

Enrichment Activity

Name: _____

HHMI Lecture: Microbes Strike Back (10 points)

Period: _____

Instructions:

Watch the animation at this site and then answer the questions: <http://www.hhmi.org/biointeractive/microbes-strike-back>

Questions:

1. What are the two main types of bacteria?
2. The world's population is about 7 billion people. How much feces contains about the same number of bacteria?
3. How often does E. coli divide (double) in a lab with unlimited nutrients?
4. How often does E. coli divide in the more hostile environment of the gut?
5. What percentage of the deaths each year worldwide are caused by infectious diseases?
6. What percentage of the world's population are carriers for the tuberculosis bacterium?
7. How many people are killed by HIV each year?
8. Pathogens don't always cause disease (infection). Which people are most likely to die from infectious diseases?
9. _____ killed more people during World War I than the war did.
10. _____ killed a quarter to a third of the population of Europe.
11. What is the leading infectious disease worldwide?
12. In 1982 Dr. Barry Marshall did experiments that showed that *Helobacter pilori* causes ulcers. Since then, scientists have also discovered that it causes what else?
13. How is tuberculosis spread from person to person?
14. What are the two main ways that we combat infectious diseases?
15. Why do molds and bacteria make antibiotics naturally?
16. How does penicillin kill bacteria?

17. When antibiotics were introduced, they increased the average lifespan of people by _____ years.
18. What three things have helped to drive the development of antibiotic resistance?
 - 1)
 - 2)
 - 3)
19. What is MRSA?
20. Vancomycin-resistant enterococci is resistant to most antibiotics. Why does Dr. Finlay *not* consider VRE a superbug?
21. What are the three ways that bacteria are able to share genes, like antibiotic resistance genes?
 - 1)
 - 2)
 - 3)
22. How long does it typically take to develop a new drug?
23. How long does it typically take for bacteria to develop resistance to a new drug?
24. How is a vaccine different from an antibiotic?
25. Why didn't the Gonorrhea vaccine work?
26. What is pathogenomics?
27. How will pathogenomics help scientists develop new antibiotics and vaccines?

NOTE: Remember that this lecture was given in 1999 prior to the completion of the human genome project.

28. Mrs. Majda presented a similar lecture in class. How did the HHMI college-level lecture compare to the high school lecture presented by Ms. Majda. What was different? What was the same? What skills do you feel you need to improve in order to be able to successfully learn everything you will be tested on in a college course?