

Cells and Systems Formative Assessment

Time: 20 min. 6 questions.

Instructions

Answer all six questions. For multiple choice, select the letter of the best answer. For short answer questions, write one or two sentences. For true or false, write the word True or False. For numeric questions, write the number with appropriate units. You may use a diagram or notes to help you think through your answer.

Questions

1. A student observes a single-celled organism under a microscope and a multicelled organism in a pond. Which statement best describes a key difference between them?

A) Single-celled organisms have cells, but multicelled organisms do not.
B) Single-celled organisms carry out all life functions in one cell, while multicelled organisms divide these functions among many cells.
C) Multicelled organisms are always larger than single-celled organisms.
D) Single-celled organisms cannot respond to their environment.

[\(Outcome\)](#)

2. Plant cells have a cell wall in addition to a cell membrane. Explain why a plant cell needs both structures.

[\(Outcome\)](#)

3. True or False: Diffusion is the movement of gases and liquids from an area of lower concentration to an area of higher concentration.

[\(Outcome\)](#)

4. A student is studying how a fish's body system works. The fish uses gills to take in oxygen from water, blood vessels to carry oxygen throughout the body, and cells in the muscles to use that oxygen. This is an example of which concept?

A) An organism with no systems
B) A system in which different parts work together to perform a function
C) A single cell performing all life functions
D) An organ working independently from other organs

[\(Outcome\)](#)

5. In a human body, the digestive system breaks down food, and cells in the intestines absorb nutrients. If the intestinal cells were damaged and could not absorb nutrients properly, how would this affect the overall health of the body?

[\(Outcome\)](#)

6. A plant and an animal both need to gather food and water to survive. However, they do this in very different ways. A plant's roots absorb water from soil, while an animal might drink water or eat food containing water. This shows that organisms can have similar functions that are met in a variety of ways. Based on this idea, name one other function that both plants and animals share, and briefly describe how each one meets that function differently.

[\(Outcome\)](#)

Curriculum Coverage

Question	Outcome Alias	Specific Focus
1	Outcome	Similarities and differences between single-celled and multicelled organisms
2	Outcome	Distinction between plant and animal cells
3	Outcome	Movement of gases and liquids through diffusion
4	Outcome	Application of system concept to organism structure and function
5	Outcome	Role of cells and organs in healthy body function
6	Outcome	Similar functions met in a variety of ways across organisms

Answer Key

1. **B.** Single-celled organisms carry out all life functions in one cell, while multicelled organisms divide these functions among many cells. This directly reflects the key difference: single-celled organisms are complete living systems in one unit, whereas multicelled organisms depend on specialization of cells into tissues and organs.
2. The cell wall provides rigid support and protection to the plant cell, giving it structure and strength. The cell membrane controls what enters and exits the cell, regulating the movement of materials in and out.
3. **False.** Diffusion is the movement of gases and liquids from an area of higher concentration to an area of lower concentration, driven by the concentration difference.
4. **B.** A system in which different parts work together to perform a function. The gills, blood vessels, and muscle cells are different parts of the fish's body that work together to deliver oxygen where it is needed, demonstrating the system concept.
5. If intestinal cells could not absorb nutrients properly, the body would not receive the nutrients it needs to grow, repair tissues, and maintain energy, which would harm overall health and the functioning of other body systems that depend on those nutrients.
6. Acceptable answers include respiration (plants take in carbon dioxide through stomata and release oxygen; animals breathe in oxygen through lungs or gills and release carbon dioxide), or growth (plants grow by adding new cells from root and shoot tips; animals grow by cell division throughout their bodies), or response to stimuli (plants respond to light by growing toward it; animals respond to light with their eyes and nervous system). The key is identifying a shared function and explaining two different ways it is accomplished.