Unit 2 Ecosystems: Everything is Connected

Content Area: **Science**
Course(s): **Environmental Science CP**
Time Period: **October**
Length: **10 Blocks**
Status: **Published**

Transfer Skills

Enduring Understandings

The solid part of Earth that consists of all rock, and the soils and sediments on the Earth's surface is the geosphere

The mixture of gasses that surrounds the Earth is called the atmosphere

The hydrosphere includes all of the water at or near the Earth's surface

Scientists classify the ecosystems of the world into large areas called biomes

Aquatic ecosystems can be classifies into freshwater ecosystems and marine ecosystems

Essential Questions

How do the nonliving parts of Earth's systems provide the basic materials to support life?

How does the environment affect where and how an organism lives?

Content

Vocab:

Feedback loop, erosion, geosphere, lithosphere, biosphere, atmosphere, hydrosphere, crust, mantle, core, tectonic plate, landform, nutrient, biogeochemical cycle, primary producer, photosynthesis, consumer,

decomposer, cellular respiration, eutrophication, nitrogen fixation, biome, climate, weather, climatograph, net primary production, canopy, emergent layer, understory, epiphyte, deciduous, estivation, coniferous, hibernation, permafrost, salinity, photic zone, aphotic zone, benthic zone, littoral zone, limnetic zone, wetland, flood plain, estuary, upwelling

Skills

Describe two major ways that Earth's systems interact

Define Earth's geosphere, lithosphere, biosphere, atmosphere, and hydrosphere

Describe the parts of the Earth's geosphere

Describe Earth's biosphere and atmosphere

Discuss the water cycle

Explain how the law of conservation of matter applies to the behavior of nutrients in the environment

Describe the carbon cycle

Describe the events of the phosphorus cycle

Explain the importance of bacteria to the nitrogen cycle

Explain how biomes are characterized

Describe how net primary production varies among biomes

Explain how organisms are adapted to the conditions of their biomes

Describe the criteria ecologists use to classify aquatic ecosystems

List the major categories of freshwater ecosystems

Explain the ecological importance of estuaries

List the major zones of the ocean

Resources

Standards

SCI.9-12.5.1.12	All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.
SCI.9-12.5.1.12.A	Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.
SCI.9-12.5.1.12.A.1	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
SCI.9-12.5.1.12.A.a	Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.
SCI.9-12.5.1.12.C	Scientific knowledge builds on itself over time.
SCI.9-12.5.1.12.C.1	Reflect on and revise understandings as new evidence emerges.
SCI.9-12.5.1.12.C.a	Refinement of understandings, explanations, and models occurs as new evidence is incorporated.
SCI.9-12.5.1.12.D	The growth of scientific knowledge involves critique and communication, which are social practices that are governed by a core set of values and norms.
SCI.9-12.5.1.12.D.1	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.
SCI.9-12.5.1.12.D.a	Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.
SCI.9-12.5.3.12	All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.
SCI.9-12.5.3.12.B	Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.
SCI.9-12.5.3.12.B.3	Predict what would happen to an ecosystem if an energy source was removed.
SCI.9-12.5.3.12.B.4	Explain how environmental factors (such as temperature, light intensity, and the amount of water available) can affect photosynthesis as an energy storing process.
SCI.9-12.5.3.12.C	All animals and most plants depend on both other organisms and their environment to meet their basic needs.
SCI.9-12.5.3.12.C.1	Analyze the interrelationships and interdependencies among different organisms, and explain how these relationships contribute to the stability of the ecosystem.
SCI.9-12.5.3.12.C.2	Model how natural and human-made changes in the environment will affect individual organisms and the dynamics of populations.
SCI.9-12.5.3.12.C.a	Biological communities in ecosystems are based on stable interrelationships and interdependence of organisms.
SCI.9-12.5.3.12.C.b	Stability in an ecosystem can be disrupted by natural or human interactions.