

Create an Ice Sculpture

Objective

The purpose of this activity is to create an ice sculpture at home using the unique properties of water.

Recommended Ages: 3+ with adult supervision

Materials

- Ice Cubes
- Paint Brush
- Tray/Cookie Sheet/Plate (or something to catch water)
- Food Coloring (optional)
- Tap Water
- Table Salt in a Salt Shaker
- Cup for Water
- Bowl to container ice cubes
- Paper Towels

Preparation

1. Pour a cup of water from your tap.
2. Collect ice in a bowl.
3. Set out a tray/cookie sheet/plate as your ice sculpture crafting space.

What to Do

1. Start by selecting 2 ice cubes and try to stick them together. This probably will not work too well.
2. Next, dip your paint brush into the bowl of tap water and gently brush the water onto one of the ice cubes.
3. Gently press the ice cubes together for a couple of seconds or until they stick.
4. Continue steps 2 and 3 to build your ice sculpture.
5. When you are finished building your ice sculpture, take a shaker of table salt and gently sprinkle the salt onto your sculpture.
6. Observe what happens to your ice when it is exposed to the salt.



7. *Optional:* Once you have observed the reaction of the salt and ice add a couple drops of food coloring to your ice sculpture to get a better look.



Guided Questions

- What is ice made of? How do we make ice cubes? Do we need the temperature to be hot or cold when we make ice?
- Why do you think the ice cubes stuck together easier with a little water added to them?
- What happened to the ice when we added salt? Why do you think that happened?
- Can you think of a time you saw salt on the sidewalks/road? What time of year was it?

What is happening?

All things around us are made of matter. There are 3 main kinds, or states, of matter: solid, liquid, and gas. Solids, like ice, keep their shape. Liquids, like water, change shape to fit their container. Gases, like water vapor, expand to fill their container. Water can change between those states of matter by the addition or removal of heat. When we remove heat from water, it gets cold and freezes into solid ice. We can change that ice back into a liquid though, by adding some heat. Our ice sculptures use this heat change to stick together. The 2 solid cubes of ice are not able to stick together because they are holding their shape. We added water to the surface of an ice cube and the cold temperature of the ice froze the water between the 2 ice cubes so it became one solid piece.

When we add the salt something interesting happens. Salt dissolves in the water making a solution. The salty water solution has a lower freezing temperature (freezes at about $\sim 15^{\circ}\text{F}$) than just water (freezes at 32°F) by itself. This makes the ice cube melt at a faster rate and we see that in the tunnels and holes the salt creates. This is also why we spread salt on roads and sidewalks when the weather turns icy and snowy. Once the temperature drops below 15°F though, the salt is not as effective. Applying the food coloring helps us see the tunnels and holes better as well as makes our sculpture stand out even more.