



EGGSHELL GEODE

Create crystal geodes inside empty eggshells.

Materials

Eggs

1 cup of water

A soluble solid: *table salt, rock salt, sugar, baking soda, Epsom salts, sea salt, borax, or cream of tartar*

Heat proof containers (coffee cups work well)

Spoons

Food coloring

Egg cartons or mini-muffin tins



Procedure

- Crack the eggs as close to the narrow end as possible. Clean the eggshells using hot water. Carefully remove all of the egg membrane - this is an important step to avoid growing mold. Place eggs in carton or muffin tin, so they are standing upright, and set aside.
- Ask an adult to heat water in a container until it starts to boil. Mix in $\frac{1}{4}$ cup of one of your soluble solids into the water. Stir until it dissolves. Continue to add more of your soluble solid to the water in small amounts until the water can't dissolve any more. You have now created a super-saturated solution.
- Add food coloring to your super-saturated solution and then carefully pour your solution into the eggshells. Fill them as much as possible without overflowing or tipping them over.
- Find a safe place to put your shells until all the water evaporates.

Results

Crystals will form inside the eggshells as the water cools and evaporates.

Why?

When you dissolved the soluble solids into the heated water, you created a super-saturated solution. This means that the water has dissolved more of a substance than it usually could at room temperature. As this solution cools and the water evaporates, the soluble solid cannot stay dissolved and forms into a solid again. Since this happens slowly, along with evaporation, the crystals have time to grow larger than they were when the experiment started. Natural geodes in rock are formed in a similar way. Water with dissolved solids seeps into empty spaces in rock and the solids slowly precipitate out (stop being dissolved) and form crystals.