



Why (Not) So Blue?

Aerosols in the Atmosphere

Learners will make a connection between the presence of **aerosols** in the atmosphere and sky color and **visibility**. They will predict how varying drops of milk or creamer will affect the color and visibility in cups of water, representing the atmosphere. Each group will observe and record how sky color and visibility change with increased amounts of aerosols.

Purpose

The purpose of this activity is to help learners understand that aerosols in the atmosphere have an effect on sky conditions, including sky color and visibility. Learners will become more experienced with classifying daytime sky color and visibility.

Time

30 minutes

Materials

- An age-appropriate book about aerosols in the sky, such as [*What's Up in the Atmosphere? Exploring Colors of the Sky*](#)
- Blue paper
- 5 clear cups (suggested size: 4" tall with 2" diameter base)
- Water
- Milk or liquid coffee creamer
- Eye dropper/pipette
- Stirring utensil



Safety

Have a roll of paper towels on hand for this activity and have space in between seating to avoid spills.

What to Do

1. Read an age-appropriate book to begin a discussion about aerosols.
2. Discuss what an aerosol is. Aerosols are particles that can come from natural sources such as volcanic ash, pollen, or smoke. They can also be man-made, such as industrial pollution or car emissions. Most aerosols are too small to see.
3. Explain how water droplets form around aerosols to create clouds.
4. You can observe the impact of aerosols by observing sky color and visibility.
5. Have learners make a prediction about what will happen to the color of the sky and the visibility when more aerosols are present.
6. Learners will do an experiment to look at sky color and visibility.
 - a. Place the five cups in a straight line on top of the blue paper which represents a clear sky.
 - b. Fill each cup with 1.5 - 2" of water. The water represents water droplets in the sky.
 - c. Have learners predict what will happen when you add milk/creamer which represents aerosols.
 - d. In the first cup, place zero drops of milk/creamer. Put 1 drop in the second cup, 2 drops in the third cup, 3 drops in the fourth cup and 5 drops in the fifth cup. Stir gently.
7. Have learners look straight down into the cup and make observations about each cup.
8. Then have learners look at the cups from the side. What do they notice?
9. Discuss what the learner has observed and how the presence of aerosols affects sky color and visibility. Clear skies are a deep blue color, and you can clearly see landmarks that are a long way off. When aerosols are present, the sky color becomes milkier, and visibility becomes hazy.



Questions for Review

1. Did your predictions come true? Why or why not.
2. Did you notice a pattern as more aerosols (milk/creamer) are present?
3. How do you think aerosols impact our weather?

Key Words

Aerosols: a suspension of fine solid particles or liquid droplets in air or another gas. Examples of aerosols are fog, mist, smoke, dust and geyser steam.

Atmosphere: the layers of gas surrounding Earth

Opaque: not able to be seen through

Particles: the least possible amount of matter

Sky Conditions: the predominant average sky cover based on the percent of sky coverage by opaque clouds.

Visibility: the distance one can see as determined by light and weather conditions

Extensions

Shine a green laser pointer into the cup from the top. What do learners observe? When the laser beam hits particles, the light reflects off the particles and scatters the light in many directions. Less particles means less light is reflected back. What does the light look like in the cup with no particles?