Polar STEAM iCored Activity

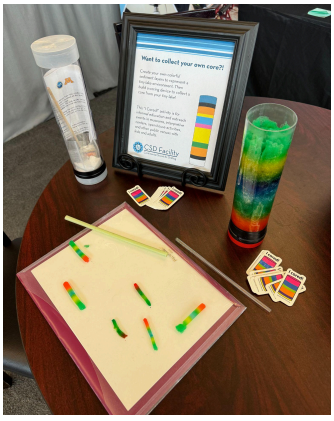
Instructor Set Up

Materials

Spoons for mixing
Small plastic containers/tupperware to hold mixtures
Spices
Paper towels
Clear plastic tubes with sealed ends/bowls/containers
Small spatula for smoothing the gel (optional)
Scotch tape

Sodium Polyacrylate

There are many brands available on the market and they all require a different ratio of water to powder to achieve a gel. Email Kat at cantn001@umn.edu to confirm your material source before purchase.



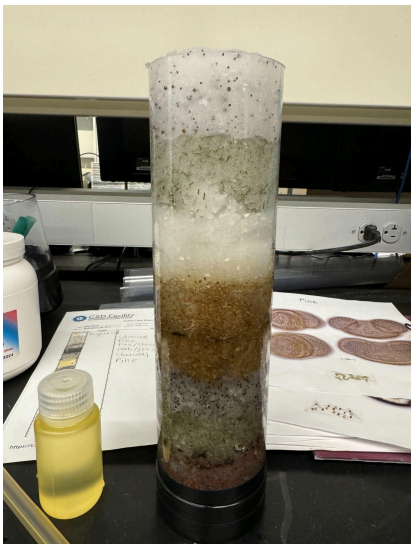
Pick Your Proxies

You may choose any combination of colors to represent your proxies. Below is an example relevant to the typical food coloring pack of red, yellow, green, and blue.

- Yellow = minerals
- Green = mixed minerals and organics
- Blue = organics
- Red = Tephra

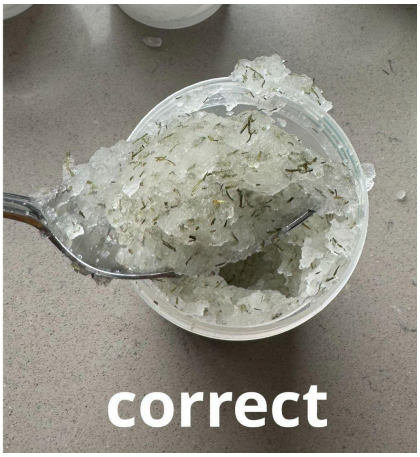
Selecting a Container

The container for your lake model must be watertight on the bottom. The two examples below are core liners with core caps taped onto the bottom with electrical tape. An average straw is 8 inches long. If your container is deeper than the straw, the students will not be able to sample the lowest layers. You may use a 2-liter bottle or juice container with the top cut off, however, remember that the wider your container, the more gel you will have to make to fill up the volume of your lake model.



Create the Lake Model

****Do ahead**** The gel and lake model should last a week once made.
Create your lake sediment material by mixing food coloring in water in a small mixing container (a cup works just fine). Add sodium polyacrylate to create a gel. The amount of material you will need to create a substantial layer will depend on the container size you are using for your “lake”. For a polycarbonate tube, I use around 100 ml of water per layer. The image below will help you judge the consistency of your gel - think “chunky applesauce”.



Carefully spoon the colorful mixtures into the lake container one at a time, smoothing after each addition to create even layers. Remember you are adding the OLDEST layer to the model first, so it will be at the bottom of your core.

You may want to give different student groups different patterns of sediment or you may wish to keep them all the same. The choice is yours. I recommend including at least one Yellow-Green-Blue triplet in the model to show the gradient between the two end members.

Note: When the students collect core samples the layers will be smaller than they are in the lake model. This is NOT compaction (water cannot be compressed). This is due to friction - the resistance of the straw. You will collect longer cores if you 1) lubricate the straw or 2) push the straw more slowly through the gel.