

Cells and Systems Formative Assessment

Time: 20 min. 6 questions.

Instructions

Answer all six questions. For multiple choice, select the best answer. For short answer, write one or two sentences that explain your thinking. For true or false, write the word and correct the statement if it is false. For the numeric question, show your calculation and include units.

Questions

1. A single-celled organism like an amoeba and a multicelled organism like a grizzly bear both need to gather food and move materials through their bodies. Which statement best explains how they differ in meeting these functions?
A) The amoeba uses organs while the bear uses cells.
B) The amoeba performs these functions with a single cell, while the bear uses specialized cells, tissues and organs.
C) The amoeba has a cell membrane and the bear does not.
D) The bear is more efficient because it has more cells.
([Outcome](#))
2. Explain what is meant by "the cell is the basic unit of life." Use an example from either a plant or an animal to support your answer.
([Outcome](#))
3. Your heart rate increases when you exercise. Describe what is happening in your circulatory system during this response to exercise.
([Outcome](#))
4. True or false: Plant cells and animal cells both have cell walls that provide structure and protection to the cell.
([Outcome](#))
5. A student investigates how salt concentration affects the movement of water into and out of plant cells through osmosis. In one beaker, she places a plant cell in pure water. In another, she places an identical plant cell in salt water. After 30 minutes, the cell in pure water has absorbed water and swelled, while the cell in salt water has lost water and shriveled. Based on concentration differences, explain why this happened.
([Outcome](#))
6. A research team develops a new medicine that helps the lungs exchange oxygen and carbon dioxide more efficiently in people with respiratory disease. This medicine improves the function of lung tissue. How many major body systems are directly involved in the process of gas exchange that this medicine affects?
([Outcome](#))

Curriculum Coverage

Question	Outcome	Content
1	Outcome	Similarities and differences between single-celled and multicelled organisms
2	Outcome	Role of cells as basic unit of life

3	Outcome	Body response to changing conditions; circulatory system function
4	Outcome	Distinguish between plant and animal cells
5	Outcome	Movement of liquids into and out of cells through osmosis based on concentration
6	Outcome	Role of organs and tissues in body systems; respiratory system

Answer Key

1. **B.** The amoeba is a single cell that performs all life functions within itself, while the bear relies on many specialized cells organized into tissues and organs to carry out the same functions.
2. **Acceptable answer:** The cell is the smallest unit that can perform all the functions of life. For example, a single-celled alga can make its own food, grow, and respond to light, all within one cell. (Accept any organism example with explanation of independent life function.)
3. **Acceptable answer:** During exercise, the heart beats faster and pumps blood more quickly throughout the body to deliver more oxygen and nutrients to the muscles that are working hard.
4. **False.** Animal cells have cell membranes but not cell walls; only plant cells have both a cell membrane and a cell wall.
5. **Acceptable answer:** Water moves across the cell membrane from where the concentration of water is higher (pure water) to where the concentration of water is lower (salt water solution). In pure water, water enters the cell and it swells; in salt water, water leaves the cell and it shrivels.
6. **2.** The respiratory system (lungs exchange gases) and the circulatory system (blood carries oxygen throughout the body) are the two major systems directly involved in gas exchange.