

# Making Ice Grow



## Materials:

- Unopened water bottles
- Bowl of ice
- Freezer

## Science Concept:

States of Matter, Temperature,

## Directions:

- 1.** Before the activity, place unopened water bottles in the freezer for about 2 hrs. 30-45 minutes. The water needs to be cold, but not frozen. To test if the bottles are ready, just give one a whack on the bottle, anywhere you want. If you hit it hard enough, you should see the water instantly begin to freeze from the top to the bottom. The result will be a clear liquid turning to an opaque white.
- 2.** Place ice cubes in a bowl and stack the ice on top of each other with 1 piece of ice on top (kind of like a pyramid).
- 3.** Take the water bottle out of the freezer and be very gentle with it. Pour it on top of the ice very slowly.
- 4.** Watch as the ice starts to grow upwards! Keep the stream of water going and move it around to make more ice towers. Make as many as you'd like until either the water runs out or the bowl is too full of water.

*If they don't grow very fast, try leaving your bottles in the freezer for another 10 minutes. If your bottles are freezing with only a slight touch, or before you want them to, try taking your bottles out of the freezer 5 minutes earlier.*

# Homemade Frost



## : **Materials:**

- Tin can
- Glass jar
- Ice
- Salt
- Timer
- Observation sheet

## : **Science Concept:**

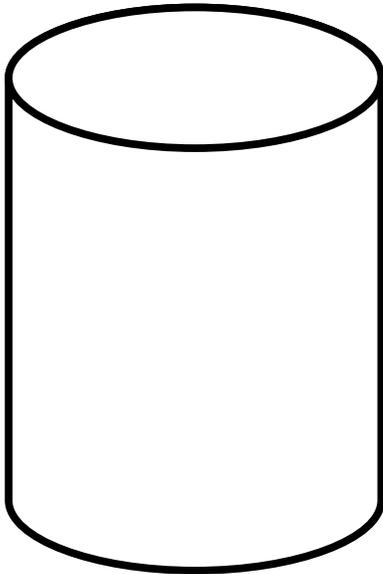
- Chemistry, Temperature

## **Directions:**

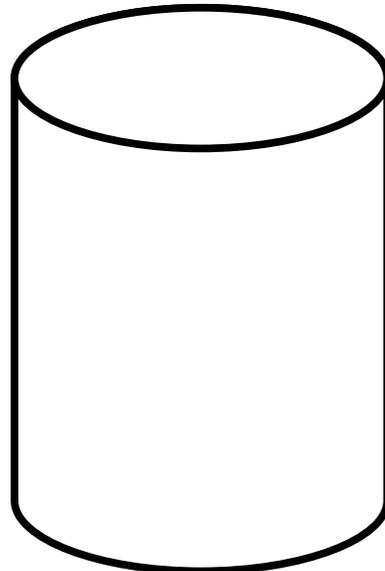
- 1.** Ask your child where they've seen frost before. Perhaps on the grass, the windows, or the trees. Explain that today we're going to make our own frost.
- 2.** Fill a tin can with ice, some salt, and some water. Then let it sit and observe. Make sure to touch the can to see how cold it is!
- 3.** After a few minutes, you'll start to see frost form around the outside of the tin can.
- 4.** Explain that the salt lowers the melting temperature of ice, so adding it causes a chemical reaction between the ice and salt. It helps the ice to melt quickly and it cools off the can to below freezing. The can becomes much colder than the surrounding air, which causes the water vapor in the air to form tiny ice crystals on the side of the can, or frost! Look closely at the frost and you can see crystals of ice growing on each other.
- 5.** To extend the activity, try doing this with different variables. Add more or less water and salt to the ice to see if it speeds up the frost. See the observation sheet for more ideas.

# Homemade Frost

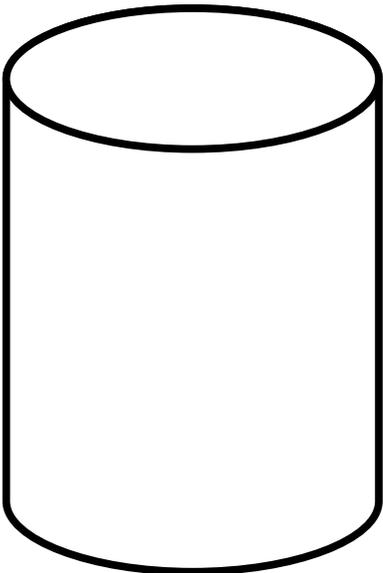
Complete the frost experiments and draw the observations below. Record how long it takes for frost to appear on the tin cans.



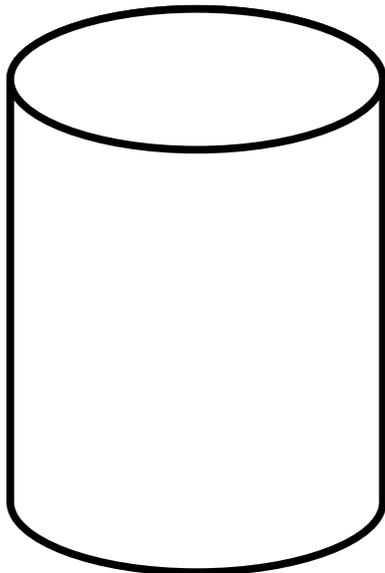
1 tablespoon of salt  
1 tablespoon of water  
How long: \_\_\_\_\_



$\frac{1}{4}$  cup of salt  
1 tablespoon of water  
How long: \_\_\_\_\_

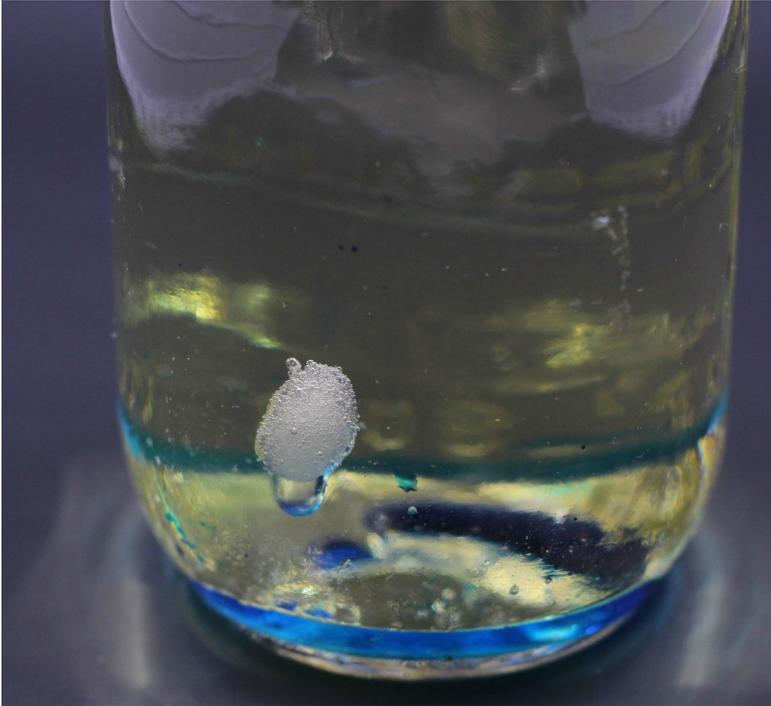


$\frac{1}{4}$  cup of salt  
 $\frac{1}{4}$  cup of water  
How long: \_\_\_\_\_



\_\_\_\_\_ of salt  
\_\_\_\_\_ of water  
How long: \_\_\_\_\_

# Floating Ice Cube



## Materials:

- 1 clear jar
- 1 ice cube
- Food coloring
- Baby oil
- Vegetable Oil
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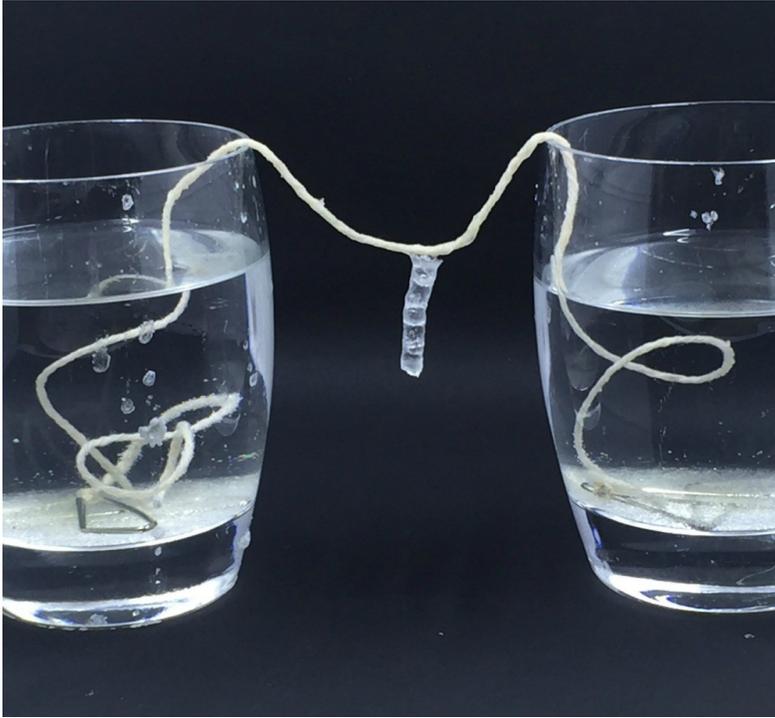
## Science Concepts:

Density, States of Matter

## Directions:

- 1.** Add a couple drops of food coloring to an empty clear jar.
- 2.** Fill half of the jar with vegetable oil and the top half with baby oil, leaving a small space at the top. If you look closely, you'll see the vegetable oil settle under the baby oil.
- 3.** Gently drop an ice cube into the jar. It should sit somewhere in the middle, not sinking to the bottom or floating to the top.
- 4.** Now you have to be patient and wait for the ice to start melting. After a little while, you'll see drops of water coming off the ice. It will sink to the bottom and mix with the food coloring. One by one you'll see the drops fall until the ice cube is completely gone.
- 5.** This is an experiment of density. Density is the mass per unit of volume. You can also say it's the amount of stuff in a given amount of space. Explain that when water freezes to ice, it is less dense than vegetable oil and water, which is why it floats. When ice melts, it is water, which makes it more dense and sinks to the bottom.

# Making Icicles



## Materials:

- 1 cup of Epsom salt
- 2 cups of warm water
- Cotton string
- 2 paperclips
- 2 glasses
- 1 plate

## Science Concepts:

Chemistry, States of Matter

## Directions:

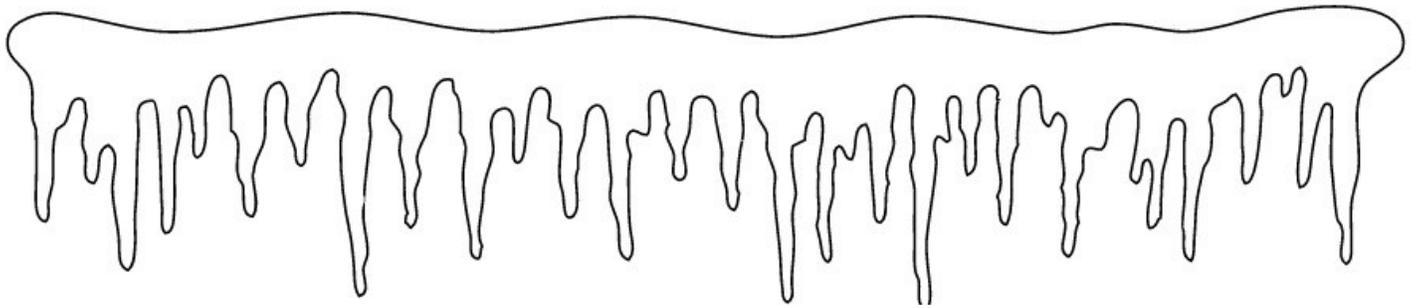
1. Stir 1 cup of Epsom salt into 2 cups of warm water. You should still see some chunks of salt. If you don't, then add more salt.
2. Tie a paperclip to each end of a piece of cotton string, about 20 inches long.
3. Place the string inside the salt water mixture and let it sit for 1 hour.
4. Take the string out and put one side in one glass and the opposite end in another glass. They should be about a foot apart (which is not pictured above) and you want the string to hang down so the lowest level is below the water level in the glasses. Make sure to put a plate underneath the string to catch any drops.
5. Pour the salt water in both of the glasses.
6. Observe the string and watch over the next 2 days as icicles begin to form! Draw what you see on your observation sheet.

# Making Icicles - Explanation

In this experiment, we did not make real icicles, but we demonstrated a similar way to how icicles are formed. Icicles typically form on days when the outdoor air temperature is subfreezing, but the sunshine warms and melts some snow or ice. As it drips off your roof, a water droplet freezes when it loses its heat to the cold air. An icicle starts to form with a few frozen droplets

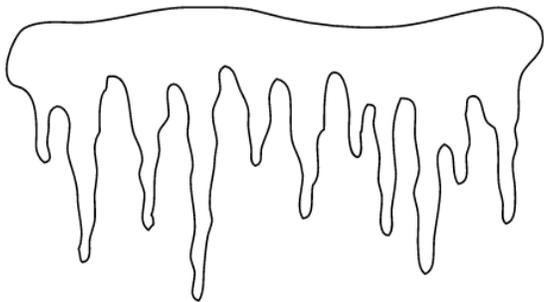
In our experiment, we saturated the water with Epsom salts, which meant the water dissolved as much material as it could. We soaked the string in the water so that when we hung it between the two glasses, the water would continue to flow through the string. The water carried the dissolved Epsom salts and then dripped to the lowest part of the string. It left bits of the salt behind and over time it build up and formed an icicle shape!





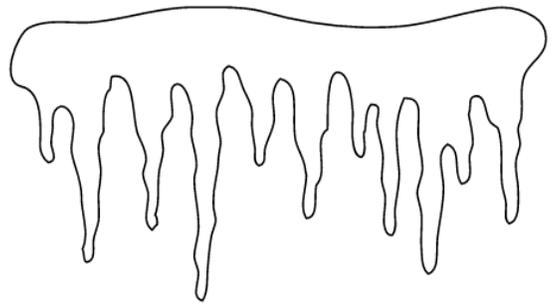
**Day 1**

Directions: Observe the homemade icicles for 3 days. Record your observations in these boxes.



**Day 2**

**Day 3**



# Building with Ice Cubes



## Materials:

- Colored ice cubes
- Water dropper
- Warm water
- Cookie sheet

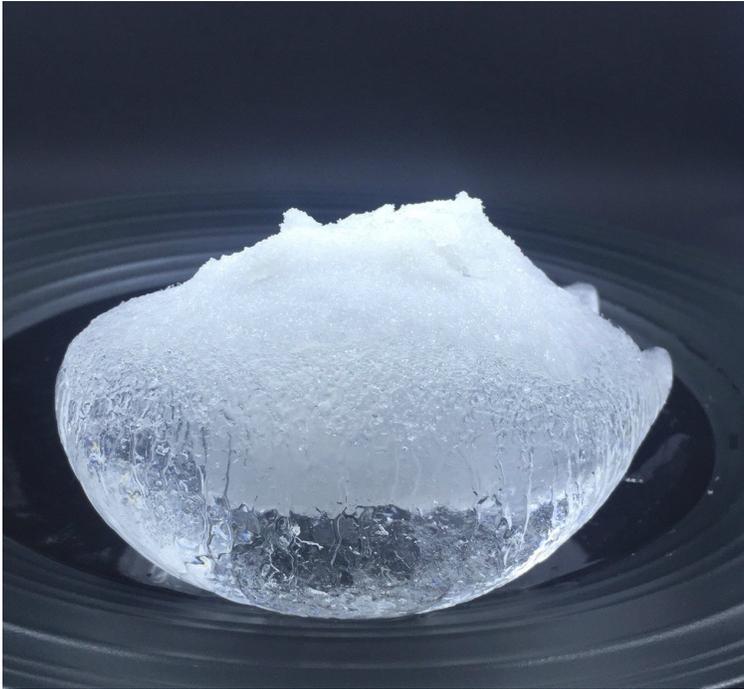
## Science Concepts:

States of Matter, Temperature

## Directions:

- 1.** Before the activity, freeze a thin layer of ice on a cookie sheet. Also color water with food coloring and freeze them in an ice cube tray to make colored ice cubes.
- 2.** When the ice is ready, ask your child what they would need for ice cubes to stick together. Try testing out their ideas. Even try stacking them on each other and pointing out that they just fall over without the secret ingredient.
- 3.** Explain that the ice cubes need warm water to melt a little before they are able to stick to another ice cube. Test it out by squirting a little warm water with a dropper on an ice cube. Then hold another ice cube on it for 15-20 seconds. They will be stuck together!
- 4.** Keep building with the ice cubes. If you have snow outside, try building ice cube structures in the snow. The cold snow helps the ice cube structures stay together better.

# Melting Ice



## Materials:

- 1 big piece of ice
- Salt
- Ice melt
- Timer
- Observation sheet

## Science Concepts:

Chemistry, States of Mater

## Directions:

1. Before the activity, find 2 big pieces of ice from outside or freeze bowls of water into ice.
2. Ask your child what they can use to melt the ice quickly.
3. Explain that salt is the best way to melt snow. Show them how this works by setting the ice pieces on plates and then placing a moderate amount of salt on one piece and nothing on the other.
4. Then set the timer and wait to see which piece of ice melts faster. Make sure to watch the one with the salt because it starts to melt fast! Draw your observations and record how long it took to melt each piece.
5. Talk about how salt melts ice because adding it lowers the freezing point of the water, which prevents the ice from forming.

# Melting Ice

Draw in the boxes what the pieces of ice look like. Record how much time it took to melt.

## Ice Piece

Time to Melt: \_\_\_\_\_

## Ice Piece with Salt

Time to Melt: \_\_\_\_\_