30 It's Catching!

Different diseases are caused by different factors, such as germs, heredity, or even the environment. Some diseases caused by germs are **infectious** (in-FEK-shuss), which means that they can be passed from one person to another. Many infectious diseases, such as chickenpox, are more common among children. How quickly can an infectious disease spread among a group of people? What can be done to stop more people from getting sick?

CHALLENGE **How does an infectious disease spread in a community?**

MATERIALS

For each group of four students

- **1 dropper bottle of Disease Indicator**

For each pair of students

- **1 large plastic cup containing "saliva"**

For each student

- **1 SEPUP tray**
- **1 dropper**
- **1 plastic bag**
- **paper towel**
- **1 Student Sheet 30.1, "Anticipation Guide: Diseases"**
- **1 Literacy Student Sheet 1a, "Keeping a Science Notebook"**
- **1 Student Sheet 30.2, "Tracking the Disease"**

For the Extension

- **additional copies of Student Sheet 30.2**

PROCEDURE

Part A: Planning Your Day

Complete the "Before" column of Student Sheet 30.1, "Anticipation Guide: Diseases."

1. How fast could an infectious disease, such as the flu, spread through a population? After discussing this as a class, write your ideas down in your science notebook.
2. Discuss in your group of four what variables affect whether a person who is exposed to a disease will get sick. Write these ideas down in your notebook.
3. In Table 1, "My Movements" (on Student Sheet 30.2, "Tracking the Disease"), fill in the Place column by listing the one place or event that you plan to go to each day.

REMINDER

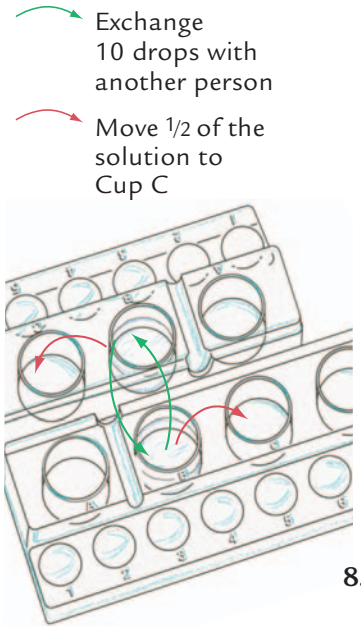
Good laboratory procedure means no accidental contamination! Be sure to follow the directions and be careful with your dropper.

4. Use your dropper to put 10 drops of "saliva" from the large plastic cup into large Cup A of your SEPUP tray.
5. Use your dropper to fill Cup B ¾ full of "saliva" from the large plastic cup.
6. After you and your partner have completed Steps 2 and 3, return the large plastic cup to your teacher.

Part B: Meeting Other People

Your teacher will guide you through Steps 7–11.

7. On Day 1, go to the place you chose and recorded in Table 1 on Student Sheet 30.2. Then:
   a. Read the card to determine the number of people with whom you should exchange "saliva." (If no one else is at this place, you do not need to do anything.)
   b. Exchange "saliva" with people at this place by using your dropper to transfer 10 drops of solution from your Cup B into Cup B of the other student's tray while the other student transfers 10 drops of solution from his or her Cup B into Cup B of your tray. Cup B should now contain about the same amount of solution with which you started.
   c. Use your dropper to remove half of the solution from your Cup B and place it into Cup C of your own SEPUP tray.
   d. Return to your seat, and record the names of the people you exchanged with on Student Sheet 30.2.
8. On Day 2, go to the place you chose in Table 1. Repeat Steps 5a and 5b, but this time, transfer solutions in Cup C.



9. Use your dropper to remove half of the solution from your Cup C and place it into Cup D of your own SEPUP tray.

10. Return to your seat, and record the names of the people you exchanged with on Student Sheet 30.2.

11. On Day 3, go to the place you chose in Table 1. Repeat Steps 5a and 5b, but this time, transfer solutions in Cup D.

12. Return to your seat, and record the names of the people you exchanged with on Student Sheet 30.2.

Part C: Getting Tested

13. *Did you catch the disease?* Find out by following these steps.

    a. Place Student Sheet 30.2 in a plastic bag.

    b. Place one drop of "saliva" from Day Three on the plastic bag above the Disease Test box for Day Three.

    c. Add one drop of Disease Indicator to your "saliva." If you have been infected with the disease, the solution will change color. If the solution does not change color, congratulations, you have escaped catching the disease this time!

14. *If you were infected with the disease, when did you get it?* Find out by testing your initial "saliva" (Cup A), and saliva from Day 1 (Cup B), and Day 2 (Cup C). To test, add one drop of Disease Indicator to one drop of "saliva" on the plastic bag above the correct Disease Test box.

15. When you finish testing, write down your results in your notebook or on a piece of paper. Then use a paper towel to wipe off the test drops and remove your Student Sheet from the bag. Copy your results for all four tests into Table 1 on Student Sheet 30.2.

16. In your science notebook, use the class data to complete a table like the one below.

Class Results

Times	Number of people infected	Percent of people infected
Initial (Day 0)		
Day 1		
Day 2		
Day 3		

17. Use the data in your table to create a line graph of the number of infected people over time. Be sure to include the initial data (Day 0), label your axes, and title your graph.

EXTENSION

As a class, repeat the activity. Be sure to choose different places to visit or events to attend. Did the disease spread within your community in the same way? What similarities or differences do you observe? What role do the initially infected people play in affecting the spread of disease?

ANALYSIS

1. Based on your graph of the class results, what happened to the number of people infected with the disease over time?

2. Think about how the infectious disease was spread from person to person in your community. If you were trying to avoid catching the disease, what could you do? Use evidence from this activity to support your answer.

3. **a.** 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. Explain what you would recommend to try to prevent more people from getting infected.

   b. What are the trade-offs of your recommendations?

4. What are the strengths and weaknesses of this model for the spread of infectious diseases?

5. Could you use this activity to model how diseases that are *not* infectious are spread? Explain.

6. Fill in the "After" column for Statements 1–3 only on Sheet 30.1, "Anticipation Guide: Diseases." Did your thinking change?