

Philosophy of The SAGUARO Project

Investigating relevant problems

The SAGUARO Project learning modules focus on investigating topics frequently addressed in Earth systems science courses that affect students in their daily lives: plate tectonics and geologic hazards, severe weather and global climate, and the distribution and use of natural resources. Each module contains activities focusing on several related processes and problems. Beginning at the global scale, the investigations progress to regional and, in some cases, local-scale studies. The content and form of the inquiry progresses from guided to open-ended as students build their knowledge and reasoning skills. Threaded throughout each module are animations and other visualizations that enhance understanding.

Interpreting meaningful patterns

An Earth scientist makes a living by observing and measuring nature; the activities in this module are designed to help students develop these skills. Whether recording the path of a tropical cyclone or the distribution of deadly earthquakes, a successful Earth scientist relies heavily on his or her ability to recognize patterns. Patterns in space and time are the keys to many of the great discoveries about how the Earth works. Using the powerful visualization and analytical tools of a Geographic Information System (GIS), students learn to recognize and interpret nature's fundamental patterns. A GIS allows students to identify physical and spatial relationships by constructing multiple representations of data in the form of maps, tables, charts, and graphic layouts. The analytical tools allow students to quantify those relationships in feature databases through sorting, querying, simple calculations, and statistics. The tool also makes it possible for students to integrate and develop their own data for further investigative research.

Thinking scientifically

These modules promote scientific thinking—the ability to formulate questions and to implement strategies for answering them. Experience shows that students working with these materials become intrigued by the data sets and are motivated to explore more deeply to answer their own questions. This type of critical thinking and problem solving is an important step in developing a scientifically literate society and attracting the next generation of students to the Earth sciences.