



STEM Activity Idea:

CRYSTAL SNOWFLAKE

Suggested Program Level: Brownie

Learn how crystals are formed, and create your own snowflake that won't melt!

Supplies (1 set for each girl):

- string (12 inches)
- wide mouth jar
- white pipe cleaner
- food coloring (optional)
- long spoon
- tablespoon
- boiling water
- Borax
- small wooden dowel or pencil
- scissors
- oven mitts or towels
- paper towels

Instructions:

1. Show the girls how to cut their pipe cleaner into three equal sections. Have the girls twist the three sections together in the middle so the pipe cleaners look like a six-pointed star. The snowflake should fit inside the mouth of their jar easily, and if it is too big, you will need to ask them to trim the edges until the snowflake fits in smoothly.
2. Ask the girls to tie one end of their string to one of the points on their snowflake. Then ask the girls to tie the other end of their string around the middle of their dowel or pencil.
3. Adults need to pour boiling water into each jar, reminding the girls not to touch the outside of the jar or the water.
4. For each cup of water, the girls will need to add three tablespoons of Borax. This may be easier to pre-measure for each girl if the jars are not the same sizes. The girls can add the Borax one tablespoon at a time, stirring after each addition. Not all of the Borax will dissolve.
5. If the girls want to add food coloring, they may add a couple drops after the Borax is added.
6. Ask the girls to place their snowflake in the jar so the pencil or dowel rests on the edge of the jar. The snowflake should float freely, so if the string is too long the girls will need to roll the string around the pencil or dowel until the snowflake isn't touching the bottom of the jar.
7. The girls can put the jars somewhere out of the way, using towels or oven mitts if the jars are too hot to touch. The jars will need to sit overnight undisturbed.
8. The girls can remove the snowflakes from the jars the next day and let them air-dry on paper towels.

Why?

Crystals are molecules arranged in repeating patterns. When you dissolve Borax crystals in hot water, the warmer water molecules move faster allowing for more Borax to dissolve. As the water cools, there isn't as much room for the Borax so crystals begin to form on top of each other, creating a crystal structure around the pipe cleaner.