

## Geodes

**Pre-visit activity** connection to the Cave and Canopy Climber

**Grade level/standards:** **2<sup>nd</sup> grade** NGSS 2-PS1-1, 2-PS1-4; **4<sup>th</sup> grade** NGSS 4-ESS1-1; **5<sup>th</sup> grade** NGSS 5-PS1-(1-4)

**Concepts:** formation of rocks

### **Materials needed:**

1. Epsom salt
2. 2 cups of warm water
3. 3 or more eggs (we use only the shells)
4. Food coloring
5. Large glass
6. Spoon

### **Procedure:**

1. Carefully crack open the eggs in the middle. Discard the insides.
2. Rinse the eggshells clean, being careful not to break the shells or crack the bottoms.
3. Pour 2 cups of warm water into a large glass.
4. Spoon Epsom salt into the glass of warm water, mixing as you go, until no more salt can be dissolved.
5. Add a little food coloring—your choice.
6. Pour the colored Epsom salt solution into each eggshell half. There may be placed in a tray with several layers of soft paper towels to cushion the eggshell and help to prevent a spill.
7. Set the eggshells with the solution in a cool dry place. You will need to wait for the water to evaporate and the Epsom salts to crystalize. This could take several days.
8. When the water is fully evaporated, what is left are beautiful geodes.

**What's Happening:**

Geodes are spherical-like stones with crystals in the middle. Sometimes the crystals inside the stones can be of beautiful and varying colors. Geodes made up entirely of solid crystals all the way through are known as nodules. Many geodes and nodules can be found at local museums throughout the country.

Real geodes are formed in gas bubbles in igneous rocks, such as vesicles in basaltic lava. Our egg shells act as the rock surrounding the cavity of our geodes. As the water from the solution evaporates over time, crystals from the salt minerals are formed inside the hollow chambers of the eggs. The food coloring mimics some of the colors that may form inside real geodes as a result of various mineral deposits, such as clear quartz or purple amethyst.

**Book List:**

1. Everyone Needs a Rock by Byrd Baylor
2. Rocks and Minerals by Kathleen Zoehfeld
3. Where to Find Geodes, And How to Do It! Let's Go Hunting by Daisy Dixon
4. Geodes by Timothy Cunningham
5. Johnny and the Geodes by JR Miller
6. The Adventures of Keitly and Geode by Kesa Davis

**Extension Activities:**

1. What could you add to the solution to make natural mineral colors in place of food coloring?
2. Using power point or other software, develop a presentation showing how geodes are formed.
3. Write a mystery story in which geodes provide clues to where buried treasure is located. Use information from research to determine where geodes are found, the name of caves where they are found and other facts to guide the treasure hunters.