Name_____ Period _____ Date _____

Flu Transmission

STEM Sims

Lesson 2: Does Hand Washing Affect the Spread of Influenza?

One of the major guidelines for reducing the spread of diseases is to wash your hands with soap and water for 20 seconds. The flu virus is highly contagious. Can hand washing reduce the number of infections due to influenza? Lather up and start your investigation.

Here are some definitions to help you in your investigation.

Genes -	the material inside cells that results in various traits
Virus -	a small collection of material that make up genes that can infect and damage cells
Influenza -	a virus that attacks the lungs, throat, and nose
Contagious -	a disease that can easily spread among people
Epidemic -	a disease that is widespread
Pandemic -	a disease that has spread worldwide
Linear growth -	growing by the same amount each time
Exponential growth -	growing by doubling each time

Preparing for the Science

1. A person starts with $2 in their bank account. Each week that person receives $5 for completing chores around the house. Use this information to complete Table 1 below.

Table 1.

Time	Money earned	Total Money in their bank
Start	0	$2

End of Week 1		
End of Week 2		
End of Week 3		
End of Week 4		

2. The previous example is of linear growth. Each week the person's bank account increased by the same amount. How much did the person's account increase by each week?

3. On your own paper, create a graph of total amount of money in the bank versus number of weeks.

4. A different person also starts with $2 in the bank. However, each week this person has the total money in the bank doubled. To double something means to multiply the number by 2. Use this information to complete Table 2 below.

Table 2.

Time	Money earned	Total Money in their bank
Start	0	$2
End of Week 1		
End of Week 2		
End of Week 3		
End of Week 4		

5. The previous example is of exponential growth. Did the person's total bank account increase by the same amount each week?

6. On your own paper, create a graph of total amount of money in the bank versus number of weeks.

Doing the Science

1. Start the Flu Transmission Simulation by clicking on the "Simulation" tab.

2. Click on the "None" button under the Factor menu on the left-bottom of the screen.

3. Click on the "Run" button at the bottom center of the screen.

4. Note the Progress bar, which shows time running for a six-week period.

5. Click on the "1" icon on the Progress bar.

6. Count and record in Table 3 the number of infected students at the end of the first week of the flu outbreak.

7. Click on the "2" icon on the Progress bar.

8. Count and record in Table 3 the number of infected students at the end of the second week of the flu outbreak.

9. Repeat this process until you have counted and recorded data for all six weeks.

10. Click on the "Hand Washing" button under the Factor menu on the left-bottom of the screen.

11. Repeat steps 3 - 9 only enter your data in Table 4.

Table 3. None Data

Week	Infected	Uninfected	Week	Infected	Uninfected
1			4		
2			5		
3			6		

Table 4. Hand Washing Data

Week	Infected	Uninfected	Week	Infected	Uninfected
1			4		
2			5		
3			6		

Do You Understand?

1. As time progressed, how did the number of students who were infected by the flu change when the None factor was selected?

2. Is the spread of flu when the None factor was selected more like linear growth or exponential growth? Please support your response with evidence.

3. As time progressed, how did the number of students who were infected by the flu change when the Hand Washing factor was selected?

4. Is the spread of flu when the Hand Washing factor was selected more like linear growth or exponential growth? Please support your response with evidence.

5. How did hand washing affect the spread of the flu?

6. Coronavirus is another virus that spreads in a similar way as the flu. Why do experts say people should wash their hands with soap and warm water for 20 seconds to avoid a coronavirus infection?