



Ice Cream in a Bag



Next Generation Science Standards: Matter and its Interactions: 2-PS1-1; 2-PS1-4

Ice cream freezes at -6 degrees C (21 degrees F). Ice cream can be made in the classroom with the understanding that the freezing point of water is actually lowered by adding salt to the ice between the bag walls. Heat energy is transferred easily from the milk through the plastic bag to the salty ice water causing the ice to melt. As it does so, the water in the milk freezes, resulting in ice cream.

Materials

Makes about 3 cups (1 bag will serve approximately 4 students)

- 1 cup of your chosen dairy product
- 1/4 cup sugar
- 1/2 teaspoon vanilla extract
- Duct tape (or another strong tape like packing tape)
- Bath or hand towel
- Crushed ice (1 bag of ice will freeze 3 bags of ice cream)
- 1 cup rock salt (approximately 8 cups per 5 lbs.)
- 1 quart and 1 gallon size Ziploc freezer bags (Ziplocs are usually stronger & work best)
- Timer (clock, stopwatch, etc)

Directions

1. Put the dairy product, sugar, and vanilla in a 1-quart freezer bag and seal. For security, fold a piece of duct tape over the seal. (These ingredients may be pre-combined in a larger quantity by the teacher and poured into student bags.)
2. Place the bag with the ingredients inside a gallon freezer bag.
3. Pack the larger bag with crushed ice around the smaller bag.
4. Pour $\frac{3}{4}$ to 1 cup of salt evenly over the ice.
5. Wrap in a bath towel. Start your timer and shake. After 10 minutes, open the outer bag and remove the inner bag with the ingredients. Wipe off the bag to be sure salt water doesn't get into the ice cream.
6. Cut the top off and spoon into cups to observe.