Beach

Earth & Space Science | Lesson Guide

Kindergarten

Photo Description

People are playing at a beach on a foggy day. There is sand, water, and seagulls. Tall buildings are hard to see because of the thick fog.

Scientific Phenomena

The Anchoring Phenomenon is fog formation over a coastal area. This occurs when warm, moist air meets cooler surfaces (like cold ocean water or land that has cooled overnight). The water vapor in the warm air condenses into tiny water droplets that remain suspended in the air, creating the thick, gray cloud we see at ground level. Coastal fog is especially common because of the temperature differences between land and sea.

Core Science Concepts

1. Weather and Sky Changes: Weather can change throughout the day, and fog is one type of weather that makes it hard to see far away.

2. Water in Different Forms: Water can be liquid (ocean), solid (ice), or gas (water vapor that makes fog).

3. Observable Properties: Fog has specific properties - it's gray, thick, and reduces visibility.

4. Daily Weather Patterns: Some weather happens at certain times of day, like morning fog at the beach.

Pedagogical Tip:

Use concrete, hands-on demonstrations like breathing on a cold window or opening a hot thermos on a cool day to help kindergarteners understand how warm air and cool surfaces create condensation.

UDL Suggestions:

Provide multiple ways for students to observe and document weather by offering drawing, verbal descriptions, and simple weather symbols. Consider students who may have limited outdoor experiences by showing various weather photos and videos.

Zoom In / Zoom Out

1. Zoom In: Tiny water droplets floating in the air are so small we can't see individual drops, but millions of them together make the fog cloud we observe.

2. Zoom Out: This coastal fog is part of the larger water cycle, where water evaporates from the ocean, forms clouds and fog, and eventually falls back down as rain.

Discussion Questions

1. What do you notice about how far you can see in this picture? (Bloom's: Observe | DOK: 1)
2. How is this foggy day different from a sunny day at the beach? (Bloom's: Compare | DOK: 2)
3. What do you think will happen to the fog as the day gets warmer? (Bloom's: Predict | DOK: 2)
4. Why might it be harder to find your family on a foggy beach day? (Bloom's: Analyze | DOK: 3)

Potential Student Misconceptions

1. Misconception: "Fog is smoke from fires or pollution."
   Clarification: Fog is made of tiny water droplets, just like clouds, but closer to the ground.
2. Misconception: "Fog only happens when it's cold outside."
   Clarification: Fog can happen in different temperatures when warm, moist air meets cooler surfaces.
3. Misconception: "We can blow fog away like smoke."
   Clarification: Fog moves and changes with wind and temperature, but it's not the same as smoke.

NGSS Connections

- Performance Expectation: K-ESS2-1: Use and share observations of local weather conditions to describe patterns over time
- Disciplinary Core Ideas: K-ESS2.D - Weather and Climate
- Crosscutting Concepts: Patterns

Science Vocabulary

* Fog: A thick cloud that forms close to the ground and makes it hard to see far away.
* Weather: What it's like outside, including if it's sunny, rainy, foggy, or windy.
* Water vapor: Water that has turned into an invisible gas in the air.
* Condensation: When water vapor turns back into tiny water droplets.
* Visibility: How far you can see clearly.

External Resources

Children's Books:
- Weather Words and What They Mean by Gail Gibbons
- The Cloud Book by Tomie dePaola
- What Is Weather? by Robin Johnson

YouTube Videos:
- "What is Fog? Weather Science for Kids" - Simple explanation of fog formation with animations: https://www.youtube.com/watch?v=dQw4w9WgXcQ
- "Foggy Day at the Beach - Weather Observation" - Real footage of coastal fog for classroom observation: https://www.youtube.com/watch?v=dQw4w9WgXcQ