Borax Crystal Ornaments

A crystal (or crystalline) solid is a solid material whose constituents (such as atoms, molecules, or ions) are arranged in a highly ordered microscopic structure, forming a crystal lattice that extends in all directions. Examples of large crystals include snowflakes, diamonds, and table salt.

In this experiment, using Borax with the chemical formula $Na_2H_4B_4O_9$, you will make a Borax Crystal Snowflake. This special snowflake is almost just as beautiful and unique as a snowflake you capture from the sky. It demonstrates some great concepts of crystals, chemistry, and science.

Creating the Borax Crystal Snowflake uses some fun, hands-on chemistry and makes a perfect winter decoration.

Join us for STEM Night on Wednesday, March 24th! Share your completed project, trouble-shoot or ask questions, and learn more about your crystals.
There are three times to choose from; 6:00pm, 6:30pm, or 7:00pm.

1. https://zoom.us/
2. Choose "Join a Meeting"
3. Meeting ID **327 957 4509** Password **8KNVdX**

Explore the full project plan and videos here:
https://www.stevespanglerscience.com/lab/experiments/magic-crystal-snowflake/

Kit Inclusions

- 1 Craft Sticks
- 3 Pipe cleaners
- String
- Borax

Items You Need from Home

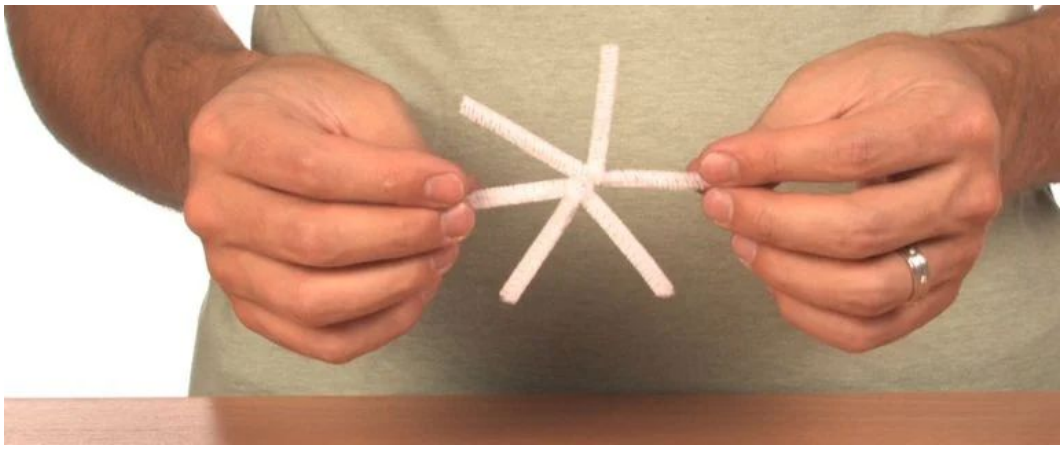
- Wide-mouth container
- Food coloring (optional)
- Scissors
- Adult supervision

Instructions

Step by Step:

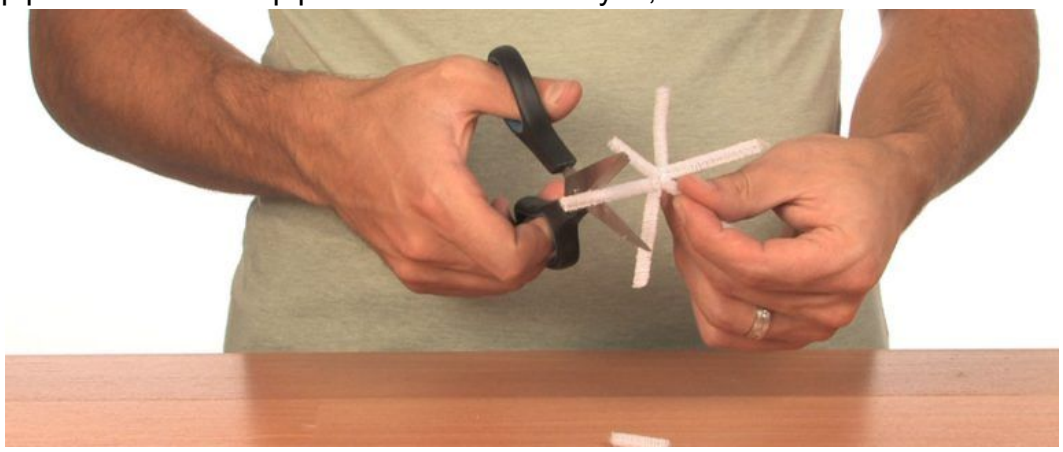
1. You may have three or more pipe cleaners because you want to make three or more Borax Crystal Snowflakes. That's great! These directions tell you how to make one so duplicate them if you're making more. With the scissors, cut a pipe cleaner into three equal sections

2. Twist together the three sections of pipe cleaner at their centers to form a six-pointed star. Don't stress if the sides aren't perfectly even. Little imperfections make them more beautiful and natural.



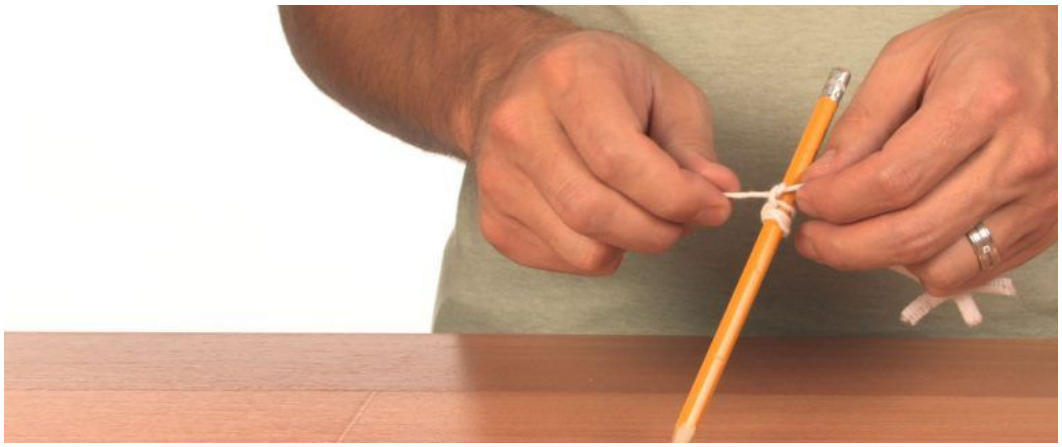
3. Compare the size of your snowflake to the width of the opening on the container. The shape needs to fit easily into the container without any squeezing. It can't even be a close fit due to likely crystal growth in the container as well as on the

pipe cleaner. If the pipe cleaner can't easily fit, shorten each section as needed.



4. Cut a 10" (25 cm) length of string.
5. Tie one end of the string to the center of the pipe cleaner snowflake. Lay the pencil across the opening of the container and lower the pipe cleaners into the container. The snowflake can be close to but should not touch the bottom of the container.

6. Tie the other end of the string to the pencil so the snowflake hangs freely in the container. When you have your string tied and set, lift the pencil and the snowflake out of the container and set it aside.



7. Make sure your crystal-growing container is safe for boiling water! Bring a pot of water to a boil and fill the container with it.

8. Add 3 tablespoons of borax powder for each cup (237 ml) of water in the container. Stir the solution carefully since it's hot and get all the borax to dissolve. If there are no borax pieces on the bottom of the container, add another tablespoon and stir. Keep adding and stirring borax until none will dissolve into the water anymore. It's OK if some borax settles to the bottom of the container.

9. If you want a colored snowflake, stir in some food coloring. More coloring – 20+ drops – is probably better than fewer. Lower the snowflake into the hot, colored supersaturated solution and let it sit, undisturbed overnight. Moving or bumping the container while the crystals are growing is not a good idea so put it in a warm, out-of-the-way place. The next day, carefully lift the pencil and check out the gorgeous crystals! Untie (or cut) the string from the pencil and you've got yourself a beautiful, sparkly, colorful holiday decoration!

Interested in more projects like this one?
Here are some great websites to check out with other fun STEM ideas!

- https://www.scientificamerican.com/education/bring-science-home/
- https://www.instructables.com/teachers/
- https://utahstemfest.com/