

States of Matter

There are three (maybe four) states of matter: gas, liquid, and solid (plasma). Changes in temperature cause changes in state of matter. Gas occurs at highest temperatures, liquid at medium temperatures, and solid at colder temperatures. These temperatures are different for each substance. Here are some key terms:

Melting: solid changes to liquid

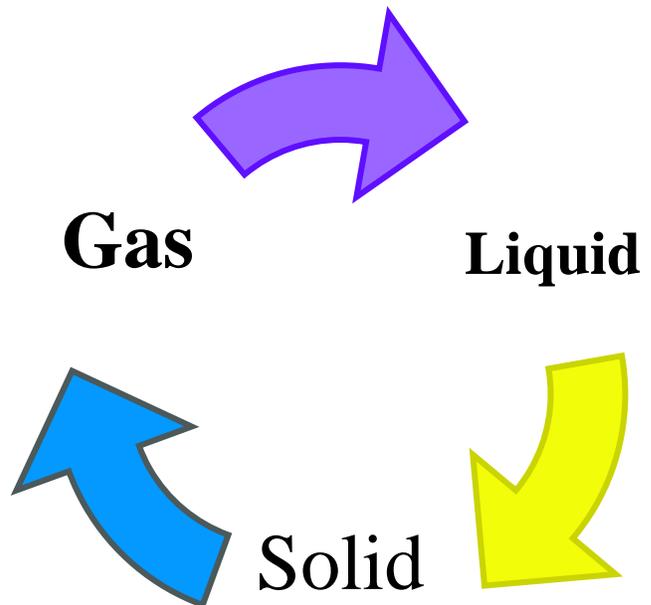
Evaporation: liquid changes to gas

Deposition: Gas changes to solid (like dry ice)

Sublimation: Solid changes to gas (like dry ice)

Condensation: Gas changes to liquid

Freezing: Liquid changes to solid



Why is Dry Ice Dry?

Materials:

A small piece of Dry Ice

A regular ice cube

gloves

Disappearing Ice

Here's a quick experiment to help children better understand why it's called dry ice. Ask the children, "Why do you think they call this dry ice?" Place a regular ice cube on one plate and a similar size piece of dry ice on a second plate. Keep both plates out of the reach of the children. "Let's try to guess what is going to happen to the ice cube and the piece of dry ice if we leave it on the plate for one hour." Of course, the children are likely to tell you that both pieces of ice will melt, turning into a puddle of water.

Allow the children to view the plates after one hour and to discover the difference between real ice and dry ice. There should be a puddle of water on the plate where the real ice was, but the dry ice plate will be dry. Where did the dry ice go? Dry ice is not made from water, it's made from some of the air that we breathe... it's frozen carbon dioxide. The dry ice turned into invisible carbon dioxide gas that disappears into the air. Magic!

All About Dry Ice

First of all, here's the background information and safety lesson on dry ice. Dry ice is frozen carbon dioxide. Instead of melting, dry ice turns directly into carbon dioxide gas but does not melt like real ice. Dry ice must be handled with care as it is -110°F (-78°C). It must be handled using gloves or tongs, as it will cause severe burns if it comes in contact with your skin. Never put dry ice into your mouth. .

More Dry Ice Experiments (Farm Classroom)

Materials:

- Dry Ice
- Tongs
- Paper Plates
- Soap
- Plastic containers
- Benches
- Bubble solution from before
- Root beer extract
- Sugar
- Wooden spoon for stirring

Dry Ice - Grocery stores use dry ice to keep food cold during shipping. Some grocery stores and ice cream shops will sell dry ice to the public (especially around Halloween) for approximately \$1 per pound. It's a good idea to take a beverage cooler with you along with a pair of gloves to protect your hands. If you are planning to perform a number of dry ice demonstrations, plan to purchase 5 to 10 pounds.

Floating Bubble

You'll notice that when you add dry ice to water, the cloud of carbon dioxide and water does not go up into the air, but instead falls towards the ground. Why? This cloud-like mixture of carbon dioxide and water is heavier than the surrounding air. You'll use this little piece of science trivia to perform the amazing Floating Bubble trick.

A small fish aquarium works well for this activity. Fill the bottom of the aquarium about an inch deep with warm water. Use gloves or the tongs to add a few pieces of dry ice. Of course, the dry ice will begin to smoke turning into carbon dioxide and water vapor.

Using a bubble wand and a bottle of bubble fluid, blow a few bubbles into the aquarium (it's a little difficult so be patient). To everyone's amazement, a few bubbles will appear to float in mid-air in the aquarium. The bubble is really just floating on a cushion of invisible carbon dioxide gas.

Oooh Ahhh Awesome Bubbles

Who would have guessed that you could have this much fun with soapy water and a chunk of dry ice? Fill a tall glass or plastic cylinder with warm water and add a squirt of liquid dish soap like Dawn or Joy. Use gloves or the tongs to place a piece of dry ice into the soapy water. Get ready for a room full of ooohs & ahhs!

Instead of the dry ice just bubbling in the water to make a cloud, the soap in the water traps the carbon dioxide and water vapor in the form of a bubble. The children will see the bubbles climb out of the cylinder of warm, soapy water and explode with a burst of smoke as they crawl over the edge.

Add some food coloring to the water to make the demonstration more colorful. If you want to give the exploding suds an eerie glow, drop a glowing lightstick into the water along with the dry ice. The lightstick will give the bursting bubbles an eerie look.

Lightsticks... the Eeeeeerie Glow!

Make a trip to your local supermarket or Halloween store to find a supply of lightsticks. When you bend the lightstick, a small glass tube breaks and the chemicals in the lightstick mix. The result is an eerie glowing light that is safely contained within the walls of the lightstick. Drop a lightstick into your bubbling, dry ice potion for a great eerie effect.