Name: _____ Date: _____

Simulating the Spread of Infectious Disease[1]

1. An infectious disease is any disease caused by germs such as viruses or bacteria. What are some examples of infectious diseases?

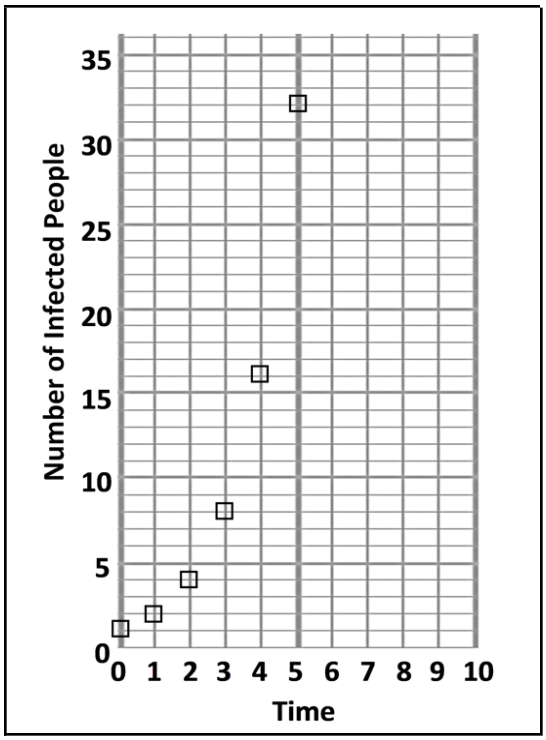
Simulation Procedure

- Each participant will get a data strip with his/her secret number for time 0.
- On the back of your data strip, draw a line cutting the strip in half.
- On the back of the data strip on the top half, write your secret number (you will use this to communicate your secret number silently).
- When your teacher puts you into breakout groups:
  - **Silently** show your partner your secret number. (Or write it in the Chat!!)
  - Multiply your secret number times your partner's secret number. This is your NEW secret number.
  - Record the product on your data strip as your new secret number and record the name of the person you interacted with.
  - If your secret number has changed, cross out your old secret number on the back of your data strip and record your new secret number.
- Your teacher will tell you when to begin the next round of interactions (and re-scramble the breakout groups). For each interaction, repeat the steps, this time showing your new secret number (if it changed).
- After the simulation is complete, your teacher will explain the simulation and collect the data.

2. Enter the data from your simulation in this table.

Time	0	1	2	3	4	5	6	7	8	9	10
Total # Infected people	1										

3. The squares in this graph show exponential growth if the number of infected people doubled at each time. Use dots to graph the data from your simulation.



4. Describe any differences between your simulation results and exponential growth.

5. What may have caused these differences? (looking for any hidden variables here).

[1] Adapted from an activity (Some Similarities between the Spread of Infectious Disease and Population Growth)
By Drs. Ingrid Waldron and Jennifer Doherty, Dept Biology, Univ Pennsylvania, © 2018 adapted from Serendip Studios

6. WITHOUT sharing original secret numbers, How can we determine who patient zero was? (Tracking the origin of an infectious disease is called contact tracing.)

7. Using the data gathered to support your argument, why does social distancing, masking and staying home when you are sick affect COVID-19 infection rates? Let's watch this to illustrate how social distancing works!

8. In your simulation the infection spread very rapidly. In real life, infections do not spread this rapidly. What are some reasons why the spread of infectious disease is slower in real life?

9. Secret numbers could substitute for any communicable disease such as SARS-CoV-2 or HIV. People aged 13-24 make up 17% of the United States population, yet account for 26% of new cases of HIV. Go to the website http://www.cdc.gov/hiv/risk/age/youth/index.html and give 3 reasons why this is the case. Support your answers with statistics.

10. Learn about HPV. Go to https://www.cdc.gov/std/hpv/stdfact-hpv.htm What is HPV?
    a. How common is HPV? Compare HPV infection rates to HIV.

    b. Why does the CDC recommend vaccinations of adolescents between ages 11-12?

11. State three things that you learned from this activity.