

4-4

Thinking About Food Storage

In Tasks 4-1, 4-2, and 4-3 the team identified and mapped food access points. Depending on the area you mapped, you may have noticed that some food access points are far away from areas where people live and not everyone has the same ways of getting to them. In some places people have to walk or drive long distances to access food. Some of the food they may want to access needs to be kept at a certain temperature so it remains safe to eat. If these foods are left out too long at a higher or lower temperature, they may start to form bacteria. This can lead to people getting sick. For people who have to commute far, especially in hotter climates, it is important that they have a way to store this food to keep it as close to the safe temperature as possible during transport and while storing it.

Objective



In this task, the team will explore different types of insulation that may aid in keeping food at a certain temperature over a specific length of time. Many countries' food safety guidelines suggest that refrigerated foods should not be left out at room temperature for longer than two hours, and when the temperature is above 32°C (90°F) it should not be left out for longer than one hour. To avoid the "danger zone" when food can grow dangerous levels of bacteria, the safest temperature for cold food is around 5°C (41°F) or below, and for hot food it is around 60°C (140°F) or above. Keep this in mind during this task.

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

- **What different food storage techniques are used locally and globally?**



1. Go to the Task 4-4 folder and get the Thinking About Food Storage experiment instructions. There is only one version of this task, but the materials can easily be adjusted, so use what you have available.
2. Complete the activity according to the instructions in the task folder.
3. After completing the activity, discuss how the use of different materials for food storage can be useful when thinking about the problem question, **How do we ensure good nutrition for all?**





Task 4-4. Thinking About Food Storage

In this task, the team is going to help Sasha. Sasha needs some help deciding what materials to use to keep his food cold. Sasha doesn't have a bicycle or a car and has to walk 5 kilometers, partly down a dirt road and partly on a sidewalk, to get to the nearest food access point. The temperature lately, because it is late summer, has been above 90°F. It takes Sasha about an hour and a half to walk to and from the food access point. What material would you suggest Sasha should use to keep his food cold?

What you'll need:

- Safety thermometers
- 1 plastic cup
- 1 Styrofoam cup
- 1 paper cup
- 1 glass cup
- 1 ceramic cup

Optional: cotton balls, aluminum foil, wool, coffee cup sleeves, cup lids or plastic wrap and rubber bands to make a lid, extra bigger plastic cups, ice, a blow dryer or heat lamp

1. Hand out a copy of the Testing Temperatures Record Sheet to each team.
2. Each team should get one thermometer and one of each type of cup.
3. Fill each cup up with cold water. (Preferably at 40°F or below—use ice or a refrigerator/freezer if necessary. If you use ice, you can also visually see how quickly it melts in some of the cups.)
4. Have students take an initial temperature reading and record the temperature for each cup on their Testing Temperatures Record Sheet.
5. Continue taking the temperature at regular intervals (every X number of minutes), recording the time and temperature on the Testing Temperatures Record Sheet until you have at least three readings.
 - Feel free to do more readings if you have more time.
 - Feel free to use ice or heat to speed up the process.
 - Remember to tell students to leave the thermometer in the cup long enough to get an accurate reading.
6. While teams are testing and recording their water temperatures, discuss the different types of insulators. For this activity teams used plastic, Styrofoam (polystyrene), paper, glass, and ceramics. Other insulators include wool, aluminum foil, cotton, and even air. While Sasha is trying to keep his food cold, discuss how these insulators can also keep food hot.
 - What if we placed a lid on the cups?
 - What if we put a sleeve on the cups made of a different material?
 - What if we placed the cups in a larger cup with cotton, wool, air, or aluminum foil between them?

Discussing heat: [Bill Nye discusses Heat Video \(1:56\)](#)

If you have time, you can run the same experiment using lids, cotton, wool, air, and aluminum foil.



7. Take the temperatures and times recorded on the Testing Temperatures Record Sheet and graph them on the Testing Temperatures Graphing Sheet.
8. Compare and contrast your results and decide which material you would suggest Sasha use, and explain why.

Testing Temperatures Record Sheet

Group name(s) _____ Date _____

Material	Time ----- Temperature			
	Plastic	-----	-----	-----
Paper	-----	-----	-----	-----
Glass	-----	-----	-----	-----
Styrofoam	-----	-----	-----	-----
Ceramic	-----	-----	-----	-----

Testing Temperatures Graphing Sheet

Group name(s) _____ Date _____

*Place your temperature on the Y axis and your time on the X axis and graph your data below.
Remember to make a color-coded key to show which material is being graphed.*

