

Cells – Ch. 6 Review

1. Are cats vertebrates or invertebrates? How can you tell?

Cats are vertebrates. You can tell because you can feel a cat's backbone when you pet it, or you can see the backbone in a cat skeleton. A backbone is made up of small bones called vertebrae, which is why animals with vertebrae are called vertebrates.

2. Write a definition for each of the following:

(a) unicellular organism A unicellular organism is a living thing made up of just one cell.

(b) multicellular organism A multicellular organism is a living thing made up of more than one cell.

(c) cellular differentiation Cellular differentiation is the specialization of a cell to do just one job, not all the jobs required to fulfill the organism's needs.

(d) specialized cells Specialized cells are the cells that result from differentiation. They include muscle, blood, and nerve cells. Each type has a different role in keeping a multicellular organism alive.

3. Arrange the following according to increasing levels of organization: organ system, tissues, cells, organism, organs

cells, tissues, organs, organ systems, organism

4. List four types of animal tissue and explain the function of each.

Animal tissues include epithelial, muscle, connective, and nervous tissues.

Epithelial tissue covers the body and the surfaces of organs.

Muscle tissue helps the organism move.

Blood is a connective tissue that brings nutrients and oxygen to the body cells and takes away wastes and carbon dioxide.

Nervous tissue carries messages from the body to the brain and then back to the body.

5. What is a differentiated cell?

A differentiated cell is one that cannot do everything that the organism needs to survive. It is an "expert" at a specific job.

6. Name five human organ systems.

respiratory, circulatory, digestive, musculoskeletal, and nervous system

7. Compare the processes of gas exchange in humans and frogs.

In humans, gas is exchanged only through the respiratory and circulatory systems working together. In order for a human cell to get oxygen, the oxygen must be carried to it by blood cells that have received the oxygen from the alveoli in the lungs. Carbon dioxide must follow the same route out. Frogs exchange gases in the same way when they are on land. However, when they are in water, they do not use their lungs. Rather, they get oxygen directly through the cells of their skin. In both animals, gases get to cells by diffusion through the cell membranes.

8. How do plants transport water and minerals from their roots to their leaves?

Plants transport water and minerals from their roots to their leaves through their xylem vessels.

9. What groups of organisms can perform photosynthesis?

Plants and other organisms with chloroplasts, such as algae and some other protists, are the only ones that can carry out photosynthesis.

10. Why do paramecia have cilia?

Paramecia wave their cilia in unison to propel themselves in a chosen direction and also to create water currents that direct food into the oral groove.

11. How do unicellular organisms use phagocytosis for nutrition?

Some unicellular organisms, such as the amoeba, use phagocytosis to envelope food particles with their cell membranes until the particles are inside the cell, which is endocytosis.

12. Complete the following table.

Table 1

Organ system	Function	Organs and structures involved
circulatory	nutrient and waste transport and gas exchange with cells	heart, blood vessels
respiratory	gas exchange between organism and environment	mouth/nose, trachea (windpipe), bronchi, lung, blood vessels
digestive	breaks down food into nutrients	mouth, esophagus, stomach, gall bladder, pancreas, small and large intestines, rectum
musculoskeletal	structural support, protection of inner organs, movement, locomotion	muscles and bones
nervous	responds to changes in environment and in body and directs function of all organ systems	brain, spinal cord (in vertebrates), nerves, sensory organs (eyes, ears, nose, taste buds, skin)

13. Which organ system do vertebrate animals use to help them respond to their environment?

Vertebrates use all of their organ systems to respond to the environment but the nervous system controls the response.

14. Name the five major groups of organisms.

The five major groups of organisms are animals, plants, fungi, protists, and bacteria.

15. Give an example of how you respond to your environment.

Sample answer: If something scares me, my brain sends messages through my nervous system to my heart to beat faster and to my lungs to breathe faster to send more oxygen in my blood cells to my muscle cells so I can use my musculoskeletal system to move out of danger or defend myself.

16. Give one example of how trees might respond to their environment.

Sample answer: Trees respond to less sunlight in the fall by not making chlorophyll. Then, the green color of the leaves disappears and they turn yellow and red before dropping off for the winter.

17. Explain how your skin can be considered an organ.

An organ is two or more tissues working as a group to perform one or more functions. Human skin is made up of epithelial, nerve, and other tissues that work as a group to protect the body from the environment and other functions.

18. Must larger animals be composed of larger cells? Explain.

There is a limit to the size a cell can be and still function, so larger animals are generally composed of more cells, not larger cells.