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| --- | --- | --- | --- |
| Virus  Capsid  Core  Specificity  Lytic  Lysogenic  Prophage  Archaea  Prokaryotic  Aerobic  Anaerobic  Facultative  Obligate  Chemotrophic Heterotroph  Phototrophic Autotroph  Chemotrophic Autotroph  E-coli  Salmonella  Binary Fission  Conjugation  Horizontal Gene Transfer  Gram-positive  Gram negative  Antibiotic resistance  Bacteriophage  Infection  Pathogen |  |  | Disease  Vaccine  Antibiotic |

**VIRUS BASICS:**

1. The name virus comes from the Latin word for?
2. Viruses are made up of what two parts?
3. The Capsid is made up of what?
4. The core is made up of what?
5. What is meant by viral specificity?
6. Do bacteria also have the same specificity?
7. What are the steps of a Lytic viral life cycle?
8. What does Lyse mean?
9. How is a Lysogenic cycle different than a Lytic cycle?
10. What is a prophage?

**BACTERIA BASICS:**

Archaea:

1. The name “archaea” comes from the Latin word meaning?
2. What was the reason that this group of bacteria was classified separate from the other bacteria in 1970?
3. Are Archaea prokaryotic or eukaryotic? Single or multicellular? Aerobic or anaerobic?
4. Archaea are often referred to as extremophiles. Explain the three main examples of where this name comes from
5. What is the evidence that suggest that these were the first living organisms?

Bacteria:

1. Which Empire do Eubacteria belong to? (what is an Empire?)
2. Which Kingdom was Eubacteria previously grouped into before the domain system was introduced?
3. What is the general composition of the cell wall of these organisms?
4. There is a lot of diversity in this Domain in terms of Obtaining Energy. What are the two main ways they are Autotrophic?
5. What is a chemotrophic heterotroph?
6. What is E-coli and Salmonella and how do they make us sick?
7. Bacteria also have diverse metabolisms. Define the following; obligate aerobes, facultative aerobes, obligate anaerobes, facultative anaerobes
8. What is the connection between botox treatments and bacteria?
9. What limits bacterial growth.
10. Describe Binary Fission and Conjugation
11. What is an Endospore?
12. How are Bacteria positive and or useful both to ecosystems and to humans?

**INFECTION:**

1. Compare and Contrast Infection and Disease. Be sure to include definitions of both.
2. What is the definition of a Pathogen.
3. List the ways that disease is usually spread?
4. Compare and Contrast Bacterial disease and Viral disease. How does each differ in their effect to the body, transmission, treatment etc.
5. How do vaccines work and what are interferons?
6. Before we understood the genetic phylogeny of bacteria they were classified based on if they were gram-positive or gram-negative. What do these terms means and why do you think doctors still use this form of classification today.
7. Explain how antibiotic resistance occurs using your understanding of evolution
8. What is horizontal gene transfer?
9. What are bacteriophage and how might they help with future antibiotic resistance issues?

**EXAMPLE LONG ANSWER:**

1. Based on what we learned in the Evolution unit, explain how not completing a full course of antibiotics can lead to bacterial strains that are resistant to that antibiotic. (Include a graph of the population showing the number of individuals vs. resistance before and after)
2. Bacteria can be classified as being Gram-positive or Gram-negative. Give a detailed explanation of what this means and what the medical implications are
3. All cells need to be able to attain an energy rich molecule in some way, and then they need to extract that energy into a form (ATP ) that they can use for their “fuel”. Explain the diversity of ways that bacteria & protists are able to do both of these processes.
4. Explain why organisms that have the ability to reproduce both sexually and asexually have evolved to reproduce sexually in times of stress and asexually in times of non-stress.
5. Explain the sequence of events theorized from the first cell through to eukaryotic cells. Include the types of cells as well as the conditions that enabled that evolution to occur.
6. What has changed in Taxonomy of Bacteria in recent years. Be sure to include the old as well as the new system of classification details and explain WHY this change has occurred.
7. Viruses and Bacteria are both pathogen, however there are many differences between bacteria and viruses. Highlight those differences in terms of how they infect and also how they are prevented or treated.