

A STEM in the Park

Take Home Activity

STEM

in the **PARK**™

Science, Technology, Engineering, and Mathematics

Ice Cream Science – At Home

What You Need

- 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
- Gloves or mittens to keep fingers from getting too cold
- A kitchen timer



What To Do

1. 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.
2. Double-bag by placing this bag inside the other quart size bag. Remove the air and seal it well.
3. Put the two bags inside the gallon size bag and fill the bag with ice, then sprinkle salt around it. Let all the air escape and seal the bag.
4. Put on your gloves and shake and massage the bag until the mixtures thickens into ice cream.

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Observe

Get a timer and see how long it takes your ice cream to thicken and harden.

Learn

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.

For more on the history of ice cream visit:

<http://magma.nationalgeographic.com/ngexplorer/0304/articles/mainarticle.html>

Investigate

What would happen if you used different amounts of salt or rock salt ? How about different thicknesses, types or different amounts of milk or cream (whipping cream, low fat milk, skim, etc)? Would your time to turn the ingredients into ice cream be greater or less? Choose a variable to test and investigate further.

This activity is brought to you by the BGSU Chemistry Department