Unit 8: Ecology

Content Area: **Science**
Course(s): **AP Biology**
Time Period: **Semester 2**
Length: **3 weeks**
Status: **Published**

Modifications

https://docs.google.com/document/d/1ODqaPP69YkcFiyG72fIT8XsUIe3K1VSG7nxuc4CpCec/edit

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.9-12.5.3.12	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.A	Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.
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.a	As matter cycles and energy flows through different levels of organization within living systems (cells, organs, organisms, communities), and between living systems and the physical environment, chemical elements are recombined into different products.
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.a	Biological communities in ecosystems are based on stable interrelationships and interdependence of organisms.
TECH.8.2.12.C.CS3	The role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.

College Board AP Biology Big Ideas

Big Idea 2: Biological systems utilize free energy and molecular building blocks to grow, to reproduce, and to maintain dynamic homeostasis.

Big Idea 4: Biological systems interact, and these interactions possess complex properties.

Enduring Understanding - College Board AP Biology

Enduring understanding 2.A: Growth, reproduction, and maintenance of the organization of living systems require free energy and matter.

Enduring understanding 2.D: Growth and dynamic homeostasis of a biological system are influenced by changes in the system's environment.

Enduring Understanding 4.A. Interactions within biological systems lead to complex properties.

Enduring Understanding 4.B. Competition and cooperation are important aspects of biological systems.

Enduring Understanding 4.C. Variation within biological systems affects interactions with the environment.

Essential Questions

How do organisms interact with their physical environments?

How do organisms interacts with other members of their own species?

How do organisms interact with other species?

Knowledge and Skills

Essential knowledge 2.A.1: All living systems require constant input of free energy.

Essential knowledge 2.A.2: Organisms capture and store free energy for use in biological processes.

Essential knowledge 2.A.3: Organisms must exchange matter with the environment to grow, reproduce, and maintain organization.

Essential knowledge 2.C.3. Organisms constantly respond to changes in their external environments.

Essential knowledge 2.D.1. All biological systems from cells to populations, communities, and ecosystems are affected by complex biotic and abiotic interactions.

Essential knowledge 2.D.2. Homeostatic mechanisms reflect both continuity due to common ancestry and divergence due to adaptation in different environments.

Essential knowledge 2.D.3. Biological systems are affected by disruptions to their homeostasis.

Essential knowledge 2.D.4. Plants and animals have a variety of chemical defenses against infections that affect homeostasis.

Essential knowledge 4.A.5. Communities are composed of populations of organisms that interact in complex ways.

Essential knowledge 4.A.6. Interactions among living systems and with their environment result in the movement of matter and energy.

Essential knowledge 4.B.4 Interactions between and within populations influence patterns of species distribution and abundance.

Essential knowledge **4.B.5** Global distribution of ecosystems changes substantially over time.

Essential knowledge 4.C.3. The level of variation in a population affects population dynamics.

Essential knowledge 4.C.4. Diversity of species within an ecosystem may influence the stability of the ecosystem

Resources

AP Investigation: AQnimal Behavior - requires choice chambers, mealworms or other small organisms; Energy Dynamics - requires brassica plants, caterpiller larvae, plant growing chambers, balances; Transpiration - requires light sources, leaves, Vernier gas pressure probes, laptops, fan

Assessments

https://docs.google.com/document/d/1wR7bQF-8AQoRrt0g4C3hKja0yjwDjC9_BiAmONWbTcI/edit