

Activity 1: Disease Outbreak

Guiding Question: How do scientists figure out the source of an infectious disease outbreak?

Key Words: *evidence, infectious, pattern, trade-offs*

Get Started:

1. What causes disease?

2. *Infectious* diseases can be passed directly from one person to another. What are some examples of infectious diseases? What causes them?

3. In what ways are people exposed to infectious diseases?

5. Read the introduction and Guiding Question to Activity 1, “Disease Outbreak” in your Student Book.

Do the Activity:

Part A: Planning Your Day

1. Think about the ways an infectious disease is spread around a community. Record your ideas in the space provided.

2. In the table on Student Sheet 1.1, “Tracking the Disease: Collecting Data,” which is attached to this packet, your classmates filled in the “Place” column by listing the place they would go to on Day 1. For this activity, your first place has been assigned to you.

Part B: Going Out:

3. Read procedure steps 3-4 in your Student Book. *Watch the LABsent video (found here: <https://labaid.s3.us-east-2.amazonaws.com/labsent-videos/Cells-PartB-Day-1.mp4>) to view procedure steps 3-4 being done.* Each time the video says to record, you may want to pause the video to give you ample time to complete your observations. Use Student Sheet 1.1 to record your results.

From Cells to Organisms 1

Name _____

Date _____

4. Read procedure step 5 in your Student Book. *Watch the LABsent video (found here: <https://labaid.s3.us-east-2.amazonaws.com/labsent-videos/Cells-1-PartB-Day-2.mp4>), to view procedure step 5 being done.* Each time the video says to record, you may want to pause the video to give you ample time to complete your observations. Use Student Sheet 1.1 to record your results.

5. Read procedure step 6 in your Student Book. *Watch the LABsent video (found here: <https://labaid.s3.us-east-2.amazonaws.com/labsent-videos/Cells-1-PartB-Day-3.mp4>), to view procedure step 6 being done.* Each time the video says to record, you may want to pause the video to give you ample time to complete your observations. Use Student Sheet 1.1 to record your results.

6. Read procedure step 7 in your Student Book. *Watch the LABsent video (found here: <https://labaid.s3.us-east-2.amazonaws.com/labsent-videos/Cells-3-Microbe-Demonstration.mp4>) to view procedure step 7 being done.* Record your results.

Part C: Analyzing the Results:

7. Where did the disease come from? **When you return to class**, you will get the class totals from your teacher and complete the table titled “Analyzing the Locations” on Student Sheet 1.2, “Tracking the Disease: Analyzing Data,” which is attached to this packet.

8. From the data in your table, create a bar graph in the space provided on the next page of the number of infected people at each place. If you need help with graphing, use the Bar Graphing Checklist in Appendix C to help you.

- Be sure to label your bars and axes, and title your graph.
- If you like, use different colors or shadings in your graph.

Bar Graph:

Name _____

Date _____

9. On Student Sheet 1.2, record your ideas about the place where you think the infection started.
10. **When you return to class**, fill out the totals for each activity in the tables for “Analyzing the Action” on Student Sheet 1.2.
11. From the data in the “Analyzing the Action” tables, create a bar graph of infected people who took each action at the place you have hypothesized the infection started.

Bar Graph:

Name _____

Date _____

12. **Evidence** is factual information or data that support or refute a claim. Think about your ideas about the source of the disease and the evidence that supports your claim. What are they?

Build Understanding:

1. What patterns do you see in the graphs? What do the patterns tell you about how the infection started?

2. A pattern is a set of repeating things or events. Scientists observe patterns in their data. Patterns lead to questions about relationships and ideas about what causes these relationships. How does the crosscutting concept of *patterns* relate to this activity?

3. *Cause and Effect* are events that have causes. If “A” causes “B” to happen, they have a cause-and-effect relationship. A major activity of science is to explain how this happens. Sometimes the causes are simple and sometimes they are complex. Sometimes both A and B occur, but one does not cause the other. How does the crosscutting concept of *cause and effect* relate to this activity?

Analysis:

1. Use your graph of the class results to answer the following questions.
 - a. Where did people get the infectious disease? Describe the evidence that supports this claim.
 - b. From what action did people get the infectious disease? Describe the evidence that supports this claim.
 - c. How certain are you of your answers to a and b? Explain.

2. Imagine that you are the director of the health department in the town where this disease is spreading. It is your job to help prevent people from getting sick with this disease.
 - a. Explain what actions you would recommend to try to end the outbreak.
 - b. A **trade-off** is a desirable outcome given up to gain another desirable outcome. What are the trade-offs of your recommendations?

Name _____

Date _____

3. Think about the outbreak of the disease in the community compared with just one person getting sick with the disease. What information can you get from the outbreak that you could not get from one sick person?

4. How well did this activity model the spread of an infectious disease? Share your ideas with the class.

5. a. How might knowing more about the cause of a disease help stop its spread?
b. What questions do you have about the causes of an infectious disease and how it spreads?

Name _____

Date _____

STUDENT SHEET 1.1

TRACKING THE DISEASE: COLLECTING DATA

- A. The Restaurant
- B. The Cafe
- C. Picnic at the Lake

- D. The Zoo
- E. The Market (convenience store)

Day	Place (where I went)	Action (what I did)
Day 1	Restaurant	1.
		2.
		3.
Day 2	Zoo	1.
		2.
		3.
Day 3	Market	1.
		2.
		3.

Do you have the disease? _____

STUDENT SHEET 1.2**TRACKING THE DISEASE: ANALYZING DATA****Analyzing the Locations**

Place	Number of people who visited	Number of people infected*	Percentage of people visiting who became infected
A. Restaurant			
B. Cafe			
C. Lake Picnic			
D. Zoo			
E. Market			

Based on the data above, which place(s) do you think were most likely to be the source of the infection? _____

Use the tables below to analyze the most likely place(s) to find out what action caused the disease.

Analyzing the action at: _____

Action	Action name	Number of people who did the action	Number of people infected*	Percentage of people participating who became infected
1				
2				
3				

Analyzing the action at: _____

Action	Action name	Number of people who did the action	Number of people infected*	Percentage of people participating who became infected
1				
2				
3				

* Use these columns of data for your bar graphs.