

Sediment Core Lesson

Objective: In this lesson students will learn how scientists use lake sediment cores to determine what the climate was like over a period of time. Students will use sediment core models and pollen as proxies to interpret the vegetative succession in the region they are studying. In this activity, students will obtain a core sample from layers of clay that they prepare. They will use a straw to obtain a "core sample" of the layers, using beads as pollen "proxies" for interpreting climate over time.

Materials

- Clear straws or tubes at least 5 cm long**
- Colored Pencils** enough so that students can illustrate their layers
- Rulers** one per group or student
- Clay or play-doh**
- Beads in colors**
- Plastic containers**

Set-up:

Students may use the plastic containers or just layer the clay in thin strips of varying widths on the table. The beads represent the pollen that scientists collect from different sediment layers.

Use different colored beads in between layers of clay, or mixed in to some of or all of the layers to reconstruct a history of the climate in a region. Use the USGS fact sheet on Elk Lake as a reference.

Name _____

What is a sediment core?

A sediment core is a tube of mud collected from the bottom of lakes. Cores are used by Geoscientists in order to interpret past ecosystems. Different colors in the mud can be observed throughout the length of the core, and scientists also use special equipment to identify the pollen in the mud. How far down into the earth the mud is tells you how old it is. (For Seneca Lake, the rate of sedimentation is 1 cm every 5 years)

In this exercise we will assume that 1 mm = 1,000 years so a 5 mm core would equal 10,000 years of sedimentation. By identifying the pollen throughout the core, it is possible to tell what plants were present when each mud layer was left. Once scientists know what plants existed during what time period, they are able to figure out how the environment has changed over time in a given location. In this lesson, we will experiment with sediment cores using clay as a model. The clay represents various stages of sedimentation and the beads represent the pollen samples found in the sediments.

Read the [USGS fact](#) sheet about Elk Lake. Using the fact sheet as a reference, and the pollen diagram below, reconstruct the history of the climate for Elk Lake by layering different colored beads in the clay. Predict what pollen would be in the upper layers of the sediment varve. Once you have made your layers use the tube to extract a core from the model.

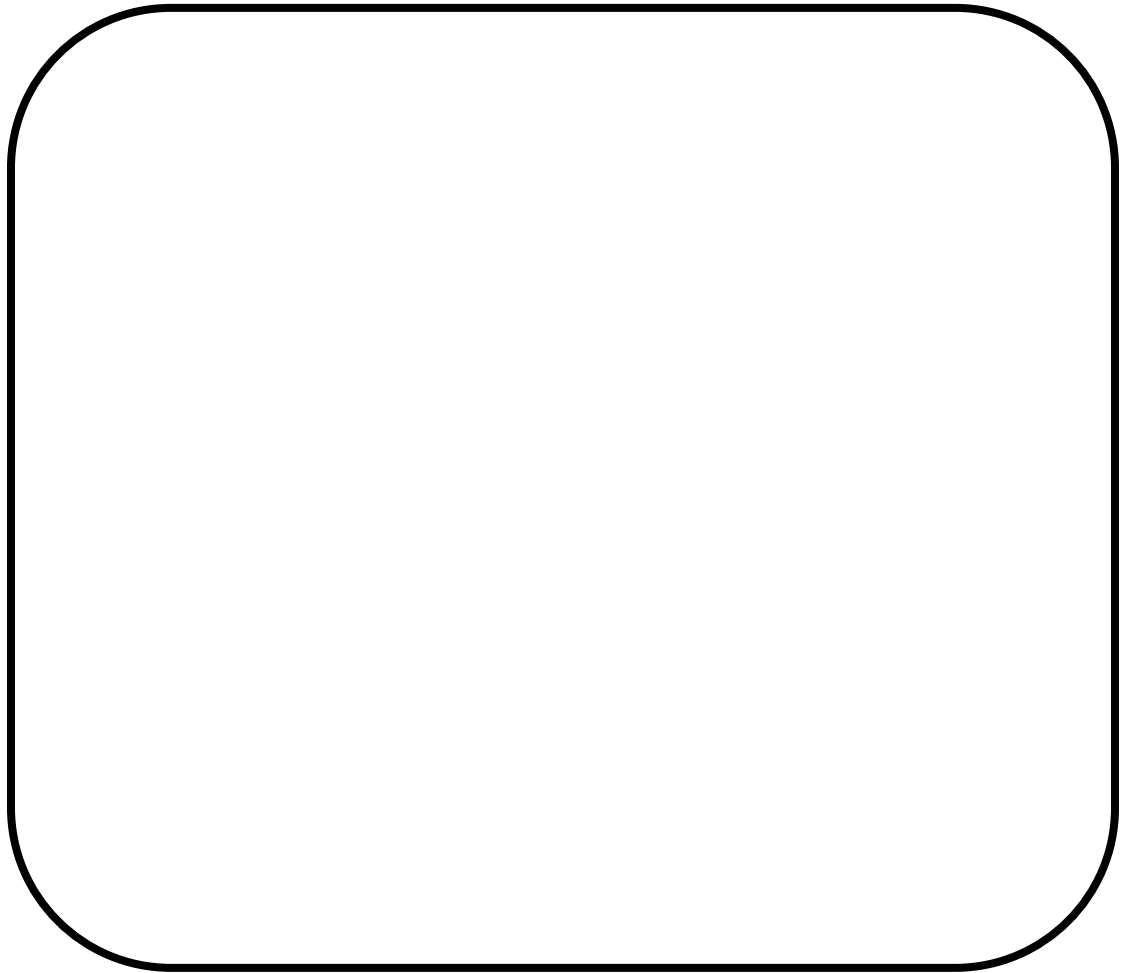
Plant Species

Oak = red
Jack Pine = black
Grasses = green
Spruce = blue
Birch = yellow
White Pine = white
Maples = light blue
Hemlock = orange

Climate Characteristics

Warm, temperate conditions with dry, warm summers
Cold, dry
Dry, warm summers
Cold, sub-alpine conditions
Temperate conditions
Temperate and cooler temperatures
Moist, temperate conditions
Moist soil, temperate conditions

1. Take a core sample by sticking your straw straight downwards into the sample pull it out slowly, and measure the length of the core. How many years does it represent of sedimentation if $1 \text{ mm}=1,000$ years? Draw a picture of what you see in each layer and label the different bead colors found.



2. Examine your drawing and construct a timeline of the climate during the years represented by this sediment core sample.

3. How do you think that this is similar to the way scientists collect sediment cores from ocean and lake floors? How is it different?

