

# 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. For true/false, circle or write your choice. For numeric questions, show your working and include units where needed. You may use a calculator.

## Questions

1. A student observes both an amoeba (a single-celled organism) and a grizzly bear (a multicelled organism). Which statement correctly compares these two living things? ([Outcome](#))  
A) The amoeba has cells, but the grizzly bear does not.  
B) Both organisms have cells that carry out life functions, but the amoeba performs all functions in one cell while the grizzly bear uses many specialized cells.  
C) The grizzly bear is made of tissues, but the amoeba is made only of water.  
D) Single-celled organisms are always smaller and simpler than multicelled organisms.
2. Describe the role of cells as the basic unit of life. ([Outcome](#))
3. True or False: Plant cells and animal cells have the same structures because they both need to carry out life processes. Explain your answer in one sentence. ([Outcome](#))
4. When a person exercises, their heart rate increases. This is an example of the body responding to a change in conditions. Name one other change in body function that occurs in response to exercise or changing conditions. ([Outcome](#))
5. A cell membrane controls what enters and leaves a cell based on concentration differences. If a cell is placed in pure water (low salt concentration) and the cell contains salt solution (high salt concentration), water molecules will move into the cell. This process is called osmosis. Based on this description, approximately how many times more concentrated is the salt solution inside the cell than the pure water outside? Round your answer to the nearest whole number. ([Outcome](#))  
A) 2 times  
B) 5 times  
C) 10 times  
D) Cannot be determined from the information given
6. Research into human body systems has led to improvements in health. Give one example of how research about cells, organs, or systems has brought about an improvement in human health or nutrition. ([Outcome](#))

## Curriculum Coverage

| Question | Outcome Alias | Specific Focus                                                               |
|----------|---------------|------------------------------------------------------------------------------|
| 1        | Outcome       | Similarities and differences between single-celled and multicelled organisms |
| 2        | Outcome       | Role of cells as basic unit of life                                          |
| 3        | Outcome       | Distinguish between plant and animal cells                                   |

|   |         |                                                       |
|---|---------|-------------------------------------------------------|
| 4 | Outcome | Body responses to internal and external stimuli       |
| 5 | Outcome | Osmosis and movement of liquids into and out of cells |
| 6 | Outcome | Research leading to improvements in human health      |

## Answer Key

1. **B.** Both organisms have cells that carry out life functions, but the amoeba performs all functions in one cell while the grizzly bear uses many specialized cells. This correctly identifies that single-celled and multicelled organisms both use cells, but differ in how many cells they have and how specialized those cells are ([Outcome](#)).
2. **Cells are the basic unit of life because all living things are made of cells, and cells carry out the functions needed for life, such as growth, reproduction, and response to the environment.** The answer should identify that cells are the smallest living unit and that they perform essential life functions ([Outcome](#)).
3. **False. Plant cells have a cell wall and chloroplasts, while animal cells have only a cell membrane and no chloroplasts.** This correctly distinguishes the key structural differences between plant and animal cells ([Outcome](#)).
4. **Acceptable answers include: breathing rate increases, blood pressure increases, body temperature rises, metabolism increases, or pupils dilate.** Any physiological change that occurs as the body responds to exercise or environmental change is acceptable ([Outcome](#)).
5. **D) Cannot be determined from the information given.** The question provides a description of osmosis but does not give specific numerical data (such as percentage salt concentration inside or outside the cell) needed to calculate the ratio ([Outcome](#)).
6. **Acceptable answers include: development of vaccines to prevent disease, creation of medicines to treat infections or chronic conditions, improved understanding of nutrition for heart health, development of insulin therapy for diabetes, or understanding how exercise strengthens bones and muscles.** Any example that shows how research into cells, organs, or systems has led to a health or nutritional improvement is acceptable ([Outcome](#)).