



Zombie Apocalypse

Student Activity



Name _____

Class _____

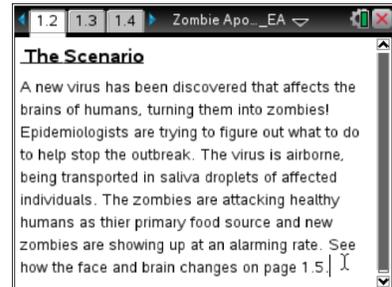
Open the TI-Nspire document *Zombie_Apocalypse.tns*.

In this activity you will explore the spread of a fictional virus that turns normal humans into angry, hungry zombies. Although zombies aren't real, they are a fun way to learn about how a disease can spread and how populations can suffer the effects of REAL viruses, like influenza. You will also learn a little about the human brain and certain areas of the brain that, if affected, would cause a person to become a zombie again, if such a thing were real. Explore the activity and remember, although zombies aren't real, viruses and diseases certainly are. Knowing how populations become infected is important to understand if we want to control the spread of diseases.

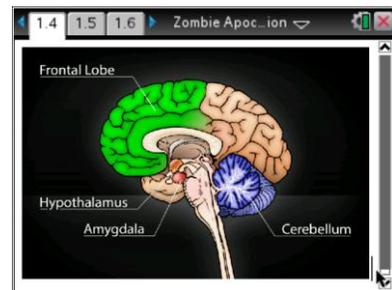


Move to pages 1.2 - 1.6

1. Read the scenario of the zombie virus epidemic on page 1.2.
Page 1.3 describes the method by which the virus infects humans and explains the resulting symptoms in the human brain.

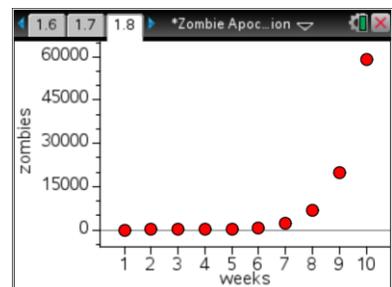


2. Review the parts of the brain on page 1.4. These are the structures that are affected by the zombie virus. Read about the symptoms of this fictional disease on page 1.5. Go to page 1.6 and step through the progression of the disease. The normal human becomes 'zombified' over time as the virus works on specific areas of the brain. Can you think of some real diseases that affect the brain?



Move to pages 1.7 - 1.8

3. Read about the background of the zombie crisis on page 1.7. Advance to page 1.8 and look at the graph. Look at both axes. Notice the pattern of the data. What predictions can you make based on this data?





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Move to pages 1.9 – 1.17. Answer the following questions here or in the .tns file.

Q1. The greatest rate of infection occurred between week _____ and week _____.

Q2a. What is the approximate infection rate between week 1 and week 6?

Q2b. Now read page 1.11 and use the graph on page 1.12-

What is the approximate infection rate between week 1 and week 6?

Q3. Take a look at the graph on page 1.15 and predict what the number of zombies will be after the 25th week.

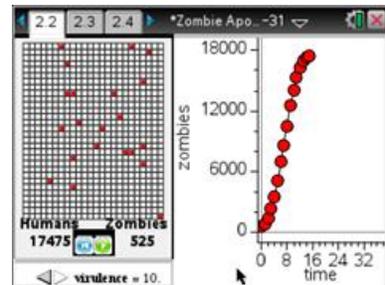
Q4. Explain what you believe will be happening with the rate of zombie production after 30 weeks.

Move to page 1.18.

4. The rate of infection of any disease will eventually decrease because of many different factors. For this activity, the main factors are lack of food (healthy humans) and lack of additional targets to infect (again, healthy humans). For other epidemics or diseases those factors may include the development of a vaccine or the elimination of a vector (the source that carries and distributes the pathogen) such as mosquitos, rats, or other organisms. Historically, factors such as sanitation have helped to control the rate of disease spread. What other factors can you think of?

Move to pages 2.1 – 2.3

5. "Virulence" is a measure of how effectively a disease-causing agent can spread through a population. Using the simulation on page 2.2, explore how changing the virulence of the zombie virus changes how quickly a human population can become infected.





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6. On page 2.3, notice that both zombie and human populations are plotted on the graph. Even when you change the virulence in the simulation you should see a relationship between the numbers of humans and zombies.

Move to pages 2.4 – 2.12. Answer the following questions here or in the .tns file.

- Q5. In the graph, "time" is the independent variable, but there is no actual UNIT of time indicated. What do you think would be an appropriate unit of time for the spread of the Zombie Virus?
- Q6. Estimate the point at which the number of zombies and the number of humans are equal? What variable would affect this point?
- Q7. Based on the graph of humans and zombies from the previous page, which do you think is the relationship between the two populations?
- A. Inverse
 - B. Direct
 - C. There appears to be no relationship
- Q8. What effect did changing the virulence have on the rate of Zombie Virus infection?
- A. As virulence increased, the rate decreased
 - B. As virulence increased, the rate increased
 - C. As virulence increased, the rate did not change



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- Q9. Although the Zombie Virus isn't a real concern for us YET, name another disease that you think has a pretty high degree of virulence.
- Q10. What if a new "strain" of the Zombie Virus appeared that was almost the same as the original virus, except that it did not affect the cerebellum? Predict what the result would be.
- Q11. What if the virus changed again, and neither cerebellum nor the frontal lobe were affected? Predict the results.