

Lesson Topic: Unit 5 Ecology
Grade level: 7th
Length of Unit: 4-5 weeks

Content Standards

Students who demonstrate understanding can:

MS-LS1-6. Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.

MS-LS1-7. Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.

MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

MS-LS2-3. Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.

MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

Big Ideas:

Students will understand

- **Ecology** is the study of interactions between organisms and their environment
- An **ecosystem** consists of both living and non-living components
- **Energy** is transferred among members of a food chain or a food web
- **Matter** is neither created nor destroyed. The water, carbon, and nitrogen are constantly recycled.

Essential Question(s):

- What is ecology?
- Describe and give examples of ecosystems including its living and non-living components and their roles in the ecosystem
- Create a food chain and food web indicating each organism's role in the system
- Explain how energy is transferred through a food chain and food web
- Show the path of matter (i.e. carbon, water and nitrogen) as it is cycled through an ecosystem.

Student objectives (outcomes):

Students will be able to:

- Distinguish between the biotic and abiotic environment.
- Explain how populations, communities, ecosystems, and the biosphere are related.

- Explain how the biotic environment relates to communities.
- Describe the functions of producers, consumers, and decomposers in an ecosystem.
- Distinguish between a food chain and a food web.
- Explain how energy flows through a food web.
- Distinguish between an organism's habitat and its niche.
- Distinguish between the two types of competition.
- Give examples of predators and prey.
- Distinguish between mutualism, commensalism, and parasitism.
- Define coevolution, and give an example.
- Trace the cycle of water between the atmosphere, land, and oceans.
- Diagram the carbon cycle, and explain its importance to living things
- Diagram the nitrogen cycle, and explain its importance to living things.
- Define succession.
- Contrast primary and secondary succession.

Assessment Evidence

Performance Task(s):

- Interactions of Living Things Test
- Cycles in Nature Test
- The Earth's Ecosystems Test
- Zoo Habitat Model Construction Project (see staff shared for pic. examples)
- Bionutrient Cycle Models

Other Evidence:

Learning Plan

Learning Activities:

Interactions Notes
 Ecosystems Notes
 Bio-nutrient Notes

Resources:

<http://www.science-class.net/archive/science-class/Ecology/Ecology.htm>
<http://www.ck12.org/life-science/>

