

WE ALL SCREAM FOR ICE CREAM

TRADE LINK: COOK/CHEF

RATIONALE

At this level, students explore properties of fluids and use the particle theory to explain their observations. They also learn about chemical reactions and try to relate them to their own experiences. Cooks take advantage of this knowledge in their preparation of foods. Kitchen chemistry can involve a range of scientific principles from the simplest to the most complex.

METHOD

In this activity, you will cool down milk, sugar and vanilla by putting the solution in a test tube and placing it in a container filled with an ice and salt mixture. It will cool down enough to freeze. In essence, the salt and ice takes heat away from the milk solution.

MATERIALS

1. Soup can, coffee can or small metal container.
2. A test tube or baby food jar.
3. 10ml of salt.
4. Crushed ice.
5. Celsius thermometer.
6. 15 ml homo milk (or half and half cream).
7. Pinch of sugar.
8. Vanilla.
9. Swizzle stick, popsicle stick or thin stick (for stirring), about 15cm long.

GETTING STARTED

Chemical reactions have become a part of our everyday life. They are all around us. You may have learned how we can affect the properties of some objects by adding new substances to them. In some places, in the wintertime, people add salt to roads to lower the freezing point of water. This helps to keep roads free of snow and ice. In this activity, you will take advantage of this scientific principle and get a "tasty" result.

The activity 1 is based on a resource called "Making Connections: Linking Science and Math with Trades and Occupations," developed by the NWT Apprenticeship and Occupational Certification.

THE ACTIVITY

1. Put crushed ice in the metal container so that it is about 1/2 full.
2. Add 10 ml of salt to the ice and stir until the temperature is between -8 degrees Celsius and -10 degrees Celsius.
3. If the temperature is not low enough, add more salt and keep stirring.
4. Put 15 ml of milk (or half and half), a pinch of sugar and one drop of vanilla into a CLEAN test tube (or baby food jar).

TEACHER BACKGROUND

Duration: one (1) 45 minute class.
Group Size: small groups of 4 students (or smaller if you have sufficient supplies).
Setting: indoors (classroom).

5. Place the test tube in the metal container and pack the ice around it.
6. Stir your mixture for the next 15 to 20 minutes until your ice cream is ready to eat.
7. Describe all the reactions (physical and chemical) which took place during this experiment.

BRANCHING OUT (EXTENSIONS AND VARIATIONS)

1. Challenge students to lift an ice cube floating in water out of a container without touching it. All they are allowed to use is a string and some salt. (Solution: salt lowers the freezing point of water, so when you put salt on the string and touch it to the ice, the ice cube under the string melts a little. As the ice melts, the air around it cools and causes the ice cube to refreeze and the string becomes frozen to the ice cube.)
2. Invite a cook to come into the classroom and talk about chemical reactions and food chemistry.

SKILLS FOR SUCCESS

Line Cooks read recipes and use them to prepare food consistently. Look at the materials used in this activity:

1. What kind of liquid can be used instead of 3% milk? (Problem Solving)
2. What is the first step of this activity? (Reading)
3. What ingredients are mixed with the milk? (Reading)

INFORMATION BITE

During your training as a cook, you will not only learn about kitchen safety and basic cooking principles, you will also learn advanced preparation technique for both small and large situations. A strong background in classification systems will assist you in learning about various types of foods such as sauces, stocks, soups, salads, fish, dairy products and cheeses, baked goods and desserts. Cooks are employed in hotels, restaurants, catering firms, cafeterias, institutions and isolated camps. Kitchen mathematics includes ratios (estimation math), recipe conversions (calculation math), fractions, decimals, and working with invoices and orders (budgeting math).

