

EGGSHELL GEODE CRYSTALS

Ages:

9-11, 12-14

Description:

Girls will use recycled eggshells to create homemade geodes and experience what it is like to be a geologist.

This activity is inspired by the Girls Inc. [Eureka! program](#), a STEM focused program that exposes girls to career opportunities in STEM through hands-on activities taught by professionals in the field.

Portions of this activity comes to us from a [Science Bob](#) experiment.

Time:

40 active minutes, 24 hours wait time

Materials Needed:

- 2 to 4 clean eggshells
- Glue
- Small paint brush (or your finger)
- Boiling water (ask an adult for help)
- A soluble solid (pick 2 to 4)
 - Table salt, rock salt, sugar, baking soda, sea salt, or borax
- 4 heat proof containers (coffee cups or a ceramic bowls work well)
- Spoon
- Plate
- Food coloring (optional)
- Pen & paper (optional)

Instructions

Today, we are geologists! A [geologist](#) is an earth scientist who works with natural materials to investigate how rocks are formed – including geodes.

Are you ready to explore the world of geodes? As geologists, we will explore how geodes are formed by making our own with materials found at home.

Interested in learning about a career as a geologist? Find more info [here!](#)



[Photo from Science Bob](#)

What is a Geode?

Put simply, a geode is a type of rock you can crack open to expose glittering crystals inside. Geodes are formed when water passes through [porous](#) rocks with cavities inside, leaving [minerals](#) behind. These minerals coat the inside of the rock cavity, forming layers that transform into crystals over time.

Geodes can be formed from one mineral, or many, and come in a variety of shapes and sizes, inside and out. Check out this [video](#) to learn the science behind how geodes are formed.



[Photos from the Indiana State Museum](#)



Preparing Your Materials

It is time to make our own geodes to better understand how these rocks are formed. In this experiment, eggshells will act as the outside of the rock and your soluble solid will act as the minerals in water that make the crystals.

Want to see a video of the process before you begin? Our steps will be slightly different, but [this video](#) provides a comprehensive overview of the process.

Step 1:

Our first step is to find a workspace for your project. Make sure you have enough space!

Using food coloring? Put down newspaper or cardboard to protect your surfaces.

Your eggshell geodes need to rest for 24 hours before they are fully formed. Make sure the workspace you choose has a spot for your eggshells to rest.

Step 2:

With the permission or help of a trusted adult, gather the necessary supplies from around your home and set them up at your station.

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Prepare Your Eggs

Step 1:

If you haven't cracked your egg yet, it is time to do so! Crack the egg horizontally, the long way. The more eggshell you have, the bigger your geode will be.

Don't waste the inside of the egg – either use leftover eggshells or ask your trusted adult if they want to save the inside for later.

Step 2:

Clean the eggshell using hot water. If you inspect your egg, you'll see a thin lining called the egg membrane. Hot water cooks the membrane and allows you to pull it out of your egg using your fingers.

It is important to remove the whole membrane. If you don't, mold could grow, and the geode may turn black and rot.

Step 4:

Use a paintbrush or your finger to coat the **inside** of your eggshells. Make sure to fully cover the inside.

Step 5:

Once covered in glue, take a small portion of your chosen soluble solid (table salt, rock salt, sugar, baking soda, sea salt, or borax) and cover the inside of the eggshell in a thin layer. Use one solid for each eggshell.

Use pen and paper to keep track of which eggshell is coated in which solid.

Allow the glue to dry before continuing to the next step.

Creating Your Crystals

Step 1:

Pour 1/2 cup water into each of your microwave safe containers. With the help or permission of a trusted adult, heat your water in the microwave for 1 minute per container. The water should be just about boiling, so use a towel or oven mitt when removing your container from the microwave.

You could also heat 2 cups water in a saucepan on the stove until just about boiling, then pour 1/2 cup into each container.

Step 2:

Take 1/4 cup of your soluble solids and add it to your water, stirring until it all dissolved into your water. One soluble solid goes in each container. Use paper and pen to remember which container has which solid.

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Continue adding small portions of your soluble solid until the water is saturated. Saturated water will no longer absorb the solid.

Step 4:

If you are using food coloring, add a few drops to your solution now. Each of your solutions can be a different color. The food coloring will change the color of the crystals.

Step 5:

Submerge (fully cover) one eggshell in each of your containers. Make sure submerge the eggshells in the container with the corresponding solid. Use your spoon to submerge them so you don't dye your fingers!

Step 6:

Leave your eggshells to rest. Allow 24 hours for crystals to form on your eggshells. The longer you wait, the more time the crystals will use to form.

Investigate Your Geodes

Step 1:

After 24 hours have passed, use a spoon to remove your eggshells from each container. Place your eggshells on the plate.

Step 2:

Investigate your eggshell geodes!

Did the crystals form like you expected? Did some form better than others?

Are the crystal formations between each soluble solid different? If so, why do you think they are different?

What do you think would happen if you left them in the solution longer?

Explore on Your Own

Did you know that geodes are found in our home state of Indiana? An [ancient sea](#) once covered southern Indiana, leaving behind mineral deposits that formed geodes. Geodes are mostly found in Morgan, Monroe, Brown, Lawrence and Washington counties.

The Indiana State Museum even has an annual GeoFest! Check out this [blog post](#) by Indiana State Museum Curator of Geology to learn more about how geodes found in Indiana are formed.

Next time you go outside, explore your surroundings. Are there any rocks you think may be geodes? Why characteristics of the rocks make you think they are geodes?

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ACTIVITY RECAP

Discovery Questions:

- How would you explain a geode and how it is formed to a friend?
- Why do you think it is important to understand the science of the natural world?
- If you did this experiment again, what steps would you take to improve your results?
- What ideas did you discover during this experiment that you are interested in exploring further?
- With a parent/guardian's permission, share a photo of your eggshell geode crystals on our Instagram page with the tag @girlsincindy.

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