



## #NCSCONnects Virtual Activity

**Activity:** Instant Ice Cream in a Bag

**Category:** STEAM

**Suggested Grade Level:** All



### Description:

Have you ever made ice cream? There is a lot of interesting chemistry that goes on behind the scenes. Think about how you start with refrigerated (or room-temperature) ingredients and then cool them down. How do the ingredients change during this process? How important do you think it is that they are cooled to a certain temperature? Let's explore the best way to chill the ingredients and turn them into a creamy delicious treat!

### Supplies:

- Measuring cup
- Newspaper
- Spoon
- Tape
- Bowl
- 1 large resealable bag and 2 small resealable bags
- Tray of ice cubes
- Kosher salt
- Sugar
- Vanilla extract
- Half and Half (alternatives: milk, heavy whipping cream)



### Instructions:

1. Add a spoonful of sugar, 80 mL (½ cup) Half and Half, and a dash of vanilla extract to a small bag.



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2. Seal the bag with the ingredients inside and massage the bag to mix.
3. Place the bag into the second small bag and seal it.
4. Add 4 cups of ice cubes to one of the large gallon-sized bags. Then add ½ cup of salt to the bag.
5. Seal the large bag and massage to mix the ice with the salt.
6. Put the small bags filled with ingredients into the large bag and re-seal.
7. Wrap the large bag in newspaper and tape the package closed.
8. Shake the wrapped bag for about 5 minutes.
9. Open the bags and scoop out the ice cream into a bowl.  
Have a taste of your instant ice cream!



**Adaptations:** Try adding more salt or ice. Can you improve the recipe to make the cream freeze more quickly? For a tasty twist, try adding different flavorings, such as chocolate or strawberry syrup instead of vanilla extract.

**Takeaways:** This experiment involves something called “freezing point depression.” Salt (chemical name sodium chloride) lowers the freezing point (temperature) of water. This means that the salt water can remain liquid at temperatures colder than 0 degrees Celsius (32 degrees Fahrenheit).

When you are making ice cream (whether in a bag or an ice cream machine), the cold salty water surrounding the cream and sugar allows the cream to transfer its heat and freeze quickly to form ice cream. This is the same process that goes on when icy roads have salt spread on them to melt ice or prevent it from forming. While pure water freezes at 0 degrees Celsius (32 degrees Fahrenheit), water mixed with salt will freeze below 0 degrees Celsius.

**References:** For video instructions go to YouTube.com and search “Making ice cream in a bag.”



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