

Cells and Systems

This worksheet helps you explore how cells form the basic units of life and how they work together in systems ([Outcome](#)). You will examine structures and functions in both plant and animal cells, and consider how organisms respond to their environments ([Outcome](#), [Outcome](#)).

Exercises

1. **Plant and animal cells both have a cell membrane, but plant cells have an additional structure. Name this structure and explain why it is important for a plant cell.**

Structure: _____

Why it is important: _____

2. **Match each cell structure to its primary function.**

Structure	Function
A. Mitochondrion	1. Controls cell activities and holds genetic material
B. Nucleus	2. Stores water and nutrients in plant cells
C. Vacuole	3. Releases energy for the cell to use
D. Chloroplast	4. Captures light energy to make food in plant cells

Write your answers: A = _____, B = _____, C = _____, D = _____

3. **A single-celled amoeba and a multicelled grizzly bear both need to gather food and respond to their surroundings. Describe one similarity and one difference in how these two organisms meet these needs.**

Similarity: _____

Difference: _____

4. **When you exercise, your heart rate increases and you breathe faster. Which two body systems are working together to respond to this change, and what is each system delivering to your muscles?**

System 1: _____ delivers: _____

System 2: _____ delivers: _____

5. **Gases and liquids move into and out of cells through diffusion and osmosis, based on concentration differences. If a cell is placed in salt water with a higher salt concentration than the cell's interior, which direction will water move, and why?**

Direction water moves: _____

Why: _____

6. **Choose the best answer.**

Red blood cells, nerve cells, and bone cells all have different shapes and functions, yet they all came from the same organism. This shows that:

- A) All cells in an organism are identical.
- B) Different cell types contribute different roles to support the healthy functioning of the body.
- C) Cells change their function depending on their location.
- D) Only some cells are necessary for an organism to survive.

Answer Key

1. Structure: cell wall. Why it is important: It provides support and protection for the plant cell / gives the plant cell its rigid shape.
2. A = 3, B = 1, C = 2, D = 4.
3. Similarity: Both organisms need to find and consume food to survive / both respond to stimuli in their environment. Difference: The amoeba is a single cell that performs all functions itself, while the grizzly bear is multicelled with specialized organs and tissues that work together to gather food and respond to stimuli.
4. System 1: Circulatory system delivers: oxygen and nutrients to muscles. System 2: Respiratory system delivers: oxygen (to the blood) / removes carbon dioxide.
5. Direction: Water moves out of the cell (into the salt water). Why: Water moves from where there is more water (lower salt concentration inside the cell) to where there is less water (higher salt concentration outside the cell).
6. B.