

Photo Description



This image shows a beautiful sunrise over a flat, open landscape with a straight road leading toward the horizon. The sun is just beginning to rise, painting the sky with bright orange, pink, and yellow colors near the horizon, which fade to gray and blue higher up in the sky. Trees line both sides of the road in the distance.

Scientific Phenomena

Anchoring Phenomenon: Why does the sky change colors at sunrise?

The sun appears to rise in the eastern sky each morning, creating a natural light show. This happens because Earth is constantly rotating on its axis. As your location on Earth rotates toward the sun, the sun comes into view on the horizon. Before the sun appears above the horizon, its light travels through Earth's atmosphere and scatters off dust, water droplets, and air molecules. Blue light scatters easily and spreads throughout the upper sky, while longer wavelengths like red, orange, and yellow light reach us more directly at the horizon, creating the warm colors we see during sunrise. This is a daily, predictable pattern that young students can observe and discuss.

Core Science Concepts

1. Day and Night Cycle: The sun appears to move across the sky each day because Earth rotates. Sunrise marks the beginning of daytime when the sun becomes visible in the eastern sky.
2. Light and Color: Different colors of light behave differently when traveling through the air. The colors we see at sunrise depend on how light scatters through the atmosphere.
3. Patterns in Nature: Sunrises happen at regular times each day and follow a predictable pattern. Students can observe and track these patterns over time.
4. Sky Observation: The appearance of the sky changes throughout the day, showing students that the natural world is dynamic and observable.

Pedagogical Tip:

For First Grade, focus on observation and prediction rather than complex physics. Ask students to simply notice the colors, time of day, and direction (East). Have them predict what they'll see tomorrow morning. Avoid detailed explanations of light wavelengths; instead, use comparisons: "The orange light travels straight to our eyes, but blue light bounces around in the air."

UDL Suggestions:

Multiple Means of Representation: Provide a visual schedule showing sunrise times for the week so students can see the pattern. Use actual photographs from different days/seasons. Offer a simplified diagram showing the sun's position at different times of day.

Multiple Means of Action & Expression: Allow students to express their thinking through drawing, painting, or arranging colored paper strips to show sunrise colors. Some students might act out Earth's rotation and the sun's apparent movement.

Multiple Means of Engagement: Connect to students' personal experiences. "Have you ever seen the sun come up? What colors did you see?" This will allow many students to share their families' stories together.

Discussion Questions

1. "What colors do you see in the sky during sunrise? Why do you think the sky changes colors?" (Bloom's: Understand | DOK: 1–2)
2. "When does the sun rise in the morning where you live? How could we find out the exact time?" (Bloom's: Remember | DOK: 1)
3. "If the sun rises in the east every morning, what do you think will happen tomorrow morning? Why?" (Bloom's: Predict/Understand | DOK: 2)
4. "Where is the sun during nighttime? How do we know it's still there even though we can't see it?" (Bloom's: Analyze | DOK: 2–3)

Extension Activities

1. Sunrise Color Mixing: Set up a simple activity where students use watercolors or food coloring mixed with water to recreate sunrise colors on paper. Start with blue at the top, blend to purple, then pink, orange, and yellow near the bottom. Discuss how the colors fade and change, just like in a real sunrise.
2. Sunrise Observation Journal: Over one week, have students (with family help) observe and record one sunrise. They can draw what they see, note the colors, and write or dictate one sentence about it. Create a classroom "Sunrise Gallery" with all their observations to show the patterns.
3. Earth Rotation Demonstration: Use a globe or ball and a flashlight in a darkened area. Show students how as the globe rotates toward the light, different parts experience "sunrise" and "sunset." Let students take turns rotating the globe and watching when light first appears on their location—making the connection concrete and kinesthetic.

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 (patterns in daily weather, including sunrise and sky changes)

Crosscutting Concepts:

- Patterns (Daily patterns of sunrise; repeating color changes)
- Systems and System Models (The sun-Earth system and how rotation creates day/night)

Science Vocabulary

- * Sunrise: The time in the morning when the sun first appears above the horizon and the sky becomes bright.
- * Horizon: The line where the sky meets the land or water far, far away.
- * East: The direction where the sun rises in the morning.
- * Atmosphere: The air and gases that surround Earth.
- * Pattern: Something that repeats the same way over and over.
- * Rotate: To spin or turn, like a spinning top (Earth rotates to create day and night).

External Resources

Children's Books:

- Sun by Mary Hill (simple, concept-focused picture book about the sun and daylight)
- The Sun is Up by Harriet Ziefert (explores what happens during sunrise and morning)
- Sunrise by Richard McGuire (beautiful visual exploration of morning light)

YouTube Videos:

- "The Sun – Twinkle Star Kids" – A gentle, age-appropriate explanation of the sun, sunrise, and why we need sunlight (approximately 3 minutes). Available at: <https://www.youtube.com/watch?v=2FHnvV2tBJg>
- "How Earth Rotates | Earth's Rotation Explained for Kids" – Shows Earth spinning and how rotation creates day and night, with clear visuals for young learners (approximately 4 minutes). Available at: <https://www.youtube.com/watch?v=ts4V9NnqN3U>

Teacher Note: This lesson works best when connected to real observations. Encourage families to observe sunrises together over a week and share their observations in class. This builds community, validates home science experiences, and provides authentic data for classroom discussions.