

**Evolution education at Iowa State University:
Student understanding and acceptance of evolution, creationism, and intelligent
design**

by

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ABSTRACT

The issues surrounding evolution education in the United States are of key importance to biology educators. To date little research has been published measuring the understanding of and attitude toward evolution held by biology majors in the university education system. The goal of this research was to investigate the understanding and attitude toward biological evolution of particular Iowa State University students, while simultaneously detecting any change over time due to instruction. Subjects included students in a freshman level introductory biology course for biology majors, and seniors having majored in Biology or Genetics. The survey instrument used both quantitative and qualitative measures to determine students' understanding and attitude. The results show that students' understanding of particular evolutionary concepts does improve with instruction, while only some measures of attitude toward evolution improved. Students were more likely to accept non-human evolution after instruction, but no more likely to accept human evolution. Additionally, students did not significantly change their theistic view after instruction. Nature of Science issues were also measured, and student understanding of the NOS did improve with instruction.

CHAPTER 1: INTRODUCTION

Students' understanding of and attitude toward biological evolution is among the most studied topics in biology education today. A quick search of either a biology or education database for the topics evolution and education will show an increase in evolution education research over time. For example, a search of Biosis Previews shows approximately 19 papers regarding evolution education were published between 1980 and 1989, 35 papers were published between 1990 and 1999, and 103 papers were published between 2000 and August 2007. Researchers in both education and biology have tackled the subject with a variety of approaches. These studies have focused on a broad spectrum of people including clergy (Colburn & Henriques, 2006), college students not majoring in the life sciences (Bishop & Anderson, 1990), college freshman and sophomores (Sinatra et al, 2003), freshman biology majors (Verhey, 2005), biology textbooks (Aleixandre, 1994), high school student teachers (Zuzovsky, 1994), and high school biology teachers (Moore & Kraemer, 2005; Osif, 1997; Tatina, 1989; Van Koevering & Stiehl 1989).

Not only has evolution education been studied in academia, it has also been debated in both the public realm and the judicial system. This debate has persisted for decades in many places across America, the most recent event in this debate being the 2005 lawsuit between the Dover Area School District and parents from the Dover area (Kitzmiller v. Dover Area School District , 2005). In order to properly understand the current situation however, it is imperative to examine the long history of the debate. The following details the major players, common arguments, and historical particulars of the debate.

A History of the Creationism/Intelligent Design Movement

Many others have written and covered the topic of creationism and evolution in books, newspapers, and peer-reviewed papers (Crouch, et al, 2006; Ruse, 2005; Scott, 2004; Pigliucci, 2002; Alters & Alters, 2001; Wilson & Dolphin, 1983). Since the 1980s at least every two years one major book or paper has been published that addresses the educational, philosophical, or historical issues of evolution education, creationism, and intelligent design. Within the last decade however, there has been an increase in the publication of books and papers that specifically deal with the subject of intelligent design.

It is important to note that some of the concepts that are used today to argue against evolution or for creationism are actually hundreds or even thousands of years old. The Bible itself is a prominent source of such concepts, but excluding that, there are several other ancient sources of creationist beliefs. The concept of design in nature is the primary example. Traced back to the early Greeks, the idea that nature was designed by god(s) has existed in many different versions, and was widely debated.

Early Works: 600 BCE – 1700 CE

Anaximander, a Greek philosopher who died around 546 BCE, was likely the first (and best known) to write about the argument from design. He spent a great deal of time considering what he called the “indefinite primal stuff” of the universe. He claimed that this primal stuff “steers all” and that this steering has led to the current state of nature. This is understood by modern philosophers to refer to something conscious and purposeful (i.e. directed by an intelligent agent) (Kirk & Raven, 1957).

Heraclitus, who lived between 535 BCE and 475 BCE, argued for the presence of design in the natural world. While he was in favor of the concept of design, he also argued against the existence of a higher power/god. "This universe, which is the same for all, has not been made by any god or man, but it always has been, is, and will be an ever-living fire, kindling itself by regular measures and going out by regular measures". His claim was that the design the Greeks observed around them was an inherent property of nature/existence (Kirk & Raven, 1957).

Another prominent Greek philosopher to tackle the idea of design in nature was Plato. He lived from 427 BCE to 347 BCE. Plato also argued that there was evidence of design in nature, but never explored it beyond the parable of creation in his dialogue *The Timaeus*. In the dialogue the character Timaeus argues that nothing “becomes or changes” without some cause. From that evidence he concludes that some demiurge(god) must be directing the universe. Some philosophers take *The Timaeus* as evidence that Plato himself was a supporter of the argument from design. While this may be true, it is important to note that the god in this dialogue does not have the ability to create something from nothing (*ex nihilo*), only to organize what already exists (Kirk & Raven, 1957).

The last Greek philosopher known to explore the concept of design in detail was Aristotle. Aristotle lived between 384 BCE and 322 BCE and was the most famous student of Plato. He also argued for the presence of design in nature, as detailed in his late writings. His examples were primarily taken from his observations of the natural world. (Kirk & Raven, 1957)

It is important to note that design was not the only concept that related to the topic of evolution and religion that the Greeks investigated. Democritus, a Greek philosopher who lived from 460 BCE to 370 BCE, is considered by many to be among the first atheists. He argued that all matter is made up of various imperishable, indivisible elements that he called "atomos," from which we derive the English word atom. He did believe in the concept of a soul, however, it was a soul that was also made up of "atomos" that he thought were similar to fire-type "atomos" (Kirk & Raven, 1957).

Later Development: 1700 CE – 1860 CE

After the Greeks, the concept of design in nature was largely assumed by the Western world. Most literature did not differ appreciably from the Greek arguments until the late 1700s. The primary sources of this newfound focus on design were from philosopher scientists in Western Europe.

Earliest among these sources is Archdeacon William Paley's argument from design in nature from 1802. Paley is cited -- even today -- for his argument that "as the telescope has a telescope maker, so likewise the eye has an eye maker . . ." (Ruse, 2005).

Other creationist arguments developed around the proto-evolutionary concepts that came about in the late 18th and early 19th centuries. Both Jean Lamarck and Erasmus Darwin argued for the inclusion of the Christian god in evolutionary thinking. If both were alive today they might be in favor of intelligent design (Ruse, 2005).

While most modern readers might assume the design argument was relegated to the British Isles, the scholars on the European mainland were coming up with their own concepts of design. The Frenchman and noted biologist Georges Cuvier might also be considered an early proponent of intelligent design or creationism. He commonly cited

the lack of intermediate forms in the fossil record as evidence against evolution. His theory of Catastrophism suggested that the fossil record was a result of major destructive events, such as worldwide floods. These events wiped out almost all life, and migration occurred to fill in all the newly empty space (Ruse, 2005).

In the 1820s a group of clergy who were keenly interested in scientific ideas regarding design and evolution began meeting in England. This group consisted of prominent geologists William Buckland and Adam Sedgwick, botanist John Henslow, and the mineralogist and science writer William Whewell. The group took Cuvier's works and pushed toward design being the crucial link between science and religion. Using the fossil record, and more generally biological progression, as proof of God's divine plan was an extremely attractive proposition (Ruse, 2005).

This was the backdrop that Charles Darwin returned to in England after his five year voyage on the HMS Beagle. Arriving home in 1836, Darwin would spend the next 23 years compiling his thoughts on evolution and natural selection. Several times toward the end of those 23 years Darwin would test the waters to see how the scientific community would react to his ideas. The final piece of encouragement that Darwin needed to publish his work was competition from Alfred Russel Wallace, a fellow biologist. Once Darwin's work *The Origin of Species* was published, he encountered a public reaction that was both intensely positive and negative. Religious scholars and scientists hotly contested the validity of his theory of natural selection, while other scientists and noblemen vigorously defended it and his overwhelming evidence for evolution (Ruse, 2005).

While the initial reaction to Darwin's concept of evolution via natural selection contained a great deal of dissent, by 1865 it was a required part of completing a science degree at both Oxford and Cambridge. The fact that previous concepts of evolutionary theory had been discussed for decades prior to Darwin's book is cited as a primary reason for Darwin's evolutionary theory showing having a relatively rapid acceptance by both the scientific field and the public in Great Britain (Ruse, 2005). This acceptance would not, however, transfer to the fledgling nation of the United States of America.

The Shift to America: 1860 CE – 1957 CE

In the U.S., evolution had an advocate in Asa Gray, the noted Harvard Botanist. While Gray was an ardent proponent of evolutionary theory, he was a theistic evolutionist. He maintained that the natural selection was directed process, and that director was God. On the opposing side in the U.S. was Louis Agassiz. Also of Harvard, Agassiz debated Gray over the topic of evolution several times in the 1860's. Perhaps the most prominent American biologist of the day, Agassiz resisted evolution to his death, instead subscribing to a version of Catastrophism theory based on ice-ages (Ruse, 2005).

Eventually evolution became widely accepted in academic circles, if not public circles, and the debate between creationism and evolution went quiet. This quiet lasted approximately 50 years, with the reawakening around the time of the First World War. The debate began again in America, with the first major event being the trial of John T. Scopes.

The Scopes trial (see page 11, Political and Legal History) signaled to the Protestant fundamentalist movement in America that they had a mission. They had already published several books and pamphlets stating that the Bible was without error

and the word of God. Some of the authors held clearly theistic views of evolution, but those pamphlets were removed from circulation and the movement proceeded to become distinctly anti-evolution (Scott & Branch, 2006).

This anti-evolution mentality was encouraged by the effects and suspected causes of World War I. Many in the fundamentalist community saw the war as a sign that humanity needed to return the values and teachings of the Bible. These were some the underlying factors in American society that lead to the passage of the Butler Act in 1925 and the subsequent trial of John Scopes as a publicity stunt. Much later during World War II, many believed that Germany had come to their concepts of racial superiority and eugenics directly from their acceptance of and research into evolution. This only encouraged those in America suppressing evolution (Ruse, 2005).

After the trial, several other states attempted to pass anti-evolution laws, but only a few succeeded. After 1926 it was not the legal system that pushed evolution to the sidelines, it was capitalism. Those in charge of textbook selection in the southern states preferred books that either barely mentioned or entirely omitted evolution. This economic pressure forced the textbook companies to change their product, which were sold not only to the South, but to the entire U.S. school system. Thus quietly and quickly, evolution disappeared from K-12 education in America (Scott & Branch, 2006).

Modern Development: 1957 – Present Day

It was not until the launch of the Russian satellite Sputnik-1 in 1957 that evolution education again received significant attention in America. The U.S.-Russia space race was heating up, and America was thought to be seriously lagging behind in science education. To remedy this, the federal government began a textbook development

program aimed at bringing education at the K-12 level up to date. These textbooks largely reflected the way science was taught at the university level, thus biological evolution was naturally included. Evolution was featured prominently in National Science Foundation supported biology curriculum projects of the 60s , immediately drawing a reaction from the long quiet fundamentalist movement (Scott & Branch, 2006).

The reaction of the creationist community to evolution returning to the educational system was to attempt to produce scientific data that competed with the theory of Evolution. This shift in strategy came about due the lack of progress in the legal arena. In 1960 John C. Whitcomb (with assistance from Henry Morris) published the book *The Genesis Flood*. In their book Morris and Whitcomb claimed scientific evidence that the flood mentioned in the Bible actually occurred as described. They also stated that their evidence supported a 10,000 year old or younger Earth, which they claim contradicts evolutionary theory. In actuality, it contradicts data from geology as well as the known decay rate of radioactive materials. Henry Morris continued to work against the teaching of evolution after the publishing of his first book by founding the Creation Research Society in 1963 and the Institute for Creation Research in 1972, and by later publishing many more books on the topic of evolution and creationism (Scott & Branch, 2006).

This push toward creation science led to several “equal time” laws being pushed in state legislatures. Equal time laws were laws that required that creation science and evolution science be given exactly the same amount of instructional time in public schools. Eventually this resulted in the Supreme Court ruling in *Epperson v. Arkansas* in 1968 (see page 11, Political/Legal History). The ruling in that case and similar cases

focused on keeping state and federal government out of religious matters and lead to the Lemon and Endorsement tests (see page 11 Political/Legal History). The legal rulings of the next decade forced the creationist movement to switch tactics. They moved from wanting equal time for creation science, to wanting equal time for intelligent design. Initially, Intelligent Design Theory (ID) was advanced by the conservative Christian non-profit organization The Foundation for Thought and Ethics (FTE). The FTE is responsible for several books on the topic of creationism and intelligent design including *The Mystery of Life's Origin* and the more well-known *Of Pandas and People: The Central Question of Biological Origins* (also called *The Design of Life: Discovering Signs of Intelligence in Biological Systems*) which was initially a textbook covering creation science. Their work however, would largely go unnoticed until the late 1990's (Scott & Branch, 2006).

Phillip Johnson picked up the ID flag in 1991 with the publication of his book *Darwin on Trial*. The significance of this book is that it was far more mainstream in its release than any of the books published by Henry Morris. Johnson himself is largely credited with inspiring the anti-evolution movement to solidify and show a united front against evolution (Scott & Branch, 2006).

The next major player to appear in the debate was the Discovery Institute (DI). This think tank was founded by former Republican politician Bruce Chapman in 1990 and currently serves as the primary base for the ID movement. The DI sponsors research in ID, produces publications on ID, and encourages legal action promoting ID. The legal actions primarily take the form of bills put forth before state legislatures (Scott & Branch,

2006). With the failure of ID in Dover PA (Kitzmiller v. Dover Area School District , 2005) the DI has taken yet another approach, “teach the controversy”.

The current perspective of the ID and creationist movement is to teach the controversy that they claim exists in evolutionary theory. This takes various forms from pressuring teachers to have their students “critically analyze” evolution to “teaching evolution as theory not fact.”

It is critically important to keep in mind that this issue of teaching evolution, creationism, and intelligent design is a science education controversy, not a science controversy. Scientists have long agreed that evolution is a proper field of research and an integral part of biology. It is only in the sphere of education that any noteworthy disagreement occurs.

All of the arguments put forth by creationist, ID proponents, and fundamentalists have failed when put under the legal microscope. This has not been for lack of trying however. The major legal and political events that parallel the development of creationism and ID are important to discuss as well, and follow in the next section.

Political and Legal History

The first significant American anti-evolution law was passed in 1925 in Tennessee. This law was named the Butler Act, and it made illegal teaching of any theory that denied the biblical creation story. One year later the famous Scopes monkey trial began and ended with John T. Scopes being convicted of teaching evolution. The Tennessee Supreme Court eventually reversed the conviction, but only because of a technicality, not because of any violation of the 1st Amendment.

Three years after Tennessee passed their anti-evolution law, Arkansas passed their own version that did not mention the bible at all; it simply made teaching evolution illegal. This law, and several like it in other states, stayed on the books until the 1960s when an Arkansas biology teacher obtained an injunction against the law. This eventually led to the U.S. Supreme Court hearing the case and deciding that the law was unconstitutional as it violated the 1st Amendment.

This decision and several others by the Supreme Court lead to the development of the Endorsement Test and the Lemon Test in regards to violations of the 1st Amendment. The Endorsement Test states the following: “when the government transgresses the limits of neutrality and acts in ways that show religious favoritism or sponsorship, it violates the Establishment Clause” (Kitzmiller v. Dover Area School District , 2005). The Lemon Test is actually made up of three tests, more commonly referred to as the three prongs. The three prongs of the Lemon Test are:

1. The government's action must have a legitimate secular purpose
2. The government's action must not have the primary effect of either advancing or inhibiting religion
3. The government's action must not result in an "excessive entanglement" with religion.

In 1981, Arkansas attempted to write a law that would pass all of the tests laid out by the Supreme Court. This law required that public schools give “. . . balanced treatment to creation-science and to evolution-science” (Annas, 2006). One year later, a Federal court found that the Arkansas definition of ‘creation-science’ was biblically based and thus unconstitutional as its primary purpose was religious, not secular.

Almost immediately following that decision, a Louisiana law named the “Creationism Act” reached the Supreme Court in the case of *Edwards v. Aguillard*. This law forbade the teaching of evolution unless creation-science was taught as well. The Court struck the law down saying it had a clear religious purpose and violated the 1st Amendment.

More recently, the strategy of passing state-level laws in favor of creationism or intelligent design has been replaced by attempts to influence local school boards. School policies, and the subsequent lawsuits they inspire, have primarily dealt with intelligent design as an alternative to evolution. The version of intelligent design being put forth varies from case to case, but they share the common thread of implying that the diversity of life is too complex to have arisen via evolutionary processes. The first legal challenge involving intelligent design was the Dover case in 2005. This case was widely popularized in newspapers and in television media. Even President George W. Bush made a statement on the issue of teaching intelligent design alongside evolution, saying: “I felt like both sides ought to be properly taught”. (The Washington Post, August 3rd, 2005) For six weeks, U.S. District Court Judge John E. Jones III presided over the trial where he was presented with evidence from scientists, intelligent design proponents, school board members, parents, and many others. At issue was a resolution passed by the Dover Area School Board that stated: “Students will be made aware of gaps or problems in Darwin’s theory and of other theories of evolution, including, but not limited to, intelligent design. Note: Origins of Life is not taught” (Kitzmiller v. Dover Area School District, 2005). After hearing extensive testimony from the plaintiffs and defendants, Judge Jones concluded that intelligent design was not science, but creationism relabeled.

This led to his judgment that the policy set out by the Dover Area School Board amounted to an endorsement of religion, and the purpose of the policy was to advance/promote a specific religion (in this case, Christianity). According to the Judge, the School Board's actions clearly violated the 1st Amendment.

Previous studies of the acceptance rate of evolutionary concepts.

There has been a great deal of previous work in the area of evolution education and creationism. Many past studies investigated the percentage of their survey population that held various creationist and evolutionary positions. While no two studies measured the concept in exactly the same way, a general idea can be obtained from each study. Most studies used variations on the major categories of creationism. These categories include: Young Earth Creationism, Gap Creationism, Day-Age Creationism, Progressive Creationism, Evolutionary Creationism, Intelligent Design Creationism, and Theistic Evolutionism (Scott, 2005). This previous work has been summarized in Figure 1 and Table 1. Each column represents the percentage of the subjects holding beliefs in categories ranging from Young Earth Creationism through Theistic Evolutionism.

Ingram and Nelson collected data from college students enrolled in an upper level biology course in Evolution at a major public University in the central part of the United States in 2001 & 2002. These students were given a survey measuring their acceptance or rejection of statements regarding creationism and evolution. The average proportion of students from three semesters that strongly agreed with the statement: "A supreme being (e.g. God) created humans pretty much in their present form; humans did not evolve from other forms of life (e.g. fish and/or reptiles)" was 30% (Ingram & Nelson,

Table 1: Previous studies of rates of acceptance of evolution

Group sampled	% with creationist views	Source
College students enrolled in an upper level biology course in Evolution	30%	Ingram & Nelson, 2006
High school biology teachers in Minnesota	30%	Moore & Kramer, 2005
College students enrolled in an introductory biology course for biology majors	50%*	Verhey, 2005
general student population attending a large, public university	59%	Brem et al, 2003
U.S. adults	62%	Miller et al, 2006
Christian Clergy	74%	Colburn & Henriques, 2006

*estimated from available data

2006). While there were many questions on their survey that touch on creationist topics, this question most likely catches a majority of the ‘flavors’ of creationism. This is important to focus on as the various types of creationism have differing compatibilities with evolutionary theory.

Moore and Kramer collected their data from high school biology teachers in Minnesota during the 2003 school year. Here the teachers were given an appreciably different survey. However, the aims of the survey were quite similar to the work of Ingram and Nelson. The average proportion of teachers who responded to various questions and statements with responses reflecting creationist views was 30%. These questions and statements included: “Which statement best represents your understanding of evolution?”, “Creationism should be taught in public schools.”, and “Do you think that creationism has a valid scientific foundation?” (Moore & Kramer, 2005).

Verhey’s data came from college students enrolled in an introductory biology course for biology majors at a mid-sized public University in the northwest United States in 2003. This study utilized the creation-evolution categorization from earlier work that is very similar in structure and definition to the categories developed by Eugenie C. Scott (Scott, 2004). The value presented here is an estimate based on the graphs of the data provided in Verhey’s paper. Approximately 50% of the students held attitudes that fit into one of the creationist categories (Verhey, 2005).

In 2003 Brem collected data from college students attending a large, public university in the Western United States in 1999. The subjects were taken from the general student population and were pursuing a wide range of majors, including life science majors. While this study was primarily concerned with measuring the perceived

social consequences that students associated with having creationist or evolutionary positions, they provided an adequate measure of the students own positions. 59% of the students surveyed held views between Theistic Evolutionist and Young Earth Creationist. An additional 15% provided inconsistent or neutral responses (Brem et al, 2003).

A national survey (Miller, Scott, & Okamoto, 2006) of the opinion of evolution of 1484 U.S. adults was performed in 2005. This survey was widely publicized after its publication in both television and the national press. The question most attended to was that of “general” acceptance or rejection of evolution. That question led to the conclusion that only 39% of the U.S. holds creationist positions. However, an examination of certain specific statements that were asked on the survey revealed a more detailed view of the nation’s opinion. These statements were released in the supplemental material of the paper. The first statement was: “Over periods of millions of years, some species of plants and animals adjust and survive while other species die and become extinct.” Seventy eight percent of U.S. adults surveyed stated that was true. The second statement was: “Human beings were created by God as whole persons and did not evolve from earlier forms of life”. Sixty two percent of U.S. adults surveyed stated that was true. These data lead to the conclusion that at least 62% of the nation holds viewpoints between Theistic Evolutionist and Young Earth Creationist (Miller, Scott, & Okamoto, 2006 ~ supplemental material).

Colburn and Henriques did a study in 2006 in which they collected data from Clergy who are members of a Western U.S. Christian ecumenical council. Subjects included Catholics, Lutherans, Methodists, and other Christian denominations. Seventy-four percent of the clergy surveyed agreed with the concept that God must play a role in

the creation of life and the evolution of life. An inspection of the other relevant data in the paper reveals that the clergy held notably variable viewpoints along the creationist-evolutionist continuum (Colburn & Henriques, 2006).

Even given all of the previous work that has been done, there are still things about evolution education that educators, researchers, and the public do not understand. This study serves as one more step toward improving science education in America. Specifically, the goal of this research is to gain an understanding of the status of biology majors at Iowa State University regarding their knowledge and acceptance of evolutionary theory. Only after we comprehend what the students do and do not understand, what preconceptions and misconceptions they have, and what their theistic views are can we start to improve our teaching methods and practices.

CHAPTER 2: METHODS

The subjects of this study consisted of students enrolled at Iowa State University, in Ames, Iowa. We selected those students who fell into one of two groups; incoming freshman enrolled in the majors section of an introductory biology course or seniors graduating with degrees in Biology, Genetics, or multiple degrees including either Biology or Genetics. The introductory course is listed as Biol 211 – Principles of Biology I in the Iowa State University course catalog, with the following description: “Introduction to the nature of life, including the cellular basis of life; the nature of heredity; evolution; diversity of microbial, plant, and animal life; and principles of ecology. Intended for life science majors.” This course is specifically aimed at all life science majors, including biology, genetics, agronomy, microbiology, etc. Most students

who take this course also take the associated lab course (Biol 211L), where diverse topics, including evolution, are discussed in a laboratory setting.

The freshman subjects were selected for two reasons: to provide a point of comparison with the senior students in regards to knowledge and opinion of evolution and to serve as study group for a before/after comparison with themselves. Additionally, these subjects were examined to determine the efficacy of the majors section of the Biology 211 lecture course in regard to improving their understanding of the theory of evolution and changing their attitudes toward evolution. Senior subjects were selected as a point of comparison for the freshman subjects, and to ascertain the status of the quality of education in the field of biology that they received. Only those seniors who had declared majors of biology or genetics were sampled because those are the only majors at Iowa State University where the student is required to complete an upper-level course in biological evolution.

A survey was developed to administer to the subjects. (Appendix A) The survey consisted of five questions that test basic knowledge of evolutionary concepts and 10 questions that measure attitude toward evolution, creationism, intelligent design, public policy regarding evolution education, and the nature of science. Following each question a space was provided for the subject to elaborate on their choice in a text-response format.

Freshman subject samples were collected from an introductory biology course during the fall semester of 2006. Samples were collected twice, during the first 14 days of the course, and during the final 14 days of the course. The first sample was collected prior to any course-related instruction on the theory of evolution. Four separate samples

were collected of seniors and then pooled together for analysis. These samples were collected during the 14 days prior to the official graduation date during the spring 2006, summer 2006, fall 2006, and spring 2007 semesters.

Surveys were administered using WebCT (Blackboard) software. Senior subjects were enrolled in a stand-alone online course that contained the survey. This course was unrelated to any other course the seniors may have been taking. Freshman subjects were enrolled in a stand-alone online course that was separate from their introductory course. Once enrolled, subjects were able to access the survey at any time during the 14 day study periods. Subject responses were downloaded from the WebCT database into Microsoft Word and Excel files for later analysis.

Eighty-two of a possible 162 surveys (50.6%) were collected from the freshman subjects during the first 14 day sample. Thirty-two of those surveys were completed by males and 50 were completed by females. This sample group is referred to as “Freshman Pre-Instruction”. One hundred and twenty-two of a possible 153 surveys (79.7%) were collected from the freshman from the second 14 day sample. Forty-three of those surveys were completed by males and 79 by females. This sample group is referred to as “Freshman Post-Instruction”. A total of 61 of a possible 142 surveys (42.9%) were collected from the seniors. Of those 61 surveys 27 were completed by males while 34 were completed by females. Forty-six of the senior samples were from students who listed biology as at least one of their majors while the remaining 15 were from students who listed genetics as at least one of their majors. This sample group is referred to as “Seniors”.

Statistical analyses of data were ANOVA, MANOVA, ANCOVA, Pearson Correlation, and Chi-square tests. Significance was accepted at the $p < 0.05$ level, except where noted. Tukey and Tamhane's tests were conducted as post hoc analyses in ANOVA cases where assumption of homogeneity of variance could not be assumed. All statistical analyses were performed using SPSS software.

The survey was developed over a period of 9 months using several sources. The primary source material initially was an unpublished set of data and the associated survey created by Dr. James Colbert. This survey had been used by Dr. Colbert as an informal method to gauge student understanding and attitude toward evolution as well as the effectiveness of his instruction. This source was selected after a review of the questions and responses showed it to be an effective building block for the new survey. Several secondary sources provided examples of effective wording of questions, survey structure, and content. (Bishop & Anderson, 1990; Brem et al, 2003; Colburn & Henriques, 2006; Demastes et al, 1995; Ingram & Nelson, 2006; Lawson & Worsnop, 1992; Moore & Kraemer, 2005)

CHAPTER 3: RESULTS

Quantitative Results

The quantitative analysis of the data revealed several significant results, which are summarized below. Refer to Appendix B for related and additional material.

Questions 1-5

Of the 15 questions on the survey, the first 5 were designed to be a short quiz over basic evolutionary concepts. The definition of biological evolution, the elements and actions of natural selection, the definition of the phrase "Survival of the fittest", and

presence of homologous structures in evolutionary history were tested by these 5 questions. The analysis of the subject responses to these questions revealed significant differences. Each question had only one correct answer, thus the score for each question was either a 0 or a 1. Subject responses were scored between 0 and 5 where 5 represented the subject answered all 5 questions correctly and 0 represented no questions answered correctly. Each individual score was averaged together within its specific group. The results and each group's average scores are summarized in Table 2 below.

Questions 6 & 7

Questions 6 and 7 were designed to provide a transition point for the subjects between the “right & wrong” style of the first 5 questions and the more opinion-based remaining questions. Thus, these two questions can be analyzed in the same manner as the first 5 questions, or as the last 8. Due the complex nature of the analysis the decision was made to simply examine questions 6 and 7 for correlations with the rest of the survey, and examine the response frequencies by group.

Table 2: Average Scores on Evolutionary Concept Quiz

	Average Score (0 - 5)	Std. Dev.	Percentage Scoring 3/5 or Lower
Freshman Pre-Instruction	2.15 ^a	1.31	85.5%
Freshman Post-Instruction	3.47 ^b	1.17	51.6
Seniors	4.07 ^c	0.998	27.8

***a,b,c*: significantly different from each other at $p < 0.01$ using Tamhane due to violation of assumption of homogeneity of variances ($N = 265$; $F = 52.58$; $df = 2, 262$; $p = 0.000, 0.001, 0.000$)**

Table 3: Frequency Data for Question 6

6. Evolution occurs:	Freshman Pre-Instruction	Freshman Post-Instruction	Seniors
a. in individuals	1.2%	0.8	3.3
b. in all populations of organisms	80.5	91.0	82.0
c. only in populations of non-human organisms	2.4	0	0
d. only within specific kinds of organisms (e.g. distinct breeds of dogs)	4.9	1.6	0
e. under no circumstances	1.2	0	0
f. None of these answers fits my viewpoint	9.8	6.6	14.8

Table 4: Frequency Data for Question 7

7. Speciation, the origin of species,	Freshman Pre-Instruction	Freshman Post-Instruction	Seniors
a. can only occur in organisms of a similar kind	9.8%	12.3	13.1
b. has not occurred since the creation of the Earth	4.9	0	0
c. always results in more complex organisms	7.3	0.8	0
d. can occur in any population of organisms	61.0	79.5	80.3
e. None of the answers fit my basic viewpoint	17.1	7.4	6.6

Table 5: Frequency Data for Question 8

8. Biological evolution is a valid science idea	Freshman Pre-Instruction	Freshman Post-Instruction	Seniors
a. Strongly Agree	45.1%	60.7	65.6
b. Agree	37.8	29.5	23.0
c. Disagree	4.9	4.9	1.6
d. Strongly Disagree	3.7	2.5	3.3
e. I don't understand the question / f. None of the answers fit my basic viewpoint	8.5	2.5	6.6

Regarding the correlations, no significant correlation effects were observed between questions 6 or 7 and any other question on the survey. The frequencies for each questions' responses are reported below in Table 3 and in Appendix B. In viewing the frequency data for question 6, it is important to note that there are fewer subjects selecting answers c, d, or e as the subjects' educational level increases. It is unclear if this effect due to the subjects' instruction in biology, other educational experiences, college in general, or some other factor. The frequency data for question seven (Table 4) reveals a drop in the belief that speciation has not occurred (and is not occurring) on Earth and a reduction in the percentage of subjects who hold a common misconception about the evolutionary process. Namely that evolution, through natural selection, always produces better and more complex organisms than those that came before.

Question 8

This question began the section of the survey where the subjects were asked to express their opinion on various topics in an Agree-Disagree format. Questions 8 through 12 use this format. Question 8 specifically asked the subject to respond to the statement: Biological evolution is a valid science idea. Table 5 details each groups overall response to this question.

Results of the One-Way ANOVA indicate no significant differences between the three subject group responses on this question. ($N = 251$; $F = 2.14$; $df = 2, 248$; $p = 0.706, 0.290, 0.116$) The correlation analysis & MANOVA(detailed below) showed several significant relationships between the response to this question and other questions. In all groups, those subjects who answered Agree/Strongly Agree were more likely ($p < 0.05$) to score highly on the 5 question quiz. Additionally, those subjects who answered Agree/Strongly Agree to question 8 were more likely ($p < 0.05$) to answer Disagree/Strongly Disagree that the Earth is 6,000-10,000 years old, and Disagree/Strongly Disagree that evolution is “just a theory”. The groups separated out on two questions. Those Freshman Pre-Instruction and the Senior subjects who answered Agree/Strongly agree to question 8 were more likely ($p < 0.05$) to Agree/Strongly Agree that both humans and non-humans have evolved. Those Freshman Post-Instruction subjects who answered Agree/Strongly agree to question 8 were only more likely ($p < 0.05$) to Agree/Strongly Agree that humans evolved. No significant correlation exists between the Freshman Post-Instruction responses to question 8 and their opinion of the occurrence of non-human evolution.

Question 9

The ninth question of the survey asked the subject to respond to the statement:
The Earth is approximately 6,000 – 10,000 years old. Table 6 lists the frequency data for this question across all subject groups.

Correlations between question 9 and questions 10, 11, and 12 were detected. For all subjects, those that selected Agree/Strongly Agree to question 9 were more likely ($p < 0.05$) to Agree/Strongly Agree that evolution is “just a theory”. Those Freshman Pre-Instruction and the Senior subjects who answered Agree/Strongly agree to question 9 were more likely ($p < 0.05$) to Disagree/Strongly Disagree that both humans and non-humans have evolved. Those Freshman Post-Instruction subjects who answered Agree/Strongly agree to question 9 were only more likely ($p < 0.05$) to Agree/Strongly Agree that humans evolved. No correlation exists between the responses of the Freshman Post-Instruction to question 9 and their opinion of the occurrence of non-human evolution

Table 6: Frequency Data for Question 9

9. The Earth is approximately 6,000 – 10,000 years old	Freshman Pre-Instruction	Freshman Post-Instruction	Seniors
a. Strongly Agree	6.1%	3.3	3.3
b. Agree	13.4	9.8	1.6
c. Disagree	20.7	14.8	13.1
d. Strongly Disagree	53.7	59.8	68.9
e. None of the answers fit my basic viewpoint	6.1	12.3	13.1

Table 7: One-Way ANOVA on Question 9

	N	Mean	Std Dev	Freshman Pre-Instruction	Freshman Post-Instruction	Seniors
Freshman Pre-Instruction	77	1.7	0.947	X	0.380	0.019*
Freshman Post-Instruction	107	1.5	0.840	0.380	X	0.291
Seniors	53	1.3	0.696	0.019*	0.291	X

***Significant at the $p < 0.05$ level using Tamhane as a post hoc test**

A One-Way ANOVA revealed that there are significant differences between the responses given by the Freshman Pre-Instruction and the Senior subjects. ($N = 237$; $F = 3.53$; $df = 2, 234$; $p = 0.019$) No significant differences were detected between any other combinations of the groups. These results are detailed in Table 7. The sample sizes for the ANOVA are smaller than the full sample due to the need to remove the “None the above” responses to perform the analysis. The means were calculated by assigning a value to the responses where 4 = Strongly Agree, 3 = Agree, 2 = Disagree, and 1 = Strongly Disagree.

Question 10

Question 10 was focused on estimating the subjects’ understanding of the word “theory”. Each subject was asked to respond to the statement: Biological evolution is just

a theory, and therefore unlikely to be correct. Table 8 contains the frequency data for all groups responses to question 10.

Correlations between question 10 and questions 11 and 12 were detected. For all subjects, those that selected Agree/Strongly Agree to question 10 were more likely ($p < 0.05$) to Disagree/Strongly Disagree that both humans and non-humans have evolved. This is the only question where the Freshman Post-Instruction group did not separate out on the topic of human/non-human evolution. On every other question, the Freshman Post-Instruction showed no correlation between their answers and their opinion of non-human evolution.

A One-Way ANOVA revealed that there are significant differences between the responses given by the Freshman Pre-Instruction and the Freshman Post- Instruction, and the Freshman Pre-Instruction and the Senior subjects. ($N = 238$; $F = 9.89$; $df = 2, 235$; $p = 0.001, 0.005$) No significant differences were detected between the Freshman Post-Instruction and the Senior subjects. These results are detailed in Table 9. Again, the sample sizes for the ANOVA are smaller than the full sample due to the need to remove “None the above” and “I don’t understand” responses to perform the analysis. The means were calculated by assigning a value to the responses where 4 = Strongly Agree, 3 = Agree, 2 = Disagree, and 1 = Strongly Disagree.

Questions 11 & 12

Questions 11 and 12 were designed to measure subject opinion of evolution in non-humans and humans, respectively. For question 11 each subject was asked to respond to the statement: Non-human species have evolved. (i.e. undergone biological evolution). Question 12 used the statement: Humans have evolved. (i.e. undergone

Table 8: Frequency Data for Question 10

10. Biological evolution is just a theory, and therefore unlikely to be correct.	Freshman Pre-Instruction	Freshman Post-Instruction	Seniors
a. Strongly Agree	1.2%	0	0
b. Agree	8.5	3.3	3.3
c. Disagree	41.5	27.0	29.5
d. Strongly Disagree	31.7	64.8	55.7
e. I don't understand the question / f. None of the answers fit my basic viewpoint	17.1	4.9	11.5

Table 9: One-Way ANOVA on Question 10

	N	Mean	Std Dev	Freshman Pre-Instruction	Freshman Post-Instruction	Seniors
Freshman Pre-Instruction	68	1.75	0.699	X	0.001*	0.005*
Freshman Post-Instruction	116	1.35	0.548	0.001*	X	0.848
Seniors	54	1.41	0.567	0.005*	0.848	X

***Significant at the $p < 0.05$ level using Tukey HSD as a post hoc test**

biological evolution). Table 10 contains the frequency data for all groups responses to question 11 and Table 12 contains the frequency data for all groups responses to question 12.

A correlation between questions 11 and 12 was detected. For all subjects, those that selected Agree/Strongly Agree to question 11 were more likely ($p < 0.05$) to Agree/Strongly Agree that humans have evolved.

The One-Way ANOVA revealed significant differences between the subject groups on question 11 only. ($N = 256$; $F = 4.72$; $df = 2, 253$; $p = 0.044, 0.029$) No significant differences were detected between the groups on question 12. ($N = 250$; $F = 2.06$; $df = 2, 247$; $p = 0.378, 0.620, 0.137$) The significant differences on question 11 consisted of differences between the Freshman Pre-Instruction and the Freshman Post-Instruction subjects, and between the Freshman Pre-instruction and the Senior subjects. These results are detailed in Tables 11 and 13 respectively. As previously mentioned, the sample sizes for the ANOVA are smaller than the full sample due to the need to remove “None the above” and “I don’t understand” responses to perform the analysis. The means were calculated by assigning a value to the responses where 4 = Strongly Agree, 3 = Agree, 2 = Disagree, and 1 = Strongly Disagree.

Question 13

This question was the first of the final three questions of the survey. These three questions used a variable set of responses, each with specific details relevant to the question. Question 13 sought to provide the subjects an opportunity to express their

Table 10: Frequency Data for Question 11

11. Non-human species have evolved.	Freshman Pre-Instruction	Freshman Post-Instruction	Seniors
a. Strongly Agree	48.8%	68.1	70.5
b. Agree	35.4	29.4	26.2
c. Disagree	7.3	0.8	0
d. Strongly Disagree	2.4	1.7	1.6
e. I don't understand the question / f. None of the answers fit my basic viewpoint	6.1	2.5	1.6

Table 11: One-Way ANOVA on Question 11

	N	Mean	Std Dev	Freshman Pre-Instruction	Freshman Post-Instruction	Seniors
Freshman Pre-Instruction	77	3.39	0.746	X	0.044*	0.029*
Freshman Post-Instruction	119	3.64	0.593	0.044*	X	0.947
Seniors	60	3.68	0.567	0.029*	0.947	X

***Significant at the $p < 0.05$ level using Tamhane as a post hoc test**

Table 12: Frequency Data for Question 12

12. Humans have evolved.	Freshman Pre-Instruction	Freshman Post-Instruction	Seniors
a. Strongly Agree	39.0%	50.8	63.8
b. Agree	42.7	34.4	29.3
c. Disagree	8.5	4.9	1.7
d. Strongly Disagree	3.7	4.1	5.2
e. I don't understand the question / f. None of the answers fit my basic viewpoint	6.1	5.7	4.9

Table 13: One-Way ANOVA on Question 12

	N	Mean	Std Dev	Freshman Pre-Instruction	Freshman Post-Instruction	Seniors
Freshman Pre-Instruction	77	3.25	0.781	X	0.378	0.116
Freshman Post-Instruction	115	3.40	0.781	0.378	X	0.620
Seniors	58	3.52	0.778	0.116	0.620	X

opinion on the teaching of evolution, Intelligent Design, and creationism in public college science classes. The question first presented the subjects with the following statement: In the U.S. today there is a great deal of public debate over the teaching of biological evolution in public college science classes. Other ideas such as Intelligent Design/Creationism have been put forth as an alternative. The subjects then had 10 possible responses to select from. These responses provided a gradient of options from only evolution being taught, to none of the above being taught. The responses and the frequency of the subject selection of those responses are detailed in Table 14.

A Chi-Square analysis on the responses to question 13 showed a significant change in subject response choice. Taking the responses of the Freshman Pre-Instruction, the Freshman Post-Instruction and the Seniors as a progression over time, as time in the college educational system increases, the rate of subject selection of responses b and c decreases while the selection of responses e and g increases. This is also detailed in Table 14.

Question 14

Question 14 was intended to provide the subjects an opportunity to express their opinion the lack of acceptance of evolution in the general U.S. population. The question first presented the subjects with the following statement: Biological evolution is overwhelmingly accepted within the scientific community. It has been for decades. A majority of the American public however, does not accept the idea. How do you account for this? The subjects then had 8 possible responses to select from. These responses provided several distinct options that reflect various explanations that have been given for

Table 14: Frequency Data and Chi-Square analysis for Question 13

13. In the U.S. today there is a great deal of public debate over the teaching of biological evolution in public college science classes. Other ideas such as Intelligent Design/Creationism have been put forth as an alternative.	Freshman Pre-Instruction	Freshman Post-Instruction	Seniors
a. Neither biological evolution nor Intelligent Design/Creationism should be taught in College science classes.	0%	1.6	0
b. Both biological evolution and Intelligent Design/Creationism should be taught in college science classes and given equal time.	31.7*	16.4*	13.1*
c. Both biological evolution and Intelligent Design/Creationism should be taught in college science classes but Evolution should be given more time.	19.5*	12.3*	4.9*
d. Both biological evolution and Intelligent Design/Creationism should be taught in college science classes but Intelligent Design/Creationism should be given more time.	2.4	0.8	0

Table 14: (continued)

e. Only biological evolution should be taught in public college science classes.	4.9*	16.4*	14.8*
f. Only Intelligent Design/Creationism should be taught in public college science classes.	1.2	0.8	0
g. Only biological evolution should be taught as a valid scientific idea, but Intelligent Design/Creationism might be addressed to educate students about the nature of science and why Intelligent Design/Creationism is not accepted by the scientific community.	15.9*	39.3*	45.9*
h. I don't know enough about this subject to make a choice.	11.0	4.1	3.3
i. None of these choices fits my basic viewpoint. (If you select this, please write what your viewpoint is in the space below)	3.7	1.6	9.8
j. A combination of choices fits my basic viewpoint. (If you select this, please write what your viewpoint is in the space below.)	9.8	6.6	8.2

***Significant trend relationship at $p < 0.05$ (N = 265, df = 14, $p = 0.001$)**

this disparity in the past. The responses and the frequency of the subject selection of those responses are detailed in Table 15.

A Chi-Square analysis on the responses to question 14 showed a significant change in subject response choice. Again taking the responses of the Freshman Pre-Instruction, the Freshman Post-Instruction and the Seniors as a progression over time, as time in the college educational system increases, the rate of subject selection of responses c, e, and f decreases while the selection of responses a and h increases. This is also detailed below in Table 15.

Question 15

This question was designed to allow to the subjects to self-identify with the view of the origin of the diversity of the Earth that they most agreed with. The possible answers were based on the categorization scheme in Eugenie Scotts' book, *Evolution vs. Creationism: An Introduction*. The number of possible groups was reduced to six, with five being actual categories and one being a "none of the above"-type answer. The subject response and the associated frequencies are reported in Table 16.

A correlation analysis showed relationships between question 15 and questions 8, 9, 10, 11, 12, and the total quiz score. Those Freshman Pre-Instruction subjects that selected answers that were "more evolutionist" (e.g. responses d & e) were more likely to score highly on the five question quiz. The Freshman Pre-Instruction and Senior subjects that selected the "more evolutionist" answers were more likely to Agree/Strongly Agree with the statement that evolution is a valid science idea. The Freshman Pre-Instruction and Senior subjects that selected the "more evolutionist" answers were also more likely to

Table 15: Frequency Data for Question 14

14. Biological evolution is overwhelmingly accepted within the scientific community. It has been for decades. However, a majority of the American public does not accept the idea. How do you account for this?	Freshman Pre-Instruction	Freshman Post-Instruction	Seniors
a. This is due to a lack of public understanding regarding what science is and how it works.	6.1%*	23.0*	19.7*
b. This is due to a lack of effort from the scientific community to educate the public.	1.2	1.6	0
c. This is due to a real conflict between science and religion.	35.4*	14.8*	11.5*
d. This is due to a perceived conflict between science and religion.	23.2	31.1	27.9
e. This is due to strong cultural influences acting upon the public.	9.8*	4.1*	1.6*
f. I don't know enough about this subject to make a choice.	8.5*	0.8*	1.6*
g. None of these choices fits my basic view point. (If you select this, please write what your viewpoint is in the space below.)	7.3	2.5	4.9
h. Or a combination of choices fits my basic viewpoint. (If you select this, please write what your viewpoint is in the space below.)	8.5*	22.1*	32.8*

***Significant trend relationship at $p < 0.05$ (N = 265, df = 10, $p = 0.001$)**

Agree/Strongly Agree with the statements that humans and non-humans have evolved. The Freshman Post-Instruction subjects that selected the “more evolutionist” answers were also more likely to Agree/Strongly Agree with the statements that evolution is good science and that humans have evolved. The Freshman Post-Instruction subjects’ responses did not however, show any relationship with their opinion of non-human evolution. All three subject groups showed a correlation where the subjects that selected the “more evolutionist” answers were also more likely to Disagree/Strongly Disagree that evolution is “just a theory” and that the Earth is 6,000 to 10,000 years old.

A Chi-Square analysis of the responses to question 15 showed no significant relationship between a subjects’ response and their group (e.g. Freshman Pre-Instruction).

An ANCOVA was performed on the responses to question 15 as the independent variable on the subjects’ total score on the quiz with group as a covariate. This revealed that the subjects group accounted for the most variance in the total quiz score (25.8%). The subjects’ response to question 15 accounted for only 3.9% of the variance. This analysis is detailed in Table 17.

MANOVA

A MANOVA was performed on the subjects’ group and total quiz score with questions 8, 10, and 15. Taken together, only the subjects’ total quiz score had a significant impact on how they answered questions 8, 10, and 15. Additionally, when all three questions are taken together, the subjects’ group had no significant influence on how they answered question 8, 10, and 15. These results are detailed in Table 18 below.

Table 16: Frequency Data for Question 15

15. Please read all of the following options, then select the one that is closest to your perspective.	Freshman Pre-Instruction	Freshman Post-Instruction	Seniors
a. The Earth is young (6,000 - 10,000 years), with each of the six days of Genesis/ Creation being 24-hour days. God created each kind of organism in its present form.	7.3%	4.1	3.3
b. The Earth is ancient (many millions of years), with each of the six days of Genesis/Creation being long periods of time (thousands or millions of years). God created each kind of organism in its present form.	8.5	10.7	6.6
c. The Earth is ancient (many millions of years). Biological evolution occurs, but God has intervened at critical points. God created species through the laws of nature.	28.0	28.7	19.7
d. The Earth is ancient (many millions of years). Biological evolution describes a natural process that produces species without reliance upon intervention from God. Biological evolution neither supports nor denies the existence of God.	31.7	41.0	55.7
e. The Earth is ancient (many millions of years). Biological evolution occurs as a natural process to produce species. Biological evolution supports the idea that God does not exist.	6.1	5.7	1.6
f. None of these options fit my perspective. If you select this answer, please describe your perspective, in as much detail as you can, in the following text box.	18.3	9.8	13.1

Table 17: ANCOVA on Quiz Score with Question 15 as the Independent Variable and Group as the Covariate

Source	<i>df</i>	Mean Square	F	<i>p</i>	Partial Eta Squared
Corrected Model	6	25.254	18.288	0.001	0.298
Intercept	1	49.992	36.202	0.001	0.123
Group	1	123.902	89.725	0.001	0.258
Question 15	5	2.916	2.112	0.064	0.039

***R Squared = 0.298 (Adjusted R Squared = 0.282)**

Table 18: Manova Analysis on Group and Quiz Score with questions 8, 10, and 15

Source	Pillai's Trace	F	<i>df</i>	<i>p</i>
Group	0.040	1.451	6, 422	0.194
Quiz Score	0.136	2.009	15, 636	0.013*
Group X Quiz Score	0.159	1.317	27, 636	0.132

***Significant at $p < 0.025$**

When each question is taken separately, however, differences in significance appear. Subject group membership showed a significant relationship ($p < 0.05$) to the responses to question 10. Subject total quiz score showed a significant relationship ($p < 0.05$) to the responses of both question 8 and question 10. Subjects with a high total quiz score were likely to Agree/Strongly Agree that biological evolution is a valid science idea. Subjects with a high total score were also likely to Disagree/Strongly Disagree that biological evolution is just a theory. This data is detailed in Figures 1, 2, 3, & 4.

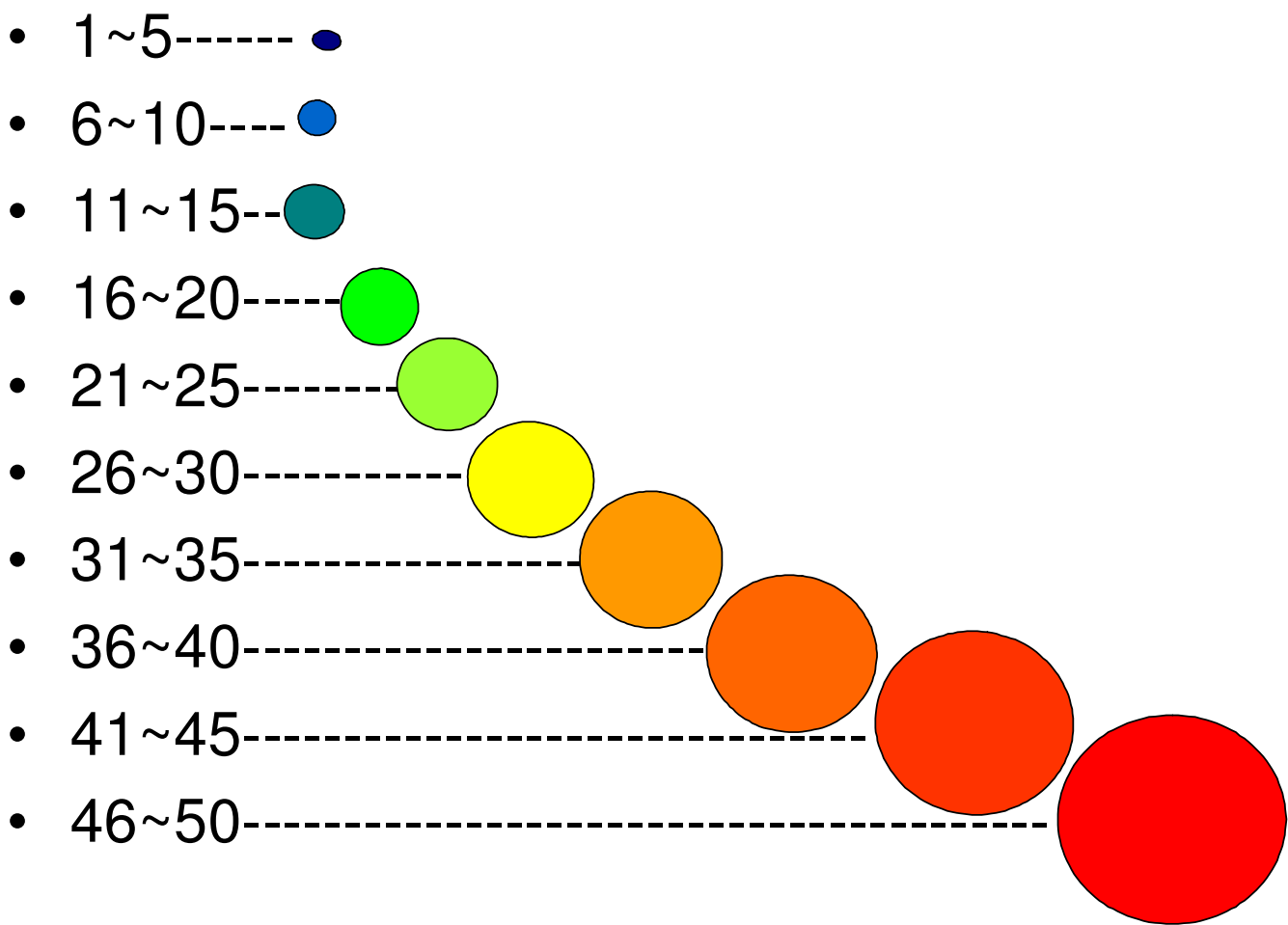


Figure 1: MANOVA Graphical Key

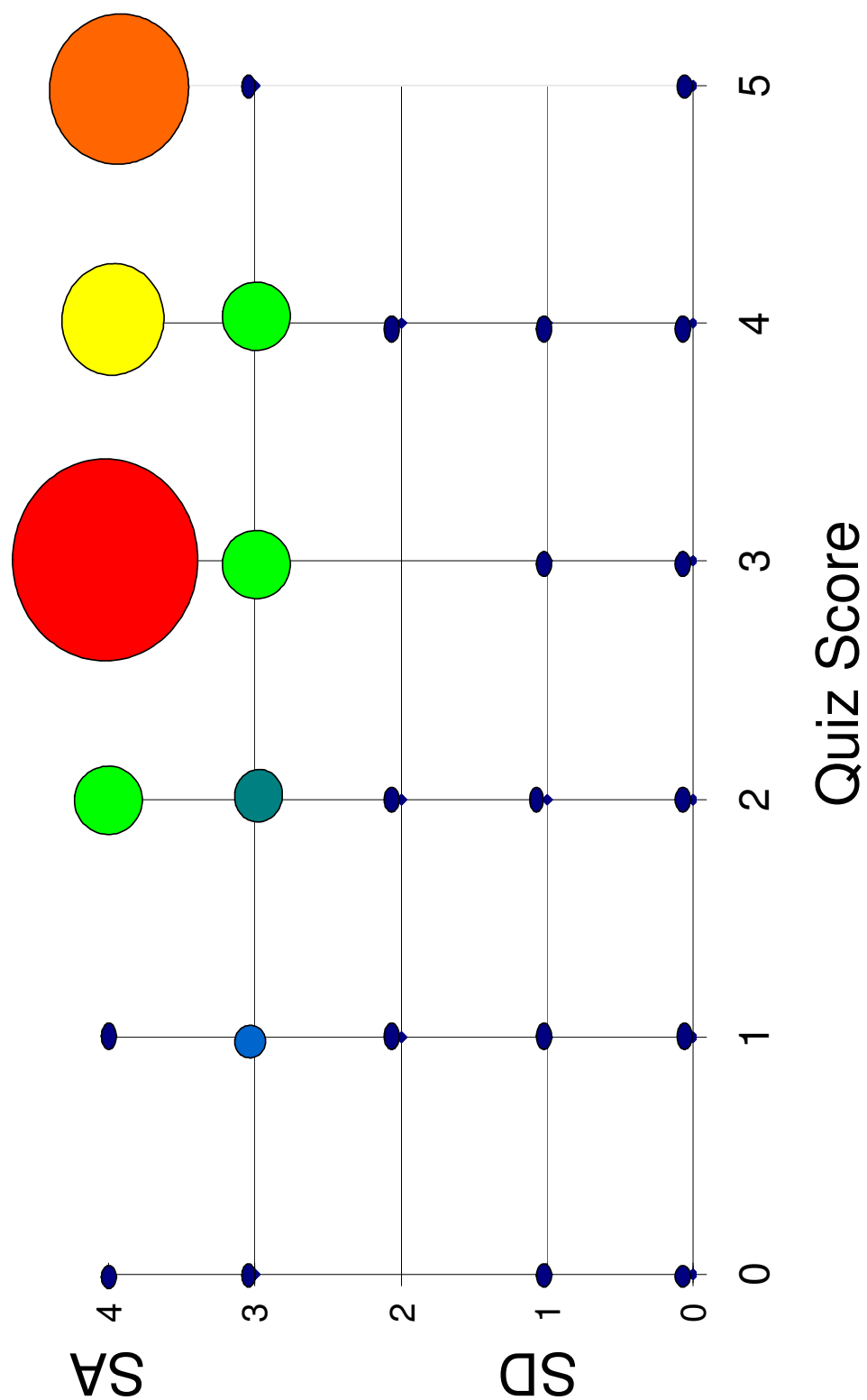


Figure 2: MANOVA on Response to Question 8 by Quiz Score

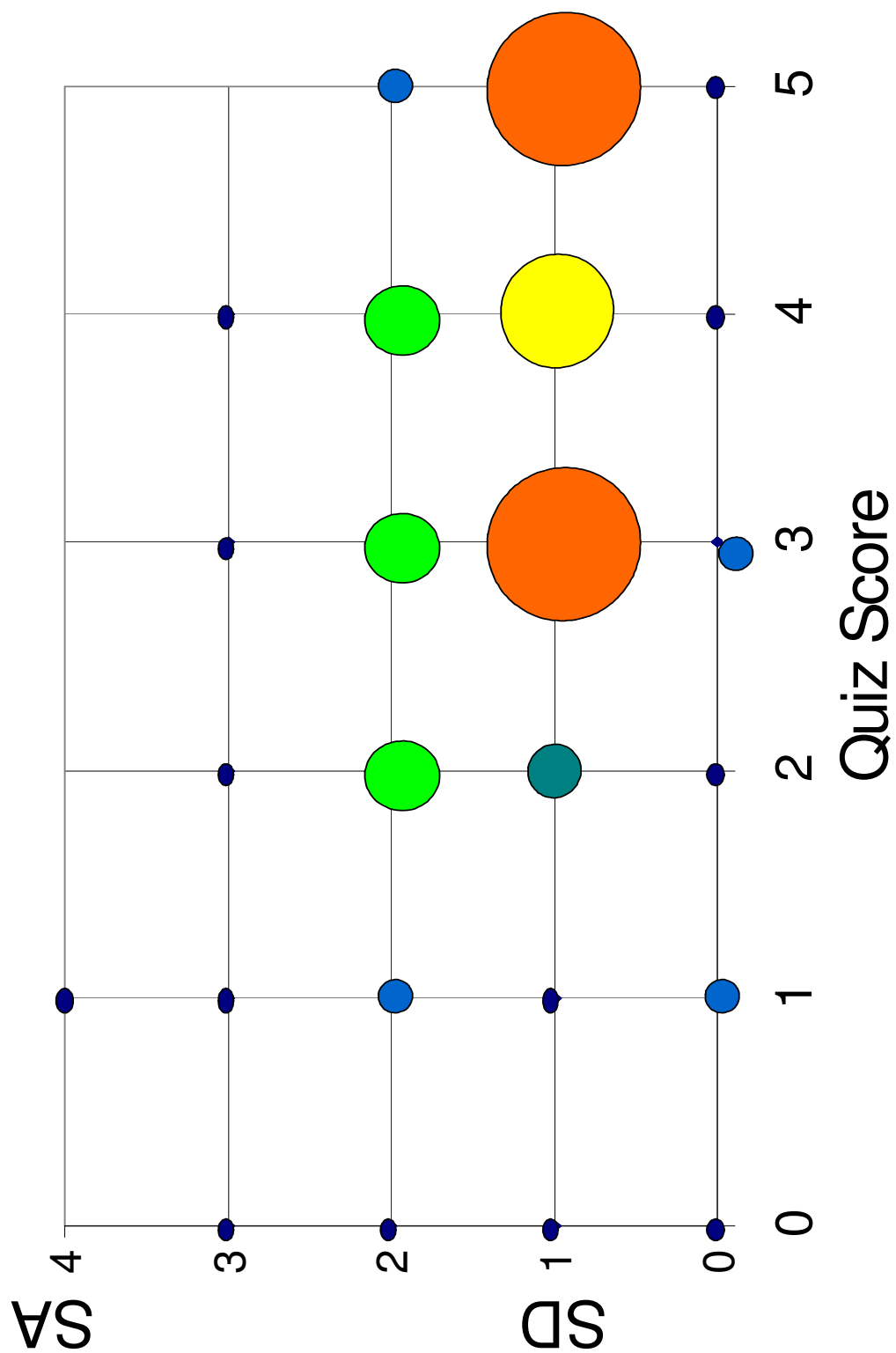


Figure 3: MANOVA on Response to Question 10 by Quiz Score

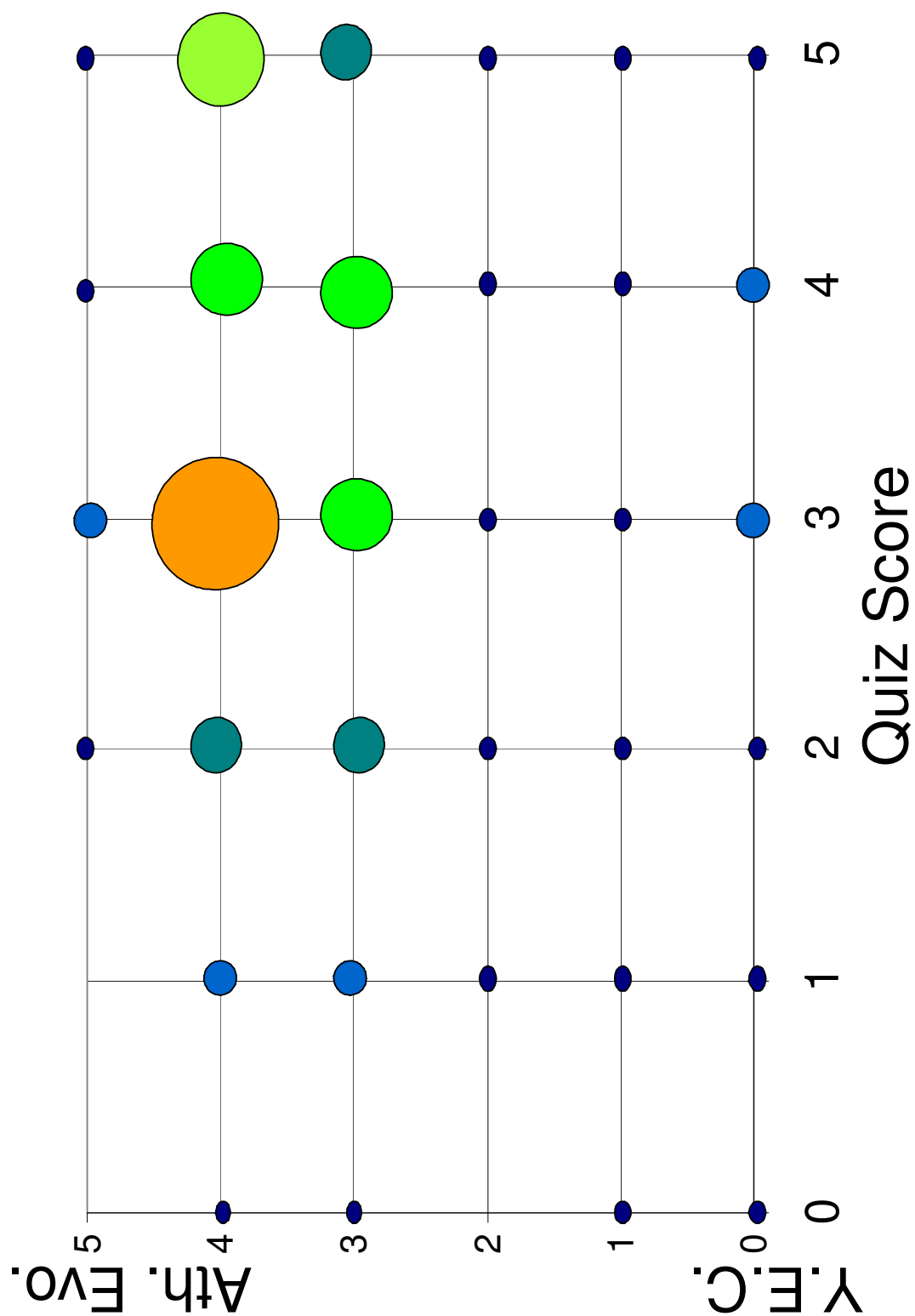


Figure 4: MANOVA on Response to Question 15 by Quiz Score

Qualitative Results

After each question, students were provided with an opportunity to elaborate on their answer in a textbox. The qualitative analysis was performed using two methods. First, each text response was coded and examined for content. Second, each response was categorized twice. The first categorization was into the creationist-evolutionist scale in Scott, 2005. The second was into categories designed to provide an additional level of analysis of the overall attitude and understanding of the subjects. These categories allow for a double check of the overall consistency of the survey. Some responses are provided below as examples of the categories used in the first categorization. At least 1 text response that fit each category was found except for the category of Gap Creationism, which no students mentioned. Spelling and grammar have not been corrected. Statements are coded as shown in Table 19.

Table 19: Coding for text responses

Source	Code (Group-Question #-Subject #)*
Freshman Pre-Instruction Text Data	FE-15-12
Freshman Post-Instruction Text Data	FT-12-34
Senior Text Data	S-15-8

***The letter A in place of a question number signifies the response came from the additional space area at the end of the survey.**

Categorization 1

Young Earth Creationism

FE-A-41: "I believe in creation, but i also believe that all species have udergone some changes in the last 6-10 thousand years, whether it is thicker fur, a darker complexion,

different diets, etc. I have avidly studied both evolution and creation from every point of view i could find when i was younger, and that is why i believe what i do.”

FE-15-17: “From the first day of Creation, there was light (the Sun). For simple reasons of astronomy, a day has been the same length since the beginning. My God is easily powerful enough to achieve this. I think evolution is a valid idea, but the world is not old enough for it to have occurred.”

S-15-31: “God created the heavens and Earth in six days. he then created animals, plants and man. B/c of mans interactions on the planet, speices have need to adapt/evolve from the form God created fro them...but not deviating in drastic measures”

S-15-20: “Faith, God has said that it was created in 7 days and so it was”

S-9-20: “based on the liniage studies done on the bible current creatinist believe that the Earth is about 6000 years ago”

Day-Age Creationism

FE-15-3: “I believe God created the Earth and everything in it but the Bible says that a day to us is like a “million” years to God. Not neccessarily a million but I just threw out a big number. It could be 2 seconds or a million. No one really knows what God is thinking.”

FE-15-66: “the bible says six days but God has no beginning nor does he have an end and since time is not a factor with Him, there is no telling how long the actual process took. 6 days is a misguided interpretation...it actually should be read as 6 periods (of time)”

FT-15-56: “Earth is really old. God created everything during the seven days which in our time was many years for each of the seven days. God created the animals and plants but have evolved since God created them.”

S-15-35: “I feel like this answer best represents my thoughts. I also think there is no way for humans to have known the concept of time that it took God to create the Earth so those six days could have been millions of years.”

S-9-9: “6,000-10,000 yrs old refers to what the bible says. i beleive everything in the bible is fact, but there are parts that we will never understand. for example is God's time equal to our time. No, the bible says that our lives are like a drop in the bucket, and in the blink of God's eye. so who knows really anything about time, it's just a scale we use to determine events with reason. Also, who knows if God's plan wasnt through evolution. You can't possibly answer questions comparing God and evolution theory.”

Progressive Creationism

FE-15-69: “I believe that the Earth is probably older and that it, as well as everything in it, was created by God. However, I also believe that organisms, including humans, have

changed slightly, or mutated over time. I don't believe that even through billions of years a small organism could change into the complexity of a human being, though."

FE-A-10: "I believe that God made us the way we are, but gave us the capabilities to adapt to our surroundings, which could be the definition for biological evolution."

S-11-20: "There is a difference between micro evolution and macro evolution even though there has been adaptations and morphological changes there have not been changes in species."

Evolutionary Creationism

FE-A-81: "I believe that evolution does occur and that God is involved in it. I believe that there are many changes that occur within species over many years, but I also believe that God created all the humans and the species on this Earth and is a part of everything."

FE-A-69: "i am a christian who is interested in science many of my family members shy away from science because they feel it is not of GOD. But I believe that you can except Science and God... I believe that evolution did happen, but i believe that God was controlling it as it happened. these are my beliefs and I am sticking with them."

S-15-6: "I feel God made the world, but he also made man, and since man can choose free will, he can ruin the world God created. So God needs to step in sometimes and

change things up a bit, hence why DNA replication isn't perfect. There is room for error in the case where a mutation needs to happen to save a particular species.”

Intelligent Design Creationism

FE-A-44: “My personal feeling on this is it isn't very important. Evolution is just part of bio, DI (I.D.) is a hypothesis and it shouldn't be an issue. Evolution should be taught and DI (I.D.) introduced. If science is to keep moving forward it needs to be open to all ideas and spend time on the one that bear the most fruit.”

FE-15-61: “But God designed it so that it did not need His intervention.”

FE-14-28: “I believe that an intelligent being designed the universe, and that biological evolution just proves the existence of such a being, However, I don't want to pressure anyone to believe the way I do.”

Theistic Evolutionism

FE-A-73: “It's amazing how many conditions have to be right for life to exist and thrive the way it does on this planet. I have to believe someone up there started this “perfect” planet and now is just watching it go”

FE-15-80: “Well i believe that the Earth is old but god created every single species in this world but wht god doesn't intervene in is Evolution we evolve not because god

makes us evolve no we evolve caz we choose and make choices and discover new inventions which leads to our evolvement”

S-15-38: “As I mentioned previously, I believe that both evolution and divine creation has occurred. Its not just one idea or the other, but a combination of both. A divine creator was responsible for creating life on Earth, but after that evolution took over. I believe that if a divine creator could intervine after putting organisms on Earth, then there wouldn't be so many bad things happening.”

Agnostic Evolutionism

FE-15-62: “I choose this becuase evolution seemed to work without any help, that it did it by natural and a random proccess. However it does nothing in determing God’s existence. Because of the nature of God their is no exidence against or for his existence.”

FE-A-33: “I believe strongly in biological evolution, but I haven’t figured out what role God plays, if there is a God. I would like to believe there is a higher being though.”

FT-15-11: “I believe in biological evolution. I do not believe in God, but that says nothing about whether God really exists. However, we have neither evidence that God exists or whether he doesn’t exist, so he is simply an unknown.”

S-15-39: “The following answer was CLOSE to representing my viewpoint, but not exact: The Earth is ancient (many millions of years). Biological evolution describes a

natural process that produces species without reliance upon intervention from God.

Biological evolution neither supports nor denies the existence of God. I believe that the Earth is ancient....and I believe that biological evolution neither supports nor denies the existence of god. I am not sure what role god has played in the intervention of creation and whether or not there is truth in the genesis creation story.”

S-15-37: “I think that biological evolution is a fact and that it doesn't support or deny that there is a "god".”

Materialist Evolutionism

FE-15-76: “I do not believe that god exists. The Earth is scientifically made, show me a miracle that someone can never explain in scientific terms (as in years down the road) and on my death bed I will confess that there is a god. But at this day and time, science supports the idea, in my eyes, that there is no god.”

Nature of Science issues

There were also many students who used the common usage of the word theory to misinform their opinion. Other students stated the common concept that hypotheses become theories which become laws.

Just a theory

FE-A-24: “God created everything on Earth, and evolution is a bunch of crap. there might be evidence supporting evolution, but what about the evidence not supporting it.

evolution is just a theory and we learned today in class that theories are not the absolute truth.”

FE-A-56: “just because you take a class with evolution in college, it doesn’t mean they have to believe in it. it is just a theory. it is not that big of a deal.”

S-13-12: “Both should be taught, both are theories that we cannot prove true or false or maybe a combination of both. We don't know, so we can't judge. Evolution has more (in my opinion) substance and who says their isn't a high being that put rugged ingrediants there and behold reactions occured and here we are today.”

S-13-6: “Because they are both valid theories, and since niether one has more proof of infalibility than the other, its only reasonable to teach both in college with equal weight...granted students will still have the option to pick whether or not they want to read it.”

S-10-7: “Evolution is "only a theory." But it is a strongly supported theory. Until an equally large body of evidence to the contrary is produced/found, I will continue to believe the evolution is valid.”

S-10-15: “I don't like the word "unlikely." Yes, it is a theory - and at most it could become a law - but still nothing is every 100% certain in science...or anything for that matter.”

S-10-10: “Most things that are believed in science are theories. Evolution has not been proven false yet. The method of hypothesis testing states that nothing is proven true, only proven false. Only after much testing without something being proven false can it become a law.”

Categorization 2

The second categorization used categories developed to best group the most responses into the fewest categories while providing a measure of analysis. Text responses to questions 1 through 7 used four categories: Authoritative, Personal, Factual Claim/Restate Answer, and Not Applicable/Unreadable/Joke/Other. Examples of text responses that belong in each category are found in Table 21. An Authoritative response had to contain a reference to an outside source (e.g. God, Biology Professor, Parents) as having knowledge regarding the question. A Personal response by contrast, contains a reference to the student as the primary knowledge base. A Factual Claim/Restate Answer response included a description of a biological principal (sometimes in great detail) cited as an explanation. The Not Applicable/Unreadable/Joke/Other category was where responses that did not fit into the other three categories were placed. Responses in this category contained a variety of content ranging from gibberish to blank space.

Categorization of questions 8 through 12 used the Authoritative and Not Applicable/Unreadable/Joke/Other categories, and two new categories: Belief and

Table 20: Examples of Responses coded from Question 1-7

Authoritative	FT-1-50: I looked over the choices and I decided that the one I choose was most like what I learned in Biology 211.
Personal	FT-7-65: I believe it is the right answer.
Factual Claim /Restate Answer	FE-5-11: Each of the parts listed did not exactly act like the others, but they represent a bodily extremity that facilitates movement, and thus they likely had a common ancestor at some point.
Not Applicable/ Unreadable/ Joke/Other	FE-2-40: Becasue i had to pick one. S-7-26: i dont really feel there needs to be any explanation for this

Table 21: Comparison of results with previous works

Group	% with creationist views	Source
Freshmen Pre-Instruction	43.8%	Appendix B
Freshmen Post-Instruction	43.5	Appendix B
College students enrolled in an introductory biology course for biology majors	53.0	Verhey, 2005
Seniors	29.6	Appendix B
College students enrolled in an upper level biology course in Evolution	30.0	Ingram & Nelson, 2006

Table 22: Comparison of results with previous works (Answer C removed)

Group	% with creationist views	Source
Freshmen Pre-Instruction	15.8%	Appendix B
Freshmen Post-Instruction	14.8	Appendix B
College students enrolled in an introductory biology course for biology majors	53.0	Verhey, 2005
Seniors	9.9	Appendix B
College students enrolled in an upper level biology course in Evolution	30.0	Ingram & Nelson, 2006

Detailed Claims/Cites Evidence. The Belief category required that the subject specifically use some form of the word belief (e.g. believe) in their response. The Detailed Claims/Cites Evidence responses contained similar content to the previous category of Factual Claim/Restate Answer. This category did not include, however, those responses that were only a restatement of the answer selected.

Questions 13 through 15 were not categorized due to the widely variable text responses to those questions. Appendix C holds all the raw counts for the categorization. Appendix D contains all text responses to all questions including the additional space section at the end of the survey.

CHAPTER 4: DISCUSSION

The acceptance rate of the theory of evolution of subjects in this study was not significantly different from the subjects in previous studies. While no researchers have previously examined freshman biology majors in conjunction with senior biology majors, there still are worthwhile comparisons to be made. For these comparisons, I categorized the answers from question 15 into either Evolutionary Views or Creationist Views. Subjects who answered a, b or c were put into the Creationist Views category while subjects who answered d or e were put into the Evolutionary Views category. The Freshman Pre-Instruction subjects did not differ significantly from the Freshman Post-Instruction in their attitudes on this topic. A previous study by Verhey in 2005 showed similar proportions of subjects (college students enrolled in an introductory biology course for biology majors) selecting creationist answers. The Seniors did differ significantly from both the Freshman Pre-Instruction and the Freshman Post-Instruction in their attitudes on this topic. The Seniors do not appear different, however, from the

college students enrolled in an upper level biology course in evolution studied by Ingram and Nelson in 2006. These comparisons are summarized in Table 22. It should be noted that those students who selected answer c, “The Earth is ancient (many millions of years). Biological Evolution occurs, but God has intervened at critical points. God created species through the laws of nature.”, are considered Theistic Evolutionists, and could feasibly be grouped with the Evolutionary Views category. This ‘re-grouping’ does not change any of the significance values presented in the Results Section, it merely provides an alternative comparative difference between this study’s groups and the previous study’s groups. This difference is detailed in Table 23. The substantial differences seen in the comparisons in Table 23, along with the grouping schemes in the previous research suggests that those students who self-selected as Theistic Evolutionists should be grouped as holding creationist views.

This research also suggests that understanding of evolutionary concepts improves with further education in biology. I found that when tested over evolutionary concepts, the average scores of biology major’s increase over time. Each group shows a significant difference (see Table 2), and those differences increase as instructional time increases. It is important to note, however, that only in the comparison between the two samples of freshmen are the same students involved. Also, not only were the senior data collected from a different set of subjects, it was a smaller set of subjects. The analysis does not account for the likely attrition from the biology major of some portion of students who may or may not understand evolution. Keeping that in mind, it is still clear that student understanding of evolution significantly improved after taking this particular introductory biology course.

The One-Way ANOVA that was performed on the data showed several significant differences between the subject groups. First, there were significant differences between all groups in regards to their average quiz score. These differences revealed a trend of the score to increase as instructional time increased. In other words, the Seniors scored higher than the Freshman Post-Instruction, who in turn scored higher than the Freshman Pre-Instruction. Next the ANOVA showed significant differences between the Freshman Pre-Instruction and the Seniors in regards to their responses to question 9. The Freshman Pre-Instruction on average selected answers that were more towards agreeing that the Earth is 6,000 – 10,000 years old, while the Seniors selected answers that were on average more towards the disagree end of the scale. This suggests that there is a shift that occurs between a students' arrival at Iowa State, and their graduation, where they become on average less likely to think that the Earth is 6,000 – 10,000 years old. It does not appear however, that this shift occurs during the students' instruction in the Biology 211 lecture course. The third significant difference involved responses to question 10 (evolution is “just a theory”). The ANOVA revealed differences between the Freshman Pre-Instruction and the Freshman Post-Instruction and between the Freshman Pre-Instruction and the Seniors. The directionality of these differences shows that the Freshman Pre-Instruction were on average selecting answers significantly closer to the agree end of the scale than either of the other groups. These details, along with the fact that there is no significant difference between the answers of the Freshman Post-Instruction and the Seniors, suggest that the change in student understanding of the term “theory” occurs during their instruction in the Biology 211 lecture course. The last significant difference the ANOVA analysis detected was on the subjects responses to

question 11 (non-humans have evolved). Significant differences were detected between the Freshman Pre-Instruction and the Freshman Post-Instruction and between the Freshman Pre-Instruction and the Seniors. In contrast to the ANOVA on question 10, directionality of these differences shows that the Freshman Pre-Instruction were on average selecting answers significantly closer to the disagree end of the scale than either of the other groups. These details, along with the fact that there is no significant difference between the answers of the Freshman Post-Instruction and the Seniors, suggest that the change in student acceptance of non-human evolution occurs during their instruction in the Biology 211 lecture course. There is not, however, any evidence that the subjects change their attitude toward human evolution with instruction. This result, taken in tandem with the result that for the same students, understanding of evolution does improve with instruction, is particularly noteworthy. This shows that the some students are separating the concepts of human evolution and non-human evolution in their minds. Why this is the case is not apparent from the qualitative data, but in other cases subjects have denied human evolution because they hold humans as being “special” or “above” other organisms. This may be what is occurring in these populations of students.

The Chi-Square analysis revealed that all subjects were not significantly shifting their views on religion and evolution over time. No relationship was detected between subject group membership (i.e. whether they were in the Senior, Freshman Pre-Instruction, or Freshman Post-Instruction group), and subject choice on question 15. This implies that the subjects are not becoming more atheistic or agnostic over time. Conversely, nor are they becoming more religious. This result is of particular importance

as many creationist parents claim that they do not wish their children to lose their religious identity when they are exposed to instruction in evolution (Alters & Alters, 2001).

The Chi-Square analysis also showed that the subjects' attitudes toward teaching Intelligent Design in public college science classes (Question 13, Table 14) changed over time. There were significant differences between the groups on their answer choices. An examination of the frequency data shows that in both instances the shift was toward answers that represent a negative view toward teaching Intelligent Design. In other words, as a student's education in biology increases he/she is less likely to think that teaching Intelligent Design in public college science classes is a good idea.

Chi square analysis also provided insight into subject response to question 14. Again there were significant differences between the groups. The frequency data show a trend over time of selecting answers that represent a better understanding of the issues surrounding the teaching of evolution. With increasing instruction, subjects were more likely to blame a lack of public understanding and a perceived conflict between science and religion for the lack of public acceptance of evolution in the United States.

The ANCOVA on the subjects' quiz score with group as the covariate and the responses to question 15 as an independent variable also provided an interesting result. When we take group into account, the subjects' religious preference (i.e. their answer to question 15) shows no significant relationship to the subjects' performance on the quiz over evolution. Only 4% of the variance in quiz score is explained by the responses to question 15, while 25.8% of the variance in quiz score is explained by subjects' group membership. This suggests that it is the subjects' educational experience, not their

religious preference that informs their quiz answers. Additionally, these results, along with the significant differences between the average quiz scores of the three groups suggest that subjects can learn evolutionary theory regardless of their religious preferences.

The MANOVA on group and quiz score with questions 8, 10, and 15 showed some significant and some important non-significant results. This MANOVA was performed on these three questions because together they represent a measure of the students' opinion and understanding of the nature of science and their opinion on the origins of the diversity of life on Earth. When examining how the subjects answered questions 8, 10, and 15 together, only the subjects' quiz score had any impact on their choices. Group membership showed no relationship to how the students answered the three questions together. No significant interaction was detected between group and quiz score in relation to the questions. When we tease apart the questions and examine which are actually being affected by group membership and quiz score, several significant distinctions appear. First, a subject's quiz score is only significantly related to how they answer questions 8 and 10, the nature of science questions. A higher quiz score translates to a better grasp of nature of science issues regarding evolution(see Figures 1 & 2). Neither a subject's quiz score, or group membership showed any relationship to how students answered question 15. We can also conclude that after instruction in an introductory biology course, understanding of the scientific use of the word theory improves, but decreases after several more years of college. These relationships are detailed in Table 19.

Thirty-eight correlations were detected between subjects' responses to the questions. Many of the correlations served as a check of the consistency of the subjects' responses. For example, there is a positive correlation for the Freshman Pre-Instruction and the Seniors. In both those groups, the subjects that agreed that evolution is good science were likely to agree that both humans evolved. Additionally, both the Freshman Pre-Instruction and the Seniors who agreed that evolution is good science were likely to agree that non-humans evolved. The Freshman Post-Instruction subjects who agreed that evolution is good science however, were only likely to agree that humans evolved. There was no correlation between the Freshman Post-Instruction responses to evolution being good science and their response to non-human evolution. In all groups, there is a positive correlation where those subjects who agreed that the Earth was 6,000 – 10,000 years old were likely to agree that evolution is “just a theory”. Additionally, there is a positive correlation for the Freshman Pre-Instruction and Senior subjects who agreed that the Earth was 6,000 – 10,000 years old. Those subjects were likely to disagree that humans and non-humans evolved. The Freshman Post-Instruction who agreed that the Earth was 6,000 – 10,000 years old however, were likely to disagree that humans evolved. There was no correlation between Freshman Post-Instruction response to the age of the Earth and their responses to non-human evolution. Why the Freshman Post-Instruction did not answer as consistently in two instances regarding to non-human evolution is unclear. A third check of answer consistency was the correlations with question 10, the “just a theory” question. In all groups, those subjects who agreed that evolution is “just a theory” were likely to disagree that humans and non-humans evolved. The last consistency check was the correlation with question 11. In this correlation, all subjects

who agreed that non-humans evolved were likely to agree that humans evolved. All of these correlations suggest that the students were consistent in their answers across the survey. Additionally, they show that many expected trends are present in this subject population (e.g. that young Earth creationists don't think evolution happened; people who think evolution is good science also think evolution occurred, etc). In all groups, the students who scored highly on the first five survey questions were more likely to agree that evolution is good science. This suggests three possible conclusions. The first is that those students who grasp evolutionary theory also hold a better understanding of science. The second is that those who understand science are more likely to grasp and accept biological evolution. The third interpretation is that understanding science and biological evolution are intricately intertwined.

In addition to acting as a check on the consistency of the data, the correlations involving subject responses to question 15 can also be examined for specific trend relationships. There are several worth mentioning. First, only the Freshman Pre-Instruction group subjects who scored highly on the 5 question quiz were also likely to select the more evolutionist choices (d and e) to question 15. This suggests that incoming freshman biology majors who already understand evolutionary theory are also likely to accept evolution as a well-supported scientific theory. Those Freshman Pre-Instruction and Seniors who selected the more evolutionist choices were more likely to agree that evolution is good science, that humans evolved, and that non-humans evolved. The Freshman Post-Instruction subjects that selected the more evolutionist choices were only more likely to agree that evolution is good science and that humans evolved. This suggests that those students who hold a greater understanding of what science is, and

accept that evolution occurred, are also more likely to accept evolution as a well-supported scientific theory. Lastly, in all groups, the subjects who selected more evolutionist choices to question 15 were also likely to disagree that evolution is just a theory and that the Earth is 6,000 – 10,000 years old. This also suggests that those students who accept evolution as a well-supported scientific theory also have a greater understanding of what science is and understand the various pieces of evidence for the ancient age of the Earth.

The qualitative data, while not statistically analyzed, is suggestive of several trends in the thinking of the subjects. For example, the first seven questions show the subjects shifting from Personal-type responses to Authoritative-type and Factual-type responses as instructional time increases. Questions 8, 9, and 10 show trends in subject response where the subjects are shifting from Belief-type responses to Detailed Claims-type responses as instructional time increases. The subject text responses to questions 11 and 12 show no apparent trend of any kind. The trends in all responses suggest that as instructional time increases, the students are less likely to support their answers with personal and belief statements, and more likely to cite an authority (i.e. a book or professor) or a fact learned during instruction. While subjects shift from citing, for example, the bible to citing the text book is not effective education, showing more subjects citing factual data is an improvement. This shift between sources of knowledge deserves more examination and research.

It is important to consider that some amount of the effects seen in the results section could be due to variables outside the focus of this study. First, the instructor for the Biology 211 lecture course from which we drew our Freshman Pre-Instruction and

Freshman Post-Instruction samples is known to put forth “extra effort” in regards to evolution and the nature of science. Thus the effects seen in this study may not be seen to this degree if a different lecture course were sampled. Attrition of students from the biology program may also be playing a part. There are always students who drop from the program in each term. This loss may affect not only the comparison between the freshman and seniors, but between the two freshman groups as well. In regards to the senior group, a much less complete sample was collected than in the other groups. This could lead to bias in our data toward those students who felt inclined to complete the survey. These limitations remain and should be kept in mind when evaluating the data.

CHAPTER 5: CONCLUSIONS

This study was designed to measure the understanding of the status of biology majors at Iowa State University regarding their knowledge and acceptance of evolutionary theory. The two primary sample groups were biology majors enrolled in an introductory biology course and senior students who self-identified as biology or genetics majors.

This study’s findings that student understanding of evolution improved with instruction, attitude toward evolution improved with instruction, and student theistic view did not significantly change with that same instruction are perhaps the most important results of this work. One can surmise then, that college students taking an introductory biology course CAN learn evolution while simultaneously improving their attitude toward it and yet not change the foundation of their theistic view. This should be very encouraging to some educators, parents, and students. To the educators this provides confirmation that their students, no matter their theistic view, can learn material on

evolution. Parents, for whom religious beliefs are important, should see this as evidence that instruction in evolution does not cause “religious damage” to their children. Students who think they will not be able to learn evolution effectively due to their beliefs, can take this as evidence to the contrary.

Also, this study found that there are strong correlations between different aspects of student attitude toward evolution. These correlations are suggestive of areas of evolutionary understanding that are linked in the mental constructs of biology majors.

The qualitative data collected during this study show that biology majors hold many common misconceptions about evolution, education, and the nature of science. These same text responses are suggestive of a shift in student thinking after instruction. It appears that as instructional time increases, the students are less likely to support their answers with personal and belief statements, and more likely to cite an authority (i.e. a book or professor) or a fact learned during instruction. The next step regarding this data is to certify the categorization scheme and perform several statistical analyses to tease out any significant differences.

Now that we have a better comprehension of what the students do and do not understand, what preconceptions and misconceptions they have, and what their theistic views are can we start to improve our teaching methods and practices.

Recommendations

This research fits well into a gap in the current knowledge base regarding evolution education. Biology majors may become the future educators and defenders of evolution. I would argue that understanding their understanding and attitude toward evolution is at least as important as that of the public at large. If those in charge of

educating the next generation hold misconceptions about evolution, those misconceptions will permeate American society for decades to come.

It has been widely acknowledged in academic circles that the United States desperately needs to improve its science education. Education in evolutionary content is an integral part of that improvement. Additionally, the results from this research remind us, students hold many misconceptions about the nature of science. Improvement of student understanding of the nature of science should also be a future goal, as this will likely facilitate student learning of evolutionary material

To this end, more research such as that presented here, mentioned in the introduction, and being done by Ross Nehm at the City University of New York is needed. Not only so that educators can better grasp what biology students understand about evolution, but how best to improve that understanding. Dr. Nehm has published several journal articles concerning the use of active learning techniques (Nehm & Reilly, 2007), science teacher education (Nehm, 2005), and the integration of nature of science topics into biology education (Hoskins & Nehm, 2005).

APPENDIX A: SURVEY INSTRUMENT

Question 1

In biology, which of the following is the best definition of biological evolution?

- a. The process of purposefully producing genetically better adapted organisms
- b. The process of passing acquired genetic characteristics to new generations
- c. The change over time in the genetic composition of a population
- d. The process by which individuals can acquire new genetic traits
- e. I don't understand the question

What was your reasoning for choosing the response above?

Question 2

Darwin's idea of "natural selection" is based on all of the following EXCEPT:

- a. characteristics that are acquired during the life of an individual are passed on to offspring
- b. the best adapted individuals produce the most offspring
- c. there is differential reproductive success within populations
- d. variation exists within populations
- e. populations tend to produce more individuals than the environment can support
- f. I don't understand the question

What was your reasoning for choosing the response above?

Question 3

In the phrase "Survival of the Fittest", the fittest are:

- a. the organisms with best developed muscles
- b. the organisms that survive into the next generation
- c. the organisms that are biggest & fastest
- d. the organisms that successfully pass their genes on to the next generation
- e. I don't understand the question

What was your reasoning for choosing the response above?

Question 4

Natural selection acts directly

- a. by causing mutations that improve survival
- b. on genotype
- c. on phenotype
- d. on recessive alleles
- e. I don't understand the question

What was your reasoning for choosing the response above?

Question 5

The wing of a bat, the fore-limb of the dog, and the flipper of the whale are said to be homologous structures. This indicates that:

- a. All of these organisms share a common ancestor
- b. They have exactly the same function
- c. They evolved three separate times
- d. Evolution is non-random
- e. I don't understand the question

What was your reasoning for choosing the response above?

Question 6

Evolution occurs:

- a. in individuals
- b. in all populations of all organisms
- c. only in populations of non-human organisms
- d. only within specific kinds of organisms (e.g. distinct breeds of dogs)
- e. under no circumstances
- f. None of these answers fits my viewpoint

What was your reasoning for choosing the response above?

Question 7

Speciation, the origin of new species,

- a. can only occur in organisms of a similar kind
- b. has not occurred since the creation of the Earth
- c. always results in more complex organisms
- d. can occur in any population of organisms
- e. None of the answers fit my basic viewpoint

What was your reasoning for choosing the response above?

Question 8

**Please select the response that best fits your reaction to the following statement:
Biological evolution is a valid science idea.**

- a. Strongly Agree
- b. Agree
- c. Disagree
- d. Strongly Disagree
- e. I don't understand the question
- f. None of the answers fit my basic viewpoint

What was your reasoning for choosing the response above?

Question 9

**Please select the response that best fits your reaction to the following statement:
The Earth is approximately 6,000 - 10,000 years old.**

- a. Strongly Agree
- b. Agree
- c. Disagree
- d. Strongly Disagree
- e. None of these fit my basic viewpoint

What was your reasoning for choosing the response above?

Question 10

**Please select the response that best fits your reaction to the following statement:
Biological evolution is just a theory, and therefore is unlikely to be correct.**

- a. Strongly Agree
- b. Agree
- c. Disagree
- d. Strongly Disagree
- e. I don't understand the question
- f. None of these answers fit my basic viewpoint

What was your reasoning for choosing the response above?

Question 11

**Please select the response that best fits your reaction to the following statement:
Non-human species have evolved. (i.e. undergone biological evolution)**

- a. Strongly Agree
- b. Agree
- c. Disagree
- d. Strongly Disagree
- e. I don't understand the question
- f. None of these answers fit my basic viewpoint

What was your reasoning for choosing the response above?

Question 12

**Please select the response that best fits your reaction to the following statement:
Humans have evolved. (i.e. undergone biological evolution)**

- a. Strongly Agree
- b. Agree
- c. Disagree
- d. Strongly Disagree
- e. I don't understand the question
- f. None of these choices fit my basic viewpoint

What was your reasoning for choosing the response above?

Question 13

Read the statement provided, then read the answers provided and select the ONE that BEST represents your position.

In the U.S. today there is a great deal of public debate over the teaching of biological evolution in public college science classes. Other ideas such as Intelligent Design/Creationism have been put forth as an alternative.

- a. Neither biological evolution nor Intelligent Design/Creationism should be taught in College science classes.
- b. Both biological evolution and Intelligent Design/Creationism should be taught in college science classes and given equal time.
- c. Both biological evolution and Intelligent Design/Creationism should be taught in college science classes but Evolution should be given more time.
- d. Both biological evolution and Intelligent Design/Creationism should be taught in college science classes but Intelligent Design/Creationism should be given more time.
- e. Only biological evolution should be taught in public college science classes.
- f. Only Intelligent Design/Creationism should be taught in public college science classes.
- g. Only biological evolution should be taught as a valid scientific idea, but Intelligent Design/Creationism might be addressed to educate students about the nature of science and why Intelligent Design/Creationism is not accepted by the scientific community.
- h. I don't know enough about this subject to make a choice.
- i. None of these choices fits my basic viewpoint. (If you select this, please write what your viewpoint is in the space below)
- j. A combination of choices fits my basic viewpoint. (If you select this, please write what your viewpoint is in the space below.)

What was your reasoning for choosing the response above? / What is your viewpoint?

Question 14

Read the statement provided, then read the answers provided and select the ONE that BEST represents your position.

Biological evolution is overwhelmingly accepted within the scientific community. It has been for decades. However, a majority of the American public does not accept the idea. How do you account for this?

- a. This is due to a lack of public understanding regarding what science is and how it works.
- b. This is due to a lack of effort from the scientific community to educate the public.
- c. This is due to a real conflict between science and religion.
- d. This is due to a perceived conflict between science and religion.
- e. This is due to strong cultural influences acting upon the public.
- f. I don't know enough about this subject to make a choice.
- g. None of these choices fits my basic view point. (If you select this, please write what your viewpoint is in the space below.)
- h. Or a combination of choices fits my basic viewpoint. (If you select this, please write what your viewpoint is in the space below.)

What was your reasoning for choosing the response above? / What is your viewpoint?

Question 15

Please read all of the following options, then select the one that is closest to your perspective.

- a. The Earth is young (6,000 - 10,000 years), with each of the six days of Genesis/Creation being 24-hour days. God created each kind of organism in its present form.
- b. The Earth is ancient (many millions of years), with each of the six days of Genesis/Creation being long periods of time (thousands or millions of years). God created each kind of organism in its present form.
- c. The Earth is ancient (many millions of years). Biological evolution occurs, but God has intervened at critical points. God created species through the laws of nature.
- d. The Earth is ancient (many millions of years). Biological evolution describes a natural process that produces species without reliance upon intervention from God. Biological evolution neither supports nor denies the existence of God.
- e. The Earth is ancient (many millions of years). Biological evolution occurs as a natural process to produce species. Biological evolution supports the idea that God does not exist.
- f. None of these options fit my perspective. If you select this answer, please describe your perspective, in as much detail as you can, in the following text box.

What was your reasoning for choosing the response above? / What is your viewpoint?

Question 16

In the box below, please write anything else that would help us better understand your view on the issues raised in this survey.

APPENDIX B: QUANTITATIVE DATA ~ PERCENTAGES

1. In biology, which of the following is the best definition of biological evolution?

- a. The process of purposefully producing genetically better adapted organisms
- b. The process of passing acquired genetic characteristics to new generations
- c. The change over time in the genetic composition of a population
- d. The process by which individuals can acquire new genetic traits
- e. I don't understand the question

2. Darwin's idea of "natural selection" is based on all of the following EXCEPT:

- a. characteristics that are acquired during the life of an individual are passed on to offspring
- b. the best adapted individuals produce the most offspring
- c. there is differential reproductive success within populations
- d. variation exists within populations
- e. populations tend to produce more individuals than the environment can support
- f. I don't understand the question

3. In the phrase "Survival of the Fittest", the fittest are:

- a. the organisms with best developed muscles
- b. the organisms that survive into the next generation
- c. the organisms that are biggest & fastest
- d. the organisms that successfully pass their genes on to the next generation
- e. I don't understand the question

4. Natural selection acts directly

- a. by causing mutations that improve survival
- b. on genotype
- c. on phenotype
- d. on recessive alleles
- e. I don't understand the question

Freshman Pre-Instruction N = 82 %	Freshman Post-Instruction N = 122 %	Seniors N = 61 %
12.2	10.7	3.3
15.9	16.4	11.5
68.3	69.7	83.6
2.4	2.5	1.6
1.2	0.8	0
29.3	57.4	75.4
25.6	17.2	11.5
15.9	9.8	4.9
8.5	4.9	3.3
15.9	9.8	4.9
4.9	0.8	0
0	0	0
43.9	18	1.6
4.9	0	0
50	82	98.4
1.2	0	0
35.4	16.4	6.6
24.4	27	24.6
11	45.9	67.2
8.5	4.1	1.6
20.7	6.6	0

5. The wing of a bat, the fore-limb of the dog, and the flipper of the whale are said to be homologous structures. This indicates that:

- a. All of these organisms share a common ancestor
- b. They have exactly the same function
- c. They evolved three separate times
- d. Evolution is non-random
- e. I don't understand the question

6. Evolution occurs:

- a. in individuals
- b. in all populations of all organisms
- c. only in populations of non-human organisms
- d. only within specific kinds of organisms (e.g. distinct breeds of dogs)
- e. under no circumstances
- f. None of these answers fits my viewpoint

7. Speciation, the origin of new species,

- a. can only occur in organisms of a similar kind
- b. has not occurred since the creation of the earth
- c. always results in more complex organisms
- d. can occur in any population of organisms
- e. None of the answers fit my basic viewpoint

8. Please select the response that best fits your reaction to the following statement:

Biological evolution is a valid science idea.

- a. Strongly Agree
- b. Agree
- c. Disagree
- d. Strongly Disagree
- e. I don't understand the question / f. None of the answers fit my basic viewpoint

Freshman Pre-Instruction N = 82 %	Freshman Post-Instruction N = 122 %	Seniors N = 61 %
56.1	91.8	82
18.3	3.3	11.5
6.1	0.8	1.6
12.2	0.8	3.3
7.3	3.3	1.6
1.2	0.8	3.3
80.5	91	82
2.4	0	0
4.9	1.6	0
1.2	0	0
9.8	6.6	14.8
9.8	12.3	13.1
4.9	0	0
7.3	0.8	0
61	79.5	80.3
17.1	7.4	6.6
45.1	60.7	65.6
37.8	29.5	23
4.9	4.9	1.6
3.7	2.5	3.3
8.5	2.5	6.6

9. Please select the response that best fits your reaction to the following statement:

The Earth is approximately 6,000 - 10,000 years old.

- a. Strongly Agree
- b. Agree
- c. Disagree
- d. Strongly Disagree
- e. None of these fit my basic viewpoint

10. Please select the response that best fits your reaction to the following statement:

Biological evolution is just a theory, and therefore is unlikely to be correct.

- a. Strongly Agree
- b. Agree
- c. Disagree
- d. Strongly Disagree
- e. I don't understand the question / f. None of the answers fit my basic viewpoint

11. Please select the response that best fits your reaction to the following statement:

Non-human species have evolved. (i.e. undergone biological evolution)

- a. Strongly Agree
- b. Agree
- c. Disagree
- d. Strongly Disagree
- e. I don't understand the question / f. None of the answers fit my basic viewpoint

12. Please select the response that best fits your reaction to the following statement:

Humans have evolved. (i.e. undergone biological evolution)

- a. Strongly Agree
- b. Agree
- c. Disagree
- d. Strongly Disagree
- e. I don't understand the question / f. None of the answers fit my basic viewpoint

Freshman Pre-Instruction N = 82 %	Freshman Post-Instruction N = 122 %	Seniors N = 61 %
6.1 13.4 20.7 53.7 6.1	3.3 9.8 14.8 59.8 12.3	3.3 1.6 13.1 68.9 13.1
1.2 8.5 41.5 31.7 17.1	95.1 3.3 27 64.8 4.9	0 3.3 29.5 55.7 11.5
48.8 35.4 7.3 2.4 6.1	66.4 28.7 0.8 1.6 2.5	70.5 26.2 0 1.6 1.6
39 42.7 8.5 3.7 6.1	50.8 34.4 4.9 4.1 5.7	60.7 27.9 1.6 4.9 4.9

13. Read the statement provided, then read the answers provided and select the ONE that BEST represents your position.

In the U.S. today there is a great deal of public debate over the teaching of biological evolution in public college science classes. Other ideas such as Intelligent Design/Creationism have been put forth as an alternative.

- a. Neither biological evolution nor Intelligent Design/Creationism should be taught in college science classes.
- b. Both biological evolution and Intelligent Design/Creationism should be taught in college science classes and given equal time.
- c. Both biological evolution and Intelligent Design/Creationism should be taught in college science classes but Evolution should be given more time.
- d. Both biological evolution and Intelligent Design/Creationism should be taught in college science classes but Intelligent Design/Creationism should be given more time.
- e. Only biological evolution should be taught in public college science classes.
- f. Only Intelligent Design/Creationism should be taught in public college science classes.
- g. Only biological evolution should be taught as a valid scientific idea, but Intelligent Design/Creationism might be addressed to educate students about the nature of science and why Intelligent Design/Creationism is not accepted by the scientific community.
- h. I don't know enough about this subject to make a choice.
- i. None of these choices fits my basic viewpoint. (If you select this, please write what your viewpoint is in the space below)
- j. A combination of choices fits my basic viewpoint. (If you select this, please write what your viewpoint is in the space below.)

Freshman Pre-Instruction	Freshman Post-Instruction	Seniors
N = 82 %	N = 122 %	N = 61 %
0	1.6	0
31.7	16.4	13.1
19.5	12.3	4.9
2.4	0.8	0
4.9	16.4	14.8
1.2	0.8	0
15.9	39.3	45.9
11	4.1	3.3
3.7	1.6	9.8
9.8	6.6	8.2

14. Read the statement provided, then read the answers provided and select the ONE that BEST represents your position.

Biological evolution is overwhelmingly accepted within the scientific community. It has been for decades. However, a majority of the American public does not accept the idea. How do you account for this?

- a. This is due to a lack of public understanding regarding what science is and how it works.
- b. This is due to a lack of effort from the scientific community to educate the public.
- c. This is due to a real conflict between science and religion.
- d. This is due to a perceived conflict between science and religion.
- e. This is due to strong cultural influences acting upon the public.
- f. I don't know enough about this subject to make a choice.
- g. None of these choices fits my basic view point. (If you select this, please write what your viewpoint is in the space below.)
- h. Or a combination of choices fits my basic viewpoint. (If you select this, please write what your viewpoint is in the space below.)

15. Please read all of the following options, then select the one that is closest to your perspective.

- a. The Earth is young (6,000 - 10,000 years), with each of the six days of Genesis/Creation being 24-hour days. God created each kind of organism in its present form.
- b. The Earth is ancient (many millions of years), with each of the six days of Genesis/Creation being long periods of time (thousands or millions of years). God created each kind of organism in its present form.
- c. The Earth is ancient (many millions of years). Biological evolution occurs, but God has intervened at critical points. God created species through the laws of nature.
- d. The Earth is ancient (many millions of years). Biological evolution describes a natural process that produces species without reliance upon intervention from God. Biological evolution neither supports nor denies the existence of God.
- e. The Earth is ancient (many millions of years). Biological evolution occurs as a natural process to produce species. Biological evolution supports the idea that God does not exist.
- f. None of these options fit my perspective. If you select this answer, please describe your perspective, in as much detail as you can, in the following text box.

Freshman Pre-Instruction	Freshman Post-Instruction	Seniors
N = 82 %	N = 122 %	N = 61 %
6.1	23	19.7
1.2	1.6	0
35.4	14.8	11.5
23.2	31.1	27.9
9.8	4.1	1.6
8.5	0.8	1.6
7.3	2.5	4.9
8.5	22.1	32.8
7.3	4.1	3.3
8.5	10.7	6.6
28	28.7	19.7
31.7	41	55.7
6.1	5.7	1.6
18.3	9.8	13.1

APPENDIX C: QUALITATIVE DATA ~ ANALYZED

	Question 1		Question 2		Question 3		Question 4	
Freshman Pre-Instruction								
Authority	3	3.7%	4	4.9%	1	1.2%	1	1.2%
Personal	35	42.7%	28	34.1%	15	18.3%	29	35.4%
Factual Claim, Restate Answer	38	46.3%	36	43.9%	52	63.4%	31	37.8%
N/A, Unreadable, Joke, Etc	6	7.3%	14	17.1%	14	17.1%	21	25.6%
SUM	82	100.0%	82	100.0%	82	100.0%	82	100.0%
Freshman Post-Instruction								
Authority	23	18.9%	17	13.9%	21	17.2%	8	6.6%
Personal	25	20.5%	27	22.1%	14	11.5%	26	21.3%
Factual Claim, Restate Answer	62	50.8%	62	50.8%	74	60.7%	65	53.3%
N/A, Unreadable, Joke, Etc	12	9.8%	16	13.1%	13	10.7%	23	18.9%
SUM	122	100.0%	122	100.0%	122	100.0%	122	100.0%
Seniors								
Authority	9	14.8%	5	8.2%	8	13.1%	6	9.8%
Personal	13	21.3%	5	8.2%	7	11.5%	6	9.8%
Factual Claim, Restate Answer	31	50.8%	42	68.9%	39	63.9%	37	60.7%
N/A, Unreadable, Joke, Etc	8	13.1%	9	14.8%	7	11.5%	12	19.7%
SUM	61	100.0%	61	100.0%	61	100.0%	61	100.0%

Freshman Pre-Instruction	Question 5		Question 6		Question 7	
Authority	4	4.9%	1	1.2%	0	0.0%
Personal	17	20.7%	24	29.3%	22	26.8%
Factual Claim, Restate Answer	43	52.4%	43	52.4%	30	36.6%
N/A, Unreadable, Joke, Etc	18	22.0%	14	17.1%	30	36.6%
SUM	82	100.0%	82	100.0%	82	100.0%
Freshman Post-Instruction						
Authority	17	13.9%	12	9.8%	8	6.6%
Personal	12	9.8%	20	16.4%	21	17.2%
Factual Claim, Restate Answer	69	56.6%	75	61.5%	60	49.2%
N/A, Unreadable, Joke, Etc	24	19.7%	15	12.3%	33	27.0%
SUM	122	100.0%	122	100.0%	122	100.0%
Seniors						
Authority	5	8.2%	2	3.3%	6	9.8%
Personal	10	16.4%	12	19.7%	9	14.8%
Factual Claim, Restate Answer	35	57.4%	36	59.0%	30	49.2%
N/A, Unreadable, Joke, Etc	11	18.0%	11	18.0%	16	26.2%
SUM	61	100.0%	61	100.0%	61	100.0%

Freshman Pre-Instruction	Question 8		Question 9		Question 10		Question 11	
Authority	0	0.0%	9	11.0%	0	0.0%	0	0.0%
Belief	38	46.3%	21	25.6%	24	29.3%	7	8.5%
Detailed Claims, Cites Evidence	28	34.1%	35	42.7%	43	52.4%	45	54.9%
N/A, Unreadable, Joke, Etc	16	19.5%	17	20.7%	15	18.3%	30	36.6%
SUM	82	100.0%	82	100.0%	82	100.0%	82	100.0%
Freshman Post-Instruction								
Authority	3	2.5%	5	4.1%	4	3.3%	5	4.1%
Belief	23	18.9%	17	13.9%	10	8.2%	12	9.8%
Detailed Claims, Cites Evidence	80	65.6%	72	59.0%	91	74.6%	78	63.9%
N/A, Unreadable, Joke, Etc	16	13.1%	28	23.0%	17	13.9%	27	22.1%
SUM	122	100.0%	122	100.0%	122	100.0%	122	100.0%
Seniors								
Authority	1	1.6%	2	3.3%	1	1.6%	1	1.6%
Belief	10	16.4%	9	14.8%	5	8.2%	2	3.3%
Detailed Claims, Cites Evidence	36	59.0%	35	57.4%	37	60.7%	42	68.9%
N/A, Unreadable, Joke, Etc	14	23.0%	15	24.6%	18	29.5%	16	26.2%
SUM	61	100.0%	61	100.0%	61	100.0%	61	100.0%

Freshman Pre-Instruction	Question 12	
Authority	0	0.0%
Belief	15	18.3%
Detailed Claims, Cites Evidence	46	56.1%
N/A, Unreadable, Joke, Etc	21	25.6%
SUM	82	100.0%
Freshman Post-Instruction		
Authority	4	3.3%
Belief	15	12.3%
Detailed Claims, Cites Evidence	76	62.3%
N/A, Unreadable, Joke, Etc	27	22.1%
SUM	122	100.0%
Seniors		
Authority	1	1.6%
Belief	12	19.7%
Detailed Claims, Cites Evidence	35	57.4%
N/A, Unreadable, Joke, Etc	13	21.3%
SUM	61	100.0%

APPENDIX D: RAW QUALITATIVE DATA

Freshman Pre-Instruction Text Responses

Question 1

FE-1-1: It seemed that it was the best worded answer for the question.

FE-1-2: It seemed the best fitting.

FE-1-3: Because if I remember correctly, evolution is the change of characteristics in organisms over time.

FE-1-4: I've read it somewhere.

FE-1-5: not answered

FE-1-6: It was my best guess at the correct answer from what I remember reading about the theory of evolution.

FE-1-7: not answered

FE-1-8: It seemed like the correct answer.

FE-1-9: it seemed like the best answer

FE-1-10: Evolution, in most cases, happens naturally over a long period of time. This answer best represented my understanding of biological evolution.

FE-1-11: Evolution promotes traits that allow the organism to adapt better to its environment, and discourages traits that negatively impact the survival of the organism. The beneficial traits are then more likely to be passed down to future offspring, while the negative traits are not, and in large populations this causes a gradual shift towards the more useful trait.

FE-1-12: not answered

FE-1-13: not answered

FE-1-14: not answered

FE-1-15: Based on which theory you view, bio-diversity has been viewed as a result of an organisms' adaptation to environmental problem, such as a moth discovering it can hide better from predators by being brown instead of white. This relies heavily on the knowledge of animals in their environment, whereas genetic quirks in one single organism pass said quirk on to its offspring, thus changing the species through a slow process, based on a single genetic mutation.

because evolution occurs when a group of organisms adapts with difficulties in their environment

FE-1-16: I am well-acquainted with the basic theory due to high school biology.

FE-1-17: Well, I have not learned much about biological evolution yet, but from what I remember from high school, that answer sounded like the best one for the question.

FE-1-18: To me it seemed like the best suited answer in terms of biology

FE-1-19: I had learned that evolution was the development of organisms over time and their changes from ages and years past.

as a student from India studying the Darwin theory and related theories of evolution it is evident to me that evolution is in fact a GRADUAL change brought about in an organism!!

FE-1-20: Because it said the change over time, and evolution didn't happen instantly so I figured it was close.

FE-1-21: Evolution means to evolve in certain ways, and I believe that traits and characteristics are passed on from generation to generation.

because evolution is the change of genetic make-up over a long period of time.

FE-1-22: Because evolution is the changing of genetics over time.

FE-1-23: Organisms must adapt to new conditions present in order to evolve.

Organisms pass on traits that help them survive to the new generations. Evolution occurs in order for the species to survive and preserve itself.

FE-1-24: not answered

FE-1-25: Because as biological evolution occurs, a populations' genetic composition slowly changes, over hundreds of generations.

FE-1-26: I believe that over time organisms mutate to better fit their environment.

FE-1-27: Becuase biological organisms change to fit their surroundings, they do not change on purpose

FE-1-28: Evolution occurs over time and it involves an entire population.

FE-1-29: To me, evolution is nature's way of choosing which species is most able to live. It is like survival of the fittest, and in order for some species to survive, their genetic composition must be changed.

FE-1-30: I chose my that definition for biological evolution because it's how we change over time.

FE-1-31: I feel the response i chose was the best choice for the question.

FE-1-32: The word biological indicated genetics, while evolution indicates adaptation, giving me choice A for a good answer

FE-1-33: not answered

FE-1-34: It seemed right.

FE-1-35: Evolution as i know it was the evolving of animals to survive, only the strong and fit for conditions survived, so called weeding out the crowd.
change in time is genetic composition

FE-1-36: not answered

FE-1-37: It was the only option that seemed appropriate

FE-1-38: Biological evolution: Biology is life. Biological evolution means the evolution of life. I interpret that as having to do with genetics passing on through life.

FE-1-39: The fourth choice had the word "can." Biological evolution happens - it is not a choice. The other two seemed like definitions of something other than evolution, and seemed completely wrong. Whether or not this affects the survery, I am tired, and just realized that after I started. Sorry!
because I thought it was right

FE-1-40: It most closely matches what I've been taught.

FE-1-41: The fact that species have the ability to adapt to their surrounding enviroment.

FE-1-42: With evolution there are two types mirco-evolution which is slight change in the gentic make-up and macro-evolution which complete change in the gentic make-up of and organism. Through out my studies of Biology i was taught that biogical evolution was made up of micro and macro evoltion thus my answer for number 2

FE-1-43: Evolutuon take time and as undesired traits are weaded out though natural selection evolution occures

FE-1-44: Evolution takes a long time to happen, it doesn't immediately happen to a single organism, but that population over many years.

because evelotion is caused by a mutation in the creatures dna

FE-1-45: not answered

FE-1-46: A population or group of a species acquire certain characteristics over time so that they can better live in their environment. I chose the answer I thought best explained this reasoning.

FE-1-47: It made more sense and thats what i've learned in science all my life

FE-1-48: When we think of Evolution we think of a change, and if you break the word down it is Evole meaning change over time. Therefore with evolution your passing characteristics down over time

FE-1-49: It more fully decribes the process. If someone looks at that answer, they would understand it better than if they looked at the rest of the answers.

FE-1-50: It made the most sense

FE-1-51: sounded the best

FE-1-52: I broke the phrase down and that definition seemed to fit the phrase the best. because that's what i think it means

FE-1-53: Because as the organism aquires new traits, they pass it on to new generations, which makes us evolve.

FE-1-54: not answered

FE-1-55: I believe that evoltion is the change over time in organisms to be better suited for life. So it makes since that it would be the change in a population over time to increase a species chances of survival.

FE-1-56: Evolution produces organisms better adapted than their parents to survive

FE-1-57: I selected it because it said change over time. In evolution, their is now final product to be made, its purpose is to evolve to the evironment for as long as that environment exists. So creatures may evolve into a simpler organism instead of a more complex one.

FE-1-58: Evolution is a series of mutations and survival, not adaptation

FE-1-59: Because it changes over time...

FE-1-60: I know what evolution is

FE-1-61: I believe that from generation to generation, people change biologically. If we look through history, we can see how we have evolved from Neanderthals. We have lost hair, stopped using muscles, and have began putting our brains to better use.

FE-1-62: Biological evolution does not happen to one particular organism of an entire population. Also, it is a process that happens over time.

FE-1-63: That is the purpose, is that the new organisms will be better off than the last, through characteristics!

FE-1-64: not answered

FE-1-65: it sames like the right answer

FE-1-66: I believe that evolution means change over time and biology means life which in turn means the change of life through the differing traits passed from generation to generation

FE-1-67: Because when organisms evolve, they pass the favorable genetic trait to their offspring

FE-1-68: Evolution is a change in a species over time so, that one is the one I thought fit best.

FE-1-69: It fit my opionion best

FE-1-70: Evolution occurs over a long period of time.

FE-1-71: The answer I choose was the best answer out of the other responses. That answer correctly explained the question.
because i thought it fit best.

FE-1-72: Genetic evolution happens gradually through natural or artificial selection.

FE-1-73: I felt it best encompassed what evolution meant to me.

FE-1-74: It seemed to fit my understanding about the question.

FE-1-75: Because, if I remember correctly, the definition of evolution is the change of the population, not the individual

FE-1-76: The reason is not to pourposly change a population, its just the change over time that a population undergoes genetically and adapts to the enviroment and the conditions presented to that specific group of organisms.

FE-1-77: cause i dont care nor do i know!

FE-1-78: the process of passing genetics traits is the process of evolution

FE-1-79: Because I'm not sure that biologists believe that evolution is necessarily with purpose.

FE-1-80: A Biological Evolution in my view is when humans can discover or if possible create new genitics in organisms and a biological evolution can also be explained when humans discover new types of life forms or genes within other organisms

FE-1-81: It best represents how I interpret the term "biological evolution"

FE-1-82: A and B both discussed evolution as a result of adaptation and survival of the fittest

Question 2

FE-2-1: It is the least like Darwin's "natural selection" idea

FE-2-2: Individuals cannot pass on acquired characteristics to offspring.

FE-2-3: Because natural selection is survival of the fittest so it has nothing to do with how the organisms reproduce.

FE-2-4: Natural selection seems like a process of the most adapted thriving.

FE-2-5: not answered

FE-2-6: not answered

FE-2-7: not answered

FE-2-8: it seemed like it was the correct answer

FE-2-9: not answered

FE-2-10: It is my understanding that natural selection is the natural elimination of species that are too weak to survive in the environment, and this answer was the one that seemed the least natural.

FE-2-11: B, C, D, and E are correct as far as I remember regarding Darwin's theory of Evolution.

FE-2-12: not answered

FE-2-13: not answered

FE-2-14: not answered

FE-2-15: This theory was presented in my high school advanced biology class, but I don't believe it was included in Darwin's Theory. I can't remember who's theory it was but instinct tells me it was not Darwin.

because in this case these offspring will reduce the chances of other weak offspring so they dominate

FE-2-16: Traits acquired during the lifetime do not change the genetic composition of the offspring. For example, a bodybuilder does not automatically have muscular children.

FE-2-17: Honestly, I thought all of the answers sounded like they could be right, so I just picked the one that sounded the least right.

FE-2-18: The answer was the only one that didn't describe it.

FE-2-19: I did not believe that all best adapted organisms produce the most offspring.

FE-2-20: not answered

FE-2-21: Traits acquired during the lifetime of an organism cannot be passed to the next generation. They are learned behaviors.

FE-2-22: I am not familiar with Darwin's "natural selection"; therefore, I don't think it would be beneficial to pick a random answer.

FE-2-23: i chose this because in every population i know natural selection effects all of them, in the way that the strong survive, and standards are higher.

FE-2-24: It seemed like the most reasonable response

FE-2-25: An organism that can be better adapted to its environment is most likely to survive and produce offspring. Once they are able to survive this organism can now give its traits to newer generations.

FE-2-26: not answered

FE-2-27: The idea of natural selection does not have to do with the amount of offspring an organism produces. If an ill-equipped organism produces, say, 12 offspring who are

also ill-equipped, less of them will likely survive than 12 well-equipped offspring of a well-equipped parent.

FE-2-28: It is correct, example, I cannot pass my knowledge of chemistry on to my offspring through genetics. My offspring might be more likely to understand chemistry, but they won't have the knowledge, they have to be taught.

FE-2-29: an animal with the best characteristics is able to survive and has the best chance of producing offspring that survive

FE-2-30: Just because you are the best adapted does not mean that you will always produce the most offspring.

FE-2-31: If a person were to have plastic surgery on their nose, their children would not receive that trait because it is not in the genetic composition of the parent.

FE-2-32: I chose that response because all the other choices were involved in natural selection.

FE-2-33: I chose this answer because I feel that it best answers the question

FE-2-34: I guessed. I could eliminate some, but not all answers

FE-2-35: not answered

FE-2-36: It seemed right.

FE-2-37: i feel that all the answers were true

FE-2-38: Because the characteristics are passed on to next generation

FE-2-39: not answered

FE-2-40: Becasue i had to pick one.

FE-2-41: Darwin's idea was that stronger individuals lived to produce offspring causing future generations to include stronger or healthier offspring. This idea didn't include numbers of offspring

FE-2-42: I chose C because it is the closest definition that I know based on my biology ap class. Natural selection happens because species adapt to what best suits the environment, which in turn affects the genetics.

FE-2-43: Natural selection is just that better equipt oraganism survive better, but that doesn't mean have the most offspring. That would mean rabbits the best equipt even though an eagel is equally well equipt.

FE-2-44: Characteristics acquired as a result of experience can't be passed on genetically.

FE-2-45: I don't know i did it by process of elimination

FE-2-46: The theroy of natural selection is that varaition exists in a speices and the most adapted to the eviroment surive and reproduce changing the genetic make-up of the speacies. example would be giraffes probaly had variating lengths of necks, but since the fight for survial was much more serve on the lower level of vegatation the ones with longer next did not have to fight for food as much which allowed them to survive easier and reproduce...producing the giraffe that we have today with a long next...this is why i picked my answer for number 4

FE-2-47: Charectoristic aquired during a lifetime are not genetic and therefor can't be passed down though natural selection

FE-2-48: The characteristics are not acquired during life, but the organism is born with the genetic mutation.

FE-2-49: becouse the ones that are more adapted to the envierment will reprodre and pass on their dna

FE-2-50: not answered

FE-2-51: It just seemed like the best answer.

FE-2-52: It stood out from the theory

FE-2-53: Just kinda weeded the others out thought this was right

FE-2-54: I wasn't sure of this question, so I picked the one that is least likely to be true in my view.

FE-2-55: not answered

FE-2-56: sounded right

FE-2-57: not answered

FE-2-58: because that's what i think the answer is

FE-2-59: Because his theories dealt with "survival of the fittest" and that there is variation among species like the Finches in the Galapagos.

FE-2-60: acquired traits are things that have to be acquired and thus they can't be passed on.

FE-2-61: Genes do not change over a lifetime. Just the luck genes produce offspring

FE-2-62: Because Natural Selection is where nature selects those that happen to be better adapted to the environment and reproduce offspring that may have that trait.

FE-2-63: A different guy said that.

FE-2-64: it makes sense - survival of the fittest. if an animal can survive better in an environment than another, then it will reproduce more because it is the most advanced

FE-2-65: Darwin looked at different species and saw how the weak were picked off. He didn't say anything about how many offspring were produced.

FE-2-66: Well, not all of the organisms that are the most well off are the one's that produce the most. Some who are not so well off, may produce more than others.

FE-2-67: i learned it in high school

FE-2-68: well i don't believe that there has ever been a lot of cases where there were too many offsprings. natural selection is about survival of the fittest not over populated species

FE-2-69: Because when a species goes through natural selection, they do not create variation throughout the species, they create favorable adaptations within a species

FE-2-70: It didn't fit with the others.

FE-2-71: I didn't understand the question.

FE-2-72: The other response had to do with natural selection so I chose that one because I thought it didn't effect natural selection.

FE-2-73: Characteristics acquired during an individual's lifetime are not passed on genetically to the next generation. For instance, dying one's hair doesn't mean one's offspring will have dyed hair too.

FE-2-74: I felt the answer didn't fit Natural Selection.

FE-2-75: I did not fit with my understanding of natural selection.

FE-2-76: Because natural selection is based on a species ability to survive, not the number that species produces

FE-2-77: the reason i chose that answer, is that in all of the studies Darwin did, not every "superior" species produced the most offspring, so that wasn't specific enough of an answer to convince me otherwise.

FE-2-78: because that's what it is!

FE-2-79: natural evolution to me means the best survive, that answer seemed to fit the definitions

FE-2-80: Because Darwin may not have taken variation into account when constructing his claims, so he may have claimed much more than was actually possible with the knowledge now held.

FE-2-81: After narrowing it down, that answer seemed inconsistent with the other answers.

FE-2-82: it seemed to be the least likely to go with natural selection

Question 3

FE-3-1: because they survive and then pass on their genes that they obtain on to their young

FE-3-2: Because the fittest organisms will be able to reproduce and pass on their genetic material.

FE-3-3: Because the weakest die off so if they are the best they will continue to survive.

FE-3-4: I know what the saying means.

FE-3-5: not answered

FE-3-6: not answered

FE-3-7: not answered

FE-3-8: It was not talking about being muscular. Being the fittest means to survive and still be strong.

FE-3-9: not answered

FE-3-10: not answered

FE-3-11: Because the “fittest” have the most likely chance of passing their genes on to future generations.

FE-3-12: not answered

FE-3-13: They are the strongest, allowing them to produce offspring for the next generation.

FE-3-14: not answered

FE-3-15: Producing strong offspring is the only sure way to make a “line” or family to continue to dominate any given society, or ecosystem in the plant/animal world. In the end even the strongest of individuals must die, while their strong genes continue to dominate inside their offspring, and offspring to follow.

FE-3-16: not answered

FE-3-17: The fittest are the ones most able to succeed; this may mean strength, speed, unique physical traits, or unique behaviors. Therefore, they are the ones who will live longer and generate more offspring.

FE-3-18: Because survival has nothing to do with being big, or fast, or having big muscles. It is all about what other kind of traits you have to survive in your given environment. Therefore, you would reproduce and your species would make it for more generations.

FE-3-19: Only the animals that pass on their genetics will allow their species to survive allowing them to survive.

FE-3-20: Some organisms can be small or have other characteristics and still survive. survival of the fittest here is a term given to any organism who literally “fits” in an environment, be it concerning its rate of reproduction or its ability to adapt in an environment or simply living on for generation to generation!!

FE-3-21: The strongest refers to the individual best adapted to its surroundings.

“Survival of the Fittest” refers to those who in a sense outwit and outlast.

FE-3-22: I chose this because strong doesn’t mean physical strength all the time, it can also be mental. but lots of times in history it has been physical strength.

FE-3-23: If they are moving to the next generation they survived and were the most fit.

FE-3-24: The fittest of the organisms does not necessarily mean they are the strongest or the fastest or even the biggest. A species with the strongest muscles also does not mean

that it is equipped with the necessary drives to survive, nor does it mean that it will be able to survive onto the next generation.

FE-3-25: not answered

FE-3-26: Because the ones that are the best suited for survival will survive to the next generation.

FE-3-27: The organisms that successfully pass their genes on, have the right characteristics to surviving in a certain environment, their offspring will hopefully have the same characteristics and survive well in the same environment.

FE-3-28: The organisms are fittest when they can survive and reproduce, not how strong are smart they are

FE-3-29: The organisms that can pass their genes on to the next generation are showing their strength.

FE-3-30: If an organism is strong enough to survive into the next generation, and they produce off-spring, then the off-spring will also be very strong, and will hopefully be able to survive into the next generation.

FE-3-31: I chose this response because it's not only the organisms that survive, it's the organisms that survive and pass on their genes so their species can survive.

FE-3-32: I chose my answer because I thought it best fit with survival of the fittest.

FE-3-33: If they are "fittest" that means they will certainly survive in adulthood and into the next generation so that they may pass on those genes.

FE-3-34: not answered

FE-3-35: It seemed right to me.

FE-3-36: they survived into the next generation, because they were able to handle the transition, environment, and other aspects

FE-3-37: the biggest and fastest will be able to get the prey

FE-3-38: not answered

FE-3-39: why are we asked to reason all of our answers It made sense, but so do a job (cents)

FE-3-40: Survival of the fittest was a Darwin idea also. His ideas involved the passing of genes.

FE-3-41: I chose the answer because it is right. It has nothing to do with specific traits, and everything to do with which organism survives and which doesn't for the purpose of having a better ability to adapt to its environment.

FE-3-42: The ones that pass on there genes are the ones who are the ansestors of the current population and survival is the community as a whole make an organism fit

FE-3-43: "Survival of the Fittest" to me means survival of the "best" genetic qualities.

FE-3-44: The fastest and biggest tend to rule over the slower and weaker of the species. The weakest will probably die faster.

FE-3-45: Survival of the fittest is the specism that is able to exsist or multiple years...this is done by reproducing offspring that have the same genetic material has the parents, hence why i chose the answer to number 6

FE-3-46: when you reproduce you genes survive though your offspring

FE-3-47: The species that successfully passes traits to offspring will survive (in terms of the whole species, not applying to individuals in that population.)

FE-3-48: because that is what I was told in high school

FE-3-49: not answered

- FE-3-50: If the organism passes on its genes to the next generation, it has successfully survived.
- FE-3-51: It made sense to darwins theory of survival of the fittest
- FE-3-52: Obviously the organisms that best adapt to thier environment are going to be the strongest "Fittest" even over ones that have big muscles
- FE-3-53: This is the best answer, because when a animal goes into the next generation, it is surviving.
- FE-3-54: it sounded correct
- FE-3-55: Survival of the fittest is dependant on the animal being able to survive long enough to reproduce so really the ones that pass on the genes are the ones that sucessfully managed to adapt to their surroundings.
- FE-3-56: because to that's what i think the answer is.
- FE-3-57: Because Darwin states that the more an organism can adapt to the environment will be able to beat out the other organisms. So, in theory whoever gets the food first will survive longer before the food runs out.
- FE-3-58: The animals that are healthy will probably be the best at surviving, getting food and escaping predators. The biggest and fastest individuals are probably really healthy and they have most likely lived fairly long.
- FE-3-59: The weakest links die first.
- FE-3-60: The fittest organisms are not always those that are stronger or faster, it is those that survive to reproduce to pass on their traits to the next generation.
- FE-3-61: Because that's what it means
- FE-3-62: i think that sounds right
- FE-3-63: The species must not only survive for itself, but for generations after, so it's more of a long span idea
- FE-3-64: It is the organisms that survive to the next generation, if they didn't survive, that means they were not necessarily "fit" for the world that we live in today.
- FE-3-65: it seems like the best answer
- FE-3-66: Survival of the fittest means that the offsprings have aquired traits that will ensure their species survival. meaning adaptation and change occurs that allow the species to survive
- FE-3-67: because the traits that they pass will help with survival of the species
- FE-3-68: "Survival of the Fittest" is saying that those that survive will be able to pass on the genes that helped them survive.
- FE-3-69: "Fittest" in this sense means the organisms that are most fit to survive in the environment in which they are a part of.
- FE-3-70: Surival of the Fittest is when the best species are able to pass their genitics to the next generation. So the babies of that animal have a better chance of survival. My response was the closest to that.
- FE-3-71: becasue that is how i intake the phrase.
- FE-3-72: Organisms that survive long enough to pass on their genes are the "fittest" in the population.
- FE-3-73: Best answer
- FE-3-74: The answer I chose fit the general view of nateral selection.
- FE-3-75: Because it was the answer that made sense

FE-3-76: Because it is simply those who survive, you are not guaranteed to pass on the genetic traits from one generation to another, do a Punnett square and you will realize this, so the answer is the ones who survive, since they will have the chance of passing on their traits to the next generation (still not 100%; positive though)

FE-3-77: that is what I believe to be the correct answer

FE-3-78: that's what survival of the fittest means to me

FE-3-79: It encompasses more than simply 'biggest and fastest'; the organisms that reproduce have ensured another generation of their species the chance to survive for themselves.

FE-3-80: The reason I chose this answer is because in my eyes only the strong and people/organisms that really want to survive can survive

FE-3-81: It put all of the other ideas together to form a concise response.

FE-3-82: the species that is most well adapted to its environment is most likely to survive and pass its DNA to offspring

Question 4

FE-4-1: Becuse natural selection is about changing into the best possible type() (Gene) for survival

FE-4-2: Because it can only act on characteristics that are actually shown, not just the genotypes.

FE-4-3: not answered

FE-4-4: I found it in a textbook.

FE-4-5: not answered

FE-4-6: I had no idea what the answer was.

FE-4-7: not answered

FE-4-8: not answered

FE-4-9: not answered

FE-4-10: not answered

FE-4-11: Because natural selection favors traits that promote survivability, so thus alleles that give favorable traits are more likely to be kept in the system, which is an effect on genotype.

FE-4-12: not answered

FE-4-13: not answered

FE-4-14: because i felt like it

FE-4-15: I can't remember the difference between phenotypes and genotypes, so I guessed.

FE-4-16: not answered

FE-4-17: I forgot the difference between genotype and phenotype.

FE-4-18: It just sounded like the right answer.

FE-4-19: i didnt understand

FE-4-20: Natural selection seems to be genetically related.

FE-4-21: not answered

FE-4-22: Refers back to only the strongest survive, and Natural eselection is based on this theory

FE-4-23: Again, I'm not familiar with natural selection.

FE-4-24: i believe it effects the offspring.

FE-4-25: not answered

FE-4-26: Mutations allow organisms to manipulate its DNA by trial and error. Which in turn allows the organism to figure out which combinations allow it to have a higher survival rate.

FE-4-27: not answered

FE-4-28: It was a guess, I wasn't sure.

FE-4-29: Mutations create new characteristics, that may or may not help an organism to survive. The mutations that hinder an organism will be stopped, because the organism will fail to pass on their genes to the next generation. The mutations that are helpful will be passed on.

FE-4-30: dont know

FE-4-31: Natural selection acts on your genotype (it deals with what you are made of, and not just how you are observed).

FE-4-32: I believe that natural selections depends on both phenotypes and genotypes. Phenotypes, since they are expressed, can be something like skin color. If a person lives

near the equator they will need darker skin in order to survive. Genotypes are important as well because these are the unexpressed genes in a species. Often it is the genetic composition of an individual that determines the strength of that individual.

FE-4-33: I wasn't really sure about this answer, but I thought about all the other ones and this one made the most sense.

FE-4-34: I felt this best answered the question.

FE-4-35: i guessed

FE-4-36: not answered

FE-4-37: It seemed like a good answer.

FE-4-38: natural selection is when animals are chosen by others due to their physical characteristics, or phenotype

FE-4-39: it only acts on genotype

FE-4-40: not answered

FE-4-41: the other answers didn't fit in my opinion

FE-4-42: I'm not sure about what natural selection means or what the responses to the question mean.

FE-4-43: It seemed like the best choice.

FE-4-44: not answered

FE-4-45: not answered

FE-4-46: not answered

FE-4-47: the definition of the natural selection is when mutation also known as genetic variations occur and then the most adapted to the environment survives hence the answer to number 8

FE-4-48: Dinosaurs

FE-4-49: I know that natural selection has to do with genetic mutations.

FE-4-50: because the genome controls everything and any new mutation will be expressed

FE-4-51: not answered

FE-4-52: I made the most sense.

FE-4-53: It made sense to me

FE-4-54: It corrects mutations to better adapt to the organism's environment and to also keep the number of critters to not become extinct nor to overpopulate

FE-4-55: Animals need to mutate in order to survive the changes in the world.

FE-4-56: not answered

FE-4-57: sounded right

FE-4-58: not answered

FE-4-59: because that's what I think the answer is.

FE-4-60: Because natural selection can improve an organism or hurt them depending on the genes they receive and if it is mutated, then it will help or hurt them.

FE-4-61: The individuals that are the most well equipped to survive will probably mate more, passing on their genes that improve survival.

FE-4-62: Physical characteristics help survival.

FE-4-63: I said genotype and not phenotype because it is the genes that cause the traits to be expressed. therefore organisms that have genes that cause them to have traits that inhibits their survival die off and vice versa for those that have genes that cause them to have traits that improve their survival.

FE-4-64: Because they don't decide to change

- FE-4-65: Im not sure, but I think a genotype causes a phenotype most of the time. So a genetic difference would cause a physical difference
- FE-4-66: I don't know exactly why I chose the one I did!
- FE-4-67: i dont know
- FE-4-68: that was the only answer that i thought was right
- FE-4-69: because nature is trying to have that special gene to be passed from generation to generation for survival
- FE-4-70: Some people are unable to get certain diseases because they have a mutation in certain genes.
- FE-4-71: I didn't understand how the question had to do with the responses.
- FE-4-72: because that is what i think natural selection is.
- FE-4-73: Genes that are not expressed (phenotype) have no effect on natural selection.
- FE-4-74: Best answer
- FE-4-75: Fits my understanding of natural selection.
- FE-4-76: I guessed
- FE-4-77: The genotype is directly effected the phenotype is aresult from the genotype. The reccesive allele deals with the genotype, and the first answer didnt make relative sense. I could have flipped this around but i amstill confident wth my choice for the time being.
- FE-4-78:
- FE-4-79: that is what it meant to me
- FE-4-80: I didn't understand many of the terms in the answers.
- FE-4-81: It was correct
- FE-4-82: the best sequencing of genetic material will make the animal more likely to survive and if the right animals produce offspring they can bring out recessive traits

Question 5

FE-5-1: homo means the same, hetro means different

FE-5-2: Because homologous structures show evidence of evolution.

FE-5-3: not answered

FE-5-4: I read it

FE-5-5: not answered

FE-5-6: not answered

FE-5-7: not answered

FE-5-8: not answered

FE-5-9: not answered

FE-5-10: All of the areas mentioned were important for the survival of the animal they were a part of. Evolution is non-random because the animal evolves into what it needs to survive in the environment it lives in.

FE-5-11: Each of the parts listed did not exactly act like the others, but they represent a bodily extremity that facilitates movement, and thus they likely had a common ancestor at some point.

FE-5-12: not answered

FE-5-13: Homo means same and that was the only response involving the word "same."

FE-5-14: i did not know that one at all. but homologous or whatever that word was derives from the latin word humus i believe

FE-5-15: Similarities between bone structure and musculature show a logical transition between species.

FE-5-16: not answered

FE-5-17: According to evolutionary thought, these structures imply that the three have a common ancestor. In this case, the ancestor was a very long way back on the evolutionary chain, but the structures are anatomically similar.

FE-5-18: I guessed at this one.

FE-5-19: All the items listed provided each species with the same capability

FE-5-20: Homo means similar and the organisms all use their functional attachments.

FE-5-21: it is apparent from studying the structural bone make up of these organisms that they shared a common ancestor!!! just as the fetus of a human baby has gills giving a direct link to that of a fish and a toad!!

FE-5-22: All have an appendaged that is similar in function and makeup, but live in totally different environments, thus they must have evolved from one simpler organism.

FE-5-23: Evolution is not random. The bat, dog, and whale all have something in common because the homologous structure is an important structure in all three species.

FE-5-24: I just think it means that they have all evolved overtime, not from the same ancestry

FE-5-25: It is what we learned in biology

FE-5-26: All three of these species have evolved itself with a common structure but have different uses.

FE-5-27: not answered

FE-5-28: They are homologous, which means they all descend from a common ancestor.

FE-5-29: All of the limbs of the different animals mutated from a limb of some common ancestor.

- FE-5-30: The limb of the animals are all an adaption from a common ancestor
- FE-5-31: Because they have similar body parts they probably acquired them from a similar ancestor.
- FE-5-32: The animals listed are all mammals, and they have all been around for quite some time. I think that the only explanation for the structures being homologous is that they share an ancestor.
- FE-5-33: I chose this response because I felt that it was the right one out of all the other choices. I narrowed it down.
- FE-5-34: I chose this answer because in a way I could see all of the animals evolving from one organism into others.
- FE-5-35: The prefix "homo" means "the same"
- FE-5-36: not answered
- FE-5-37: The three parts all evolved from the same organism a long time ago.
- FE-5-38: their structures are alike, which is saying they come from a common ancestor
- FE-5-39: they are separate species
- FE-5-40: not answered
- FE-5-41: I don't know
- FE-5-42: I tried to determine the meaning of Homologous by breaking it into two parts.
- FE-5-43: I do not like any of the choices, though I understand the question. The body parts mentioned are homologous because they are similar in three different organisms.
- FE-5-44: Which answer best says that, I haven't the slightest clue!
- FE-5-45: what I learned in class
- FE-5-46: I reasoned that since all the animals are mammals, they must have a common ancestor whose forelimb adapted to a number of purposes.
- FE-5-47: not answered
- FE-5-48: If they are all common somewhere along the line an evolution branch broke off, stating that they had a common ancestor somewhere in their ancestral history, that's why I picked the answer for number 10
- FE-5-49: they are all very different mammals yet are similar in this way which shows that at one point there was a common ancestor that had this trait
- FE-5-50: I know that mammals evolved from the same early mammals and thus have similar characteristics.
- FE-5-51: I remember that from last year's bio class
- FE-5-52: It was the best answer.
- FE-5-53: Not so sure why
- FE-5-54: Homologous means the same or alike therefore if they are all presenting something such as a fin to best adapt them to their environment it must have been passed on through an ancestor
- FE-5-55: Each of the apparatuses are used for movement, and so could have their ancestor used its apparatus for movement.
- FE-5-56: it made sense
- FE-5-57: Looking at the structure of the forelimb it is entirely conclusive that they are related even though the forelimb itself may not have the same exact function in each animal.
- FE-5-58: because that's what I think the answer is.
- FE-5-59: Because they are the same bone structure, but have different functions.

FE-5-60: It just makes sense that if a structure is similar that they all probably came from one common ancestor.

FE-5-61: The similar bone structures suggest that they evolved from the same organism.

FE-5-62: Those three organisms are homologous because their limb bones possess the same number and same positioning of those bones, indicating they all evolved from a common ancestor

FE-5-63: They are all semi similar so they could have come from the same animal maybe

FE-5-64: they're all mammals

FE-5-65: Honestly, it was a guess!

FE-5-66: seems right

FE-5-67: these animals all evolved from a common ancestor and that is why they have similar traits

FE-5-68: i do not understand what "homogenous structure"

FE-5-69: The structure helps them all to move.

FE-5-70: I'm not sure what the right answer is.

FE-5-71: I remember learning about that in my 10th grade biology class.

FE-5-72: because that answer seems like it would make the most sense to me.

FE-5-73: All of these organisms mentioned are mammals. They share a common ancestor, however distant that organism may be.

FE-5-74: I thought that answer matched homologous the best.

FE-5-75: I don't know, just thought it looked right.

FE-5-76: I guessed

FE-5-77: homologous means the same, as in homosexual (just an example) so same and common have the most commonalities between each other. Therefore my choice was the only relative one to choose.

FE-5-78: duhhhhh

FE-5-79: they must have in order to have a similar structure

FE-5-80: 'Homo' means 'same' and whales dogs and bats are all mammals which means that they did all evolve from the same first mammalian species.

FE-5-81: It seemed logical.

FE-5-82: Because homologous means common ancestor

Question 6

FE-6-1: because it is always occurring

FE-6-2: Because the other answers were not fitting.

FE-6-3: All organisms evolve to better adapt to their surroundings

FE-6-4: It's what I believe happens.

FE-6-5: not answered

FE-6-6: not answered

FE-6-7: not answered

FE-6-8: not answered

FE-6-9: not answered

FE-6-10: Evolution occurs when it is needed. Some animals have not changed at all in thousands of years because they have not needed to. Others evolve repeatedly as their environment changes.

FE-6-11: Evolution is constantly occurring to all organisms because currently we cannot completely control environment and genetics, which are major factors in evolution. More fit organisms still tend to live longer and function more efficiently in general, while the weaker tend to die more easily and are not as well suited to the tasks they must perform.

FE-6-12: not answered

FE-6-13: not answered

FE-6-14: not answered

FE-6-15: All animals and plants evolve and change. Whether its rapid, or not, determines the level of adaptation and mutation among the populations of individual species.

FE-6-16: I really not sure whether evolution in living creature exist or not

FE-6-17: Given that natural selection does happen, and leads to change over time, evolution occurs with everything, because every living thing is subject to mutations.

FE-6-18: Because evolution can happen in any kind of species so they can adapt to live on in different conditions in different environments.

FE-6-19: Evolution is like a rebirth and can occur in any living organism

FE-6-20: It is what I believe.

FE-6-21: It is because of evolution of THE ENTIRE POPULATION that the structural make up is INDIVIDUALISED . . . otherwise a giraffe would fail to have such a long neck or a human would still have a tail instead of a tailbone.

FE-6-22: Even with humans if you follow sports at all you can see that athletes are becoming bigger stronger and faster and not all of those can be taught.

FE-6-23: I believe evolution indeed takes place within all organisms: plants, humans, insects, animals....everything.

FE-6-24: i believe that for it to be considered evolution of a species the same changes must be evolved by the total population, or it is just the creation of a new species

FE-6-25: Evolution is for every living organism. We all change over time this has been proven

FE-6-26: If it at the beginning there were only single celled organisms that lived in the ocean, evolution must have occurred in order for there to be complex multicelled organisms living both on land and water.

FE-6-27: When organisms evolve they do so in numbers. You don't see more evolved organisms than others in a species.

- FE-6-28: Every population of every organism goes through evolutionary changes, whether the changes happen quickly or very very slowly.
- FE-6-29: All organisms are striving to fit perfectly in their environment, and all environments change over time.
- FE-6-30: I don't really know it was kind of just my opinion
- FE-6-31: Populations are the smallest level that evolution can be seen at.
- FE-6-32: I recall one of my biology teachers stating that there is no way that the human population could ever evolve into an even more intelligent life form than ours. I don't know if I believe that mammals as a whole will actually evolve over time. It seems more likely for insects and other non-mammals to evolve.
- FE-6-33: Evolution occurs to everything, it's just a matter of how much time it takes.
- FE-6-34: It is just my personal belief.
- FE-6-35: I don't agree with some ideas about evolution
- FE-6-36: not answered
- FE-6-37: Evolution is continuously happening.
- FE-6-38: every animal has evolved to what it is now
- FE-6-39: it my belief
- FE-6-40: not answered
- FE-6-41: Because all organisms undergo some changes in order to adapt to their environment.
- FE-6-42: I believe everything evolves.
- FE-6-43: Evolution is a theory, not a fact. I am not sure whether or not I believe in it or not. The evidence could be better for this theory.
- FE-6-44: not answered
- FE-6-45: I was tempted by "in all non-human organisms", but decided to choose all organisms because I think that while human evolution has slowed (since the world population is growing), it is still happening.
- FE-6-46: Because throughout history there is shown the evolutions of species which has led to the way they are today
- FE-6-47: Evolution is completely random it occurs when mutations occur, it is even occurring right now just in micro form so it is not as noticeable but it occurs in every species and organisms in the world. explaining my answer for number 12
- FE-6-48: We all evolve (even humans) evidence shows that we are slowly getting taller as an organism.
- FE-6-49: All organisms are evolving.
- FE-6-50: i don't know why
- FE-6-51: not answered
- FE-6-52: not answered
- FE-6-53: It made sense and is partly true
- FE-6-54: The world and all the organisms in it are constantly changing and those organisms are constantly having to adapt to different environments, meaning evolving from what they had before
- FE-6-55: Everything evolves.
- FE-6-56: made the most sense
- FE-6-57: Just by looking at past research you can see that each species has changed, some more than others.

FE-6-58: because to that's what i think the answer is.

FE-6-59: Because everyday things are changing for organisms and they are evolving with new traits.

FE-6-60: evolution is always happening to everything. everything wants to survive longer.

FE-6-61: Technically, evolution happens FOR the individual but HELPS the population.

FE-6-62: Evolution can not occur in a single individual it require many individuals to combine thier genetic information and let natural selection work in order to produce change. A organism retains its identity throughout its lifetime

FE-6-63: Because the world undergoes constant evolution

FE-6-64: evolution doesn't suddenly happen to a population of animals. The change appears in one, then spreads if it is more adapted to the current situation

FE-6-65: that is kind of my view point

FE-6-66: i believe that all oraganisms can change over time

FE-6-67: because when a trait is formed, it is passes on in the offspring

FE-6-68: There are cases of microevolution in almost all species

FE-6-69: I don't believe in evolution.

FE-6-70: I believe evolution occurs to all species, for example humans are slowly becoming taller.

FE-6-71: i think of it as something different.

FE-6-72: Evolution occurs in all populations of organisms, because populations, including human demographics, are constantly changing.

FE-6-73: Mr. Stone, my Biology teacher in high school

FE-6-74: Went with my understanding of evolution.

FE-6-75: I guessed

FE-6-76: not strictly in a single individual, cause if that individual dies before mating, then the genetic evolution dies with it, there is no chance for it to pass it on. The only answerthat made the most sense was the one dealing with populations, for reproduction and the mixingof genes is what passes along the genetic material, and the evolution....

FE-6-77: how many times are you going to ask me this

FE-6-78: although i am religious i still believe in evolution, how could you not

FE-6-79: It seemed an obvious answer; I've noticed that biology classes always emphasize that humans are animals and therefore part of biology. I dislike this because it makes the class seem less advanced when we examine such obvious and basic ideas. I feel that everyone should be aware of this by now.

FE-6-80: Evolution is when people or organisms evolve into a state which surpass their ancestries level

FE-6-81: It is correct.

FE-6-82: Species adapt to environment and produce offspring with their superior DNA

Question 7

FE-7-1: It's seemed like the best answer

FE-7-2: not answered

FE-7-3: Any class can have new species, it is not restricted

FE-7-4: I didn't agree with any.

FE-7-5: not answered

FE-7-6: not answered

FE-7-7: not answered

FE-7-8: not answered

FE-7-9: not answered

FE-7-10: not answered

FE-7-11: It can occur anywhere, due to the miniscule chance of a mutation.

FE-7-12: not answered

FE-7-13: not answered

FE-7-14: not answered

FE-7-15: There are many organisms that are still changing and creating species constantly, whether its crossbreeding of two different types of bears, dogs, or cross-pollination of plants, new "breeds" are developed constantly. With human influence more and more new breeds of plants are being made constantly.

FE-7-16: not answered

FE-7-17: Scientifically, it is possible over a huge expanse of time due to evolution. However, my religious views would indicate b.

FE-7-18: It just sounded like the best answer.

FE-7-19: None of the answers provided the definition i would hav given

FE-7-20: I believe in that answer.

FE-7-21: DIVERSITY IF LIFE ITSELF PROVES THAT SPECIATION KEEPS OCCURRING THROUGHOUT THE ENTIRE POPULATION!!

FE-7-22: Like breeds of dogs some can be successful in making a bew specise but some cannot even reproduce.

FE-7-23: Extraordinary things happen in science, new species being one of them. I think the creation of new species can occur within any group.

FE-7-24: i chose this because I don't think a new speciese can just be created out of no where, but I believe that God can only create new creatures. but I also don't believe that all creatures were created at the beginning of time, i think that god can create whenever he wants, he has no boundries.

FE-7-25: I believe that the probability of speciation exists for all forms of life.

FE-7-26: I'm not entirely familiar with speciation.

FE-7-27: not answered

FE-7-28: Every population undergoes evolution.

FE-7-29: All organisms can be split from a group and thrown into a new environment, a few mutations happen, and BOOM a new speicies.

FE-7-30: another opinion

FE-7-31: A new species can develop in any pop. if there are differing conditions between the individual species (food difference, geographical separation...)

FE-7-32: I don't know that I believe that the origin of a new species is possible. I honestly don't think of any species as producing another speices that its not its own.

FE-7-33: Again, it's the same concept as evolution. It will/does happen, it's just a matter of time.

FE-7-34: It just depends upon breeding

FE-7-35: New species pop up everyday, either from cross-breeding, genetic mutations, etc.

FE-7-36: not answered

FE-7-37: Just because it is newly 'discovered' doesn't mean it hasn't always been around.

FE-7-38: idk

FE-7-39: that's just my opinion

FE-7-40: not answered

FE-7-41: Because it is correct, according to what I believe.

FE-7-42: Evolution occurs in everything but doesn't necessarily have to be for the better.

FE-7-43: I chose this because I know that interbreeding can take place with some different types of species, though, typically with problems. I do not believe in creationism, though. I believe there is some other explanation aside from big bang, adam and eve, and evolution. Right now, independent design is sounding good to me, but I am still on the path to discovering what I actually believe.

FE-7-44: not answered

FE-7-45: I think a new species could occur anywhere under the right circumstances.

FE-7-46: because it evolved it probably evolved from something simpler

FE-7-47: the creation of new species does not occur very often but it can occur in any species and organisms because all it is, is mutation in an organism and make that organism more adapted to the environment allowing it to survive longer and more effectively than its previous ancestors, hence the answer for number 14

FE-7-48: because I said so

FE-7-49: New species can occur in any population.

FE-7-50: because I liked that answer.

FE-7-51: not answered

FE-7-52: not answered

FE-7-53: It made the most sense to me

FE-7-54: not answered

FE-7-55: New species can come from any population.

FE-7-56: I don't know

FE-7-57: because that's what I think the answer is.

FE-7-58: Because I think of Speciation as finding new organisms that we do not know of yet.

FE-7-59: Any species under the right conditions has the ability to evolve into something else.

FE-7-60: It can happen any time that resources available change. a species evolves to keep reproducing.

FE-7-61: Speciation occurs in all populations because that is how evolution functions. The population undergoes natural selection they pass those traits to their offspring and this continues to happen to the point where a new species has been created.

FE-7-62: I don't know about that one.

FE-7-63: I liked that choice the best

FE-7-64: The world is always changing, and therefore, all organisms can change into new things.

FE-7-65: i just guess⁷⁸

FE-7-66: i believe new species come all the time, i also believe that they come from common ancestors and become more complex than their ancestors

FE-7-67: I do not know anything on this subject

FE-7-68: There are many different species that are similar to each other, but are different at the same time.

FE-7-69: Is this like cross-breeding

FE-7-70: It looked like the best response since I haven't learned that much about that topic yet.

FE-7-71: because i don't think that news things are created anymore.

FE-7-72: Any population of organisms can produce a new species, because mutations happen in all species and evolution can result.

FE-7-73: The other answers weren't right.

FE-7-74: I don't know the answer.

FE-7-75: I guessed

FE-7-76: again on ly relevant question in my mind

FE-7-77: i dont know

FE-7-78: i think it would be very difficult to a new species if it wasnt coming from a similar specie

FE-7-79: I suppose that I've been under the impression that once a species has mutated enough from it's similar relative it is classified as a new speices.

FE-7-80: The origin of new spicies i think can b found in all organisms it may come by fluke or by chance but i think it is possible that it may happen and well that also can be discribed as a biological evolution

FE-7-81: It seemed like a good educated guess.

FE-7-82: Organisms are often changing due to a changing environment

Question 8

FE-8-1: Because without evolution we wouldn't be how we are

FE-8-2: Because for me it seems perfectly logical and I choose to believe it.

FE-8-3: I believe in creation.

FE-8-4: not answered

FE-8-5: not answered

FE-8-6: I believe that biological evolution can occur within species, but not in the creation of a new species. I haven't found any convincing evidence to support the theory of new species evolving.

FE-8-7: not answered

FE-8-8: not answered

FE-8-9: evolution plays a great role in the changing of species over time regardless of how creatures were first put on the planet!

FE-8-10: I am a religious person, so I believe that God gives us the ability to survive. However, I think that He does this by giving us the ability to react to the circumstances of the environment around us, therefore becoming biological evolution, a valid scientific idea.

FE-8-11: Biological Evolution is a logical and supported theory that is supported by a large amount of data researchers have found over the years.

FE-8-12: not answered

FE-8-13: not answered

FE-8-14: i agree though i believe slightly differently in the case of some like humuns. I do not think that we came from monkeys

FE-8-15: The similarities between species show a common flow, or idea that can connect cows to dolphins, and all species to one another. If creationism is the question at had, you would think an all-powerful being of some type, whould have had a little more fun and made some of us green, or purple, rather than this very basic "neutral color scheme" he went with.

FE-8-16: it depends on evidence

FE-8-17: I feel that it has a good deal of evidence, but there is also quite a bit of propaganda and stretching of the evidence. There is also a great deal of evidence against evolution, which also needs to be considered in any educated circle.

FE-8-18: Because there is proof that supports that statement.

FE-8-19: I feel that biology is a very important subject to understand because it is what makes everything!

FE-8-20: I believe it is a theory that has been proved true.

FE-8-21: i hesitated to strongly agree because the world of science is sometimes . . .very rarely but sometimes based on assumptions soo its hard to directly agree on any statement!!

FE-8-22: I strongly agree with the theory of Biological evolution.

FE-8-23: I agree with the statement; however, have other views as well.

FE-8-24: For religioise reasons

FE-8-25: Because I do believe it to be true

FE-8-26: To me, it is impossible for organisms not to be able to evolve and change over time.

FE-8-27: The study of what organisms derived from tells us more about what happened in the past.

FE-8-28: Because it's the best explanation for the development of today's species.

FE-8-29: I believe it is true.

FE-8-30: I think evolution is pretty much a fact, organisms do change over time to fit their surroundings

FE-8-31: There is a vast amount of evidence that suggests that evolution is possible.

FE-8-32: Even though a lot of my answers do seem contradictory, I think that evolution is possible. I think that the way humans got here was through evolution, even if I don't really believe that it is going to happen soon.

FE-8-33: I strongly agree because look at how far we've come, from one-celled organisms to us now.

FE-8-34: I do not believe in evolution, I accept the scientific theory, but I don't believe it.

FE-8-35: not answered

FE-8-36: not answered

FE-8-37: it is a true statement

FE-8-38: evolution is based on science, and science alone

FE-8-39: because i think its a valid reason

FE-8-40: animals undergo changes to adapt, but not to the cataclysmic proportions that the theory of evolution provides.

FE-8-41: First i'm trying to determine what exactly is a valid science idea. I know evolution is a science idea.

FE-8-42: YES!!! Any theory about the beginning of life can be valid because NO ONE has a clue how it all began. We all believe what we want, whether it is true or not. But, we can only believe and have faith because we simply do not know. It is always good to continue to research because the world, life, etc is constantly changing. Who knows, maybe evolution will be proven as a theory...

FE-8-43: because it is, not strongly because while I am not contrary to evolution, I don't feel terrible strong about it, just as I don't feel terrible strong about 9.8 meters per second its just part of bio

FE-8-44: Evolution seems valid to me because it's so logical... I don't understand how evolution could not happen.

FE-8-45: evidence in fossils and writings

FE-8-46: I believe that evolution occurred and there is plenty of proof that exist for it. evidence

FE-8-47: Biological evidence supports this theory.

FE-8-48: because I believe in evolution

FE-8-49: I think that evolution is something that happens and is happening.

FE-8-50: I strongly agreed with the response

FE-8-51: Science has its own right to hold any view point that it wants to

FE-8-52: I believe that it is and isn't a valid scientific idea. Evolution has not been proven yet, but i believe that God caused evolution to happen.

FE-8-53: because that is just my opinion on the history of life

FE-8-54: Although I lean perhaps more toward “Intelligent Design” than evolution I believe that more than enough evidence has been shown to at least give evolution some credation.

FE-8-55: because to that’s what i believe.

FE-8-56: I think it is agreeable because it has logical evidence, but at the same time we do not know for sure and never will because no one was alive and able to tell the beginning story.

FE-8-57: I strongly believe in evolution because of all the evidence and it just makes sense that organisms would naturally try to change over time in order to increase their chances of survival.

FE-8-58: It makes sense

FE-8-59: I strongly agree because their is now other explanation that can explain for the vast variety of life on earth, and simply saying God did it offers no solid evidence other than a personal view. The inward similarity and outward diversity of our planet strongly shows that all life is descended from a single ancestor.

FE-8-60: I do have religious beliefs, but I’m willing to believe that it was a sort of God based evolution. I refuse to be close minded to either matter.

FE-8-61: I think its part of the puzzle. The chances of everything just ‘working out’ seem mathematically insignificant. There should some guiding power, but I still think evolution exists, I just don’t think it is the only way to explain origins of species

FE-8-62: i don’t know

FE-8-63: well i am a Christian and i personally believe that God Created everything and that only by his power are these things able to happen such as evolution

FE-8-64: I really do not have any reason that it is not possible.

FE-8-65: I believe in some types of evolution.

FE-8-66: not answered

FE-8-67: I think evolution is valid in that it can be backed by other theories, but I don’t know enough about it to believe that it is true. I am interested in learning about it, however.

FE-8-68: Biology evolution has a lot of evidence to back it up and I agree with many of the reasons behind it. However, I do want to learn more about it still cause I don’t have much experience behind it.

FE-8-69: i think that the sentence makes sense.

FE-8-70: Evolution is a valid science idea, because there is a great deal of evidence to support this idea.

FE-8-71: I just put agree because I still believe that God created the simplest organism.

FE-8-72: For evolution to start, there has to be an organism to build on.

FE-8-73: It so much more bases in fact not to be a correct idea.

FE-8-74: Because there is strong evidence that supports it

FE-8-75: it deals with just about everything we studdy. For it is in all the organisms taht we are learning about. So of course it is a huge science idea.

FE-8-76: thats what i believe

FE-8-77: i agree

FE-8-78: I believe in evolution but along the guidlines of the church and my religiuous beliefs

FE-8-79: I can't see another reasonable explanation that I would be comfortable with at this time.

FE-8-80: It's not only a strong Biology idea but also an idea of common sense we go through biological evolution everyday i mean we may not notice it but they say we only use 5% of the human brain and also in the bible it states of evolution so u can't really say it is a strong biology belief

FE-8-81: I agreed with the statement.

FE-8-82: There is so much evidence supporting the statement and species have changed over time

Question 9

FE-9-1: I think it is much older than that (4-ish billions)

FE-9-2: Because this statement does not coincide with my other beliefs.

FE-9-3: The packet said so.

FE-9-4: I think it is older

FE-9-5: not answered

FE-9-6: not answered

FE-9-7: not answered

FE-9-8: not answered

FE-9-9: i think it is older

FE-9-10: I believe that the Earth is older than 6-10,000 years old, but I know that my religious beliefs do not quite agree. There is a lot about this basic question that I do not really understand.

FE-9-11: Those numbers are likely some fabrication by humans from the past that relied on religion and inferior tools to come up with their numbers.

FE-9-12: not answered

FE-9-13: not answered

FE-9-14: i dont think their is any way to really PROVE how old the world is no matter how advanced technology gets. all i think that matters is we care for the world we have

FE-9-15: Geologist have proven otherwise

FE-9-16: the earth is more older then that

FE-9-17: According to historical events and estimates, largely based upon Greek and Roman writings, somewhere in that time is the guess for the Christian Creation.

FE-9-18: It is way older than that. It is billions and billions years old.

FE-9-19: I don't know what to say about the age of the earth

FE-9-20: I read it is millions of years old.

FE-9-21: PALIATOLOGY (i think i spelt tht wrong) PROVES STRONGLY that earth is easily more than a million years old. . infact probably more than a billion(if the big bang theory is taken into account)

FE-9-22: I learned in geology that it is older

FE-9-23: Again, I agree but also have other view points.

FE-9-24: religious reasons

FE-9-25: because the earth is approximately 4,600 million years old

FE-9-26: From prior knowledge, I thought the Earth was alot older, millions of years old.

FE-9-27: I don't really know what happened or how the earth came about , no one does.

FE-9-28: The Earth is almost 4.6 billion years old.

FE-9-29: I learned it is 4.6 billion years old, there are several ways of measuring radiation and half-life values that have determined the world is OLD.

FE-9-30: radiocative dating

FE-9-31: The Earth is MUCH more that thousands of years old.

FE-9-32: Through radiometric dating, it has been proven that there was the existance of simple organisms and rocks hundreds of millions of years ago.

FE-9-33: Scientists have found fossils dating back to billions of years ago.

FE-9-34: I don't really know how old earth really is.

FE-9-35: We talked in class today about how some organisms are quite a few millions years old...

FE-9-36: not answered

FE-9-37: The Earth is way older than 65,000 years old.

FE-9-38: the earth is closer to four billion years old

FE-9-39: cuz its wrong

FE-9-40: not answered

FE-9-41: Because of the research I've done of both the Intelligent design and evolutionary theories, it is much more plausible to agree that the life of earth is 6-10 thousand years old and not billions of years old.

FE-9-42: I don't know how old the earth is. I have trouble grasping dates and timespans.

FE-9-43: Earth is ancient, and much older than we think or know it is. I think that the measurements that science uses to determine age are not advanced or accurate enough.

FE-9-44: not answered

FE-9-45: I understand that there is a lot of evidence suggesting the Earth is much older.

FE-9-46: Studies show that the earth is much older than that because of the many layers of rocks that represent different time periods

FE-9-47: it is about 4.6 billion years old....so that's false

FE-9-48: Dinosaurs

FE-9-49: The earth is much older.

FE-9-50: I don't believe in the religion

FE-9-51: We will never exactly know the exact age of the earth

FE-9-52: Due to different tests like core sampling and radioactive dating using isotopes scientists were able to declare the age of the earth to be greater than 6-10,000 years old

FE-9-53: This would make the world too young. It is at least 4,000 million years ago.

FE-9-54: what about the dinosaurs

FE-9-55: If it's fact and has been proven I don't see why it wouldn't be true. it's over a billion years old.

FE-9-56: I based my thinking of geological findings and it makes sense that they are formed over billions of years. Since there are small changes in the environment everyday.

FE-9-57: The Earth has been around a lot longer than that.

FE-9-58: The evidence that on that age of the earth is based on a story given to man by God to show humans how to live, not how to understand the geological origin of the earth.

FE-9-59: I disagree because that statement is only based on a guess by those who wrote the bible and had none of the scientific instruments that we have today.

FE-9-60: not answered

FE-9-61: I just said that because I don't really know how old it is, and I honestly don't care. No one needs to convince me that it's older than the bible says it is. Should I care how old the earth is

FE-9-62: Radiometric dating evidence

FE-9-63: The Earth is not just thousands of years old, but millions of years old.

FE-9-64: it says it in my bio book

FE-9-65: well the bible does say a different number of years than what scientists say so, I really don't know how to answer this question

FE-9-66: The oldest found fossil was over dated over 600MYA

FE-9-67: There is evidence that states otherwise

FE-9-68: I believe the Earth is probably older, however, I don't understand it enough to "strongly disagree".

FE-9-69: After learning how scientist think that the earth is that age in class the other day, I agree. They have been able to pin point that time period with proof.

FE-9-70: i don't usually think of how old the earth is.

FE-9-71: There is evidence suggesting the earth's age to be about 4.5 billion years old. Statigraphy and radiometric dating have been instrumental to scientists reaching this approximation.

FE-9-72: Just talked about how old the Earth was thought to be in class and it was in the billions.

FE-9-73: There is fossils and other organisms that are millions of years old. There for the earth can't be in thousand at this date and time.

FE-9-74: Because there are fossils that have been discovered to be millions and millions of years old

FE-9-75: due to what we have learned from carbon dating, and from any of the radioactive dating, certain rocks give us insight to how old our earth is, and it is for certain older than 10000 years old...

FE-9-76: i believe it to be much older that that

FE-9-77: its WAY older then that!

FE-9-78: i believe the earth is much older because there have been records of fossils dating back millions of years ago

FE-9-79: I hold that the Bible is valid, but to a point. I like to think that God did create mankind, but that men created the Bible. Another point to add is that I'm not terribly religious. Probably average.

FE-9-80: We don't know for certain how old the earth is ppl say it was 10,000 mya by the big bang theory i believe it was even more than that again u can't really date how old the earth is caz of the oldest fossils for all we know there may be fossil which we havn't discovered which may date back to even longer than 10,000 MYA

FE-9-81: I agreed with the statement.

FE-9-82: The earth is around 4.5 billion years old

Question 10

FE-10-1: if not for evolution we wouldn't be how we are today

FE-10-2: not answered

FE-10-3: It has never been proved. Where did the matter come from that things evolved from

FE-10-4: I believe it to be correct. It's logical

FE-10-5: not answered

FE-10-6: It is not unlikely to be correct simply because it is "just a theory," but I don't believe there is enough evidence to support the theory and make it truth.

FE-10-7: not answered

FE-10-8: not answered

FE-10-9: i believe that evolution plays a large role in society

FE-10-10: I think biological evolution is the process by which we adapt to our environments.

FE-10-11: If everything that was a "theory" was unlikely to be true, we wouldn't believe in gravity, or a LOT of other concepts of the universe.

FE-10-12: not answered

FE-10-13: not answered

FE-10-14: i think it very likely could be true to some degree or another

FE-10-15: There is too much evidence to disprove it. Evolution happened and is still happening.

FE-10-16: maybe

FE-10-17: This statement refers to a theory as being an unproven assumption. However, evolution theory has a great deal of scientific evidence, and is a scientific theory that explains certain phenomena.

FE-10-18: I just kind of answered the same question earlier.

FE-10-19: Evolution occurs

FE-10-20: Theories are assumed to be true until proven wrong.

FE-10-21: not answered

FE-10-22: It is a scientific theory which means it is substantiated with lots of research and evidence.

FE-10-23: Biological evolution is not unlikely to be correct. It is an important part of Biology in many ways.

FE-10-24: religious purposes

FE-10-25: Although biological evolution is just a theory it has been proven time and again to be true.

FE-10-26: Even if it may be a theory, there has to be something to explain occurring events.

FE-10-27: A theory is an educated guess based on what we know. However, it does not mean it's true

FE-10-28: Theories are ideas that have A LOT of evidence to back them up. Although it's not possible to prove a theory, there is enough evidence of this one to make me believe it fact.

FE-10-29: It is possible that it is not correct, but I think it is basically true.

FE-10-30: although evolution is not a fact i believe there is alot of evidence to support it

FE-10-31: There is a great deal of evidence that is continually being added to to prove that it is possible.

FE-10-32: I truly do believe that the human species evolved from a lesser species. There is no proof that human life existed at the time of the dinosaurs, and now obviously there is human life.

FE-10-33: I agree that a theory does not make anything correct, but once again, look at how far we've come.

FE-10-34: I don't believe in evolution, I think that animals can cross breed and produce new types of dogs, but I don't believe that all things evolved from a single cell organism.

FE-10-35: I prefer to listen to my faith and religious beliefs when it comes to evolution

FE-10-36: not answered

FE-10-37: The answer I chose seemed right.

FE-10-38: there is a lot of evidence that backs the evolution theory

FE-10-39: its difficult to say

FE-10-40: not answered

FE-10-41: Aspects of the theory as resonable, but some of it, in my opinion is lame like a three-legged dog.

FE-10-42: I believe evolution is true.

FE-10-43: It is a theory, and I do not personally think it is the right answer, but it could be.

FE-10-44: all of scientific theorys are guesses but wouldn't be called a thoery if it was most likely wrong

FE-10-45: I think that because it's a theory, it may be wrong, but could just as well be right.

FE-10-46: there is evidence that strongly supports this theory, and for it to be a scientific theory is more than enough for me to consider it a truth

FE-10-47: It is a theroy but there is plenty of evidence that supports it, so most likely it is correct and it did occur. which is why i picked the answer for numebr 20

FE-10-48: Dinosaurs

FE-10-49 Theories are supported by facts.

FE-10-50: beouse i belive in the thory of evolution

FE-10-51: There is valid research that shows evolution may not be just a theory.

FE-10-52: I'm neutral

FE-10-53: Evolution has not been proven true or false

FE-10-54: it fit my opinion the best

FE-10-55: Gravity is just a theory but that works so why not evolution

FE-10-56: just because it's a theory doesn't mean that it's not correct.

FE-10-57: Because I agree and disagree, since I do not know what to believe about evolution.

FE-10-58: Right now it is just a theory. There has to be some way to actually prove this with facts.

FE-10-59: Theories tend to be correct, not wrong.

FE-10-60: It may be true that evolution can never be proven to beyond a fraction of a doubt. however it has gone through so many tests and it has so much evidence supporting it; it seems more likely to be correct.

- FE-10-61: Theories are generally fairly trustworthy, but then again we find out new information all the time. I don't really care if it's real or not. I care more about the present than the past.
- FE-10-62: it's a theory because it fits the facts... so far
- FE-10-63: Biological evolution is just a theory, but that doesn't mean that it is unlikely to be correct.
- FE-10-64: theories are base on facts so biological evolution is a fact
- FE-10-65: it could be true, but i believe God ccontrols it
- FE-10-66: I have no evidence to believe that it is not true
- FE-10-67: I'm not sure how I feel about the question.
- FE-10-68: A theory has evidence to help prove it correct. (Gravity is a theory.) The fact that it is a theory is not why I disagree with it.
- FE-10-69: It is a theory, but it is much like gravity. While they can't prove it, there are many things that has been brought forward that backs up the theroy.
- FE-10-70: i'm not sure how i feel about that statement.
- FE-10-71: Theories are supported with evidence and facts. They also agree with all known laws of nature. Scientific theories are likely true.
- FE-10-72: A theory can be correct.
- FE-10-73: Facts to back up biological evolution.
- FE-10-74: There is evidence to show that biological evolution is highly likely
- FE-10-75: its a theory just not a fact...
- FE-10-76: i dont know
- FE-10-77: biological theories tend to be supported and often that of as correct
- FE-10-78: i believe parts of biological evolution, but i also follow and believe in the church and my religious beliefs
- FE-10-79: I learned in Biology that theories will never become laws because they are constantly changing and growing with new discoveries. This change does not warrent too much caution because it will constantly become more complicated and, in all likelihood, we will never be able to fully explain most, if not all, theories.
- FE-10-80: There is no answer for that i mean u can agree and u can't agree i am mutual i know i answered disagree but u never know it may or may not b true
- FE-10-81: I disagreed with the statement.
- FE-10-82: Species have changed over time

Question 11

- FE-11-1: everything evolves in order to survive, according to darwin
- FE-11-2: not answered
- FE-11-3: Species evolve to adapt to their changing surroundings.
- FE-11-4: not answered
- FE-11-5: not answered
- FE-11-6: They have undergone changes in the species through selective breeding, but never evolved into a new species.
- FE-11-7: not answered
- FE-11-8: not answered
- FE-11-9: all species undergo evolution just at different rates
- FE-11-10: We have seen evidence of this, so yes, I agree.
- FE-11-11: How else did humans come about ;o
- FE-11-12: not answered
- FE-11-13: not answered
- FE-11-14: you can see that by looking at animals over the century's
- FE-11-15: Fossils of past animals and plants have shown common traits of plants/animals today. A common ancestry is definatly present.
- FE-11-16: it is not evoulotion I beleive it is called adaption to life
- FE-11-17: For religious and personal reasons, I do not believe that evolution has occurred. I believe that it is a valid theory, but nevertheless incorrect. There is too much evidence directly opposing it for me to put faith in it.
- FE-11-18: I am not sure.
- FE-11-19: Probably other organisms have evolution more htan humans.
- FE-11-20: Certain organisms have changed over time.
- FE-11-21: not answered
- FE-11-22: Darwin's Finches of the glapogos islands is a perfect example of evolution.
- FE-11-23: I think everything evolves over time.
- FE-11-24: i believe that there might have been some evolution but only to an extent
- FE-11-25: I believe all organisms evolve
- FE-11-26: As I have always believed, there must have been a way for organims to be the way they are to this date.
- FE-11-27: From what I know this true.
- FE-11-28: Of course they've evolved, every organism undergoes evolution.
- FE-11-29: Wolves have evolved into various breeds of domestic dog. There are different types of finches on about every continent, all of which are slightly different. Of coarse things have evolved!
- FE-11-30: Non human species have evolved to fit their sorroundings and as their sorroundings change they can change to
- FE-11-31: Many organisms have changed in the past, and still are changing.
- FE-11-32: It is believed that dogs evolved from dolphins, so it would have to be true that non-human species evolved.
- FE-11-33: The species before us have evolved out of a non-human species, before that and before that.
- FE-11-34: I don't believe in biological evolution.

- FE-11-35: If you called adaption through natural selection a type of evolution, then i might say species evolved
- FE-11-36: not answered
- FE-11-37: Humans have changed over the course of the years.
- FE-11-38: different species have evolved into others
- FE-11-39: obviously theyve changed
- FE-11-40: not answered
- FE-11-41: All species have "evolved" to a certain extent, but not from fish to crustatian to fish or anything like that.
- FE-11-42: Doesn't evolution teach that basically everything evolved from very small organisms
- FE-11-43: It's possible, if we're talking animals. If we're talking about extra-terrestrials, then, yes, I believe that they exist and are out there. How can someone not agree that there is not life out in the universe when Earth is so insignificant in comparison to the entirity of the universe.
- FE-11-44: not answered
- FE-11-45: Again, evolution seems logical to me and there's evidence to back it up.
- FE-11-46: In order to adapt they need to evolve
- FE-11-47: thats how human speices were evolved was by non-human spieaces evovling. bacteria evovles everyday in the present day. so thats why i picked the answer for number 22
- FE-11-48: Dinosaurs
- FE-11-49: Non-human species have evolved.
- FE-11-50: becouse dna is always changing
- FE-11-51: not answered
- FE-11-52: not answered
- FE-11-53: All organisms have somehow evolved not just humans
- FE-11-54: I feel that every organism including humans has had to undergone some kind of evolution other wise most of us would not be here and our different methods and lifestyles would be different
- FE-11-55: They have had to in order to survive the changes on Earth.
- FE-11-56: not answered
- FE-11-57: biological discoveries have shown that statement to be true
- FE-11-58: I think there are more than enough examples to show that animals and plants have evolved.
- FE-11-59: because they have evoloved.
- FE-11-60: I agree because we have seen this demonstrated like in Flinches in the Galapogos.
- FE-11-61: Everything is evolving.
- FE-11-62: There is proof.
- FE-11-63: Every organism on the planet has evolved, even if it has changed very little it still is under the influence of natural selection
- FE-11-64: Why not
- FE-11-65: not just creatures besides humans... you can see evidence
- FE-11-66: i think its right
- FE-11-67: why not it sounds good

- FE-11-68: I believe in the evolutionary process of humans
- FE-11-69: there is evidence that shows this
- FE-11-70: I believe that other animals have evolved other than just humans but it is often times hard for us humans to see that.
- FE-11-71: i dont think they have.
- FE-11-72: Non-human evolution is quite apparent, but I also believe humans have undergone evolution.
- FE-11-73: I believe in evolution.
- FE-11-74: Different types of non human organisms are around to day.
- FE-11-75: Because when comparing animal fossils with certain modern species, there are many similarities
- FE-11-76: Look for instance at the finches that darwin had studdied.. they had evolved difrent beaks for diffrent tasks. There is the simple answer. But just look at any species and record changes over some time. You will see that certain climatic events may kill off the recessive population, or vise versa, so yeah populations evolve.
- FE-11-77: if evolution never occured we would all still be monkyes
- FE-11-78: i agree
- FE-11-79: There is evidence for this in archaelogical research.
- FE-11-80: Every organism to ever live on this earth has evolved not matter how small their brains may be i mean when we get close to fire we know not to throw ourselves in it because the last time some1 did he/she caught fire and that really must have hurt =) and its the same with other organisms when somethingbad hapens to them they know not to do it again
- FE-11-81: I agree with the statement.
- FE-11-82: species have changed over time

Question 12

FE-12-1: Humans have changed from being “cavemen” to how we are today

FE-12-2: I am not really sure what I believe about that question.

FE-12-3: We have evolved to become stronger smarter and to endure the changes in our physical enviroment.

FE-12-4: Life spans are longer, people are taller, etc...

FE-12-5: not answered

FE-12-6: see previous explanation

FE-12-7: not answered

FE-12-8: not answered

FE-12-9: first dating back to lucy and the homo rectus all the way to now

FE-12-10: not answered

FE-12-11: Even if the changes are very, very, minute, humanity continues to evolve, because it is simply a naturally occuring process. Medicine has helped forestall the nature of natural selection, but to some extent, natural selection will exist.

FE-12-12: not answered

FE-12-13: not answered

FE-12-14: their again is proof from skeletons that humans have gotten larger in size and our basic body sturcture has changed. And our skulls have changed shape so yes

FE-12-15: The differences in human remains that have been un-earthed have shown differences in skull size of humans. Biological diversity among humans is present now. With differences in body shape and skin tone present everywhere based on geographic location.

FE-12-16: Because Human are the most noble creature God created , so I beleive that human were created by God not by chance or were evolved from some kind of animal

FE-12-17: Every human ancestor fossil that has ever been found was later discovered to be the bone of a different Hominid, or a completely unrelated specie. There is no chain currently in evidence.

FE-12-18: I am pretty sure (in my beliefs) humans have evolved from monkeys.

FE-12-19: We had to get here somehow

FE-12-20: Humans are still humans, but the technology and lifestyles have molded us.

FE-12-21: ERECT POSTURE ,TAIL BONE and many more things aaccount for evolution in humans!!

FE-12-22: Some proof is out there to show exactly what we evolved from but i do believe that we share a common ancestor with chimpanzees

FE-12-23: Humans have evolved. It's evident if we think back to the “cave man” days.

FE-12-24: because humans look the same as we did 2000 years ago.

FE-12-25: I believe that humans have evolved... I'm not so sure that I really believe that we evolved from Neanderthal's but I do believe that we have and continue to evolve.

FE-12-26: I do believe humans have evolved. The basic shape of a human skull has changed in shape and size. Also the structure of humans (i.e. standing upright), and the unknown use of the appendix. Providing some evidence that the human species has changed over time.

FE-12-27: not answered

FE-12-28: It's clear we've evolved when you consider how our ideas have grown throughout the past thousands of years. Every species on the planet has undergone evolution.

FE-12-29: We used to be a "ape like" creature, then we ventured into different environments and changed. Northern European people are short stout people so they can retain heat. People in Africa are tall to lose heat. Skin colors developed depending on environment.

FE-12-30: I believe there is enough evidence to support this

FE-12-31: There is evidence of a common ancestor between humans and apes and over time humans have become more complex and civilized.

FE-12-32: I believe at one time humans were simply cavemen, and maybe they were not hominids, but they were some kind of a more intelligent life than the animals around them.

FE-12-33: Just look at the caveman and then look at us. That right there is a big difference let alone what came before them and so on and so forth. We didn't just appear.

FE-12-34: I don't believe in evolution.

FE-12-35: not answered

FE-12-36: not answered

FE-12-37: It seemed right.

FE-12-38: I don't like the thought that we evolved from apes

FE-12-39: were not apes anymore

FE-12-40: not answered

FE-12-41: How else would we have different skin tones, it's our bodies natural reactions to our ecosystem.

FE-12-42: Evolution teaches humans have evolved.

FE-12-43: Maybe...not sure, what I believe here.

FE-12-44: I don't know, I know several theories about the origins of man, if I knew I suppose I'd get a nobel prize ...

FE-12-45: Humans are under the same conditions and stresses that all other species are.

FE-12-46: in order to adapt they need to evolve

FE-12-47: there is medical proof, and research that proves that humans evolved from apes. that's a given fact especially with hominids and their bone structure being so similar to ours

FE-12-48: Dinosaurs

FE-12-49: Humans have evolved and are continuing to evolve, in ways such as getting taller.

FE-12-50: we used to be primates

FE-12-51: not answered

FE-12-52: not answered

FE-12-53: Humans have evolved, which explains why we have adapted to our environment better than our ancestors have

FE-12-54: as like the previous question humans have had to do the same things in order to stay alive and adapt in this world

FE-12-55: I agree and disagree, because humans could have evolved but that also has not been totally proven yet.

FE-12-56: it is just my opinion

FE-12-57: Not really certain about that one, perhaps its just because I don't want to be evolved from a monkey. :)

FE-12-58: because I KNOW THAT WE HAVE EVOLVED

FE-12-59: This is true because over the years we have been able to live longer and better.

FE-12-60: Looking at fossil records you can see remains that look similar to humans and so i think that they evolved into humans because we were more fit to survive.

FE-12-61: The remants of Lucy suggest that humans were once something else. I forget the name...

FE-12-62: In order to be where we are at evolution had to take place, the primordial soup didn't just magically sprout a human, it took billions of years for our evolution to make us who we are.

FE-12-63: It is shown in fossil evidence that just the physical structure of our bodies have changed, and that's evolution. Why would people fight it and say that we haven't changed and that we're exactly the same as the first humans that were ever on earth, when there is evidence to prove that we have grown taller and slighter

FE-12-64: evidence

FE-12-65: i think its right

FE-12-66: sure we have...God did it though

FE-12-67: I believe in the in the evolutionary theory of humans

FE-12-68: we have evolved, but not from monkeys

FE-12-69: Humans have evolved a lot of when they were first known to come into the earth. We are much smarter, taller, and have less hair than the know "cave men".

FE-12-70: i don't think humans just evolved.

FE-12-71: Humans, like all animals, are a product of evolution.

FE-12-72: Aren't human's pinkys getting smaller each generation I think we might lose it some day.

FE-12-73: We have growen of the years and it has be proven past the cavemen.

FE-12-74: Because there is evidence of ancient humans and neanderthal people

FE-12-75: Look at our history, we have ancestors that are big hairy, hunched over due to spinal alignment, and walk more on all fours than on just thier two legs. So evolved yes, although one topic up for me to question is, even though our ancestors have evolved, thier common names werent humans they were that of otehr names, so with that in mind i could be completly wrong on my answer, and consequently many others on this quiz.

FE-12-76: again... we would alll still be monkeyes if we had not evolved

FE-12-77: i agree

FE-12-78: Fossils and other reasoning and evidence.

FE-12-79: I would have to agree that humans may have changed over the years and have improved in some traits, but i dont believe that they have evolved from some other ancestor.

FE-12-80: well first way i can prove we have evolved is by saying this how is it i am writing this test or doing this test now on a pc which connects to a world wide web if we didn't evolve

FE-12-81: I agree with the statement.

FE-12-82: Humans have changed over time and just becasue they have evolved does not mena that God did not play a part in it, he created the world

Question 13

FE-13-1: I don't know what either of those things are...

FE-13-2: I agree with both choices c and g.

FE-13-3: Evolution is an important theory in the history of science but many people also believe in creation. If one idea is accepted the other should also be just as accepted to educate everyone so they can make their own INFORMED choice on what they believe.

FE-13-4: not answered

FE-13-5: not answered

FE-13-6: Neither theory has enough proof to say beyond a doubt that one is truth and the other falsehood. Both should be given equal time so that the students can evaluate the evidence for both and make their own decision about which they agree with.

FE-13-7: not answered

FE-13-8: not answered

FE-13-9: i dont think that creation should be "taught" bc its peoples beliefs but i think that the other ways of how life began, including creation, should be metioned to give others not very familiar with the concept an opportunity to understand that there are more than one view out there

FE-13-10: i'm a very religious person, so I think creationism should be taught, but people should be able to decide for themselves, so both should be discussed and given equal time.

FE-13-11: Intelligent Design is bullshit. However, it can serve as a valuable reminder that religion should have no effect on science. The two should be separated completely. Of course, science should still have morals, but morals are not completely one with religion; you can have morals without being religious.

FE-13-12: not answered

FE-13-13: not answered

FE-13-14: i am a Catholic and their for have religious opinion on some such things also Separation of church and state. I'm at college to learn about science, not about God.

FE-13-15: not answered

FE-13-16: Biological evolution should most definitely be taught. Intelligent Design/Creationism should not be taught to everyone, perhaps in optional classes. However, the important point is that equal time should be devoted to the evidence opposing evolution. Not Creationism necessarily, but be honest about the significant weaknesses in evolution theory.

FE-13-17: I dont know.

FE-13-18: Everyone needs to know all the thoeries/ideas so they can choose their own to believe

FE-13-19: I believe both are important and play a role in our history.

FE-13-20: not answered

FE-13-21: I believe in college science classes evolution should be the only theory tuahgt. however I think there should be classes that cover Intelligent design and students should have the right to choose what they was to study.

FE-13-22: I believe it's part of science to be taught about biological evolution, but on the other hand many take offense to those teachings.

FE-13-23: i don't think that one persons beliefs should be pressed on the majority, because who is to say that one persons ideas are right above all elses

FE-13-24: As a christian this is a tough question. I believe that evolution should definitely be taught in public college and I also feel that creationism should be discussed...Teaching creationism should be left to the church or a specific class teaching creationism. I feel that both of these can reside side by side. One of my favorite reads is "Finding Darwins God"

FE-13-25: Both groups would challenge themselves to try to understand the beliefs of others.

FE-13-26: People have different views about things. And if told they should believe some thing they don't believe, they tend to get mad. So tell it as a theory.

FE-13-27: Evolution is a scientific theory, therefore it should be focused on more in a science class. Creationism is an important theory to many people, myself included, especially Christians. My belief is that both theories are correct. I support the idea of evolution, without dismissing the idea of Creationism. In the Bible, it is said that God built the Earth in seven days. It is never specified how long one of God's "days" are. What I believe is that through God, species evolved throughout time. The first "day" he made light and dark. That was when the Earth was first formed. The second "day" he formed land and sea. This was when the Earth settled and land emerged. Then he made plants, which were the first recognizable organisms able to inhabit the Earth. On the fourth day, he created sea animals, and the earliest ancestors of land animals came from the sea. Humans were created last, which follows evolution, since humans only recently appeared, compared to the age of the Earth.

FE-13-28: Biological evolution has evidence to back it up, we are scientists not pastors.

FE-13-29: Religious beliefs are a matter of faith and can not be proven therefore are not a science

FE-13-30: They are both items that need explained and many people are unaware of the other, so it is important to teach both because it is possible that they work together.

FE-13-31: I went to a Catholic highschool, and we were always taught that God created the earth, but we were also taught that we could believe in evolution. I believe that God created everything on earth, but I also believe he created it by having species evolved, and that evolution is a more logical answer to the way that different species were formed.

FE-13-32: not answered

FE-13-33: Though I don't believe in biological evolution I still think that it a valad idea and that it should be taught in class, just as long as creationism is given an equal amount of time to be taught.

FE-13-34: By giving the same amount of study time to each topic, it gives the student a chance to decide what way they prefer to believe

FE-13-35: not answered

FE-13-36: Evolution is accepted by the sci community, therefore that is what should be taught. Students need to be aware of other viewpoints, so Creationism should be addressed as well. Since the sci community doesn't supports Creationism, the topic should be covered but it isn't the sci community's place to render it a good or bad idea.

FE-13-37: my beliefs

FE-13-38: its my perception

FE-13-39: not answered

FE-13-40: because all of the other options imply that the instructors would be pressing their own views and squelching the views of those who disagree, which in this topic is bad.

FE-13-41: Intelligent design should be taught in a religious course while evolution in science

FE-13-42: When I said creationism earlier, I meant adam/eve/god. I believe all theories should be taught. Theories are theories, and that is what science is about. No one has to believe a theory, but it is important to be educated about them!

FE-13-43: Evolution has more scientific value, but science is uncertain and I think it is valid to but ID out there as something a petticular student might want to look at. I would wonder about the value of my education if they were equal as evolution has so much more to do with science today

FE-13-44: not answered

FE-13-45: not answered

FE-13-46: I believe in Biological evolution and that it did occur, but i also respect that there are many religions out there and that they do not believe in the theory of evolution and that is perfectly all right. Which is why i believe that evolution should be taught in college biology classes, but creationism/and theory of intelligent design should be mention as a reason but also why it is not supported by the scientific community

FE-13-47: Creationism is not science. but evolution should be presented as a theory not a fact also. and Dinosaurs

FE-13-48: We are in biology class to learn, and if we are taught that animals and humans just appeared as is, end of story, what would we learn We need to learn about evolution, but also address the other theories.

FE-13-49: because i believe that you should not force ideas on the people and should give everyone a chance to share their ideas

FE-13-50: People have their own viewpoints and if they are really grounded in their view, it won't change even if something against their viewpoint is taught in class. We should be open-minded, be able to listen and learn about both creationism and evolution. Then we can form our own opinions once we have more knowledge on both subjects.

FE-13-51: They should teach both view points and let the people decide which one they agreed upon

FE-13-52: Just dont have that strong of back up knowledge with this topic to hold a strong view point

FE-13-53: I think that both view points of the origin should be considered when taking a science class. This does not mean that people will have to change their minds.

FE-13-54: if you are going into a biological field you should take the evolution classes but if you aren't you should either have to take the evolution classes or a creationism class

FE-13-55: I think both reasonings are plausible but honestly this is science, religion shouldn't have a say in the scientific facts.

FE-13-56: because people should be taught both so that they can make up their own mind of what to believe.

FE-13-57: I think you should mention both, but at the same time not spend so much time there because we don't know the right answer for the evolution/creation of man. No one was there to record it, so I think we should touch on it then keep on going and focus on

stuff that is unknown and not on such a debatable subject that does not have a right answer.

FE-13-58: It is just what i think.

FE-13-59: Students must be educated on evolution and the issues surrounding it.

FE-13-60: I choose this due to that fact that there is a lot of support on both ends of this debate, and for the student to get a full view of the world and to make a decision on their own they should be given the full context of both studies.

FE-13-61: Biology courses are SCIENCE courses. The materials covered should be from the standpoint of the scientific community. "Intelligent Design" or whatever it is called now should be presented briefly as another idea but should NOT be the focus of a SCIENCE course.

FE-13-62: I think that people should know about all theories of how the world began, but more time should be spent on evolution because it's more scientific and it IS a science class. If equal time was spent teaching creationism it would risk turning the class into a religion class.

FE-13-63: It is perfect!

FE-13-64: I believe that people have the right to choose for themselves, so therefore, if they teach both, students can make the decisions for themselves.

FE-13-65: i dont know

FE-13-66: i believe in creationism and evolution together

FE-13-67: I do not have enough information

FE-13-68: Everyone should be taught the same thing so that they know how to respond if asked if they agree

FE-13-69: I feel that if there is debate on an issue (and there certainly is, in this case) that both ideas should be taught so that students can be informed on both ideas and can be educated enough to form their own opinion on what they believe is truth. Even though Intelligent Design/Creationism is a religious viewpoint, many people believe in it and the scientific community needs to be aware of what it is exactly, that others believe.

Likewise, just because someone doesn't believe in evolution does not mean that they shouldn't be taught it or try and learn about it. Knowing the "other side" helps strengthen one's beliefs and helps to refute the other side's ideas when debates come about.

FE-13-70: I believe that both subjects should be taught because they both have valuable information behind them. Students should be taught both ways so they can form their own opinion. However, evolution tends to have more proof to back it up. More proof, along with it being public school, should mean that evolution is given more time to be taught.

FE-13-71: because i believe more in evolution

FE-13-72: As a college student, I would like to learn about both evolution and intelligent design, but I feel evolution is a more scientific subject.

FE-13-73: Both biological evolution and intelligent design should be taught evenly because I believe that life was started by intelligent design and is continued by evolution.

FE-13-74: No scientific bases in creationism.

FE-13-75: Because evolution has the more scientific viewpoint, and what we're addressing is science, not religion

FE-13-76: Both of these should be taught in colleges. I believe more in evolution than creationism, etc. With this in mind I don't believe one should be taught heavier or more intensely than another, both are fundamental to our society. So it should be each individual's choice to learn what they like. I choose the more science related side of things, but that's just me.

FE-13-77: I don't have one

FE-13-78: This is how I feel

FE-13-79: I think both should be brought up, and briefly covered equally just to give students the background, because there are so many opinions on how earth came about and evolved that just briefing each theory is what should be done. And if one theory interests a student there are many other ways he or she can learn about that particular theory.

FE-13-80: I think that creationism may be addressed though it would be hard to include all religious beliefs that are held (and should one really get to monopolize this debate). I believe that because we are learning how to use science we should be taught the views of scientists and the theories that coincide with the field.

FE-13-81: I am not educated on Intelligent Design/Creationism well enough to make a decision.

FE-13-82: Biological evolution has so much evidence to support it, but creationism has definitely not been disproved

Question 14

FE-14-1: many people base things on religion and many people base things on science, depending on where you stand can make you believe/ not believe in different things when it comes to biological evolution

FE-14-2: I agree with both c and g.

FE-14-3: Many people argue the points of science and religion to the point where it is annoying. So the topics are usually ignored in discussions to avoid conflict. If we were to teach both aspects equally and be open minded to both thoughts on both subjects instead of arguing because we think we know everything, a lot more would be accomplished.

FE-14-4: not answered

FE-14-5: not answered

FE-14-6: There isn't enough scientific evidence to prove the theory of evolution, and people can see this.

FE-14-7: not answered

FE-14-8: not answered

FE-14-9: people stand to strongly on their viewpoints and need to be more opened with other people's ideas even if they dont agree is still worth while to recognize that there could be a combination of more than one way that life began

FE-14-10: I think religion and science can work together, but people don't want to believe that they can. Science and religion argue the same point, but people overlook that little fact. How can a person look at the world around us and not think that there was a higher power involved

FE-14-11: A large amount of Americans don't pay attention to what happens other than what directly concerns them, thus neglecting anything else that might slightly affect them indirectly, or that could prove useful just for intelligence purposes.

FE-14-12: not answered

FE-14-13: not answered

FE-14-14: again i am catholic and a biology major so i see both sides of the issue

FE-14-15: I believe that people are afraid of a lot of the knowledge that is out there. If people make an effort to learn about scientific evolution it pulls them further away from religious beliefs. I know myself that becoming a Biologist is going to mean taking myself to the limit of my faith. If we know the mapping of the stars and constilations and where everything is in the universe, and we don't stumble upon the pearly gates, what then I can't will myself to be both a scientist and a faithful servant to God. At one point or another, which I haven't reached yet, I feel as those I'm going ot have to chose which one I really believe in, and that scars the crap out of me. I feel most members of the public feel the same, if they stay ignorant to scientific evolution, and its ideals, they can better hold on to their faith. The idea of one life, and of mortality is not a nice thing to dwell on, but its true.

FE-14-16: Really I do not have any idea about American community point pf view

FE-14-17: I feel that culture is a factor, perhaps a remnant of the religion that once made a difference. I don't think the general public really understands evolution theory or why it is incorrect or not; they merely hold that viewpoint because they have been told to.

FE-14-18: That is just my opinion.

FE-14-19: Most of the public has no idea what any of these things are

FE-14-20: I did not know enough about the subject.

FE-14-21: ASK THE ROMAN CATHOLIC CHURCH WHY THEY TREATED COPERNICUS/GALILIO and other scientists in the way they did n u will get an accurate understanding as to why there is a REAL conflict between science and religion!!

FE-14-22: Older generations had a stronger sense for there religion than members of my generation.

FE-14-23: There is conflict because of cultures. Religion plays a huge role in this. because religion is the basis of our country and culture

FE-14-24: In my opinion it is a perceived issue. Like I said earlier, I believe that I could be a scientist and believe in both evolution and creationism. After all who says that God didn't cause the big bang :)

FE-14-25: Many who are very religious will refuse the idea of evolution. Then there are people such as myself that believe in both and contradict their own religion. There are some people that need direct proof in order to believe science, even though it is ironic, due to the unknown events in religion.

FE-14-26: Science is only one's best guess, not a fact.

FE-14-27: Religion is seen as an important part of our culture. In the past, people have killed other people for disobeying laws set down by their religions. People are harrassed and prosecuted for their beliefs. When the new idea of evolution came out, religious people took it as an oposing idea to creationism, even though it's not. It's more of another way to look at it.

FE-14-28: I believe that an intelligent being designed the universe, and that biological evolution just proves the existance of such a being, However, I don't want to pressure anyone to believe the way I do.

opinion

FE-14-29: Many people are scared to believe more that one cause of our existance, but would be more willing if religion was not pressuring them.

FE-14-30: There are too many conservative people in society today that are afraid that God will strike them down if they don't follow the bible word for word. As long as they believe God created everything there should be no problem.

FE-14-31: There is a lack of understanding about science and how it influenced and still influence us as well as there is a perceived conflict between religion and science. I chose these two responses because I believe that many people are not educated enough in the science field and granted they may not change there mind but they should learn it and then come to a conclusion.

FE-14-32: I have accepted that some people choose to believe in biological evolution. I am very strong in my religious beliefs.

FE-14-33: Christianity uses the Bible, saying that Adam and Eve were created by God as the first two people on earth (after he also created earth.) Scientists who believe evolutionary theories do not agree with this and say we evolved from one celled microorganisms or something.

FE-14-34: not answered

FE-14-35: Things are only problems if people make them out to be problems. Everyone should have their own viewpoint and not bother anyone else about it.

FE-14-36: that is how i feel

FE-14-37: i think its percieved

FE-14-38: not answered

FE-14-39: Already basically answered this question about 5 times.

FE-14-40: Science believes one thing, religion believes another.

FE-14-41: People are too obsessed with religion to have a good sense of what is science and what is religion. I like the idea that people believe in something to relieve fear of something else. Once someone has believed in something for so long, he/she may be afraid to change. Not many people like change. How would churches be supported if everyone believed in a scientific explanation. The church seems to brainwash people from believing in what science has and can offer. People are unwilling to think for themselves! I forgot other things I wanted to address, and I apologize because I could have made a stronger argument!

FE-14-42: I don't think this is really an issue, plan and simple evolution is what is taught, and DI is mentioned.

FE-14-43: I think that there is a perceived conflict, and that the public needs to be educated about what science is and how it works before that perception will change.

FE-14-44: One theory says one thing and the other something completely opposite since there is no middle ground then that creates conflict

FE-14-45: I believe that the reasoning for the public not agreeing/or following the view of the scientific community is because as a human being most people want to live for something more... and that is what religion gives to most people is a sense of purpose. This is why majority of the public does not follow the viewpoints of the scientific community

FE-14-46: Dinosaurs

FE-14-47: Many think that science is in conflict with religion, but there are ways to mesh the two. For example, the earth was created in 7 days. These days are not necessarily 24 hours, but possibly millions of years, explaining evolution as if God were not done creating.

FE-14-48: because promoted religious people are telling people not to believe in evolution

FE-14-49: not answered

FE-14-50: Science and religion will always clash, I don't think there is anything we can do about it.

FE-14-51: Not everyone takes the time to read a paper or watch the news about something scientific

FE-14-52: I feel that these opinions arise from both a conflict between science and religion, and the public's non-willingness to accept the views that scientists have due to religion

FE-14-53: Many people believe that there is a war between evolution and the church. But, people should realize that creationism could have caused evolution to form. Who fully knows or not.

FE-14-54: not answered

FE-14-55: I agreed with the statement

FE-14-56: I think that people are just unwilling to accept the facts. It happens in everything from Politics to literature so why not science

FE-14-57: because that's what I think.

FE-14-58: I did not know that people do not accept biology.

FE-14-59: not answered

FE-14-60: not answered

FE-14-61: I think most Americans are not fully educated on the idea and that it will take two or three generations to educate enough people to change the consensus. Also, people cannot separate science and religion in their minds.

FE-14-62: I always found religions to be very dogmatic in their views, "If some one says something that dose not match my religion they must be wrong. " I think that the religious community dose not like to admit that what they believe in could be wrong, while the scientist must be willing to alter their view with newer discoveries.

FE-14-63: not answered

FE-14-64: I think that people make more of a big deal of it than it really is. Why can't they go hand in hand

FE-14-65: people idolize Aragorn, not Lincoln....

FE-14-66: Well, there is a conflict between science and religion!

FE-14-67: i am still struggleing on if i should follow the bible way of how the earth came about or the science way

FE-14-68: there is a huge conflict between science and religion.

FE-14-69: faith and the fear of god makes people believe that the church is always right

FE-14-70: The Church controlled science for a long time so there has always been the conflict between what the two viewpoints believe is true

FE-14-71: There is a huge conflict between religion and evolution. That is an understanding thing because the two cross paths in soo many ways. It's hard to see how they could both work but i believe in both of the concepts. It is a very tricky matter than will never be solved.

FE-14-72: im not sure how i feel about it.

FE-14-73: The public has a variety of beliefs that they seek to maintain.

FE-14-74: I know some people who will only believe the Bible's teachings.

FE-14-75: do not know enough about the topic.

FE-14-76: Because there are major conflicts between science and religion, such as the existence of dinosaurs.

FE-14-77: If you want to sit down with me, i can explaine my issues with religion. But i will not rant on a computer about my views on such matters. One thing though is that i am not a religious man, and i doubt i ever again will be. If somone can be as blind as to not see the relevance of science in our everyday lives, and not understand taht evolution is going on, then i cannot do much about that, i can stand strong to my beilifs though.

FE-14-78: i dont know

FE-14-79: some religions, mine included, are old fashion

FE-14-80: Have you seen arguments over this topic I do not believe it is percieved though it might be possible to reach a harmony within some people.

FE-14-81: I have always believed that religion is a better way to describe creation, but that evolution has some part in the world we live in today.

FE-14-82: Just becasue we evolved like other organisms does not mena that there is not a god, he is behind it all so both science and the public see one side, God didn't create us if we beleive in evolution. God is behind the workings of everything

Question 15

FE-15-1: either way, with or without God, things are going to change in order to survive

FE-15-2: I didn't really agree completely with this response, but this came closest to my belief. I see absolutely no problem with believing completely in evolution and in God at the same time. I think that evolution was guided by God, but organisms could not have been created in their present form.

FE-15-3: I believe God created the earth and everything in it but the Bible says that a day to us is like a "million" years to God. Not necessarily a million but I just threw out a big number. It could be 2 seconds or a million. No one really knows what God is thinking.

FE-15-4: Just my beliefs

FE-15-5: not answered

FE-15-6: Based on my belief system and the evidence I've been presented from both sides, this seems like the most logical and better supported choice.

FE-15-7: not answered

FE-15-8: not answered

FE-15-9: i think that life was put here on earth, but evolved over time to what it is today

FE-15-10: not answered

FE-15-11: I believe in biological evolution. I do not believe in God, but that says nothing about whether God really exists. However, we have neither evidence that God exists or whether he doesn't exist, so he is simply an unknown.

FE-15-12: not answered

FE-15-13: not answered

FE-15-14: Catholic in the house

FE-15-15: The science is easier to prove. I'd believe something written in a text book, before being consumed by some fictitious story in the bible.

FE-15-16: not answered

FE-15-17: From the first day of Creation, there was light (the Sun). For simple reasons of astronomy, a day has been the same length since the beginning. My God is easily powerful enough to achieve this. I think evolution is a valid idea, but the world is not old enough for it to have occurred.

FE-15-18: That is also just my opinion.

FE-15-19: I don't know what to think

FE-15-20: I believe both God and evolution worked together.

FE-15-21: not answered

FE-15-22: I believe in evolution, but am a christian and The calendar was invented way later than what would have been God's times, and who says that his creation of Adam out of the mud, wasn't the evolution of a single celled creature that took millions of years rather than a day. But was said to be a day to make it seem more miraculous

FE-15-23: I am not able to answer this question because I don't have a strong enough opinion.

FE-15-24: because there is evidence of the earth being older than 10000 years, but I do believe in God and he did create everything

FE-15-25: Whew, I believe that Biological evolution describes a natural process that produces species without reliance upon intervention from God. Biological evolution neither supports nor denies the existence of God. But I also believe that Genesis is true

but the 6 days of creation were actually thousands/millions of years for each day of creation

FE-15-26: To be honest, I am not sure what I believe. I do believe in God and I do believe in evolution. Believing in both contradict each other and I cannot find a common ground in which i fit God and Evolution on a time line.

FE-15-27: I don't know what happened.

FE-15-28: My reponse to Question 26 outlines this belief.

FE-15-29: God created Biological evolution in a perfect way, he doesn't need to step in to correct anything.

FE-15-30: I have only the evidence provided by scientists to support my opinion on how the earth was made if there is a god i dont know what his reasons are for creating the earth the way he did

FE-15-31: I believe that God created Earth but I am unsure how the dates coenside with Earth's age and evolution.

FE-15-32: Again, I was raised Catholic and I truly do believe that the earth evolved, but I don't think it could have gotten there without the intervention of God.

FE-15-33: I do believe in biological evolution. I am just unsure where God comes into play, and I do not know really my complete stance on God, however I definitely do believe in biological evolution.

FE-15-34: In the begining God created the heavens and the earth.

FE-15-35: I am unsure of how old the earth is according to Christianity, but I believe that animals were placed here on earth and did some adapting and natural selecting to get the species we have today

FE-15-36: not answered

FE-15-37: That is my viewpoint.

FE-15-38: my religious beliefs

FE-15-39: its my opinion

FE-15-40: not answered

FE-15-41: Alter it stlightly and say that species adapted to some degree and it would be perfect.

FE-15-42: Don't know.

FE-15-43: D is the answer I like best, but it does not completely fit what I believe. I am not sure where I stand when it comes to religion, and I am not sure if I believe in god or not. I feel that there is most likely a scientific explanation to this continued debate, but it is unknown.

FE-15-44: I just don't know. I guess when doing science I assume consider evolution because it is A THEORY unlike ID. I am open to other thoeries. I personally think God made the earth and all that inhabit it, how once again if I knew that hello nobel prize.

FE-15-45: Evolution is not threatening in any way to my view of God or my religion.

FE-15-46: not answered

FE-15-47: i believe this because the earth is very old but also the theroy of evovlution does not prove or disprove anyrhing..yes god did not intervene to create humans but what about the "spark " that cause evolution to begin. every scienctist knows that it was random that everything was the perfect condition for evovlution to occur at that moment but there is the slight possible that that percise moment was created by an outside force... "god "

- FE-15-48: Evolution can still occur even after God is done his seven days
- FE-15-49: Explained in the earlier question.
- FE-15-50: well I don't know why
- FE-15-51: not answered
- FE-15-52: I believe in God, and I believe in science. I think that evolution could have happened, but God was the reason.
- FE-15-53: I do believe that the earth has evolved with the help of God
- FE-15-54: Science has never denied that of God however it just does not account for what other religions do, I feel very passionate about my answer
- FE-15-55: This best fits my viewpoint, that God has led animals through the evolutionary process.
- FE-15-56: earth is really old. God created everything during the seven days which in our time was many years for each of the seven days. God created the animals and plants but have evolved since God created them.
- FE-15-57: Not sure, I haven't really decided where I rest on the whole issue just yet.
- FE-15-58: because to that's what I think.
- FE-15-59: Because I believe the Earth was made billions of years ago slowly, but I also believe there is a God.
- FE-15-60: I think that the Earth was formed over a long period of time with biological evolution. I believe that God played a part but it wasn't exactly what was written in the bible.
- FE-15-61: But God designed it so that it did not need His intervention.
- FE-15-62: I choose this because evolution seemed to work without any help, that it did it by natural and a random process. However it does nothing in determining God's existence. Because of the nature of God there is no evidence against or for his existence.
- FE-15-63: I think that if the six days did occur they were extremely long, but I also think that evolution occurred so I chose c when I was really a mixture of b and c.
- FE-15-64: Like I said before... the chances of life simply.. appearing are (at least to me) mathematically insignificant. There had to be something to even the odds a little
- FE-15-65: what I choose explain itself
- FE-15-66: the bible says six days but God has no beginning nor does he have an end and since time is not a factor with Him, there is no telling how long the actual process took. 6 days is a misguided interpretation...it actually should be read as 6 periods (of time)
- FE-15-67: I have been taught to keep church and science separated
- FE-15-68: It is what I was taught and believe.
- FE-15-69: I believe that the Earth is probably older and that it, as well as everything in it, was created by God. However, I also believe that organisms, including humans, have changed slightly, or mutated over time. I don't believe that even through billions of years a small organism could change into the complexity of a human being, though.
- FE-15-70: I don't know enough about either topic to fully understand which way is "the correct way". So as of right now, I believe in both evolution and God.
- FE-15-71: I think the earth is ancient and was created.
- FE-15-72: Biological evolution doesn't involve God, but I do believe that God had an influence on the creation of life and the development of life on earth today.
- FE-15-73: I believe in a mix between God and evolution.
- FE-15-74: In class we never talk about God in context with biological evolution.

FE-15-75: That is the choice that makes the most sense to me

FE-15-76: I do not believe that god exists. The earth is scientifically made, show me a miracle that someone can never explain in scientific terms (as in years down the road) and on my death bed I will confess that there is a god. But at this day and time, science supports the idea, in my eyes, that there is no god.

FE-15-77: that was the closest answer to what I believe!

FE-15-78: I believe in god

FE-15-79: I don't like to believe that God created us 'special' because it gives the false confidence that we can do with the world as we please rather than live in harmony with it. I do believe the Earth is millions of years old and that organisms evolved through natural, possibly surprising, processes.

FE-15-80: Well I believe that the Earth is old but god created every single species in this world but what god doesn't intervene in is Evolution we evolve not because god makes us evolve no we evolve because we choose and make choices and discover new inventions which leads to our evolution

FE-15-81: It fits my viewpoint.

FE-15-82: described in my selection

Additonal space

FE-A-1: Many of my views on the issues that were raised in this survey are strictly based on science, i do not base things in science on my religion, although i know many people do.

FE-A-2: not answered

FE-A-3: I believe both topics should be equally addressed. A lot of people who believe in God dont know much about evolution and inversely, a lot of people who believe in evolution dont know much about creation. I believe the students could most benefit if they are reminded that this is not a debate class but a learning class and should keep an open mind about both topics instead of making up their mind and not really even learning the other side. It helps people to make an informed decision and be able to back up what they really believe.

FE-A-4: I mostly just went with what I thought of the subject and what I have been taught in my lifetime.

FE-A-5: not answered

FE-A-6: not answered

FE-A-7: not answered

FE-A-8: not answered

FE-A-9: not answered

FE-A-10: I believe that God made us the way we are, but gave us the capabilities to adapt to our surroundings, which could be the definition for biological evolution.

FE-A-11: Intelligent design is simply a bunch of crap that was designed by religious nutjobs to bring religion into to something that is not in the slightest way related to religion. It is simply another way of saying "God created everything. " If anything, religion has tended to impede the progress of science, and bringing religion back into science is something that should be barred.

FE-A-12: not answered

FE-A-13: not answered

FE-A-14: i love biology and hate chemistry because i like learning about living things not about chemicals and moles and scientific notation and all that crap. I love NATURE

FE-A-15: not answered

FE-A-16: I am really not sure what my position towards Evoulotion

FE-A-17: You did a good job writing this survey without too much bias. I was not offended in any way, and if anyone else was, they are too sensitive and insecure about their beliefs.

FE-A-18: I think I may have gotten the wrong survey, because in my directions it said that I was about to graduate this term, and that's incorrect. I am an incoming freshman who just started taking this class. So I guess I would probably throw mine out because I got sent the wrong test.

FE-A-19: No comments

FE-A-20: None.

FE-A-21: i would love to write some more on the above cited issues but i honestly have to work on how to paste a "clickable " link of the bryophyte!!

FE-A-22: not answered

FE-A-23: Even though evolution can be a religious issure, I as a student would like to learn more about the topic from a science standpoint.

FE-A-24: God created everything on earth, and evolution is a bunch of crap. there might be evidence supporting evolution, but what about the evidence not supporting it. evolution is just a theory and we learned today in class that theories are not the absolute truth.

FE-A-25: not answered

FE-A-26 Biological Evolution and Religion go hand in hand because both try to explain natural phenomenon. Both need more evidence and both cannot be proven in its entirety at any given point. It all depends on the viewpoint of the person. I do believe that colleges should continue to teach evolution to a point that is comfortable to all types of students.

FE-A-27: I don't not like science, but I am not sure what happened in the past.

FE-A-28: not answered

FE-A-29: It was fun.

FE-A-30: i dont know

FE-A-31: I am a Christian, but I believe in evolution and am interested in how they work together.

FE-A-32: I think I am pretty open to many scientific theories involving evolution. I am able to accept the fact that evolution almost positively happened, with the help of God. I think that every theory presented in this survey agrees with my personal belief regarding evolution and natural selection.

FE-A-33: I believe strongly in biological evolution, but I haven't figured out what role God plays, if there is a God. I would like to believe there is a higher being though.

FE-A-34: I'm sure that you can already tell that I am a christian and that is what I choose to believe in.

FE-A-35: not answered

FE-A-36: not answered

FE-A-37: I feel that everyone is entitled to their own opinion and everyone can learnt about anything.

FE-A-38: idk

FE-A-39: thanks

FE-A-40: not answered

FE-A-41: I believe in creation, but i also believe that all species have udergone some changes in the last 6-10 thousand years, whether it is thicker fur, a darker complexion, different diets, etc. I have avidly studied both evolution and creation from every point of veiw i could find when i was younger, and that is why i believe what i do.

FE-A-42: I have no religious offiliation and believe in the evolution idea of the creation of life.

FE-A-43: It was hard to choose an answer because when it comes to religion, I am not sure what I believe. Part of my goal throughout college is to discover that. I want to know more before I begin widely advertising what I believe. I feel I need to know more to better support what I believe. Science is my major and something I love. I feel it holds answers, but does it know the answers to everything Maybe or maybe not. What I believe is that science should be studied and taught as it is, without the effects of religion. The idea that people do not want independent design taught in school bothers me. It is a theory. I feel people should believe whatever they want, but learning about new ideas is

always a good idea and necessary to be a well-informed and well-rounded person. This has been interesting, and I am happy I took it. Good luck with the research!

FE-A-44: My personal feeling on this is it isn't very important. Evolution is just part of bio, DI is a hypothesis and it shouldn't be an issue. Evolution should be taught and DI introduced. If science is to keep moving forward it needs to be open to all ideas and spend time on the one that bear the most fruit.

FE-A-45: not answered

FE-A-46: not answered

FE-A-47: I believe that i explain everything the best that i can.

FE-A-48: Dinosaurs they explain evolution. And if rock is formed in layer from the land and it is also being erroded how do we get new rock. and rock and roll

FE-A-49: not answered

FE-A-50: none

FE-A-51: not answered

FE-A-52: not answered

FE-A-53: I believe that evolution did occur but the help of God, this is because i've gone to a catholic high school and that is how i was taught and it has forever stuck with me.

FE-A-54: The survey was very nicley asked and no bias choices were selected by me. It was a pleasure to be able to express my views on evolution

FE-A-55: God created evolution.

FE-A-56: just because you take a class with evolution in college, it doesn't mean they have to believe in it. it is just a theory. it is not that big of a deal.

FE-A-57: Just a sugesstion, next time let us see the previous question and answer when you ask us to explain, it would make it a lot easier to type out longer responses.

FE-A-58: nothing.

FE-A-59: I thought this survey was interesting. I thought it would be more about Biology than opinions of the beginning of man and evolution.

FE-A-60: not answered

FE-A-61: None.

FE-A-62: not answered

FE-A-63: My view is their is no absolute truth, only degrees of truth. Both God and evoluiton possess only a degree of truth and do not explain everything.

FE-A-64: not answered

FE-A-65: I think this was an interesting survey, too bad we don't get extra points for it.

FE-A-66: More classes should do something like this.

FE-A-67: not answered

FE-A-68: i dont really have much to write because my mind is open to what ever i dont really know what to believe

FE-A-69: i am a christian who is interested in science many of my family members shy away from science because they feel it is not of GOD. But I believe that you can except Science and God... I believe that evolution did happen, but i believe that God was controlling it as it happened. these are my beliefs and I am sticking with them.

FE-A-70: i have nothing else to say

FE-A-71: Even though I've learned a lot in my high school biology class, I know I actually know little about the huge topic of biology. I am ready to learn new things and I

am very open to new information. I'm excited for this class and i hope I learn a lot of interesting items.

FE-A-72: I believe one can understand biological evolution and still maintain one's religious beliefs.

FE-A-73: It's amazing how many conditions have to be right for life to exist and thrive the way it does on this planet. I have to believe someone up there started this "perfect" planet and now is just watching it go.

FE-A-74: More indepth about biological evolution.

FE-A-75: Have less typing

FE-A-76: These are my views, not ment to insult anyones intelegence, nor my own. I have felt this way for many years and i doubt that i willchange for a while. I will not preach about what i beilieve unless asked about it in a manner like i just have been, but all i must say is no mater what somone beilives, stay constant to your beilif or what you have beilived in has just been false.....

FE-A-77: is there any posible way to find out how old the earth astually is !

FE-A-78: i have nothing else to say

FE-A-79

FE-A-80: I don't have anything else jumping out at me to express.

FE-A-81: I believe that evolution does occur and that God is involved in it. I believe that there are many changes that occur within species over many years, but I also believe that God created all the humans and the species on this earth and is a part of everything.

FE-A-82: i hope this was of assistance

Freshman Post-Instruction Text Responses

Question 1

FT-1-1: not answered

FT-1-2: Its what I believe and what makes most sense

FT-1-3: The population develops according to their surroundings. Evolution is this development. A “new “ species is not necessarily “better “ or more “advanced, “ it is simply more fit for the environment.

FT-1-4: I didn’t see that the available answers were correct.

FT-1-5: not answered

FT-1-6: In lecture, we have learned that individual organisms do not evolve, rather it is the population that does. The answer that I chose best fits the description of populations evolving.

FT-1-7: it sounded the best

FT-1-8: It seemed most accurate according to what I have learned

FT-1-9: Well evolution involves species aquring new traits that can help them survive in their environment

FT-1-10: Everything we have learned supports this statement.

FT-1-11: In biology, we learned that evoultion by definition is change over time. I suspect that biological evoultion is change of species over time

FT-1-12: When I think of evolution I think of things evolving. I define evolving as changing.

FT-1-13: It represented my thoughts accurately.

FT-1-14: not answered

FT-1-15: It is when a organism changes overtime to produce suriving fertile offspring

FT-1-16: We learned this is class.

FT-1-17: because as people evolve they pass their genes onto their kids

FT-1-18: I felt that it explained evolution the best because it is a change in genetic traits over a long period of time.

FT-1-19: Evolution simply represents the movement of genetic data towards strains that are more favorable to reproducing in the current environment. It has nothing to do with acquired traits, etc.

FT-1-20: It was the definition given in class.

FT-1-21: Species don’t acquire new/better traits and call it evolution. Over a period of time, a species changes due to environment and certain traits/characteristics they possess.

FT-1-22: i thought that was the right answer

FT-1-23: ive learned about evolution in class

FT-1-24: it seems right

FT-1-25: evolution is not learned or adapted, it is mutations that happen to benefit a species

FT-1-26: Evolution happens over time and it has to remain with in a giving species to be considered evolution

FT-1-27: this is what we learned in class

FT-1-28: it was the best fitted answer because if reproduction happened by accident, it wouldnt happen that much.

FT-1-29: Evolution allows certain individuals carrying beneficial genes to reproduce more than their un-mutated counterparts. This changes the frequency of certain alleles over the course of time.

FT-1-30: Evolution is the gradual change of the genetic makeup of a population due to mutation within the genes and natural selection which is how they adapt to a changing world.

FT-1-31: Evolution is really “survival of reproduction “. Only those that survive to reproduce pass on their genes, and through time only those genes exist. The genes that allowed the parents to survive long enough to reproduce are carried through to the next generations and eventually a new organism that is better capable of surviving might exists.

FT-1-32: IT was discused in class.

FT-1-33: Evolution doesnt have a purpose, and it is not an individual process.

FT-1-34: This is the definition that I feel most closely resembles the one that I learned in Bio 211. I believe this is the best scientific definition for evolution.

FT-1-35: i believed it was the best explanation out of the four choices

FT-1-36: not answered

FT-1-37: Individuals do not evolve, populations evolve.

FT-1-38: it seemed to be the best answer, although I didn’t like any of them.

FT-1-39: not answered

FT-1-40: Because that’s what it is

FT-1-41: I believe it is the correct answer.

FT-1-42: organisms as a species have to better adapt to an environment, if they want to survive and not go extinct.

FT-1-43: It serves my best understanding of evolution from my bio class.

FT-1-44: because over time the gentic makeup of a population will change due to mutations and the “fitness “ passing on their DNA

FT-1-45: since biological evolution means passing the traits that you to the next generation so that they are able to survive better in that enviornment

FT-1-46: i selected this answer because evolution is the change over time in species. new genes and traits are what it takes for species to evolve

FT-1-47: None

FT-1-48: I chose the answer because the change of spcies to adapte to their environment.

FT-1-49: We talked about it in class.

FT-1-50: I looked over the choices and I decided that the one I choose was most like what I learned in Biology 211.

FT-1-51: evolution is the change over time but in way that adapted organisim to its environment

FT-1-52: Simply based on Prof.Colbert’s lectures I conclude that the present day organisms are a breed of genetically different organisms from their ancestors. They have evolved in a way that does NOT make them superior to their predecesors but simply fit enough to reproduce.

FT-1-53: There were faults in the other answers. The adaptations aren’t necessarily “better “ and they arent really “aquired “

FT-1-54: It is a slow process over time, a population will retian characteristics for a certain environment and loose characteristis that hinder survival in an environment.

- FT-1-55: The other answers were wrong. (didn't jive with natural selection)
- FT-1-56: I chose that because it seemed like the most logical definition of biological evolution.
- FT-1-57: it was the best answer
- FT-1-58: Evolution alters populations
- FT-1-59: Biology is always changing and organisms become adapted to their environments and pass of traits to offspring.
- FT-1-60: Because the traits acquired in populations are through natural selection and makes the better adapted individuals, individuals don't evolve they adapt
- FT-1-61: I learned that evolution is a slow change over time. Certain characteristics are adapted and carried on from generation to generation, but they must be "dominant" and strong enough to be passed down. Not all characteristics are evolved. Those that aid the organism remain and are built upon.
- FT-1-62: not answered
- FT-1-63: Evolution takes time and can't happen in a short period of time and evolution also deals with change in the genetic makeup of an individual.
- FT-1-64: I believe it is the right answer.
- FT-1-65: evolution involves genetics, regardless if there are mutations in the genome or not
- FT-1-66: not answered
- FT-1-67: Because evolution is a change and it happens over time.
- FT-1-68: The other answers did not completely answer the question.
- FT-1-69: That's what I learned in class
- FT-1-70: I chose this answer because it best suits the question because evolution doesn't necessarily mean that the organism gets better.
- FT-1-71: The traits acquired aren't necessarily better.
- FT-1-72: The characteristics/traits that a species passes on are generally those that are best suited for the environment in which the species lives, which then leads to evolution as the result of natural selection
- FT-1-73: It seemed to be the best answer. Genes are varied for a number of reasons, most of them being random, and this is part of the evolution process.
- FT-1-74: It's what we learned in class
- FT-1-75: because evolution happens over time, and it happens to make species more suitable to their environment
- FT-1-76: Organisms that are better equipped to survive in their environment due to their specific genetic traits live to pass on their DNA to offspring. The evolutionary process furthers this idea by creating better adapted organisms.
- FT-1-77: not answered
- FT-1-78: because it seemed right
- FT-1-79: Over time, organisms go through changes to adapt to their surrounding environment to survive.
- FT-1-80: Evolution is defined as change over time and is composed of natural selection which is traits to reproduce better.
- FT-1-81: not answered
- FT-1-82: Because individuals don't change.

FT-1-83: Because when a sexually reproducing organism has offspring, each individual will have a slightly different set of chromosomes caused by crossover. If a certain trait is not favorable, then the individuals that have that unfavorable trait will die off leaving the favorable trait

FT-1-84: i decided it was the best choice over all the others

FT-1-85: what I learned in class

FT-1-86: Genes aren't the only thing that change, phenotypes change also. Plus, evolution is not always for the better.

FT-1-87: It was what I believe my instructor said or I read it in our book

FT-1-88: I didn't choose (a) because evolution doesn't mean the development of more perfect species, its purpose is to adapt populations to the current environment. I didn't choose (b) because even though individuals passing on genetic information is part of evolution it is not the whole deal. I didn't choose (d) because individual do not change genetically during their lifetime. (c) was the best answer because evolution trends in the survival of certain genes in a population.

FT-1-89: it accurately depicts that evolution is not really a purposeful idea - random changes occur, and nature acts on them, changing the genetic material of populations towards those most suited for reproduction

FT-1-90: because

FT-1-91: Evolution is the change over time in the genetic composition of a species because that is what eventually creates new species.

FT-1-92: because it was the only one that was related to evolution of a species and not an individual.

FT-1-93: evolution does not happen to any individual alone. it happens over a long period of time involving the entire species

FT-1-94: It made the most sense to me.

FT-1-95: It sounded the most right.

FT-1-96: That answer fit my understanding of evolution.

FT-1-97: Organisms are already built with several distinct genes which enable them to adapt to environments better. An organism does not gain abilities to adapt better these traits are already there.

FT-1-98: From learning about Darwin's and Wallace's study about evolution, I believe it is a gradual change of generations over time by passing on the genetics. Their genes get gradual change through crossing over and several other reasons can effect how species change over time.

FT-1-99: Evolution occurs over a period of several generations, never in the lifespan of one organism.

FT-1-100: it seemed it was the best answer

FT-1-101: for right now that is my best understanding of biological evolution

FT-1-102: because biology to me has to do with the changing of the environment

FT-1-103: I believe that biological evolution is the result of a change in frequency and assortment of the genes possessed by an individual. The changes occur because though genes cause a particular phenotype to occur which possesses some advantage to the organism in that particular environment.

FT-1-104: individuals don't evolve and evolution is a gradual process

- FT-1-105: Evolution takes place in populations, not individuals. The changes due to evolution are not necessarily better than before.
- FT-1-106: I think I knew it before BIOL 211, but we definitely did cover it in class.
- FT-1-107: I believe it is a natural process, and not something we can choose. It happens, over time, to a group of people, rather than individually.
- FT-1-108: Over time, the organisms with better adapted traits will live long enough to reproduce, and their genetics will be inherited by their offspring.
- FT-1-109: We learned in class that a particular species cannot evolve during its life time, but it can pass on needed traits to new generations
- FT-1-110: because evolution usually makes an organism better adapted, so it would pass down better genetics
- FT-1-111: That is what i remember learning
- FT-1-112: It was the only one that completely made sense, the others had to do with passing on acquired characteristics which doesn't happen. Genes are passed on.
- FT-1-113: Evolution is the changing of genes in a population.
- FT-1-114: evolution is the change in species over time because they are better adapted to their environment
- FT-1-115: Evolution, to me, implies new traits.
- FT-1-116: Because it serves to better the species and help its survival.
- FT-1-117: The above response seemed the most logical.
- FT-1-118: made sense
- FT-1-119: cause it true
- FT-1-120: Seemed to make the most sense.
- FT-1-121: An individual doesn't acquire new traits or evolve, it is the population that evolves.
- FT-1-122: This response was most similar to the definitions that I've heard in all my biology classes

Question 2

FT-2-1: Acquired traits are not part of the DNA and can't be passed on to offspring.

FT-2-2: not answered

FT-2-3: Traits that are acquired throughout an organism's lifetime are not hereditary, meaning there is no genetic information assigning this trait, therefore, the characteristic cannot be passed on to offspring.

FT-2-4: I forgot what the answer was on the test.

FT-2-5: not answered

FT-2-6: This again goes along with the way that populations rather than individuals evolve.

FT-2-7: made the most sense

FT-2-8: Because I know that there is no evidence that characteristics acquired during an individual's life can be passed onto offspring

FT-2-9: It seemed reasonable

FT-2-10: We learned that natural selection has to do with "reproduction of the fittest"

FT-2-11: Natural selection is based on really survival of the reproduction. Those species that survive are able to reproduce the most

FT-2-12: Those organisms that are best adapted for their environment will live to a reproductive age where they will produce offspring.

FT-2-13: It represented my thoughts accurately.

FT-2-14: not answered

FT-2-15: it was explained in class and in the book

FT-2-16: If someone loses a leg in a car crash, they won't produce children with only one leg.

FT-2-17: because Darwin never said anything about variations

FT-2-18: It was the only one that did not make sense.

FT-2-19: Acquired characteristics are not passed on.

FT-2-20: Characteristics acquired during life are not passed on to offspring.

FT-2-21: Darwin's idea of natural selection says nothing about acquiring traits. That's a no-no.

FT-2-22: We learned this in class

FT-2-23: it's what I learned this semester

FT-2-24: I don't know, it seems too advanced for Darwin's time

FT-2-25: characteristics are not genetic, they are learned

FT-2-26: It is based on reproduction of the fittest so not everything that reproduces survives

FT-2-27: this is what we learned in class

FT-2-28: I have no idea what differentials have to do with biology

FT-2-29: That point didn't have anything directly to do with natural selection.

FT-2-30: Acquired characteristics are impossible to pass to offspring as they are not in the genetic makeup of the animal.

FT-2-31: If an organism can survive to reproduce then it will pass on its genes.

FT-2-32: Natural selection is survival of the fittest which means that how a population reproduces will determine its survival.

FT-2-33: it best reflected the main idea of Darwin's work

- FT-2-34: I know that acquired characteristics are not passed on to offspring and this is not one of the characteristics of natural selection because of what I've learned in Bio 211.
- FT-2-35: i believe it was the best answer to choose from
- FT-2-36: not answered
- FT-2-37: Lamarck's wrong assumption of evolution was that an individual could pass on traits he gained during his life.
- FT-2-38: I remember it
- FT-2-39: It was false.
- FT-2-40: Because you can't pass on newly acquired traits they have to be in your genes
- FT-2-41: I believe it is the correct response.
- FT-2-42: the population has to produce more offspring than the environment can handle because not all the offspring survive. the adults that survive to reproduce pass those surviving genes.
- FT-2-43: Learned in bio class
- FT-2-44: because you are born with DNA that make up your characteristics and your DNA does not change over time/
- FT-2-45: since the organism doesn't pass all the traits that it acquired during its life span it only passes the best characteristics
- FT-2-46: traits that are acquired through out life can't be passed on because they are not genetic traits just learned traits
- FT-2-47: the organisms genotypes determine the characteristics that certain individual will have,
- FT-2-48: None
- FT-2-49: From class I learned that Darwin found the findings by collecting data on species that were able to adapt to their environment.
- FT-2-50: In class.
- FT-2-51: The other answers were true, but the one I chose. Evolution doesn't happen over a lifetime as it says in the one i chose.
- FT-2-52: acquired traits can't be inherited
- FT-2-53: When I learnt about Darwin's theory of evolution there was a point in it which stated that the environment does tend to produce more than it can sustain. I based my answer on that one piece of information I vividly remember.
- FT-2-54: There were faults in the other answers.
- FT-2-55: Skills such as making excellent pumpkin pie are not passed down to offspring. I can't cook at all, but my mom and dad are excellent cooks.
- FT-2-56: it was right
- FT-2-57: Because I believe that is the one statement that Darwin's natural selection didn't include
- FT-2-58: .
- FT-2-59: I just think that is the answer
- FT-2-60: All of the others were part of Darwin's idea.
- FT-2-61: The better adapted animals obviously know what works so that's what they do thus in turn reproducing more and surviving better
- FT-2-62: I have learned in biology that populations are not always over populated. The other choices were true statements that I have learned about population. Natural disasters or events can cause fluctuations in populations.

- FT-2-63: You can't pass on traits acquired during your lifetime; if cut off your finger, your children won't be missing one too.
- FT-2-64: There are no characteristic changes in an individual during their lifetime, they can't just acquire a new trait and pass it on to their offspring.
- FT-2-65: I believe it is the right answer.
- FT-2-66: if you dye your hair red, your offspring won't have red hair
- FT-2-67: not answered
- FT-2-68: Depending on how well the species is doing and what types of food is available, only those who are able to take care of offspring mate.
- FT-2-69: A 'parent' cannot pass on traits it acquired during its lifetime to its 'child'.
- FT-2-70: An organism cannot change genetically throughout their life. It takes time through generations.
- FT-2-71: I chose this because what happens to you in your life doesn't pass down. For example, if I got a scar on my face from a cut, my offspring wouldn't be born with a scar on its face.
- FT-2-72: Just because they are the most successful species does not mean that they will produce more.
- FT-2-73: Darwin did not say that individuals can pass on things such as learned behaviors genetically.
- FT-2-74: Natural selection has nothing to do with the characteristics that an organism learns during its lifetime.
- FT-2-75: It's what we learned in class
- FT-2-76: the characteristics that are passed on are not gained during the individual's life
- FT-2-77: In the simplest terms, if you lost your arm you wouldn't pass this acquired trait to your offspring. They would, most likely have the standard two-armed body.
- FT-2-78: not answered
- FT-2-79: not answered
- FT-2-80: Most organisms don't reproduce with any other organism in their species. Instead they choose the well adapted and most likely to reproduce.
- FT-2-81: Genetics is the term associated with the definition I choose
- FT-2-82: Natural selection can be viewed as reproduction of the fittest instead of survival of the fittest.
- FT-2-83: Because it is about being able to reproduce in order to thrive.
- FT-2-84: not answered
- FT-2-85: I knew that evolution does not occur in individuals
- FT-2-86: it's the right answer
- FT-2-87: There are checks and balances in nature, and so if a species produces more than the environment can handle, there will be an event to check the population, such as less food, so the population decreases again.
- FT-2-88: I don't believe that when Darwin was speaking of "natural selection" that it had anything to do with the amount of resources.
- FT-2-89: I chose (a) because all organisms (except bacteria) do not experience a change in their genetic information during their lifetime.
- FT-2-90: genetic material that gets passed on is not an acquired trait. It would make no difference, for instance, if my dad was able to bench only 100 pounds or 250. I would be no stronger because of it.

FT-2-91: because

FT-2-92: Characteristics that are acquired during an individual's lifetime are not passed on to their offspring because they are not part of that individual's genetic makeup.

FT-2-93: the rest were true

FT-2-94: natural selection deals with the survival of a specific individual that has a specific trait

FT-2-95: You don't pass on things like immunities.

FT-2-96: Its not about variety. Just reproduction and population.

FT-2-97: Acquired traits are not passed on. The most adapted animals are the most successful thus will reproduce.

FT-2-98: Organisms that are better adapted to their environments have a greater chance to reproduce.

FT-2-99: From his saying "Survival of the fittest " that is better to say "Reproduction of the fittest. "

FT-2-100: We discussed this exact question in class

FT-2-101: not answered

FT-2-102: i learn that in bio 211

FT-2-103: because of all the choices i dont think it has to do with the variation

FT-2-104: Characteristics acquired an individual of a species will not be passed on because there is no genes for those characteristics. Without that genetic information the organism has no means by which to pass on those characteristics.

FT-2-105: individually characteristics acquired in an individual's lifetime are not passed on

FT-2-106: not answered

FT-2-107: I don't think Darwin believed in the passing on of acquired traits; I think it was some other guy before him.

FT-2-108: Variation doesn't exist, on a large scale, in a population because then they would be too different. However, on a small scale, variation certainly exists - that's how evolution occurs.

FT-2-109: The characteristics or adaptations are not adapted during the life of the organism. They are either born with a specific adaptation or they aren't.

FT-2-110: Survival of who can produce the most offspring

FT-2-111: not sure

FT-2-112: It was the most correct answer.

FT-2-113: Natural selection is the several of the fittest or the producing of the most offsprings.

FT-2-114: because the other answers are part of darwins theory

FT-2-115: We don't evolve during our lives, our genetic traits will remain the same.

FT-2-116: a specie can only produce as much as it planet can hold.

FT-2-117: The above response seemed the least accurate.

FT-2-118: learned in class

FT-2-119: its right

FT-2-120: Seemed correct

FT-2-121: Because characteristics acquired are not passed on.

FT-2-122: because it seemed like it didn't agree with Darwin's definition of Natural Selection

Question 3

FT-3-1: “Survival of the Fittest “ deals with which organisms are able to reproduce successfully.

FT-3-2: not answered

FT-3-3: Reproduction is the key in a fit individual. It’s favorable genes will only survive if it reproduces.

FT-3-4: That was the correct answer on the test.

FT-3-5: not answered

FT-3-6: There are a lot of factors that can affect an organism, including environmental ones, and if an organism is able to survive in a harsh environment, then they are considered to be the most fit to survive.

FT-3-7: that is what i was taught in high school

FT-3-8: Because the fittest organisms need to be able to reproduce and have their genes continue into the following generation(s)

FT-3-9: It seemed the most reasonable answer

FT-3-10: without reproduction the species wouldn’t survive past the present generation

FT-3-11: survival of the fittest by definition are those species that survive long enough to reproduce offspring into the next generation

FT-3-12: The fittest are those that can survive long enough to pass on their genes to reproduce.

FT-3-13: I learned this in class.

FT-3-14: not answered

FT-3-15: that’s the def....

FT-3-16: They are able to reproduce. Therefore, they are the most fit for the environment.

FT-3-17: natural selection is “reproduction of the fittest “

FT-3-18: I know that survival of the fittest does not technically mean muscular or huge. The phrase means that the species survives and reproduces.

FT-3-19: If an animal cannot reproduce, it doesn’t matter how fit or strong it is in its environment.

FT-3-20: It was the closest to the right answer.

FT-3-21: This question is misunderstood. It should really be reproduction of the fittest because those organisms that are best adapted to their environment will produce offspring with similar characteristics.

FT-3-22: we also learned this in class

FT-3-23: i learned it in class

FT-3-24: reproduction of the fittest

FT-3-25: not answered

FT-3-26: you have to be ‘fit’ to survive past the first stages of life

FT-3-27: this is what i learned in class

FT-3-28: if you do survive for more than one generation that’s ok, but if you can’t pass your genes successfully, then you don’t survive anymore

FT-3-29: You made a big point of this: “It’s reproduction of the fittest “ not “survival... “

- FT-3-30: The whole reasoning for Natural Selection is that the animal that manages to reproduce is able to continue on its genetics. The ones that are most adapted to their environment have the best chance of that.
- FT-3-31: This is the same as response to number 3.
- FT-3-32: If the organism is succesful in reproduction it is more likely to survuve than if it does not reproduce succesfully
- FT-3-33: The organisms with genes that are best adapted to its environment allow an individual to survive and reproduce passing its genes on to another generation
- FT-3-34: "Survival of the Fittest " really refers to reproduction and the ability to pass on genes to offspring. We learned about this in Bio 211.
- FT-3-35: i believe it was the best answer to choose from
- FT-3-36: not answered
- FT-3-37: Remember Dr. Colbert saying the answer.
- FT-3-38: I know it is right
- FT-3-39: not answered
- FT-3-40: because that's the answer
- FT-3-41: I believe it is the correct response, and I specifically remember this discussed in Biology 211.
- FT-3-42: it is extremely important that the organisms best adpated organisms pass on there genes because not all organisms need to be fit.
- FT-3-43: survival of reproduction. Bio class
- FT-3-44: That is what I learned in class
- FT-3-45: it means that the organism with the best traits is able to pass its charactertics to the future generation so that the future generation is able to adapt to the enviornment
- FT-3-46: it is like the species that are fittest to mate and pass up their genes to the next generations because the fittest species will mate the most.
- FT-3-47: the organisms that pass their genes on to their offspring are more fit, because the survived to reproduced
- FT-3-48: None
- FT-3-49: I chose the response because speices that survive and produce more offspring are more adaptive.
- FT-3-50: Class.
- FT-3-51: I learned in Biology class that survival of the fittest is more truthfully survival of those who reproduce. It's no survival of the fittest if those who are the strongest are unable to pass their genes ontop the next generation.
- FT-3-52: survival of the fittest means the ability to reproduce to survive that is passing on genes to next generation
- FT-3-53: I have learnt from biology 211 a new and modified statement to "survival of the fittest " which goes by as "REPRODUCTION of the fittest " . I base my answer on that clearly obvious statement.
- FT-3-54: Survival of the fittest does not apply to surviving individuals, but rather surviving genes. (survival of the fittest genes)
- FT-3-55: Survival doesn't matter, what matters is what things that inable an organism to survive in an environment get passed down.
- FT-3-56: it was right

FT-3-57: The survival of the fittest is the ability to pass on your genetic information. The point of all life is to pass on genetic evolution.

FT-3-58: .

FT-3-59: To be the most successful you have pass on genes

FT-3-60: Offspring that are able to reproduce and pass their genes to their offspring are considered the fittest.

FT-3-61: If you are able to reproduce you must have been doing something right in order to stay in your population

FT-3-62: I learned that survival of the fittest is not correct in all senses; rather, I learned "reproduction of the fittest. " Those organisms that produce their offspring that survive will pass on the genetic information.

FT-3-63: According to Prof. Colbert: "Reproduction of the fittest. "

FT-3-64: If organisms successfully pass their genes on to the next generation, then they will survive the longest because most likely the good genes will be passed on.

FT-3-65: I believe it is the right answer.

FT-3-66: survival of the fittest deals with those that live to produce offspring

FT-3-67: not answered

FT-3-68: Because this shows survival not in just one generation, but is guaranteed at least one more.

FT-3-69: Survival of the fittest is more correctly said as reproduction of the fittest.

FT-3-70: Learned in class

FT-3-71: I chose this because the best suited animals will survive and reproduce to pass on their genes to their offspring.

FT-3-72: This does not mean that the species is the fastest or strongest.

FT-3-73: Organisms that are best suited for their environment will most likely survive to reproduce and thus pass on their genes.

FT-3-74: We learned that the phrase was incorrect: it should be "reproduction of the fittest. "

FT-3-75: It's what we learned in class

FT-3-76: survival of the fittest means that it was able to survive and reproduce

FT-3-77: Just because something is stronger or faster doesn't necessarily mean they will survive and pass on their genetic information.

FT-3-78: not answered

FT-3-79: because that's the answer

FT-3-80: The "fittest " organisms are able to survive and then reproduce to pass on their genes.

FT-3-81: Survival of the fittest should actually be reproduction of the fittest

FT-3-82: not answered

FT-3-83: It's about being able to survive in order to reproduce.

FT-3-84: Because the organism that has the most favorable trait will pass it on to the next generation

FT-3-85: evolution produces organisms that are best suited to survive to reproduce

FT-3-86: i dont know

FT-3-88: Survival of the fittest means that the organism has acquired characteristics to help it successfully reproduce offspring with the same characteristics so that they can produce offspring with characteristics to help them survive and repeat this process.

FT-3-89 You can be big and strong but still not reproduce, so the fittest would have to be the ones that reproduce

FT-3-90: survival of the fittest is relative to the environment and the habits of a particular species. So the strongest or the fastest may or may not be those that survive to produce offspring. Also it does not matter if a population survives into the next generation because it may not reproduce. It is those that survive due to their characters that are favorable in that environment to reproduce that are considered the “fittest “ these are the organisms that stick around in the population - thus, reproduce because

FT-3-91: Organisms that successfully pass on their genes are the fittest in a biological standpoint, because they are the ones that have the most influence on the next generation.

FT-3-92: survival is based on an organisms ability to reproduce

FT-3-93: because to survive you have some sort of gene that was in your advantage and you would pass that on to your offspring

FT-3-94: Passing genes means able to reproduce.

FT-3-95: If they can make it through the first, they can reproduce.

FT-3-96: those adapted, most fit, survive or as the questions says they live on into the next generation

FT-3-97: Fittest does not necessarily mean that these animals are the strongest or fastest. Fittest can simply mean they camouflage better in their environment then others of their kind.

FT-3-98: Because it doesn't matter if you can survive if you can't have children to pass on your genes to.

FT-3-99: The point of survival is to pass on your genes

FT-3-100: not answered

FT-3-101: just know it

FT-3-102: because i have always been taught that it does have to do with the organism that do survive

FT-3-103: Being the most fit doesn't necessarily mean the strongest. It just means that one is more likely to reproduce and pass on their genes.

FT-3-104: its is actually “reproduction of the fittest “--organisms best adapted to the environment are most likely to survive long enough to reproduce and pass on their genes

FT-3-105: If you survive to reproduce, you have a shot at contributing offspring to the world.

FT-3-106: Fitness is related to whether or not an individual can survive long enough to produce offspring carrying the advantageous genes. However, I would like to point out that “Survival of the Fittest “ was not associated with evolution, but rather emerged with Social Darwinism.

FT-3-107: If they survive, then they are the fittest

FT-3-108: The organisms best suited to the environment will outlive the organisms that are not well suited for the environment. The biggest and strongest may not be best suited for a particular environment. Therefore, the best suited organisms live to breed and produce offspring that will inherit their genes.

FT-3-109: its survival of who can produce the most offspring

FT-3-110: because the “fittest “ should survive to the next generation

FT-3-111: reproduction of the fittest

FT-3-112: It was the most correct.

FT-3-113: Survival of the fittest, if the animal doesn't reproduce they species will not survive.

FT-3-114: because the animals that survive to reproduce are supposed to be better suited for their environment.

FT-3-115: They pass on their genetic information so a part of them 'survives', the fittest can also be referred to as 'those who successfully reproduce'.

FT-3-116: it involves reproduction...so the only way to pass genes is to reproduce.

FT-3-117: seemed like the thing to do at the time

FT-3-118: was taught that in class

FT-3-119: right

FT-3-120: because survival is dependent on reproduction

FT-3-121: The fittest in the muscular sense isn't always the most adapted for an environment.

FT-3-122: survival of the fittest refers to reproduction

Question 4

FT-4-1: not answered

FT-4-2: not answered

FT-4-3: Natural selection is the process by which favorable traits are passed along to future generations. The traits are phenotypes, or physical reflections of genes.

FT-4-4: That was the answer on the test.

FT-4-5: not answered

FT-4-6: Natural selection cannot affect the genotype of an organism as it is not expressed, but it can affect its phenotype, since it is expressed to the environment.

FT-4-7: i thought it made the most sense

FT-4-8: Because the phenotype is the observed characteristic, and this is all that natural selection can act upon

FT-4-9: Natural selection involves organisms surviving due to what is presented on the outer body. For example, hummingbirds with longer beaks who feast on tall flowers have a greater advantage over hummingbirds with shorter beaks

FT-4-10: It changes the physical characteristics, but not the actual genes. It “weeds out” the species that aren’t fit to survive

FT-4-11: phenotype is what we can. natural selection is based on the phenotypes of species that are able to survive in their environment

FT-4-12: I do not exactly understand what the question is asking.

FT-4-13: It doesn’t make sense.

FT-4-14: not answered

FT-4-15: not answered

FT-4-16: I’m not sure.

FT-4-17: it acts on the genotypes

FT-4-18: Natural selection involves genetic changes.

FT-4-19: Natural Selection acts on phenotype because it favors present traits that aid in chances for reproduction.

FT-4-20: It was the right answer.

FT-4-21: Natural selection shows the visible things amongst organisms in a species.

FT-4-22: i guessed

FT-4-23: same

FT-4-24: when two individuals sexually reproduce they combine their different genetic characteristics and the genotype of the offspring is altered, better or worse, and is different than the parents’ genes

FT-4-25: not answered

FT-4-26: your genes make you who you are so natural selection is based on the genes not your appearance

FT-4-27: this is what i remember from class

FT-4-28: because it seemed to fit best to what we have learned

FT-4-29: Killing an animal with a recessive allele “a” will keep that allele from being passed on.

FT-4-30: not answered

FT-4-31: As natural selection is occurring, certain genes and traits might be passed on less and less. Genotype is how you read a gene and that is why I chose that answer. If you studied how different genes were passed on you would look at the letters like Aa or

AA. This also describes the phenotype. If you were just looking at the phenotype you wouldn't always know the genotype.

FT-4-32: I don't remember this particular thing

FT-4-33: outside forces can not differentiate between genotype, its an individuals phenotype that determines its interactions with the environment

FT-4-34: We just had this question on our last Bio 211 test and I know that phenotype is the correct answer.

FT-4-35: i believe it was the best answer to choose from

FT-4-36: not answered

FT-4-37: It was the only logical answer.

FT-4-38: I guessed

FT-4-39: not answered

FT-4-40: because it affects the different alleles that are passed on

FT-4-41: I believe it is the correct answer.

FT-4-42: its the physical traits that help organisms adapt and survive the environment.

FT-4-43: bio class. Environment is better adapted for certain phenotypes. Those phenotypes will reproduce offspring with same traits.

FT-4-44: because phenotypes is the change in characteristic

FT-4-45: natural selection basically causes mutation so that the organism is able to cope up with the surrounding environment.

FT-4-46: phenotypes are the physical characteristics that can determine survival like beak shape.

FT-4-47: natural selection acts on the phenotype of an organism, which alters the genotype if not suitable to environment

FT-4-48: None

FT-4-49: I because changes in mutations help species change to survive their environment.

FT-4-50: Class.

FT-4-51: It seemed like the best choice out of the choices, natural selection acts through the genes of a person, not how they look.

FT-4-52: because the one can notice the phenotype

FT-4-53: its the population of a species that survive and not SPECIFIC genotypes or genes. In other words population can be linked to the PHENOTYPES.

FT-4-54: I got this question wrong on the test also. I think it is poorly written. It doesn't affect recessive alleles, and dominant alleles and phenotype are THE SAME. (to me anyway)

FT-4-55: Phenotype is physical characteristics of an organism. The environment only acts on the physical properties of an organism.

FT-4-56: only the genes that show matter.

FT-4-57: It was my best guess.

FT-4-58: .

FT-4-59: Natural selection does not cause mutation, phenotype can differ with environmental conditions, so the answer is genotype

FT-4-60: I wasn't sure so I guessed.

FT-4-61: The new traits are exactly what the environment acts on, and those traits are expressed based on environment

FT-4-62: Natural selection chooses certain visible, observable characteristics that help organisms survive. These characteristics are then passed on to other generations.

FT-4-63: not answered

FT-4-64: Phenotype is something physical, and the physical properties of an individual are what make up natural selection.

FT-4-65: I believe it is the right answer.

FT-4-66: those with the better physical characteristics will have a better chance of survival in a given environment and be able to produce their offspring

FT-4-67: not answered

FT-4-68: I think it has to do with genotype, but I'm not quite sure.

FT-4-69: It acts on how an organism looks.

FT-4-70:

FT-4-71: Natural selection is wiping out the weaklings, and choosing the best suited to go on.

FT-4-72: It is not based on looks.

FT-4-73: The phenotype is the characteristic that is present and thus what will affect survival (i.e. if a mammal species has different fur shades, those with the shade of fur that best acts as camouflage will more likely survive)

FT-4-74: Recessive alleles may or may not be passed on to the next generation, which may help or hinder their chance of survival.

FT-4-75: It's what we learned in class

FT-4-76: if an individual does not have the necessary genes to survive, it will not be able to reproduce, therefore leading to natural selection

FT-4-77: The individuals phenotype (coloring, size, etc.) determines whether or not they will survive in their environment. A white rabbit living in a snowy habitat has a greater chance of survival than a black rabbit in the same environment.

FT-4-78: not answered

FT-4-79: not answered

FT-4-80: Natural selection is all about looks.

FT-4-81: Natural selection produces the gene that is most suitable to reproduce better.

FT-4-82: Because it does not act directly on phenotype.

FT-4-83: It made the most sense

FT-4-84: because the allele may change

FT-4-85: natural selection changes over time the genotype, which then in turn changes the phenotype

FT-4-86: felt like that was the answer

FT-4-87: It's not that I don't understand the question, but I don't feel like any of them match up with what natural selection means to me. I feel that natural selection allows species to pass on the "good" characteristics to their offspring to hopefully help them survive better, but doesn't necessarily always act on the genetic makeup or physical characteristics. Also, mutations aren't "made" like they change, they are there to begin with.

FT-4-88: A guess

FT-4-89: Although genotype, mutations, and recessive alleles are part of evolution it is the species physical characteristics that determine its survival.

- FT-4-90: Natural selection does not cause mutations - it acts on existing ones that produce disadvantaged or advantaged phenotypes.
- FT-4-91: because
- FT-4-92: Natural selection acts directly upon phenotype, because it's an organism's phenotype that determines its fitness in a particular environment.
- FT-4-93: mutations are passed to following generations not necessarily phenotype and natural selection does not necessarily act directly on genotype
- FT-4-94: i actually couldnt tell you why
- FT-4-95: phenotype is what you can see.
- FT-4-96: Changing of genes.
- FT-4-97: It's the physical things that keep a species surviving
- FT-4-98: Mutations occur in order to make the species more adaptable to their environment.
- FT-4-99: This is because as species mate, genes change from crossing over, mutation, or random mating.
- FT-4-100: Those organisms best equipped to reproduce survive and pass on their genes.
- FT-4-101: not answered
- FT-4-102: learn in bio 211
- FT-4-103: because this choice is the one that has to do most than the other ones
- FT-4-104: It is the phenotype that affects an organism's physical environment and gives it the abilities or appearance needed to help or hinder it's survival.
- FT-4-105: phenotypic and physiological qualities that allow an organism to be successful in an environment will be favored in natural selection--not the specific genes or alleles themselves
- FT-4-106: Whether you survive to have offspring depends on your genetic make-up and your environment.
- FT-4-107: Phenotype is what appears in the individual due to variations in the genes, so it is what is selected upon.
- FT-4-108: It causes certain traits that not every organism has to be the one that helps them best survive
- FT-4-109: Phenotype is the physical characteristics that will increase or decrease the adaptability of organisms to help them better survive in their environment.
- FT-4-110: i guessed
- FT-4-111: because the phenotype is what is shown so that is what is affecting the organism in its environment
- FT-4-112: organisms choose their mates based on whether or not they look healthy to produce offspring
- FT-4-113: Genotype is passed on to the next generation.
- FT-4-114: because
- FT-4-115: I don't know exactly, I guess I figured that how an individual appears affects its likelihood for survival.
- FT-4-116: it's the physical properties that help the organism survive or not.
- FT-4-117: ahh, so much typing! my reason for choosing the response above really doesn't change; I choose the response that seems the most accurate to me.
- FT-4-118: same as before
- FT-4-119: meoooooww

FT-4-120: seemed like the best answer

FT-4-121: Natural Selection favors the individuals who are well adapted, which can be those who have some mutation which causes them to survive.

FT-4-122: in reproduction, the genotypes of the parents are passed on to offspring

Question 5

FT-5-1: Homologous structures are similar structures even though they don't function the same way.

FT-5-2: not answered

FT-5-3: The structures obviously do not have exactly the same function, but they show that they are related by a common ancestor.

FT-5-4: None of the answers were correct based on the evidence.

FT-5-5: not answered

FT-5-6: Homologous structures are an indication that somewhere along the line, there was an ancestor that also had the same structure. Even though it evolution is sometimes hard for me to understand, such as in this case, I know that it is possible for three different species to evolve out of one common ancestor.

FT-5-7: i thought it was the correct answer

FT-5-8: Because homology of structures is a common indicator of some common ancestor

FT-5-9: Like with humans and monkeys having a common ancestor due to our DNA structures and body structures bat, whales and dogs share a common limb that can only mean that they shared a common ancestor

FT-5-10: They all have similarities, but not in every way, so their ancestors may have been the same way back in time.

FT-5-11: i think that they could have evolved from the same ancestor due to their similar resemblance in structure

FT-5-12: If animals have similar structures they are assumed to have a common ancestor.

FT-5-13: It represented my thoughts accurately.

FT-5-14: not answered

FT-5-15: not answered

FT-5-16: We learned this in class.

FT-5-17: means to have one ancestor in common.

FT-5-18: All three structures are used for movement and are located in reasonably similar areas. This gives good evidence that the three may have had a common ancestor.

FT-5-19: It was the right answer.

FT-5-20: The examples are related in some way through a common ancestor.

FT-5-21: we learned this

FT-5-22: i learned it in class

FT-5-23: if they all have the same structures than they must have evolved from a common ancestor according to darwin's theories

FT-5-24: not answered

FT-5-25: they all share a fore-limb of some kind

FT-5-26: this is what i learned in class

FT-5-27: because the diagram from class showed that they all had a similar bone structure.

FT-5-28: They're all mammals, so that response makes the most sense

FT-5-29: If they all share a similar bone structure than it is plausible that they all had a common ancestor in order to have the similar structure.

- FT-5-30: We learned about this question in class. Because the three organisms have homologous structures that provide almost the same function, it shows they are more closely related than to a plant.
- FT-5-31: Because of the bone structure it can be assumed that at some point no matter how far away these species shared a common ancestor.
- FT-5-32: the structure of each species anatomy is similar suggesting a common ancestor
- FT-5-33: We have learned in Bio 211 that similarity in such structures indicates a common ancestor.
- FT-5-34: i believe it was the best answer to choose from
- FT-5-35: not answered
- FT-5-36: It was the best answer available. I was going to put they all evolved from a common ancestor but then I realized many animals have one bone in common but they probably do not have a common ancestor. But doesn't all life share a common ancestor
- FT-5-37: Guess
- FT-5-38: not answered
- FT-5-39: because that is the answer
- FT-5-40: I do not like any of the responses. Perhaps the choices should be re-phrased.
- FT-5-41: the organisms have the same structures in the wing, fore-limb, and flipper, because of the similarity they had to have common ancestors a long time ago.
- FT-5-42: Common structure in 3 different species means evolved from same organism
- FT-5-43: because the structures change over time to fit the use. But they have the same ancestors
- FT-5-44: since anatomical homology is the evidence that support that they share common ancestor
- FT-5-45: Having homologous structures means that they came from a common ancestor and then through evolution, evolved their structures to help them survive.
- FT-5-46: their common ancestor had the same structure, and these species evolved and found different uses for that particular structure
- FT-5-47: not answered
- FT-5-48: They come from the evolve to fit the needs of the species.
- FT-5-49: Class.
- FT-5-50: homologous structures mean it doesn't have the same exact function, but that it evolved from the same thing so that's why i chose that one
- FT-5-51: homologous structures imply common ancestor
- FT-5-52: Learnt in the class I based this answer. another example of such physical appearance similarities is that of a horse and that between a human , fish and a tadpole. Also from the video shown during class it became apparent that such similarities are because of a common ancestor.
- FT-5-53: Common sense. Homologous means same.
- FT-5-54: The common ancestor changed over time to produce new species that adapted the forelimbs for their particular environment.
- FT-5-55: diagrams in books
- FT-5-56: Also my best guess.
- FT-5-57: .
- FT-5-58: They have similar structures that must have come from a similar ancestor.
- FT-5-59: All of these adaptations evolved from a single organisms at one time.

FT-5-60: Using information that links them together like that must say something about their ancestor

FT-5-61: The structures are the same, but they have evolved over time.

FT-5-62: not answered

FT-5-63: Since all of the animals had a common body part, they would have to have all evolved from a common ancestor because evolution isn't just a random thing.

FT-5-64: I believe it is the right answer.

FT-5-65: they all have the same type of structure so they all had to come from a common ancestor in order for the diversity to happen

FT-5-66: not answered

FT-5-67: Because homologous is saying that only one type of allele is there, so it must be similar.

FT-5-68: One of the implications of common ancestry is homologous structures.

FT-5-69: Learned in class

FT-5-70: Since they all have the same bone but in different shapes, it indicates that they all evolved from a similar life form.

FT-5-71: They all have a similar function.

FT-5-72: Each organism evolved at some point in time. These times could be the same or different. However, what can be said is they all had a common ancestor from which their homologous structures are derived.

FT-5-73: They are a similar feature for all of the animals mentioned, which indicates that they share a common ancestor.

FT-5-74: It's what we learned in class

FT-5-75: i dont understand the homologous structures

FT-5-76: They have a common ancestor because they have a homologous structure linking them.

FT-5-77: not answered

FT-5-78: because they are a homologous they have same.

FT-5-79: The homologous structures mean that they are similar if not the same. So they must be derived from a common ancestor.

FT-5-80: Homologous structures are used with other things to help determine ancestry

FT-5-81: They have very similar structures which means they may have evolved from a distant ancestor.

FT-5-82: They have the bones that are similar to our ulnar and radius.

FT-5-83: because all share a trait but evolved differently

FT-5-84: like characteristics is grounds for relativity

FT-5-85: the information I learned in class

FT-5-86: These are similar bones in the "arm" of the organism, so maybe these all descended from a similar ancestor millions and millions of years ago since they are similar.

FT-5-87: Discussed in class

FT-5-88: All these organisms have a very similar structure in the bones of their limbs. Even though they have evolved into structures for different purposes they share the same bone structure indicating a common ancestor.

FT-5-89: I can't really explain this. I just know

FT-5-90: because

FT-5-91: Homologous structures indicate a common ancestor, because they must have served similar purposes at one point in time.

FT-5-92: common structures = common ancestor

FT-5-93: if all these organisms share a specific structure in thier bodies it is very possible that they do share a common ancestor

FT-5-94: Similar structures come from a similar animal.

FT-5-95: It seemed to make the most sense.

FT-5-96: They have similar features so science believes this mean they have a common ancestor

FT-5-97: Organisms that have a common ancestor should share common anatomical structures.

FT-5-98: They are talking about homologous structures, where different species have similar bone structures, but different uses. These animals must have the same ancestor to have similar structures.

FT-5-99: We discussed this exact question during a lecture

FT-5-100: not answered

FT-5-101: learn in bio 211

FT-5-102: since they all share that, then they must have been related a long time ago

FT-5-103: The structure is very similar, but it serves different functions. It would not have been a far strech for the original appendage to be modified into all of the new appendages in the example.

FT-5-104: they have very different functions due to the different environments and lifestyles they adapted to, but since the structures are very similar their lineage can be traced back to a common ancestor, indicating that each species has evolved from that common ancestor gradually over time

FT-5-105: not answered

FT-5-106: Homologous structures are an important way of seeing the steps of evolution.if they are virtually the same structure, then they must have shared a common ancestor

since they all have these homologous structures, it is a sign that they could have evolved from a common ancestor.

FT-5-107: Didn't understand

FT-5-108: all orgnaisms share a common ancestor

FT-5-109: not answered

FT-5-110: not answered

FT-5-111: It was the most correct answer.

FT-5-112: not answered

FT-5-113: not answered

FT-5-114: because they all serve as forelimbs

FT-5-115: In class discussion

FT-5-116: they all evolved from a same organism to serve a different purpose....ie swim, fly, walk, and grab

FT-5-117: Por que

FT-5-118: it is right

FT-5-119: yup

FT-5-120: if they have similar skeletal structures, they could have common ancestry

FT-5-121: They all show similar bone compositions that when compared differ slightly only to suit the organism's life.

FT-5-122: the term homologous refers to something that has the same use in different animals

Question 6

FT-6-1: not answered

FT-6-2: not answered

FT-6-3: DNA, fossil evidence

FT-6-4: Science, as far as I know, shows that to be true.

FT-6-5: not answered

FT-6-6: I chose this because in lecture, Dr. Colbert taught us that evolution occurs within a population, not an individual. However, I am aware that not all organisms and species evolve, as humans probably are not going to be evolving anytime soon.

FT-6-7: i agreed with that statement

FT-6-8: This is what I have learned

FT-6-9: All organisms have evolved in somewhat compared to their ancestors

FT-6-10: Evolution can't be controlled, and it can't occur in individuals, but on organisms as a whole by natural selection

FT-6-11: evolution is always happening. not in humans though but it is present. we as humans are unable to see it because our life span is too short

FT-6-12: Organisms are constantly changing over time.

FT-6-13: Evolution is constantly occurring.

FT-6-14: not answered

FT-6-15: not answered

FT-6-16: not answered

FT-6-17: evolution occurs in populations

FT-6-18: Evolution does not happen to individuals. It happens to all species as a whole.

FT-6-19: Evolution is always occurring, despite the fact that we rarely see it. However, individuals cannot evolve.

FT-6-20: It was the right answer.

FT-6-21: Evolution does not occur in individuals but in populations. Over a period of time a population is allowed to evolve.

FT-6-22: it is the answer that i thought was correct

FT-6-23: same

FT-6-24: because it happens and we have scientifically observed this

FT-6-25: not answered

FT-6-26: over time everything changes and evolves just not one individual... its a species

FT-6-27: this is what i learned in class

FT-6-28: because it does occur in all populations that live.

FT-6-29: It's the right answer.... I hope

FT-6-30: All populations experience evolution, it is simply a question of how fast and often it occurs for the population

FT-6-31: Evolution occurs all of the time in every organism on earth. This is because the environment is always changing and the organisms need to change with it so that they have a better chance for survival.

FT-6-32: It is observed through time not in a specific individual

FT-6-33: environments are always changing, each population has to adapt to these changes or die

FT-6-34: I have learned in Bio 211 that evolution doesn't occur in individuals, it occurs in populations, and this response seemed to be the most correct based on what I've learned.

FT-6-35: i believe it was the best answer to choose from

FT-6-36: not answered

FT-6-37: Evolution occurs in all organisms and occurs in populations, not individuals.

FT-6-38: Most logical

FT-6-39: not answered

FT-6-40: because that's the answer

FT-6-41: I believe it is the correct response. Individuals do not evolve, it is the population.

FT-6-42: all the species have been touched by evolution, including humans, so species are evolving still and some species have already evolved.

FT-6-43: Not an individual process.

FT-6-44: because that is what we were taught in class

FT-6-45: evolution can occur in any population of an organism,so that a organism is able to live and reproduce in an enviornment.

FT-6-46: evolution occurs to all populations through natural selection choosing the best adapted animals to pass on their genes to the next generation.

FT-6-47: evolution occurs under five circumstances according to darwin, it does not occur in an individual, and it does not occur in a specific species

FT-6-48: not answered

FT-6-49: Populations change fin differnt species. All species can evolve over time.

FT-6-50: Class.

FT-6-51: Evolution happens to all species

FT-6-52: I think all population has the ability to evolve

FT-6-53: If i have learnt anthing for sure from the biology211 class then it is the fact that evolution does NOT occur in a individual , it occurs in a POPULATION AS A WHOLE!!! also its not neccesariy that it occurs in all the populations of all organisms.

FT-6-54: Evolution occurs in populations, not individuals, of all organisms.

FT-6-55: Evolution doesn't affect individuals, It affects populations over time.

FT-6-56: It was right

FT-6-57: That was the most logical choice.

FT-6-58: .

FT-6-59: Evolution happens only in populations, but it is not subject to certain populations

FT-6-60: Evolution is occuring in all populations

FT-6-61: Evolution is a theory that occurs over time and every individual organism experciences it no matter what

FT-6-62: Evolution occurs everywhere and is constanly and slowly changing organisms, including humans.

FT-6-63: Evolution cannot occur in individuals and doesn't only affect non-human animals.

FT-6-64: At least at one period in an organisms exsistence, they will evolve either into more complex organisms or simpler organisms.

FT-6-65: I believe it is the right answer.

- FT-6-66: evolution is random and isn't selective between species
- FT-6-67: not answered
- FT-6-68: It can't be seen in individuals because evolution happens over a period of time, but every species goes through evolution.
- FT-6-69: That is what I have learned.
- FT-6-70: Learned in class
- FT-6-71: Evolution happens to every organism and is always occurring.
- FT-6-72: Evolution is occurring now.
- FT-6-73: As environmental conditions change, populations must also in order to survive, which leads to evolution. If a population does not change and is not adapted to its changed environment, it may become extinct.
- FT-6-74: All populations undergo evolution because the genes in populations change over time.
- FT-6-75: From what I learned in class, I know that the mechanisms causing evolution act on all populations
- FT-6-76: evolution happens to all species on the planet, including humans
- FT-6-77: All organisms have the ability to evolve.
- FT-6-78: not answered
- FT-6-79: because
- FT-6-80: Evolution occurs everywhere and is happening right now with every species in existence.
- FT-6-81: Evolution can happen in any organism including humans
- FT-6-82: Evolution can happen in all populations of organisms and not just to the individual.
- FT-6-83: Evolution occurs within populations but does not occur in all populations yet has the potential to.
- FT-6-84: because all organisms evolve slightly from one generation to the next
- FT-6-85: evolution does not occur in only a select few organisms
- FT-6-86: thought that was the answer
- FT-6-87: We learned that evolution occurs in populations, not individuals, but it could probably happen to any kind of organism and most things have probably evolved, but there may be some that haven't changed much through the years.
- FT-6-88: Every organisms evolves
- FT-6-89: Evolution does not stop no matter what happens to the population. Even in the "living fossils" evolution has occurred despite what appears to be a lack of change.
- FT-6-90: It's always happening. Everywhere.
- FT-6-91: because
- FT-6-92: Evolution occurs in all populations of organisms, because populations' genetic compositions are always changing.
- FT-6-93: evolution is constant and but not always noticeable in a short time span but can be easily seen over long periods of time
- FT-6-94: evolution occurs over a long period of time to an entire population of a species
- FT-6-95: You cannot evolve by just living, but passing genes on to populations can cause mutations, which is evolution.
- FT-6-96: I just no its not in humans.
- FT-6-97: evolution doesn't pick and choose. It happens to everyone everywhere

- FT-6-98: All organisms up to date have had several changes in their populations.
- FT-6-99: All animals have changed since the beginning of life. If not their might be huge birds still flying around, but they have changed into our current birds and reptiles.
- FT-6-100: Mutations occur, causing evolution in all species
- FT-6-101: not answered
- FT-6-102: also learn that in bio 211
- FT-6-103: because evolution is taking place all the time
- FT-6-104: Evolution occurs because of a genetic change which can not happen in an individual but can happen in a population. Evolution can occur in any species, even human, sinse we all have genes.
- FT-6-105: over time, all species evolve, but individuals do not
- FT-6-106: evololution does not occur in individuals.
- FT-6-107: Evolution, while possibly untrue, is the best science has to offer in explanation of the world's diversity.
- FT-6-108: That's what I believe, that's what makes sense to me. No one is above evolution - without it, we wouldn't be here today, and we won't survive into the future.
- FT-6-109: Depending on the environment, organism are always evolving to best suite the environment. It is a very, very slow process. Individuals do not evolve.
- FT-6-110: Evolution in my opinon occurs gradually and only occurs in species that need better adaptations to fit their environment.
- FT-6-111: evolution happens to every oranisms species
- FT-6-112: evolution occurs over long periods of time to populations not individuals
- FT-6-113: It is the most correct answer.
- FT-6-114: Evolution can not occur in an individual organism it can only evolve through a population
- FT-6-115: because it occurs over time to all species
- FT-6-116: Individuals can't evolve but populations are constantly mixing genes and producing cross-overs, this happens with all species. Its a fact of life.
- FT-6-117: i just know the evolution happenes everywhere.
- FT-6-118: it's what we were taught
- FT-6-119: no
- FT-6-120: evolution occurs all the time and can be found in all organisms
- FT-6-121: Everything living is effected by evolution, even humans.
- FT-6-122: becuase evolution has occured in every species on the planet at one point or another

Question 7

FT-7-1: not answered

FT-7-2: not answered

FT-7-3: DNA, fossil evidence

FT-7-4: unsure

FT-7-5: Because I said so

FT-7-6: Speciation can occur because some of the organisms of the species were better able to adapt to their environment.

FT-7-7: i narrowed it down to two and i figured this answer was correct

FT-7-8: Because this is what I have learned and believe

FT-7-9: All species have speciated in some way that's why there are so many diverse species in the world

FT-7-10: This process simply requires the species to have a need for a change such as a defense mechanism against predators

FT-7-11: it is true that speciation can occur in any population. it is not designed for just one

FT-7-12: A new organism can only be produced from an organism that is similar to the original organism.

FT-7-13: It represented my thoughts accurately.

FT-7-14: not answered

FT-7-15: not answered

FT-7-16: hybrids and mixes

FT-7-17: speciation can occur in any population

FT-7-18: It was the only one that was true. Speciation can happen and is happening to this day.

FT-7-19: Speciation can occur in any type of organism through a number of factors, whether it be mutation or through allopatric methods.

FT-7-20: It was the right answer.

FT-7-21: Because of genetic variability, speciation can occur in any population whether the organisms are similar or not.

FT-7-22: thought it was the right answer

FT-7-23: same

FT-7-24: i reasoned and came to that conclusion

FT-7-25: not answered

FT-7-26: any species can be affected by certain factors to cause speciation

FT-7-27: this is what i learned in class

FT-7-28: if there is a division of a species, it could potentially become a new species because of adaptation

FT-7-29: a,b,c and d are not right

FT-7-30: It was the only one that made sense.

FT-7-31: This just means that a new species is created from the old and the two cannot reproduce. It does not have a limit from organism to organism.

FT-7-32: a new species can form from any other species because of many factors including geographical separation.

FT-7-33: given enough time any species genes can change enough to separate into separate species

- FT-7-34: Based on what I've learned in Bio 211, this appeared to be the best response to the question.
- FT-7-35: i believe it was the best answer to choose from
- FT-7-36: not answered
- FT-7-37: There aren't restrictions concerning how a new species comes into existence.
- FT-7-38: I remember from the notes
- FT-7-39: not answered
- FT-7-40: because that's the answer
- FT-7-41: I believe this is the correct response and makes sense. I relate my answer best to the example presented in class about the two squirrels on opposite sides of the Grand Canyon.
- FT-7-42: speciation doesn't discriminate
- FT-7-43: Fits my best knowledge
- FT-7-44: becousue I don't know what the question is talking about
- FT-7-45: speciation is basically producing new species which has improves traits so that it is able to sustain life in the enviornment.
- FT-7-46: Speciation can occur in any species and that species can either evolve into another species or it can remain along with another species appearing that is also well suited to survive.
- FT-7-47: i did not agree with any of the answers
- FT-7-48: not answered
- FT-7-49: I have know idea.
- FT-7-50: Class.
- FT-7-51: I am unsure what to put for this question
- FT-7-52: if population of any organisim undergo conditions that lead to spciation such as geographical seperation over a long period of time it can lead to speciation
- FT-7-53: From the example of the squerril in the grand canyon it becomes apparent that speciation can occur in any species at anytime under certain conditions. these conditions could be physical or geographical.
- FT-7-54: Speciation occurs IN A SPECIES creating 2 seperate species.
- FT-7-55: Any population can separate and be faced with a new environment and change to better fit that environment.
- FT-7-56: my own
- FT-7-57: I thought speciation only occurs in small population.
- FT-7-58: .
- FT-7-59: this seems most logical
- FT-7-60: Speciation can occur in any group of organims.
- FT-7-61: with any mix up in traits it is easy to say that change can occur in any way
- FT-7-62: Speciation can occur with any organism. Science has already seen new species evolve and others develop.
- FT-7-63: not answered
- FT-7-64: Speciation can happen to any organism, it is not a process that is selected to just a few organisms.
- FT-7-65: I believe it is the right answer.

- FT-7-66: speciation can happen to any species and can be in the form of allotropic speciation (geographically different areas) or sympatric speciation (geographically identical areas)
- FT-7-67: not answered
- FT-7-68: Because like evolution, it is non-ending. It also does not always mean complex, things like nematodes have gone backwards.
- FT-7-69: Speciation results if the two organisms can interbreed successfully.
- FT-7-70: None of the other answers made sense
- FT-7-71: Speciation can occur within any population given the appropriate conditions.
- FT-7-72: Speciation is happening now.
- FT-7-73: Speciation is possible with any organisms, but the conditions must be right for it to occur. Speciation also doesn't mean more complex animals.
- FT-7-74: New species are just variations of old species.
- FT-7-75: I didn't understand that question
- FT-7-76: if organisms are similar to each other, this may lead to speciation
- FT-7-77: Organisms have the capacity to speciate at many levels.
- FT-7-78: not answered
- FT-7-79: because it can
- FT-7-80: New species can reproduce, or maybe the species may evolve to better adapt to its environment.
- FT-7-81: Speciation does not occur because of problems, but instead it happens in any organism at any time.
- FT-7-82: Can occur in any organisms, but this does not mean that the organism has to be more complex. Sometimes speciation can result in simpler organisms rather than more complex ones.
- FT-7-83: Because any species can evolve.
- FT-7-84: i do not know
- FT-7-85: speciation is always happening life everywhere
- FT-7-86: none of the other answers seemed right
- FT-7-87: Speciation doesn't always result in more complex, sometimes they are "dumbed down. " Speciation seems probable that it could occur in most species.
- FT-7-88:
- FT-7-89: A perfect example for my answer is the countless number of dog breeds. All dogs share the wolf as a common ancestor but by selective forces, in this case man, countless variety can be made. It is awe inspiring to think that potential is in every organisms on earth.
- FT-7-90: It's always a possibility.
because
- FT-7-91: Speciation can occur in any population if reproductive barriers develop.
- FT-7-92: speciation is random like evolution
- FT-7-93: its just a genetic mistake that occurs more often and it changes an organism so much that it cant be a part of the parents species
- FT-7-94: A species can change enough to be considered a new species.
- FT-7-95: I just guessed.
- FT-7-96: Speciation happens everywhere to anything under certain conditions.
- FT-7-97: Any population can have speciation, by natural separations or by humans.

- FT-7-98: Speciation happens within a similar species because they are the most closely related.
- FT-7-99: Speciation is caused by geography, anyone can fall victim to it
- FT-7-100: not answered
- FT-7-101: i would have went with D but it did not explain in detail what speciation is
- FT-7-102: becuase the animals would have to be somewhat similar to change into something else
- FT-7-103: All organizums have genes, and when enough changes/differences have been made in a population that population will become a new species.
- FT-7-104: speciation occurs quite often--which is how we have so many new species, and it does not always result in more complex organisms--sometimes simpler oraganisms are the result if they are better suited to their environment
- FT-7-105: not answered
- FT-7-106: If evolution makes sense, so does speciation. Plus this has been observed, such as on the Galapogos Islands.
- FT-7-107: If the change works, it happens.
- FT-7-108: It can occur because of different reasons like geographical barriers...etc.
- FT-7-109: It can occur in any organisms
- FT-7-110: speciation is not picky
- FT-7-111: not answered
- FT-7-112: not answered
- FT-7-113: It is the most correct answer.
- FT-7-114: because it was the most fitting
- FT-7-115: All the other answers didn't fit my viewpoint.
- FT-7-116: any factors can cause evolution and it can happen to all organisms. any organism can go through a mutation or be separated from its original habitat to produce a new specie.
- FT-7-117: ahh, why is it necessary to keep asking this after every single question
- FT-7-118: it's what we were taught
- FT-7-119: fun times
- FT-7-120: seemed to be the best answer
- FT-7-121: Given the right conditions a new species could be created at any point, although it might not seem a whole lot different then previous species.
- FT-7-122: It has happened for us and for other animals, just at different times

Question 8

FT-8-1: Biological evolution is change in a population of organisms over time, which i believe does occur.

FT-8-2: not answered

FT-8-3: Evidence throughout history. Follows fossil and DNA evidence.

FT-8-4: I have looked at the evidence and made my own analysis.

FT-8-5: Dinosuars

FT-8-6: Biological Evolution is really the only thing that could explain how things came about. Don't get me wrong, I am a devout Catholic, but I still understand that evolution best explains how life on earth came about.

FT-8-7: i strongly agreed with the statement

FT-8-8: This response goes along with my personal viewpoint

FT-8-9: Its reasonable

FT-8-10: Everything we have learned in this unit supports it

FT-8-11: as of right now. biological evoultion is the best scientific explanation for the diversity of life on Earth

FT-8-12: I do not know what to think. Evolution conflicts with my religious views.

FT-8-13: It made the most sense.

FT-8-14: not answered

FT-8-15: not answered

FT-8-16: Scientifically it makes sense.

FT-8-17: i believe in evolution and religion together

FT-8-18: Evolution is an evidence based theory. This theory is supported by substantial evidence and can basically be proven right.

FT-8-19: There is way too much evidence to count to support biological evolution.

FT-8-20: Evolution is a strongly supported explanation.

FT-8-21: Evolution doesn't say anything about how life began, it simply explains how life has changed, evolved over time. Many scientists that are religious are in agreement that evolution is a fact of life.

FT-8-22: i agree but there is always room for doubt that why i don't strongly agree

FT-8-23: same

FT-8-24: it's been scientifically observed/documentated

FT-8-25: not answered

FT-8-26: there are facts to back it up

FT-8-27: class has really helped me to better understand the theory

FT-8-28: without it, we could never study our ancestors.

FT-8-29: It is a foundation of the science and I believe in evolution

FT-8-30: There is too much evidence to refute that it is a plausible scientific theory.

FT-8-31: I agree with this because there is evidence with fossils of how different life forms have changed through time.

FT-8-32: Even though it has a lot of evidence it is still considered a theory

FT-8-33: I believe it is the best idea to explain the diversity of life, but not concrete fact

FT-8-34: There is a lot of evidence to support the Theory of Evolution and it is the best theory we have to describe the diversity of life on Earth.

FT-8-35: I agree with the theory of evolution and thinks that it makes sense, therefore I strongly agree that it is a valid idea

- FT-8-36: not answered
- FT-8-37: All the evidence I've heard for evolution.
- FT-8-38: There are grey areas
- FT-8-39: There is much evidence in support of evolution.
- FT-8-40: because it is
- FT-8-41: There is evidence.
- FT-8-42: biological evolution has a lot of facts and evidence supporting tis point of view.
- FT-8-43: My understanding of evolution is fact-filled and convincing.
- FT-8-44: becosue it shows how the earth populations of organisms came about
- FT-8-45: biological evolution is best theory that explains diversity of life on earth plus it is highly accepted by all the scientists around the world
- FT-8-46: I think evolution is always occuring.
- FT-8-47: it is an idea because it has not been proven yet, and it is very science oriented
- FT-8-48: not answered
- FT-8-49: I strongly agree because the fact that it is accepted in the biological community.
- FT-8-50: After everything we learned, i don't understand why you would say its not.
- FT-8-51: I strongly agree with evolution. I agreed with it before college from learning about it in high school, but college strengthened my knowledge for the matter.
- FT-8-52: it not an idea its a scientific theory based on evidences such as fossials
- FT-8-53: opposable thumb, fossils showing convincing data of common ancestors and many such evidences show for a FACT that evolution is NO DOUBT a proven scientific theory.
- FT-8-54: It's not really an idea, its a theory.
- FT-8-55: It's the best explanation we have.
- FT-8-56: my own
- FT-8-57: that is my belief.
- FT-8-58: .
- FT-8-59: It has been proven (fossils, DNA, etc.)
- FT-8-60: There is a lot of evidence to supprot the theory of evolution, and even though I am religious I able to accept both science and relgion into my point of view.
- FT-8-61: Biological evolution is strongly favored and accepted by many people because it is based on known evidence
- FT-8-62: I have learned that evolution is a theory that has been backed up by a lot of evidence, data, and research that has not been proven false thus far.
- FT-8-63: not answered
- FT-8-64: I agree because there are many facts that support this theory, but I have a strong religious background, so I still accept my religious theory.
- FT-8-65: I believe it is the right answer.
- FT-8-66: regardless of Science vs. Christianity, the theory of evolution is backed up by a plethora of scientific evidence.
- FT-8-67: not answered
- FT-8-68: I believe that there was a creator, but evolution is a sound idea that explains why things have changed over time.
- FT-8-69: There is proof.
- FT-8-70: Because there is evidence to back it up.

FT-8-71: I agree that evolution has a lot of backing support and it seems very believable. However, I refuse to strongly agree because it is entirely a theory, and I am a Christian, so God's way is also a pretty heavy theory in my life.

FT-8-72: How can you not semi-agree, for the most part it has been proven.

FT-8-73: It explains why we have such a diverse number of species. The explanations it provides logically fit the observations that have been made and currently there is no better explanation for species diversity.

FT-8-74: Biological evolution does not say how life was created, so it does not go against my viewpoint. Organisms have changed over the years, and evolution is a logical explanation.

FT-8-75: There's lots of evidence for it and it's widely accepted by scientists.

there is evidence that proves this statement to be true

FT-8-76: I agree, but there is always doubt. Nothing is 100% accurate.

FT-8-77: not answered

FT-8-78: s

FT-8-79: Evolution exists and it's a great way to explain the diversity of our planet over time.

FT-8-80: Evolution is a theory supported by evidence int is not an idea

FT-8-81: There is a lot of evidence that supports the idea of biological evolution.

FT-8-82: Because I agree with the idea that we all have evolved. And I understand the information and facts that are present to support this idea.

FT-8-83: i need to have more evidence to support that claim

FT-8-84: the evidence is overwhelming and it is the best possible explanation for the diversity of life on earth

FT-8-85: Evolution has been proven and is an accepted scientific theory

FT-8-86: I am unsure about my reasoning for this one

FT-8-87: I feel that a lot of research has been done to prove evolution, and it holds many strong points

FT-8-88: I believe it is a strong scientific idea because of the experiments done by well renowned scientists and because no other process could explain the countless diversity on earth.

FT-8-89: There is much strong evidence to support it's existence - and one doesn't have to rule out the involvement of a higher being.

FT-8-90: because

FT-8-91: Evolution is a valid scientific idea, because there is a great deal of evidence supporting it and it is widely accepted in the scientific community.

FT-8-92: it is valid because there is a significant amount of scientific evidence. i don't strongly agree because of my faith

FT-8-93: because there is a lot of proof of it over time

FT-8-94: Best idea given so far.

FT-8-95: It makes sense.

FT-8-96: Science has hard evidence that evolution occurs and I believe it.

FT-8-97: I strongly agree with this because alot of organisms have a common ancestor.

FT-8-98: Because of all the evidence that backs it up.

FT-8-99: Look at the organisms that surround us, there is evidence that they are changing and adapting

FT-8-100: not answered

FT-8-101: because it is science best way of explaining the orgin of life and how new species form

FT-8-102: i do agree, because without evolution, a lot of things wouldn't make sense

FT-8-103: There is vast amount of evidence to suport the idea of biological evolution. One example that is easy to see all the different breeds of dogs that are now avalible. Evolution is an idea that can be studied scientifically. The existance of evolution dose not nessisarily mean that there is no god, it just means that things can and do change.

FT-8-104: biological evolution is an idea supported by much evidence

FT-8-105: It is very logical and backed with evidence. Nothing can be 100% sure, but it is a reasonable idea.

FT-8-106: Evidence supports it and it makes sense.

FT-8-107: Evolution does exist and it can be proven.

FT-8-108: It is the best theory, but it doesn't necessarily make it valid

FT-8-109:

FT-8-110: its the only reasoning for diversity on earth

FT-8-111: Because.

FT-8-112: I understand the thoughts behind evolution, but what started it all

FT-8-113: becasue there is so much evidence supporting it and it seems to be a very good explanation

FT-8-114: I believe it's what is taking place.

FT-8-115: i just believe it. some types of organisms look very much alike but by dna testing they are not. they must have evolved.

FT-8-116: it's not so much a generally sound idea as pretty much the prominent scientific theory

FT-8-117: There is strong evidence supporting evolution

FT-8-118: it's what we were taught

FT-8-119: booo religion

FT-8-120: there is large amounts of evidence to support the theory of evolution

FT-8-121: Evidence heavily favors that things have evolved over time, including humans from some common source.

FT-8-122: To me, it's a good explanation for how everything has gotten to be how they are and there's excellent evidence to support it

Question 9

FT-9-1: not answered

FT-9-2: we really don't know the age of the earth

FT-9-3: Radiometric Dating, Geology

FT-9-4: The largest amount of facts fit into that timeframe.

FT-9-5: Dinosaurs

FT-9-6: According to radiometric and other dating methods, the earth is far older than 10,000 years.

FT-9-7: i think it is way older than that

FT-9-8: Because this does not coincide with scientific findings, and there is not much evidence supporting this

FT-9-9: The earth has been around longer than 6,000 years. If the dinosaurs where on the earth million of years ago then with that said the earth is much older than 6,000 years

FT-9-10: Seems reasonable due to fossil records.

FT-9-11: those were the approximate dates that were given to our biology class

FT-9-12: I do not know whether to believe what my religion tells me or my science class.

FT-9-13: The earth is billions of years old.

FT-9-14: not answered

FT-9-15: not answered

FT-9-16: I have not researched this myself, and therefore, I hold no strong oppinion.

FT-9-17: it is older than that

FT-9-18: Evidence shows that the earth is millions of years old.

FT-9-19: Radiometric Dating.

FT-9-20: The earth is far older.

FT-9-21: We have evidence such as fossils that lead us to believe the earth is quite old.

FT-9-22: i really don't know

FT-9-23: same

FT-9-24: i think it may be a little older than that, but just a little

FT-9-25: not answered

FT-9-26: i dont really have an opinion

FT-9-27: it obviously isn't there's proof

FT-9-28: it is in the billions.

FT-9-29: There is evidence that it is much older. This doesn't mean it contradicts religion

FT-9-30: Various evidence including fossils have proven this to be much to short of a time period.

FT-9-31: In class we learned that fossils have been found that are older than 65 million years old. This means that the earth has to be older than 10,000 years old.

FT-9-32: According to findingsamd radiometric dating the earth is much much older than that

FT-9-33: I am 23 years old, as far as i know the earth is 24 years old

FT-9-34: Based on evidence and things such as the fossil record, the Earth is much older than 6,000-10,000 years old.

FT-9-35: at the beginning of the year we were told that the earth was 4,600 years old which isn't between 6,000-10,000

- FT-9-36: not answered
- FT-9-37: The Earth is much older than 10000 years old. Evolution occurs over a very long period of time.
- FT-9-38: Creationists are stupid
- FT-9-39: not answered
- FT-9-40: i don't know the answer
- FT-9-41: I truly believe that there are not accurate measurements testing the age of the earth. I believe the earth is ancient, and no, a few thousand years does not translate into ancient.
- FT-9-42: there are fossils that date back millions of years ago, there are several different
- FT-9-43: techniques to date rocks which have also been dated million years old
- FT-9-44: Fossils indicate it is much older
- FT-9-45: I believe that the earth is much older but i don't really have an opinion about the age of the earth.
- FT-9-46: earth is millions of years old as shown through fossil records.
- FT-9-47: I believe that the Earth is millions of years old.
- FT-9-48: the earth is a lot older than 10,000 yrs old, the origin of life began around 4.5 mya, so it is older than that
- FT-9-49: not answered
- FT-9-50: I found that the earth has to be 160,000 years old.
- FT-9-51: Its a lot older than that.
- FT-9-52: The earth is much older than 6 to 10,000 years old....it's more in the billions
- FT-9-53: the earth is 4500 million years old
- FT-9-54: I am no narrow minded , science-opposing and bible interpreting monk from the middle ages. I base my answer from the short story I read in the first week of class on "how old is the earth"!!
- FT-9-55: I'm really bad with dates.
- FT-9-56: the earth is 4.6 billion years old. Things need time to evolve. That time span is very short in terms of evolution.
- FT-9-57: fossil records are enough evidence for me.
- FT-9-58: Fossils older than that.
- FT-9-59: .
- FT-9-60: Fossils show it is much older
- FT-9-61: I don't know how old I think the Earth is.
- FT-9-62: I have no idea on any of the procedures used here
- FT-9-63: The Earth is much older than 6 to 10,000 years old as I learned in biology.
- FT-9-64: not answered
- FT-9-65: 6,000-10,000 years is not enough time for all the organisms on Earth to be the way that they are now. They needed more time to evolve.
- FT-9-66: I believe it is the right answer.
- FT-9-67: the Earth has been around for 4.6 billion years
- FT-9-68: not answered
- FT-9-69: There are fossils from millions and billions of years before that.
- FT-9-70: The fossil record states that organisms have been around for millions of years.
- FT-9-71: I believe that the earth is older due to scientific data

FT-9-72: The earth is far more older than this because we have carbon dating, and you can tell because of the layers of rock in the earth's crust.

FT-9-73: I have different views.

FT-9-74: Based on current dating techniques the earth must be older. If it were not, evolution would be a very rapid process, but as scientific evidence shows, it is not.

FT-9-75: I haven't come to a decision on how old the Earth is. Scientific evidence has proven older, but my religious side still wants to believe otherwise.

FT-9-76: There's lots of evidence suggesting that it's older

FT-9-77: the earth is much older than that, there are fossils older than that

FT-9-78: Life existed hundreds of millions of years ago, thus, the earth existed.

FT-9-79: not answered

FT-9-80: The earth is much older than that, I believe. We have a good fossil record that supports that the earth is older than 10,000 years.

FT-9-81: No One actually knows how old the Earth is

FT-9-82: The Earth is older than 10,000 years.

FT-9-83: Because it's been around for years and years and years not just since humans have been present.

FT-9-84: the earth is old

FT-9-85: there is evidence of rocks dating back billions of years ago

FT-9-86: the earth is billions of years old

FT-9-87: I guess it is considered a fact that the earth is 4.6 billion years old, so I suppose I'd have to disagree

FT-9-88: There is clear evidence showing that the earth is much older

FT-9-89: I disagree because of the calculations done by scientists who study geology

FT-9-90: That just doesn't make any sense. ;-)

because it's billions of years old

FT-9-91: There is a substantial amount of evidence that suggests the earth is much older than 6,000-10,000 years.

FT-9-92: it's way older than that...that's about when humans showed up I believe

FT-9-93: the earth is way older than that. organisms lived here millions of years ago and we can prove that

FT-9-94: Too many scientific facts saying it is much much older which I believe.

FT-9-95: More like 4.5 billion

FT-9-96: I think it's older.

FT-9-97: I'm not sure if these are right

FT-9-98: Because it has been around for 4.5 billion years ago from geology evidence.

FT-9-99: There are fossils that support this claim

FT-9-100: not answered

FT-9-101: the earth is older than that

FT-9-102: because it had to have evolved from something.

FT-9-103: Fossil dating and the dating of the different layers of rock show the earth to be much older than this.

FT-9-104: the earth is MUCH older than that. The fossil record and carbon dating support that the earth is billions of years old.

FT-9-105: I don't know if it is correct or not, but I disagree with it

FT-9-106: Radiometric dating shows a much greater lifespan of the Earth than that. However, I did not feel that the methods of dating were explained well enough for me to put much faith in the idea. I wish we had covered this a little more in class.

FT-9-107: tons of evidence exists to disprove that.

FT-9-108: I am religious, so I believe that the earth is this old. However, I believe that a possible explanation for science saying it is older could be that the "6 " days in the bible could actually mean something different, like a longer period of time.

FT-9-109: I remember that in lecture we talked about the earth's age in millions and the question stated the earth's age in thousands, which is wrong.

FT-9-110: facts show that this statement is not true

FT-9-111: Fossils will contradict that.

FT-9-112: I think there is more information in addition to evolution that makes the earth older then what evolutionary scientist think!!

FT-9-113: not answered

FT-9-114: because that would mean that dinosaurs are older than the earth

FT-9-115: I believe the bible's timeline is different then that of the Earth's.

FT-9-116: dinosaurs were around 65 million years ago...where did they live...the moon

FT-9-117: it's impossible to really know...

FT-9-118: Those numbers come from an interpretation of a spritual source. While they mean something, they do not mean timed years.

FT-9-119: It's what i believe

FT-9-120: that's what evidence supports so far but we could find more evidence in years to come

FT-9-121: I don't remember how old exactly the Earth is, but with the large amount of information given by different sciences, it's kind of hard to say its only 10,000 years old.

FT-9-122: if the earth is only thousands of years old, then how where there organisms on earth millions of years ago

Question 10

FT-10-1: not answered

FT-10-2: The theory can go both ways

FT-10-3: A theory is widely accepted and has much evidence behind it.

FT-10-4: I don't want to get into what "theory" means, because when dealing with "evolution," the wording itself can almost validate or disprove an argument.

FT-10-5: Dinosaurs

FT-10-6: Scientific theories, and any theories for that matter, must have a large basis of fact and evidence to support them, so therefore the theory of evolution is not just some idea, it is well researched and supported.

FT-10-7: there is much evidence for evolution

FT-10-8: This is what I believe

FT-10-9: Theories are basically educated statements that are based on small evidence so they may not be entirely true

FT-10-10: It isn't "just a theory." theories are important to scientific progress.

FT-10-11: as stated earlier, biological evolution is the best scientific explanation that we have right now for the diversity of life on earth

FT-10-12: Again I really do not know how I feel about this issue.

FT-10-13: it was what i thought

FT-10-14: not answered

FT-10-15: not answered

FT-10-16: It's not likely to be incorrect because it's "just a theory" but rather because it contradicts the Word of God.

FT-10-17: theorys can also be correct

FT-10-18: Evolution is not just a theory. Theories are backed up with a lot of evidence.

FT-10-19: Theories are the best explanations for the natural world that science has to offer, taking into account all natural laws and evidence.

FT-10-20: Evolution is correct.

FT-10-21: Biological evolution isn't "just" a theory. It is a theory that is supported by facts and data and is correct.

FT-10-22: it is a valid theory

FT-10-23: it is a science

FT-10-24: theories can be right

FT-10-25: not answered

FT-10-26: a theory can be correct

FT-10-27: It's not false there is evidence

FT-10-28: there is no way to disprove it.

FT-10-29: It has A LOT of evidence to back it up. But you never know, it could still be wrong, although its unlikely

FT-10-30: I think there is enough evidence to give it a good amount of support

FT-10-31: We learned in class that evolution is just a theory, but there is a lot of evidence supporting it, like fossils, that it is very likely to be true.

FT-10-32: biological theories are made when an abundant amount of information is gathered therefore the theory has a very strong possibility of being true.

FT-10-33: the theory is based on a series of observations, it should not be brushed aside just because it isn't concrete fact, there is more evidence on this world of evolution than there is of any god

FT-10-34: Theories are based on all the available evidence and they incorporate scientific laws. They are science's best explanations for the natural world. The Theory of Evolution is widely accepted.

FT-10-35: i believe that evolution is a well supported theory and that it isn't incorrect. furthermore just because its a theory doesn't mean that its likely to not be correct

FT-10-36: not answered

FT-10-37: So is gravity, but not many people disagree with that!

FT-10-38: I firmly believe in evolution

FT-10-39: Being a theory has does not mean it is less likely to be correct. It is a well-thought-out and well-supported idea.

FT-10-40: there is a lot of evidence supporting the theory of evolution

FT-10-41: My response to the previous question (18 I think) could help to explain why I chose this response. I believe in evolution.

FT-10-42: there is too much evidence for biological evolution to be wrong, if biological evolution is wrong i don't want to be right

FT-10-43: Strong fossil evidence to support idea of evolution

FT-10-44: because a theory has to be supported with evidence and I believe in evidence and there is strong evidence to support this theory.

FT-10-45: a theory is something that is supported by facts and figures and there are strong evidence that support the biological evolution therefore it is very much true

FT-10-46: I believe evolution is constantly occurring and so therefore correct.

FT-10-47: although evolution is a theory, there is a lot of data, observations, and fossils that prove it to be a logical theory

FT-10-48: not answered

FT-10-49: I strongly disagree because there is evidence that the theory is true. Also once again the scientific community does accept the theory.

FT-10-50: Again, we were given too much evidence to think it doesn't happen

FT-10-51: There is a lot of evidence that proves evolution is a valid theory

FT-10-52: a biological theory is based on evidence and can be true

FT-10-53: Although i cannot quote the definition of theory as of now I can confidently say that evolution isn't just a theory . . . its a PROVEN FACT!!!!

FT-10-54: Theories are explanations, not "guesses".

FT-10-55: There is lots of evidence supporting it.

FT-10-56: Question lacks grasp of the word theory

FT-10-57: Scientific theories are fact based and highly supported by information.

FT-10-58: .

FT-10-59: There is too much evidence saying that is not the case

FT-10-60: Numerous evidence supports the theory of evolution, beyond a reasonable doubt.

FT-10-61: Biological evolution is based on many facts and is represented very well and is not just a theory

FT-10-62: It is a theory, but it has been accepted, backed up with numerous evidence, and has not been proven false yet.

- FT-10-63: There is evidence of evolution, hard to dispute.
- FT-10-64: Biological evolution may be a theory, but it has good facts to support it.
- FT-10-65: I believe it is the right answer.
- FT-10-66: biologic evolution has been supported by lots of evidence, so it's not likely to be dismissed
- FT-10-67: not answered
- FT-10-68: There has to be some sort of evolution to explain why things have changed the way they have.
- FT-10-69: Theory in this sense means it is correct.
- FT-10-70: Theories are usually accepted as correct.
- FT-10-71: It is a theory, but I think there is more support for evolution than there is against it.
- FT-10-72: It is scientifically proven.
- FT-10-73: It is the best explanation we have for biological diversity based on known data.
- FT-10-74: There has been evidence to prove evolution has occurred.
- FT-10-75: It might still be proven false, but lots of people have tried to falsify it and failed
- FT-10-76: just because its a theory, that doesn't mean it's incorrect, there's evidence to prove that it is true
- FT-10-77: Theories are based on substantiated evidence. The evolutionary theory is well supported.
- FT-10-78: not answered
- FT-10-79: b
- FT-10-80: Evolution is a theory but it doesn't mean it's wrong.
- FT-10-81: A theory in not "A just ", it is supported by science and evidence, and Evolution is supported by many things.
- FT-10-82: Just because it is a theory this does not mean that it is 100% incorrect. Also, this can not be proven 100% correct.
- FT-10-83: That is not my view. There are supporting facts to this theory.
- FT-10-84: a theory is a hypothesis that can be falsifiable. It does not mean that it is wrong, but able to be disproven.
- FT-10-85: it is a theory that is based on many years of research and supported by many scientists
- FT-10-86: theoris are accepted in the scientific world
- FT-10-87: Yes, it is just a theory, so maybe it is right and maybe it is not, we don't know for sure, hence why it's a theory.
- FT-10-88: It is a theory, but it is up to the individual to agree or disagree with the theory
- FT-10-89: I strongly disagree because the term theory is misunderstood in this statement. Theories require alot of sound evidence before they are even accepted by the scientific communitiy.
- FT-10-90: Scientific Theories are backed by a large amount of evidence and laws. I think it's likely to be correct (although we can't really prove it)
- FT-10-91: because
- FT-10-92: Scientific theories are explanations that the majority of scientists accept. They are supported with substancial evidence.

- FT-10-93: the significant amounts of evidence say otherwise
- FT-10-94: it can be correct it just might not be 100% of the time
- FT-10-95: The facts add up to me, along with any evidence.
- FT-10-96: It has facts.
- FT-10-97: Many theories are right.
- FT-10-98: Biological evolutions has proof but many choose not to believe in it. Science has always clashed with religion and others.
- FT-10-99: Ther is enough evidence for evolution, plus there is no way we would really know one way or another.
- FT-10-100: Theorys are backed by research and proof
- FT-10-101: through bio 211 i learned that the theory of evolution is back up by years of reach and informations
- FT-10-102: evolution explains so many things in biology and i believe it is real
- FT-10-103: Scientific theories are supported by a collection of facts, observations, and experaments. They are much more than a mere guess.
- FT-10-104: in science, theories are only theories if they are supported by much evidence, and the theory of evolution is thoroughly supported by lots of evidence and is therefore very believable
- FT-10-105: It is a theorie based on many well-known scientific facts.
- FT-10-106: This sentence incorrectly uses the word theory; a scientific theory is very different than just a hypothesis. We covered this thoroughly in class.
- FT-10-107: It is just a theory, simply because not enough time has passed for us to view it in all organisms. but enough evidence exists to make it the most likely possibility
- FT-10-108: Evolution has very convincing proofs. There are many examples that support theory of evolution.
- FT-10-109: I dont think that it is unlikely to exist. I think that the evolution theory is one that is very good and logical.
- FT-10-110: theories in science are proven facts
- FT-10-111: the theory has been suggest by many scientists and there isn't much info to complete with it
- FT-10-112: Fossils show that evolution happened.
- FT-10-113: THere are scientific bases to evolution however, I still feel that thereis more to it
- FT-10-114: because it seems to be quite plausible
- FT-10-115: a scientific theory is based on facts and very well-researched, it will never become a fact because our knowledge is constantly growing and science is constantly changing. But to the scientific community a theory is well-established and widely believed.
- FT-10-116: don't understand
- FT-10-117: that question implied that "theory " is something to be taken likely. "hypothesis " or "guess " would be a better word for that context. Thank you Colbert; you did a really good job at making sure we understood the proper usage of the word "theory "!
- FT-10-118: Because it is a theory, it is likely to be correct.
- FT-10-119: It is in reference to what i believe
- FT-10-120: evolution is just a theory because it can never be proven 100%;

FT-10-121: We have seen evolution in action, so I think it would be pretty difficult to say it isn't valid.

FT-10-122: Sure it's a theory, but there's plenty of evidence to support this theory, i.e., fossils

Question 11

FT-11-1: not answered

FT-11-2: everything evolves

FT-11-3: Fossil evidence

FT-11-4: micro or macro

FT-11-5: Dinosaurs

FT-11-6: Going back to the question about homologous structures, it is obvious that species have evolved, even if this was the only piece of evidence available. It is hard to deny the fact that a species had a common ancestor if they have similar bone structures.

FT-11-7: i feel they have

FT-11-8: not answered

FT-11-9: In one of the lectures I remember Dr. Colbert saying that microorganisms have also evolved

FT-11-10: Examples from the text show various "evolutions" to better suit those species

FT-11-11: evolution is occurring everywhere. as humans we do not evolve

FT-11-12: There are proven changes through fossils and living animals

FT-11-13: It went w/ my beliefs.

FT-11-14: not answered

FT-11-15: not answered

FT-11-16: I don't hold a strong opinion either way.

FT-11-17: every creature evolves

FT-11-18: There has been a lot of fossils of organisms that aren't human that are similar to some species today. There is a lot of evidence.

FT-11-19: We wouldn't be here if something had not evolved into us.

FT-11-20: It was the right answer.

FT-11-21: Human species aren't the only species that evolve. Every species evolves in some way, shape, or form.

FT-11-22: it's true

FT-11-23: i don't know

FT-11-24: just look at bacteria

FT-11-25: not answered

FT-11-26: the squirrel example from class

FT-11-27: there's proof to support this

FT-11-28: they too have to survive.

FT-11-29: There's a lot of evidence for this idea.

FT-11-30: This has been made obvious by the observation of several species

FT-11-31: Everything has evolved. It is most likely that we started out as a type of single celled organism.

FT-11-32: there is plenty of evidence of this including fossils

FT-11-33: i believe, although i am not sure, that through such species as drug resistant bacteria and pesticide resistant insects this evolution has been observed

FT-11-34: There is evidence in the fossil record that non-human species have evolved.

FT-11-35: i agree because you can trace common ancestors back and see the similarities between organisms then and now

FT-11-36: not answered

- FT-11-37: If by non-human you mean anything other than humans than yes I strongly agree. Biological diversity is so great on planet earth.
- FT-11-38: everything evolves
- FT-11-39: not answered
- FT-11-40: because there is evidence to support that
- FT-11-41: There is evidence for evolution; therefore, I believe evolution to be true.
- FT-11-42: i agree that non-human species have evolved, however, i also think that humans have evolved a lot too.
- FT-11-43: Non-human species have evolved as have human species. Supported by fossil record and DNA similarities
- FT-11-44: becose their is fossile evidence of non humman creatures evolving
- FT-11-45: we ourself have evolved from a non human species.
- FT-11-46: Evolution occurs to everything.
- FT-11-47: all species that exist on earth have evolved from other species
- FT-11-48: not answered
- FT-11-49: I agree because there is evidence of different spices that can be linked to others. Also species can have an ancestor.
- FT-11-50: I think humans, and non-human species both have.
- FT-11-51: i believe most species have gone through some sort of evoultion.
- FT-11-52: there are many examples support that. such as elephant which evolved from mamoth
- FT-11-53: A whale is a perfect example of “non-human “ species evolving from ancient time. the video show during class proves that evolution occurs in even “non-human “ species.
- FT-11-54: um.. because they have
- FT-11-55: Obviously, look at birds and all the speciation that has occured.
- FT-11-56: I could say evidence leads me to believe that it happened, but nothing in science is so conclusive as the statment.
- FT-11-57: Bacteria are evolving becoming more immune to our antibiotics.
- FT-11-58: .
- FT-11-59: Mammoth to elephant... different bird species... etc
- FT-11-60: Through fossil records we are able to see that species have evolved and changed throughout time.
- FT-11-61: I believe that all individual organisms have to at one point or another go through some type of evolution
- FT-11-62: All organisms undergo some type of evolution. This evolution may not be huge, but subtle differences certainly occur and are present if viewed closely.
- FT-11-63: not answered
- FT-11-64: Humans can't be the only organisms that have evolved. I believe that many organisms have evolved over time.
- FT-11-65: I believe it is the right answer.
- FT-11-66: that's how we have so much diversity in animals
- FT-11-67: not answered
- FT-11-68: Everything has undergone evolution, and will continue to evolve.
- FT-11-69: This is what I have learned. There is also proof. Example, whales having hip bones and hind legs in the fossil record.

- FT-11-70: Because there is evidence that they have.
- FT-11-71: I definitely believe that species have undergone changes through their existence on this planet.
- FT-11-72: Everything is evolved from a former species.
- FT-11-73: This can be seen through fossils and DNA evidence. Many species in fact evolved before humans did.
- FT-11-74: We can see evidence of this in fossils.
- FT-11-75: Again, lots of evidence supporting that statement
- FT-11-76: Every species on the planet have evolved to better fit their environment, including humans
- FT-11-77: Everything has the capacity to evolve.
- FT-11-78: not answered
- FT-11-79: jlb
- FT-11-80: Every species on earth have evolved in some way to survive and reproduce.
- FT-11-81: Every species must have evolved at some point
- FT-11-82: I believe that humans, just like any other organisms, have the ability to evolve.
- FT-11-83: It's visible.
- FT-11-84: because all share a common ancestor
- FT-11-85: humans have found fossils which show evolution of species
- FT-11-86: humans evolved into their present form
- FT-11-87: fossil records show how species have changed over time
- FT-11-88: Countless evidence
- FT-11-89: I agree because the fossil record shows that humans are descended from non-human organisms. Therefore, non-human organisms undergo evolution and continue to do so.
- FT-11-90: Yes. Try explaining how we got from sea-faring animals to land-dwellers otherwise.
- FT-11-91: because
- FT-11-92: Species have evolved because their genetics have changed over time.
- FT-11-93: they aren't exactly the same as they were when they were first discovered on this earth
- FT-11-94: because all species have evolved in some way
- FT-11-95: You can witness a change in bacteria that become immune to certain vaccines.
- FT-11-96: I don't know.
- FT-11-97: I believe that non-human species have evolved. There is abundant evidence, but I also think humans have evolved.
- FT-11-98: I believe many if not all have evolved.
- FT-11-99: It is because of evolution.
- FT-11-100: Species would die off every time the environment changed if they did not evolve
- FT-11-101: not answered
- FT-11-102: everything evolves not just humans
- FT-11-103: because I don't think they could have evolved any other way

FT-11-104: Non-human species have evolved thus changing from there original form, but humans have evolved as well.

FT-11-105: all species undergo biological evolution, if given enough time

FT-11-106: From what I know they have.

FT-11-107: I have seen enough evidence to make me believe that some evolution has occurred. I can not quite wrap my head around going from fish to humans, but microevolution makes sense. If microevolution makes sense, then evolution must as well.

FT-11-108: Evidence

FT-11-109: Once again, there is a lot of evidence that supports that claim.

FT-11-110: all things evolve to meet their needs

FT-11-111: most if not all species have evolved

FT-11-112: not answered

FT-11-113: not answered

FT-11-114: Fossils show that.

FT-11-115: because evidence supports it

FT-11-116: They have evolved in my opinion and there is evidence to support this.

FT-11-117: fossil records proved that they have

FT-11-118: species have obviously evolved at least somewhat

FT-11-119: There is evidence. Plus, it makes sense.

FT-11-120: the evidence found in archeological digs suggests this

FT-11-121: We can see through fossil records how species have changed over millions of years.

FT-11-122: Everything, not just humans, have undergone evolution. Fossils show that birds and whales have undergone evolution

Question 12

FT-12-1: I do believe that humans have changed in certain characteristics over time.

FT-12-2: some people are better adapted than others. e.g. some people are immuned to disease or illnesses others aren't.

FT-12-3: Fossil, DNA, physical evidence

FT-12-4: We have adapted, not evolved. Much of the evidence used has been INTENTIONALLY fraudulent, and that suggests a severe lack of professionalism and even a blatant disrespect for the opposition (creation science).

FT-12-5: Dinosaurs

FT-12-6: I do not believe that the current human species has evolved, but I do believe that the current human species evolved out of an ancestor thousands of years ago.

FT-12-7: i feel humans have

FT-12-8: Because I am not sure

FT-12-9: It all depends on ones beliefs

FT-12-10: Humans have gained adaptations to make life easier

FT-12-11: humans have never evolved

FT-12-12: I believe humans have always exsisted in there current form.

FT-12-13: It's what i believe.

FT-12-14: not answered

FT-12-15: not answered

FT-12-16: It contradicts my faith.

FT-12-17: agree because we came from another species

FT-12-18: There is a lot of evidence and I can see how similar apes are to us. Humans and Apes DNA's are very much alike.

FT-12-19: To some extent, humans have evolved. However, increasing attempts to balance for human handicaps have definitely slowed the pace of evolution as natural selection is not occurring as quickly.

FT-12-20: Humans have changed over the course of history.

FT-12-21: Humans have indeed evolved. However, it is hard to tell because the life-span of humans is quite long and the results take time to be noticeable. But yes, humans have evolved and are still evolving over time.

FT-12-22: this is true as well

FT-12-23: there is evidence

FT-12-24: i think it's happened a little bit, a smidgeon or so

FT-12-25: our appendix

FT-12-26: humans have changed over time

FT-12-27: there's proof

FT-12-28: we hvae changed and still are.

FT-12-29: We have evolved and still are.

FT-12-30: We aren't exactly the same as humans 400 years ago are we

FT-12-31: Fossils have been found of skeletons that are very similar to the modern day humans. I saw on a show once how they lined all of them up to see how they changed over time to become what we are today.

FT-12-32: Again fossils are a pretty good source of evidence for this, and the fact that we share many characteristics including gentical with primates.

FT-12-33: I believe there is evience that are ancestors far enough back where not homo sapiens, but i dont know if homo sapiens have evolved (some say our species is on average taller now than it was before)

FT-12-34: There is some evidence that humans have also evolved. We likely share a common ancestor with the ape.

FT-12-35: i agree because you can trace common ancestors back and see the similarities between humans and other animals

FT-12-36: not answered

FT-12-37: We're undergoing evolution all the time.

FT-12-38: Humans have evolved

FT-12-39: not answered

FT-12-40: because there is evidence to support it and humans are not exempt from the laws of nature

FT-12-41: Again, evidence supports evolution. Evolution does not have to be major to be evolution, either.

FT-12-42: there is a fossil called lucy, who is 3.3 million years old and is said to be part od species that would later evolve into homo sapiens.

FT-12-43: Fossils, bio class

FT-12-44: Becouse if you look back on the skellton of ancinct man he was built diffrent then we are. Over time the populations of humans changed to better fit are envierment

FT-12-45: we do have evolved ,we have gained resistance against so many diseases, thus in a way we have evolved

FT-12-46: Evolution occurs to everything.

FT-12-47: even though i dont like to admit it, being the superior species, there is evidence that states we have evolved from another species

FT-12-48: not answered

FT-12-49: I agree because we can be liked to chmpanzees and have a common ancestor.

FT-12-50: Evidence presented in class.

FT-12-51: I think humans have evolved, but not completely from monkeys. Evolution states that humans and monkey may have the same ancestor, but doesn't say humans evolved from them.

FT-12-52: I know it said and agreed that human evolved but I don't agree with that

FT-12-53: Like every other species humans are no different in the basic FACT that we like everyone else have gone evolution. teh fossils of neanderthal man and ther such ancestors , the names of whom I cannot remeber as of now, proves that HUMANS HAVE EVOVLED.

FT-12-54: ...

FT-12-55: We have mummies of intermediate species of humans.

FT-12-56: see # 23

FT-12-57: That is what i believe.

FT-12-58: .

FT-12-59: I am sure that humans have evolved, I just don't know for sure from what ancestor

FT-12-60: I don't know

FT-12-61: Humans have found some of the best ways to get what we need, simply by farming more effectively hunting less and in turn saving lives

- FT-12-62: I learned in biology that humans have evolved from apes and therefore, humans have evolved. We share several characteristics with them as well as developmental factors.
- FT-12-63: not answered
- FT-12-64: I believe that God created humans the way that we are now.
- FT-12-65: I believe it is the right answer.
- FT-12-66: we're a lot smarter and more efficient with our bodies than we were tens of thousands of years ago
- FT-12-67: not answered
- FT-12-68: If you look back at Neanderthals and all types of ancestors that have led up to humans you cannot deny that humans have evolved.
- FT-12-69: Evidence from fossil record.
- FT-12-70: There is fossil evidence that they have.
- FT-12-71: I think that we have evolved to have less hair and we are rapidly gaining height.
- FT-12-72: It is scientifically proven.
- FT-12-73: Humans have evolved as can be seen through fossils and through comparisons to our closest relative (chimpanzees).
- FT-12-74: Humans have evolved to better suit our surroundings, but not to the extent of other species. I do not think we evolved from monkeys.
- FT-12-75: The mechanism causing evolution acts on humans just as it does on all other species
- FT-12-76: humans have had to evolve to better fit their surroundings, without evolving, humans would have died off
- FT-12-77: Knowledge about early human ancestors and class discussion.
- FT-12-78: not answered
- FT-12-79: the whole idea of evolution
- FT-12-80: I believe that humans have evolved but it's difficult to see that because we are a fairly new species, according to evolution.
- FT-12-81: Humans have evolved, but maybe not as much as scientists have considered
- FT-12-82: not answered
- FT-12-83: We have the information and facts to support this theory and I believe it to be true
- FT-12-84: i need more evidence to prove or disprove that statement
- FT-12-85: i dont have direct evidence but all species undergo evolution, humans are no exception
- FT-12-86: just agree
- FT-12-87: skeleton fossils show different body structures from past years.
- FT-12-88: We have and will continue to evolve
- FT-12-89: I strongly agree due to the fossil evidence of organisms that are so similar to us that the only logical conclusion is that they are our ancestors, or related to our ancestors.
- FT-12-90: We had to come from somewhere, and I think there's a lot of backing for us sharing a common ancestor with the chimpanzee. I think science fails to explain how we ended up with rational thought and emotion - what makes us human - but that could be where a higher being got involved.

- FT-12-91: because
- FT-12-92: Humans have evolved, because all species do.
- FT-12-93: we've adapted
- FT-12-94: we didnt magically appear one day. we came from the evolution of something
- FT-12-95: The skeletons that have been found add a great amount of scientific data that I believe.
- FT-12-96: I think we adapt.
- FT-12-97: Humans evolve. We are taller than decades ago.
- FT-12-98: Humans just like all organisms had to have had a process of arriving at the organism we are today.
- FT-12-99: Because we cannot see our own evolution because it is too soon. It happen over million of years.
- FT-12-100: Our immune systems allow us to evolve to fight off different bacterial and virus infections.
- FT-12-101: not answered
- FT-12-102: we are not the same as people from millions of years ago
- FT-12-103: i think that is the only excuse for humans to exist
- FT-12-104: All species evolve, and humans are a species.
- FT-12-105: the fossil record support that humans have changed over time and DNA comparison shows that humans share a close common ancestor with apes.
- FT-12-106: I agree with this, however I do not know for shure.
- FT-12-107: They have followed the same trend as every other organism.
- FT-12-108: We havent' always been this smart or advanced. We haven't always been this tall or this strong or anything. We've changed
- FT-12-109: If you would take the average size of a human being from bible times and now, I believe human beings in this day of age would have a greater average heigh, weight, and size.
- FT-12-110: It is true. I feel that humans have evolved judging from fossils and things
- FT-12-111: Humans have not always been here, therefore we must have evolved
- FT-12-112: not answered
- FT-12-113: Fossils show that.
- FT-12-114: I don't feel that humans have evolved. Maybe the skeltons of "man " that were found were actual different species of animal.
- FT-12-115: it seems that we would evolve if other creatures have
- FT-12-116: Same as 23
- FT-12-117: fossil record have proved it....plus dna shows that we are only 1% different that chimps...there fore we must have evolved from them.
- FT-12-118: (see last response)
- FT-12-119: The wording in the question is weird. Humans ARE evolving.
- FT-12-120: evidence supports this
- FT-12-121: There has been something about a missing link, but I think it's pretty evident where we came from.
- FT-12-122: We share in common with Chimps 99 percent of our DNA, which shows that we've evolved from a common ancestor. Plus the Homo erectus and the AMH fossils and comparisons with other primates proves that we've evolved from other primates

Question 13

FT-13-1: not answered

FT-13-2: We should be able to comprehend and understand both sides. So that we can have our own opinion that's based on what we have comprehended

FT-13-3: Evolution is a valid scientific theory. Although many people believe in intelligent design or creationism, there is no scientific evidence supporting the claims. Therefore, it can be addressed as a common belief, but should not be emphasized in classes.

FT-13-4: That is the most accurate and righteous decision to make, although I don't think it will ever happen.

FT-13-5: not answered

FT-13-6: I feel that both ideas should be given adequate time, perhaps maybe slightly more to evolution as it would be taught in a science class, however, I do not think that the creationism theory should be thrown out the door because a lot of people do believe that as well. As a Catholic, I do believe solely in evolution, however, I cannot throw my beliefs out the window. I have been taught that the Theory of Evolution may be accepted and believed, as long as I realize that God created everything on earth.

FT-13-7: I think that would be the best way to educate the youth. If they have religious beliefs, they will practice them on their own time.

FT-13-8: Because I personally think this is a good way to teach this. I really liked how the issue of Evolution vs. Creationism/Intelligent Design was addressed by Dr. Colbert. Evolution is SCIENCE an idea made by a man so one shouldn't believe in one's opinion. Creationism is based only on beliefs, and evolution can be shown through fossil records and other proof.

FT-13-9: I think that both should be taught but on a non-bias level due to religious views.

FT-13-10: I do not feel there is enough evidence for either to be taught as fact in a classroom.

FT-13-11: This is my belief.

FT-13-12: not answered

FT-13-13: because the theory of evolution is the explanation of diversity of species and should be taught in schools.

FT-13-14: I think Creationism should at least be understood by the scientific community because this is what the majority of the general population believes in, even if it is supernatural. How can you fight against something if you have no knowledge about it?

FT-13-15: only evolution should be taught

FT-13-16: Intelligent design is not scientific so therefore it should not be taught in science classes. Biology is all about Evolution. It is necessary to teach it.

FT-13-17: Biological Evolution can be supported by hard fact. Intelligent Design cannot be tested. However, Intelligent Design can be used to show the stupidity of trying to meld religion into science.

FT-13-18: Compromise

FT-13-19: It is important to see both points. The way Dr. Colbert went about teaching evolution was great. He taught us the scientific approach w/o bringing in arguments about intelligent design. The little he mentioned about intelligent design was good. I'm glad I learned both points. Usually students already know about intelligent design and lack

knowledge in the area of scientific evolution. I'm glad we went into depth in the science area.

FT-13-20: my religious side says they should be equal but as long as both are addressed and both are given credit it really doesn't matter to me

FT-13-21: same

FT-13-22: basically, we really don't know the exact origin of the earth as it is now and it's good to keep the doors open to different viewpoints

FT-13-23: not answered

FT-13-24: most people have an religious position on the evolution idea so both should be mentioned

FT-13-25: evolution is correct why not teach it

FT-13-26: human evolution can be proven scientifically someday where as creationism can only be proved if one were to talk to god

FT-13-27: Perfect answer. ID is not a science, but I think people should still know what it is and WHY it was rejected, just to be fair.

FT-13-28: I believe that there is a higher power that created the earth and everything else but I still think that evolution has definitely occurred.

FT-13-29: I think that mostly biological evolution should be taught in a public biology college class. I am Catholic so I have other views also, but I know that being in a place like Iowa State, there are people from all over the world, and some might not have the same ideas because of their religion. I think that just like in Biology with Professor Colbert, we should mostly learn about biological evolution and then mention Intelligent design so that everyone is aware of both ideas. Then I think if people want to find out more about Intelligent design they can learn about it on their own.

FT-13-30: If people believe in both and there is enough evidence to support both theories then, both should be taught and you should be able to make up your own mind about it.

FT-13-31: I don't believe intelligent design is part of science, and this issue should be addressed

FT-13-32: I believe that the Theory of Evolution is the best way to describe the diversity of life on Earth, but Creationism should also be discussed because it is an idea that some believe in and it should be acknowledged.

FT-13-33: i believe that both are important things to cover, just because people don't believe in certain things doesn't mean that they don't exist. and it would be beneficial to just have knowledge of it regardless of if you believe it or not

FT-13-34: not answered

FT-13-35: I choose to only teach biological evolution because creationism is already taught in church. If people want to learn about creationism go to church.

FT-13-36: Creationism is wrong, but I believe you need to be educated on a topic in order to not believe it, an ideal that Creationists lack.

FT-13-37: not answered

FT-13-38: because the theory of evolution is the only scientific option. intelligent design deals with paranormal stuff which has nothing to do with science, therefore it should not be taught in a science class but explained why it is not taught

FT-13-39: I like both C and G. I think all theories should be covered. It is up to the individual student to collect his/her beliefs and up to the educator to provide the material.

FT-13-40: i believe that both are ok for students to learn because it is up to the student to accept or reject either biological evolution or intelligent design. people can teach things without making a student truly believe in it.

FT-13-41: Important to learn what sci accepts but also important to know why the other ideas are rejected

FT-13-42: i belive that every one should make up their own mind and and I belive that both should be explanied

FT-13-43: since intelligent design has no theory supporting it , therefore we can be sure weather or not it is right or wrong.

FT-13-44: I think that both should be covered. But i find evolution is more important.

FT-13-45: i being a christian, feel that evolution is hard to understand, and believe. i feel that both should be taught

FT-13-46: not answered

FT-13-47: I think it would be a good idea because it allows students to have a better understanding of the topic.

FT-13-48: Evolution has so much evidence behind it, it has to be taught, however the supernatural "intelligent design " concept should be used to prove what isn't a scientific theory.

FT-13-49: Evolution should be given much more time because it is a scientific concept and it is a public college. However, I think the other one should be addressed to the students so they know what it is.

FT-13-50: evoultion is so important in biology so it need to be taught in class.

moreover, many people know little about evolution. ID is not a scientific theory

FT-13-51: Evolution is the only answer I personally belive for the existance of various species living on planet earth today. But talking of other ideas , although not in as a FACT, could make the students realise theri probable misconception about evolution.

FT-13-52: Biological evolution is science based and should be in a science course while the other could be in a theology course or something.

FT-13-53: Religion should have no place in school.

FT-13-54: Because that is how I have been taught, and it seems to me my education has been valid.

FT-13-55: This is because intelligent design theory is not based on any facts.

FT-13-56: .

FT-13-57: There are two well known view points, so both should be taught, but because evolution is a 'science' it should be focused on more intently

FT-13-58: I don't know a lot about this, I feel it is a parent's choice as to what they teach their child.

FT-13-59: Biological evolution is based on evidence and fact not creationism, I believe in god, but facts in front are needed simply because of the number of different religions

FT-13-60: I believe both should be taught, but I think that because we are in college science, the focus should be on evolution and biological evolution rather than on creation.

FT-13-61: The way I was taught in my AP Bio class was always my favorite: Before we began our chapter on Evolution, our teacher had us look up past and present religions of the world and writed down three that interested us. We were to focus on the stories of creation. The project was to show us that there are many therioes of what is going and how life on earth became what it is today. This helped many students (especially

Christian ones) accept, or at least tolerate, our study of evolution. I think that she did an excellent job in how she taught it. I don't really believe that the Creation story should be taught in public schools because it has no scientific background.

FT-13-62: I think that both biological evolution and intelligent design are important topics to discuss in the classroom. It would be good that students had a background in both, but they can believe in whatever they want.

FT-13-63: Because High school they didn't put much emphasis on it and it seemed like a backwards idea.

FT-13-64: I don't really care what is taught in class, i'm going to have to learn it anyways

FT-13-65: not answered

FT-13-66: Because we attend a public college, and if people have their views of Creationism great, but that does not explain why change has occurred. It can be agreed that there was a creator, but from that point on is science, and that's what we're here to learn.

FT-13-67: There is no proof of Intelligent Design and science needs proof. I believe that ID should just be mentioned.

FT-13-68: Intelligent design is based off religion and that doesn't need to be in public schools. Religion should be more of an individual or family thing than a public subject. If there is a religion class then intelligent design could be taught there, but not in science.

FT-13-69: I think that we should be taught religion as well as science, because not teaching religion isn't fair.

FT-13-70: They need to help people realize that it is their choice as to what they believe.

FT-13-71: Creationism is an idea that can't be tested/proven with science and therefore shouldn't be taught

FT-13-72: Both ideas should be discussed and information should be provided concerning both sides. I think that the student should be able to choose for him/herself which they believe. They will not be able to make educated decisions if one side is given more time and a biased opinion over the other.

FT-13-73: I think it's important to address Intelligent Design, but it should not be presented as an alternative to evolution

FT-13-74: i am not sure what intellegent design is, so i cannot give my opinion on it, but i do believe that biological evolution should be taught

FT-13-75: Both viewpoints are valid in their own way, but creationism is really a personal belief, and those who don't have this viewpoint should not be forced to deeply study it. Some time should be spent on it as a comparison to evolution, but not a substantial amount.

FT-13-76: not answered

FT-13-77: becuase

FT-13-78: Biological Evolution should be taught because it only mentions the change in the species over time, and not how they were created.

FT-13-79: I think that instructors have the right to decide if they want to teach both, mention one, or teach one if they want to.

FT-13-80: In studying science, I think it is important to stick with teaching evolution in public schools. If I were interested in learning about creation and intelligent I would register to take a religion course.

FT-13-81: I believe that evolution should be taught and the idea of intelligent design should be addressed but not taught.

FT-13-82: intelligent design is not a scientific theory because it can not be tested or disproven

FT-13-83: biological evolution is based on years of scientific observations, intelligent design holds no place in science. this shud be presented to students though so they can understand why it is not being taught

FT-13-84: only evoloution should be tought because it can be proven be evidence.

Intelligent design is a sensitive subject and violates the sepration of church and state

FT-13-85: I feel that evolution is probably something that should be taught, but I am still unsure of that myself. There are many religions and cultures in America and teaching certain things like creationism might be offending to some, even though I am Christian and believe in Creationism

FT-13-86: It was the only answer close to my viewpoint. We need to have our own veiws but must also be educated on other options

FT-13-87: It would seem unfair to oust ID but it cannot count as a scientific theory. If it was taught as a philosophy then it would be more acceptable.

FT-13-88: I guess I kind of explained my viewpoint in question 25. It's still a little shaky, but it makes the most sense to me. I place a lot of value on scientific evidence, but I can also acknowledge that it's never going to explain everything. Some things are impossible to explain. I think we need to be educated about evolution especially. It makes a lot of sense for the same types of reasons that theories about gravity did back in the day.

FT-13-89: because

FT-13-90: Evolution should be taught because it is a scientific theory, but Intelligent Design and creationism should be mentioned to make students aware of these ideas and why they are not part of science.

FT-13-91: by teaching both, debates can be avoided and that way students can see both sides and can choose for themselves which one they wish to believe

FT-13-92: because if it is not supported by the rest of the scientific community then it shouldnt be taught

FT-13-93: I agree with the statement.

FT-13-94: People need to be educated. They dont have to agree.

FT-13-95: Inteligent Design is a belief and I think it should be acknowledged but it is not scientific so should not be taught in a science class

FT-13-96: These concepts are key in molding a person that can accept others ideas. to educate people on the various views.

FT-13-97: I believe that both points are valid and should be explored equally by students.

FT-13-98: not answered

FT-13-99: because evolution has prove and the other doesn't

FT-13-100: the students should be taught it to help understand biological diversity

FT-13-101: Biological evolution is the only on that actually has any scientific evidence to support it. The other should be breifly addressed just to demonstraight that there are more ideas out there, but they do not have any means to gather scientific evidence or to test the idea.

FT-13-102: biological evolution is a scientific theory, and scientific theories do not support supernatural ideas--which describes intelligent design. So yes both ideas should be addressed and discussed as to how they are different, but there is no need for in-depth education on intelligent design in a science class. Biological evolution is science, intelligent design is religion.

FT-13-103: I do not know what should be done.

FT-13-104: I feel that ideas are thrown aside too quickly when students are given only one viewpoint. Intelligent Design is not a scientific theory however, so college science classes should not cover them the same way as a valid scientific theory such as evolution. The issue should be addressed and explained as to why Intelligent Design does not make sense in the light of biological thought.

FT-13-105: biology is for learning about science. if you want to know about intelligent design, take a religion or philosophy class. otherwise it should only be mentioned as an alternative to evolution.

FT-13-106: I think both views should be taught, and the student can decide what to believe.

FT-13-107: I think that only biological evolution should be taught because it is a well known theory. The people who want to teach intelligent design are just the idiots who let their religion make decisions for them. Evolution isn't controversial. But ignorance makes it controversial.

FT-13-108: i don't necessarily think intel. design should be taught just mentioned

FT-13-109: not answered

FT-13-110: not answered

FT-13-111: Evolution has more scientific evidence, but many people also believe in intelligent design, so both should be presented as ideas that are out there.

FT-13-112: Even though I believe fully in creationism i feel that both sides should have a fair chance at being heard. Let people make up there mind after both sides have been presented

FT-13-113: not answered

FT-13-114: because

FT-13-115: I think that people should be informed as to why intelligent design is not taught as a scientific theory, and why it is not a scientific theory.

FT-13-116: everone in the class has different view points therefore they should all be given equal time to satisfy everyone.

FT-13-117: too many unprovable ideas...

FT-13-118: Ethics, and why theories are accepted need to be taught to students and not just on this issue.

FT-13-119: ew

FT-13-120: evolution is a scientific theory and intelligent design is not but it should be explained why it is not considered scientific

FT-13-121: It should be addressed because it's such a big issue for people, but people should be educated why creationism is not a scientific theory and why it should be left for religion classes.

FT-13-122: Everyone should be taught both viewpoints, and be able to choose which one they agree with, rather than being taught one view point and thinking that it's the only explanation

Question 14

FT-14-1: not answered

FT-14-2: Its both lack of education, religion and cultural differences

FT-14-3: Many people do not understand how science works. This theory is seen as “just “ as theory although it is supported by much evidence and scientific community. Also, many percieve a conflict between religion and evolution because of many traditional beliefs being clung to.

FT-14-4: Evolution is at odds with the Christian faith and they cannot be reconciled. If evolution can be taken literally, why can't the Bible, since it passes countless tests of authenticity

FT-14-5: not answered

FT-14-6: I chose this because, as I have mentioned, I am from a Christian background, and I know that people who are set in their ways have a hard time accepting anything else besides creationism.

FT-14-7: i felt it stated my beliefs the best

FT-14-8: Both A and D reflect my viewpoint

FT-14-9: People will believe in what they want to they have that right so if someone wants to believe in religion that's there choice

FT-14-10: People are too stubborn to see that their religion has nothing to do with evolution

FT-14-11: i believe that religion as well as the culture or society that one lives in has to due with their view on evolution and science as whole. those that lack that information tend to have bias viewpoints on what they were brought up to believe

FT-14-12: I feel that intelligent design and evolution do conflict each other.

FT-14-13: It is what I believe.

FT-14-14: not answered

FT-14-15: not answered

FT-14-16: I think it has to do with a combination of a real conflict between God and science, and also that the general public has not been educated about what evolution is.

FT-14-17: this is because people who believe in god thinks they cant believe in evolution I think people are scared of believing in evolution because of how it seems to contradict the bible.

FT-14-18: The majority of people in the United States don't care about what doesn't directly affect them.

FT-14-19: Perceived conflict and lack of understanding for many Americans.

FT-14-20: The reason the public disagrees with the scientific approach is because they lack knowledge. From very early on people have been taught about God and how he created the earth. No one has taught the people about evolution from the scientific stand point. I believe if people were educated about the scientific approach they would be more accepting.

FT-14-21: the conflict does exist and some people can not find a medium between science and religion

FT-14-22: people arent going to change their religious beliefs because of something they learned in their science class, for the most part.

FT-14-23: evolution doesn't actually talk about the origin of life on earth and that's where everybody(the general public) gets caught up, it's really a matter of ignorance of both them and the scientific community for not doing a better job of showing this

FT-14-24: not answered

FT-14-25: people are taught from a young age something different so it is hard for them to except a new idea

FT-14-26: my high school teacher never explained the process correctly and therefore i had the wrong idea about the entire theory

FT-14-27: because most of the population believes that we evolved from monkeys and this is not true, we share a common ancestor.

FT-14-28: I think most people believe evolution says HOW life was created, not HOW it brought about a variety of species. This is in direct contradiction to their religious belief, at least to them.

FT-14-29: There is little to no middle ground in this between the religious and scientific communities, leaving people to be forced to choose between one or the other.

FT-14-30: I think that people don't really understand what evolution is. Evolution is how organisms change through time so that they have a better chance of survival. It says nothing about how life started on earth. I think that this is why many people struggle to believe in both, they feel like if they think evolution is right then they are going against what their religion is telling them.

FT-14-31: Because of lack of money or other factors the general public is not educated about scientific theories and if they don't understand it then they are less likely to accept it.

FT-14-32: A lack of understanding and conflict between the two ideas are what causes this division

FT-14-33: I think the biggest reason why a lot of people don't accept the Theory of Evolution is that they perceive it to conflict with their religion.

FT-14-34: it best states my view about religion and schools

FT-14-35: not answered

FT-14-36: People think they have to choose either religion or evolution but they don't have to. I am Christian but still believe in evolution.

FT-14-37: In general, people are stupid.

FT-14-38: not answered

FT-14-39: because many people misunderstand what the theory of evolution is explaining. they think that if they accept the theory of evolution they have to forsake their religion, which is not true. evolution doesn't explain the origin of life, it explains the origin of species

FT-14-40: A, B, C, D, and E all apply. Many individuals do not understand the theory of evolution (even I was confused when I began the semester) and think religion is the one and only answer. People are stuck in their opinions and would hate to find evolution to be true and be wrong in their original beliefs.

FT-14-41: the sciences aren't taught very well to the public, even at a young age. people don't fully understand and don't want to "give up" their religion for this science idea that is fairly new compared to the idea of intelligent design.

FT-14-42: There is no conflict, many just assume there is. Need to address public with the facts.

FT-14-43: their are common miscunciuptions of evolution becouse some public schools arn't alowed to teach evoloution. SO the students grow up and don't understand evolution

FT-14-44: i agree with all the reasons that are given since there are large no. of reasons which says that why it is not taught in public schools. there is no single reason to it.

FT-14-45: I think people get evolution and creation confused.

FT-14-46: i dont believe that the older generation has enough education on evolution to even begin to believe the theory

FT-14-47: not answered

FT-14-48: Must people chose religion over science more.

FT-14-49: Evolution says nothing about creation of the Earth, Creation of the Earth says nothing about species adapt to their enviornment.

FT-14-50: I believe there is a real conflict between the two that will remain undecided. That is due to a number of things, but mostly education.

FT-14-51: people have a false stereo type about evolution. they don't simply understand that evoluion can be supported by religion

FT-14-52: My prime reason is that the publice are not educated enough about the theory of evolution. But religion is always going to come in the way of science ever so often since there is no definate answer for "who created earth " although we can answer most questions we also stumble upon a few questions 'unansarable " by us.

FT-14-53: All of those choices contribute.

FT-14-54: The public doesn't realize that they can believe in both science and religion.

FT-14-55: honestly I would say none of the points alone is the culprit, and think it is a combination of misunderstandings.

FT-14-56: They believe what they have been taught and many of them do not understand biology.

FT-14-57: ,

FT-14-58: I think people are not educated enough about evolution, but mostly I think people believe they would be going away from the church because that is where most of their answers have been found

FT-14-59: Religion has been around much longer than the theory of evolution, so many people are stubborn when it comes to listening and accepting other ideas, such as evolution.

FT-14-60: Althought biological evolution is supported many americans simply dont want to give in. Many people are set on their old ways and dont want to realize that science has some real answers and that would make them believe they would have to give god 2nd priority when they wouldnt have to do that at all

FT-14-61: People do not understand the topic of evolution fully and they also sometimes refuse to believe that humans evolved from apes. They also have influences from religion and creation that may distort their beliefs.

FT-14-62: Religion was around long before the theory of evolution. Traditions of these religions have been withstanding through time and people may just not accept evolution for these reasons; or they must just be undereducated.

FT-14-63: I think that the public is under educated about evoultion, so they just assume that it is something that shouldn't be discussed. If the public was more educated, then they would have a greater understanding of evoultion and how science works.

FT-14-64: I believe it is the right answer.

FT-14-65: people have been brought up thinking that God created humans and all life, not evolution.

FT-14-66: not answered

FT-14-67: The media makes it out to be a battle between religion and science and you can't believe in both. In reality there are many from both sides who believe both.

FT-14-68: It is a lack of understanding and a conflict between what science says and what religion says.

FT-14-69: If people are religious, can't they accept that god is scientific

FT-14-70: A lot of people believe in religion, and have nothing to do with science.

FT-14-71: Most people grew up going to church so people have grown up believing one thing and now they are being taught another thing. It is hard to take it all in.

FT-14-72: Most people think evolution is an explanation for the origin of life and therefore replaces religious beliefs, which creates conflict.

FT-14-73: Many people think that science and religion can not mix, but if they were to really pay attention to what both sides are saying, they would see that the discussions on both sides overlap.

FT-14-74: I think it's both that the public is uneducated about science and that there's a perceived conflict between religion and science

FT-14-75: people don't know enough about evolution to realize that one can believe in a religion and evolution at the same time

FT-14-76: A-E are all valid points. People are skeptical of what they don't understand. Also, culture and religion shape many peoples' viewpoints.

FT-14-77: not answered

FT-14-78: because

FT-14-79: Many people take their religion seriously, as a way of life, so they choose to go by the bible and say that evolution doesn't exist and the earth is only 10,000 years old.

FT-14-80: Most of the public believes that if you accept evolution, you reject religion. However, I believe in both evolution and creationism.

FT-14-81: I think this is a combination between the fact that many people are not educated enough on the subject of science and that there is a conflict between science and religion.

FT-14-82: I believe that some people just don't understand what is actually being said about evolution. Also, some people don't want to change their view points and believe that believing in evolution goes against their religion.

FT-14-83: some people do not take the time to weigh the facts and do not care

FT-14-84: many people lack an understanding of scientific method, therefore do not understand why intelligent design holds no place in science

FT-14-85: religion is close to people and most do not want to go against the church

FT-14-86: A lot of people automatically reject evolution because of religion and reasons such as "have a monkey for an ancestor" and do not necessarily understand what it is

FT-14-87: Both C and E fit what I believe. I have had many arguments with people that believe of a intelligent design, I myself know enough to make an argument but still feel I need to know more to make a stronger point. Religion is a touchy subject nobody wants to reject something that has been believed for thousands of years

FT-14-88: In my opinion evolution does not cause any harm to religion. It is impossible to prove or disprove god's existence. Science and religion occupy different areas of interest and the harm they cause each other is by misunderstanding this.

FT-14-89: A through E are all valid reasons.

FT-14-90: people think it conflicts with their religion when it doesn't have to....also people are stubborn and uneducated.

FT-14-91: Many Americans hold beliefs that are not entirely consistent with evolution due to their religious and cultural backgrounds. There is a general lack of education about evolution, because many people don't understand its basic principles.

FT-14-92: the problem most Americans have with biological evolution is that they think it is a substitute for creationism but it is not trying to state how the world started just how it became what it is today

FT-14-93: the majority of the country is not educated in this field

FT-14-94: I believe what the statement says.

FT-14-95: I think that the public is not educated enough. Also not willing to accept evolution AND religious views.

FT-14-96: I think people are unwilling to open their minds and thoughts to something that violates their beliefs. Also many people don't know enough about evolution to have an opinion on it.

FT-14-97: I believe ignorance plays a major role when discussing this.

FT-14-98: People may see a conflict between religion and science, which is why they don't believe in evolution. Plus, we have been teaching it in schools for too long.

FT-14-99: I believe that the general public is just underinformed, they think that a Theory means it is just a guess.

FT-14-100: not answered

FT-14-101: if the public took the time to learn about evolution it will make the world a better place

FT-14-102: I'm not sure how I feel because I would like to know more about the topic

FT-14-103: Many people do not really understand what evolution is and believe that it goes against religious teachings. People often think that evolution deals with the origin of life, but evolution only really talks about how we get new species. Evolution is often mistaken for the idea of spontaneous generation of life.

FT-14-104: there are many misconceptions about biological evolution and many people think they know all about the issue, when really they have not had proper education on the subject and therefore make a decision on how they feel about evolution without knowing much about it--just when they hear

FT-14-105: I think most people do not really understand evolution. Also religion and science have had confrontations since the beginning of their developments.

FT-14-106: Growing up on a view of Creationism automatically biases people against evolutionary theory, whether it has merit or not. However, religion and science can coincide. The progression of evolution actually does match the days of Creation, if you do not take the story literally. It is written in Hebrew narrative, which was never meant to be taken literally. That's just personal opinion.

FT-14-107: I believe people don't know enough about the subject to really make a choice one way or the other, and also there is a conflict in their minds about evolution and religion. Some churches also present the idea that evolution is bad and if you believe it

you will go to “hell “. they don’t know about it either. evolution has nothing to do with creationism, and most people dont realize that.

FT-14-108:

FT-14-109: Religion tells people that evolution is wrong and they believe it. It is perceived because it isn’t actually true, but people do believe it anyway.

FT-14-110: i think the public is not aware of educated enough on what science can really prove, and also they may not want to believe it

FT-14-111: not answered

FT-14-112: It fits my viewpoint the best.

FT-14-113: I feel that religion is a major part of our country and creationism contains more bases of fact to many Americans then evolution

FT-14-114: I believe that the public is not well informed, and therefore they simply rely on the only knowledge they have of the history of Earth. That history is usually through their religion.

FT-14-115: People believe that they can not believe in God and in evolution, but you can. No matter what God is behind everything.

FT-14-116: I believe some people think that they have to choose one belief or the other which doesn’t have to be the case.

FT-14-117: the older generation were more religious than the younger ones...therefore they will not readily believe evolution.

FT-14-118: It’s true. For some reason, people seem to believe that accepting science means refuting any form of religiousness. Problem anyone

FT-14-119: It hasn’t been taught very long and many people do not have a background with it. They only know what they hear, and that’s usually conflict.

FT-14-120: people often believe that both religion and science cannot agree on anything but they do in some cases

FT-14-121: A majority of the public is just too lazy to learn anything about the theory of evolution and why it is a valid theory. It has been around for a while but many people just disagree because it’s easier to stay with what they’ve been taught.

FT-14-122: People think that evolution must be wrong and that what they hear in their religious teachings is right. But I’ve never heard anything against evolution in the Bible. I believe there’s room for both of them in society today

Question 15

FT-15-1: not answered

FT-15-2: it fits what i believe in

FT-15-3: I feel that this theory is supported by much evidence and observation. At this point in time, I don't see science leading to a confirmation or denial of a higher power. Although I believe there is a connection between existence of everything and God, I feel that it is too deep for humans to yet comprehend using a scientific method.

FT-15-4: Frankly, because God is never wrong, and my life is a testimony to that.

FT-15-5: not answered

FT-15-6: The Earth is ancient, that is many millions of years old. Evolution is the theory that best describes how current species came about, however, through evolution, God created all of the species.

FT-15-7: it fits my opinion the best

FT-15-8: Because this is where I have found common ground between my scientific and religious beliefs.

FT-15-9: Its been noted that god and jesus christ have existed so im sticking to that

FT-15-10: Evolution simply improved on God's creatures

FT-15-11: as a Christian, i believe that God created man and earth and that all things were added later.

FT-15-12: I was taught intelligent design as a young child and therefore believe that more than evolution which I just learned about several years ago.

FT-15-13: Learning and church have formed this belief.

FT-15-14: not answered

FT-15-15: not answered

FT-15-16: Probably a combination. I believe in Creationism where each day might have been a million years and if evolution did occur, it was by the hand of God to create diversity upon the earth. I also believe that extreme evolutionists cannot believe in God and that their beliefs deny His existence. (For example, life first came from the sea, then the land, then the air...when it really was sea, air, earth.)

FT-15-17: god helped in the process of evolution

FT-15-18: I do believe that the earth is really old and I do believe that God created species in long periods of time. I don't believe that he created us in present form.

FT-15-19: Biological Evolution can be supported, as well as the age of the earth, but it is impossible to determine if there is or there is not a God.

FT-15-20: I accept evolution and I believe in God.

FT-15-21: I really don't have an answer for this question.

FT-15-22: that is my belief

FT-15-23: i dont know

FT-15-24: i like this point of view, besides all of these questions are a matter of upbringing background,

FT-15-25: . The Earth is ancient (many millions of years). Biological evolution describes a natural process that produces species. Biological evolution neither supports nor denies the existence of God.

FT-15-26: i storngly believe that God created the world and its creatures

FT-15-27: i am religious but i also believe in evolution

FT-15-28: we can not prove nor disprove the existence of god

FT-15-29: This viewpoint allows for mutual acceptance and understanding of both evolution and religion

FT-15-30: There had to be divine intervention to explain some of the things that have happened since the beginning.

FT-15-31: I don't really know, I believe in both evolution and God but I don't really have how they fit together straight in my head.

FT-15-32: By combining both viewpoints and giving each equal importance people are more likely to accept them.

FT-15-33: when I invent a time machine I'll let you know what I believe. I'm guessing the earth is really old, how old, who knows

FT-15-34: This was the response that fits my view on the subject. I believe in God and I believe in the Theory of Evolution, and I don't believe the existence of one disproves the existence of the other.

FT-15-35: I believe the answer best fits my viewpoint

FT-15-36: not answered

FT-15-37: I believe in God and evolution. Many people believe evolution is talking about the origin of life when really it doesn't. I don't see a conflict in religion and evolution. Evolution builds and changes things, but what happens when evolution doesn't have anything to build on? God had to have created the first kind of organism for evolution to build on.

FT-15-38: I grew up Catholic, and now through science, I believe there to be no God. In my opinion, the second law of the Conservation of Mass, disproves any existence of God.

FT-15-39: not answered

FT-15-40: I don't know how old the earth is or how it was created

FT-15-41: I do not think millions of years deserves the term "ancient." Ancient is more like billions or trillions of years, and yes, I believe the earth is much older than the scientific community believes. As far as God is concerned -- I do not know whether or not I believe in God or not. Right now, no. I am leaning toward a Buddhist view on life. What I think is ridiculous is the accepted beliefs in religion without evidence.

FT-15-42: biological evolution doesn't try to prove that God doesn't exist, but explain why there is biodiversity.

FT-15-43: I have my beliefs, but I also have an open mind about biology and evolution and the fact that they can coexist.

FT-15-44: God doesn't exist evolution was just a chance

FT-15-45: biological evolution just says that species have evolved through time to form species that can sustain life and can reproduce it does not say anything about the existence of God.

FT-15-46: I believe in God having a role along with evolution.

FT-15-47: scientists do not know all of the reasons for evolution, mass extinctions, or the evolution of certain species, God definitely intervened at these times

FT-15-48: not answered

FT-15-49: In biology it is neutral on the topic of God by not talking about the topic. Evidence is shown from organisms to evolve over a time span.

FT-15-50: I think they are 2 completely different topics. It's like trying to compare a restaurant to a laundry mat, they are two completely different things.

FT-15-51: I think that species are the way they are today due to both God and science.

- FT-15-52: I beleive that God created all the specious throght natural selection and evolution
- FT-15-53: This seems for me to be the best answer as far as how I support teh evolution theroy and still not make any religious comments on “interventions “ or watever from a supernatural power.
- FT-15-54: Misconception about evolution is that it denies the existance of God.
- FT-15-55: I don’t believe in God.
- FT-15-56: The earth is old. God made it and all life, I don’t know how. He could have done it by evolution. Who knows, but him.
- FT-15-57: Because organisms are too complicated to evolve from single celled orgasms.
- FT-15-58: .
- FT-15-59: I am Christian, but I also believe in evolution and that they work together
- FT-15-60: I agree with that response the most.
- FT-15-61: No where has biolgical evolution said that god does not exist, they simply have stated and shared information on common ancestors to lead to how we all got here and it wasnt on an ark or from adam and eve
- FT-15-62: I believe that evolution and scientific based theories is how the earth has been created. However, I do believe that God played a role, but science laid the foundation.
- FT-15-63: not answered
- FT-15-64: Biological evolution can still exist, even though I believe that God created humans. I believe that animals have evolved over time.
- FT-15-65: I believe it is the right answer.
- FT-15-66: Evolution and Creation are based upon two different ideas, so they’re best kept as separate ideas rather than supporting/refuting one another
- FT-15-67: not answered
- FT-15-68: Biological evolution neither says yea or nay to God.
- FT-15-69: I cannot completely ignore the act of God.
- FT-15-70: because
- FT-15-71: I believe that evolution is occuring, but God does intervene when he wants to.
- FT-15-72: These are my views and they have been for a while.
- FT-15-73: The earth is old based on dating methods used with rocks, etc. Evolution explains diversity, and can not prove the existence of God
- FT-15-74: God’s “day “ may not be the same as the human day. Therefore, the earth may be millions of years old, and God made each of the species at a specific time. Evolution has happened since then, and the original species have changed, but God had a hand in everything.
- FT-15-75: Evolution doesn’t threaten the existence of God in my opinion, but it could operate without His intervention
- FT-15-76: I believe that God created everything on earth, but evolution has changed all organisms to better fit their environments
- FT-15-77: It seems logical.
- FT-15-78: not answered
- FT-15-79: Because that’s what I have been taught since i was little
- FT-15-80: I think that god had no part in creating the diversity of species.
- FT-15-81: I believe that evolution happende, but God caused the major events to happen.
- FT-15-82: not answered

FT-15-83: No comment

FT-15-84: the earth is old and I do not know how life on earth arised

FT-15-85: evolution says nothing about how life started, it just says how species became what they are today. there still lies the possibility that god created the earth and let his creation run its course.

FT-15-86: I believe the earth is very old and evoloution has been proven, but science cant prove or disprove the existance of god

FT-15-87: although that statement is conflicting with the acceptance that world is 4.6 billion years old...

FT-15-88: Evolution is the reason how but not why

FT-15-89: Due to the nature of God it is impossible to say anything about his existance from science. Due to the nature of the earth it is possible to say how old it is and what has happened to it.

FT-15-90: Best fit my viewpoint.

FT-15-91: because

FT-15-92: I believe that evolution is a natural process that God has influenced to create the diversity of life that is present on earth today.

FT-15-93: it only makes sense to have a greater being to initiate what happens in our world because it is so complex and unique that evolution alone can not account for it

FT-15-94: evolution takes a lot of time to occur but god is not going to be ruled out in my perspective

FT-15-95: Evolution says nothing how life began...meaning there could be a god, but doesn't say anything about one actually existing or not existing.

FT-15-96: Just how i was taught.

FT-15-97: I believe in God, but I also cannot ignore that evolution has occured

FT-15-98: In my mind i cannot corrolate both as one. to me God has not intervine even though i believe in God. there is a big flaw in what i believe.

FT-15-99: Because it is close to my beliefs and it is hard to know one way or another because no one was really around to tell us the true story, so why is their such a controversy over it

FT-15-100: I believe that science can neither prove or disprove the existance of god

FT-15-101: not answered

FT-15-102: thats just how i feel

FT-15-103: i am not sure how i feel on this topic

FT-15-104: Evolution occurs, but I feel that God often guides it along.

FT-15-105: it is well-supported that the earth is millions of years old and that species evolve over time, but this does not mean that God did or did not create the world.

Whether or not God exists is a personal belief and is a separate idea from scientific facts.

FT-15-106: not answered

FT-15-107: I don't yet understand how some of the major things occurred. For instance, how could exterior eggs evolve You'd have to simultaneously mutate genes that create a hardy shell, an internal food source, a porous shell for breathing, and a baby with an egg tooth. Without even one of these factors, the mutation would be lethal and would not result in a viable offspring. I think random chance is not enough to describe this development. However, I think the greater part of history was guided by the natural occurrence of evolution.

FT-15-108: i believe in science because i am one of the people jesus damns - i believe when i see. however, there is evidence to support the idea that the earth is about 4.6 billion years old.

FT-15-109:

FT-15-110: That is just how i feel. Evolution works on the creatures that god originally created.

FT-15-111: .

FT-15-112: not answered

FT-15-113: not answered

FT-15-114: It fits my viewpoint the best.

FT-15-115: I feel that god created live however, species have adapted to survive in regions and in environments in our changing world. God doesn't dictate species and people are free to change

FT-15-116: Because God is behind everything

FT-15-117: I hold that God exists in some way.

FT-15-118: i believe god created biological evolution....therefore he didn't have a hand in the actual evolving.

FT-15-119: I'm really just going to have to say that I don't know.

FT-15-120: i believe that God has played a role in the world we have today but evolution does explain our world today the best

FT-15-121: The theory of evolution doesn't support that there is no God or all mighty deity, it just shows how we get different species. It does contradict the bible though, which really gets people upset.

FT-15-122: I believe that God created the earth and put certain organisms on it. Then, nature took over and evolution occurred, advancing all organisms on earth to what they are today. In fact, we all may still be evolving

Additional space

FT-A-1: I believe that biological evolution does occur, but God is in control. I believe that organisms do change over time to better adapt to their environment and that God controls how each organism changes. I also don't believe that humans have ever evolved from apes even though humans do share certain characteristics with apes. I believe that God created the two species separately and have helped each evolve in their own way.

FT-A-2: people should be better educated

FT-A-3: N/A

FT-A-4: no further comments

FT-A-5: not answered

FT-A-6: I think there were a lot of good points brought up. I think it is sad that people who are Christian are unable to accept the Theory of Evolution because of the fear of what God may do. I do believe in Evolution, but I am a Christian as well, and I feel that I am able to live a life that is well balanced, and that I am able to accept both Theories together.

FT-A-7: i think this assessment has shown my opinions well.

FT-A-8:

FT-A-9: I personally don't really care about the idea of evolution

FT-A-10: The issues have been over-emphasized a little. We need to just be allowed to learn without having to analyze the "why" of how people feel about evolution.

FT-A-11: nothing , but thank u for your time

FT-A-12: I do not have any further comments.

FT-A-13: I have no further issues.

FT-A-14: that is all

FT-A-15: not answered

FT-A-16: not answered

FT-A-17: i dont know what you left out.

FT-A-18: I do believe in Evolution. I also believe that God created this Earth and everything on it. I think that the bible is not meant to be taken literally. A day in God's time could be a million years. Evolution is a theory that needs to be taught because without understanding evolution, you cannot fully understand biology.

FT-A-19: I am an avid hater of the combination of religion and science, but am also quite cynical. I don't particularly hate religion and actually somewhat encourage it, although I myself am not religious. I simply feel that religion and science have their separate places and history has shown that this is necessary.

FT-A-20: Evolution should be taught in school.

FT-A-21: The first time I took this survey I felt completely clueless. This time, I felt I truly learned something from Bio 211. Thank you Dr. Colbert and Justin for sharing your knowledge with us.

FT-A-22: God will always be apart a certain individuals lives as an educator it is not your job to try to intergrate that notion into a lesson plan, each student can do that on their own.

FT-A-23: im not too worried.

FT-A-24: this survey was off the chain

FT-A-25: not answered

FT-A-26: not answered

FT-A-27: science needs to do a better job educating the public about evolution and then i think it will be a smaller debate

FT-A-28: N.A.

FT-A-29: People need to know what evolution really suggests. There is far too much confusion about what the theory actually advocates.

FT-A-30: not answered

FT-A-31: I think that the last question is very hard to answer.

FT-A-32: not answered

FT-A-33: I believe all ideas should be considered, or at least respected, but i have no idea how old the earth is. However, sometimes its hard to believe that we have evolved from such lower life forms becuae even the vast amount of time that may have passed isnt even enough to account for our position. given that evolution is so hard to observe in complex species it is hard to tell

FT-A-34: A lot of my views on evolution came from the knowledge I acquired in Biology 211. I didn't know that much about evolution before this course.

FT-A-35: not answered

FT-A-36: not answered

FT-A-37: Hope my answers helped you!

FT-A-38: Creationists are stupid and ignorant, period. There is no way to test Creationism, so therefore it cannot even be a Theory, it is nothing but faith.

FT-A-39: not answered

FT-A-40: i pretty much understand everything

FT-A-41: I have nothing further to add, but I do think the one of the question's choices were a bit difficult to understand. I suggest fixing it. This is an interesting survey.

FT-A-42: i think god and science can't be connected and should be dealt with care, because people can be easily offended. until scientists can prove god exists, intelligent design shouldn't be on the same par as biological evolution.

FT-A-43: not answered

FT-A-44: nothing

FT-A-45: not answered

FT-A-46: These are my ideas.

FT-A-47: i think the survey covered a lot on the theory of evolution, and i wish that americans would know more about the theory, and that everyone would quit blaming the lack of knowledge on the christian faith

FT-A-48: not answered

FT-A-49: Nothing I can think of at this time.

FT-A-50:

FT-A-51: This is a risky subject because there is so much different opinions on this matter. A lot of people are not highly educated about this matter, and they don't know the full concept of evolution. Bio211 really helped me to fully understand evoulution. It helped me to better form my ideas about this matter. Even though I believe in evoution, I am still a firm believer of religion. The problem is people believe you have to chose between one concept or the other. I think species formed to the way they are presently due to both God and science.

FT-A-52: I support evolution theory. also I believe in God and that he is the one who did all of the creation through natural selection and evolution. Human and monkeys shared a common ancestor I don't know about that.

FT-A-53: I accept and claim to understand Evolution somewhat. I cannot give a presentation on the Theory of Evolution but I strongly believe in it since I see evidence for it as does the whole world and the millions of people before me who have TRIED to understand the theory of evolution. Religion has traditionally been "interfering: " with science through times immemorial , there is nothing one can do about it. What we can do though is EDUCATE the masses about the Theory of Evolution and give them evidence about it and simply show them a fact of how science WORKS!!

FT-A-54: I think Biology 211 / the professor taught evolution well and without conflict. I also think that the world's view on evolution is changing in favor to evolution. (Might just be me tho.)

FT-A-55: Why do we have to write something after every question It is irritating.

FT-A-56: none

FT-A-57: Nothing.

FT-A-58: .

FT-A-59: I know that there is a lot more to evolution that I need to know before I can fully understand all of its significance and detail. But I do think I have a good base.

FT-A-60: I was raised Catholic, but I believe in the theory of evolution.

FT-A-61: No comments

FT-A-62: I think everyone has various opinions about evolution and science, but all anyone can do now is present the theories and knowledge to society to offer them evidence and support in biological evolution.

FT-A-63: not answered

FT-A-64: I think you did a good job of understanding my view on the issues raised in this survey.

FT-A-65: nothing thank you

FT-A-66: none

FT-A-67: not answered

FT-A-68: not answered

FT-A-69: Nothing.

FT-A-70: I think you got it.

FT-A-71: I believe equally in God and evolution, and I believe they coexist to create the perfect ecosystem of our planet, the only known rock in space that contains life.

FT-A-72: None.

FT-A-73: not answered

FT-A-74: I don't have anything else to say.

FT-A-75: I thought the evolution/intelligent design debate was old news...

FT-A-76: I think you can understand my views enough with my previous explanations

FT-A-77: Even with previous knowledge, some people are just confused about evolution. It is hard to decide what is correct when society is fed so many conflicting ideas.

FT-A-78: not answered

FT-A-79: not answered

FT-A-80: I don't know why people don't accept the biological evolution theory because there is so much evidence that supports it. Religion may have a big part of people not believing. The evolution theory doesn't describe how the earth or species were created. In my words, I think that the earth is millions of years old, if not billions, and the diversity of species have evolved through time, and most have become extinct.

FT-A-81: I do not mind talking about my beliefs regarding evolution

FT-A-82: not answered

FT-A-83: None

FT-A-84: Nothing

FT-A-85: i strongly believe in biologicial evolution; it is too logical and there is too much evidence. i am undecided on whether there is a god or not. i would like to believe that god created the universe including the earth; that he created the earth with some foresight, knowing the changes that would take place, and then letting those changes run their course with little or no intervention. but as of now i am completely baffled as to how the creation of the universe and of the earth actually happended. i hope one day we find out.

FT-A-86: not answered

FT-A-87: I have no other comments. Have a great day!

FT-A-88: Well I believe we should be taught a lot more about evolution. To be able to feel that we can educate others on the subject.

FT-A-89: My experience in this class has taught me things that will allow me to take fermer stand on this issue.

FT-A-90: I think I explained myself pretty well already.

FT-A-91: nope

FT-A-92: not answered

FT-A-93: nothing else to add

FT-A-94: i dont have any other ideas to comment on

FT-A-95: Keep the way it is taught the same, for it did not raise any bad thoughts of what was being said to me.

FT-A-96: Nothing left to say!

FT-A-97: Evolution should be taught. It is a part of science, but should not be preached. People have their own beliefs and that should be preserved.

FT-A-98: Not everyone will accept their own views as to be right.

FT-A-99: This quiz seemed to be more about beliefs, evolution, and not about comprehensive biology or stuff we actually know.

FT-A-100: I feel that science is a changing form of discovery and that all students should be aware that even the information that they just learned will be outdated and replaced within a matter of years.

FT-A-101: not answered

FT-A-102: that i beleive in evolution but i also beleive in god

FT-A-103: not answered

FT-A-104: I think that God chreated life and provided the mecognizum of evolution to allow for change to occur. I think the evoloution may also have been the means by which God creates new creatures. The theory of biological evolution nether supports or denies the existance of God and it actually gives us a much beter understanding of the

biological world than we had before. Besides, wouldn't be boring if everything stayed the same

FT-A-105: nothing

FT-A-106: not answered

FT-A-107: Counterevidence for evolution should be covered more in college biology. If the theory is so well-backed, teachers should not be afraid to point out its weak spots. We need to be well-informed, not biased.

FT-A-108: not answered

FT-A-109: I am a christian, and I believe that God created the earth and all the organisms. However, I also believe that evolution exists in the micro form. I believe in microevolution but not macroevolution.

FT-A-110: I feel that evolution is a great theory that everyone should be aware of. It upsets me though that many cannot experience evolution though because their religion tells them lies and makes it seem as though evolution is going against God. EVolution says nothing about God, and I wish people would stop being so ignorant and actually realize that.

FT-A-111: I believe in both God and evolution, which makes it hard for me to hold on to both, but in certain ways believing this makes everything fall into place

FT-A-112: not answered

FT-A-113: not answered

FT-A-114: .

FT-A-115: not answered

FT-A-116: not answered

FT-A-117: I think that the evidence that has been found supporting creationism should be discussed too. I am a catholic who believes that God can be found in science.

FT-A-118: not answered

FT-A-119: it was good to put things about religion and different aspects of the course in this to see how much we learned and to get a general overview on how a college classroom full of 17-19 year olds view biology

FT-A-120: I don't really have much to say about the issues raised in this survey. I think that Professor Colbert did a good job of having us discuss all of these issues in class.

FT-A-121: not answered

FT-A-122: These are important issues and it would be interesting to see how different everyone's views are from one another

Senior Text Responses

Question 1

S-1-1: Evolution is not directional in that an organism does not "chose" to evolve. Natural selection merely actions on different phenotypes present in a population, and those phenotypes that are best suited for an environment are inherently more prevalent in a population, and in time this results in evolution.

S-1-2: not answered

S-1-3: not answered

S-1-4: not answered

S-1-5: not answered

S-1-6: I learned it in Bio Evolution [Bio 303 before it was renumbered]

S-1-7: I have taken a course in Evolution and feel I understand it's meaning. And you can't "add" genetic characteristics.

S-1-8: All evolution is based on genetic mutation. Any favorable mutation that appear in a population will be "selected for". Thus the presence of the mutation will increase in the population over time.

S-1-9: it isn't an exact process, but it is the passing of genetics by the most fit individuals which leads to a population shift.

S-1-10: This is the phrasing of the answer that I remember from 303

S-1-11: Evolution occurs in a population, not in an individual.

S-1-12: Sounds similiar to what I have learned in Bio evolution class and covers the main points of "change" and "population". It should have stated over time.....or did it state that too - its kinda hard to answer since I can't look back at the question I answered.

S-1-13: not answered

S-1-14: not answered

S-1-15: I'm a biology major - seemed like the best worded answer.

S-1-16: not answered

S-1-17: The evolutionary process is not purposeful in the sense that there is a set direction or advancement of a species. Organisms do not aquire traits they are inherited. This is heritability anyways and is not the best definition of Evolution, however it is part of the existence of evolution. Evolution happens through time through random mutations in an individual that can be selected for or against, depending on environmental and other factors. If the mutation is favorable, that individual will be better fit to mate and produce offspring carrying the trait.

S-1-18: The key words I felt were change, genetic composition, and population. I thought this was the only answer that expressed the fact that traits themselves are not passed, but differences in genes that may over time lead to a different trait are changing slowly over time. It also expressed that it happens in one population that is seperate from others of the species which is key to evolution.

S-1-19: I wrote this because i think evolution is the passing of acquired genes from one generation to another that maks them more fit than others in the population

S-1-20: Evolution is the process of over time accumulating characteristics which increase fitness

S-1-21: Acquired characteristics are not inherited and evolution does not have a directed purpose or value judgments that would allow for the creation of "better" organisms.

S-1-22: phenotypes may only change with the change in genes.

S-1-23: Evolution passes traits through generations due to the successfulness of the traits in helping the offspring survive.

S-1-24: It was the correct choice.

S-1-25: not answered

S-1-26: Because evolution is a slow gradual process

S-1-27: It looked like a good answer.

S-1-28: I feel biological evolution deals with the advancement of a population throughout time, without an the involvement of any outside factors, mainly humans. It is a purely natural process dealing with survival of the fittest, natural selection, etc.

S-1-29: Evolution is always happening, without the interference or purposeful interaction of humans.

S-1-30: Biological evolution occurs over time naturally.

S-1-31: Because that is the correct answer.

S-1-32: "The change over time in the genetic composition of a population" eludes to the possibility of a novel species arising as the population changes to adjust to the many demands of its environment or reproductive success. This best summarizes biological evolution and the evidence of the relatedness within the phylogenetic tree.

S-1-33: not answered

S-1-34: It is my understanding that the basis of biological evolution is not only the mere passing of genes to another generation, but the processes that dictate the passing of those genes (i.e. natural selection, mutation, etc.)

S-1-35: because that's the answer

S-1-36: Evolution is not just about the passing of genes to offspring. Evolution also concerns the changes in the genes that have occurred in order to become better adapted to the environment.

S-1-37: Sounded like the best definition that matched what i belief I have learned. Evolution is a change and the most significant change that is used in classification of species is genetics, so it seems correct to say that evolution is a process in changing genetic makeup.

S-1-38: Organisms are not "acquiring" genetic traits during their lifetimes; the genetics they are born with are theirs throughout their lives. Nor are there "purposeful" changes in organisms; organisms do not have the ability or desire (ok, except for maybe us humans :)) to change their genotype. Rather, over time, the genetics of a population may change through natural phenomena as mutation, bottlenecks, etc.

S-1-39: The change over time in the genetic composition of a population I chose the answer because evolution is essentially the change in the frequency of alleles in a population (or world) over time. It is not passing on acquired traits and or choosing to pass on certain things through the generations.

S-1-40: It is what I learned and believe from class.

S-1-41: that's the definition that i recall from biology 315 – evolution

S-1-42: It's not acquiring new traits and its not a decision as described in option a. It is also not just a process that occurs during one generation. "The change over time in the genetic composition of a population" is the best answer.

S-1-43: a. The process of purposefully producing genetically better adapted organisms; is wrong since selection has no purpose or end goal, and sometimes genetically inferior organisms can arise. b. The process of passing acquired genetic characteristics to new

generations: is partially correct, but lacks natural selection as a force to drive evolution.

c. The change over time in the genetic composition of a population; the genetic composition of a population over time since it infers heritability and change over time.

d. The process by which individuals can acquire new genetic traits: is wrong since there is no concept of change over time.

S-1-44: Evolution affects the entire population, not the individual. It is not purposeful; rather it is the result of natural selection choosing those mutations which positively effect the populations ability to survive given a specific environment.

S-1-45: evolution refers to the change in genetic makeup of a population over time

S-1-46: best answer

S-1-47: It best fit my understanding of biological evolution.

S-1-48: Evolution is change and so therefore that is the best answer to fit what I've been taught evolution is.

S-1-49: Genetics is passed from generation to generation without a directed reason for choosing a certain trait (you could argue that there is an exception to this, but typically you don't get to decide what genes are passed to the next generation. Evolution produces a small change in the genetics of a population as natural selection effects those traits.

S-1-50: it is the answer most like that learned in class

S-1-51: because genetics are the basis for evolution

S-1-52: All wording seemes correct, and it was the most reasonable answer.

S-1-53: Seemed the most logical answer - random genetic change

S-1-54: To evolve means to change over time. It is natural to only choose the best surviving organisms. This would, with time, create better adapted organisms than previous generations.

S-1-55: Because its not the traits you have acquired throughout your life, its the traits that were passed on to you from your parents that gave you a better advantage over the other members of your population to produce viable offspring.

S-1-56: I thought it was the best answer

S-1-57: It was the most like the definitions I have heard in class.

S-1-58: I think that evolution doesn't have to be dramatic

S-1-59: Because evolution is a change over time and the biological aspect relates to the genetic composition.

S-1-60: I think that's what I learned in class!

S-1-61: I didn't like the first two answers. I did understand the question so "e" was out. Then I just had to decide whether I thought you meant "evolution" as a noun or a verb. I picked noun. Now that I look back, I decided I also don't like that "d" said something about individuals changing traits. Traits change from generation to generation but not in individuals themselves. For example, if humans were evolving to all have brown eyes, my blue eyes would not just turn brown, but in the next generation there would be more brown-eyed individuals than there are in my generation. You're welcome for that diarrheic response.

Question 2

S-2-1: Traits acquired over time (not genetically acquired) have no genetic basis, and are thus not subject to evolution.

S-2-2: not answered

S-2-3: not answered

S-2-4: not answered

S-2-5: not answered

S-2-6: Darwinism has nothing to do with aquired traits, its all genetics and the "survival of the fittest"

S-2-7: If you learn how to fly an airplane, your children aren't born with the knowledge. They may have the ability (later in life) but the knowledge of how to fly the plane is not written in to their genetics that they received from you.

S-2-8: Acquired characteristics during a life span (aka a scar) are not passed on. I think this was a theory that LaMarkk came up with to explain the length of giraffe necks.

S-2-9: you can't aquire traits to pass on they are genetic traits that the individual possesses at birth to pass on.

S-2-10: Evolutionary theory directly limits passing on traits picked up during a lifetime as they do not pass into the zygotic genetic code.

S-2-11: Acquired characteristics are not always passed on -- it depends when the characteristic was acquired and whether it affects the germ line.

S-2-12: I don't know - if I could compare them side by side I would have an answer, but there is no back button.

S-2-13: not answered

S-2-14: not answered

S-2-15: blah

S-2-16: Organisms don't aquire traits, they could pass on knowledge through teaching, but that is called culture. This is Lamarckian theory of aquiring traits and adapting to the environment during the life of an individual.

S-2-17: It is impossible to pass characteristics obtained in ones life time to offspring.

S-2-18: species do not die out because the environment cannot contain them it is just that another more fit organism is out there which is able to reproduce better than another.

S-2-19: class related

S-2-20: The other responses were all memorized as correct in beginning biology.

S-2-21: traits that organisms aquire over a life do not equal a change in genes, thus they cannot be passed to offspring

S-2-22: I don't think the idea of "natural selection" involves producing more offspring than can be supported; it deals with the idea that offspring that adapt well to the environment will survive

S-2-23: It was correct

S-2-24: That question deals more with evolution than natural selection.

S-2-25: Because that is the basis of LeMarken (spelling?) evolution

S-2-26: All the others are biological.

S-2-27: The most well-adapted individuals are going to be the ones with the highest fitness rate and the offspring most likely to go on to produce further generations. This is how populations advance to become more sophisticated, and the less adapted organisms eventually die out.

- S-2-28: acquired characteristics can't be passed on. if i work out every day to build up really large biceps and then conceive a child, my child's biceps won't also be large.
- S-2-29: That's Lamarckian
- S-2-30: acquired traits that are passed on to offspring are the viable traits that the F1 generation will need to become viable members of their generation
- S-2-31: Natural selection involves the most adapted individuals survive and then reproduce and pass on their traits.
- S-2-32: Because even poorly adapted individuals can produce more offspring, and that may be their downfall
- S-2-33: It is not guaranteed that any single characteristic that was learned during an organism's life will be passed on. Each animal may learn differently.
- S-2-34: Not all organisms that produce the most offspring are the most successful according to Darwin's "natural selection." Organisms that give birth to few or one offspring can be successful in propagating the species as long as the offspring possess traits that allow optimal survival and fitness in a given environment.
- S-2-35: it's the answer
- S-2-36: Not all characteristics are passed on to the offspring. For example, if a person spends his life being a blacksmith and uses his arm a lot so that it becomes larger than the other one, this does not mean that he will produce offspring with a bigger right arm.
- S-2-37: Characteristics acquired during a lifetime are not passed on to the next generation I've learned this in Evolution class, bio 315. Also this answer is Lamarck's theory, not Darwin's.
- S-2-38: The organisms are not "acquiring" characteristics! All other are correct. :)
- S-2-39: An organism cannot acquire something during their lifetime and pass it onto their organism. Only if a change (mutation) occurs in the gametic cells can the genetic information change be passed on. This means that, for example, the idea of a giraffe having a long neck because it had to stretch to reach the leaves is wrong.
- S-2-40: It is what I remembered from class.
- S-2-41: Even some of the best adapted animals only produce one or two offspring per reproduction cycle. It is the survivability of the offspring and the parents that determines whether or not an organism is best adapted.
- S-2-42: Organisms can't choose to adapt.
- S-2-43: Clearly, answer #1 is a Lamarckism, traits are not acquired in one's lifetime to be passed on, but rather variation in a population is selected against and the fit individuals produce more offspring.
- S-2-44: I know that genetic heritability is important in natural selection. However, small changes during the life of the individual (for example getting a mole) are not generally heritable. The question is confusing, at best... misleading at worst.
- S-2-45: Lamarck was the individual who supported Acquired Characteristics. Darwin only maintained that genetic changes were passed on, not characteristics acquired during an individual's lifetime
- S-2-46: best answer
- S-2-47: Acquired characteristics are not passed on to offspring.
- S-2-48: Based on my knowledge of natural selection being the strongest survives out the weakest.

S-2-49: Traits acquired during an individual's life are not passed through genetics. My favorite example from high school is that if a person is hit on the head with a hammer everyday, the damage that is done because of that will not be passed onto their offspring because it is not based on their genetics, but their environment.

S-2-50: you spelled following wrong

S-2-51: you can't pass on aquired traits

S-2-52: It was right.

S-2-53: Acquired traits are not passed on

S-2-54: Characteristics that are capable of being passed from generation to generation do not just occur in one life time, it takes many generations for a significant changes to take place.

S-2-55: Its not the traits that were aquired during your life, those mutations are normally disadvantageous to your ability to reproduce....i.e. cancer.

S-2-56: It makes no sense

S-2-57: Those best adapted will have the most offspring.

S-2-58: that is more lamarkian thinking

S-2-59: I've had this information in lectures before.

S-2-60: The organisms best adapted to the environment will be able to produce the most offspring, which will in turn produce more offspring and continue the line of those particular individuals.

S-2-61: It was a guess. (I was choosing between a and e.)

Question 3

S-3-1: Fitness is the ability of an organism to pass on their genes, and thus the organisms that successfully pass their genes on to the next generation are the fittest and better suited for survival.

S-3-2: an organism can not be considered genetically fit until it has produced viable offspring

S-3-3: not answered

S-3-4: not answered

S-3-5: not answered

S-3-6: that is how it is i guess...don't know how I'd back it up but with the fact that darwinism doesn't necessarily mean the fastest and strongest, he is referring to the best ability to pass their genes on to another generation.

S-3-7: Even if you're eaten or killed, if you've already successfully passed on your genes, then you're "fit." Those that die off right away contribute nothing to the next generation and aren't "fit" at all.

S-3-8: If you're strong and fast, but can't reproduce, your genetic material will be lost. Thus no evolution occurs.

S-3-9: its the correct answer

S-3-10: Fit refers to the ability to survive in an environment and produce offspring

S-3-11: I was able to eliminate the other responses and I remembered that survival more or less refers to genes that are passed to the next generation.

S-3-12: Fittest means reproduction, and the goal of reproduction is to pass your genes on. Plus, I learned it in class

S-3-13: not answered

S-3-14: not answered

S-3-15: not answered

S-3-16: The level of fitness in evolutionary sense has to do with the ability to pass on genetic information to the most possible offspring.

S-3-17: Because the fittest are the ones that reproduce and pass on genes

S-3-18: This is because evolution is based around passing genes to the next generation, there is no specific idea for who is the fittest, for one species it could be who's biggest and fastest for another it could be who's the smallest.

S-3-19: learned it in a class at some time

S-3-20: I'm not going to give reasons anymore; all knowledge of evolution is memorized and recalled information required for biology classes.

S-3-21: being "fit" means producing viable offspring.

S-3-22: "survival of the fittest" deals with the genes that are best for surviving their environment, therefore, if an organism survives their genes must have been adapted to survive their environment and are therefore passed on.

S-3-23: I don't think i can continue to answer this question

S-3-24: Those that are the fittest are those that produce the most offspring that successfully reproduce also. This means that the first generation's genes will survive.

S-3-25: I really don't feel like any of the answers were really correct. Survival of the fittest is about the ability to pass on genes and that if you are not fit you will die. However it is dealing with a population and populations do not reproduce, only individuals

S-3-26: It's the right answer.

S-3-27: The overall goal of an organism is to pass on its genes to offspring. The fittest organisms will be the most successful at doing this, and their offspring will be the most likely to continue passing on these genes.

S-3-28: organisms with big muscles or speed may not be characteristics that provide the best reproductive success....and surviving into the next generation does nothing to the genetic makeup of a population if that organism doesn't reproduce.

S-3-29: Fitness refers to reproduction

S-3-30: you are only fit if you produce offspring

S-3-31: The fittest are the ones that reproduce and pass their genes onto another generation.

S-3-32: The fittest should survive to reproduce, if they do not, then they may not have been the most fit.

S-3-33: In modern biology, fitness is measured by an organism's reproductive success.

S-3-34: Fitness allows for the continuance of a species. That only results if the genes characteristic of a species are successfully passed on to new generations.

S-3-35: it is the answer

S-3-36: The term fitness when applied to natural selection does not mean that the person has the biggest muscles. Fitness concerns the ability to produce viable offspring.

S-3-37: I remember from evolution class that the fittest are the most able to survive AND pass on their characteristics to their offspring.

S-3-38: If an animal is not fit, it is selected against and thus cannot pass on its genes.

Also learned this in bio 315.

S-3-39: It's all about passing on the genes; it doesn't matter how long you're alive! You just have to pass on your genes. What about all those poor animals (ex: squid) who just make babies and die right away! And clearly being the biggest and fastest is not always desirable; bacteria (very tiny!!!!) and turtles (very slow!) seem to be doing just fine.

S-3-40: Just because an organism survives does not mean that it will pass its genes on. In other words, in order to be "fit" an organism must also reproduce successfully.

S-3-41: Remember from class.

S-3-42: being fit means producing viable offspring. As Dr. Wallace likes to say "Although you may be practicing, you are not fit until you reproduce."

S-3-43: fitness refers to genetic fitness--what is passed on, and not what is acquired during the lifespan.

S-3-44: The other answers were just plain silly. Fitness: is the genetic contribution to the next generation; so answer D was the best choice.

S-3-45: The underlying theme behind evolution is an intra-species competition for proliferation. As such, the highest fitness occurs when the individual beats his fellows and passes the most genes on to the following generation.

S-3-46: "Fit" refers to reproductive success

S-3-47: what i learned

S-3-48: Survival of the Fittest corresponds to fitness of an organism and ability to produce viable offspring.

S-3-49: You have to die eventually so the goal is to pass on your genes to have "someone" to outlive you.

S-3-50: Being 'fit' means that the organism is going to be able to successfully reproduce. This allows the 'better fit' genetic traits to be passed to the next generation

S-3-51: pass on genetics, you could be the biggest and badest dude out there, but if you can't have big and bad kids your done after you die

S-3-52: It was right.

S-3-53: Organisms bet suited for the environment will pass on their genes

S-3-54: Those that are capable of surviving based on their given phenotype will be able to successfully pass on their genes.

S-3-55: you can be the best adapt individual, but if you can't produce offspring then your advantageous traits dissapear with you. No accumulation of traits, no evolution.

S-3-56: because it is the correct one

S-3-57: It's the definition.

S-3-58: in evolution class this seemed to be the definition given

S-3-59: The fittest have the highest reproductive success because they are able to pass on their genes.

S-3-60: The organisms that are best adapted to the environment (the fittest) are the most likely to reproduce and past their traits on to the next generation.

S-3-61: Everything's all about reproductive success, right?

Question 4

S-4-1: While there must be a genetic basis for a particular phenotype, natural selection cannot act on a specific genetic trait unless there is a discernable phenotype that differentiates it.

S-4-2: Natural selection can only act on what is visible or present, which would be the phenotype of an organism. The genotype of this organism is affected by natural selection because it is linked to the phenotype.

S-4-3: not answered

S-4-4: not answered

S-4-5: not answered

S-4-6: Natural selection reacts at the genomic level, hence genotypes...as phenotypes only represent the genotype

S-4-7: Changing the genotype could produce multiple combinations. If the phenotype allows you to run faster, be smarter, or outsmart all enemies, then it doesn't really matter what your genotype is.

S-4-8: It's the phenotype that matters. The genotype cannot be changed by selection.

S-4-9: aa

S-4-10: Natural selection acts on those characteristics that are displayed.

S-4-11: Natural selection, the environment, acts on the products of genes, which would be the phenotype.

S-4-12: Learned it in class. And its commonsense

S-4-13: not answered

S-4-14: not answered

S-4-15: not answered

S-4-16: not answered

S-4-17: Nat. Sel. is not a conscious, thinking process so it can't cause mutations. It acts most directly on phenotype because this is what interacts with the environment where nat. sel. occurs.

S-4-18: Because you only pass genes not phenotype or any of the other

S-4-19: Natural selection happens by a mutation in the genotype which then changes the phenotype of an organism to better equip it for passing its genes on to the next generation

S-4-20: learned it in a class at some time

S-4-21: .

S-4-22: genes are responsible for the development of phenotypical traits

S-4-23: natural selection deals with the process of genes, therefore the genotype is directly affected.

S-4-24: a

S-4-25: not answered

S-4-26: Because the environment can not know nor care about the genotype

S-4-27: Not really sure

S-4-28: The genes of an organism are what are going to be passed down to the next generation. This is the only thing (not phenotype) that will allow the acquired characteristics (within the gene pool) to be passed down to future generations.

S-4-29: the phenotype is the physically expressed result of genotype, and thus natural selection acts on it. it's possible for multiple genotypes to produce the same phenotype (for example, a gene homozygous for the dominant allele can produce the same

phenotype as one that is heterozygous with one copy of the dominant and one of the recessive allele)..

S-4-30: Individuals with deleterious genes are selected against

S-4-31: The environment affects the characteristics of an organism.

S-4-32: Natural selection selects for traits of an individual, which is essentially the phenotype.

S-4-33: I remember learning about male birds and how the longer tailed birds would mate with more females. This quantitative characteristic is determined by an organism's genotype, which is passed on to a certain amount of offspring depending on how appealing this male is to the females, measured by natural selection.

S-4-34: not answered

S-4-35: Natural selection is the propagation of certain genes in generations because those genes allow the organism to best survive. The physical expression of genes, the phenotype, is what determines the success of those genes as it correlates to survival in a given environment.

S-4-36: it is the answer

S-4-37: The occurrence of natural selection is based on the difference of phenotypes that occur in the population and effect fitness and survival.

S-4-38: Remember this from evolution. Its also common sense after taking lots of biology.

S-4-39: Genes are what are passed on to each generation. However, phenotypes can also be selected for or against, which can lead to a change in genotype, so the previous answer is not completely correct.

S-4-40: Though caused by the genotype, the phenotype (too slow, too big, certain shape) is what makes an individual more or less fit. This questions was confusing, though . . .

S-4-41: Natural selection selects against those organisms whose phenotype makes them less fit to survive in a particular environment. Although a genotype has a particular allele, if the allele is not expressed it is not a candidate for selection.

S-4-42: Remember from class

S-4-43: Because genes determine the phenotypes that help or hinder the survival of an organism.

S-4-44: Phenotype is what can be affected because it is the way the genes are expressed. Genotype is present, but can appear 'invisible' like when recessive alleles are present.

S-4-45: While the genotype leads to the expressed phenotype, natural selection does not work directly against those genes, but rather in the phenotype.

S-4-46: Natural selection does not cause mutations, nor is it able to see the genetic code that does not display obvious phenotypes. Natural selection is not some entity that plays life like a puppet. It is a theory that describes the ability of those with the best phenotype for the environment.

S-4-47: The phenotype of an individual determines its fitness

S-4-48: what i was taught in evolution

S-4-49: The best adapted phenotype will be the favored one.

S-4-50: it made the most sense based on my knowledge of natural selection

S-4-51: Natural selection acts directly on phenotype, but indirectly on genotype as the phenotype is effected by the environment, but the genotype is what is passed to the next generation.

S-4-52: they aren't eliminated and can therefore persist

S-4-53: It was right.

S-4-54: The traits an organism displays are what natural selection acts upon

S-4-55: Phenotypes, given the organism's genes, are the physical features of an organism that allow for their survival. Those without favorable phenotypes will not survive. It is then that genotypes are altered when that certain phenotype is selected against.

S-4-56: Phenotype is the expression of genes. Unless the environment has a direct bias against the code GGTTATTC, then it would have to act against your phenotype which is the expression....i.e. a little taller reaches the leaves that are a little higher and therefore you live through drought, passing on your genes to the next generation the next year.

Although, UV radiation from the sun causes thymine dimers, so wouldn't you be less fit to live in the sun if you had more thymine, and therefore it would be acting against your genotype directly?

S-4-57: It's what happens.

S-4-58: that seems like the root of change

S-4-59: Natural selection changes the genotypes to better adapt the organism.

S-4-60: Natural selection acts on particular traits that are best suited for the environment.

S-4-61: I'm sensing a pattern of questioning... Natural selection doesn't *cause* mutations. The recessive alleles answer was also stupid. Choosing between 'b' and 'c'... well, it affects both phenotype and genotype but I guess that I am under the impression that the most fit phenotypes are selected for, and that in turn impacts genotypes.

Question 5

S-5-1: According to its definition, homologous structures are those that share a common ancestor.

S-5-2: not answered

S-5-3: not answered

S-5-4: not answered

S-5-5: not answered

S-5-6: homologous appendages would indicate that they came from the same ancestor, but evolved in different ways.

S-5-7: It is reasonable to assume that the very same structure did not evolve three different times, though it could have happened.

S-5-8: At one point in history some common ancestor had a forelimb, over eons, that organism went through divergent evolution and eventually become each of the animals mention. The forelimb remained, though changed from the original

S-5-9: its the right answer

S-5-10: They all have the same general structure (humerus, radius/ulna, wrist, hand), but in slightly different forms depending on the environment. This shows that there was probably a common ancestor from which all of these animals evolved.

S-5-11: To have bones that are similar indicates that there was a common ancestor -- I thought this was the most likely answer.

S-5-12: From the genetic point homologous means similar or same and the only answer that compares them on the same level is this one.

S-5-13: not answered

S-5-14: not answered

S-5-15: not answered

S-5-16: not answered

S-5-17: If they all have homologous structures then most likely they had a common ancestor because the chances of it evolving three different times in this many different animals is unlikely. Also, you can't say that they evolved separately because they all have completely different habitats that all have separate selection pressures

S-5-18: Because they obviously don't have the same function, and homologous structures could have occurred either from a common ancestor or from convergent evolution from three separate lineages. If all have similar structure, however, it probably means that it is advantages in survival so evolution will come to this structure many times

S-5-19: These are homologous because they are used for the same function and have similar structure

S-5-20: learned it in a class at some time

S-5-21: .

S-5-22: homologous meaning that the structure has a similar function in each organism

S-5-23: These characteristics can be traced back to a common ancestor due to fossil records.

S-5-24: adaptive radiation

S-5-25: All are vestigial limbs that developed into specific limbs. They probably became specialized to those animals involved with specific environmental stresses.

S-5-26: Well it isn't as clear of a relationship as that, but most likely they did evolve from a common ancestry

S-5-27: Learned this in Bio 303

S-5-28: Having homologous structures typically goes along with the three organisms having a common ancestor. Since the three organisms are very different, this forelimb structure has evolved in order to adapt to the needs of the animal. The general pattern and formation of the forelimbs all have a very strong resemblance.

S-5-29: b is definitely incorrect, and i don't believe they would be called homologous if they evolved separately three times for different function

S-5-30: Homology just refers to structure

S-5-31: there structure is so similar that they likely evolved from a common ancestor

S-5-32: Homologous structures have evolved over time into different structures, but they came from the same place or ancestor

S-5-33: Because homologous features come from the same source, while analogous features end up having the same function, but arrive there in different ways.

S-5-34: not answered

S-5-35: Although these limb functions are very different, their structures are similar. Homology such as this points to the fact that these organisms shared a common ancestor at some point in the phylogenetic tree, even if it was a long time ago.

S-5-36: not answered

S-5-37: The similarity in structure of those limbs from three different species hints that those different species were derived from a common ancestor that possessed a limb of similar basic structure.

S-5-38: it is the answer

S-5-39: The confirmation of homology is a major issue when determining phylogeny. Homology is the similarity between organisms that results from inheriting genes or traits from a common ancestor.

S-5-40: I remember this from evolution and comparative chordate anatomy.

S-5-41: All of these structures rose from a common ancestral form that was close to what is found today. It is unlikely that these structures evolved at three separate times, especially if one considers Ozam's (spelling?) razor.

S-5-42: They are all derived from the same ancestra being with some sort of limb; each animal, however, has had changes in their limb to better fit their enviroment.

S-5-43: Long ago, a common ancestor had a trait that was similar to the leg/arm. The trait was conserved at least somewhat throughout the evolution of the three animals. learned from class

S-5-44: Not completely positive that was the best possible answer, but the closest i could come to it.

S-5-45: Homologous structures indicated a synapomorphy that began in a common ancestor.

S-5-46: Homologous structures are critically in establishing relationships and ancestry. Therefore the question pretty straight forward.

S-5-47: I do not subscribe to your dogma of macro evolution, nor do I think that ridiculous comparisons of anatomy such as this tell us anything about how they come to be present today. Obviously they do not have the same function. I know that evolution is random; therefore, I suppose I don't understand the question.

S-5-48: "Homo" refers to "one." This feature evolved once among the ancestors of the animals in question.

S-5-49: Homologous structures descend from a common ancestor. (?)

S-5-50: that's what I've been taught

S-5-51: Similar structures came from a similar ancestor from which the organisms evolved from.

S-5-52: this whole explaining thing is getting old, it's the best answer, that's why i chose it

S-5-53: It was right.

S-5-54: All developed from a quadriped ancestor

S-5-55: Animals will evolve the structures that fit them best. The structures in those examples happen to be very similar but that does not mean that they came from a common ancestor. Because similar traits are capable of evolving separately.

S-5-56: homologous means they are the same and if they are the same they would have to have a common ancestor at some point.

S-5-57: Because they do.

S-5-58: analogous would be sharing a common function but no common ancestor

S-5-59: These structures are all the same and homologous indicated common ancestor.

S-5-60: Homologous structures look similar (somewhat) and can have similar function, but in order to be termed homologous they must have derived from a common ancestor.

S-5-61: Who knows. Evolution is nonrandom here because the structures described all serve a purpose. The organisms evolved with those features because they had to, not by chance.

Question 6

S-6-1: All groups of organisms are capable of evolving. Individuals don't 'evolve', but groups of individuals within the same species (populations) do evolve.

S-6-2: Evolution does not occur in single individuals, it occurs on a large scale across populations and generations. An individual does not evolve in their lifetime.

S-6-3: not answered

S-6-4: not answered

S-6-5: not answered

S-6-6: Evolution occurs in micro scale, but it would be seen in populations of the same species from one area to another.

S-6-7: All populations evolve. And individuals can't. They are either fit, unfit, or somewhere in the middle. An individual's phenotype and/or genotype do not change to increase fitness, therefore evolution does not occur in individuals.

S-6-8: Even humans evolve. We went from hunching to walking upright

S-6-9: evolution occurs when a possible shift in survivalship of an organism occurs and only the fit reproduce and pass on there genetics.

S-6-10: Evolution occurs in population shifts as a whole.

S-6-11: Evolution is ABLE to occur within all populations, but there are 5 Hardy-Weinburg Equilibrium points. If all of these hold, then there is no evolution within a population. However, I am sure that this is extremely rare.

S-6-12: It is always occuring, even if we don't see it, it takes a lot of time

S-6-13: not answered

S-6-14: not answered

S-6-15: not answered

S-6-16: not answered

S-6-17: Evolution can't happen in an individual, that what be Lamarckian adaptation. It must happen in populations through selection of the most fit organims that pass on their traits to their offspring. Every population evolves, some slower than others, but because of random mutation it will always be working.

S-6-18: Because a population is needed for a genetic change to occur, and any species that reproduces will evolve as individuals with certain characteristics are more likely to have reproductive children

S-6-19: Evolution is occurs in all organisms not just what we believe to be more advanced organisms

S-6-20; learned it in a class at some time

S-6-21; .

S-6-22: evolution processes depend on the individuals interaction with the environment- not all organisms, even in the same population share exactly the same experiences

S-6-23: evolution is a process that is seen throughout the entire population of all organisms.

S-6-24: nature is the key

S-6-25: Evolution occurs everywhere. It doesn't act on individuals, but on populations of individuals.

S-6-26: Evolution occurs in all populations whicha re not at the hardy-wienberg equalibruim

S-6-27: Seemed like the right answer.

S-6-28: Everything organism on the planet is constantly undergoing evolution. It is a natural process that works on everything, taking no exceptions. It may be much faster or slower in some, but it is occurring in every living thing.

S-6-29: evolution occurs within all species as recombination takes place and produces advantageous characteristics that lead to changes in the genetic makeup of the population...

S-6-30: Micro-evolution can be measured in our lifetimes in many populations

S-6-31: not answered

S-6-32: It seemed like the best answer.

S-6-33: Because although it would be amusing if evolution only occurred in certian breeds of dogs, it doesn't, it occurs in anything pressured by selection.

S-6-34: not answered

S-6-35: the ancestry taught in science of the phylogenetic tree and other more specific speciation trees

S-6-36: The passing of genes and their persistence to characterize a group depends on the interactions of the group as a whole--that is, the population. Evolution takes place in all organisms, whether in complex humans or relatively simplistic bacteria or plants.

S-6-37: it just does

S-6-38: The evidence that supports evolution, exists in different populations and in different organisms. I think that all populations and all organisms undergo or are capable of undergoing evolution. The environment is constantly changing, so organisms have to adapt to be able to survive and reproduce

S-6-39: Wasn't a hundred percent sure, but it seemed to make the most sense.

S-6-40: Evolution is not limited to specific organisms or populations of organisms. It is a widespread process that affects everything.

S-6-41: Certainly all life undergoes evolution, but the individual does not change, it is the population of organisms that changes over a loooooooooooooong period of time.

S-6-42: Evolution is a dynamic, albeit slow process that is constantly occurring.

Although some organisms and processes that exist today are quite primitive and have evolved very little over time, the process is still active.

S-6-43: learned from class

S-6-44: evolution is the change in a population through time

S-6-45: all duh.

S-6-46: Populations are key in evolution process, since varriation and competition, are intregral in driving it.

S-6-47: All organisms are constantly adapting to their environment. In that sense, evolution is constantly occurring in all organisms.

S-6-48: Ummm.... because evolution DOES occur in all organisms

S-6-49: Evolution is not restricted to one species and it acts at the population level.

S-6-50: I personally don't see enough evidence for complete evolution but I can see that there are minor forms of evolution that have occurred.

S-6-51: Evolution requires populations of organisms to be effected. One individual does not create evolutionary change. Also, evolution occurs in all organisms, even humans, although humans may be able to influence their evolution in some ways.

S-6-52: an individual doesn't really evolve, it is more of a population thing

S-6-53: It was right.

S-6-54: Evolution occurs in all organisms

S-6-55: all organisms have their own gene pools that are capable of changing.

S-6-56: I don't believe in evolution, mainly because of many reasons with physics and chance. For example the law of thermodynamics. plus, a wing is worthless without flight, so unless the arm of an animal suddenly flattend to help it glide I see no possible advantage in a slightly flattend arm, therefore the trait would be lost to the next generation. It a good idea, and survival of the fittest is observable and true. I just don't see organisms gaining complexity when the universe is spiraling to its imminent end.

S-6-57: It's what I think.

S-6-58: it is general and occurs within a population

S-6-59: Because evolution occurs larger than just populations.

S-6-60: An individual cannot evolve on its own; it must reproduce and past on traits to its offspring. Therefore, evolution happens in populations and it happens in ALL populations, not just certain ones.

S-6-61: I somewhat touched on this earlier. I don't know how to answer what my reasoning was other than to restate my answer: Evolution occurs in populations, not individuals.

Question 7

S-7-1: Speciation can occur in any species at any time.

S-7-2: Usually speciation occurs when a population of the same organism is somehow separated (there are many ways in which this can occur) and over time the two subpopulations evolve independent from one another and this could lead to one or two new species than what these organisms were before.

S-7-3: not answered

S-7-4: not answered

S-7-5: not answered

S-7-6: not answered

S-7-7: Speciation is a continuing process, even if we can't observe it directly. And evolution does not mean "becoming more complex." If a simpler form or system will allow the species to survive, it can still evolve to be simpler.

S-7-8: not answered

S-7-9: its the right answer

S-7-10: Speciation is the result of a subpopulation of a species being subject to differential pressure from the main body of the species and over time becoming reproductively isolated or unique.

S-7-11: The first choice didn't really make sense to me, so I chose the one I did because it is possible for speciation to occur in any population.

S-7-12: It can occur in any organism but it also doesn't fit my entire thoughts on it. Dr. Wallace has some very good points in his class about it.

S-7-13: not answered

S-7-14: not answered

S-7-15: not answered

S-7-16: not answered

S-7-17: Speciation occurs when one population of organisms is somehow split, either through environmental changes or migrations, etc that ultimately cause a differential in selection pressures of the population. Different pressures cause differing evolution and eventually the organisms become so distant that they become (through our definitions) a "new" species. It can occur in all organisms.

S-7-18: All populations are evolving all the time

S-7-19: speciation can occur in any population due to evolution which can cause a change in the genotype and which can pass those genes from generation to generation

S-7-20: learned it in a class at some time

S-7-21: .

S-7-22: speciation is possible in any organism, not necessarily more complex, but different

S-7-23: speciation can result from any organisms b/c it deals evolution which also affects all organisms.

S-7-24: i remember a discovery channel special on the black whistler being considered as a new species because of the growth of that particular sub-population of cougars.

S-7-25: not answered

S-7-26: i dont really feel there needs to be any explanation for this

S-7-27: a

S-7-28: There are no rules for evolution. Everything is able to undergo speciation under to right conditions (ie. isolation).

S-7-29: a. can only occur in organisms of a similar kind a is not correct because speciation requires both organisms to be of identical species before it happens... b. has not occurred since the creation of the earth b is incorrect because there are many more species now than there were at the beginning of life after earth was formed. c. always results in more complex organisms some speciation could include the loss of gene function because it is not needed, in which case the organism would be less complex. d. can occur in any population of organisms yes! e. None of the answers fit my basic viewpoint no...

S-7-30: Darwin

S-7-31: a dog can not reproduce with a cat to form a new species....therefore the species have to be similar in order to create a new species

S-7-32: Speciation is random, but I believe it can occur in any organism.

S-7-33: Because any species can gain enough differences to eventually segregate and speciate, or can be separated by a mountain, river, disaster, etc., that can lead to speciation.

S-7-34: not answered

S-7-35: Speciation can occur in many ways as has been seen in evolution whether it is through isolation of a species into two different environments that result in differentiation, mating of closely related organisms to form a new species, or mutations that separate a species in two, speciation happens.

S-7-36: not answered

S-7-37: Speciation will involve the divergence of one population from the next--the resulting divergence would be related somehow to the population it originated from.

S-7-38: species are formed all the time

S-7-39: The concept of speciation can occur in any population under the right circumstances. For instance if a reproductive barrier has occurred then the organisms can eventually become two different species. A species must be able to breed and produce viable offspring. If this new species can no longer breed and produce viable offspring with organisms that belonged to the original population, then a new species has resulted.

S-7-40: Through process of elimination...this was just a guess.

S-7-41: Speciation can occur at any time in any organism or population of organisms when that population is in reproductive isolation.

S-7-42: Certainly speciation has occurred since the beginning of the earth (duh, we're here!), and certainly more complexity is not always achieved. Yes, humans are more complex than bacteria, but complexity does not imply success! (seems to me there's a lot more bacteria, and man, they can bring us crashing down!).

S-7-43: Speciation occurs when populations of organisms become unable to reproduce together. However, the predecessor and the new species must have been similar for it to have been evolution!

S-7-44: Biology 315

S-7-45: speciation is always occurring.

S-7-46: Any kind of organism can experience a speciation event. I don't believe that the complexity always has to increase.

S-7-47: speciation is on going even today. Populations that undergo divergent selection, over time, if reproductively isolated can speiciate

S-7-48: I have no idea how speciation occurs, nor do I believe that anyone can.

S-7-49: Answer D was pretty close, but it did not mention anything about the mechanisms of speciation, such as bottlenecks, etc. Speciation isn't likely to occur within ANY population without some mechanism to kick-start it.

S-7-50: Speciation can occur in all types of organisms.

S-7-51: I'm not sure what I think of speciation due to my lack of research and knowledge on the subject

S-7-52: If a population of a certain species is divided by some sort of object (man-made or environment such as roads, rivers, mountains, etc.) they will not be able to share genetic information anymore, eventually leading to a different species over time and evolution.

S-7-53: those answers sucked

S-7-54: It was right.

S-7-55: Speciation can occur in any group of organisms

Some species may change so much given a variety of factors that they become so distinct as to merit them as a new species.

S-7-56: Thats the answer that you would want. In a population your still interacting and sharing genes, so you would never gain enought different genetic material to be unable to mate with someone of the same species. I don't however see orgainsms becomeing more advanced.

S-7-57: It's the truth.

S-7-58: I guess that it can happen via allopatric, sympatric, parapatric speciation

S-7-59: Discussed this in class. One population of organisms can be split and become two separate species because of it.

S-7-60: Speciation occurs when animals of the same species become separated (somehow) and change enough over time to become reproductively isolated, thus producing two separate species. This can happen to all species under the correct conditions.

S-7-61: All the other answers were obviously wrong.

Question 8

S-8-1: As a Biology major, I strongly believe in evolution. There are extensive lines of evidence that support this theory. It is a valid scientific theory.

S-8-2: Based on everything scientists have learned through genetics how could I not think this? Many people might argue against evolution because of their religious backgrounds, however science and religion, I think, are two very different, separate things. Science, and specifically evolution, is based on empirical data and logical theory. Religion on the other hand is based on faith. I find it impossible to say that evolution is not a scientific idea, because even if someone strictly religious does not agree with evolution, they cannot say that there isn't data to back up the idea that it exists

S-8-3: not answered

S-8-4: not answered

S-8-5: not answered

S-8-6: not answered

S-8-7: Evolution is a theory, yes. But a large body of evidence (in my view) supports the theory.

S-8-8: not answered

S-8-9: it is valid based on fossil evidence however is not a proven theory because you can't go back and prove certain things, also how fossils are reassembled can have different viewpoints.

S-8-10: I believe in the process of evolution: species change over time due to environmental pressure. To me this idea makes sense. However, the why of the process is not well defined by evolution, and theories such as intelligent design or specifically God are more in line with my beliefs.

S-8-11: Biological evolution is a very valid idea. There has been an overwhelming amount of evidence for evolution. However, with all things science, it can never be proven, just disproven.

S-8-12: We have shown that everything is related in pedigrees. Tracing back elements and functions has revealed that we are similar in certain characteristics.

S-8-13: not answered

S-8-14: not answered

S-8-15: I have a functioning brain.

S-8-16: not answered

S-8-17: Many reasons, there is massive amounts of evidence included in the fossil record, in homologous structures of different organisms, in residual organs/structures that aren't used by the current owners. We can observe evolution, we can create evolution in a test tube or elsewhere. It is testable and falsifiable.

S-8-18: I don't know as if I believe in the big bang, but as far as biological evolution it only makes sense that those individuals that reproduce and have reproductive offspring will have more of an impact on future gene pools, and those that are reproductive probably have distinct genes that will be passed on in higher than random amounts

S-8-19: I believe this because of the overwhelming evidence that has been displayed to set out and prove biological evolution

S-8-20: Biological evolution is a secular point of view, and even though micro evolution can be backed up and argued for macro evolution can't be proven or even supported by current evidence

S-8-21: Biological evolution is a very good model for the existing data, but like many scientific models it is not perfect. Perhaps in future a better model for the appearance/disappearance/changes in species will be found.

S-8-22: there is evidence of evolution, there is no evidence of a divine entity creating existence

S-8-23: I believe in biological evolution b/c there is a wide range of scientific data to support this theory.

S-8-24: it is

S-8-25: not answered

S-8-26: Because evolution is a fact of life. Bacteria and viruses are evolving in front of us

S-8-27: a

S-8-28: Although much of science is hypotheses and theories, much of what is believed to be true today has strong supporting evidence. Biological evolution is one of these. The fossil record is something that cannot be discounted, and although there are still many gaps and many questionings, the fossil record is proof that biological evolution has been occurring since the beginning of time and still continues today.

S-8-29: There is so much evidence that supports the theory, and no evidence has proven it incorrect so far.

S-8-30: It can be observed and measured and accounts for many phenomena

S-8-31: not answered

S-8-32: I agree, research shows that biological evolution occurs.

S-8-33: It's as scientific as the "theory" of gravity.

S-8-34: The scientific evidence presented to me in my classes has made sense, especially when we look at how conserved molecular sequences are and the homology of many organisms.

S-8-35: Fossil, DNA, anatomical, physiological, geographical, among mounds and mounds of other evidence show relationships among organisms and patterns of origin. Evolution is valid.

S-8-36: it makes sense

S-8-37: I believe evolution exists. There is evidence that supports that evolution has occurred and can occur. I also believe that a divine creator was responsible for the creating the human race and other organisms, but these organisms had to evolve to the changing environment. Basically I don't believe that its either evolution or divine creation, but rather a combination of both.

S-8-38: There is massive amounts of evidence to support evolution. Its almost impossible to comprehend biology without believing evolution. I believe, supporting evolutionary theory, does not refute my religious beliefs.

S-8-39: I think evolution with a mix of genetics and the other sciences helps to explain how the earth was and the organisms on earth have changed over time. Evolution needs to be combined with other sciences though to make any sense to an individual.

S-8-40: I take issues with some of the terminology; mostly I do not know what is meant. The term "idea" . . . to me that says it's just kind of a passing thought, and by gosh, evolution is more than that! Evolution explains the diversity that we have on this planet. Without it, biology simply doesn't make sense! So I think it's much more than an idea. Secondly, "valid" . . . valid as in . . . it's a law? Because no, it's not a law. It is a theory.

Theory, of course, does not imply "just a theory;" a theory is a powerful tool in science, offering the best explanation based on an overwhelming amount of evidence. So I guess I am just too unsure about the terminology to commit to an answer on this one. :)

S-8-41: I think there is enough evidence to say that evolution is valid scientifically.

S-8-42: It is my belief

S-8-43: things such as the fossil record and experiments on small organisms with short reproduction cycles are good indicators that evolution is a real thing.

S-8-44: It is a hypothesis that can be tested.

S-8-45: Biological Evolution lays the basis in small minute changes over the vastness of time that explains the complex and diverse world we see today.

S-8-46: Small changes in genetic sequences occur often. In bacteria, for example, we all see the development of resistance to some of our best treatments. The bacteria are still bacteria, though, and I have yet to hear of a report of even a simple change from their specific species. To base an idea on rough fossil evidence and genetic or anatomical similarities is interesting but hardly convincing. As the religion to the atheist, I don't believe that evolution itself is a scientific endeavor whereas its supporting branches certainly are.

S-8-47: Biological Evolution has a strong base of evidence. There are any number of fossils that show the evolution of species, there are homologous structures within seemingly unrelated species, there's genetic evidence, etc.

S-8-48: I am a Christian

S-8-49: Evidence presented to me has been convincing in showing that evolution does indeed occur.

S-8-50: I agree the biological evolution is a valid idea in science, but not in the large scale. I also believe if we give one idea a chance, we should give others a chance. That's what science is, finding truth through experiments and many different hypotheses, so it is a valid idea, as are other arguments.

S-8-51: Biological evolution has a base in science. It has provided theories and facts as to how it is valid, instead of just offering the 'just believe' idea. It is also hard to look past the fossil records and the similarities of diverse organisms.

S-8-52: with all the evidence supporting the theory of evolution, it is becoming less and less of a theory, but there are still some unanswered questions, which is exactly why more research needs to be done. Is this some sort of evolution vs creationism vs ID survey?

S-8-53: I could go into the philosophy of science and logic, and point out that all scientific arguments are not in fact valid, they are invalid, but very strong arguments. They are invalid because the scientific statement "All eukaryotic cells have a nucleus" cannot be proven to the point that it would be considered (by logic) to be valid (i.e. we cannot show that all eukaryotic cells for all time before and time hereafter have, have had, and will have a nucleus). But I still agreed with the preceding statement that had that key word 'valid' in it. I accept that science may be logically invalid, but to me science is valid in every way that is important (in the reality we are all subject to).

S-8-54: Evolution can be proved - i.e. antibiotic resistance of bacteria - one small mutation becomes more prevalent and eventually dominates in a population because it is advantageous

S-8-55: I believe in evolution and how organisms can change over time. It's reasonable and has a lot of evidence behind it.

S-8-56: IDEA....not proven. Just like christianity is a valid creationism IDEA....not proven.

S-8-57: It's the explanation for the past events that makes the most sense to me.

S-8-58: I think that it helps explain fossil records and the ancestry of extant species

S-8-59: Evolution is an important theory for science but I feel it is overly focused on.

S-8-60: Organisms change over time. Scientific research validates this and we can see it when looking over the fossil record and when looking at extant species. I believe research supports it and provides me with enough evidence to convince me of its occurrence.

S-8-61: There's proof in the fossil record. There's proof in numerous studies. Evolution occurs. Whether humans evolved from apes is a different question.

Question 9

S-9-1: Geologic evidence strongly disputes that theory. The earth much, much older than 10,000 years.

S-9-2: Scientific data exists that says the earth is billions of years old.

S-9-3: not answered

S-9-4: not answered

S-9-5: not answered

S-9-6: not answered

S-9-7: Carbon dating and other dating techniques claim the Earth to be millions of years old. If the decay of carbon isotopes occurs at a constant rate, I say that carbon dating is reliable, and thus the Earth is far older than 10,000 years.

S-9-8: LOL

S-9-9: 6,000-10,000 yrs old refers to what the bible says. i beleive everything in the bible is fact, but there are parts that we will never understand. for example is God's time equal to our time. No, the bible says that our lives are like a drop in the bucket, and in the blink of God's eye. so who knows really anything about time, it's just a scale we use to determine events with reason. Also, who knows if God's plan wasnt through evolution. You can't possibly answer questions comparing God and evolution theory.

S-9-10: Even though religious figures have worked back through the bible to determine the age of the earth, and put it between 6,000 and 10,000 years, I do not believe this is so. The integration of Science into our understanding of beliefs is important, and one cannot be whole-hartedly or blindly followed on its own. The more I have learned about science, the more I beleive in God. The more I believe in God, the more I want to know about science. To me they are very inter-related, and not at all mutually exclusive.

S-9-11: There is reliable carbon-dating evidence which dates rocks and other fossils back millions of years. I believe that time span is short.

S-9-12: Carbon Dating & other methods reveal otherwise.

S-9-13: not answered

S-9-14: not answered

S-9-15: Please see response to Question 17.

S-9-16: not answered

S-9-17: There is much evidence from radio-isotope dating and superposition that the eath is around 4.5 billion years old.

S-9-18: Since says it is older - the physics and chemistry behind it makes a strong case, but in science there are alway chances of error so I only put disagree not strongly disagree. And I have a Christian background that still compels me to doubt the physics of evolution a bit

S-9-19: i strongly disagree with this since carbon dating and other methods have proven that there are things on earth older than 10,000 years

S-9-20: based on the liniage studies done on the bible current creatinist believe that the earth is about 6000 years ago

S-9-21: Does how old the earth is really have any bearing on how we live our lives today? Will knowing how old the earth is help us find a cure for cancer, AIDS, or even the mumps? Does it improve anyone's lives? No? Then who cares? Certainly not me.

S-9-22: the earth is 4.6 billion years old

S-9-23: There are fossil records that support the earth being much older than this.

S-9-24: my grandfather's older than that...

S-9-25: The earth, according to evidence, is around 4 billion years old.

S-9-26: Evidence shows it is much older

S-9-27: We have a fossil record dataing back hundreds and hundreds of millions of years. We also have sedimentary fossils showing that, although life had not occured yet, the earth date back billions of years.

S-9-28: Carbon dating has identified innumerable examples of objects that are older than 10,000 years. Geological studies and records pinpoint the earth's age at about 4.6 billion years.

S-9-29: Radiometric dating

S-9-30: this does not fit with my religious view points

S-9-31: I don't remember.

S-9-32: The earth is probably at least 4 billion years old and has been figured out to be so by measuring the decay of materials with known half-lives.

S-9-33: not answered

S-9-34: I recall learning that the earth is about 4 billion years old.

S-9-35: not answered

S-9-36: Carbon decay indicates that rock material and other organic fossilized matter have been around for waaaaay longer than 10,000 years.

S-9-37: it is several billion years old

S-9-38: The earth is a lot older than that. The earth has existed for more than 4.5 billion years. I'm not sure of the exact age of the earth, but I'm positive it's much older than 6 to 10 thousand years.

S-9-39: The earth is MUCH older

S-9-40: That is too young for the Earth. That is the view of some members of the church who do not use the sciencific evidence available, such as geological dating that has been done on the parts of the Earth. Also this is too short of time for all of the necessary biological processes and biochemical processes to have become as efficient as they are in "lower" animals (i.e. non-humans).

S-9-41: Heck no! I find it very difficult to believe that the Earth managed to cool down from a fiery ball and diversify into millions of species in even 10,000 years. Plus, we've dated all those rocks! I'm going to stick with 4.5 billion thank you very much. :)

S-9-42: Radiometric dating of fossils/rocks says differently!

S-9-43: my beliefs

S-9-44: Potassium dating, Carbon dating, and other types of radioactive dating very easily prove otherwise.

S-9-45: Rocks have been dated to be older.

S-9-46: The earth has been proven to be many times older than that through geological evidence and radiation dating.

S-9-47: We cannot know for certain, as none of our models have been around long enough to prove their accuracy that extensively. We learn in statistics that we can only make predictions to things that are within our own data set or slightly outside. We have no idea how the samples used in our dating techniques would have been effected outside of our modern era.

S-9-48: Since I hold biological evolution to be true, as well as scientific methods such as carbon dating, an earth that young just isn't possible. Especially with the time measurements of the expansion of the universe supporting the idea of an older earth.

S-9-49: Scientific data dates the Earth at approximately 4.5 billion years old.

S-9-50: I haven't done enough research or personal inquiry into it. I feel it doesn't exactly matter too much to my beliefs/viewpoints/life view. God can still exist despite the age of the Earth. No one was there when Earth was started so I think trying to date the Earth is a very arduous and possibly pointless idea.

S-9-51: Fossil records and other data suggest that the earth is MUCH older than 6-10,000 years old.

S-9-52: in order to believe that then you just reject all the sciences, physics, geology, biology, chemistry, astronomy, etc. it is ridiculous that anyone would believe that.

S-9-53: It is right.

S-9-54: I don't remember the number exactly (3.2 billion maybe?) but definitely older than that

S-9-55: That's too young...chose wrong answer and couldn't go back and change it. The earth is a lot older than that.

S-9-56: I'm not a geologist, I don't know for sure. Carbon dating seems a little fishy. If the earth is 3.5 billion years old...carbon dating is approx 50 years old....then we have been measuring radioactive decay for a very short period of time and might not know some of the carbon recycling properties of the universe. Flucuations in decay?

Catastrophic events depositing large quantities of carbon 6 billion years ago that have been cycled into our planet? I don't know haven't thought about it too much.

S-9-57: There are fossils that are older than 10,000 years, so the earth MUST be older than 10,000 years.

S-9-58: It is a lot older based on class Bio 315

S-9-59: The Earth is much older than that just based on fossil and mineral data.

S-9-60: The earth is much older, according to geological research.

S-9-61: Carbon dating and all that other crap tells me that the Earth is older than that.

Question 10

S-10-1: Nothing can be proven certain, but rather can only be disproved. Science is an accumulation of knowledge, which eventually leads to generalizations. Generalizations that are strongly supported by multiple lines of evidence are called theories. Thus, while evolution can never be 'proven correct', it is subject to being disproved, but is no more "unlikely to be correct" than if it were not a theory.

S-10-2: not answered

S-10-3: not answered

S-10-4: not answered

S-10-5: not answered

S-10-6: you can see evolution in many different small populations over the world, for example the ground finches in the Galapagos islands.

S-10-7: Evolution is "only a theory." But it is a strongly supported theory. Until an equally large body of evidence to the contrary is produced/found, I will continue to believe the evolution is valid.

S-10-8: There are lots of theories in physics, but no one questions the validity of those

S-10-9: No one really knows, now do we. we have evidence and it is the most likely answer, but it is not necessarily proven.

S-10-10: Most things that are believed in science are theories. Evolution has not been proven false yet. The method of hypothesis testing states that nothing is proven true, only proven false. Only after much testing without something being proven false can it become a law.

S-10-11: Biological evolution is a theory, but that does not indicate the likelihood of it being true or false. It may be proven false at any time, but it can never be proven true. As it is classified as a theory, it carries a little more weight, so to say, than other ideas which are not theories or laws.

S-10-12: Biological Evolution is a theory and yes a theory can always be proven false but that is not the point. The point is that it could be true and scientific evidence points towards this theory.

S-10-13: not answered

S-10-14: not answered

S-10-15: I don't like the word "unlikely." Yes, it is a theory - and at most it could become a law - but still nothing is every 100% certain in science...or anything for that matter.

S-10-16: not answered

S-10-17: Evolution is not just a theory. It has been tested over and over again. there is evidence everywhere you look. Based on the principles of evolution you can make predictions and hypothesis that can be tested and falsified. These results usually if not always fit in accordance to biological evolution.

S-10-18: Evolution is a theory....that is why it is likely correct. It had to withstand many tests to get to the status of theory and because nothing can be proven, it is as likely to be true as things such as the electromagnetic spectrum.

S-10-19: i disagree because biological evolution is theory but i don't think that it is likely to be wrong

S-10-20: you don't prove a theory true, you can only fail to prove it false

S-10-21: See previous response to "Biological evolution is a valid science idea."

- S-10-22: evolution has a great deal of supporting research and likely explanations, at the moment, it is the best explanation of differentiation of life
- S-10-23: biological evolution is a theory and therefore may be incorrect, however there is a wide range of data that supports the theory.
- S-10-24: i disagree
- S-10-25: not answered
- S-10-26: There are plenty of theories are thought to be correct.
- S-10-27: a
- S-10-28: The fossil record is undeniable. Although it is incomplete, it shows that there has been some sort of organismal progression or advancement through time. Biological evolution has most definitely occurred.
- S-10-29: To become a theory, there must be much supporting evidence, and the theory can be proven false by evidence that contradicts it. As the theory has existed for a long time without contradictory evidence, it is most likely correct.
- S-10-30: Theory means best explanation
- S-10-31: not answered
- S-10-32: I believe that biological evolution occurs
- S-10-33: A theory is set of statements or principles devised to explain a group of facts or phenomena, especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena.
- S-10-31: not answered
- S-10-35: In my scientific career I have learned that no theory can be proven absolutely true, if it is then it is made a law. However, evolution has a sufficient amount of evidence that I think it is likely correct.
- S-10-36: Evidence continues to back up biological evolution. Concrete and tangible evidence that continually can be demonstrated and reinforced.
- S-10-37: it makes sense
- S-10-38: For an idea can become a theory, it has to be heavily researched and supported by multiple scientists. A theory should not be discredited just because it is a theory and not a fact. A fact can not be adjusted to accommodate new found data, a theory can.
- S-10-39: Its more than just a theory...
- S-10-40: Religion is also "just a theory". Besides, there is much scientific evidence to support the theory of evolution.
- S-10-41: JUST a theory?!?! A theory is an explanation based on an OVERWHELMING amount of evidence. It can't be proven, per se, but science can't really ever be proven; there is always the chance, all-be-it unlikely, that the next time we let go of the apple it will go up instead of falling down towards the Earth. As I said in a previous question, biological evolution is a theory, and it explains the state of our world, what with the diversification of species. Without it, biology doesn't make sense!
- S-10-42: Although still a theory, there is strong evidence for evolution.
- S-10-43: learned from class and my personal beliefs
- S-10-44: Although it is a theory, it is a strongly supported theory.
- S-10-45: It has been tested, and to my knowledge has not been disproved. A theory does not suggest a lack of confidence.

S-10-46: While we may not know everything, or even prove certain things (ie evolution of the progenote), but the science of evolution is built upon small testable theories that while be incomplete are not refutable.

S-10-47: What a loaded question! As a person with scientific training, I know that the word "theory" in everyday use is quite different from the way it is used in the scientific world. A scientist, who, through extensive testing, is incapable of disproving his hypothesis, has reason to declare his hypothesis a theory. Similarly, that scientist can test his hypothesis mathematically or through laboratory research and gain enough evidence to call his hypothesis a theory. Does evolution fall into this category? I don't believe so. If I were to answer "Strongly Agree", I would be demonstrating a considerable amount of ignorance and incompetence as a student of science. If I were to answer "Strongly Disagree", I would in essence be saying that evolution is correct as a theory. Therefore, I suppose that I, once again, fail to understand the question.

S-10-48: A "theory" in science has enough evidence to support it to bump it up from a hypothesis. Science can not "prove" something to be true in all situation and conditions. It can only prove an idea to be incorrect, which has not happened with evolution.

S-10-49: Biological evolution has not been disproved- just because something is a theory doesn't immediately make it false.

S-10-50: I agree that biological evolution on the large scale is just a theory, but on the smaller scale it is obvious to see. But it is a theory and therefore could be easily right or wrong. Personally I think it's wrong as a theory to how life was created.

S-10-51: Theories are based on different facts and information gathered. While a theory can be disproven, it is typically harder to do because of the evidence given to support it.

S-10-52: all facts were once theories. that's how science works, some one comes up with an idea, it is tested, retested, scrutinized, then tested some more, then it becomes standard and a sort of "fact", untill some one is able to prove it wrong, scientifically, the bible, or a lack of understanding of the subject, or not "being able to comprehend the numbers" is not a scientific reason.

S-10-53: See question 17.

S-10-54: Once again, I certainly believe evolution can be proved, on a small scale at least

S-10-55: There is a lot of evidence to support the theory of evolution. It just depends on the person.

S-10-56: I would say its more of a hypothesis. I haven't seen alot of experiments proving evolution...I've seen bones but there are alot of missing links to suppot it enough to call it a theory. Its a very strongly researched hypothesis, and maybe someday it will be proven.

S-10-57: There is a lot of evidence that supports evolution. It may not have been proven yet, but I think it will eventually.

S-10-58: I don't know if any of those options explains what I feel about it

S-10-59: Theories have been proven and have a lot of data to support them. By now I know better than to think of a theory as just a suggestion.

S-10-60: The term "theory" in science means that the explanation has been researched and that it makes sense of a great variety of scientific observations. A theory in science is not speculation, but an idea that has been researched and has significant data to back it up.

S-10-61: Well, "never say never," but I am fairly confident that evolution is fact. Again, whether humans evolved from monkeys is a separate issue.

Question 11

S-11-1: Numerous lines of evidence supports this. For example, a fossil was just recently reported that further links a specific type of lungfish to ancient tetrapod relatives. There are countless other examples.

S-11-2: not answered

S-11-3: not answered

S-11-4: not answered

S-11-5: not answered

S-11-6: Look at the ground finches in the Galapagos Islands, it was a large study on how environment changed the size, shape and density of the peaks of these birds.

S-11-7: The AIDS virus mutates to evade the immune system. Bacterial cells exchange plasmids to survive varying environments. If that's not evolution, what is?

S-11-8: not answered

S-11-9: we have fossil evidence that this has occurred.

S-11-10: It is easy to see in the biological record of the earth that species have changed over time.

S-11-11: In classes and even on the news, we have seen countless examples of evolution of other organisms by looking at such things as DNA or bone structure.

S-11-12: They have evolved. Example, dogs were bred from wolves and now we have several species of dogs.

S-11-13: not answered

S-11-14: not answered

S-11-15: not answered

S-11-16: not answered

S-11-17: Humans have evolved from non-human species so evolution must occur in these species. We can observe evolution of animals such as birds under heavy drought selection pressures as well as bacteria becoming resistant to antibiotics.

S-11-18: As I said before...any reproducing population is evolving

S-11-19: strongly agree because every population has the ability to evolve

S-11-20: There is a difference between micro evolution and macro evolution even though there has been adaptations and morphological changes there have not been changes in species.

S-11-21: .

S-11-22: all organism are under selective pressure by their environments

S-11-23: There are fossil records to support these findings.

S-11-24: apparently men came from monkeys. hahahaha

S-11-26: Yes but humans undergo evolution too

S-11-27: a

S-11-28: EVERYTHING UNDERGOES BIOLOGICAL EVOLUTION! Just look at the fossil record!

S-11-29: i feel like i shouldn't even have to justify my answer on this question. to summarize, my comparative chordate anatomy and evolution classes have offered ample evidence.

S-11-30: It's been observed

S-11-31: mammals have evolved to survive in their ever changing habitats

S-11-32: I believe that other organisms have evolved

S-11-33: Similarities between homologous features of animals, between genes such as the HOX or HOM genes which have been conserved for millions of years, go to show that we share a lot in common with other organisms, and in fact differ from other apes by only 1-4% of our genes, if my memory serves me correctly.

S-11-34: not answered

S-11-35: Evidence of ancestry including fossils and current related structures points to evolution as well as molecular conservation within DNA code.

S-11-36: Again, biological evidence shows that species other than humans have undergone changes over time.

S-11-37: anything with genetic material has the potential to evolve

S-11-38: Evidence, such as fossil history has supported the idea that non-human species have undergone evolution. In my opinion there is no reason to believe why it cannot occur in non-human species.

S-11-39: All species have evolved.

S-11-40: This can be seen in many species. For example look at the whale who has leg-like appendages within itself, as does the snake, yet neither of these animals walks.

S-11-41: Ummm . . . they just have.

S-11-42: Evolution is evident in all organisms. From bacteria to plants to rats, to humans there is evidence of evolution not only at a macro level but also at a micro and molecular level.

S-11-43: from class

S-11-44: I agree with the statement, however humans have also evolved. The statement does not indicate that only non-human organisms have evolved so i agree with it. If it had said that only non-human organisms have evolved, i would have disagreed.

S-11-45: All organisms can evolve.

S-11-46: All populations of organism evolve.

S-11-47: I believe I have answered this question and explained myself clearly before this, but I will try again. If you are stating that evolution explains speciation, I don't know. If you are saying that small adaptations have occurred and are occurring often without our knowledge, then yes, Non-human (and human) species have evolved.

S-11-48: Because it's true. There is a LOT of evidence showing the evolution of non-human organism, as well as humans

S-11-49: Many bacterial organisms have evolved resistance to antibiotics, so it is occurring.

S-11-50: Again, on a smaller scale it has been obvious to see evolution occurring, but as a theory as to how they got here I disagree with evolution as that type of overarching theory.

S-11-51: Fossil records, homologous structures all point to evolution in non-human organisms.

S-11-52: alright, is this some sort of salt company survey, this is retarded. with all the evidence you have to be retarded not to see it.

S-11-53: It was right.

S-11-54: Antibiotic resistance in bacteria

S-11-55: Much evolution can be seen in bacteria or viruses.

S-11-56: Evolved as in speciated, not become more complex. More diverstiy.

S-11-57: Evidence shows that they have evolved.

S-11-58: other animals

S-11-59: Looking at the changes in species but still being able to track them to similar ancestors is an indicator of evolution.

S-11-60: Species have evolved. We can see that when we look at the fossil record and comparing it to extant species.

S-11-61: Studies! Fossil record! Proof!

Question 12

S-12-1: We have and still are evolving, as is every other species on this earth.

S-12-2: not answered

S-12-3: not answered

S-12-4: not answered

S-12-5: not answered

S-12-6: Look at past human's, Homo-sapiens, the Neanderthal, the new dwarfed man they found in the philipines this past year. there has been evolution.

S-12-7: People are taller than they were two centuries ago. This could be due to better health and personal care, but could also be due to evolution. Additionally, a population never stops evolving.

S-12-8: not answered

S-12-9: we have fossil evidence that this occurred and we share many common biochemistry functions in our body as do some yeast organisms. there really is no way to prove either way it is just a belief.

S-12-10: Humans have changed over time. This is also evident in the biological record.

S-12-11: There is good supporting evidence from Olduvai Gorge in Africa of human evolution. Bone structures found in this area suggest evolution from late hominids. It is hard to look at this evidence and say that we haven't evolved. It is also going on today. Currently humans are on the average taller and heavier than earlier generations.

S-12-12: Our pedigrees have shown it with neanderthals and other dead-end lines that we not able to survive.

S-12-13: not answered

S-12-14: not answered

S-12-15: not answered

S-12-16: not answered

S-12-17: Again much evidence showing the evolution of Homo sapiens, like early hominids, australopithecus, "Lucy", Homo erectus. we have organs like the appendix that is not used, as well as the tail bone, and hair erector muscles that are left over from our evolution from a common ancestor. we have structures like our forearms that are unmistakably homologous to the flippers of whales, bat wings, horse legs, reptile legs, etc.

S-12-18: As before...we are reproducing (even in humans not all are as natural "fit" as others) so there is evolution

S-12-19: humans have evolved, fossil records and other evidence have shown this

S-12-20: There are too many gaps in the fossil record to speculate that humans branched off of another species. However there has been some adaptations such as dark and light skin bigger hearts, muscles, height weight, however these are only phenotype changes they are still the same species.

S-12-21: Since Homo sapiens first appeared as a species on this planet, we have not changed much as a species. IF our ancestors were still alive, we could probably still interbreed with them. Thus, we are still the same species, even if our societies, cultures, and technologies have evolved.

S-12-22: archeological evidence suggests that there are previous, different versions of the human being

S-12-23: Based on fossil records.

S-12-24: i can't possibly be in the same species as some of the people i know. therefore, humans must evolve.

S-12-25: There are many different species that eventually evolved into humans. An example would be Homo habilis.

S-12-26: Just a basic fact of science, evolution occurs

S-12-27: a

S-12-28: Fossil Record! We have amazing remnants of early human life that shows how far we have advanced.

S-12-29: human DNA and mitochondrial DNA has offered evidence that Homo sapiens is a descendent of many different pre- human species.

S-12-30: Humans seem to have a higher level of consciousness and sense of self, but other than that we're no different from any species subject to the same laws of nature

S-12-31: humans have evolved on a microbial level

S-12-32: I do believe that humans have evolved.

S-12-33: If we were intelligently designed, then why do we have a tailbone? or erectile hairs? back problems? genetic defects? We are in fact so closely related to gorillas and chimpanzees that we three should all be considered species of the homo genus if one were to follow the set rules of naming species and were not biased.

S-12-34: not answered

S-12-35: Fossils of the first erect walking homo species. Also our relatedness to chimps.

S-12-36: not answered

S-12-37: Fossil remains of humans have been found, although there are missing links.

S-12-38: everything (with genetic information) has evolved

S-12-39: I believe that humans have evolved and are capable of evolving to the environment.

S-12-40: Fossil evidence and more supports this.

S-12-41: Humans today are seen to have a reduction in the number of wisdom teeth necessary and their tail bones are shrinking further. They no longer have a need for an appendix. These are just a few vestigial pieces that may once have had a function in the early human. They are evidence that humans have experienced some change.

S-12-42: Of course we've evolved! We're life on this planet too! And yes, we're special, but not that special. :)

S-12-43: Other primates share not only most of our genes, but also many of our phenotypic and personality/mental characteristics.

S-12-44: from class and my beliefs

S-12-45: answered previously. And there is evidence that supports the evolution of humans - ancient fossils that look human, but are not perfectly similar.

S-12-46: Look at height differences, although we do manage to avoid many natural selection processes...

S-12-47: biological evidence, in shared characteristics and common ancestry, are my reasoning.

S-12-48: I don't believe that humanity came from apes or monkeys or whatever the current idea is. Do I think that humans have changed in the history of their existence? Sure.

S-12-49: This is also true. There is a lot of evidence (fossils, DNA studies, etc.) that shows that humans have evolved.

S-12-50: I believe we as a species continue to evolve through time.

S-12-51: I have not seen sufficient evidence to see an overarching evolutionary trend. Humans are animals. We have a highly developed brain that provides us with higher cognitive capacities, but we are in essence, animals. With that, we share various characteristics with animals that point to a common origin.

S-12-52: read the last one. we are still evolving. it is simple to see. we were several races, which are slowly meshing in to one with the new travel available this day in age.

S-12-53: It was right.

S-12-54: We can look back at humans through time and see evolution has occurred - for example, humans on average have gotten taller, even in the last 200 years or so.

S-12-55: Yes...apes to humans.

S-12-56: I don't think that our evolutionary "cousins" the chimps would have any more of an advantage in becoming what they are over what we are.....and I don't think we came from them, so i'm going with no.

S-12-57: The first human-like beings were much different than the current ones.

S-12-58: cave manish to modern man

S-12-59: I'm still undecided as to the degree of human evolution.

S-12-60: Just like other species, the fittest humans (the ones that are best adapted to the environment) produce the most offspring, which then pass their traits on to the next generation.

S-12-61: Studies! Fossil record! Proof! Do I sound like a broken record? Things such as walking erect, having two eyes, hair in all these crazy places, opposable thumbs. Yeah.

Question 13

S-13-1: I believe that is a realistic way to teach evolution. Show the lines of evidence for both (meaning show the evidence supporting evolution- which is overwhelming, and show the lack of evidence supporting intelligent design- pointing out how it varies from the nature of science).

S-13-2: not answered

S-13-3: not answered

S-13-4: not answered

S-13-5: not answered

S-13-6: Because they are both valid theories, and since neither one has more proof of infallibility than the other, its only reasonable to teach both in college with equal weight...granted students will still have the option to pick whether or not they want to read it.

S-13-7: Science has to be taught in a science class. Intelligent Design is not valid science, and therefore has no place in a science classroom. It may be briefly presented as an alternative theory to evolution, but should not be taught, emphasized, or tested over at any time.

S-13-8: not answered

S-13-9: like i said they cannot be compared and i think this should be explained. Science is not anti-God or creationism, they are just seperate from eachother.

S-13-10: I believe that both should be taught in public education. I think that evolution as a science is more-well defined than is Intelligent Design/Creationism. Evolution is also easier to see, record, prove, and disprove. I do think that Intelligent Design/Creationism have been discounted too much in this University. I don't think that they are mutually exclusive. Also, the process of hypothesis testing dictates that theories must be disproven. I have not seen any evidence that ID/C is false, and the only statement every made in this university about it is that Evolution is true, therefore ID/C MUST be false. Evolution is a scientific standard, and is taught so that we can know about it. I think ID/C should be introduced, even if not given equal time.

S-13-11: I think that evolution should be taught in schools, as it is a scientific theory. Intelligent design/ creationism are not science. They are ideas and there is no evidence. I feel that students should be taught the difference between both in a lesson about what is science and what is not. I also feel that it should be left up to the student to determine their beliefs after being presented all of the information.

S-13-12: Both should be taught, both are theories that we cannot prove true or false or maybe a combination of both. We don't know, so we can't judge. Evolution has more (in my opinion) substance and who says their isn't a high being that put rugged ingrediants there and behold reactions occured and here we are today.

S-13-13: not answered

S-13-14: not answered

S-13-15: The professor could take the first 5 minutes of the first class and say something to the point of, "Intelligent design is an idea...if you wish to explore it further...go sign yourself up for a religious studies class."

S-13-16: not answered

S-13-17: I think its important to inform students on why ID is B.S. because they're going to hear debates and viewpoints of these fundamentalists that may change their minds

towards evolution. Some people think that ID is science, so it must be shot down as early in their education as possible. They should learn about ID in the context of it being wrong, not science, but religion. They need to see the clear cut differences between the two to the point that they feel it is absolutely ridiculous from a scientific standpoint. ID can't be ignored and so it must be talked about in classes but not taught.

S-13-18: Because evolution is a theory that means there is enough scientific evidence that it needs to be taught to students - especially science students. Also, it deals directly with genetics and anatomy so it is critical students understand it. Intelligent Design should not be addressed because it is a faith not a theory, but this fact does not need to be addressed because a student with critical thinking skills can sort that out. There are many faiths and the school doesn't need to pick one out as an example of a bad theory when it, as well as any theory, holds very personal meanings for people

S-13-19: I think until other ideas have compiled as much evidence as biological evolution that they should not be taught in public classrooms

S-13-20: The current system of education gives the impression that biological evolution is the only current topic of research, creationism should also be explained and discussed and argued as is tradition in the scientific method, and allow students to make their own minds.

S-13-21: .

S-13-22: Intelligent Design and Creationism is NOT science and therefore have no place being taught in a science course. However, students should be aware that there are alternative beliefs. Those ideas are best left to a religion course or perhaps another completed devoted to the ideas of intelligent design.

S-13-23: Both theories should be addressed and ultimately the student should decide for themselves what to believe. However, there is more data involved with the scientific theory of evolution and therefore more time would have to be spent on this topic to further explain it.

S-13-24: c

S-13-25: not answered

S-13-26: Intelligent Design is not based on scientific processes and therefore it has no place in a science class. Teach it in a religion class if need be

S-13-27: a

S-13-28: My viewpoint is similar to option "g". I really think that biological evolution should be the main focus of biology class, but professors should not discount the intelligent design/creationism argument. Although not focused on, I feel it is alright to mention intelligent design if the professor wishes, but I strongly believe it is not okay to attempt to disprove this theory. If it is going to be mentioned it needs to be addressed factually and then ended, but it is not necessary to be mentioned at all. College science classes are to be based on scientific evidence such as biological evolution. Present the data and the facts. It is a little unnecessary for professors to feel they must address the faith issue of creationism, but it might be nice if they decided to just state a few things about it.

S-13-29: the last question is self-explanatory. Intelligent Design can not be a scientific theory because you can't prove the null hypothesis. There is absolutely no way to prove that an "intelligent designer" played a role, unless it reveals itself and offers scientific proof.

S-13-30: Evolution should be taught first and foremost. I don't equate ID with Creationism, however, the latter being a mere religious myth and the former being a astrophysical principle that doesn't deal with biology anyway.

S-13-31: intelligent design does not belong in a science setting, it does belong in college though. It should be taught in a religion class perhaps

S-13-32: Both should be taught and individuals should chose what classes they want to take.

S-13-33: It's like a history lesson, if we do not teach what creationism is, educated persons will not know how to defend what is observed, tested, and most likely true against those who believe science is anything other than a method to explain natural phenomenon.

S-13-34: not answered

S-13-35: In a public school no one should have to listen to someone's views on creationism. If people want to learn about that, then they can go to church. I am Christian and I am a scientist, but I have struck a balance between them and I do not see why someone's education should suffer just because some people struggle with their faith. I would be outraged if I had to learn evolution in any other way but pure science.

S-13-36: not answered

S-13-37: The more opportunities for students to learn about both theories school, the better informed the students will be in deciding what s/he would "believe" in. Having classes on intelligent design would be like having religion classes in a liberal arts and sciences curriculum.

S-13-38: by the time students have reached college they have no doubt been exposed to both intelligent design/creationism and biological evolution. This being said it seems to me that science and religion are two separate things and this is essentially what is being asked. College science classes should teach science and scientific theories. Since biological evolution is a scientific theory it should be focused on in the college science classroom.

S-13-39: This was a hard question to answer. I definately believe that evolution should be taught in science classes. I also believe that divine creation should be mentioned and discussed, so that the student can compare the two concepts and decide for themselves what they believe. I don't think that it should be one concept or the other. Students are in class to learn and not to be told what to think or what is wrong or right. The only problem I have is that I don't really consider divine creation a scientific topic, so maybe another class could be offered to deal with this topic alone. If another class if offered to teach about divine creation, then the science class should just deal with evolution.

S-13-40: Evolution should clearly be taught over other theories.

S-13-41: The idea of Creationism is often discussed greatly in philosophy and religion classes. As such, this topic should not be discussed in great detail in an evolution course. Evolution should be discussed in an evolution course, because that is the nature of the course, but it is important to address that other ideas exist in the world. One thing that should be stressed to students is that it is the student's opinion on whether evolution or creationism is correct. What is taught should not be forced upon the students as being the "correct" view of the world. Like any good argument, though, both sides MUST be addressed.

S-13-42: Intelligent Design/Creationism are BELIEFS. They are based on faith rather than empirical evidence and therefore have no place in a science classroom. If people choose to educate themselves on these topics outside of the classroom, more power to them. Evolution, however, is central to understanding biology and should be interwoven into the entirety of the biology curriculum.

S-13-43: I think that Intelligent Design is just another form of Creationism, and neither have scientific data to support them. However, evolution has a multitude of studies supporting it and religion should not be the deciding factor, especially because evolution does not dispute the idea of a greater power.

S-13-44: I feel that both subjects should be equally taught and equally available. Neither should be a requirement for a degree, but an option for equal credit towards a degree.

S-13-45: I have taken evolution as well as many religion courses. The evolution class that i took at ISU did exactly what the statement said. The religion course that i have taken have also looked at evolution only in different ways. It is good to have different viewpoints on such a controversial topic, especially if you are getting a Liberal arts and science degree - making you a "well rounded citizen."

S-13-46: Many people know about the debate, but they don't understand why intelligent design can't be 'science.'

S-13-47: evolution is the only scientific answer in my mind, but I think it is important for biologist to realize the counter arguments of ID. I feel it is important that students are not ignorant of how biology is viewed by others.

S-13-48: Evolution should be mentioned as an interesting hypothesis in general biology classes. The extreme amount observational work that scientists have done should not be thrown away simply because they had only the goal of proving a doctrine that is not provable. Anatomical work at the embryonic level is particularly fascinating. Don't throw the baby out with the bathwater. Creationism as a purely faith-based idea should not even be mentioned. If students wish to go to church or attend a class in Christianity to learn about ideas of creation they can. Similarly, the classroom should not be the church for evolutionists, and students should not be forced to attend sermons that apply scientific jargon to an ideology. Evolution should still be offered as its own class as an elective to students who wish to study the idea further.

S-13-49: Too many people do not realize that although there are "holes" in our knowledge of evolution, science will eventually be able to fill them in. Science is the only thing that should be taught in science classes. Maybe Intelligent Design could be addressed in an offshoot of a comparative religions course or something, but it should never, EVER be taught as a valid scientific theory. EVER!

S-13-50: I don't think it's bad to bring up other theories such as religious ones, but I don't think they should be taught in a public college setting.

S-13-51: I believe if you are going to teach one theory, why not teach another, if after all, they're just theories and not laws. It only seems fair to give people adequate information on all theories to allow them to make their own decision on which one, if any, they agree with or believe in.

S-13-52: I believe that it is important to teach evolution, but to provide reasoning as to why other theories addressed are not scientifically valid. This will allow people to make their own decision, but understand why intelligent design/creationism is not a scientifically based theory.

S-13-53: ;askdfjasl;kdjfa;lskdjf;alskdjf

S-13-54: ID is not science. (ID is not necessarily creationism either: I can be an atheist IDer). ID should not be taught in a science class, but sure was interesting to discuss in various philosophy classes. If evidence is discovered that supports ID, then we should consider including it in science class.

S-13-55: ID is not science! I have no problem with it being taught, as long as it's not taught as a science.

S-13-56: Both should be taught in college classes. Both should be taught as an unproven hypothesis. It should be stated that intelligent design cannot be proven completely, thus far its just as proven as evolution. If evolution can become proven to the point it is a law then intelligent design is out. If intelligent design is proven, it too late; god came back and did what he said he was going to do. Although intelligent design allows thermodynamics better in my opinion.

S-13-57: Evolution is a scientific idea with much evidence. ID should be mentioned so that people understand the difference and why the scientific community does not support it.

S-13-58: I wish i knew more about intelligent design

S-13-59: I feel this option would help students who struggle with being able to decide where they stand on evolution.

S-13-60: Evolution must be taught, as it is central to biology and helps explain other phenomena. For students who may not understand evolution or who may have conflicting religious beliefs, talking about the nature of science and why ID is not science is definitely beneficial. I think it is necessary to teach students why science cannot approve or reject the idea of God in the universe.

S-13-61: Sounds like a fair compromise. It's not up to institutions to impress religious beliefs upon students but they should be presented with varying viewpoints.

Question 14

S-14-1: Honestly, I think it's a combination of choices "a" and "d". The public (in general) has an overwhelming lack of understanding of science and how it works, in addition to evolution. This leads to a perceived difference between religion and science, at least among some people.

S-14-2: I think there is a combination of lack of public understanding and lack of education from the scientists. I have had in depth conversations with non-science people who believe evolution is about humans coming from monkeys and fish. This is not the case at all. Humans were never at one point chimpanzees but the majority of the public do not understand this and no one is really bothering to educate them.

S-14-3: not answered

S-14-4: not answered

S-14-5: not answered

S-14-6: To me, both can intermingle, but people choose to not allow it. so it is a perceived conflict. It truly doesn't exist.

S-14-7: Many people don't understand carbon dating. They don't understand the strata of rock formations and how they came to be. Unfortunately, many people that are anti-evolution refuse to learn about the techniques used as evidence to support the theory. In this way, they can find "chinks in the armor" of the theory, because their scientific knowledge is lacking.

S-14-8: This is due to a perceived conflict between science and religion. This is due to a lack of public understanding regarding what science is and how it works.

S-14-9: it is a perceived difference but really there isn't one

S-14-10: I think most of those opinions fit. Many people have not been taught evolution properly, or don't realize the inter-relatedness between science and religion. If the public is to understand and accept evolution, it must be taught openly, but also without prejudice against other points of view.

S-14-11: I feel that the public doesn't exactly understand what science is. So, they rely on what they know, their religion. The scientific evidence, and knowing what science is and is not, is compelling, and as a student of science, I believe that evolution does take place.

S-14-12: Not enough open minds???? I don't know

S-14-13: not answered

S-14-14: not answered

S-14-15: I would have clicked choices a and e.

S-14-16: not answered

S-14-17: I thought the majority of Americans accepted the theory of evolution, but maybe I got some incorrect survey data. Anyway, I believe the problem is with what the public thinks science is, its principles, and laws, as well as what biological evolution really is. Many People don't know exactly what Darwin said and they just take from popular belief which is usually wrong. Also, it there is a real conflict between science and religion because its hard to explain the existence of a higher power if you believe in evolution. Scientists study the natural, not the super-Natural. the scientific community can only do so much and science is loosing ground these days in America, while religion is on the rise. Some people are brought up a certain way and if they aren't a science major

then they won't get the proper education to make any other choices. That is cultural differences that cause the disbelief in evolution.

S-14-18: I think all choices have a lot to do with it. I think if the public had a better understanding of what evolution is the preceived conflicts would go away. Biological evoultion (outside the atoms that came together somehow to make a lipid etc) really doesn't conflict with religion at all if everyone is calm and listens

S-14-19: I believe this is due to an idea that you because you believe in one that means you cannot believe in anything of the other. I think there is pressure to be extreme towards one side when there shouldn't be

S-14-20: There is no conflict between science and religion.

the problem is that if science is done properly it will, eventually reach a true conclusion. There for science will eventually prove what religion already knows.

S-14-21: I took a course on the philosophy of science, and that would have been the correct answer on the test.

S-14-22: Some hold very tightly to their religious beliefs, and denouncing a god and believing that we are all here by mere chance would mean that they would have to let go of a central part of their lives.

S-14-23: Who is to say which party is right or right for thinking the way they do about a particular subject. No one knows and that is why these two ideas are both theories. I do believe there is a distinct difference between science and religion and this can influence a person's decision.

S-14-24: I would answer a combination of choices 'a' and 'd'

S-14-25: not answered

S-14-26: I feel like the majority of the public does not understand genetics well enough to understand evolution does occur

S-14-27: qa

S-14-28: Although many people think that science and religion are completely seperate, it has been shown that many ideas actually help support one another. Issues like creationism and biological evolution can work together, but I feel the public thinks it is one or the other. People devoted to their faith has a lot of trouble accepting the scientific perspective since it seems it completely contradicts what they have grown up believing in church. This is not necessarily the case and it would be great if the scientific community could help explain this. This may help ease the tension between science and religion.

Although people likely won't budge from their beliefs, they'll at least have a larger understanding and not be so closeminded towards science or religion.

S-14-29: the general public has just not received enough scientific education. This is evidenced by the numerous misconceptions they have about evolution, as well as genetic technologies.

S-14-30: A literal biblical interpretation cannot be reconciled with biological evolution, but any reasonable and contextual interpretation certainly can.

S-14-31:

S-14-32: It seems like the only information regarding this issue is from someone who believes very strongly in either biological evolution or creationism. I believe that they can co-exist and not enough information is out there about that.

S-14-33: It is also due to a lack of public education on the subject. I feel everyone should be intrigued to know where it is we have come from, but instead they read where we

came from from a religious book and believe it is so. There is a conflict between science and religion, but it is not science's fault. Science is not out to prove anyone wrong, but is merely trying to find out what is right.

S-14-34:

S-14-35: I think there is a lack of public understanding of the science behind evolution and there is a perceived conflict between evolution and religion that does not need to exist.

S-14-36:

S-14-37: I hold the viewpoint that the public is poorly educated about biological evolution and that there is a strong conflict between science and religion.

S-14-38: I think that science and religion are two separate ways of thinking. It seems that people believe that only 1 can be true but this may not be the case

S-14-39: I agree with a combination of answers a and d. I believe that some of the debate has to do with the lack of knowledge by the public. I think many people don't really understand the concept of evolution. In my opinion, most people probably just see evolution as humans coming from apes and most people then become offended. Also I think that most people believe that you can only believe in one or the other. In my opinion, I believe a combination of both has occurred. I see Adam and Eve as just a story and not word for word truth. Also I believed a divine creator placed people on Earth, but after being placed on Earth it was up to people to adapt. I don't believe that people and other organisms were placed on Earth perfect, so they wouldn't have to change. The environment changes and organisms have to adapt.

S-14-40: I thought choice d. was also a contributing factor. I just think people don't understand evolution. I think people are defensive and think it suggests that we come from Apes, when in actuality it means so much more... I think people also are defensive about their religions and are worried that science is replacing religion through evolutionary theory. However, I really don't think there is a conflict between the two, and I understand that many religious leaders acknowledge evolutionary theory.

S-14-41: I think many people fear the ideas of evolution (i. e. that humans came from apes) and as such they disregard it as non-sense. I think that scientists need to educate the population on what evolution is and to not force the idea on to those who do not accept it. The population needs to be open to considering another explanation and give science a chance.

S-14-42: Definitely a combination. The public (and many scientists, for that matter) does not have a good understanding of the nature of science, and often have the conception that science PROVES things. This, however, is not true. If people understood this, they would have a better idea of why evolution, though not PROVEN, is crucial to understanding biology. Also, people would not have the misunderstanding that science and religion are somehow opposing forces. People perceive that this is the case, but in reality, it is not! So many of the great scientists of the world and history have worked with both science and religion. When one understands science, they realize that science does not work against religion, and they can happily have both in their lives. I don't know that I would say that the scientific community doesn't expend enough effort to educate people, per se, but rather we need to be educating differently. Evolution has been taught for a while now, and yet a majority of educated people do not have a firm grasp on what evolution is, saying things like "we

came from monkeys." Evolution needs to be taught differently, both on the secondary and collegiate levels. Part of making education better would be to have students get a deep understanding of the nature of science, which in turn means our teachers need to be taught this as well. Go NOS!

S-14-43: I think the lack of acceptance of evolution in the general public is because of peoples distrust in science as well as a perceived conflict between science and evolution. I think that the two could work together. It could be waht a Catholic evolution professor from Brown said on the Colbert Report: saying that evolution occurred is not saying there is no higher power. It is simply giving more credit to that power for putting the process in motion.

S-14-44: Very hard to answer. I think that many people have their set beliefs from religion, and many refuse to look at any other alternatives.

S-14-45: I believe that the public disregard for evolution is due to a combination of lack of understanding, lack of wanting to understand, and the teaching of some religious officials. The catholic church allows evolution to be taught, although it does not completely agree with the topic, however most of America is protestant and many of these branches of religion still do not agree with evolution at all.

S-14-46: People don't understand science.

S-14-47: I feel there is still a lot of conflict between religion and evolution. I am unsure how to gap the bridge in knowledge since the arguements are incompatable.

S-14-48: I didn't realize that a majority of the American public does not accept the idea. As I have never conducted a survey of the American public, I do not presume to speak for their beliefs in any way. I doubt that any students have conducted their own surveys of the American public, so if they were all being truthful, they would also say that they do not know enough to answer. I personally do not believe the idea, because I have not been offered enough proof for me to say that it is believable. The proof I have been given contains jumps in logic and assumptions that other sources easily decry.

S-14-49: This is due to a lack of public understanding regarding what science is and how it works. This is due to a perceived conflict between science and religion. This is due to strong cultural influences acting upon the public. These 3 items are to blame for the general public's disregard of evolution. Many nations around the world contain religious folk who have no problem assimilating their religious beliefs with a good understanding of evolution. The only "conflict" is if people assume that the book of Genesis (or any other religious accounting of Creation) is meant literally. The biggest problem is just that most Americans don't understand science. They tend to get stuck at the "I ain't descended from no monkey!" portion of the argument and can't see past it. Another issue is that they feel that the scientific community must be wrong because there are so many arguments about evolution, not realizing that many times, these arguments are what helps create and finetune hypotheses and theories.

S-14-50: I don't know if I would necessarily say there is a conflict between science and religion, but I think many peoples religous views tend to trump scientific ones.

S-14-51: I think that the scientific community perceives that if you believe in science you can't believe in religion, and that the religious community perceives that if you believe in religion, you can't believe in science. I personally think that they go hand in hand and that science gives evidence to God and His intricate nature.

S-14-52: Religion has been a core support and institution in the lives of humans for a very long time. It is hard to discredit the beliefs of these individuals on the basis of scientific theory. It is hard for people that believe in God to accept evolution as it is contradictory to what they were taught and grew up with.

S-14-53: the bible doesn't allow for common sense. i claims authority from it's self. if i told you i was king of canada, because i said so you'd tell me to shove off. the idea of creationism is so engrained in peoples mind because of being raised with a text taht says if you dont believe every thing i say then you are going to burn in hell. there for it doesn't matter what evidence is on the table, the creationists will always reject it in favor of thier own beliefs. These creationist beliefs are not of any value to the scientific education of any body, and therefor should be left out of any science teachings, creationism belongs in the church not our schools. by saying this cant be because this book says it can't be is stupid and panders to the church. To who ever is reading this, you really got me going here. if you think that creationism or ID should be taught. i would really like to meet with you and explain why it is a horrible idea.

S-14-54: Answers a,c, and d. I have not decided whether science and religion are in conflict or not.

S-14-55: Something between a & d - the majority of people associate evolution with humans evolving from apes, which is a much different issue than evolution itself. People don't understand what evolution actually means.

S-14-56: Religion is driven by a fear of the unknown (death)...sceince is driven by the unknown, many times fear of the unknown...disease. Most religious people accept science, many science people won't accept religion. Religious people are just asking for tolerance of their beliefs, like many of societies groups. Why a hypothesis that allows the existence of thier beliefs is so strongly fought by the people who believe another hypothesis seems like a religious battle to me. It takes just as much faith to believe what has been proven about evolution as it does to believe what has been proven about inteligent design. Evolution lets you be in control of your life without somone to answer too while intelligent design puts a god in control of the universe giving those who believe a little more peice of mind, while having a high athority it answer to. neither are proven so why is it such a battle, just keep doing your research until one is proven. Till then both should be presented, in the name of education and tolerance.

S-14-57: People lack the information on what evolution really is and that it is not a contradiction of religious beliefs.

S-14-58: I feel that some people put faith before science and chose not to believe in biological evolution

S-14-59: A combination of answers A. and D.

S-14-60: I belive there is a perceived conflict between science and religion when there actually exists no such conflict. I also believe that most of the general public lacks an understanding of what science is and what falls within the realm of scientific understanding.

S-14-61: I think many people are uneducated, for whatever reason. (I don't know whether to blame it on them or the scientific community...) I think a lot of people are one-track-minded Bible thumpers.

Question 15

S-15-1: I believe in both the concept of evolution and the concept of a God. Current evidence supports the idea that the earth has come to be what it is today without intervention from God(s), but the evolutionary theory does NOT state that God(s) do not exist.

S-15-2: not answered

S-15-3: not answered

S-15-4: not answered

S-15-5: not answered

S-15-6: I feel God made the world, but he also made man, and since man can choose free will, he can ruin the world God created. So God needs to step in sometimes and change things up a bit, hence why DNA replication isn't perfect. There is room for error in the case where a mutation needs to happen to save a particular species.

S-15-7: Evolution does not tell us why the Earth or life began. (And there are theories to address each.) Evolution neither proves or disproves the existence of a God/-ess/gods, etc because it deals only with the ongoing progression of organisms to be better suited to their niche. There is no reason that God could not have guided this process. There is also no reason why the process could not have taken place on its own.

S-15-8: not answered

S-15-9: it doesn't matter how old the earth is and cannot be compared between how we as humans tell time, and God's time. It's just something that we have to agree to disagree.

S-15-10: I don't know what I believe about the interaction of God in evolution. I am not sure if He intricately directed the whole thing, intervened at critical points, or set the big bang off in such a way as to make the whole thing work. I just know that, to me, He was involved in some way.

S-15-11: I am a Christian and at first, evolution was hard for me to accept. After reading and learning about science and seeing the evidence for evolution, it is hard to refute it from just an observational stand point. I also like to keep my religion in mind and that God had a part in it somewhere.

S-15-12: Fits the best

S-15-13: not answered

S-15-14: not answered

S-15-15: not answered

S-15-16: not answered

S-15-17: I am a firm believer in biological evolution and I don't see God intervening in the existence of our species. I do believe in God, but I cannot explain the existence of both God and evolution. But I think there are things we are incapable of understanding or describing, things we can't even imagine that await us. Something beyond science. It might be a whole new dimension of existence and thinking. So in that respect I can see the existence of both. There are also things that happen that can't or have yet to be explained, Such as ESP, clairvoyance, a sixth sense, spirits, or whatever. I just hope there is more to this world than what we see. I have had experiences that make me believe in guardian angels or the sense that "someone" is watching out for me. Love might be something that could be part of the higher power, even though it has been shown to be merely chemicals in the brain, because of its power to change people.

S-15-18: Because no one has been able to give me a strongly supported theory as to where the first chemical atoms and the volcanoes etc come from that allowed for the formation of RNA, and lipids that formed the first cells etc came from. I believe God had to have created them and pushed evolution along with natural laws, but God did not create millions of years ago all the animals here.

S-15-19: The earth is ancient but nothing can be done to prove that God does not exist or does exist

S-15-20: Faith, God has said that it was created in 7 days and so it was.

S-15-21: See my previous response on the age of the earth being between 6,000 and 10,000 years old. Who cares?

S-15-22: the theories of biological evolution are supported by facts that neither argue the existence or absence of a god

S-15-23: I believe that the theory of biological evolution does not necessarily support the presence of a God, however it could.

S-15-24: It seems the most reasonable choice.

S-15-25: not answered

S-15-26: Science's goal is not to prove or disprove god

S-15-27: a

S-15-28: Biological evolution is something that occurs naturally. Its scientific perspective would say without the help from God, although biological evolution does not support or act against God's involvement. It is purely scientific. No one knows God's role in this process. There are many theories about it, but there is no right or wrong answer. Although science talks about it as independent of God's help, there are many possibilities. That is where faith and belief comes in.

S-15-29: sorry, i can't justify this with proof or examples...

S-15-30: The only place at which I believe in the potential for the intervention of some higher power is the consciousness/soul that humans seem to have. The tangible - which is all science can study - is fully explained by evolution.

S-15-31: God created the heavens and Earth in six days. he then created animals, plants and man. B/c of man's interactions on the planet, species have had to adapt/evolve from the form God created from them...but not deviating in drastic measures

S-15-32: I believe the Earth is very old and that God created it. After Earth was created biological evolution occurred.

S-15-33: As to my knowledge, there is no evidence as to the existence of God, but there is evidence to explain natural phenomenon, such as how the universe, galaxies, and planetary systems have come to be, and how the earth formed, stayed warm, and incubated life to evolve into what it is today.

S-15-34: not answered

S-15-35: I feel like this answer best represents my thoughts. I also think there is no way for humans to have known the concept of time that it took God to create the earth so those six days could have been millions of years.

S-15-36: Biological evolution and carbon dating only shows the time in which remains have existed on earth. It provides no evidence relating to a "superior being"--so it can't be denied nor supported at this point.

S-15-37: I think that biological evolution is a fact and that it doesn't support or deny that there is a "god".

S-15-38: As I mentioned previously, I believe that both evolution and divine creation has occurred. Its not just one idea or the other, but a combination of both. A divine creator was responsible for creating life on earth, but after that evolution took over. I believe that if a divine creator could intervene after putting organisms on Earth, then there wouldn't be so many bad things happening.

S-15-39: The following answer was CLOSE to representing my viewpoint, but not exact: The Earth is ancient (many millions of years). Biological evolution describes a natural process that produces species without reliance upon intervention from God. Biological evolution neither supports nor denies the existence of God. I believe that the earth is ancient....and I believe that biological evolution neither supports nor denies the existence of god. I am not sure what role god has played in the intervention of creation and whether or not their is truth in the genesis creation story.

S-15-40: I believe that God started the Earth and evolution has taken its course since then. It's a confusing view, but I grew up with religion and have learned to be a scientists, and this is how I believe it is, this is my "happy medium".

S-15-41: You can't have "God did it" as an answer in science. Then what the heck are you doing? Anything could have that answer, and your research is just worthless. Instead, you research with the assumption that there is no higher power or natural forces at play. Science does not take a higher power into account. There very weel could be, and science does not "tell" people that they shouldn't believe in a higher power, rather that in SCIENCE you can't use the higher power as an explanation. Higher powers imply belief and faith, which don't make for very good evidence.

S-15-42: Although I believe that the existence of a higher power (God perhaps) is possible, I strongly agree with the fact that the world is ancient and the theory of evolution.

S-15-43: I feel that the earth is ancient and that Genesis/Creation did occur. I feel that God did create organisms, but that biological evolution has made "progress" of those organisms into what they/we are today.

S-15-44: When biological evolution is looked at from a completely scientific perspective, it can not be said whether or not something or someone started the entire sequence of events. Did random chemicals just appear in outter space and then gravitate toward one another to produce stars, planets, and other objects in space? Or were they put there by something or someone as a big science project?

S-15-45: The existence of God cannot be proved or disproved. Therefore, the hypothesis about his existance is not scientific. Science does not prove or disprove God so they are not mutually exclusive or contradictory. Each person needs to decide how he/she feels about the existence of God, but appreciating science does not mean that one must doubt God.

S-15-46: I feel that there is no evidence for or against god.

S-15-47: I cannot know how old the earth is, nor can I know whether God exists. I wonder if any of the hard sciences need to have surveys like this? Are you standing on such shaky ground that you must ask these questions?

S-15-48: Although I am atheist, I have yet to see evidence that a god definitely does not exist. However, since the burden of proof is on the positive, as soon as scientists are able to come up with some good, hard evidence of a god, I will re-evaluate my stance on the subject.

S-15-49: I tend more towards the belief of no God, however, without evidence to prove otherwise I chose answer d.

S-15-50: I haven't done any research on the subject and so don't really know what I think. Also, I would still believe in God no matter how old the Earth was so I haven't seen much need to spend my time on that kind of extensive research on it.

S-15-51: I am still in debate on whether or not God exists, but it is possible that evolution was allowed to occur naturally without the interference of a higher power. It is hard to completely discredit an idea that you were raised with even when science provides evidence otherwise.

S-15-52: i agree very strongly with D, but the earth is several billion years old, not just millions. i feel that evolution explains how, why and what happens in the world and why it is the way it is today. but i do not believe that it has any affect on "proving" or "disproving" gods existance or role in our lives. i am very pro evolution, but i also consider my self a very spiritual person.

S-15-53: It is the best statement that matches how I feel.

S-15-54: I believe in evolution and I believe in God - that is, I believe there's something much greater than us that we cannot ever fully understand or describe. It wasn't until recently in time that the Bible, especially the creation story, was interpreted so literally. The Bible did not "descend from the clouds" in it's current state(s), but is a series of stories that were passed down for many many years before ever being written, and then were written over many many times and were translated into different languages. I believe in evolution, we can observe it happening all around us. Those who interpret the Bible (or whatever religious text) so literally loose sight of the bigger picture.

S-15-55: I am religious and believe that God has had a part in things. But I also believe in evolution

S-15-56: There is a god, and I am sure he knows what a day is. I doubt he created all organisms in their present form, but nothing is happening that he doesn't know about.

S-15-57: Fossils are millions of years old, suggesting that the earth is old as well. Science does not prove God one way or another.

S-15-58: my faith and science finally meeet

S-15-59: I believe that God created initial forms of organisms and they have evolved over time. I don't think that all organisms started from just one single organism.

S-15-60: I firmly believe in God. I also firmly believe in evolution. I believe God created the laws of nature and acts through them. I believe God designed and directs evolution. I see no reason not to teach evolution in science classrooms. It happens! To me, it is even more proof that God exists!

S-15-61: I'm big on the "not supporting nor denying the existence of God" thing.

Additional Space

S-A-1: I am a Biology major, and believe strongly in both the scientific method and in the theory of evolution. I find it incredibly frustrating when the general public has these "debates" on unfounded evidence. I hope this survey helps to better educate our youth, who many times have more open minds than our adults. Good luck with your research.

S-A-2: not answered

S-A-3: not answered

S-A-4: not answered

S-A-5: not answered

S-A-6: not answered

S-A-7: I personally combine my religious views with my educational ones on education. I guess one could say I follow a basic Intelligent Design theory myself. However, because ID cannot be tested or reproduced, IT IS NOT SCIENCE, and thus has no real place in a science classroom. Before atoms were individually visible via electron microscopes, we did not teach that electron theory might not be valid. Science must be presented as it occurs: facts. The great thing about our society is that we can challenge what we are taught. But this challenge and discussion should take place outside of a learning environment.

S-A-8: not answered

S-A-9: I think this survey is interesting to think about, but some of the questions do seem to be geared towards saying that if you are for evolution you are against god, and if your for god your against evolution. I do not beleive there needs to be a distinction.

S-A-10: I had Dr. Wallace in Bio 303. He told us on the first day that the class was not about religion, only the process of evolution. I think he did a good job instructing the class in such a way as to allow the students to decide for themselves whether or not they believed in the supernatural, but did explain evolution in a good, detailed, and objective way. I think objectiveness is important, and has lacked in some of my classes. Beliefs in a university are supposed to be respected, and diversity is good. These are all things that anyone can recognize, and are daily preached everywhere around campus. If religion is regarded as the set of beliefs of an individual, than evolution can easily fall into the category of a religion. Some of the time at ISU, those who believe in evolution have completely disregarded what I beleive. Hypothesis testing only proves things false, not true. Evolution has never been proven true, only not flase as of yet. Likewise, Intelligent Design/Creationism as a SCIENTIFIC ENDEAVOR has still not been proven false. Just because it has not been proven true does not mean it isn't real. I wish that the University as a whole would better respect my opinion, allow me to believe what I want, and follow the rules that they have layed down for themselves in terms of scientific theory. Thank you for your time. I have enjoyed mine at ISU.

S-A-11: With the past year's uproar about Intelligent Design vs. Evolution, I agree with the viewpoint of the professors. ID is not a science. It is a belief. Those not in the science community view evolution as a belief, which it is to some, but to scientists it is a science because it began as a hypothesis which could be disproved. There is no material evidence for ID -- there is no evidence available for study. A higher power is not something that can be studied following a scientific protocol. I believe that the public and especially students should be instructed on the differences between science and that which is not science. They then should be taught evolution and ID should be discussed, but cautioning

that it is not science. They are able to believe whatever they want, but to know that evolution is a science and ID is not. Science is not asking for beliefs or feelings, just material evidence.

S-A-12: I am not good with words expressing my thoughts. So most of my writing is probably vague, and I am sorry.

S-A-13: not answered

S-A-14: not answered

S-A-15: not answered

S-A-16: not answered

S-A-17: I pretty much said what I wanted to say in the last question. Good luck on the survey and your thesis Justin.

S-A-18: not answered

S-A-19: I am a supporter for biological evolution, but at the same time i am a spiritual person with my own ideas on religion. I have enjoyed biology at iowa state mostly because i have felt no pressure to give up any other beliefs or ideas that i have about religion but instead just given facts about biological evolution

S-A-20: There are many things that are taught in college classes specially biology classes and you memorize them and you answer them in a test but it doesn't nessary mean that that is the persons belief. Religion is based on faith and thought just like in science many things are not fully understood and there are difference in interpretation and beliefs. Science is a way of decerning what is true from what is false, but only in talking about it and presetning all the evidence will this truely be accomplished. this is why creatinism must also be taught to allow people to argue and debate the current ideas and beliefs.

S-A-21: You guys don't leave much room for agnostics in this survey. I happen to be pretty agnostic, myself. So, presenting the choices as either for evolution or for creationism is a bit biased, and it increases the perceived schism between them.

S-A-22: I do not believe that God created the world and everything in it as described in the Bible. Considering the evidence suggesting evolution I am in support of it.

S-A-23: Interesting survey :)

S-A-24: 90 percent of people have below average intelligence, and 25 percent of statistics are irrelevant.

S-A-25: not answered

S-A-26: not answered

S-A-27: whoop whoop.

S-A-28: I believe that it is possible for science and religion to co-exist. Eventually it will not be EITHER religion OR science. They can be intertwined and people just need to be willing to listen. Having faith that the world was created miraculously by God is a wonderful and necessary belief for many people, but understanding the scientific history of the Earth is just as important.

S-A-29: i didn't enjoy justifying my answers on this survey because of the amount of time required.

S-A-30: not answered

S-A-31: not answered

S-A-32: It seems as though people who feel strongly about this issue seem to force their ideas onto others. I think a better approach would be educating and then letting people decide on their own what they want to believe.

S-A-33: I am an atheist biology major. I have taken evolution (biol 303), read scientific literature, and hope to one day use my understanding of the world, natural phenomenon, and science to help better the understanding of others.

S-A-34: not answered

S-A-35: I think understanding evolution in scientific terms is clear. I am fully capable of intertwining my religious beliefs with the concepts in science because they are both a huge part of my life. I do not understand why there is such a big issue regarding these two subjects.

S-A-36: not answered

S-A-37: Biological evolution continues to be reinforced by tangible and consistent evidence whereas the mention of a god that influences the development of the earth and its organisms is not backed up by any evidence that can be tested. That is why my viewpoint is supports biological evolution strongly.

S-A-38: I guess I just think that the whole debate is pointless. As long as people are informed, and that means informed of all plausible possibilities, then they are free to establish their own opinions. I also think that in a college level science class the goal should be learning about what scientists have learned and not constantly debating evolution vs. creation

S-A-39: I believe the topic of Evolution and the surrounding ideas should definitely be taught. Even though controversy exists, does not mean that students should not be taught that specific topic. Over the many years that the teaching of science has occurred, there has been many controversies over certain topics. A lot of these topics were still taught even though the consequences could be very severe. The students should have the right to learn about Evolution and then make up their own minds about what they believe. One topic should not discredit the other automatically. Basically in order to make a logical decision about your beliefs, research in both issues should be performed. I person should not be told what to believe blindly.

S-A-40: I don't think I have any more opinions to add.

S-A-41: I'd refer you to question 31. Personally, I was weary of taking evolution, bio 315, as a required course for my biology degree. I did not want someone shoving evolution down my throat and telling me that God does not exist, because in my opinion He does. However, I have a wonderful teacher, Dr. Wallace, who not only addressed Creationism, but told the class that evolution and creationism are views and his job is to describe evolution from the scientific viewpoint that he knows it. As such, he has become one of my favorite teachers and evolution one of my favorite courses and I have been able to understand the ideas and evidence of evolution so that I am less ignorant on the topic. My recommendation is for the surveyists to talk with Dr. Wallace and/or sit in with his class and take note of his style of teaching and request him to help you promote the spread of evolution being offered in colleges.

S-A-42: Now of course I don't know, but I feel like I hit many things on this survey pretty close to on target. I regret to say that this is not because of my biological education here at Iowa State, but rather my Nature of Science class taken in Curriculum & Instruction. Biological evolution, as taught to me in my biology classes, was taught as fact, fact, fact. Without an understanding of how science works, the beauty and importance of it in biology was completely lost on me. I did not enter classes with an aversion to evolution; I supported it. However, I don't think the way that it is taught is

helping convince anyone with a strong opposition to it. For many of those students, I think they learn what they need to for the test, but don't really jump on the bandwagon, often because they feel it has to be separate. I cannot stress the importance of Nature of Science courses. I firmly believe that it should be taught as a basic and crucial part of the biological curriculum early on in a students' academic career. I think there would be better retention of students and students might enjoy their classes more.

S-A-43: I think that people read the bible to literally. The bible was written by men, long after the world had already existed for millions of years, and before they knew what we know. I think that people who disagree with the age of the earth and the fossil records based on religion are being ignorant because evolution is not saying that there is no higher power, simply that everything happened a long time ago, and might not be word for word what it says in Genesis. (which was written many many years later by men!)

S-A-44: Such a hard topic to teach/learn. I grew up in a very religious home, and still have very strong beliefs. I do want to say that I really enjoyed-and might possible say that Biology 315 was one of my favorite classes at ISU. Professor Wallace did a wonderful job of teaching the class. He had very strong and clear points, but made sure to never push ideas upon any student.

S-A-45: I honestly think that as a biology student in the liberal arts program, more classes from a variety of subjects are necessary in order to be the most rounded citizen possible. Although i realize that as a public university, it is not possible to require students to take a religion course. I do feel that taking atleast one course in religion would give students a better understanding of both sides of the story. I also think that an introductory astronomy class that discusses the origin of interstellar objects would help complete the whole evolution topic.

S-A-46: Good, well worded options on your survey. Nice work.

S-A-47: good survey i would have to guess that DR Wallace had something to do with this :)

S-A-48: I don't believe that you actually care what I have to say on this subject. I don't believe that you're actually reading any of this. Most of these questions were just smoke and mirrors while you will take the few questions that have been carefully written and distort them to mean whatever you are trying to prove. Do you think that physicists walk around attempting to convince the public of their ideas? They are confident enough in their science to live knowing that laymen will never understand what they do, but if they endeavored to learn the math, they would. Conversely, the followers of evolution are so incredibly incensed with the notion that all humanity must be converted that they don't mind that they have no real math or scientific experiments to prove it. Frankly if proof of evolution existed, it would be so obvious and paraded out so that even the blind would see it as the truth. The fact that evolution is nothing but a convolution of logic that most people will not follow enrages the evolutionist. If I learned enough math, I could do physics. If I studied chemistry long enough, I could do it as well. Evolution, however, cannot be learned without jumping to irresponsible conclusions or blindly accepting it as truth. I refuse to be a blind follower. I am a scientist.

S-A-49: Do you realize that there are public high schools out there that do not teach any form of evolution? The fact that I have peers who have no idea what evolution is really bothers me. Since it isn't being taught well in high school, maybe a biology course should be mandatory for all college majors. This course could touch on the basics, such

as explaining what science is and how it works, as well as a general overview of biological evolution. Instructors could begin the course by explaining that plenty of scientists also hold religious views, and the belief in evolution doesn't necessarily threaten the belief in a god.

S-A-50: No comments

S-A-51: I believe in Jesus Christ as the Son of God who came to atone for our sins because we can't do anything to earn our way to Heaven. The beauty of God's grace is that it makes life not fair. I have been in many evolution classes and heard the evidence and I've also been taught a lot by the church I go to and things seem so intricate that how could it have just randomly happened on its own. I agree that evolution has occurred on a small scale due to the obviousness of it, but on a grander scale I disagree. Yes, there are fossils that make it seem that one animal evolved to another, but they're just bones. They appear to look that way, but there's no for sure thing linking them together. There has also been some genetic evidence found, but I haven't had a chance to study it at length. To me, I have much more to lose if I die and find out God did exist when I lived as if He didn't(basically blaspheming the Holy Spirit), than if I just live as if He does exist. I don't mean just following the rules, because I can't get to Heaven on my own accord, but having a relationship with Jesus.

S-A-52: Don't have "why did you answer that way?" boxes as the question after each real question.

S-A-53: people don't understand what evolution is. they have this preconceived notion that evolution is trying to prove the bible, god, and thier whole religious faith wrong. they need to step back and look at what is really being explained and all the evidence to support it. i have heard some rediculous claims trying to show the science behind evolution wrong, but all the arguments i have seen are unfounded, lack knowledge in the subject and strike me as desparate attempts to discredit good science.

S-A-54: I don't feel like typing all that out; I have a lot of opinions on the topic. Email me or call me for an interview if you want more specifics on my views on the topic.
sippstress@excite.com 319-551-1000

S-A-55: None

S-A-56: Don't think I am an idiot, or don't know what I'm talking about because I believe in God. I have read many books, I have taken many classes, and I have come to my own conclusion. It doesn't mean you can't keep trying to prove evolution, as far as college goes teach what you feel is most relevant, I would suggest at least mentioning intelligent design. Scientifically it can't be all there, but philosophically its an idea for now.

Although to me it seems like many teachers on campus are out on a religous crusade to get rid of an opposing religion. Its just an idea as far as your concerned, then why fight it so strongly. Just let the natural evolution of things take place. If it looses support let it do so on its own. Don't make a crusade, then your just going to meet oposition from people that feel like their religious rights are being attacked, and in America that doesn't go over too well.

S-A-57: nothing

S-A-58: i can't think of anything moreto say<http://www.it.iastate.edu/>

S-A-59: This survey was pretty exhaustive. I think I hit my main points in my answer to question 31.

S-A-60: I'm somewhat apathetic so don't take anything I wrote too seriously. I don't know exactly where I stand on this subject so I pretty much just refuse to think about it.

S-A-61: not answered

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