

the RESEARCH *for*

Science Photo Library

The National Clearinghouse for English Language Acquisition and Language Instruction Educational Programs estimates that there are more than five million students identified as LEP or limited-English proficient. The NCLB Act states that ELL students must meet the same state academic achievement standards and state academic content standards expected of all students. **SRA Science Photo Library** helps students learn and understand important science terms in English. Each card includes the English science term translated into ten common languages and provides a photograph that clearly illustrates the term for the student. The combination of visuals and both written and oral language helps students develop the background knowledge needed to succeed in science.

Science and Language Learning

Science literacy and language skills can be learned simultaneously. The National Science Education Standards and English Language Proficiency Standards call for integrating content instruction in science and English language instruction. Examples of research supporting the science content and language instruction in **SRA Science Photo Library** include:

- Crandall, J., A. Jaramillo, L. Olsen, & J. K. Peyton. 2002. *Using cognitive strategies to develop English language and literacy*. ERIC Clearinghouse on Languages and Linguistics.
- Gibbons, P. 2003. Mediating language learning: Teacher interactions with ESL students in a content-based classroom. *TESOL Quarterly* 37, (2): 247–273.
- Gottlieb, M. 2004. *WIDA Consortium English language proficiency standards for English language learners in kindergarten through grade 12: Overview document*. Madison, WI: State of Wisconsin.
- Luykx, A., P. Cuevas, J. Lambert, & O. Lee. 2004. Unpacking teachers' "resistance" to integrating students' language and culture into elementary science instruction. *Preparing prospective mathematics and science teachers to teach for diversity: Promising strategies for transformative action*, 119–141. Mahwah, NJ: Erlbaum.
- National Science Teachers Association. 2000. Position statement on multiculturalism. <http://www.nsta.org/positionstatement&psid=21> (accessed December 1, 2006).
- Rothenberg, C. & D. Fisher. 2007. *Teaching English language learners: A differentiated approach*. Upper Saddle River, NJ: Pearson Education.
- Shin, F. 2005. *ELD in the content area: Science*. New York: Rosen.
- Teachers of English to Speakers of Other Languages. 2006. PreK-12 English Language Proficiency Standards in the Core Content Areas. Alexandria, VA: TESOL.
- Thier, M., & B. Daviss. 2002. *The new science literacy: Using language skills to help students learn science*. Portsmouth, NH: Heinemann.

Using Visuals to Teach Science

The use of visual aids to teach science concepts is a method that has been supported through both research and results in the classroom. **SRA Science Photo Library** uses images to help students visualize the 630 science terms that are covered in the program. The following research supports the use of visuals in science and English language education:

- Brown, J. 2004. Visual learning in science and engineering. *ACM SIGGRAPH Computer Graphics* 38, (4): 22–23.
- Holliday, W. 1980. Using Visuals to Teach Concepts. *Science and Children* 17, (7): 9–10.
- Matthewson, J.H. 1999. Visual-spatial thinking: An aspect of science overlooked by educators. *Science Education* 83, (1): 33–54.
- Wellington, J., & J. Osborne. 2001. *Language and Literacy in Science Education*. Philadelphia, PA: Open University Press.

Intervention

Schools face the challenge of teaching a wide variety of students whose abilities are vastly differentiated. Standards set forth by the No Child Left Behind Act and the Individuals with Disabilities Education Act ensure that all students receive the necessary instructional interventions they might need to achieve competency in science. **SRA Science Photo Library** is an excellent intervention tool because it allows teachers to scaffold a student's learning and to individualize instruction based on each student's personal needs.

- Carlson, C. 2000. Scientific literacy for all. *The Science Teacher* 67(3), 48–52.
- Dye, G. A. 2000. Graphic organizers to the rescue! Help students link—and remember—information. *Teaching Exceptional Children* 32(3), 72–76.
- Kameenui, E. J., D. W. Carnine, R. C. Dixon, D. C. Simmons, & M. D. Coyne. 2002. *Effective teaching strategies that accommodate diverse learners (2nd ed.)*. Upper Saddle River, NJ: Merrill/Prentice Hall.

Core Science Content

The science content in **SRA Science Photo Library** was developed based on the standards put forth by the National Academy of Science.

- National Academy of Science. 2005. *National Science Education Standards*. Washington, DC: National Academy Press.