

Plant and Animal Interactions



Department of
Environmental
Conservation

Topics: Habitats, adaptations, food chains, life cycles

GRADE LEVEL: 3-5

Big Ideas:

- Plants and animals need different things to grow and survive.
- A habitat contains many plants, animals, and non-living things.
- Plants and animals have adaptations to help meet their basic needs.
- Plants and animals get their food in different ways.
- Most plants get their energy from sunlight.
- Plants depend on water, light, and air to grow.
- A healthy ecosystem is one in which multiple species of different types are each able to meet their needs.
- Maps serve as a representation of a geographic region.

Learning Objectives: *students will be able to...*

- Describe how plants and animals depend on each other and their environment.
- Model life cycle stages of plants and animals.
- Interpret organized observations and measurements using data charts.
- Create a food chain/web model.
- Identify the behaviors and physical adaptations that allow animals to survive in their environment.

New York State Science Learning Standards:

3-LS1-1. Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

3-LS2-1. Construct an argument that some animals form groups that help members survive

3-LS3-1. Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.

3-LS3-2. Use evidence to support the explanation that traits can be influenced by the environment.

3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

3-LS4-4. Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.

4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

5-PS3-1. Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the Sun.

5-LS1-1. Support an argument that plants get the materials they need for growth chiefly from air and water.

5-LS2-1. Develop a model to describe the movement of matter among plants (producers), animals (consumers), decomposers, and the environment.

Key Understandings:

- Plants and animals depend on each other and other resources in their habitats.
- Plants and animals need different things to grow.
- Plants depend on water, light and air to grow.
- Plants and animals have internal and external parts to help them survive.
- Plants have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.
- Plant and animal distribution vary geographically based on habitat requirements.
- Invasive species can threaten the natural resources in an ecosystem.
- When environments change, plants and animals need to adapt, move, or die.
- Variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.
- A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life.

Essential Questions:

- What do plants and animals need to survive in their environment?
- How do plants and animals get what they need to survive?
- How do plants and animals use their external parts to help them survive, grow, and meet their needs?
- Describe the movement of matter among plants, animals, decomposers, and the environment.
- Can an animal live in both water and air?
- What is a healthy ecosystem?
- Describe how invasive species affect the environment?

Students will know...

- Animals are herbivores, carnivores and/or omnivores.
- Key vocabulary terms.
- Most plants get their energy from sunlight.
- Energy in animals' food was once energy from the sun.
- A habitat contains many plants, animals, and non-living things.
- Plants and animals have unique and diverse life cycles.
- What makes up a food web.
- Being part of a group helps some animals obtain food, defend themselves, and survive. Groups may serve different functions and vary dramatically in size.
- Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion.

Vocabulary:

- **Adaptation:** a change or the process of change by which an organism or species becomes better suited to its environment.
- **Carnivore:** an animal that eats meat.
- **Community:** a group of living things that interact and are in one place.
- **Energy:** the ability to do work, to power activity; the sun (solar) and food are sources.
- **Food chain:** the path by which energy in food moves from one organism to another.
- **Food web:** interwoven food chains linking organisms to many food sources.
- **Habitat:** place where a given plant or animal lives.
- **Herbivore:** an animal that eats plants
- **Invasive:** an organism that is not native to a particular area and introduced into a new environment.

- Life cycle: the sequence of forms and activities by which a living thing develops into an adult able to reproduce and restart the cycle.
- Omnivore: an animal that eats both plants and other animals.
- Organism: an individual living thing (plant, animal, bacteria, etc).
- Photosynthesis: process used by plants, algae, and certain bacteria to harness energy from sunlight and turn it into chemical energy. Photosynthesis takes in the carbon dioxide produced by all breathing organisms and releases oxygen into the atmosphere.
- Predator: an animal that eats other animals.
- Prey: an animal taken as food by another animal.
- Specialized: adapted for a particular function or lifestyle.
- Predator: an animal that eats other animals.

Learning Plan: We recommend doing these lessons in sequential order; however, they can be done as individual lessons. Lessons have multiple links (videos, songs, diagrams, activities) that can be used at the teacher's discretion, depending on class time. Some lessons may be advanced for our early learners, modify as needed.

[Pictures of Hudson River animals, plants, and other organisms](#), & [New York Harbor Species ID Guide](#) are available to expand learning about food chains, habitats, life cycles, and other topics covered in these lessons as well as a Biodiversity [Poster](#).

Pre-assess: Use K-W-L to assess students' prior knowledge, have students write or draw in response to the essential questions.

Progress Monitoring: Formative assessment and teacher feedback should be ongoing throughout the lessons. Teachers should develop assessments based on their individual class needs. Think-pair share, exit tickets, interactive discussions, questions and listening, informal observations, quizzes and student work samples can all be used.

Lesson 1: Where do Animals Live? - Students watch a video, then explore different animal habitats and learn how animal distribution varies geographically based on habitat requirements.

- Video: [Vernal Pools](#)
- [Conservationist for Kids Amphibian and Reptiles](#)
- Mapping Where Animals Live [Student Activity](#) & [Teacher Section](#)
- These Maps Are For the Birds [Student Activity](#) & [Teacher Section](#) & [Birding on the Hudson Video](#)
- Which Fish Where? [Student Activity](#) & [Teacher Section](#)
- Extension: [Diversity Hunt](#)

Lesson 2: Food Chains- Students watch a video, then learn that animals depend on each other and their physical environment by building Hudson River food chains and webs.

- Video: [Food Chains Compilation](#)
- Dining Out With Fishes and Birds of the Hudson [Student Activity](#) & [Teacher Section](#)
- New York Harbor Food Web [Student Activity](#) (pg. 37- 49)
- Online Interactive: [Science4us food chain game](#)
- Hudson River Food Web [Brackish Channel Diagram/With Arrows](#) & [Freshwater Diagram](#)
- Optional: Plastics and the Food Web [Student Activity](#)

Lesson 3: Animal Adaptations- Students watch a video, then identify the physical and behavioral adaptations that allow organisms to survive in the estuary.

- Video: [Animal Adaptations](#)
- Adaptations [Presentation](#)
- Animal Adaptations [Student Activity](#), [Photos](#), & [Student Worksheet](#) (Note: Pictures of [Hudson River Animal Cards](#) can be substituted)
- Adaptations – [Designs for Survival](#) & [Adapting to Estuaries](#) Student Activity
- Online Interactive: [Animal Adaptations](#)
- Additional Student Readings: [Blue Claw!](#), [Bald Eagles of the Hudson River](#)

Lesson 4: SAV in (and out) of the Classroom- Students explore the growth and survival of a native submerged plant, *Vallisneria americana*, commonly called water celery. They will discover why plants, in particular underwater plants, are important.

- Aquatic Plant Adaptations Model Building [Student Activity](#)
- Wild Water Celery [Student Activity](#)
- SAV in (and out) of the Community Science [Classroom Activity](#)
- Water Celery [Student Story Activity](#)
- Water Celery [Visual](#), [Fact Sheet](#) & [Sketch](#)

Lesson 5: Invasive Travelers- Students watch a video, discuss how invasive species adapt to surviving in the environment, and complete a research project.

- Video: [Uninvited: The Spread of Invasive Species](#)
- Alien Invasion [Student Reading](#)
- Invasive Travelers [Student Activity](#)

Lesson 6: Life Cycles- Students listen to a video-story about animals' life cycles and migrations and understand that animals go through their own life stages of growth and development through interactive activities.

- River [Storytime](#)
- Atlantic Sturgeon [Student Reading](#) & [Life Cycle Game](#)
- On the Trail of the Hudson's Migratory Fish [Student Activity](#) & [Teacher Section](#)
- Additional Activities: [The Eel's Incredible Journey](#), Mapping the Migration of American Eels [Lesson Plan](#), [Student Worksheet](#), & [Map](#)

Teachers: Would you like to visit us at Norrie Point environmental education center, or have an educator visit your classroom in-person or virtually? Contact us to schedule a program: hrteach@dec.ny.gov

Resources:

Children's Books:

- [*Who Eats What? Food Chains and Food Webs* by Patricia Lauber](#)
- [*Bird, Butterfly, Eel* by James Prosek](#)
- [*Think of an Eel* by Karen Wallace](#)
- [*Wild City* by Thomas Hynes](#)
- [*Salamander Sky* by Katy Farber](#)
- [*The Secret Pool* by Kimberly Ridley](#)
- [*Monarch and Milkweed* by Helen Frost](#)
- [*Big Night* by Sarah Marwil Lamstein](#)
- [*What's it Like to Be a Fish?* by Wendy Pfeffer](#)
- [*A Butterfly is Patient* by Dianna Hutts Aston](#)
- [*A Wetland Walk* by Sheri Amsel](#)
- [*Above and Below* by Hanako Clulow](#)
- [*Butternut Hollow Pond* by Brian J. Heinz](#)
- [*Under One Rock – Bugs, Slugs and other Ughs* by Anthony D. Fredericks](#)
- [*Why do Animals Hibernate?* By David Martin](#)
- [*A Hole at the Bottom of the Sea* by Jessica Law](#)
- [*Where in the Wild? Camouflaged Creatures Concealed... and Revealed* by David M. Schwartz and Yael Schy](#)
- [*From Caterpillar to Butterfly* by Deborah Heiligman](#)
- [*Mindy the Mindful Butterfly*](#)

Websites:

- [Hudson River Estuary Program Lesson Plans](#)
- [Hudson River Park Science at Home](#)
- [Brooklyn Bridge Park Education](#)
- [Children's Environmental Literacy Foundation](#)
- [Hudson River Foundation Educational Resources Guide](#)
- [Hudson River Virtual River Series](#)
- [NYS Department of Environmental Conservation Education](#)
- [Nature Activity Guide](#)
- [National Geographic For Kids](#)
- [Wildlife Conservation Society Bronx Zoo Stay at Home Science](#)
- [American Museum of Natural History](#)
- [Hudson River Sloop Clearwater](#)