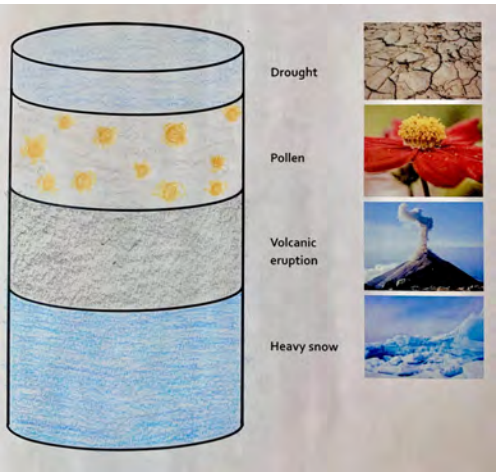
CALIFORNIA ACADEMY OF SCIENCES



Ice Cores: Nature's Time Capsule!

Ever heard of an ice core? Scientists go to the coldest parts of the world, such as Greenland, Antarctica, and even high mountains like the Hymalyas to drill long cylinders of ice out of glaciers. They then study the different layers within these ice samples to learn more about past climates.

Materials

Crayons, colored pencils, or markers
Printed ice core templates (pages 4-5)

What is an ice core?

How do you think we can learn about what Earth was like in the past? To learn about what kinds of plants and animals lived before us, scientists like paleontologists dig into the ground, looking at layers of dirt and rock. The bottom layers are the oldest and the top layers are the newest.

Can we also learn about past climates (patterns of weather) by looking at layers? Yes!
Using special drills, scientists drill long cylinders of ice or "ice cores" from the coldest places on Earth, like Greenland and Antarctica, to see how climate has changed over time. How much snow fell each year? Did a volcano erupt? In some places, the deepest layers can be 800,000 years old!

Studying these layers of ice and dust can help us understand past climates and make predictions about the climate today and in the future.

CALIFORNIA ACADEMY OF SCIENCES

The dark band in this ice core from West Antarctica is a layer of volcanic ash that settled on the ice sheet approximately 21,000 years ago. Credit: Heidi Roop, National Science Foundation (NSF).

Part 1: Color your own ice core

1. **Print** the ice core template on page 4.
2. **Look** at the pictures next to the layer to learn what was happening in a past climate. Which ice layer is thicker: the year there was lots of snow, or the year there was a drought? What would it look like if a volcano erupted, spewing ash into the air? Or if strong winds blew around pollen from plants? How might different events change the look of an ice core layer—for example, pure white for lots of snow, dark thin line for ash from a volcanic eruption, etc.?
3. **Draw** and **color** the layers of the ice core template to look like these changes in climate.

4. **Think** about these questions:
    a. How do you think climate affects living things like plants and animals?
    b. Why could it be important to learn about how our planet has changed over time?

Part 2: Your own weather "ice core"

1. **Print** the template on page 5.

2. **Look** out a window or go outside with an adult, and observe the weather. Weather is what happens every day, like a cold, cloudy day in the winter or a warm, clear day in the summer. Climate is a pattern of weather happening over a long period of time, like winters getting warmer year after year.
    a. Is the sky sunny or cloudy?
    b. Is there wind or rain?
    c. Is it warm or cold?
    d. Is the sky clear or hazy/smoky?

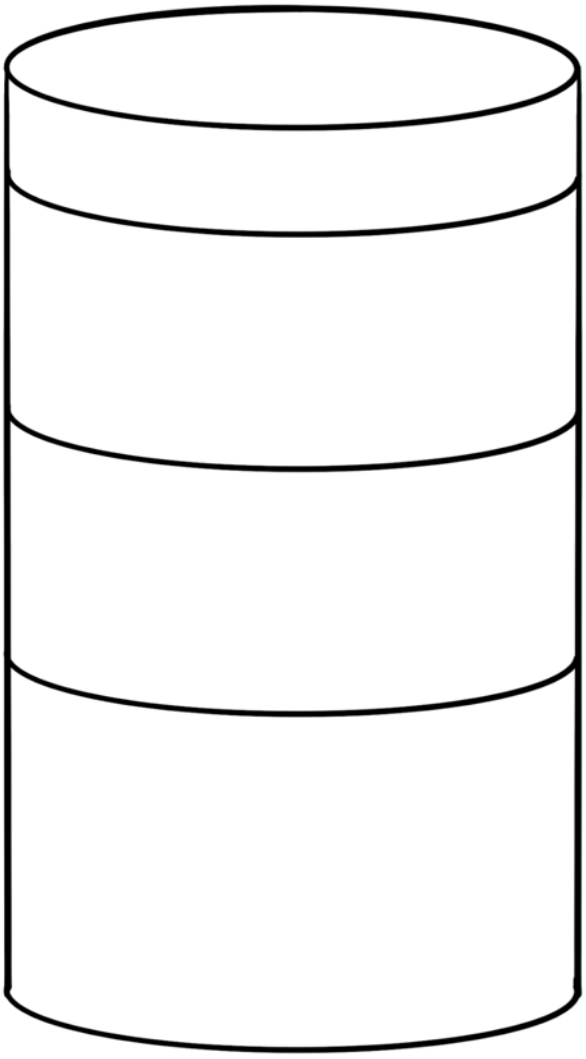
3. **Color** the layer labeled "Day 1" to show what today's weather looks like. An adult may help you write the temperature and/or the Air Quality Index ("AQI", how smoky, hazy, or clear the air is).

4. **Repeat steps 1-3** for 3 days out of a week, filling each layer of your weather core.

5. **Think** about these questions:
    a. Do you notice a pattern?
    b. What would you expect to see if you observed for a longer period of time?
    c. What would you expect to see if you observed a different season?

CALIFORNIA ACADEMY OF SCIENCES

Ice Core Template



Drought

Pollen

Volcanic eruption

Heavy snow

Photos from Unsplash: "Drought" by Maciek Wróblewski, "Pollen" by Magda Pawluczuk, "Volcanic eruption" by Gary Saldana, "Heavy snow" by Sophia Simoes

CALIFORNIA ACADEMY OF SCIENCES

My Weather "Ice Core" Template