



# Holiday “Chemistree”



You can make your own sparkly holiday decorations. All it takes is a little chemistry!

## Materials

- \* wide mouthed jar or beaker
- \* borax laundry booster
- \* pencil
- \* colored pipe cleaners
- \* HOT water

## Directions

1. Twist a pipe cleaner into a crescent moon, heart, star, or another simple shape. Leave some extra pipe cleaner at the top to wrap around a pencil to hang in the borax solution.
2. Get an adult to boil some water; pour the heated water into the jar.
3. Stir in a tablespoon of borax. Keep adding more borax and stir until the borax precipitates on the bottom and no longer dissolve. It takes about three spoonfuls of borax for each cup of hot water. Be sure the water is not cloudy.
4. Bend the extra pipe cleaner around a pencil and lay it across the jar's top lowering the pipe cleaner into the jar. Do NOT let the pipe cleaner touch the sides or bottom of the jar.
5. Leave the ornament overnight in a safe place where it won't be moved or bumped.
6. Day two, the ornament should be coated with crystals. If not, remove the pipe cleaners, reheat the water, add more borax and try again. Take the shape out and let it drip dry.



## The science behind the fun

Borax is an example of *crystal*- a *solid* with *molecules* that are arranged in a unique, repeating pattern. Every crystal has a repeating pattern based on its unique shape. They may be big or little, but they all have the same “shape”. Salt, sugar, and Epsom salts are all examples of crystals. Salt crystals are always cube-shaped while snow crystals form a six sided structure.



## How do the Borax crystals grow?

Hot water holds more borax crystals than cold water. That's because heated water molecules move farther apart, making room for more of the borax crystals to *dissolve*. When no more of the solution can be dissolved, you have reached *saturation*. As this solution cools, the water molecules move closer together again. Now there's less room for the solution to hold onto as much of the dissolved borax. Crystals begin to form and build on one another as the water lets go of the excess and evaporates. This also applies to snowflakes - As water cools the molecules move closer together. Since all water molecules are shaped the same, the water align in a six sided crystal.