

Cells and Systems

This worksheet reviews how living things are organized into cells, tissues, organs and systems, and how the human body maintains healthy function ([Outcome](#), [Outcome](#)). You will also practise describing structure and function using the concept of a system ([Outcome](#), [Topic](#)).

Exercises

1. Multiple choice. Circle the best answer for each question.

a) Which statement correctly distinguishes a plant cell from an animal cell?

- A) Only animal cells have a cell membrane
- B) Only plant cells have a cell wall
- C) Only plant cells have cells at all
- D) Only animal cells can perform diffusion

b) Diffusion is best described as:

- A) the movement of a cell from one organ to another
- B) the movement of gases or liquids from an area of higher concentration to an area of lower concentration
- C) the process by which a cell divides into two new cells
- D) the process by which organs form tissues

c) Which of these is a single-celled organism?

- A) Grizzly bear
- B) Poplar tree
- C) Amoeba
- D) Human

2. Matching. Draw a line, or write the matching letter, to connect each human body system with its general role.

Body System	Role
1. Respiratory	A) Carries oxygen and nutrients to tissues and organs
2. Circulatory	B) Breaks down food into nutrients the body can use
3. Digestive	C) Removes waste products from the body
4. Excretory	D) Exchanges oxygen and carbon dioxide with the air

([Outcome](#))

3. Fill in the blanks. Use these words: cell, tissue, organ, system.

A _____ is the basic unit of life.

A group of similar cells working together forms a _____.

A _____ is made of different tissues working together to perform a job, such as the heart.

Several organs working together to carry out a major body function form a _____, such as the digestive system.

([Outcome](#), [Topic](#))

4. Short answer. Answer in one or two complete sentences.

a) Explain why an amoeba and a grizzly bear are both considered living things, even though one is a single cell and the other is made of trillions of cells.

b) Describe, in general terms, how a substance such as oxygen moves into a cell during diffusion.

([Outcome](#))

5. Compare and contrast. List two structural differences between a plant cell and an animal cell.

1.

2.

([Outcome](#))

6. Applying the concept. The human body constantly adjusts to changing conditions. For each situation below, describe one way the body responds.

a) A student starts running during a soccer game. What happens to heart rate, and why is this useful?

b) A person steps outside on a very cold day. What might happen to their body's metabolism?

c) A hand touches a hot stove. What kind of response occurs, and why is it fast?

([Outcome](#))

Answer key

1. a) B, b) B, c) C

2. 1-D, 2-A, 3-B, 4-C

3. cell, tissue, organ, system

4. a) Both are made of at least one cell and carry out life functions such as growth, response and reproduction, whether they consist of one cell or many. b) Oxygen moves from an area of higher concentration outside the cell to an area of lower concentration inside the cell, across the cell membrane.

5. Any two: plant cells have a cell wall, animal cells do not; plant cells often have chloroplasts, animal cells do not; plant cells typically have a large central vacuole, animal cells have smaller vacuoles or none.

6. a) Heart rate increases to deliver more oxygen and nutrients to working muscles and remove wastes. b) Metabolism/heat production increases; the body may shiver and blood vessels narrow at the skin to conserve heat. c) A reflex (automatic, involuntary) response occurs; it is fast because the nerve signal travels to the spinal cord, which sends the command to the muscles directly, without waiting for the brain to process the information.