

For each question, select the best answer from the four alternatives.

- Chromosomes move toward opposite ends of the cell during (2.5) K/U
  - prophase.
  - metaphase.
  - anaphase.
  - telophase.
- The job of mitochondria is to supply cells with (2.1) K/U
  - energy.
  - nutrients.
  - oxygen.
  - protein.
- Plant cells and animal cells differ because plant cells have (2.1, 2.2) K/U
  - cell walls.
  - cell membranes.
  - nuclear membranes.
  - endoplasmic reticulum.
- Prokaryotic cells differ from eukaryotic cells in that prokaryotic cells do not contain (2.1) K/U
  - cytoplasm.
  - DNA.
  - organelles.
  - a nucleus.

Indicate whether each of the statements is TRUE or FALSE. If you think the statement is false, rewrite it to make it true.

- Cells of benign tumours can break away from the original tumour and move to different parts of the body. (2.7) K/U
- Mitosis is the longest stage of the cell cycle. (2.5) K/U
- Biophotonics is a technology that uses beams of light to detect and treat cancer. (2.7) K/U

Copy each of the following statements into your notebook. Fill in the blanks with a word or phrase that correctly completes the sentence.

- In \_\_\_\_\_ reproduction, the offspring are exact genetic copies of the parent. (2.3) K/U
- Environmental factors, such as tobacco smoke, X-rays, and UV rays, that cause cancer are \_\_\_\_\_. (2.7) K/U

Match each term on the left with the most appropriate description on the right.

- |                   |  |
|-------------------|--|
| 10. (a) diffusion | (i) the amount of substance (solute) in a given volume of solution   |
| (b) osmosis       | (ii) the disease resulting from uncontrolled cell division   |
| (c) concentration | (iii) the process by which particles spread from areas of higher concentration to areas of lower concentration |
| (d) cancer        | (iv) the movement of water from areas of higher water concentration to areas of lower water concentration      |
| (e) tumour        | (v) a mass of cells that divides uncontrollably without any function to the body (2.3, 2.7) <small>K/U</small> |

Write a short answer to each of these questions.

- The body cell of a horse has 60 chromosomes. How many chromosomes will each new horse cell have after mitosis? (2.3, 2.5) K/U
- How do chloroplasts in individual plant cells contribute to the overall function of a plant? (2.1) K/U

13. Copy Table 1 into your notebook. In the second column, fill in information about the cell's function. In the third column, explain how the cell's structure suits its function. (2.9) [SC.912.L.18.1](#)

**Table 1** Function and Structure of Cells

Type of Cell	What is the function?	How does the structure suit the function?
red blood cell		
nerve cell		
fat cell		
sperm cell		
epidermal cell of plant root		
photosynthetic cell		

14. The cell cycle varies among different types of cells. You are given samples of cells from a plant. Some of the cells have a cell cycle that is 24 h in length. Others have a cell cycle that is 72 h in length. (2.5, 2.6) [SC.912.L.18.1](#)
- (a) Which set of cells would you predict came from the root tip of the plant? Explain your answer.
- (b) Where might the other set of cells have come from?
15. Is mitosis occurring in your body right now? Explain your answer. (2.3, 2.5) [SC.912.L.18.1](#)
16. Draw a Venn diagram that illustrates the similarities and differences between plant and animal cells. (2.1, 2.2) [SC.912.L.18.1](#)
17. During prophase, the nuclear membrane dissolves. It reforms during telophase. Explain why this action is important for cell division. (2.5) [SC.912.L.18.1](#)
18. You are interested in comparing the current rates of various types of cancers with their rates of 50 years ago. (2.7) [SC.912.L.18.1](#)
- (a) Where could you find information to complete this research?
- (b) Based on your knowledge of cancer and cancer causes, what are some reasons that the rates may have changed over the last 50 years?

19. Some antibiotics interfere with a bacterial cell's ability to copy DNA. (2.3, 2.5) [SC.912.L.18.1](#)
- (a) How would this type of antibiotic be able to stop a bacterial infection?
- (b) These antibiotics do not have any effect on the DNA replication of human cells. Why is this important?
20. Imagine you are writing an article for your school newspaper on cancer prevention. (2.7) [SC.912.L.18.1](#)
- (a) Explain the causes of cancer that are most relevant to people your age.
- (b) Give three lifestyle choices students can make to decrease their odds of getting cancer.
21. Design an experiment to determine if temperature has an effect on the rate of mitosis in plant cells. Outline the procedure you will follow, including the independent and dependent variables, and controls necessary. (2.3, 2.5) [SC.912.L.18.1](#)
22. The cells of human muscles and nerves rarely divide after they are formed. How does this characteristic of muscle and nerve cells affect an individual who has suffered from a spinal cord injury? (2.9) [SC.912.L.18.1](#)
23. A friend comes to you with a mysterious mole on her arm. (2.7, 2.8) [SC.912.L.18.1](#)
- (a) What questions might you ask your friend about the mole?
- (b) What characteristics would you look for that would indicate whether she should see a dermatologist?
24. (a) Define asexual reproduction and sexual reproduction in your own words.
- (b) Which method of reproduction produces a population with more genetic variety? Explain your answer. (2.3) [SC.912.L.18.1](#)