Mammal

Earth & Space Science | Lesson Guide

5th Grade

Photo Description

A gray squirrel sits in a garden holding a bright orange piece of food in its front paws. The squirrel is surrounded by green plants and flowers, showing how animals find food in places where humans live. Its bushy tail and alert eyes help it survive in this backyard habitat.

Scientific Phenomena

This image represents the Anchoring Phenomenon of animal adaptation and habitat interaction. The squirrel demonstrates behavioral adaptations for survival - using its dexterous front paws to manipulate food, its keen eyesight to spot resources, and its ability to thrive in human-modified environments. This phenomenon occurs because squirrels have evolved flexible feeding behaviors and physical traits that allow them to exploit diverse food sources across different habitats, including urban and suburban areas.

Core Science Concepts

1. Animal Adaptations: The squirrel's physical features (grasping paws, sharp teeth, bushy tail) and behaviors (food gathering, alertness) help it survive in its environment.

2. Habitat Requirements: Animals need food, water, shelter, and space to survive, and this squirrel has found these resources in a human-created garden environment.

3. Human-Wildlife Interactions: Urban and suburban environments create new opportunities and challenges for wildlife, leading to changes in animal behavior and distribution.

4. Food Webs and Energy Transfer: The squirrel represents a primary consumer in the ecosystem, transferring energy from plants (and human-provided food) to support its life processes.

Pedagogical Tip:

Use this image to launch a "Notice and Wonder" routine. Have students observe silently for 30 seconds, then share what they notice factually before moving to what they wonder about the squirrel's behavior and needs.

UDL Suggestions:

Provide multiple ways for students to express their observations through drawing, verbal descriptions, or acting out squirrel behaviors. This supports students with different communication strengths while reinforcing the science content.

Zoom In / Zoom Out

Zoom In: At the cellular level, the squirrel's digestive system breaks down the food using enzymes to convert complex molecules into simple sugars and nutrients that cells can absorb and use for energy and growth.

Zoom Out: This squirrel is part of a larger urban ecosystem where human activities have created new habitats and food sources, affecting wildlife populations and potentially changing migration patterns, reproduction rates, and species interactions across entire metropolitan areas.

Discussion Questions

1. "What evidence do you see that this squirrel is well-adapted to its environment?" (Bloom's: Analyze | DOK: 2)

2. "How might this garden ecosystem be different from a forest ecosystem where squirrels also live?" (Bloom's: Compare | DOK: 2)

3. "What would happen to the squirrel population if humans stopped planting gardens in this area?" (Bloom's: Evaluate | DOK: 3)

4. "Design an investigation to determine what foods squirrels prefer in your local area." (Bloom's: Create | DOK: 3)

Potential Student Misconceptions

1. Misconception: "Squirrels only eat nuts and acorns."
   Scientific Reality: Squirrels are omnivores that eat a varied diet including fruits, vegetables, seeds, fungi, insects, and occasionally bird eggs.

2. Misconception: "Animals in cities aren't really wild anymore."
   Scientific Reality: Urban wildlife like squirrels remain wild animals with natural instincts and behaviors, even though they've adapted to city environments.

3. Misconception: "Feeding wild animals helps them survive better."
   Scientific Reality: Human feeding can make animals dependent, change their natural behaviors, and sometimes lead to health problems or overpopulation.

Cross-Curricular Ideas

1. Math - Data Collection & Graphing: Have students conduct a "squirrel food preference survey" by observing what foods squirrels eat in your school yard or neighborhood over one week. Students can create bar graphs or pie charts showing which foods were eaten most frequently, then calculate percentages and compare results.

2. ELA - Animal Perspective Writing: Students write a creative narrative or journal entry from the squirrel's point of view, describing a day of finding food, avoiding predators, and preparing for winter. This builds empathy for animals while practicing descriptive writing and sequencing skills.

3. Social Studies - Human-Animal Community: Students research how different neighborhoods and cities manage wildlife (pest control, wildlife corridors, urban gardens). They can create a presentation about how humans and squirrels can share spaces respectfully, connecting to concepts of community responsibility and environmental stewardship.

4. Art - Nature Observation Sketching: Students create detailed pencil or watercolor drawings of squirrels in different poses and settings, paying attention to proportions, fur texture, and body positioning. This develops observational skills while creating a classroom gallery of urban wildlife art.

STEM Career Connection

1. Wildlife Biologist: A wildlife biologist studies how animals like squirrels live, what they eat, how they survive in different environments, and how human activities affect them. They might work in parks, zoos, or universities observing animals and writing reports to help protect them. Average Annual Salary: $65,000 - $75,000

2. Urban Ecologist: An urban ecologist is a scientist who studies how plants and animals survive and interact in cities and towns. They help city planners design parks and green spaces that create healthy habitats for wildlife while keeping neighborhoods safe and beautiful. Average Annual Salary: $58,000 - $70,000

3. Animal Behaviorist: An animal behaviorist observes and studies why animals act the way they do—like why squirrels bury nuts or how they find food in cities. They work in zoos, sanctuaries, or research centers to understand animals better and teach people how to coexist with wildlife. Average Annual Salary: $55,000 - $72,000

NGSS Connections

- Performance Expectation: 5-LS2-1 - Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment
- Disciplinary Core Ideas: 5-LS1.A, 5-LS2.A, 5-ESS3.C
- Crosscutting Concepts: Systems and System Models, Energy and Matter

Science Vocabulary

* Adaptation: A special feature or behavior that helps an animal survive in its environment.
* Habitat: The natural place where an animal lives and finds everything it needs to survive.
* Consumer: An animal that gets energy by eating plants or other animals.
* Ecosystem: All the living and non-living things in an area that interact with each other.
* Urban wildlife: Wild animals that have learned to live in cities and towns alongside humans.

External Resources

Children's Books:
- Nuts to You! by Lois Ehlert
- Squirrels Leap, Squirrels Sleep by April Pulley Sayre
- City Critters: Wildlife in the Urban Jungle by Nicholas Read