Make Ice Cream in a Plastic Bag

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Yes, it sounds dangerous and the potential for messes seems highly likely, but you'll be surprised at the good, "clean" fun you'll enjoy with your students when you make ice cream. The key to success is to plan smart and follow our simple instructions. The lesson possibilities for this one are nearly endless. Your class can explore the history of ice cream and dairy products, the chemistry of ice, salt and exothermic reactions, or use it an exercise in the scientific method: what if you make the following recipe without salt?

This recipe is enough for one student, so that each student can make their own.

1/2 cup milk
1/2 teaspoon vanilla
1 tablespoon sugar
4 cups crushed ice
4 tablespoons salt
2 quart size Zip-loc bags
1 gallon size Zip-loc freezer bag
a hand towel or gloves to keep fingers from freezing as well!

Mix the milk, vanilla and sugar together in one of the quart size bags. Seal tightly, allowing as little air to remain in the bag as possible. Too much air left inside may force the bag open during shaking. Place this bag inside the other quart size bag, again leaving as little air inside as possible and sealing well. By double-bagging, the risk of salt and ice leaking into the ice cream is minimized. Put the two bags inside the gallon size bag and fill the bag with ice, then sprinkle salt on top. Again let all the air escape and seal the bag. Wrap the bag in the towel or put your gloves on, and shake and massage the bag, making sure the ice surrounds the cream mixture. Five to eight minutes is adequate time for the mixture to freeze into ice cream.

Tips
Freezer bags work best because they are thicker and less likely to develop small holes, allowing the bags to leak. You can get away with using regular Zip-loc bags for the smaller quart sizes, because you are double-bagging. Especially if you plan to do this indoors, we strongly recommend using gallon size freezer bags.

Coffee Can Ice Cream
An alternative to the baggie method is to use coffee cans. The recipe is the same, and may be doubled or tripled because the coffee can can hold more liquid than the baggies. Put the mixture in a standard size coffee can and seal with the plastic lid, then place that can inside a larger "economy size" can (usually available from the teachers' lounge or office). Pack the large can with ice and salt, and seal with the lid. Students can roll the can back and forth on the ground (outside – the condensation will drip) until the ice cream is set. The time required to set the mixture will vary depending on the number of servings in the can.

What does the salt do?
Just like we use salt on icy roads in the winter, salt mixed with ice in this case also causes the ice to melt. When salt comes into contact with ice, the freezing point of the ice is lowered. Water will normally freeze at 32 degrees F. A 10% salt solution freezes at 20 degrees F, and a 20% solution freezes at 2 degrees F. By lowering the temperature at which ice is frozen, we are able to create an environment in which the milk mixture can freeze at a temperature below 32 degrees F into ice cream.

Who invented ice cream?
Legend has it that the Roman emperor, Nero, discovered ice cream. Runners brought snow from the mountains to make the first ice cream. In 1846, Nancy Johnson invented the hand-cranked ice cream churn and ice cream surged in popularity. Then, in 1904, ice cream cones were invented at the St. Louis World Exposition. An ice cream vendor ran out of dishes and improvised by rolling up some waffles to make cones.

Brain "Freezer"
A group of children went to Holman's Dairy to buy ice cream cones. Each child bought a double scoop cone with two flavors of ice cream. None of the children chose the same combination of flavors. Holman's Dairy has nine different flavors of ice cream: Vanilla, Maple, Chocolate, Toffee, Raspberry, Strawberry, Jamocha, Nutcracker, and Almond. How many children are there?

Source: https://teachnet.com/lessonplans/science/plastic-bag-ice-cream-recipe/