HUMANS VS ZOMBIES

AN EXPONENTIAL DATA LAB

Outline of the Game:

1. Choose two students to be the initial Zombies.

2. Each day, a Zombie must tag one Human in order to stay alive.
   Notes: If you make it mandatory for a Zombie to tag a Human, you will skew your early data when you lose a Zombie or two in one day. If you don't make it mandatory for a Zombie to tag a Human, you will skew your later data when Zombies give up easily each day because they can't readily find a Human. Good luck with that!

3. A tag occurs when a Zombie makes eye contact with a Human and shoots an imaginary dart at the Human's unprotected neck. Humans can protect their neck by covering it with one hand.
   Note: there is no actual physical contact or ANY need to run.

4. Game is in session between classes and 15 minutes before and after school ON CAMPUS.

5. ZOMBIES wear a black ribbon around their wrist. HUMANS wear an orange ribbon around their wrist
   Note: The ribbons are thin and difficult to see. Another idea might be strips of fabric worn as arm bands.

6. Students are given the orange ribbon at registration and exchange it for a black ribbon on the day they are tagged (or first thing the next morning). Newly tagged Humans become Zombies the day after they are tagged. New Zombies do not tag anyone the day they become a Zombie.

7. Records were also kept on a website developed for the game. Students could track progress of the game, post questions, or make comments on the website.

8. The game has a natural ending as it gets more difficult for Zombies to stay 'alive' by making a tag each day. We chose to end our game by hosting an apocalyptic water balloon battle on the side lawn one Friday afternoon at 3:15pm (game participants had registered for the battle and had a pass). Humans wore colors and Zombies wore black or gray. We counted DRY gamers after the battle and declared a winner. We also gave out door prizes (candy) to participants.

Using the Data:

SCHOOL WIDE: A LARGE graph was placed in the entrance foyer and the number of Zombies in the building each day was tracked with a bar graph. Every student in the school could watch and predict the trend of the graph.

OTHER DISCIPLINES: One teacher in our Science department used the data to introduce bacterial growth. In her course, she related the eventual decrease in growth rate (because Zombies eventually have a difficult time locating a Human) to carrying capacity. This initiated dialog relating lack of Humans to a lack of nutrients in bacterial growth and the eventual outcome of death rate equaling growth rate.

IN THE CLASSROOM: Students can use the data to find the exponential model. Exploration of the model can include group discussions on initial value, why the growth factor is 2, horizontal asymptotes and prolonging the effects of carrying capacity by spreading the Zombie infection outside the school campus. With carrying capacity contributing to changes in growth rate, students have a concrete example of reliability of interpolation vs reliability of extrapolation.

HUMANS VS ZOMBIES

AN EXPONENTIAL DATA LAB

Complete the following chart with data from the game:

DAY	NUMBER OF ZOMBIES
0	2
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

1. Plot the data on a graph. What type of function does the data appear to be?

2. Every day, the number of Zombies _____

3. Find the exponential equation for the data_____

4. Is the equation a good fit for the data? How do you know?

5. Look at your scatter plot. Why is the data contained in the first quadrant?

6. Look at the graph of your equation on your calculator. Is your function graphed on the calculator limited to the first quadrant? If not, which other quadrant has part of the function?

7. What are 3 points in quadrant II that are not in your data? (Take them from the table on your calculator)

8. Do these points represent possible points from the game? Why or why not?