HOW MUCH WATER IS IN SNOW?

Experiment

WHAT YOU NEED:

- ☐ Clear plastic container
- ☐ Ruler
- ☐ Snow

You may hear adults talk about how many inches of snow fell during a snowstorm. Do you think that's the same as how many inches of water fell? Try this experiment and find out! (If you don't have snow where you live, you can still have fun making your own crystal snowflakes!)

WHAT YOU DO:

1. Fill the container with snow and bring it inside. Don't pack the snow down.
2. Use the ruler to measure the height of the snow in the container. Make sure to write it down so you will remember later.
3. Take a guess as to how deep the water will be in the container after the snow melts.
4. Allow the snow in your container to melt into water.
5. When the snow is completely melted, use the ruler to measure the height of the water in the container.
6. What did you find? Was your guess close to the actual amount of water?

WHAT HAPPENED:

Snow is made when water freezes in the form of ice crystals that we call snowflakes. The pointed star-like shape of a snowflake causes its points to stick out far from its body, allowing the snowflake to take up a lot of room. (If you stick your arms straight out from your body, something similar would happen with you! Your arms cause your body to take up more space and you may find yourself bumping into walls or having a hard time making your way down a hallway with your arms sticking straight out.)

When lots of snowflakes pile up, their points keep them from getting very close together, creating empty space in between the snowflakes. When the snow melts into water, the snowflakes no longer have their points, and the space between them disappears. (If you put your arms down next to your body, you are no longer taking up so much space and can get much closer to other people and things.) So the melted snow takes up less space as water than it did as snowflakes.

NAMING HAILSTONES

Experiment

WHAT YOU NEED: *(For Older Kids)*

- ☐ Ruler
- ☐ Notebook
- ☐ Pencil

Hailstones are chunks or balls of ice that sometimes fall during thunderstorms. To find how this happens, read on to find our Science Lesson on hail. Have you ever heard of golf-ball-sized hail? Or maybe you have heard of pea-sized hail. Where do people get these strange names for hail? Try this experiment to get an idea of how hail sometimes gets weird names.

GATHER AS MANY OF THE FOLLOWING OBJECTS AS POSSIBLE:

- ☐ Frozen pea
- ☐ Golf ball
- ☐ Baseball
- ☐ Softball
- ☐ Quarter
- ☐ Penny
- ☐ Grapefruit
- ☐ Ping pong ball
- ☐ Small marble
- ☐ Grapefruit
- ☐ Ping pong ball
- ☐ Small marble
- ☐ Tennis ball

WHAT YOU DO:

For younger kids, compare the sizes of the objects and then line them up from smallest to largest. Compare your order to the objects on this common hail sizes chart. Did you get them in the right order? Which size of hailstone do you think would be the most destructive?

For older kids, try to guess the diameter (a straight line through the center of a circle or round object that reaches end to end) of each object in inches. Write your guesses in your notebook. Then use a ruler and measure the diameter of each object (you may need an adult to help you). Compare your guesses with the actual measurements. How accurate were your guesses? You can also compare your measurements to this common hail sizes chart.

WHAT HAPPENED:

When a hailstorm hits an area, it's hard not to notice the pieces of ice suddenly falling from the sky. Depending on the storm, these pieces of ice can range in size from very small to very large. Knowing the size of the hail is important because it gives us an idea of how strong the storm is that made the hail. In general, the larger the hail, the stronger the storm. The common objects that you used in the activity represent common hailstone sizes.

If you have ever tried to guess the size of hailstones in inches, you may have found that hard to do – most people do. Getting an accurate size of the hailstones is tricky (unless you have a ruler handy to measure whenever a storm happens!). Hail usually melts quickly because it comes with summer storms and warm temperatures. To make it easier, we usually estimate the size of hailstones by comparing them to common round objects, like the ones listed above. The next time you experience a hailstorm, go outside after the hail has stopped falling and see if you can find any hailstones left on the ground.

Then think of as many objects as you can that the hail is similar in size to. Have you ever wondered how much water is in snow or why sprinkling salt on walkways and roads helps ice melt away? January is a cold month for many of us, but even if there isn't any snow where you live, you can still experiment with ice!

ICE AND SALT

Experiment

WHAT YOU NEED:

- ☐ Glass of water
- ☐ A couple of large ice cubes
- ☐ Piece of string
- ☐ Table salt

You may have noticed people sprinkling chunks of salt on the sidewalks or roads during the winter to help melt ice. Learn why salt melts ice in this cool experiment.

WHAT YOU DO:

1. Drop a couple of ice cubes into the glass of water.
2. Using only the piece of string, can you pick up one of the ice cubes? (Of course not!)
3. Now lay one end of the string over the ice cubes in the glass of water.
4. Sprinkle a generous amount of salt over the string and ice (some will fall into the water, too).
5. Wait about one minute, then carefully lift up the remaining end of the string and pull it straight up out of the water.
6. The ice cubes should be stuck to the string!

WHAT HAPPENED:

As we discovered in the snow experiment, water freezes and ice and snow melt at 32 degrees Fahrenheit. This is known as the freezing point of water. Salt (scientific name: sodium chloride) lowers the freezing point of water. When that happens, ice will melt at a lower temperature than normal. That's exactly what happened in this experiment.

When you poured salt on top of the ice cubes in the glass of water, they started to melt almost instantly because the salt lowered the freezing point of the ice. In other words, once you added the salt, the glass would have had to get a lot colder to keep the ice frozen since salt makes ice melt at a lower temperature.

Some of the ice around the string started to melt almost immediately. However, after a few minutes, the small amount of salt you added began to be dissolved into the water around the ice, which caused the freezing point on the surface of the ice to go back to normal. When that happened, some of the water re-froze around the ice, freezing the string to it, too!

ICE PAINTING

Experiment

WHAT YOU NEED:

- ☐ empty plastic containers or bowls
- ☐ water
- ☐ rimmed baking sheet
- ☐ table salt
- ☐ medicine dropper
- ☐ washable liquid watercolor paints *(or, you can mix a few drops of food coloring with some water, just be careful as food coloring will stain!)*

Play with salt and ice some more with this pretty project.

WHAT YOU DO:

1. Fill the containers three-quarters full of water and place in the freezer for eight hours or until frozen solid.
2. Remove the ice chunks from the containers and place them flat side down on the baking sheet.
3. Sprinkle salt over the ice chunks. Wait a few minutes and check to see if you notice any changes in your ice. You should start to notice cracks forming in the top and down the sides of the ice.Using salt to melt ice
4. Use a medicine dropper to drip some paint or colored water over the ice. Continue adding colors and, if you like, add more salt to melt the ice even more.Make an ice painting

WHAT HAPPENED:

As we discussed in the previous experiment, table salt lowers the freezing point of water.

In this case, it means the salt makes the ice start to melt almost right away. Adding colors on top of the salted ice allowed you to see the effect salt had on the ice a little better.

Notice how the salt formed cracks and holes down the sides of the ice chunk and made the top part seem a little slushy?

If you'd like, you can add more salt to some of the ice and check back periodically to see which ice melts faster—the one with just a little salt, or the one with more salt.