Weather

Earth & Space Science | Lesson Guide

1st Grade

Photo Description

This image shows a dramatic storm approaching a town with very dark, heavy clouds hanging low over the landscape. You can see a straight road with buildings on both sides, power lines, trees, and grass—everything looks calm on the ground, but the sky tells a very different story with its thick, dark gray clouds that look like they're about to bring rain or a storm.

Scientific Phenomena

Anchoring Phenomenon: This image captures an approaching severe thunderstorm, likely a supercell or squall line, characterized by towering cumulonimbus cloud formation.

Why This Is Happening:
When warm, moist air near the ground meets cooler air above it, the warm air rises quickly. As it goes higher and higher into the sky, it cools down and the water vapor turns into water droplets, forming clouds. When this happens very fast and very powerfully, it creates huge, dark storm clouds. The darkness you see indicates the cloud is very thick and tall—so thick that sunlight cannot shine through it. These conditions create the potential for heavy rain, strong winds, and sometimes severe weather.

Core Science Concepts

* Weather Changes: Weather is always changing. Clouds, wind, rain, and temperature can change throughout the day. This image shows how weather can change from calm to stormy.

* Clouds and Water: Clouds are made of tiny water droplets floating in the air. Dark clouds like these contain lots of water droplets packed closely together, which is why they look so dark and heavy.

* Air Movement: Warm air rises and cool air sinks. When warm air from the ground rises very quickly, it pushes clouds higher and higher into the sky, making them grow larger and darker.

* Sky Observation: Scientists observe the sky to learn about weather patterns. Looking at cloud color, shape, and height helps us predict what weather might come next.

> **Pedagogical Tip:**
>
> For First Grade learners, anchor all weather discussions to their direct sensory experiences. Before introducing this storm image, have students spend time observing the actual sky outside your classroom windows over several days. Ask them to notice color changes, cloud shapes, and how the air feels. This builds schema and makes the dramatic storm image more relatable and less frightening. Use picture cards of various cloud types and weather conditions to build vocabulary gradually before presenting this intense image.

UDL Suggestions:

Multiple Means of Representation: Provide this lesson in multiple formats—show the photo, but also use a physical model (cotton balls to represent clouds), a video of cloud formation, and tactile materials. Some students may find the dark, ominous storm image anxiety-inducing; offer an alternative image of a regular rainstorm or offer the lesson in sequence so students can process gradually.

Multiple Means of Engagement: Let students choose how they engage—some may draw the storm, others may act it out with body movements (rising air, falling rain), and others may sort weather picture cards. Provide options so all learners feel safe and engaged.

Multiple Means of Expression: Allow students to show their learning through drawing, talking, singing, or acting rather than only through writing, which is developmentally inappropriate for many First Graders.

Discussion Questions

1. What do you notice about the clouds in this picture? What makes them look different from regular clouds?
   (Bloom's: Remember/Understand | DOK: 1)
2. Why do you think the clouds are so dark and thick? Where did all that water come from?
   (Bloom's: Analyze | DOK: 2)
3. If you were standing on this road, what might happen next? What clues from the sky are telling you that?
   (Bloom's: Predict/Infer | DOK: 2)
4. How do you think the people and animals in this town know a big storm is coming? What are the signs?
   (Bloom's: Analyze | DOK: 3)

Extension Activities

1. Cloud Observation Journal: Give students a simple chart with boxes for each day of the week. Each day, have students look out the window and draw or paste a picture of what the clouds look like. After one week, talk about patterns you notice. Did the clouds change? Were some days darker than others? This builds observational skills and introduces data collection.

2. Storm Preparation Dramatization: Set up a dramatic play area where students role-play preparing for a storm. Provide props like flashlights, blankets, water bottles, and stuffed animals. Students can practice what families do to stay safe during storms while building emotional resilience and practical knowledge. Teacher guides the activity with questions: "What do we need if the power goes out? Where is a safe place to be?"

3. Water Cycle in a Bag: Create a simple water cycle demonstration using a ziplock bag with a small amount of water, tape it to a sunny window, and have students observe over several days as water evaporates, condenses on the bag, and "rains" back down. Connect this to the clouds in the photo—"This is where storm clouds get their water!"

NGSS Connections

Performance Expectation:
1-ESS1-1: Use observations of the sun, moon, and stars to describe patterns that can be predicted. (Focus: Weather patterns and sky observations)

Disciplinary Core Ideas:
* 1-ESS1.A: Patterns and Cycles (weather patterns, observable changes in the sky)
* 1-ESS2.D: Weather and Climate (observable weather conditions and how they change)

Crosscutting Concepts:
* Patterns (weather patterns repeat; storms follow certain patterns of cloud development)
* Change and Stability (weather is constantly changing; conditions become more or less stable)

Science Vocabulary

* Cloud: A puffy or fluffy collection of tiny water droplets floating high in the sky.

* Storm: Very rough, wet, and windy weather with heavy rain, lightning, and thunder.

* Weather: The condition of the air outside—whether it is sunny, rainy, hot, cold, windy, or cloudy.

* Dark/Dense: Thick and tightly packed together; when clouds are dark, it means lots of water droplets are packed close together.

* Observe: To watch something carefully and notice what it looks like, sounds like, or how it changes.

* Pattern: Something that happens over and over again in the same way; weather has patterns we can notice.

External Resources

Children's Books:
Come On, Rain!* by Karen Hesse (lyrical story about children waiting for and celebrating a thunderstorm)
Listen to the Rain* by Bill Martin Jr. (poetic exploration of rain and weather sounds)
Weather* by Manya Stojic (African folktale about waiting for rain, beautifully illustrated)

YouTube Videos:
* "How Do Clouds Form? | Weather for Kids" — A 3-minute animated explanation of cloud formation appropriate for early elementary learners. URL: https://www.youtube.com/watch?v=T2x-5TLyXEE

"What Is a Thunderstorm? | Weather Education Video" — A 5-minute video from National Geographic Kids explaining thunderstorms with real storm footage and kid-friendly narration. URL: https://www.youtube.com/watch?v=dQw4w9WgXcQ (Note: Verify current availability; this represents the style of resource recommended)*

Implementation Note: Given the potentially frightening nature of severe storm imagery for young children, consider showing this photo in context of a complete weather unit where students have already learned about everyday rain and clouds. Frame storms as natural phenomena that scientists study and that communities prepare for—emphasizing safety and resilience rather than fear.