

## Sweet Treat!

Grade: 3-4

Time: 20min

### Activity Overview :

Today you will be chemists right at home as you try to make your very own ice cream! You'll be using very basic ingredients to make a sweet treat from scratch. By doing this, you'll investigate the properties as well the interactions between different states of matter.

Before we begin, think about the following questions:

- What state change do you see happening?
- What causes the ice cream to freeze so quick?
- How does the type of milk used in the experiment impact the ice cream?

### Materials:

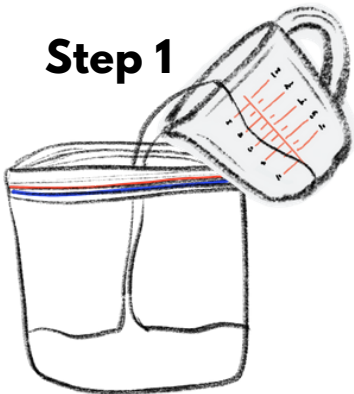
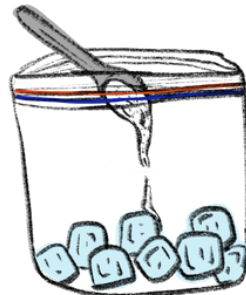
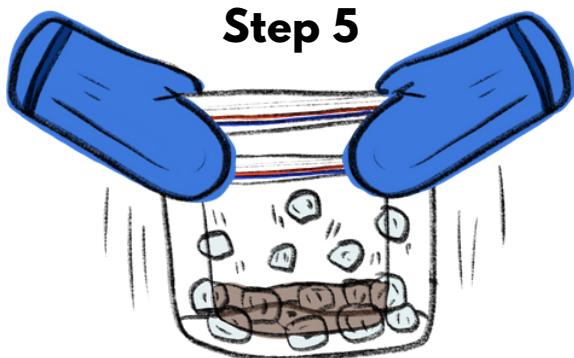
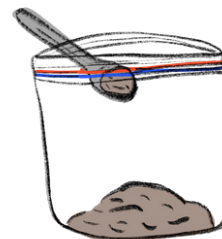
- 1 cup of half and half (you can also use whole milk, as well as almond or soy milk if you have sensitivities)
- 1.5 teaspoon of vanilla
- 1 tablespoon of sugar
- Ice cubes
- 1/4 cup of salt (larger salt crystals have a lower chance of getting into the ice cream when mixing)
- 2 Ziploc bags, 1 large and 1 small
- Oven mitts or gloves
- Measuring cup
- Spoon



**Don't worry if you don't have all these supplies. Experiment with other everyday items and see what you can make!**

## Activity:

- 1 Start by pouring the 1 cup of half and half into the small Ziploc bag.
- 2 Add the 1.5 teaspoon of vanilla and the tablespoon of sugar into the small Ziploc bag as well. Carefully get as much of the air out of the bag and then seal the bag tightly.
- 3 Take the large Ziploc bag now and fill it up halfway with ice. Then add the 1/4 cup of salt into it.
- 4 Place the small Ziploc bag into the large one and then add some more ice on top of it. Seal the bag tightly after removing as much air as you can.
- 5 Put on your oven mitts or gloves and shake the large Ziplock bag for six minutes so your milk mixture solidifies!
- 6 Remove the small Ziploc bag carefully and rinse it under cold water. Make sure you wash the top, by the seal, as well!
- 7 Then open the bag and mix it up with the spoon to soften it up.
- 8 Time to enjoy! You can eat it the way it is or you can add any toppings you like, such as chocolate syrup, caramel sauce or even some fruit, to make your sweet treat more delicious!

**Step 1****Step 2****Step 3****Step 4****Step 5****Step 7**

## Engineering and Science Connections

You saw a [state change](#) occur as the milk, vanilla and sugar mixture started as a liquid and changed to a solid when it froze. As the ice cream melts it would become a liquid again. This is called a [physical change](#) in [chemistry](#), but more specifically a [reversible change](#).

The ice cream solidified quickly due to the [salt and ice mix](#) in the larger Ziploc bag. As many of you know, water freezes at 0 °C to make ice. Ice cream, on the other hand, freezes at a lower temperature than that. So, if we used ice on its own, it would melt before being able to freeze the ice cream. Adding salt helps lower the freezing/melting point, allowing it to freeze the ice cream!

Depending on the type of milk you used for your ice cream, the outcome of your sweet treat could vary. Using something with a higher fat content gives your ice cream a better texture than using something with a lower. This is because when you initially mix the ice cream, the fat content separates throughout and has the ability to hold small air pockets. The air pockets are what give your ice cream a smoother taste.

## Extensions:

[Create wacky flavours](#) with things you have right at home!

[Make two batches of ice cream](#), one as you did before, and make the second one without adding the salt to the ice and see the difference in outcomes.

[Try comparing two different types of milk](#) by making two separate batches and keep everything the same except for the type of milk you use. You might find out that you have a new preference!

## Share your creations!

Don't forget to share your experiments and creations with us! We would love to see what you've made. You can Email us at: [esqinfo@uwaterloo.ca](mailto:esqinfo@uwaterloo.ca) or send us a message/tag us on our social media!

**Facebook:** [@uwengoutreach](#)

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**Thanks for exploring, discovering, and learning with us!**

# 3, 2, 1 Done!

**3 - Write or draw 3 things you learned from this activity**

**2 - Write or draw 2 things you found super interesting or cool and want to learn more about**

**1 - Do you have any questions about the activity? Did something make you wonder...what if? how? or why?**