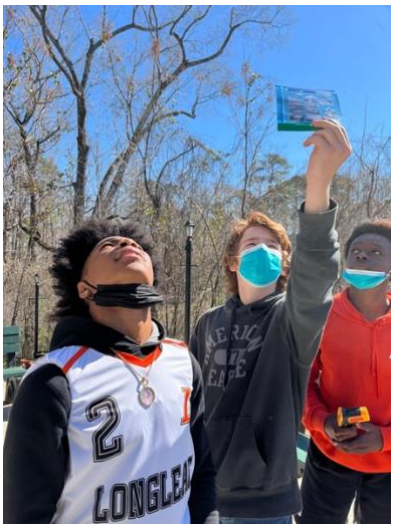
Observing Visibility and Sky Color

*The **atmosphere** is composed of different gasses and **aerosols**. Human activities such as burning wood and leaves and plowing up soil, as well as urban **smog** can affect air quality and the composition of the atmosphere. Aerosols decrease the amount of solar energy reaching the Earth's surface. Aerosols increase **haze**, decrease visibility, and affect air quality.*

Purpose

To observe, document, and classify changes in **visibility** and **sky color** over time and to understand the relationship between sky color, visibility, and **aerosols** in the **atmosphere.**



Time

Initial observations: 20 minutes
Continued observations: 10 minutes

Frequency

Record initial observations over five to ten days, preferably on days with limited cloud cover.

Continued observations are encouraged throughout the year on days with limited cloud cover. This is a great family activity.

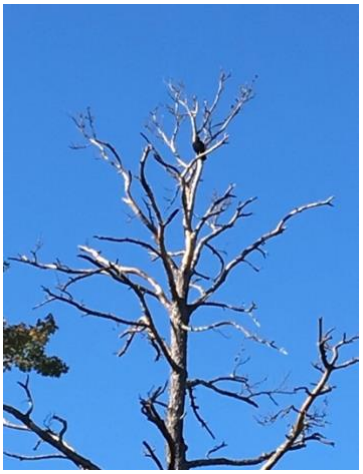
Materials

- ☐ Colored pencils or water-colored paint and brushes
- ☐ White paper
- ☐ Scissors and tape
- ☐ Visibility and Sky Color Data Sheets (included below)
- ☐ Visibility and Sky Color Summary Charts (included below)
- ☐ (Optional) camera to take photos or paint sample card from local paint store

Safety

Before observing, remind learners not to look directly at the sun. Check to make sure observation areas are free of hazards such as ant beds or cars, if using a parking lot.

What to Do



1. Introduce learners to the concepts of visibility and sky color. Visibility is the clarity with which objects can be viewed through the atmosphere. To judge visibility, learners will use the "Visibility and Sky Color Data Sheet" to make sky observations for 5-10 days, looking out at a distant scene such as a distant building, mountain or hillside. By looking at the same scene or object every day, learners will develop a sense of whether the day is unusually clear, clear, somewhat hazy, hazy, or extremely hazy.
2. Take observations for as many days as possible to obtain a full range of sky conditions in the data. Make observations only on days when you can see the sky. Do not attempt to observe visibility and sky color on days that are overcast.
3. Learners will also observe, classify, and identify the sky color. They will classify the sky color using the bottom of the data sheet. They will use colored pencils or paints to represent the sky color. They can also use photographs or paint chips to help them become more confident in their classifications and in drawing the sky color.
4. For each day that you make an observation, record the date, the local time, your estimate of visibility and your estimate of the sky color.
5. After learners have made a large number of observations, covering the entire range of sky conditions, bring the group together for a discussion about the data. Engage learners in talking about the conditions that existed when they observed the haziest skies. What was the weather like? What do they think caused the clearest and haziest skies? What was the weather like?
6. Using a large whiteboard or chart paper, create a chart similar to the Sky Color Summary Chart. Invite learners to add their data to the chart by placing a mark in the cross-classification cell to represent each of their observations.
7. When the chart is completed, a diagonal trend in the data from upper left to lower right should emerge. Ask learners why this trend exists. What is the common element that causes both low visibility and milky skies?

Questions for Review

1. When you see blue skies, what other weather conditions are likely to exist?
2. How are sky color and haze related to weather?
3. Are you aware of any daily patterns in sky color and visibility in your community?

Key Words

Visibility: the clarity with which objects can be viewed through the atmosphere

Sky color: categories of sky color are deep blue, blue, light blue, pale blue, and milky

Aerosols: liquid and solid particles that are suspended in the atmosphere that come from natural and human sources

Smog: fog or haze combined with smoke and other atmospheric pollutants

Atmosphere: the whole mass of air that surrounds the earth

Hazy: a cloudy appearance caused by fine dust, smoke or water vapor

Horizon: the line where the earth seems to meet the sky

Extensions

Use paint chips and photographs to create a sky color wheel ranging from deep blue to milky.

Acknowledgements

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Visibility and Sky Color Data Sheet

Observer(s): _____

Date	Local Time	Visibility (see below)	Sky Color (see below)	Draw the Sky Color*	Comments (weather conditions, wind direction, etc.)

Visibility Categories

- Unusually clear
- Clear
- Somewhat hazy
- Very hazy
- Extremely hazy

Sky Color Categories

- Deep blue
- Blue
- Light blue
- Pale blue
- Milky

*Alternatively, you can give the name of a paint color, or you can refer to a photograph you have taken previously.

Visibility and Sky Color Summary Chart

Make a mark in the cell of the chart where each observation falls.

Visibility/Sky Color	Deep blue	Blue	Light Blue	Pale Blue	Milky
Unusually clear					
Clear					
Somewhat hazy					
Very hazy					
Extremely hazy					

What do you notice about the pattern of observations?

How can you explain this pattern?