

Make Your Own Speleothems! Teacher's Guide

Materials (per student, pair or group):

2 glass jars or beakers
2 nails
2 15in. pieces of heavy string
Epsom salts
Water
Food coloring
Sheets of cardboard or tag board (1 sq. ft. each)
Wood blocks (optional)

Procedure:

Make a saturated solution of Epsom salts and water. Follow the directions on the bag of salt. It is important that you use enough salt. Add a drop of food coloring to this solution. This aids the students in seeing the finished formation. Fill both of your jars or beakers with the solution. Now, securely tie the two pieces of string together. Tie a nail to each end of the string. Put one nail into one of your glass jars and the other nail into the other jar. Carefully place your set-up so that the glass jars are separated enough to make the strings taut. Make sure the nails are completely submerged in the solution. Place your cardboard sheet under your string. Evenly place it between your two jars so that any solution that drips off the string will land onto the cardboard. If you want longer formations, place each beaker on a wood block to slightly elevate it above your cardboard base. Make sure the students set ups are out of the way and not disturbed. Bumping them will dislodge the salt crystals. Record your observations daily.

Analysis:

Please answer the following questions based on your lab experience.

1. What happened to the solution from your jars? The solution flowed along the string until it got to the middle, then the salt crystallized out from the water and formed stalactites and stalagmites between the two jars.
2. What do you see collecting on the string and on the cardboard? Salt crystals which are formed from atoms and molecules of salt in the water solution.
3. What type of speleothems are you creating? Stalactites are the ones hanging from the string and stalagmites are the ones forming on the cardboard.
4. Explain how your experiment is similar to how speleothems develop in a cave. It's similar because stalactites form on the lifeline of the cave when atoms join together to form molecules which form crystals. And stalagmites form under a stalactite when water drips down to the floor of the cave depositing some crystals there.
5. Explain how your experiment is different from how speleothems develop in a cave. It is different because the water evaporated in our experiment, leaving the salt crystals behind. In the cave, water does not evaporate. The crystals are precipitated instead. Also, the atoms are calcite instead of salt.
6. How are the strings of your experiment like the lifeline of a cave? The strings are like the lifeline because that is how the salt water solution was carried to the area where it formed the stalactites and the stalagmites. The lifeline is the crack in the ceiling of the cave through which the water drips into the cave and deposits those same types of formations.