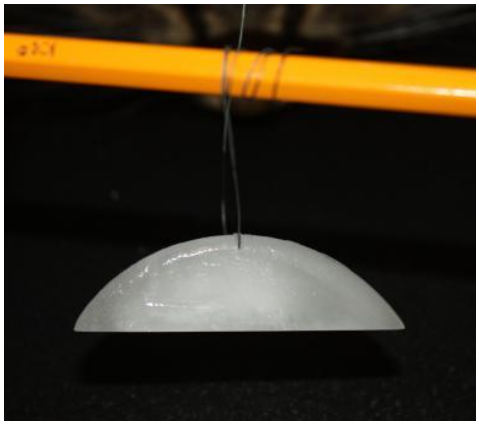
Ice Cube on a Wire



Pull a Wire through an Ice Cube

By Anne Marie Helmenstine, Ph.D. | Chemistry Expert

You can pull a length of wire through an ice cube thanks to the process of regelation.

Pull a wire through an ice cube without cutting the cube! This trick works thanks to a phenomenon called regelation, in which the ice melts from the pressure of the wire and freezes up after the wire passes. Here's how to put a wire through an ice cube or hang the ice on wire.

Ice Cube on a Wire

Cut a length of fine wire. Wrap each end of the wire around a pencil to give yourself handles for the wire.

Place the wire on top of an ice cube. Pull on the pencils to melt the ice below the wire. You can speed the process by applying a sawing motion to the wire. Either leave the wire partly in the ice or pull the wire all the way through the ice. As the wire passes through the ice, the cube will refreeze. The ice cube won't be cut. In fact, you probably won't even see the line where the wire went through the ice.

Ice Cube Illusion Necklace

An alternative is to use clear nylon fishing line instead of wire. It takes a little more pressure to melt the ice cube under the pressure of the fishing line, but you'll get a clear ice cube on a clear line -- an ice cube illusion necklace!

Ice Cube on a Wire

Art by Brenda Pepper

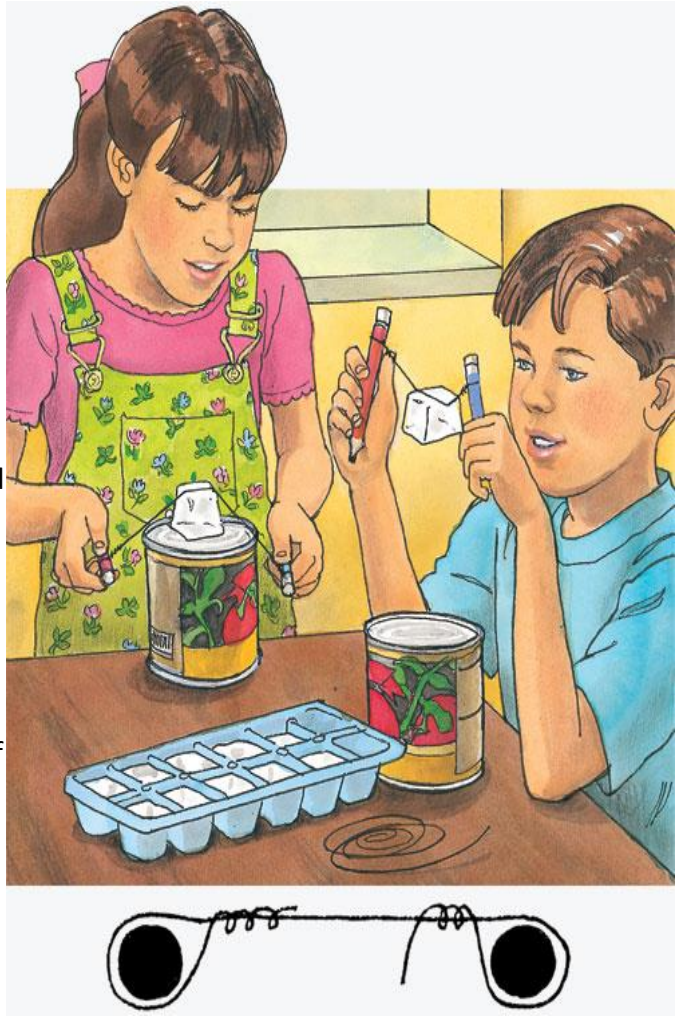
When the pressure's on, ice can get a grip.

For this activity you need a thin strong wire about two feet long. You can find a good one by carefully unraveling a strand from the bundle of thin wires used to make a thicker wire for hanging up a picture frame.

Using this wire and two sticks or pencils, make a one-foot-long wire with a handle at each end. To do it, wind one end of the wire around one stick. Then twist the short end of the wire around the longer end to hold it tightly to the pencil. Repeat these steps to attach the opposite end of the wire to the other stick.

Place an ice cube on top of a tin can. Holding one of the pencils in each hand, press the wire down across the top of the ice cube.

Now comes the only tricky part. You must keep pressing down steadily and firmly—but not so hard that you break the wire. Slowly, the wire will sink into the ice.



It is strange to think that you can cut into ice with a wire. But if you look carefully, you will see that you are not cutting the ice cube into two pieces. The wire ends up threaded right through the ice.

How It Works

Like heat, pressure can prevent water from freezing into ice. Pressure can also melt ice.

If you force a fine wire down hard enough against ice, the pressure underneath the wire can be great enough to melt the ice. As the wire sinks, the water freezes again above the wire.

A thick wire doesn't work. A person would have to press down very hard to create enough pressure under a large wire.

To create an interesting effect, use ten-pound nylon fishing line instead of wire. Fishing line is harder to press into the ice, but it can be more fun because the fishing line is almost invisible in dim light.

Does Ice Melt Faster in Water or Air?

The rate at which ice cubes melt depends on where there are and the temperature of their environment

By Anne Marie Helmenstine, Ph.D. | Chemistry Expert

Question:
Do ice cubes melt faster in water or in air?

If you watch ice cubes melt, it may be hard to tell whether they melt faster in water or air, but if the water and air are the same temperature, ice melts more quickly in one than in the other.

Answer:
Quick answer: water, assuming the air and water are the same temperature.
Longer answer: Usually water, because the molecules in liquid water are more tightly packed than the molecules in air, allowing more contact with the ice and a greater rate of heat transfer.

Also, water has a higher heat capacity than air.

Initially the surface area of ice melting in air and ice melting in water is the same, but as ice melts in air a thin layer of water results, which absorbs some of the heat from the air and slightly insulates the remaining ice.

When you melt an ice cube in a cup of water it is exposed to both air and water. The part of the ice cube in the water melts faster than the ice in the air, but as the ice cube melts, it sinks further down. If you support the ice to prevent the ice cube from sinking, you could see the part of the ice in the water would melt more quickly than the part in the air.

Other factors come into play. If the air is blowing across the ice cube, then the increased circulation may allow the ice to melt faster in air than in water. If the air and water are different temperatures, the ice may melt more quickly in the medium with the higher temperature.