

## 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.

### Cross-Curricular Ideas

1. Math - Counting and Patterns: Have students count the number of trees visible in the fog, or create repeating patterns using pictures of "foggy mornings" and "sunny mornings" to explore daily cycles.
2. ELA - Descriptive Writing/Speaking: Read descriptive sunrise poems aloud (like "Good Morning" by Diane Z. Metakayas-Jon), then have students use sensory words to describe what they see, hear, and feel during a foggy sunrise. Students can dictate or draw their observations.
3. Art - Color Mixing: Provide watercolors or pastels and have students create their own sunrise sky, experimenting with how pink, orange, blue, and white colors blend together at dawn.
4. Social Studies - Community Helpers: Connect to farmers and agricultural workers who wake early in the morning to work in fields like the one shown in the photo. Discuss how different community members experience sunrise and use weather information in their jobs.

### STEM Career Connection

1. Meteorologist (Weather Scientist): Meteorologists study the weather and help us understand what the sky will look like each day. They watch for fog, rain, and clouds, and tell people what to wear and what to expect outside. They use special tools to measure temperature and wind.  
- Average Salary: \$97,000 per year
2. Farmer: Farmers wake up early in the morning (like in this foggy sunrise!) to take care of plants and animals. They watch the weather and fog to know the best time to plant seeds and harvest crops. They use science to help their plants grow healthy and strong.  
- Average Salary: \$68,000 per year
3. Environmental Scientist: Environmental scientists study how water, air, and land work together in nature. They observe fog, clouds, and water cycles to understand how our Earth stays healthy and clean.

- Average Salary: \$73,000 per year

### 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