

4-5 Experimenting with Food Storage

In Task 4-4 the team learned that it is important to keep some foods at certain temperatures. Ensuring food stays at the proper temperature can keep it safe to eat. The team explored different materials to see which ones may help in storing these foods at different temperatures. With an understanding of different ways to store food, the team can now think about other problems people may encounter when trying to store or transport cold and hot food from the food access point back to their homes.


Objective



In this task, the team will experiment with designs for a device to keep food cool. The team will be given real-world scenarios where you can offer your help by designing a cooler that would be most beneficial in the given situation. Note that some scenarios may need different designs than others, based on how the person in the scenario accesses the food.

In this task, the team will be focusing on the following questions from the question map:

• What are challenges to accessing and storing food in the local community?

1. Go to the Task 4-5 folder and get the Experimenting with Food Storage activity sheets. There is only one version of this task, but it contains several scenarios to choose from. Select the one that works best for you, and use any materials you can access in your community in the design process. Have the team think about creative ways to reuse materials that are easily available. 
2. Complete the activity according to the instructions in the task folder.
3. After completing the activity, discuss how different methods of storing food can be useful when thinking about the problem question, **How do we ensure good nutrition for all?**

Hooray! You completed Task 4-5. Check it off the task list. *Go to Task 4-6!*





Task 4-5. Experimenting with Food Storage

1. Divide the team into groups. Each group can either choose one scenario to work on, or consider each scenario in turn.

Scenario 1: Jackie uses a bicycle to get to her favorite food access point in their city. It's the cheapest and offers the best produce. It's seven miles away from her third floor apartment. She can use a bike path for most of the route, but in some areas she has to ride on the sidewalk. She needs to be able to keep her cold food cold on her ride from the food access point back to her apartment in the summer, when the average temperature is 90°F. How would you design a cooler to help Jackie?

Scenario 2: Isla has to walk to the nearest food access point from her small village. It's a 10-mile walk from the village. The path is mostly dirt, with some pavement in places closer to the access point. It's an average of 69°F during the warmer months and 62°F in the colder months. She needs to be able to keep her cold food cold on her walk back to the village from the food access point. How would you design a cooler to help Isla?

Scenario 3: Oliver lives on a ranch in a very remote part of his country. His nearest food access point with all of the essentials to stock up on is about a two-and-a-half-hour drive away. Oliver has a small truck he takes to the food access point every two months to stock up on food and supplies. He needs to keep his cold food cold on his long drive back to his ranch from the food access point. How would you design a cooler to help Oliver?

Bonus Scenario: In the remote parts of some countries, water can take hours, sometimes even full days to retrieve and bring back to people's homes or communities. How could you design a container to make transporting water easier?

2. Each team will draw the design for a container, device, or method to address the scenario. Label all materials, dimensions, and features (wheels, a specific type of lid, shoulder straps, etc.), and explain why each material and feature was chosen.

Optional: Have each group pick a single scenario and actually build a prototype of a container or device based on their drawn design and test it. You can use the Grading Rubric for Prototypes sheet to rate the team's designs.

3. Before the teams start designing, either:

- Discuss factors to consider that may be different for each scenario as a entire class.
- Discuss factors to consider among each team, and then discuss again with the entire class after the designs are presented.



Things to consider in the design (depending on each scenario):

- **Durability:** Is it going to fall apart on rough terrain or melt in the heat? Is the lid going to fall off? Will it need to be handled a specific way?
- **Mobility:** If someone is walking and holding it, pulling it, pushing it or carrying it on their back or shoulders, would they be able to carry it? Is it too heavy? Does it need wheels or a strap?
- **Ease of use:** How long does it take to secure the lid? Does it require multiple people to use it?

4. Compare and contrast each team's design, depending on the scenario they selected.

5. Now it's time to think about your own community. Is there any scenario you notice in your own community that you could design something new for? Older people? Moms with multiple kids?

Bonus: Is there a better system you could design to help people in your community store and access food?

Design Sheet

Draw your design below. Don't forget to label the materials used in your design.



Grading Rubric for Prototypes

Groups	Temperature	Weight	Durability	Mobility	Ease of use	Total points
1						
2						
3						
4						
5						

General Rubric

Temperature—Cold

At 40°F = +5 points

1° to 5° below 40°F = +2 points

5° above 40°F = 0 points

10° above 40°F = -2 points

15° or more above 40°F = -5 points

Temperature—Hot

At 140°F = +5 points

1° to 5° above 140°F = +2 points

5° below 140°F = 0 points

10° below 140°F = -2 points

15° or more below 140°F = -5 points

Weight

At 10 pounds = +2 points

Above 10 pounds = 0 points

Below 10 pounds = +5 points

Durability

Did anything fall apart when transporting goods?

Yes = -5 points

No = +5 points

Mobility

How easy and comfortable is it to move the prototype a long distance?

Very easy = +5

Easy = +2



Somewhat easy = 0

Somewhat hard = -2

Very Hard = -5

Ease of Use

How long does it take to pack everything into the cooler and secure it?

Less than 5 minutes = +5 points

More than 5 minutes = 0 points