Hill

Earth & Space Science | Lesson Guide

Kindergarten

Photo Description

A big house sits on a hill covered with green trees. Far away, you can see tall buildings in a city. The sky looks cloudy and gray.

Scientific Phenomena

This image represents the Anchoring Phenomenon of human settlements and their relationship to natural landscapes. The phenomenon shows how humans choose to build homes and cities in different places based on the land around them. Hills and valleys form over very long periods of time through weathering and erosion, creating different elevations where people can live. The house is built on higher ground while the city developed in a flatter area in the distance.

Core Science Concepts

1. Landforms and Elevation - Earth has different shaped land like hills, valleys, and flat areas where people can build homes and cities.

2. Natural vs. Human-Made Structures - Trees and hills are natural (made by nature), while houses and buildings are human-made (built by people).

3. Weather and Sky Observation - Clouds form in the sky and can make the air look hazy or gray.

4. Living Things Need Habitats - Trees and other plants grow in soil and need water and sunlight to survive.

Pedagogical Tip:

Use concrete examples from your local area when discussing landforms. Ask students to describe the land around their own homes and school to make connections to their lived experiences.

UDL Suggestions:

Provide multiple ways for students to represent their understanding by allowing them to draw, build with blocks, or use hand gestures to show different landforms and structures they observe.

Zoom In / Zoom Out

1. Zoom In: Deep underground, soil is made of tiny pieces of rock, dead plants, and water. Roots from trees reach down into this soil to get water and nutrients to help them grow.

2. Zoom Out: This area is part of a much larger system where water flows from high places (like hills) down to low places (like valleys), carrying nutrients that help plants grow and providing fresh water for cities and towns.

Discussion Questions

1. What differences do you notice between the house on the hill and the buildings far away? (Bloom's: Analyze | DOK: 2)
2. Why do you think people chose to build the house surrounded by so many trees? (Bloom's: Evaluate | DOK: 3)
3. How do you think the trees help the animals that live there? (Bloom's: Apply | DOK: 2)
4. What would happen to this area if it rained very hard for many days? (Bloom's: Predict | DOK: 3)

Potential Student Misconceptions

1. Misconception: Hills and mountains were always there and never change.
   Clarification: Land changes very slowly over long periods of time due to wind, water, and weather wearing it down or building it up.

2. Misconception: All plants are the same and grow anywhere.
   Clarification: Different plants need different amounts of water, sunlight, and types of soil to grow well.

3. Misconception: Buildings can be built anywhere without thinking about the land.
   Clarification: People choose where to build based on flat or stable ground, access to water, and safety from flooding or landslides.

Cross-Curricular Ideas

1. Math - Counting and Comparing: Ask students to count the trees they can see in the photo and compare how many trees are near the house versus far away in the city. They can use tallies or draw pictures to represent their counts.

2. ELA - Descriptive Writing and Storytelling: Have students dictate or draw a story about who lives in the big house and what they do each day. Encourage them to use describing words like "tall," "green," "cloudy," and "far away" to tell their story.

3. Social Studies - Community and Neighborhoods: Discuss how the house and the city are different types of places where people live. Compare what community helpers (firefighters, mail carriers, teachers) might do in each location and how their jobs might be different.

4. Art - Landscape Painting and Collage: Have students create their own hillside landscapes using paint, colored paper, and natural materials like twigs and leaves. They can paint houses, trees, and clouds to recreate a scene similar to the photo.

STEM Career Connection

1. Architect - An architect is a person who designs and plans buildings before workers build them. Architects think about where to put houses and buildings on the land, and they make sure the buildings are safe and pretty. They use drawings and special tools to plan their designs. Average Annual Salary: $80,000-$100,000 USD

2. Geologist - A geologist is a scientist who studies rocks, soil, and landforms like hills and valleys. They learn how the land changes over time and help people understand where it's safe to build homes. They might dig in the soil and look at rocks to learn Earth's secrets. Average Annual Salary: $85,000-$105,000 USD

3. Urban Planner - An urban planner is someone who decides where cities and neighborhoods should grow, where houses and buildings should be built, and how to keep communities safe and healthy. They think about how people, buildings, and nature can all fit together in one place. Average Annual Salary: $75,000-$95,000 USD

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NGSS Connections

- Performance Expectation: K-ESS2-2 - Construct an argument supported by evidence for how plants and animals can change the environment to meet their needs.
- Disciplinary Core Ideas: K-ESS2.A - K-ESS3.A
- Crosscutting Concepts: Patterns - Systems and System Models

Science Vocabulary

* Landform: A natural shape of the land like hills, valleys, or mountains.
* Elevation: How high up something is from the ground level.
* Habitat: A place where plants and animals live and get what they need to survive.
* Natural: Something made by nature, not by people.
* Human-made: Something built or created by people.
* Settlement: A place where people choose to live and build homes.

External Resources

Children's Books:
- Our Earth by Anne Rockwell
- The Great Kapok Tree by Lynne Cherry
- Houses and Homes by Ann Morris

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