

**Is there life elsewhere in the universe?  
What is life's destiny on Earth and beyond?  
How did life originate on Earth?**

Such are the profound and exciting questions that can be used to stimulate students' interest in science.

Astrobiology is a relatively new science that brings together biologists, chemists, physicists, geologists, and astronomers who seek the answers to a set of challenging and intriguing questions. A completely integrated science, astrobiology offers students a rich venue for wrestling with the same fundamental ideas and concepts that engage scientists and researchers. Students will learn that scientific knowledge is not an inert set of accumulated facts, but is a dynamic and, at times, confusing and amorphous set of current speculations. Students will observe and experience how this knowledge base evolves as a result of the infusion of new data and emergence of new means of understanding the data. They will learn about, explore, and participate in the real processes of science research and discovery. At the same time, they will be introduced to a field of study that may soon yield some of the most important scientific discoveries of all time.

Through a series of inquiry-based activities designed according to the theme of the search for life in the universe, students will explore diverse concepts in chemistry, physics, biology, Earth and space science, and engineering. These concepts are truly integrated—there is no artificial division of scientific disciplines. The curriculum is a sequenced yearlong course comprised of 16 chapters.

The curriculum development team at TERC, all former classroom teachers, have focused on engaging students in science by capitalizing on the excitement people feel when they experience science-related developments and discoveries up close and ongoing. What are the benefits of teaching *Astrobiology*?

- \*Offers a full-year high school foundation science course
- \*Provides a seamless, interdisciplinary, student-centered approach
- \*Addresses science concepts in an absorbing story that is unfolding before our eyes
- \*Incorporates the National Science Education Standards
- \*Engages students in the science process through the development and application of research skills, experiments, long-term investigations, and field studies
- \*Reaches a broad range of students effectively
- \*Presents a multitude of approaches based on a 5E learning-cycle model: Engage, Explore, Explain, Evaluate, and Extend.
- \*Integrates technology experiences including WebQuests and Habitable Words—a Web site designed for student research and exploration

- \*Develops research skills including modeling, designing experiments, testing hypotheses, making systematic field observations, and doing image and data analysis.
- \*Incorporates embedded, performance-based, and traditional assessments
- \*Year-end final assessment in which students explore a topic of astrobiology in depth by choosing to either conduct research, write an astrobiology story, produce astrobiology art, or design a mission to search for life on another world.
- \*Content developed by leading educators and scientists
- \*Affordable materials, under \$600.00 per class of 30

## **Inquiry in the Astrobiology Curriculum**

Our view of scientific inquiry for middle school and early high school is one of gradual development. Inquiry skills should be introduced slowly, and in a context within which these skills can be applied to a task or a problem. In *Astrobiology: An Integrated Science Approach*, students grow in inquiry skill competence until they are able to design and carry out scientific investigations.

For more information, consult, *Astrobiology: An Integrated Science Approach (Teacher Guide)* by Jodi E. Asbell-Clarke, Daniel W. Barstow, Teon E. Edwards, James L. Larson, Jeffery F. Lockwood and Christopher H. Randall.