Is It Okay to Use Your Lunch Box as a Bowl?

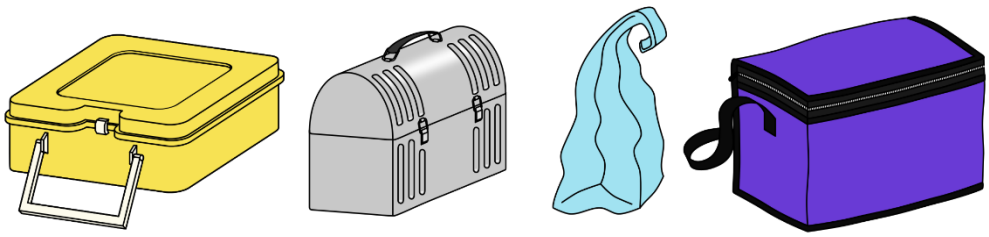
Why?

Many students bring a lunch to school using a reusable lunch box or bag. This reduces waste and keeps food at a safe temperature if ice packs are used. Sometimes students use their lunch box or bag as a plate. Other students claim that using a lunch bag as a plate or bowl could be very unhealthy because it's not as clean as a plate. In the following activity, we will explore evidence, claims, and reasoning about whether or not the insides of lunch boxes make good food receptacles.

As you work through the following questions, be sure to follow your team role(s).

Model 1 - Student Inspection of Lunch Boxes and Bags

Types of lunch boxes



Hard Plastic | Metal | Vinyl | Nylon with liner

Table A: How clean do they look?

Type	Very clean	Somewhat clean	Dirty
Hard plastic	0	2	1
Metal	0	1	2
Vinyl	1	1	1
Nylon	2	0	1
	(no crumbs or residue)	(a few crumbs or some residue)	(lots of crumbs or residue)

Table B: Is there any odor?

Type	No odor	Recent food odor	Unpleasant odor (not food)
Hard plastic	1	1	1
Metal	2	1	0
Vinyl	0	2	1
Nylon	0	1	2

Use the information from Model 1 to answer questions 1–5.
Reach an agreement with your team before writing down your consensus answers.

1. How many different **types** of lunch boxes and bags are shown in Model 1?

2. Circle the vinyl lunch bag in Model 1.

3. Look closely at **Table A** in Model 1. These data include the results of students inspecting for one characteristic of lunch boxes and bags.

a. What characteristic did students inspect to collect data for Table A?

b. **How many of each type** of lunch box/bag are students are inspecting? Explain how your team arrived at this answer.

c. Write the **description** of "Somewhat clean" as the inspecting students use it.

d. How many metal lunch boxes did students rate as "dirty"?

4. Look closely at **Table B** in Model 1. These data include the results of students inspecting for a different characteristic of lunch boxes and bags.

a. What characteristic did students inspect to collect data for Table B?

b. Do you think the lunch boxes and bags are the same set that students inspected for Table A? Explain how your team arrived at this answer.

b. Write the **description** of "Unpleasant odor" as the inspecting students use it.

c. How many nylon lunch bags did students rate as "Recent food odor"?

5. A student has asked their teacher if it's okay to use their lunch box as a bowl. The teacher, of course, asked the students to conduct an experiment to answer this question. After examining the lunch boxes and bags, student teams made the following statements. Circle the team's statement that seems to be most reasonable at this point.

Team 1: "It's **probably okay** to use your lunch box as a bowl if it looks and smells clean."

Team 2: "It's **probably not okay** to use your lunch box as a bowl even if it looks and smells clean."

Team 3: "We **need more evidence** before we can decide whether it's okay to use your lunch box as a bowl."

Check your answers to question 5 with your teacher before you continue.

Read This!

Most bacteria are not dangerous to humans. However, some bacteria might make you sick if you accidentally eat them. Scientists look for these "bad" bacteria on surfaces by wiping the surface with a cotton swab. Then they wipe the swab on a small dish of bacteria food. After the bacteria grow for about two days, the scientists look for small pinkish-purple dots that represent an entire colony of many millions of bacteria. If someone eats more than 10 colonies, they can get sick.

Model 2 - Bacteria Found in Lunch Boxes and Bags

Diagram: Collecting and analyzing samples to detect presence of bacteria

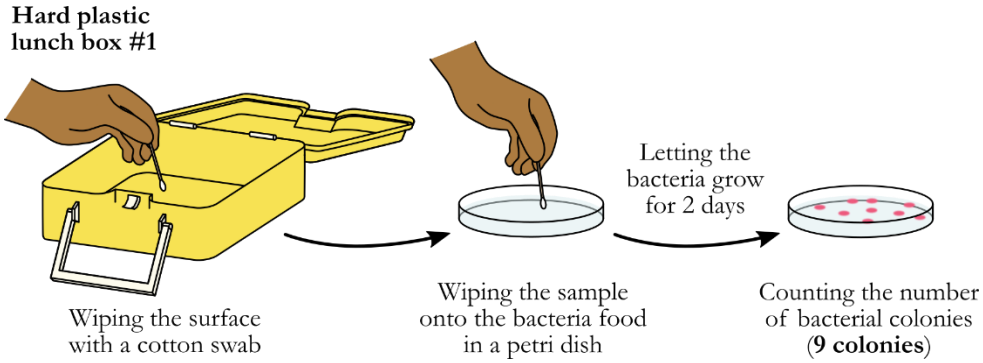
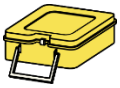
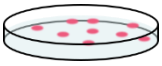
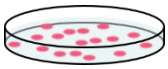
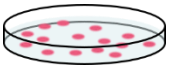
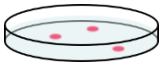
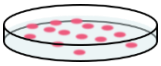
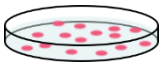
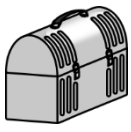
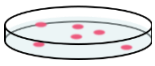
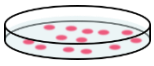
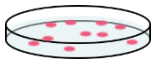
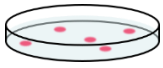
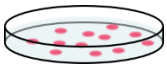
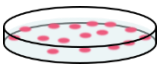


Table C: Number of colonies found in different types of lunch boxes

Type	Box #	Petri dish	# of colonies
 Hard Plastic	1		*9*
	2		
	3		

Type	Box #	Petri dish	# of colonies
Vinyl	1		*3*
	2		
	3		

Type	Box #	Petri dish	# of colonies
 Metal	1		
	2		*13*
	3		

Type	Box #	Petri dish	# of colonies
Nylon	1		
	2		
	3		*16*

Use the information from Model 2 to answer questions 6–10.
Reach an agreement with your team before writing down your consensus answers.

6. Look carefully at the **diagram** in Model 2.

   a. What does this symbol • mean?

   b. Describe what is happening in the diagram. Hint: Look at the **title** for Model 2.

7. Look closely at **Table C** in Model 2.

   a. Find the one row of data in Table C that **matches** your description in Question 6b. **Highlight** this row.

   b. How many metal lunch boxes were tested for the presence of bacteria?

   c. **Count** the number of bacterial colonies in the **Petri dish** for **Nylon lunch box #3**. Does your count match the number recorded in the data table?

Check your answers to question 7 with your teacher before you continue.

8. Some of the numbers of bacterial colonies have been counted and recorded for you in Table C.

   a. Manager: **assign one of the types** of lunch boxes to each member of your team.

   b. Each team member: **Count the number of bacterial colonies** in each of your assigned boxes. **Check** your count twice.

   c. **Record** the number of colonies in the correct space in Table C.

   d. Share your data, so every team member has a complete data table.

9. Look carefully at the completed data table.

   a. Which lunch box sample had the **most colonies**?
   Specify the **type** and **number of the lunch box** and the **number of colonies**.

   b. Which lunch box sample had the **least colonies**?
   Specify the **type** and **number of the lunch box** and the **number of colonies**.

Read This!

Scientists use the word **claim** to describe a statement that answers a question or problem. **Evidence** supports the claim. **Reasoning** connects the evidence to the claim or explains why the evidence makes sense.

10. Let's look back at the original student question that drove the bacteria testing experiment. Your team now has access to more evidence – the bacterial testing data in Model 2.

Circle the team's claim that seems to be most reasonable when you consider evidence from both Model 1 and Model 2.

Team 1: "It's **probably okay** to use your lunch box as a bowl if it looks and smells clean."

Team 2: "It's **probably not okay** to use your lunch box as a bowl even if it looks and smells clean."

Team 3: "We **need more evidence** before we can decide whether it's okay to use your lunch box as a bowl."

11. Now write your team's Claim – Evidence – Reasoning statement.

Claim	
Evidence that supports (argues for) your claim	Evidence that refutes (argues against) your claim
Reasoning (explain how each piece of evidence specifically relates to your claim)	

Check your answers to question 11 with your teacher before you continue.