

Cells and Systems

This worksheet builds your understanding of how cells form the basic unit of life and how organisms use systems to carry out functions ([Outcome](#)). You will work with ideas about cell structures, how single-celled and multicelled organisms differ, and how human body systems depend on healthy cells and tissues ([Outcome](#)).

Exercises

1. A plant cell and an animal cell both have a cell membrane. Which of the following structures is found only in plant cells?

- A) Nucleus
- B) Cell wall
- C) Mitochondria
- D) Ribosome

2. An amoeba is a single-celled organism. A grizzly bear is a multicelled organism. Complete the table by placing an X in the correct column to show which characteristic applies to each organism ([Outcome](#)).

Characteristic	Amoeba	Grizzly bear
Has only one cell		
Contains tissues		
Has a nucleus		
Carries out all life functions in one cell		

3. The lungs are organs that help the respiratory system work. Name two types of cells found in the lungs and describe one function each cell type performs ([Outcome](#)).

Cell type 1: _____

Function: _____

Cell type 2: _____

Function: _____

4. When you exercise, your heart rate increases. This is an example of how the body reacts to changing conditions. Explain why your heart rate increases during exercise ([Outcome](#)).

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5. Diffusion is the movement of gases and liquids into and out of cells. Which statement best describes what causes diffusion to occur ([Outcome](#))?

- A) Cells use energy to pump particles against concentration differences
- B) Particles move from areas of high concentration to areas of low concentration
- C) The cell membrane actively selects which particles can enter
- D) Particles move randomly without any pattern or direction

6. Scientists have developed medicines that help people with heart disease. This is an example of how research about body systems has improved human health. Describe one other way that research about cells, organs, or body systems has led to improvements in human health ([Outcome](#)).
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Answer Key

1. B) Cell wall
2. Amoeba: Has only one cell (X), Has a nucleus (X), Carries out all life functions in one cell (X);
Grizzly bear: Contains tissues (X), Has a nucleus (X)
3. Answers will vary. Examples: alveolar cells (gas exchange), ciliated cells (move mucus), goblet cells (produce mucus). Accept any two cell types with accurate functions.
4. During exercise, muscles need more oxygen and nutrients. The heart pumps faster to deliver blood more quickly to working muscles and remove waste products like carbon dioxide.
5. B) Particles move from areas of high concentration to areas of low concentration
6. Answers will vary. Examples: immunization procedures prevent disease; diets designed for heart health reduce risk of heart disease; antibiotics treat bacterial infections; insulin therapy helps people with diabetes manage blood sugar.