

ScienceSaurus

R e s e a r c h B a s e

Introduction

Science achievement and improved science education is a national concern (United States Department of Education, 1994). Students in the United States lag behind students in other industrialized nations in science and mathematics. “As the world becomes increasingly scientific and technological, our future grows more dependent on how wisely humans use science and technology. And that, in turn, depends on the effectiveness of the education we receive. With the exploding impact of science and technology on every aspect of our lives, especially on personal and political decisions that sustain our economy and democracy, we cannot afford an illiterate society” (Nelson, 1999). However, a survey conducted by the Bayer Corporation as part of its Making Science Make Sense found that a “vast majority of Americans believe public science and technology literacy are crucial to the nation’s future prosperity and security, but they do not think students are being adequately prepared in these fields” (National survey says science education needs improvement, 2003).

***ScienceSaurus* is aligned with the National Science Education Standards.**

Aligned with the National Science Education Standards, *ScienceSaurus* covers all the major strands of science including life, physical, and earth science as well as natural resources and the environment. Program Standard B of the National Science Education Standards states: “The program of study in science for all students should be developmentally appropriate, interesting, and relevant to students’ lives; emphasize student understanding through inquiry; and be connected with other school subjects” (National Research Council, 1996). *ScienceSaurus* is a high-interest, comprehensive resource for students to use in science class, during lab time, or at home. The handbook provides clear examples to help students understand and review essential science topics including scientific investigations, data analysis, lab skills and safety, writing lab reports, and test preparation skills. *ScienceSaurus* also models scientific investigation and inquiry.

***ScienceSaurus* presents information that appeals to various learning styles to help every student achieve.**

ScienceSaurus is a student handbook that offers step-by-step guidelines and clear examples of key science topics. Many students have trouble understanding or relating to their primary science textbook. “Students whose main source of information is a textbook laden with facts and written without a voice and style have little opportunity to interpret and justify” (Robb, 2003). *ScienceSaurus*, written in a student-friendly voice, offers these students additional examples and alternative explanations of key concepts. Every topic is presented in more than one way, often with several examples so students who process information in diverse methods have alternative models. The handbook provides clear explanations in a student-friendly design, which includes visual models to illustrate examples (Burnette, 1982). This makes it easy for students to access important information without digging through dense chapters (Bergerud, 1988).

ScienceSaurus is a comprehensive resource for essential, age-appropriate science concepts. The handbook is organized around topics, not chapters, which allow students to review information that is essential for understanding new concepts. As students review information in the handbook, they activate prior knowledge. Activating prior knowledge is important in learning new material (Balas, 1997). This gives students a reference tool that empowers them to become more responsible for their own learning, reviewing, relearning, and researching.

Students benefit from using a variety of learning tools.

In a study conducted by the American Association for the Advancement of Science’s Project 2061, none of the nine middle grade level science textbooks reviewed received a satisfactory rating (American Association for the Advancement of Science, 2003). The textbooks were rated on a variety of criteria, including providing a sense of purpose; taking account of student ideas; engaging students with relevant phenomena; developing and using scientific ideas; promoting student thinking about phenomena, experiences, and knowledge; assessing progress; and enhancing the science learning environment. The three-year study found that “most textbooks cover too many topics and don’t develop any of them well. All texts include many classroom activities that either are irrelevant to learning key science ideas or don’t help students relate what they are doing to the underlying ideas” (American Association for the Advancement of Science, 2003). Some science textbooks “actually impede progress toward science literacy. They emphasize the learning of answers more than the exploration of questions, memory at the expense of critical thought, bits and pieces of information instead of understandings in context, recitation over argument, reading rather than doing. They fail to encourage students to work together, to share ideas and information freely with one another, or to use modern instruments to extend their intellectual capabilities” (Nelson, 1999). Unlike a textbook approach that requires students to read about an array of science topics, *ScienceSaurus* allows students to focus on specific topics. *ScienceSaurus* also serves as a resource that students can turn to for detailed guidelines and easy-to-understand explanations of the each topic.

Science and the Internet

The Internet is becoming an increasingly popular and accessible resource for students. *ScienceSaurus* provides students with helpful guidelines and tips for conducting research on the Internet such as evaluating, using, and citing sources. However, “while more young people have access to the Internet and other media than any generation in history, they do not necessarily possess the ethics, the intellectual skills, or the predisposition to critically analyze and evaluate their relationship with these technologies or the information they encounter” (Considine, 2002). *ScienceSaurus* includes *SciLinks*[®], Internet access codes throughout the handbook with links to relevant, age-appropriate information on the Internet. *SciLinks*[®] web resources are provided at the point of use in the text for additional related information, lessons, and activities available on the Internet. This strategy of placing the link in the midst of materials already engaging students and in the sequence of what they are learning makes it much easier for students to find appropriate online content. *SciLinks*[®], which are consistently updated, give students the opportunity to explore areas of interest in greater depth and provide additional instruction. The web site links, which are specifically chosen by the National Science Teachers Association, include additional information on key topics. Access to these NSTA-selected sites allows teachers to direct students to “safe” sites.

SciLinks[®] is a registered trademark of the National Science Teachers Association.

References

American Association for the Advancement of Science. (2003). *Heavy books light on learning: Not one middle grades science text rated satisfactory by AAAS's Project 2061*. Retrieved August 26, 2003, from <http://www.project2061.org/press/pr990928.htm>

Balas, A. K. (1997). The mathematics and reading connection. *ERIC Digest*. [ED 432 439].

Bererud, et al. (1988). The effectiveness of textbook adaptation in life science for students with learning disabilities. *Journal of Learning Disabilities*, 21(2), 70-76.

Burnette, J. (1987). Adapting instructional materials for mainstreamed students. *ERIC Digest*. [ED 297 557].

Considine, D. (2002). *Media literacy across the curriculum*. Retrieved September 5, 2003, from <http://www.ciconline.org/NR/rdonlyres/eb3vg6zhcpg5xlf6lsrxack3f3z67keuqjsfx4zptiljbrkdqezhlpwgzgtucxjkiqiyf-pvcbijg5uxhuet67ls6jfe/CICML-Considine.pdf>

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

Nelson, G. D. (1999). *Science literacy for all in the 21st century*. Retrieved May 7, 2003, from <http://www.project2061.org/newsinfo/research/articles/ascd.htm>

National survey says science education needs improvement. (2003, August/September). *NSTA Reports*, 14(6), pp. 1, 9.

Robb, L. (2003). *Teaching reading in social studies, science, and math*. New York, NY: Scholastic Professional Books.

United States Department of Education. (1994). *High standards for all students*. Washington, DC.