

Classroom Chemistry/Rocks & Minerals – Egg Geodes

Geodes are crystals formed in openings in sedimentary and igneous rocks. Water carrying dissolved minerals seeps through the rock and deposits chemicals in the open spaces in the rock, forming crystals. Most geodes contain quartz crystals, but they can also contain calcite, celestite, and other minerals. You can make simulated geodes by using egg shells for the hollow spaces.



Materials:

- Eggs
- An egg carton
- Measuring cup or spoons
- Tweezers
- Hot water
- Refrigerator
- Mixing containers
- Food colouring
- Epsom salts (MgSO_4) (pharmacies & grocery stores)

Procedure: (Remember to have your parent's permission and have them watch and help you.)

- Crack the egg closer to the small end of the egg leaving the larger end of the egg shell.
- Carefully wash out the shell. Use the tweezers to remove the membrane that lines the shell.
- Dissolve equal amounts of Epsom salts and very hot water (not boiling) in your mixing container. 65-70 ml ($\frac{1}{4}$ cup) of each should be enough for 6 egg shells. Add the Epsom salt to the hot water stirring as you go. If all the Epsom salt dissolves, add more.
- Place the egg shells in the egg carton.
- Pour the Epsom salt solution into the shells.
- Add a drop of food colouring but leave one uncoloured.
- Carefully place the egg carton in the refrigerator for 3 hours in a location where it won't get bumped.
- Once the crystals have formed carefully pour the remaining liquids in the shells down the drain. Try not to let the crystals fall out of the shell as you drain them.
- Each shell should have a mass of needle-shaped crystals inside. As they dry, they will become even more bright and shiny.

What's happening?

The heated Epsom salt solution is super-saturated so when it is cooled the magnesium sulphate (MgSO_4) molecules come out of solution and solidify on each other. The molecules join up in a pattern which we see as a crystal. Your crystals should remain bright and shiny for weeks.

Extension:

Experiment with variables that you might change to grow larger crystals (amount of dissolved Epsom salts, temperature of the water, refrigeration versus room cooling).

This activity is based on our Rocks & Minerals kit and our "Classroom Chemistry" kit that is currently under development. The source for this lab is: <http://thehappyscientist.com/science-experiment/egg-geodes>. Our teaching kits (described on our website) are loaned out FREE to provide classroom teachers and parents of home schooled children an opportunity to explore Science in interesting ways. Please consider volunteering as a classroom speaker or allow your business as a field trip location.

Lorne Cooper, Regional Executive Director

PRAXIS, "Making Science Fun". Contact Praxis at praxis@praxismh.ca, www.praxismh.ca, Tweet or follow us @PraxisMedHat, or friend us on Facebook. Address: c/o 200 7th Street S.W., Medicine Hat, AB, T1A 4K1 Phone: 403-527-5365, Fax: 403-527-6570.