Full STEAM ahead with 4-H!

Food and nutrition

Learn the science behind ice cream.

Background

Have you ever thought about how ice cream is made? While it is a common grocery item that can be found in freezers across the world, you may not have thought about the science that goes into making a delicious bowl of ice cream. In this lesson you will explore what science needs to happen for your list of ingredients to become a tasty treat.

The science of ice cream

Supplies

- 1 tablespoon sugar
- ½ cup milk (2% or whole)
- ¼ teaspoon vanilla extract
- 6 tablespoons rock salt
- 1 pint-sized zip top bag
- Large plastic container with lid
- Ice cubes
- Duct tape
- Plastic cups
- Spoon

Directions

- Fill the large plastic container half full of ice. Add the rock salt.
- Put the milk in the zip top bag. Then add the vanilla and sugar.
- Seal the bag and put duct tape on the opening of the bag to make sure there are no leaks.
- Place the bag in the large plastic container and close the lid.
- Shake the container for about 5 minutes or until the mixture becomes solid.
- When the ice cream is done, wipe off the outside of the bag, open it, and enjoy!

Reflect:

- When the ice cream making is complete, record your observations of what happened while making the ice cream.
- Why was salt added to the ice?
- Would the mixture turn to ice cream if you just let it sit and did not shake it?
- What ingredients could you add to change the flavor of the ice cream?
- How would the ice cream change if you left out one of the ingredients?
- What has ice cream making taught you about physical changes of state (ex. liquid to solid)

Apply

- When ice absorbs energy to melt, it changes the water from a solid to a liquid. The ice that was used to cool the ingredients for ice cream did just that. Your hands along with outside environmental factors caused the ice to turn to water and the ingredients to begin to turn from liquid to solid. When salt is added, it makes the ice colder than it would be otherwise, which is how the ice cream freezes to a solid.

Want to extend your learning? Try out these ideas!

- For more project ideas or information about the food and nutrition projects visit, https://extension.umn.edu/projects-and-more/4-h-food-nutrition-project

Source:

- Adapted from Utah State University Extension's Discover Curriculum: *Discover 4-H Kitchen Science Clubs: Homemade Ice Cream*