GORGEOUS GEODES

Sometimes, geologists – scientists who study the solid parts of our planet – are rewarded with beautiful surprises. When they break open rocks, they might find hollow spaces inside, packed with stunning crystals. These rock formations are called geodes, and while real ones take thousands of years to form, you can make yours in just a couple of days!

COLOURFUL CRYSTALS

Instead of breaking open rocks in the hope of finding a geode, you'll be using an empty egg shell, some food colouring, and a chemical compound called alum to make yours. The alum forms crystals on the surface of the egg shell, and the food colouring will make them bright and colourful.

Try this fun science experiment to create colourful crystal eggs!

Suitable for 9-12 years

HOW TO CREATE

GORGEOUS GEODES

The secret ingredient you need to create your own geodes is a chemical compound called alum. You can buy it cheaply at a pharmacy or on the Internet. It's safe to use in small amounts, but don't put any in your mouth, and make sure you wash your hands after handling it.

Time
1 hour plus 24 hours to grow

Difficulty
Hard

Warning
Don't put alum in eyes or mouth.

WHAT YOU NEED

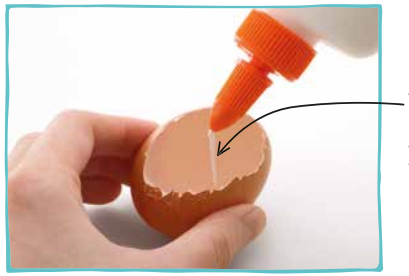
1 Before you start, wash your hands. Gently crack the egg against the edge of the bowl and pick away around the crack, to create a hole. You might want to wear protective gloves.

You can keep the inside of the egg for cooking.

2 Empty the contents of the egg into the bowl. Break a few bits of shell inwards and you should be able to begin to remove the delicate skin, or membrane, that lines the inside of the shell.

Be careful not to break the egg shell.

3 Wash the shell under running water to remove as much of the membrane as possible. Then wash your hands again.



The glue will provide a sticky surface for the alum.

4 Pour a little bit of glue into the clean, empty egg shell.

5 Use the paintbrush to spread the glue evenly around the inside of the egg shell.

6 Use the spoon to sprinkle some alum into the egg shell. Tip out any alum that doesn't stick. You may want to wear gloves for this part, if not, be sure to wash your hands afterwards.

7 Gradually pour the remaining alum into the warm water and stir with the spoon. Keep adding alum until no more will dissolve, to ensure the solution is really concentrated.

Make sure you stir the mixture to help the alum dissolve.

Top Tip: Change the food colouring you use for a different coloured egg!

Suitable for 9-12 years

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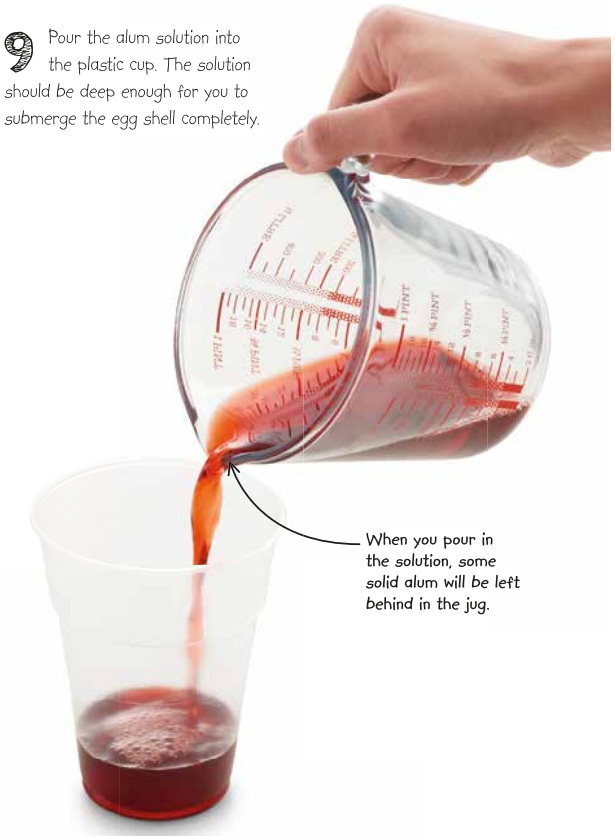
8 Add some food colouring – enough to give the the alum solution a deep colour. Stir the mixture again.

10 Submerge the egg shell in the alum solution. Gently push it down with the spoon to fill the egg shell with solution, being careful not to break it.

11 Leave the egg shell in the solution for around 24 hours. It will work best somewhere warm and dry. Afterwards, carefully lift it out of the cup.

9 Pour the alum solution into the plastic cup. The solution should be deep enough for you to submerge the egg shell completely.



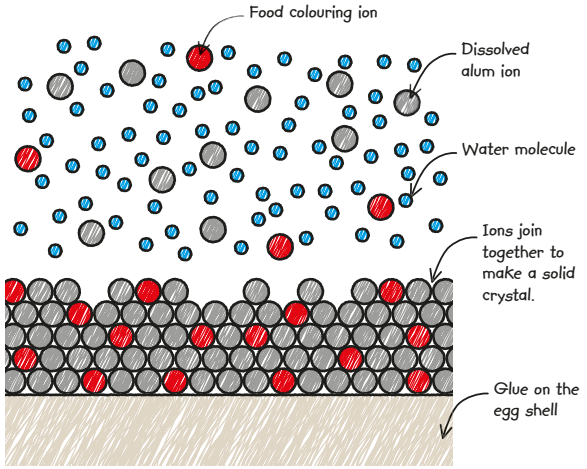
12 Gently place the egg onto the paper towel.

13 Take a close look at your egg geode. The alum and the food colouring should have formed lots of small, shiny crystals.

Throw away any remaining alum solution, then wash your hands.

HOW IT WORKS

When you dissolve the alum in the water, the alum breaks down into tiny parts called ions that mix with the water. The food colouring is already dissolved in water, and that also exists as ions. Every so often, the different ions will meet and may stick together, forming solid crystals. They join in a regular pattern, which is what gives the crystals their distinctive shape.



REAL WORLD SCIENCE

REAL GEODES

Geodes form inside holes in rock. Often the holes are caused by big bubbles of air in molten lava as it escapes from a volcano. These bubbles become trapped as the lava solidifies into rock. As water seeps through the ground, minerals dissolve in it, and those minerals crystallize inside the holes, creating these beautiful crystals.

Crystal Egg Challenge: Share a picture with a friend of all your coloured eggs! How many did you make?

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