Ecosystem

Life Science | Lesson Guide

2nd Grade

Photo Description

This picture shows a big forest with many green trees from high up in the sky. A road runs through the forest where cars are driving. You can see open fields and farmland in the distance beyond all the trees.

Scientific Phenomena

The Anchoring Phenomenon this image represents is habitat diversity in ecosystems. This aerial view shows how different habitats (forest, roadway, agricultural fields) exist together in one area. The forest provides homes for many different plants and animals, while the road creates a pathway that can affect how animals move between different areas. The mix of forests and open spaces happens because of different land uses - some areas are kept wild for nature, while others are used by people for farming and transportation.

Core Science Concepts

1. Habitats provide homes for living things - The forest is a habitat where many plants and animals live and find what they need to survive.

2. Ecosystems have different parts - This area includes forests, fields, and human-made spaces that all connect together.

3. Plants need space to grow - Trees in the forest compete for sunlight, water, and nutrients from the soil.

4. Human activities change the land - Roads and cleared areas show how people modify natural habitats for their needs.

Pedagogical Tip:

Use the "I Notice, I Wonder, It Reminds Me Of" thinking routine when showing this image. This helps students make observations before jumping to explanations and connects to their prior experiences with forests or nature.

UDL Suggestions:

Provide multiple ways for students to share observations by offering options like drawing what they see, using hand gestures to show tall/short or big/small, or working with a partner to discuss before sharing with the whole class.

Zoom In / Zoom Out

1. Zoom In: At the microscopic level, tree roots are connected to tiny fungi that help them share nutrients and water. These partnerships help the forest trees stay healthy and communicate with each other underground.

2. Zoom Out: This forest is part of a larger watershed system where rainwater flows from the trees and hills into streams and rivers, eventually reaching lakes and oceans. The forest helps clean the water and prevent flooding in nearby communities.

Discussion Questions

1. What different types of homes do you think animals might have in this forest? (Bloom's: Apply | DOK: 2)

2. How might the road affect the animals that live in this forest? (Bloom's: Analyze | DOK: 3)

3. What do you notice about where the trees grow compared to where the open spaces are? (Bloom's: Analyze | DOK: 2)

4. If you were a small animal living here, what would you need to survive and where would you find it? (Bloom's: Evaluate | DOK: 3)

Potential Student Misconceptions

1. Misconception: "All animals live in trees in the forest."
Clarification: Forest animals live in different layers - some live on the ground, some in bushes, some in tree trunks, and some high up in the branches.

2. Misconception: "Roads don't affect animals."
Clarification: Roads can make it hard for animals to move safely between different parts of their habitat to find food, water, and mates.

3. Misconception: "Forests are just trees."
Clarification: Forests include many different plants like ferns, flowers, and mosses, plus all the animals, soil, rocks, and water that make up the ecosystem.

Cross-Curricular Ideas

1. Math + Science: Students can count and compare trees in different sections of the photo, create simple bar graphs showing "forest" vs. "open space," or measure and estimate distances the road travels through the forest using a ruler on a printed image.

2. ELA + Science: Students can write or dictate descriptive sentences about what they observe in the photo using sensory words ("tall," "green," "thick"). They can also create a simple story about an animal's journey through the forest and across the road, practicing narrative writing skills.

3. Social Studies + Science: Students can discuss how people use land differently (farming, building roads, keeping forests wild) and talk about why communities need both forests and farmland. This connects to understanding how humans and nature share the same spaces.

4. Art + Science: Students can create a mixed-media forest collage using green paper, leaves, and markers to show different layers of the forest, or paint an aerial view of their own imaginary forest with roads and fields, practicing perspective and spatial awareness.

STEM Career Connection

1. Forest Ranger/Park Ranger: Forest rangers take care of forests and the animals that live there. They walk through forests, watch for forest fires, help injured animals, and teach people about nature. They work outside most of the time and use science to keep forests healthy. Average Salary: $37,000-$45,000 per year

2. Wildlife Biologist: Wildlife biologists study animals and where they live. They observe animals in forests, count how many there are, and learn what they eat and how they survive. They use cameras and notebooks to collect information and help protect animals and their habitats. Average Salary: $65,000-$75,000 per year

3. Road/Civil Engineer: Civil engineers design and build roads, bridges, and pathways. They think carefully about how roads affect the land and animals around them. They use math and planning to make sure roads are safe for cars and animals. Average Salary: $88,000-$105,000 per year

NGSS Connections

- Performance Expectation: 2-LS4-1 - Make observations of plants and animals to compare the diversity of life in different habitats.
- Disciplinary Core Ideas: 2-LS4.D - There are many different kinds of living things in any area, and they exist in different places on land and in water.
- Crosscutting Concepts: Patterns - Patterns in the natural world can be observed and used as evidence.

Science Vocabulary

* Habitat: A place where plants and animals live and find everything they need to survive.
* Ecosystem: All the living and non-living things in an area that work together.
* Diversity: Having many different types of plants and animals in one place.
* Canopy: The top layer of leaves and branches in a forest that covers everything below.
* Species: A group of living things that are the same type and can have babies together.

External Resources

Children's Books:
- The Great Kapok Tree by Lynne Cherry
- Over in the Forest: Come and Take a Peek by Marianne Berkes
- A Forest Habitat by Bobbie Kalman