



My nature connection

FROST IN A CAN

GRADES: 2-5

TIME: 15-20 min

WHERE DOES FROST COME FROM?

As the seasons change from fall to winter and the temperature cools, you may see frost forming in the grass, on your windows, and on the outside of cars. Oftentimes, this happens early in the morning. Do you ever wonder where it comes from?

ACTIVITY

INTRODUCTION

Frost occurs when water freezes onto surfaces and forms small ice crystals. These ice crystals are formed when water in the air comes into contact with a surface that is below freezing (32 degrees Fahrenheit).

Sometimes the water begins in liquid form, often in the form of dew, and freezes onto a surface. This can create a glass-like, clear ice; however, when the water freezes directly from vapor form, it creates the beautiful, tree-like branching patterns that you often see on windows. This is also known as hoar frost.

WHAT YOU'LL NEED:

- Empty tin can
- 2 cups of Ice
- Table salt
- 1 cup of water

STUDENTS WILL:
Learn the science behind the formation of frost and do a hands-on experiment

SETTING
A comfortable space indoors



FROST IN A CAN

You can re-create this wintertime phenomenon inside, no matter what the season!

1. To begin, fill an empty tin can with ice cubes. Make sure the label on the can is torn off and there are no sharp edges around the top!
2. Fill the can about halfway with water.
3. Add a few spoonfuls of salt on top of the ice.
4. Stir the salt into the can until the salt is dispersed.
5. Watch as frost begins to form on the outside of the can. After a few minutes you should see a thin white layer. You can scrape away the frost to make different designs.



WHY DOES IT HAPPEN?

The salt is a key factor in this experiment. Salt lowers the freezing point of water, which is why we sprinkle salt on roads and sidewalks in the winter to prevent them from freezing. If you did this experiment without salt, you would still see moisture start to form on the outside of the can- this is called **condensation**. Since the salt lowers the freezing temperature, the temperature of the can starts to fall below freezing. This causes the condensation to freeze on the surface - turning it to frost!



CONNECTING WITH QUESTIONS

- Would this experiment work without using the salt? Why or why not?
- Why do you think you usually see frost on the ground early in the morning instead of later in the day?
- If frost didn't form on your can, what variables of the experiment (amount of ice, amount of salt, temperature outside the can) could you change?

EDUCATION STANDARDS

Grade 2

2.2.1.2.1 Observe, record, and recognize that water can be a solid or a liquid and can change from one state to another.

Grade 3

3.1.1.2.4 Construct reasonable explanations based on evidence collected from observations or experiments.

Grade 4

4.2.1.2.2 Describe how the states of matter change as a result of heating and cooling.

Grade 5

5.1.1.1.2 Recognize that when scientific investigations are replicated they generally produce the same results, and when results differ significantly, it is important to investigate what may have caused such differences.