

# Homemade Ice Cream

## STEAM Experiment for Kids



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### Materials Needed:

- 1 Gallon size Ziplock freezer bag
- 1 Quart size Ziplock freezer bag
- 1/2 Cup half-and-half or whole milk
- 1 Tbs sugar
- 1 tsp vanilla extract
- 1/2 Cup salt (rock salt makes smoother ice cream)
- Ice (about 8-10 cups)
- Towel and/or gloves (optional, but recommended)

**Note:** It's worth buying the brand-name Ziplock freezer bags for use in the experiment. They are stronger and more durable to hold up to the tossing and shaking involved to make the ice cream. I recommend double-bagging both the bags, because if the inner bag leaks, the ice cream is ruined (we've learned from experience!).

### Procedure:

1. Take out all your ingredients. Ask your child to form a hypothesis about this experiment. What will happen when we place these ingredients in a bag and shake it?
2. Add the half-and-half, sugar and vanilla (and any other flavors you like in your ice cream) to the quart size freezer bag, and tightly seal it.
3. Put the ice and salt inside the gallon size freezer bag. We were counting the cups of ice as we added them to fill our gallon size bag.
4. Place the filled smaller bag inside the larger bag, and tightly seal the larger bag.
5. Vigorously shake and toss the bags for about 10 minutes, or until the ice cream is frozen.
6. Remember, the bags have to be constantly moving the whole time for best results! We enjoyed tossing it around to each other, shaking it to the beat of music, and dancing with it. Toss it, but don't drop it or the bag will break, leak and ruin the ice cream.
7. Open the large bag and remove the smaller bag. Dry the small bag (making sure to wipe off all salt, especially around the top so none gets into the ice cream)
8. Open the smaller bag and observe and discuss the change that happened to the ice cream.
9. It's frozen! Grab some spoons, dig in and enjoy your homemade ice cream!

### What Happened?

The liquid half-and-half mixture changed state from liquid to solid, meanwhile the ice changed state from solid to liquid. Heat transfer occurred between the two substances – the ice melted because it absorbed energy from the cream mixture, turning the cream mixture into frozen ice cream.

You should have noticed that the volume of the ice cream is now close to 1 cup. The volume increased from 1/2 cup cream to 1 cup ice cream due to air bubbles being added as we tossed the bags around, and due to the ice crystals expanding as they formed in the ice cream.

We added salt to decrease the temperature at which the ice melts. The more salt you add, the faster the ice cream will freeze. But be careful, because if ice cream freezes too fast it is grainy. If it freezes too slow it will be soft.

**More information** - <https://www.engineeringemily.com/homemade-ice-cream-in-a-bag-steam-experiment-for-kids/>

**\*\*YOUTUBE VIDEO for a delicious recipe:** <https://www.youtube.com/watch?v=N4ztYjFwxmI>