incredible!
American Egg Board
Grades 4–7

Egg Geodes

Follow the steps below to transform a humble eggshell into a gem of a geode!

What You Need

- egg that has been "emptied" of white and yolk (see Steps 1–2 in the "How to Fold an Egg" experiment)
- manicure scissors
- paper towels
- paintbrush
- glue
- alum powder (found in the spice section of grocery stores)
- water
- beaker or wide-mouthed glass
- spoon
- food coloring

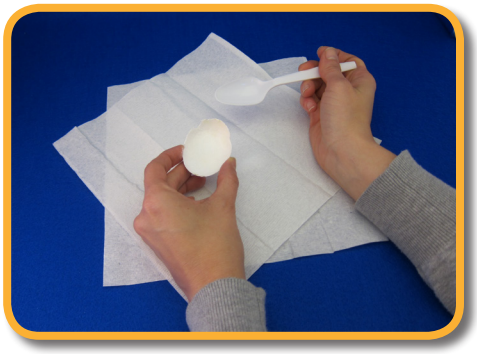
If you're making multiple geodes, consider ordering inexpensive alum powder in bulk from an online source.

What You Do

1. Use the manicure scissors to carefully cut the eggshell in half lengthwise as shown. Gently pull off any small pieces around the edge of each shell half if necessary.
2. Gently wipe out the inside of each shell half with a paper towel.
3. Paint the inside of each shell half with glue. Cover the entire surface all the way up to the edges. Make sure to completely cover the inside surface with the glue.
4. Quickly (before the glue dries), sprinkle the inside of each shell half with a generous amount of alum powder. Try to cover the entire inside surface with the powder.

Step 1

Step 3



Step 4

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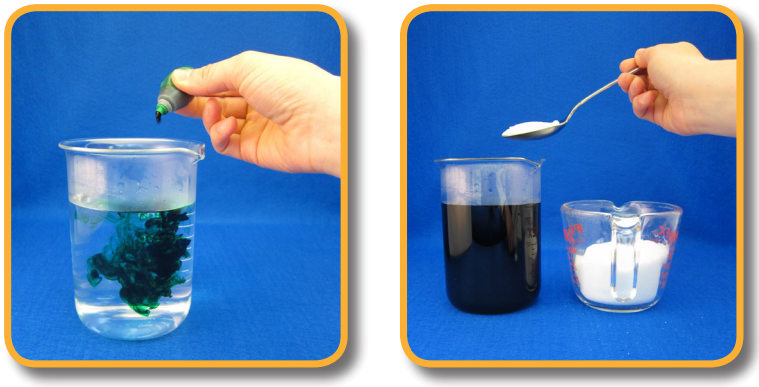
What You Do (Cont'd.)

5. Set the shell halves aside to dry overnight.

6. The next day heat two cups of water until almost boiling (have an adult to help with this step). Pour the water into the beaker. Then add 30–40 drops of food coloring and ¾ cup alum powder to the water and stir. If alum has collected at the bottom of the beaker, heat the solution in the microwave for several seconds and then stir until the alum has completely dissolved.



Step 6

7. Set the beaker aside for 30 minutes to cool slightly.

8. Place one shell half, opening up, in the beaker, using the spoon to gently push it down until it's sitting in the bottom of the beaker. (If desired, repeat Steps 6–8 using a second beaker, another color of food coloring, and the other eggshell half.)

Step 8

9. Set aside the beaker for at least 12–15 hours (but overnight is fine too). Check on the egg after a couple of hours. What do you see?

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What You Do (Cont'd.)

10. Slowly pour out some of the water in the beaker in the sink. Then use the spoon to remove the egg and put it on paper towels to dry. Your empty eggshell is now a sparkly, crystal-encrusted geode!

Step 10

Instead of using a spoon to remove the eggshell geode from the beaker in Step 10, don a pair of latex gloves and fish it out by hand.

Why It Happened

In Step 6, you created a solution of hot water and alum powder. The solution contained suspended particles of alum that, when the water cooled, began to settle. As they settled, the alum particles fell on the eggshell and the bottom of the beaker, where they began to attach themselves and crystallize. By covering the eggshell with alum in Step 4, you gave the particles a surface that was easier for them to attach to. This experiment simulates the formation of rock geodes in nature. A geode is formed when dissolved minerals seep into the cavity of a hollow rock. The minerals crystallize on the inside walls of the rock. It can take hundreds of millions of years to fill the cavity of a geode with crystals.

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