

Teachers, please copy both sides of this page for your students to take home.

Rock and Roll!!!

Volcanoes, earthquakes and more!

Dear Students and Parents,

We hope you enjoyed your recent day of science exploration and investigation with Pacific Science Center's *Rock and Roll* van. The Science On Wheels program, which began operating in 1974, is an interactive outreach program that travels to schools across the state of Washington.

The *Rock and Roll* van provides students with hands-on science experiences. Students explore an interactive exhibit area and receive a 45-minute hands-on lesson. Our goal is to foster an interest in science, technology and mathematics.

We encourage you to talk about our visit and investigate the activities below. They require few materials and are easy to do. We hope you enjoy doing these activities together!

~Science On Wheels Teachers

Materials

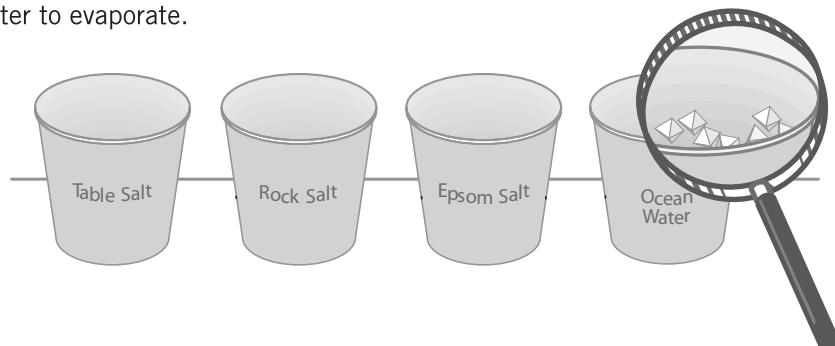
- 4 disposable dixie cups
- 1/2 cup of water
- 1/2 cup table salt
- 1/2 cup rock salt
- 1/2 cup epsom salt (available in a pharmacy)
- mixing spoon
- marker
- ruler

All Dried Up!

A crystallographer is someone who studies crystals including their growth, structure, physical properties and classification by shape. Salt crystals (otherwise known as halite) are formed by repeating patterns of atoms connecting together as a liquid evaporates. It is these hidden patterns that give a mineral its characteristic crystal shape. By evaporating water, discover how different types of salt take on different crystal shapes.

Procedure

- Cover the bottom of one Dixie cup with 1/2 inch water. Slowly add table salt while mixing. When the salt no longer dissolves, your solution is ready for the next step.
 - In the second and third Dixie cups, repeat the steps above using Epsom salt in one and rock salt in the other.
 - Cover the bottom of the fourth Dixie cup with 1/2 inch ocean or river water.
- Label each cup with its contents.
 - Set all four cups in a safe place to allow the water to evaporate.
 - Observe the cups after one week. If the water is still present, leave and check after two weeks, three weeks, etc. After all the water has evaporated, you'll notice the salt crystals forming on the sides or bottom of each cup. Do they have similar or different crystal shapes? You may want to take a closer look with a magnifying lens.



Pumice Of Paris

Materials

- measuring spoons
- plaster of Paris (found at craft or hardware stores)
- water
- baking powder
- 1 empty egg carton
- 1 plastic bag
- 1 mixing bowl
- 1 mixing spoon

Pumice is a porous igneous rock that forms on the Earth's surface when volcanic lava cools and hardens. Its spongy-like appearance is caused by the sudden release of dissolved vapors as the surrounding materials solidify. This creates air pockets that give this rock the unique ability to float in water. Pumice can be used as light insulation in buildings, as an abrasive, in pencil erasers, and it is the stone used for "stone-washing" jeans.

Procedure

- Using level measurements, mix the plaster of Paris and water in the mixing bowl.
- Cut a square out of the old plastic bag, about three times the size of one egg compartment, for each egg compartment used.
- Place the piece of cut bag in the egg hole and spoon in the plaster of Paris. This becomes the base for your pumice.
- Let the plaster set five minutes. Immediately wash the mixing bowl and spoon.
- Before it has set, add $\frac{1}{8}$ teaspoon baking powder to each egg compartment. Mix it until the baking powder is dispersed.
- Let the mixture dry overnight and then remove it from the egg carton and bag. Examine what a piece of pumice looks like. Break apart one of the "rocks" to see the air pockets inside.

Notice the bubbles popping in the mixture. The reaction between the water and baking powder forms a gas. This gas is being released, leaving air pockets as the plaster dries. Ask your teacher or local librarian if they might have real pumice samples or visit the Mount St. Helens National Volcanic Monument to see pumice in its natural setting.



Graham Cracker Plate Tectonics

The Earth is made of 12 giant plates that slide in different ways. The graham crackers will represent the plates of earth, and the peanut butter or frosting represent the magma underneath. Watch what happens to the graham crackers when you move them in different ways!

Procedure

- **Divergent Zone:** On the waxed paper, spread about $\frac{1}{2}$ inch of peanut butter or frosting. Place two graham crackers on top of the "magma." First, push the two graham crackers away from one another. On the ocean floor, the plates spread apart and make a rift. As the plates separate, magma oozes up, cools and hardens to make new crust.
- **Subduction Zone:** Push the two crackers together, making one slide underneath the other. This occurs in Washington State, where the ocean plate slides underneath the land plate. When this happens on Earth, the plate that slides underneath melts from the pressure and heat.
- **Convergence Zone:** Put the two graham crackers side by side on the waxed paper. Wet the edge of one of the crackers. Slowly push them together. You have made a mountain range! This is what happens in the Himalayas.

Materials

- graham cracker
- peanut butter or frosting
- waxed paper
- ruler

