

ICE CREAM SPECIAL

GOAL

Kids realize the benefits of an engineered environment.

GRADE LEVEL

Elementary

IMPORTANT: Before planning this activity for a classroom, ask if the school permits food to be brought in and if there are special restrictions.

MATERIALS

(per group of 3-4)

Quart-sized zip top plastic bag
Gallon-sized zip top plastic bag

Ice cubes

Salt

½ c. half & half

½ c. whipping cream

3 ½ T. sugar

¼ t. vanilla (optional)

Rubber spatula, mixing spoons, plastic spoons, small cups

DISCUSSION

When ice starts to melt, it is 32 degrees. This is not cold enough to freeze ice cream. Adding salt actually pushes the temperature of melting ice down below 10 degrees Fahrenheit (F). Heat flows from the ice cream ingredients to the melting ice. The melting ice warms up while the ice cream becomes cold enough to freeze. Shaking the bag does two things. It brings warmer ingredients in the middle into contact with the cold outside and speeds up the freezing process. It also makes the liquid ingredients mix with air. The air makes the ice cream soft and light—enabling this to be soft enough to eat with a spoon even though it is frozen!

ACTIVITY

TIP: keep towels or paper towels handy.

Step 1

Divide class into groups of 3-4. Help children measure the ingredients (you might need to pour liquid for the youngest kids.) Have children place half & half, whipping cream, sugar, and vanilla, in the smaller bag. Zip bag and place inside the larger one.

Step 2

Pack ice inside larger bag around the smaller one. Pour at least ¼ cup of table salt evenly over ice. Seal large bag.



Step 3

Now the fun begins! Kids take turns to manipulate and shake their bag. (Use gloves or wrap towel around outer bag. It gets very cold!) Check consistency of ice cream. If, after 15 minutes of shaking, it is not yet a solid, drain excess water from larger bag and add more ice and salt. Shake for a few more minutes. Remove ice cream bag from the larger one and quickly rinse with cold water before opening. (This removes the salt.) Divide ice cream into cups and enjoy!!

QUESTIONS TO ASK

After placing liquids in the smaller bag...Is this ice cream yet? What do we need to make it ice cream? Why? Before shaking the bags...What do you think will happen to the white liquid? Why? When shaking...What is happening to the liquid? When eating...How does this taste? Would you like to make your own ice cream every time you want some?

FURTHER EXPLORATION

Try making ice cream without adding salt to the ice. How does this affect the process? You could also have one group do the activity as a “control” group without using salt – although be sure to have a batch of ice cream in reserve so this group can join in the tasting later!



CONNECT TO ENGINEERING

Before engineers invented machines to stir the ice cream mixture, making this treat was an expensive, labor-intensive local effort. With the advent of refrigeration techniques, especially the continuous process freezer in the 1920's, large scale manufacturing and transport of ice cream became possible. Engineers design machines that make tasty—and sometimes far-out—ice cream flavors possible, mixing and swirling flavors and the right amounts of candy and filling into each container.

The American Society of Heating, Refrigerating and Air-Conditioning Engineers, Chair of Engineers Week 2011, helps keep indoor environments comfortable, preserve the outdoor environment, and deliver healthy food to consumers.

