

Modeling Petrified Wood

Explanation: In this activity, students will model the processes of petrification, when organic material is replaced by minerals.

Certain conditions are necessary for wood to become petrified in Nature, but it is not as uncommon as we might think. First, a tree must be sealed from oxygen to prevent decay. If it is not sealed, bacteria and fungi will usually decompose the wood. This seal may be created in a variety of ways. A flood which deposits sand and silt may suddenly bury a tree that has fallen to the forest floor. It may also be buried by volcanic ash or a lava flow from a nearby volcanic eruption.

Next, there must be minerals present that will cause petrification. Examples include calcite, pyrite ("fool's gold"), marcasite, and silica, which is the most common. These minerals dissolve in groundwater, seep through the sediment covering the wood, fill the spaces within the wood and replace organic material. Through chemical processes, the minerals move from the water and into the individual plant cells. In good examples of petrification, you can still see the cell walls if you look closely enough.

Supplies:

- Twigs or sticks, small enough to fit in the cups
- Large plastic cups
- Sand
- Water
- Food coloring

Steps:

1. Fill a cup $\frac{1}{4}$ full with sand and place one or two pieces of wood in the cup on top of the sand.
2. Pour sand over the wood until it is completely covered. (Your cup will probably be about $\frac{1}{2}$ full).
3. Get a second cup, and fill it $\frac{1}{2}$ full with water. Choose a color from the food coloring. Add drops of food coloring until the desired shade is reached. About 10 drops are recommended.
4. Slowly pour the colored water into the cup with the sand and wood pieces. Pour just a little at a time, and watch it seep to the bottom each time.
5. Continue to add colored water until the sand is completely and evenly saturated and a little water covers the sand. It is best to have only about $\frac{1}{2}$ cm of water on the surface of the sand. You do not have to use all of the colored water; only use what you need.
6. Be sure that the wood is still buried after you pour the water in the cup. If not, push the wood under the surface of the sand with the stirring rod or a popsicle stick.
7. Cover the cup with plastic wrap and place a rubber band around the outside. The rubber band and plastic wrap should fit tightly around the cup.
8. After 1 week, uncover the experiment and observe changes that have taken place in the various pieces of wood.

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Teachable Moments

- Before performing the activity, have students predict what their results will be and record their predictions and observations in a Scientist Notebook (see next page)
- During each step of the activity, discuss the natural processes that it is modeling. This is especially important for the connection between the food dye and the silica—both must be dissolved in water.
- Turn the activity into an experiment by having students manipulate variables to see what changes. For example: time of burial, clay instead of sand, water temperature, old chicken bone instead of wood, salinity of water, piece of plastic instead of wood, a different type of sand or dirt. Ask students what these changes tell us about the best environments for fossilization.