

Lesson at a Glance

Students will investigate the interrelationships among plants and animals in an ecosystem and explore how climate change might affect those interrelationships and the natural community as a whole.

Grade

3-6

Time

Four to five 1-hour sessions, depending on depth of final assessment

Core Connections

3rd Grade

- Social Studies 1.3.c *Describe ways to conserve and protect natural resources*
- Social Studies 1.3.e *Make inferences about the positive and negative impacts of human-caused change to the physical environment*
- Writing 3.W.7 *Conduct short research projects that build knowledge about a topic*

4th Grade

- Social Studies 1.3.b *Explain viewpoints regarding environmental issues*
- Writing 4.W.7 *Conduct short research projects that build knowledge through investigation of different aspects of a topic*

5th and 6th Grade

Writing

- 5.W.7 *Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic*
- 6.W.7 *Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate.*

Materials

- paper
- pencils
- Internet access
- field guides
- library books
- biology or environmental science textbooks
- other reference materials

Background Information

An ecosystem is a community of living and non-living elements. In any habitat, such as a wetland, tide pool or forest, biotic features (plants and animal) form an

ecosystem along with abiotic or non-living but life supporting features (sun, water, soil, etc.)

The biggest ecosystem of all is the "ecosphere." It includes the planet's surface, atmosphere, continents, oceans, and all living things. Within the ecosphere are regional ecosystems, like lakes, rivers, deserts and tundra. Within these ecosystems are smaller communities, such as meadows, streams, and bogs, plus human communities, like cities.

Natural communities never stand still — they are constantly adapting to varying conditions, such as temperature, moisture, fire, and wind. Climate change threatens to change the planet's ecosystems greatly. Plants and animals sensitive to temperature may move to cooler locations at higher latitudes. New pests and diseases, more frequent droughts, and changes in predator-prey relationships may lead to both plant and animal extinctions.

Activity

1. Introduce your students to the concept of ecosystems by talking about food chains and food webs. Be sure to discuss the interrelationships between living and nonliving things and the roles of producers, herbivores, omnivores, carnivores, and decomposers in a web of life.
2. Ask your students in what ways climate affects plants and animals. Discuss topics such as longitude and latitude, as well as the role seasons may play in their lives (migration, reproduction, hibernation, etc.). Have your students develop a list of ways climate affects plants and animals.
3. Divide your students into teams of four or five. Give each student group an ecological region of the state of Utah or Alaska. Have them visit the **Encyclopedia of the Earth** at <http://www.eoearth.org/topics/view/63435/> to research the ecoregions.
4. Have your students research the basic elements of the ecosystem they have chosen. Some valuable sources of information include field guides, library books, and the Internet. Their research should include the following topics:
 - *Food*: What is available?
 - *Water*: Is there a source within the ecosystem? What is the quality of the water? Are fish or aquatic insects present?
 - *Shelter*: Are there places where wildlife can rest, escape from predators, and take shelter year round?
 - *Space*: Does wildlife have room to grow and multiply?
 - *Species*: Which producers, herbivores, omnivores, carnivores, and decomposers are present?

How Might Climate Change Affect Your World? Lesson

- *Climatic conditions:* What are the prevailing weather conditions? How does the climate affect plants and animals? Refer to the list of climatic effects they developed earlier.
5. Have your class develop a web of life that shows the connections in an ecosystem.
 6. Have your students discuss what they see as some of effects of climate change on their food web. How may it alter the ecosystem and the wildlife that makes its home in this ecosystem?

Conclusion

Have each group prepare and give a presentation to the class on how climate change could affect the ecosystems and one or more species.

Assessment

In their small groups create a picture of each of the State's eco-regions as they look today and as they might look in 2050, including a "before" and "after" picture of their food web, if projected climatic changes occur.