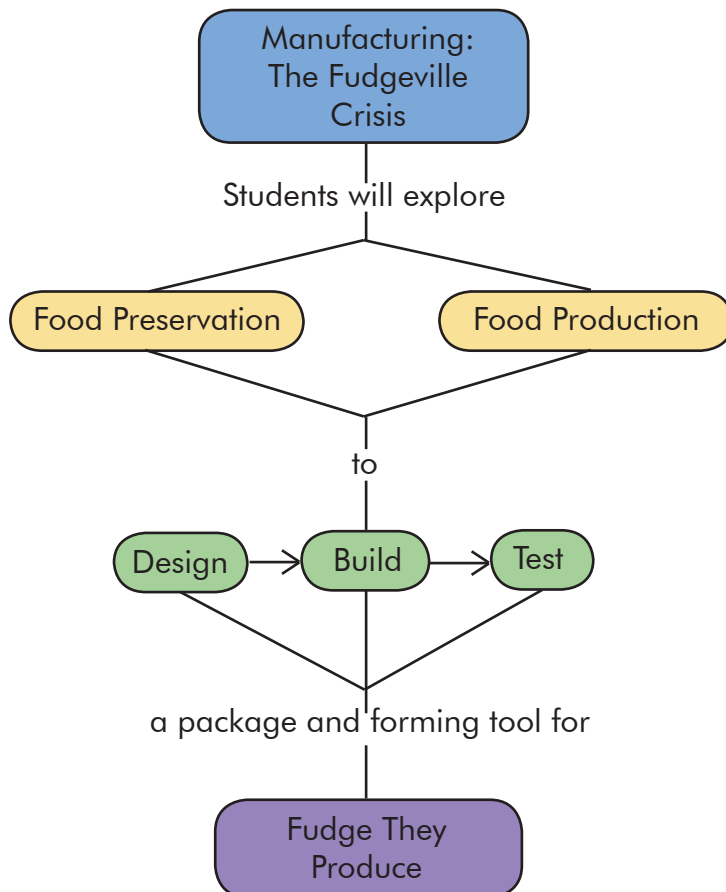


Manufacturing: The Fudgeville Crisis

This unit integrates the study of technology, science, and mathematics through the study of food processing, packaging, and forming.



Conducting the Units

There are seven main topics in this unit. Each topic varies in length and scope depending on the schedule and length of the teaching time.

Notes:

Topic 1: Food Tales (1.5–2 hours)

1. Before beginning the lesson, copy page 29.
2. Cut the paper so that each item is on one small piece of paper, fold each piece, and put in a hat.
Note: Additional items can be used if you have a demographic or special interest. See *Teacher Resources* (page 15) for websites with additional ideas or if your classroom has space, create a “General Food Store” with empty food packages on shelves and ask students to choose a package.
3. Discuss the ways food has been processed, preserved, and packaged over the years to increase shelf life and decrease the time in which it spoils. (See Transparency #2, page 35) Explain the difference between chemical additives and processes (canning, freezing, drying) used to preserve food.
4. Ask the students to find a partner or use your own system to identify partners.
5. After each student is paired up with a classmate, ask each team to choose one of the folded papers out of the hat you prepared before the lesson.
6. After each team of students has chosen a card, ask the groups to research and answer the following questions about their product.
 - ✓ Who or what culture invented it? When it was first invented?
 - ✓ How has it changed from when it was first produced to now? Are additives used to keep it from spoiling?
 - ✓ Is it packaged differently to ensure quality control?
 - ✓ What other products have come out of this product?
 - ✓ How may it change in the future?Note: You may want to discuss different places that students could find the information. For example, print on the board the recommended food websites in the *Teacher Resources* or ask the librarian to collect all the books she/he has on food or food history.
7. After the team has answered the above questions, have the students arrange and present the information on the poster board (printed or typed). Encourage students to include any graphics that would aid in showing the difference between past and present of the product.
8. Transform a corner of the classroom into a Grocery Store or the hallway outside the classroom.
9. Display the project so that all the students can see how technology (whether it was the way food was made or the additives) over time has influenced the way food is manufactured.



The Fudgeville Crisis

Design Challenge

Design a way to combine and process materials to make fudge that is then formed into equal pieces.

Your team has been asked by the mayor to:

- ▶ Design and create a poster that illustrates the guidelines each employee is to follow in order to ensure the fudge is not contaminated.
- ▶ Design a way to form the fudge into equal pieces.
- ▶ Design a germ-free production line to mass-produce fudge into equal-sized pieces.
- ▶ Make fudge using a production line and method or device.

Design Constraints

While food is being processed it cannot be directly handled with human hands.

Activity Information

Have you ever wondered if there is a city where nothing but candy is made? Fudgeville, is like that candy city most kids dream about! Imagine living in a place known for making the creamiest, sweetest, and best-tasting fudge in the country! Fudgeville is so well known for its fudge that every year there is a Fudge Festival.

This year is the Fudge Festival's 50th anniversary and many of the fudge companies in town have increased the amount of fudge made in order to prepare for the special occasion. But production may be brought to a halt when a Fudgeville resident who was visiting in a neighboring town heard that a food inspector is traveling from town to town inspecting the cleanliness of factories! The Fudgeville resident told the town mayor that two companies were shut down in Cocatown. For fear of not having enough fudge for the Fudge Festival, the mayor invited all the fudge companies to an emergency town council meeting. The Mayor addresses the company:

"Hear ye, hear ye let it be known, it's up to each of you to save Fudgeville! The secret is out; the food inspector is coming to our town! I ask that each company here makes sure that it has a germ-free production line, its pieces are equal size, and its packaging keeps the fudge fresh. If the food inspector shuts down one of your companies before the Fudge Festival, there will not be enough fudge. The fate of the Fudge Festival is up to you."

Your team will be assessed on:

- ✓ How well you followed the company's guidelines on how to keep the fudge from becoming contaminated.
- ✓ How the company was able to successfully form the fudge into equal pieces.
- ✓ How efficient the production line was in producing the fudge.
- ✓ Whether the quality of the fudge is high enough to be included in the fudge festival.





The Circle of Freshness: Identify the Challenge

Design Challenge: Design a package that can keep a standard-sized marshmallow fresh for at least five days compared with a standard-sized marshmallow exposed to the air for five days.

What is the the problem? Rewrite it in your own words.

What constraints must you work within?

1.

2.

3.

4.

What materials are available for making the package?

What tools are available for making the package?
