

UNIVERSITY OF MINNESOTA

K-12 Education

Ice Cream in a Bag

Adapted by

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Objective: To help students understand economic resources, production, and interdependence. To help students understand science and the history of ice cream making. Students will also observe a liquid becoming a solid, measure temperature, and see the effects of salt on the temperature of the ice.

Introduction: Read the book “How to Make an Apple Pie and See the World” by Marjorie Priceman (ISBN 0-679-88083-6). Locate all the different places in the world that the young lady finds the ingredients she needs to make her pie. Discuss how many of those ingredients she could have actually located in Minnesota. The commodity cards from MN Ag in the Classroom will be helpful in talking about local commodities. As the book ends the author says, “Remember that apple pie is delicious with vanilla ice cream, which you can get at the market. But if the market happens to be closed...” Even though the book suggests that you could eat it plain, this lesson will proceed as though she will need to get the ingredients to make ice cream as well. The students will learn about the ingredients in ice cream, where those ingredients come from, and then finally how to make ice cream themselves.

Input and Activities: Look at the ingredients that are used to make ice cream. Research the origin of these ingredients, perhaps discuss the transportation systems that are part of the distribution system for these ingredients, and talk about the nearest place in their community that ice cream is produced. Perhaps you can have a guest speaker come into the classroom to talk about the production of ice cream from a nearby production facility. If a resource person cannot come in, then the students might write letters or call a production facility to find out where they get the ingredients for making their brand of ice cream. After the students have had time to look at the ingredients in ice cream, and the process etc. have them make their own ice cream. Follow this recipe:

Ingredients:

½ cup milk or cream (cream works best)	Ice
2 tablespoons sugar	1 large zip-lock bag
1 teaspoon vanilla	1 sandwich zip-lock bag
6 tablespoons salt	

Procedure:

1. Add milk, sugar, and vanilla to the sandwich bag and seal. Mix well.
2. Fill the large zip-lock bag with ice. (2/3 of the bag should be filled with ice.)
3. Add approximately 4 handfuls of rock salt to the ice in the large bag.
4. Place the sandwich bag containing the milk, sugar, and vanilla in the ice water solution. (Make sure the sandwich bag is surrounded by solution.)
5. Close the large bag and shake.

You should have ice cream in 20 minutes!!!

Closure: Have a follow-up discussion about the fact that many of our favorite foods are made up of many ingredients that might come from Minnesota, from other states or from other countries. The words imports and exports can be introduced through this lesson with a basic discussion of interdependence among nations. Many of the Ag in the Classroom materials can help with these discussions especially when discussing Minnesota commodities. Many other activities can spin off of this lesson, such as bringing in a favorite food and locating where all the ingredients might have come from, or look at school lunch and talk about the origin of the food items in the lunch, or have the students write their own books titled “How to Make Vanilla Ice Cream and See the World” or whatever food they choose. See other extension ideas.

Extension Ideas: Have students weigh and measure out in cups the milk used in the activity. Record the amount of time needed to change the milk to ice cream. Have students record the temperature of ice. Take a second measurement of the salt and ice combined. How does salt affect the freezing point of water? Before the activity, have students estimate the amount of milk needed for the experiment. Then calculate actual amount needed. Calculate cost for milk used by class. Discuss the relationship of cows and humans in food chain. Discuss the life cycle of a cow. When during her life does she produce milk? Review the concept of change of state. Discuss the effect of refrigeration on the transportation of dairy products. Review with class how specialization has affected our community. Discuss the change from a rural to urban society. Does everyone have to produce his or her own ice cream today? Have students research the history of ice cream and present to the class. Discuss the benefits of the invention of the milking machine and how it has increased productivity. Read other books about cows, cheese production, etc. Look at the curriculum from Montgomery County Public Schools, Rockville, Maryland that goes along with the book by Marjorie Priceman. It can be located on the internet at their web site: http://www.mcps.k12.md.us/curriculum/socialstd/grade2/How_Make.html

Materials:

“How to Make an Apple Pie and See the World” by Marjorie Priceman (ISBN 0-679-88083-6)	Sugar
MN Ag in the Classroom Commodity Cards and Minnesota Ag Profiles	Vanilla
Milk or cream	Rock salt
	Ice
	Large zip-lock bag
	Sandwich zip-lock bag

Partnering:

- University of Minnesota
- College of Agricultural, Food and Environmental Sciences
- Research and Outreach Centers*
- Minnesota Ag Education Leadership Council
- Extension Service
- Minnesota Ag in the Classroom
- Minnesota Pork Board
- Minnesota Soybean Research and Promotion Council
- Midwest Dairy Association
- Martin County Corn and Soybean Growers
- Redwood Area Schools

*Centered at Southwest Research and Outreach Center