FACTivity

Time Needed

One class period

Materials

(for each student or group of students)

- Cave Conundrum Graphic Organizer
- Writing utensil

In this FACTivity, you will predict and observe how diseases spread in populations. Over one class period, you will simulate the spread of the "flu" in your class over 5 days of school.

Methods

Your teacher will divide the class into small groups of four to five students. Your teacher will select one student to "have the flu," and designate a "sick" area where students will go if they become "sick." You will participate in two simulations with five rounds each. In each simulation, you will predict and simulate how the flu will spread throughout your class over the course of 1 "week." When a classmate becomes "sick," he or she should move to the designated "sick" area of the room at the beginning of the next round. Cross out each day on the chart as the round ends.

Before you begin, discuss how you think the "flu" will spread throughout the class over the course of 1 week. How many and which students will be left in class by Friday? We can hypothesize what will happen using these three assumptions:

1. Only students who interact with the "sick" student will get the "flu,"
2. The students who sit nearest to the "flu" student will contract the "flu" first, and
3. Students who interact with the "sick" student will have the "flu" the next day.

Write your predictions about how the "flu" will spread in your class in the "Simulation One" section of the graphic organizer before each round. As the activity progresses, remember to write down what did happen in each round.

Simulation 1

1. **Monday (Round 1):** The student with the "flu" will shake hands with two students nearest them, "infecting" them. The original "sick" student should go to the designated "sick" area.
2. **Tuesday (Round 2):** The students who shook hands with the original "sick" student with the "flu" are "infected." These two "sick" students should shake hands with two more students closest to them, then go to the designated "sick" area with the original student.
3. **Wednesday and Thursday (Rounds 3 and 4):** Repeat the process for these two rounds. The "sick" students from previous rounds will stay in the designated "sick" area. The newly "infected" students should shake hands with the two students nearest them, then go join others in the designated "sick" area.
4. **Friday (Round 5):** Repeat the process one more time. Those four students "infected" in this last round can go immediately to the "sick" area.

At the end of Round 5, observe how many students are in the designated "sick" area and where they sat in relation to the original "sick" student. Record these observations in the "Simulation One" section of your graphic organizer. Write down what happened in each round. ▶

Simulation 2

Before starting Simulation Two, all students will close their eyes. Your teacher will secretly tap five students on the head, and if you are selected, you need to keep it a secret from other students. If you were tapped on the head, you received a "flu shot."

What do you think will happen during Simulation Two if some students have a "flu shot?"

Repeat the steps of Simulation One. However, in Simulation Two the kids with "flu shots" do not get "sick" or go to the "sick" area when they shake hands with an "infected" student. Instead, these students will remain in the game as if nothing happened.

Also, "sick" students can now choose to infect any student in the room, not just those nearest to them.

Once again, keep track of the results of each round in your graphic organizer. How many kids are "sick" at the end of the last round? Where did those "sick" students sit in relation to the original "sick" student?

Now, compare and contrast the results of Simulation One with those of Simulation Two. Were there more healthy students in one simulation than in the other? Did you notice any different patterns between the two simulations? Write your answers and observations in the graphic organizer.

This simulation is similar to how scientists create and use models. They use known facts to create logical predictions about a situation, the spreading of disease in this case, to predict what will likely happen. However, like the students with "flu shots," exceptions create differences between the modeled result and the actual result. We would expect students who sit near the "sick" students to be "infected" first, but a sick student may choose to go visit and "infect" a friend who doesn't sit close by in class. This interaction creates another difference between the assumption we used to make our predictions and the real number of students left at the end of the simulation.

What does this activity tell you about the use of models in science? How can models be helpful? What are some challenges of using models? How does this FACTivity compare with what you learned in the "Cave Conundrum" article?

Name: _____

Cave Conundrum Graphic Organizer

Simulation One	Day 1	Day 2	Day 3	Day 4	Day 5
What do you think will happen?					
What happened?					

Simulation Two	Day 1	Day 2	Day 3	Day 4	Day 5
What do you think will happen?					
What happened?					

Compare and contrast the results of Simulation One and Simulation Two: