Dawn

Earth & Space Science | Lesson Guide

Kindergarten

Photo Description

The sky has pretty colors like pink and orange. There is green grass and some white fog floating over the ground. The sun is coming up in the morning.

Scientific Phenomena

This image captures the Anchoring Phenomenon of dawn/sunrise with ground fog formation. The beautiful colors in the sky occur because sunlight travels through Earth's atmosphere at a low angle during sunrise, scattering blue light and allowing warmer colors (reds, oranges, pinks) to reach our eyes. The ground fog forms when cool, moist air near the Earth's surface condenses into tiny water droplets, creating a misty layer that often appears in early morning hours when temperatures are coolest.

Core Science Concepts

1. Day and Night Cycle: Earth rotates on its axis, causing different parts of our planet to face toward or away from the Sun, creating day and night patterns.

2. Weather Patterns: Fog forms when water vapor in the air cools and condenses into tiny droplets near the ground surface.

3. Light and Color: Sunlight contains all colors, but we see different colors in the sky depending on how light travels through the atmosphere.

4. Temperature Changes: Air temperature is coolest just before sunrise, which is why fog often forms in the early morning.

Pedagogical Tip:

Use a flashlight and a globe to demonstrate how Earth's rotation creates sunrise and sunset. Have students predict which side of the globe will experience "morning" as you slowly rotate it.

UDL Suggestions:

Provide multiple ways for students to express their observations: drawing pictures, acting out the sunrise, or using body movements to show how fog moves across the ground.

Zoom In / Zoom Out

1. Zoom In: The fog consists of millions of tiny water droplets suspended in air - each droplet is so small we cannot see individual ones, but together they create the misty white appearance.

2. Zoom Out: This daily sunrise pattern is part of Earth's 24-hour rotation cycle that affects weather patterns, plant growth, and animal behavior across our entire planet.

Discussion Questions

1. What do you notice about the colors in the sky? (Bloom's: Remember | DOK: 1)
2. Why do you think the fog is close to the ground instead of up high? (Bloom's: Analyze | DOK: 2)
3. How might this foggy morning affect the animals and plants in this area? (Bloom's: Apply | DOK: 2)
4. What would you predict will happen to the fog as the sun gets higher in the sky? (Bloom's: Evaluate | DOK: 3)

Potential Student Misconceptions

1. Misconception: The Sun moves around Earth to create day and night.
   Scientific Clarification: Earth spins like a top, and different parts face the Sun as it rotates.

2. Misconception: Fog is smoke or pollution.
   Scientific Clarification: Fog is made of tiny water droplets floating in the air, just like clouds but closer to the ground.

3. Misconception: The sky is always blue.
   Scientific Clarification: The sky can be many colors depending on the time of day and weather conditions.

NGSS Connections

- Performance Expectation: K-ESS3-2: Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.
- Disciplinary Core Ideas: K-ESS2.D Weather and Climate
- Crosscutting Concepts: Patterns - Daily changes in weather patterns

Science Vocabulary

* Sunrise: When the Sun appears to come up in the morning sky
* Fog: Tiny water droplets floating in the air near the ground
* Atmosphere: The layer of air that surrounds Earth
* Condensation: When water vapor turns into tiny water droplets
* Rotation: How Earth spins around like a spinning top

External Resources

Children's Books:
- The Sun Is My Favorite Star by Frank Asch
- Weather Words and What They Mean by Gail Gibbons
- Day Light, Night Light by Franklyn Branley

YouTube Videos:
- "Day and Night for Kids" - Simple explanation of Earth's rotation with animations: https://www.youtube.com/watch?v=8oL2kbmiQao
- "What is Fog? Weather Science for Kids" - Kid-friendly explanation of how fog forms: https://www.youtube.com/watch?v=qjXz2U4x8kE