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Enhancing Science for ELLs

Science strategies for English Language Learners that benefit all students.

By Joanne K. Olson, John M. Levis, Roberta Vann, Katherine Richardson Bruna

Most of us recall the first time we had English Language Learners (ELLs) in our classrooms. What does this child understand? How do I help her feel comfortable when I can't communicate in the same language? How do I teach academic subjects and monitor progress when he doesn't speak the language of instruction? How will her peers act toward her? These concerns are often coupled with a fear that spending valuable instructional time helping the ELLs may cause us to neglect the bulk of our class who are not ELLs. Fortunately, when teaching science, many strategies that work very well for ELLs are the same teaching strategies that work well for all learners. Implementing a few carefully chosen strategies can enhance the experience of the ELL and also add to the quality of your science program. (See Figure 1 for suggested readings on this topic.)

Strategies for ELL

Make ELLs included members of your class.

Learn how to say the names of ELLs with a reasonably accurate pronunciation. Names are important for any student—it gives the student visibility in the classroom. For ELLs, this may be even more important. Many of us are afraid that we will mispronounce their



names or embarrass ourselves by using an accent unfamiliar to us. But all people like to hear their name, even if the accent is wrong. And if you practice, you'll get better. When we call other students by their names and ignore the ELL, he or she can feel invisible in the classroom. Unless he or she requests it, it's best not to ask an ELL to use a nickname or some easier to pronounce "American" name. Names are associated with our identity, and your use of students' names shows that you respect them and are willing to take risks pronouncing their names, just as you need them to take risks speaking English in the classroom.

In addition, ELLs can benefit from having student "learning partners" who are fluent in English.

This can be beneficial in lessening the isolation of the ELLs and in encouraging non-ELLs to reach out to their new classmates.

Give students opportunities to produce oral language in situations where they can succeed.

Just as all students need to produce language in order to learn content, ELLs need to produce oral language in order to learn English. With the best of intention, teachers often find themselves lowering expectations for their ELLs. They don't call on these students because they fear that the ELL will feel embarrassed or intimidated. Instead, teachers can provide a number of language supports so that ELLs can more confidently respond in class and provide important contributions.

For example, teachers can use cooperative groups, and while students are working, quietly tell the ELL that during the class discussion he or she will be asked to report one finding from the group. This gives the student the opportunity to practice, write down what he or she wants to say, and get feedback from group members prior to the class discussion. In addition, teachers can make use of wait time more effectively. ELLs often need some time to think about the words they want to use, and this requires that the teacher genuinely listen to the student. Speaking in a new language in the classroom is a very public, often difficult task, and extra time often makes the difference between perceived success and failure. Ensuring that students have access to important words, as described in the points below, can also help encourage ELLs to share answers and ideas orally. Finally, when a student answers, focus on the content the student is trying to convey, rather than the form of the language. Speaking in a new language often involves making grammatical errors. Most of these errors will disappear with increasing ability to use the language, and it's not important to correct them if the content they express is accurate.

Provide key terms of the unit in a readily accessible location.

We know that good science instruction is focused on learning important concepts rather than vocabulary words. However, words are important labels for learning the concepts. Many ELLs will struggle

to articulate concepts if they do not have access to the English terms for the words they need. One common way to provide these words to ELLs is to use a word wall. A *word wall* is a poster or bulletin board that displays common terms for the science topics you are studying, accompanied by either a picture (or the first-language equivalent if most of your ELLs are of the same language background). A unit on electricity might have a word wall with the following terms: *battery, bulb, wire, electricity, current, circuit, light*. This strategy helps build important vocabulary for all children in the class, even though students are being assessed on their conceptual understanding, not spelling or definition of these terms.

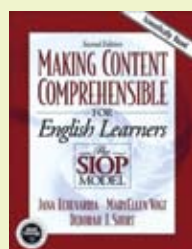
Recognize that the words that show up on word walls are not the only ones important to conceptual understanding.

Word walls usually include nouns and verbs, words that are typically learned first because they carry most of the content of speech. However, the full meaning of concepts cannot be conveyed by nouns and verbs alone. Many of the small words of speech (like prepositions) are the glue that holds concepts and ideas together, but these words may not be learned quickly by ELLs because they are more difficult to hear in normal speech. They are difficult to hear because in English many of these words are unstressed and are therefore spoken less clearly. In the following sentence, the words

Figure 1.

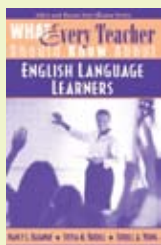
Selected resources for teaching English Language Learners.

The following resources may be of particular interest:



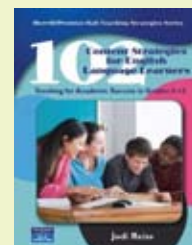
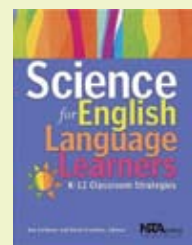
Echevarria, J., M. Vogt., and D.E. Short. 2004. *Making content comprehensible for English learners: The SIOP model* (2nd ed.). Boston, MA: Pearson.

Fathman, A.K., and D.T. Crowther, Eds. 2006. *Science for English language learners: K–12 classroom strategies*. Arlington, VA: NSTA Press.



Hadway, N.L., S.M. Vardell, and T.A. Young. 2004. *What every teacher should know about English language learners*. Boston, MA: Pearson.

Reis, J. 2008. *102 content strategies for English language learners: Teaching academic success in Grades 3–12*. Upper Saddle River, NJ: Merrill/Prentice Hall.



in small print are those that are unstressed in normal speech, while the words in larger print are those typically found on word walls.

Electric current in a complete circuit will cause bulbs to light.

Native speakers of English often fill in the unstressed words even if they don't hear them clearly because they understand the grammar of English. However, ELLs will not hear unstressed words as well because they are less clearly pronounced, and ELLs may not be able to fill them in because of their inadequate command of their new language.

Teachers can help by calling attention to words like prepositions with visual clues such as graphic organizers. Sentence strips can also be used to help students see the logical progression of the lesson. Teachers can provide key words such as *If* and *then*, and groups of students can work to fill in the remainder of the sentence. One possible student response might be:

If more bulbs are connected on the same path,
Then the brightness of the bulbs decreases.

Providing time and visual cues such as these helps all students have more opportunities to grasp the concept.

Use the learning cycle to increase comprehension and ground language in experience.

Beginning the instructional sequence with experiences (coupled with access to the names of the

equipment) helps all students have a foundation upon which they can build an understanding of the content. During the concept development phase that follows the experience, the teacher can refer back to the real objects that students were using and the events that they witnessed. Then, as students apply their new knowledge in the third phase, students can see how the new concept works to solve a more complex challenge. This lesson structure helps all students, particularly elementary students who need to have many concrete representations and ELLs who can develop the concept even if they are still learning the language.

Use alternative assessments.

Assessment does not have to be a written paper-and-pencil test. In science, children can show their understanding in a variety of ways, including models, projects, simulations, demonstrations, drawings, and even conversations. When teachers focus on assessing central concepts rather than vocabulary or trivial details, they are often surprised at how much their ELLs know. Since the goal of assessment is to determine understanding of concepts, students should be encouraged to express their understanding of concepts in their home language, simple English combined with illustrations, and/or a combination of their home language and English.

Closing Thoughts

The elementary classroom is changing, and ELLs are frequently a part of the mainstream classroom learning alongside of native English speaking

Connecting to the Standards

This article relates to the following *National Science Education Standards* (NRC 1996):

Teaching Standards Standard D

- Teachers of Science design and manage learning environments that provide students with the time, space, and resources needed for learning science.

National Research Council (NRC). 1996. *National science education standards*. Washington, DC: National Academy Press.

children, even when the ELLs' language has not yet developed fully. So, teachers need strategies to help build the language and content knowledge of *all* their students, making sure that all children have the greatest opportunity possible to succeed in learning science. While there are many strategies that can be helpful to a teacher, the strategies we've outlined here will allow teachers to both help their non-ELL students and successfully include ELLs in classroom learning opportunities.

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