

Cells and Systems Formative Assessment

Time: 20 min. 6 questions.

Instructions

Answer all six questions. For multiple choice, circle the letter of the best answer. For short answer questions, write one or two sentences. For the true or false question, write T or F. For the numeric question, show your calculation and include units with your final answer.

Questions

- Which of the following best describes the role of cells in living things?
A) Cells are found only in plants and animals.
B) Cells are the basic unit of life in all living things.
C) Cells are structures that exist only in multicelled organisms.
D) Cells are responsible for food gathering in all organisms.
([Outcome](#))
- A student observes a single-celled amoeba and a grizzly bear. Describe one key difference between how these two organisms are organized, and explain why this difference matters for how they function. ([Outcome](#))
- True or false: Plant cells and animal cells have the same structures, including cell walls and cell membranes. ([Outcome](#))
- When you exercise, your heart rate increases. Explain why your body makes this change in response to exercise. ([Outcome](#))
- Which of the following is an example of how different organisms meet the same function in different ways?
A) Both birds and fish have eyes to see their environment.
B) Both snakes and squirrels gather food, but snakes use fangs while squirrels use teeth and claws.
C) Both plants and animals need oxygen to survive.
D) Both insects and mammals have nervous systems.
([Outcome](#))
- A cell membrane allows water molecules to move across it based on concentration differences. If a cell is placed in saltwater, water molecules move out of the cell at a rate of 500 molecules per second. If the movement continues for 8 seconds before the cell reaches balance, how many water molecules in total moved out of the cell? ([Outcome](#))

Curriculum Coverage

Question	Outcome Alias	Specific Focus
1	Outcome	Role of cells as basic unit of life
2	Outcome	Similarities and differences between single-celled and multicelled organisms
3	Outcome	Distinction between plant and animal cells
4	Outcome	Body responses to changing conditions

5	Outcome	Similar functions met in different ways across organisms
6	Outcome	Movement of liquids into and out of cells

Answer Key

1. **B) Cells are the basic unit of life in all living things.** Cells are the fundamental building block of all living organisms, whether single-celled or multicelled ([Outcome](#)).
2. **Sample answer: An amoeba is a single-celled organism with one cell that performs all life functions, while a grizzly bear is multicelled with many specialized cells working together. This matters because multicelled organisms can grow larger and have specialized tissues and organs that allow more complex functions.** ([Outcome](#))
3. **False.** Plant cells have cell walls in addition to cell membranes, while animal cells have only cell membranes ([Outcome](#)).
4. **When you exercise, your muscles need more oxygen and nutrients. Your heart rate increases to pump blood faster throughout your body, delivering more oxygen and nutrients to your working tissues.** This is an example of how the body responds to changing conditions ([Outcome](#)).
5. **B) Both snakes and squirrels gather food, but snakes use fangs while squirrels use teeth and claws.** This shows that different organisms meet the same function (food gathering) in a variety of ways based on their different structures ([Outcome](#)).
6. **4000 water molecules.** Multiply the rate by the time: 500 molecules per second $\times$ 8 seconds = 4000 molecules ([Outcome](#)).