



Name: _____
Period: _____

Disease Transmission Lab



In the Classroom

Part 1: How are Diseases Transmitted?

1. You will receive a small cup with liquid in it. (DO NOT DRINK IT!!!)
2. Exchange your liquid with the liquid of a partner. To do this, pour your liquid into his/her cup, then have him/her pour the liquid back into your cup, and then even out the amount of liquid between the two of you.
3. Record the name of your partner in the data table under exchange #1.
4. Repeat steps 2 and 3 with three *different* partners.
5. Return to your seat and wait to see who is infected with the disease. The teacher will test each liquid, checking for a reaction. Then, we will analyze the data (who was infected) as a class and trace the infection back to the original source.

Exchange #	Name of Partner
1	
2	
3	
4	

1. I was (circle one) infected not infected
2. The original source of “disease” in the classroom was:_____.
3. How many people in the class ended up with the “disease” that started with just one person? _____
4. Can someone have a disease and still appear healthy? Explain the possible negative effects of this.
5. What are some ways that diseases can be prevented? (How can you keep yourself healthy?)

In the Computer Lab

Go to **Explorelearning.com** and click on “Browse Gizmos.” Select “Biology” and then “Human biology, anatomy, and health.” Find “Disease Spread” and click on “Launch Gizmo.”

Part 2: Person-To-Person Transmission

1. Infectious diseases are carried by _____ such as bacteria, viruses, and molds.
2. Name several ways that diseases can be transmitted from person to person.
3. Click on CONTROLS. Place 5 people in the room by setting the Number of people slider to 5. Then, check Person-to-person under Allowed diseases, and uncheck Airborne and Foodborne.
4. Click on SIMULATION. Notice that the simulation starts with one infected person (purple) and four healthy people.
5. Click Play (play button). The people will begin to walk randomly about the room. Each time a healthy person comes in contact with an infected person, the healthy person has a chance of becoming infected. Do the people become infected EACH time they contact the infected person? Explain.
6. Watch the simulation until all the people in the room are infected, then click on the TABLE tab. The table shows when each person caught the disease. How long did it take for all 5 people to become sick? _____
7. Was this time longer or shorter than you expected?
8. Click Reset (next to the pause button) and then Play to try the experiment again under the same conditions. Look at the table to see when all the people in the room became sick. How does this compare to what you found in the previous experiment?
9. Explain why the times can be different.

10. What factors would make the disease spread faster? Click on Controls and set different conditions that you think will make the disease spread faster. Describe the changes you made.

11. Did these changes affect how quickly the disease was spread?

12. Now, click on reset, and then click on Controls. Set the number of people at 35 and watch the simulation. Based on your observations, how does increasing the number of people affect how quickly a disease spreads through person-to-person contact?

Part 3: Foodborne Transmission

You can also catch a disease by eating food or drinking water containing pathogens. Foodborne bacteria can cause the diarrhea associated with "food poisoning."

1. Click on CONTROLS. Place 15 people in the room by setting the Number of people slider to 15. Then, click on Foodborne under Allowed diseases, and uncheck Airborne and Person-to-person.
2. Click on SIMULATION, and click Play. Observe carefully (the people turn green once they are infected).
3. What does each person do just before becoming infected?
4. How does the infection occur?
5. How is this simulation similar to the person-to-person simulation? How is it different?
6. If a person in the simulation never eats or drinks anything from the buffet table, is it possible for them to become sick with the foodborne disease? Explain why or why not.

7. When a disaster such as an earthquake or a hurricane strikes, safe water is often the hardest thing to find. If you suspect that water contains pathogens, how can the water be sterilized?

Part 4: Airborne Transmission

1. Select the CONTROLS tab. Make sure there are still 15 people in the room. Then, check Airborne under Allowed diseases, and uncheck Foodborne and Person-to-person.
2. Click on SIMULATION, and click Play. Notice that when the simulation starts, all the people in the room are healthy. Each time they breathe the air in the room, however, they have a chance of catching the airborne disease.
3. Describe the pattern of how people catch the disease.
4. Is the probability of getting the disease higher in any parts of the room?
5. Is the transmission of an airborne disease more similar to the transmission of a foodborne disease or a person-to-person disease? Explain.

Part 5: Real-life Situations

At the Centers for Disease Control (CDC) in Atlanta, Georgia, scientists work to investigate diseases and prevent outbreaks. Suppose you worked for the CDC and were investigating an unknown disease in a rural town.

1. What would indicate that the disease was foodborne?
2. If you suspected a foodborne illness, what questions would you ask the patients?

3. What information would tell you that the disease was spread by person-to-person contact?
4. What advice would you give to prevent the further spread of the disease if it was transmitted from person-to-person?
5. What information would indicate an airborne disease?
6. What steps would you take if you suspected the disease was spread through the air?
7. Of the three types of disease transmission, which do you think would be the hardest to contain within that rural area?