

**URBANDALE COMMUNITY SCHOOL DISTRICT
CURRICULUM FRAMEWORK OUTLINE**

SUBJECT: Science
COURSE TITLE: College AP Environmental Science
GRADE LEVEL: 2 Credits
PREREQUISITES: 11-12 grade, Biology and either Chemistry or College Chemistry

COURSE DESCRIPTION:

The AP Environmental Science course is designed to be the equivalent of a one-semester, introductory college course in environmental science, through which students engage with the scientific principles, concepts and methodologies required to understand the interrelationships of the natural world. The course requires that students identify and analyze natural and human made environmental problems, evaluate the risks associated with these problems, and examine alternative solutions for resolving or preventing them. Environmental science is interdisciplinary, embracing topics from geology, biology, environmental studies, environmental science, chemistry, and geography.

CONTENT STANDARDS:

In order that our students may achieve the maximum benefit from their talents and abilities, the students of Urbandale Community School District's AP Biology should be able to . . .

Content Standard I. Understand and apply the concepts of life science.

Benchmarks:

The energy available for processes on Earth is derived largely from the Sun, with a small contribution from geothermal sources.

Energy transformations drive the movement of water and air on global and local scales.

Primary production requires biologically accessible energy inputs, which vary over time and space.

Climate is influenced by interactions of multiple physical, chemical and biological factors, including human actions.

Ecosystems supply humans with a multitude of resources and processes that are collectively known as *ecosystem services*.

Ecosystem services have value.

The value of ecosystem services is integral to decision-making processes.

Sustainability is a guiding principle by which systems and resources are used in ways that they can be maintained at an acceptable level indefinitely.

Human societies require Earth's resources; the amounts required are a function of human population size, growth and affluence.

Humans engineer systems in order to (1) maximize outcomes to meet societal needs, (2) moderate system extremes, and (3) control or change interactions. Engineered systems, as all systems, have many interactions with the rest of the environment.



Human activities, including use of resources, have physical, chemical and biological consequences for watersheds and aquatic systems.

Human activities have physical, chemical and biological consequences for the atmosphere.

Human activities have physical, chemical and biological consequences for ecosystems; the magnitude of the impact depends in part on the sensitivity of the system to perturbation.

Content Standard II: Understand and apply the concepts of earth and space science.

Benchmarks:

Ecosystems emerge from biotic and abiotic interactions among Earth's atmosphere, hydrosphere, lithosphere and cryosphere.

Earth's landscapes emerge from the interactions among the atmosphere, hydrosphere, lithosphere, biosphere, cryosphere and human activity.

Content Standard III: Understand and apply the concepts of physical science.

Benchmarks:

The major biogeochemical cycles of elements and compounds (water, carbon, nitrogen, sulfur and phosphorus) are composed of specific processes that occur over varying intervals of space and time based on their chemical and physical properties.

Biogeochemical cycles are representations of the transport, transformation and storage of elements on a local, regional or global scale.

Content Standard IV. Understand and apply the concepts of health science.

Not addressed in this course

Content Standard V: Understand and apply the scientific method.

Benchmarks:

Deduce the importance of science as a process.

Hypothesize and develop experiments to test those hypotheses.

Assess laboratory data.

Communicate the outcomes of an experiment.

