

## Investigating Life in the Universe: An Integrated Science Approach

The Astrobiology Curriculum

**Publisher and Developer:** TERC

**Grade level:** 9

**Scientific domains:** Chemistry, biology, physics, earth and space science

**Web site:** <http://astrobio.terc.edu>

**Year profiled:** 2002

TERC and NASA developed *Investigating Life in the Universe (ILU)* (also known as *The Astrobiology Curriculum*) in 2002 as an interdisciplinary high school course with a mix of print and Internet resources. Through a series of inquiry-based activities, students explore diverse concepts in chemistry, physics, biology, earth and space science, and engineering. The curriculum is a sequenced, year-long course composed of six units. Students develop research skills including modeling, setting up experiments, testing hypotheses, making systematic field observations, and doing image and data analysis. Research assignments, such as long-term investigatory projects that are done in conjunction with each unit of the course, enable students to be active participants in the science of astrobiology.

### SCOPE/CONTENT

*The Astrobiology Curriculum* emphasizes five different learning goals for the student:

- To understand key ideas of astrobiology.
- To learn and apply concepts in chemistry, physics, biology, engineering, and earth and space science.
- To develop scientific thinking and problem-solving skills through lab experiments, fieldwork, modeling, and image and data interpretation.
- To develop research skills through inquiry-based projects.
- To develop technical skills.

Content covered includes the processes that have led to the formation of matter, stars, galaxies, planets, and other astronomical objects; the nature of life and its prospects in the universe, including the solar system and “extraterrestrial” conditions; why there is life on Earth and not on the moon through examination of the roles of atmosphere, temperature, water, energy, and chemical building blocks; and methods and techniques used to search for potential life in other worlds. Students also research and explore a topic of their choice.

### FORMAT

The curriculum is designed around six units, covering a total of 18 chapters of material. The curriculum is presented as a continuous story, from the opening questions to the final conclusions. Each chapter begins with introductory sections—Setting the Stage, a Challenge, and What Do You Know?—and comprises four to six activities. The activities consist of the Purpose, an Overview, the Context, Key Concepts Covered, Key Skills Developed, and Materials Needed. Think About It and Checking In sections ask students questions to help make sure they are on the right track. Students use different technologies in each activity, including telecommunications, modeling, image and data interpretation, and the use of WebQuests. WebQuests enable student teams to practice the procedures and problem-solving techniques modeled by scientist research groups.

**ASSESSMENT INSTRUMENTS**

Assessments include embedded pre- and post-assessments (concept maps, performance-based student research projects, and posters) and What Do You Know? and Think About It questions in each chapter.

**PROFESSIONAL DEVELOPMENT SUPPORT**

Information is not available.

**STAND-ALONE VS. SUPPLEMENTAL**

This program is designed primarily as a core interdisciplinary program for use in grade 9.