

## Viruses and Viral Videos

**Directions:** Ever wonder where the term *viral* came from when talking about shared electronic media? Is it an accurate term to use? In this portfolio, you are going to explore the relationship between actual viral growth and the spread of electronic media.

### Viruses

1. First you will focus on actual viral growth inside a human body. Pick a virus and research its growth rate. If you are having trouble finding a growth rate for a specific virus, make up your own growth rate. Use your growth rate to create an exponential growth function. Make a table for the number of virions (virus particles) that can grow inside a human body. Start with one virion on the first day, and continue the table for two weeks. How does that compare to the number of cells in a person's body? You will submit the following.
  - a. a comparison to the overall number of cells
  - b. a growth function
  - c. a table of virions
2. Now use a graphing calculator or computer program to graph your function from part 1. Your body also has ways of hunting and destroying viruses it finds in your body. Describe how the behaviors of the graph would change if you took into consideration other factors, like the immune system working or the physical limitations of your body. Can you think of any additional factors that could be considered? You will submit the following.
  - a. a graph of the number of virions in the body
  - b. additional factors to be considered
  - c. changes in the graph from other factors
3. Could the same general exponential growth model apply to the spread of a virus from person to person, instead of growth of a virus inside a body? What factors could influence the spread of a virus from person to person? Write a brief paragraph comparing the growth of a virus inside a single person to the spread of a virus from person to person. How might it be the same, how might it be different? You will submit a brief paragraph.

### Viral Videos

4. Next, think about how videos are posted and shared online. First, examine an unpopular video on a single social medium. Suppose that, on the very first day of this video was posted, it received its highest quantity of views. As the days go on, the video receives fewer and fewer each day. Create an exponential function that models the number of views the video gets each day. Determine for yourself the number of times the video was initially viewed on its first day, or its initial value, and decide on a daily decay factor

less than one. Now graph the function and make sure to track its number of daily views over a one-month period. You will submit the following.

- a. an unpopular video function
  - b. an unpopular video graph
5. Look at a popular video. Create another exponential function with a smaller initial value (i.e., the number of times the video was viewed on its first day), but this time, with a growth factor that is greater than one. Graph the popular video function and make sure to show its number of daily views over a one-month period. What are the differences in the functions and the behavior of the graphs between the popular and the unpopular videos? You will submit the following.
- a. a popular video function
  - b. a popular video graph
  - c. a comparison of the unpopular video to the popular video
6. What are some factors that you did not consider in your model that could influence the spread of a viral electronic media? Write a brief paragraph that describes some additional factors that you could take into account, and how that might change the behavior of the function and graph. You will submit the following.
- a. a brief paragraph