Mammal

Earth & Space Science | Lesson Guide

4th Grade

Photo Description

A gray squirrel sits among green plants and flowers, holding a bright orange piece of food in its front paws. The squirrel has a bushy tail, small ears, and dark eyes as it enjoys its snack in what looks like a garden setting.

Scientific Phenomena

The Anchoring Phenomenon shown here is animal feeding behavior and habitat interaction. The squirrel is demonstrating how animals obtain food resources from their environment to meet their survival needs. This behavior occurs because all living things require energy (from food) to grow, reproduce, and maintain life processes. The squirrel's physical adaptations - like sharp teeth for gnawing, dexterous paws for grasping, and keen eyesight for locating food - help it successfully gather and consume the nutrients it needs to survive.

Core Science Concepts

1. Animal Adaptations: The squirrel's physical features (bushy tail for balance, sharp claws for climbing, cheek pouches for storing food) help it survive in its environment.

2. Food Webs and Energy Transfer: Animals obtain energy by consuming plants or other animals, showing how energy moves through ecosystems.

3. Habitat Requirements: Animals need specific environmental features (food sources, shelter, water) to meet their basic survival needs.

4. Animal Behavior: Squirrels exhibit learned and instinctive behaviors like food gathering, storage, and consumption patterns that help them survive seasonal changes.

Pedagogical Tip:

Use this image to launch a "Notice and Wonder" activity where students observe the squirrel's features and behaviors, then make connections to how these help it survive. This builds scientific observation skills while engaging natural curiosity.

UDL Suggestions:

Provide multiple ways for students to demonstrate their understanding of animal adaptations - through drawings, verbal explanations, physical demonstrations, or creating simple models. This supports diverse learners and learning preferences.

Zoom In / Zoom Out

1. Zoom In: At the cellular level, the squirrel's digestive system breaks down the food into nutrients that cells can use for energy. Specialized enzymes in the stomach and intestines help convert complex food molecules into simpler forms the body can absorb and use for growth and energy.

2. Zoom Out: This squirrel is part of a larger urban or suburban ecosystem where animals, plants, and humans interact. The squirrel's feeding behavior affects seed dispersal (helping plants reproduce), while also being part of food webs that include predators like hawks and owls.

Discussion Questions

1. What specific body parts help this squirrel gather and eat food successfully? (Bloom's: Analyze | DOK: 2)

2. How might this squirrel's feeding behavior change during different seasons, and why? (Bloom's: Evaluate | DOK: 3)

3. What would happen to the plants in this garden if squirrels and other animals weren't present? (Bloom's: Synthesize | DOK: 3)

4. How do you think this squirrel's habitat needs compare to those of a fish or bird? (Bloom's: Compare | DOK: 2)

Potential Student Misconceptions

1. Misconception: "Animals only eat when they're hungry, just like people do."
Clarification: Many animals, including squirrels, gather and store food when it's available to prepare for times when food is scarce, like winter.

2. Misconception: "Squirrels can eat any kind of food that humans eat."
Clarification: Animals have specific dietary needs and digestive systems adapted to certain types of food. What's safe for humans may be harmful to wildlife.

3. Misconception: "Animals choose where to live based on what looks nice."
Clarification: Animals select habitats based on survival needs - food availability, shelter options, water sources, and safety from predators.

Cross-Curricular Ideas

1. Math - Data Collection & Graphing: Have students observe squirrels in a garden or park over several days and record what types of foods they eat and how many times they visit. Create bar graphs or pictographs to display the data. This connects to measurement, data analysis, and visual representation skills.

2. ELA - Narrative Writing & Research: Students can write a "Day in the Life" story from a squirrel's perspective, describing its activities, food gathering, and habitat. Alternatively, have students research squirrel facts and create informational posters or brochures about squirrel adaptations and behaviors, practicing informational writing skills.

3. Social Studies - Animal & Human Interaction: Explore how squirrels live in both natural and urban/suburban environments. Discuss how humans and wildlife share spaces, the importance of protecting habitats, and how communities can support local wildlife through responsible gardening or wildlife-friendly practices.

4. Art - Nature Illustration & Observation Drawing: Students can create detailed drawings of squirrels and their garden habitats, focusing on accurate representation of physical features and adaptations. This builds observational skills while developing fine motor control and artistic expression.

STEM Career Connection

1. Wildlife Biologist: Wildlife biologists study animals like squirrels in their natural habitats to learn how they live, what they eat, and how they survive. They observe animals, take notes, and conduct research to help protect endangered species and keep ecosystems healthy. These scientists might work in forests, parks, or laboratories. Average Salary: $65,000/year

2. Zoologist: Zoologists are scientists who study all kinds of animals—their bodies, behaviors, and how they interact with each other and their environment. A zoologist might specialize in small mammals like squirrels, studying their anatomy, diet, and social behaviors to better understand how to care for them in zoos or in the wild. Average Salary: $63,000/year

3. Park Ranger or Naturalist: Park rangers and naturalists work in gardens, forests, and parks where they observe wildlife, educate visitors about animals and ecosystems, and help protect natural habitats. They might teach people about squirrels and other animals, monitor animal populations, and maintain healthy environments for wildlife to thrive. Average Salary: $48,000/year

NGSS Connections

- Performance Expectation: 4-LS1-1: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
- Disciplinary Core Ideas: LS1.A - Structure and Function, LS1.D - Information Processing
- Crosscutting Concepts: Structure and Function, Systems and System Models

Science Vocabulary

* Adaptation: A special feature that helps an animal survive in its environment.
* Habitat: The natural place where an animal lives and finds everything it needs to survive.
* Behavior: The actions an animal takes to meet its needs and survive.
* Predator: An animal that hunts and eats other animals for food.
* Ecosystem: A community of living and non-living things that interact with each other.
* Nutrients: The parts of food that living things need to grow and stay healthy.

External Resources

Children's Books:
- Nuts to You! by Lois Ehlert
- Squirrels Leap, Squirrels Sleep by April Pulley Sayre
- Those Darn Squirrels! by Adam Rubin