SN EDUCATOR GUIDE

September 14, 2019

Fungal Infections and Climate Change

Activity Guide for Students: Your Nose is Running

Directions:

Disease research

Follow your teacher's instructions to do background research on an infectious disease in plants or animals. Think about what causes the disease, how it is spread and how it affects the organisms it infects. Use your research to answer the following questions:

1. What causes the infectious disease you researched?

2. What environmental conditions are needed for the disease you researched to thrive?

3. How is the disease you researched spread?

4. What are the symptoms of the infectious disease you researched?

5. Is there a cure for the infectious disease you researched?

Disease spread

When your teacher instructs you to do so, put on your safety goggles and gloves and collect one of the test tubes provided; record your test tube number in the table below. One of the test tubes contains a solution of sodium chloride and water (aka saltwater) and will form a precipitate when a reagent, silver nitrate, is added. The rest contain water. During each round of the experiment, you will find a student in the class who has not yet been your partner and using your pipette or dropper exchange half of the liquid in your test tube for half of the liquid in his or her test tube. Repeat this process for three rounds. After the third round of exchanges, place your test tube in the rack at the front of the room. The teacher will then add silver nitrate to each tube and inform the class which test tubes form a precipitate.

Record in the table provided the number of your test tube, the test tubes you exchanged liquid with, and which test tubes formed precipitates at the end of the experiment.

	Test tube number	Did the test tube form a precipitate?
My test tube		
Round 1 Exchanged with:		
Round 2 Exchanged with:		
Round 3 Exchanged with:		
All test tubes that formed precipitates:		

Compare the data you collected with other students in the class. See if you can determine which test tube was the original one that held the saltwater.

Data analysis

6. At the end of the first round of the experiment, how many test tubes have saltwater?

7. At the end of the second round of the experiment, how many test tubes contain saltwater?

8. What is the maximum number of test tubes that could contain saltwater at the end of Round 3 of the experiment? What percentage of the class would this be?

9. What equation can model the maximum rate at which the test tubes can become contaminated with saltwater, if everyone exchanges n times?

10. How many of the test tubes in <u>your</u> class contained saltwater by the end of the activity? What percentage of the class's test tubes is this?

11. Why might the number of test tubes containing saltwater in your classroom be different than the maximum number you calculated in question eight?

12. How could you determine which test tube was the one that originally contained saltwater?

13. How does this activity relate to the spread of the infectious disease you researched?

14. Based on the research you have done, what factor(s) could affect the spread of an infectious disease?

15. What is the likelihood of surviving or dying from the infectious disease you researched?

Bonus questions

16. Climate change is increasing global temperatures, both on land and in the oceans. How might climate change affect the future spread of the infectious disease you researched?

17. What can science do to help prevent the spread of infectious diseases?