

Chapter 1

Living in a Microbial World

1. Which of the following is not an example of a microorganism?
 - a. a bacterium
 - b. a protozoan
 - c. a flea
 - d. a virus
 - e. a single-celled fungus
2. Which of the following statements is true?
 - a. All living things are unicellular.
 - b. All living things are multicellular.
 - c. Most microorganisms are multicellular.
 - d. Living things are composed of one or more cells.
3. Which of the following statements is true?
 - a. Most microorganisms have eukaryotic cells.
 - b. Most microorganisms have cells containing organelles.
 - c. Many microorganisms have cells in which the genetic material is not surrounded by a nuclear membrane.
 - d. Animals have prokaryotic cells.
 - e. Plant cells do not contain organelles.
4. Cells have the ability to maintain internal conditions within ranges compatible with life. This ability is called:
 - a. homeostasis.
 - b. evolution.
 - c. metabolism.
 - d. environmental response.
5. Which of the following are not composed of cells?
 - a. Bacteria and archaea
 - b. Fungi and protozoa
 - c. Viruses and prions
6. Metabolism refers to:
 - a. the transfer of genetic information from generation to generation.
 - b. the changes in the characteristics of living things over time.
 - c. the response of living things to chemical signals in their environment.
 - d. the ability to reproduce.
 - e. the ability to assimilate and use energy.

7. Which of the following is an example of basic science?
- a study to determine the mechanism used by bacteria to adhere to the lining of the intestine
 - the development of a new anti-tuberculosis drug
 - the use of microorganisms to digest oil released during an oil spill
 - a study to determine how to prevent corrosion of water pipes by microorganisms
 - research into the use of microorganisms as a source of biofuel
8. Which of the following statements about model organisms is true?
- They tend to be slow growing.
 - They tend to have unique biological properties, very different from other organisms.
 - They tend to reproduce quickly.
 - They tend to be more complex and harder to study than other living things.
 - They are used regularly in applied science, but not in basic science.
9. Which of the following statements about a hypothesis is true?
- A hypothesis is an explanation for a scientific phenomenon that has been repeatedly tested for many years and never disproved.
 - A hypothesis can never be disproved. It can only be proved.
 - A hypothesis is the initial observation of a natural phenomenon that leads to a question.
 - A hypothesis is the question that stems from the observation of a natural phenomenon.
 - A hypothesis is used to make a prediction about a future event that can later be observed or tested experimentally.
10. Those factors that are kept the same in the experimental group and the control group are called:
- control variables.
 - experimental variables.
 - manipulated variables.
 - observed variables.
11. What are the primary differences between prokaryotic and eukaryotic cells? Which groups of microorganisms have which cell type?
12. Which typical characteristics of living things are not observed in viruses?
13. Why are control groups necessary in a proper scientific experiment?

Chapter 1 Answers

1. c
2. d
3. c
4. a
5. c
6. e
7. a
8. c
9. e
10. a
11. Prokaryotic cells are simpler and usually smaller in size than eukaryotic cells. In prokaryotic cells, membrane-bound organelles, including the nuclear membrane, are not present. In eukaryotic cells, cellular processes occur in organelles, with different activities taking place in discrete locations within the cell. Bacteria and Archaea have prokaryotic cells. Fungi, protozoa, and algae all have eukaryotic cells.
12. Viruses are not composed of cells. They are unable to replicate outside the cells of other organisms and they have little if any independent metabolism.
13. In a proper experiment, the effect of the experimental variable, if any, is compared between the experimental group and the control group. Without the control group, in which the experimental variable was not manipulated, there would be no way to evaluate the effect of the experimental variable.