

SECTION 4-1 REVIEW

INTRODUCTION TO THE CELL

VOCABULARY REVIEW Define the following terms.

1. organelle _____

2. nucleus _____

3. eukaryote _____

4. prokaryote _____

MULTIPLE CHOICE Write the correct letter in the blank.

- _____ 1. One early piece of evidence supporting the cell theory was the observation that

a. only plants are composed of cells.	c. cells come from other cells.
b. only animals are composed of cells.	d. animal cells come from plant cells.

- _____ 2. Cells are limited in size by the

a. rate at which substances needed by the cell can enter the cell through its surface.	c. amount of material the cell can collect to fill itself.
b. rate at which the cell can manufacture genetic information.	d. amount of cell membrane the cell can produce.

- _____ 3. The diameter of most plant and animal cells is about

a. 0.1 to 0.2 μm .	b. 10 to 50 μm .	c. 1 to 2 mm.	d. 10 to 50 mm.
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- _____ 4. The characteristic of a nerve cell that relates directly to its function in receiving and transmitting nerve impulses is its

a. long extensions.	c. ability to change shape.
b. flat shape.	d. ability to engulf and destroy bacteria.

- _____ 5. One difference between eukaryotic and prokaryotic cells is that only

a. prokaryotic cells are surrounded by a cell membrane.	c. eukaryotic cells have genetic information.
b. prokaryotic cells have a nucleus.	d. eukaryotic cells have membrane-bound organelles.

SHORT ANSWER Answer the questions in the space provided.

1. State the three parts of the cell theory. _____

2. How does the ability of a white blood cell to change its shape affect its function? _____

3. How are the organelles of a single cell like the organs of a multicellular organism? _____

4. Name two features of eukaryotic cells that prokaryotic cells lack. _____

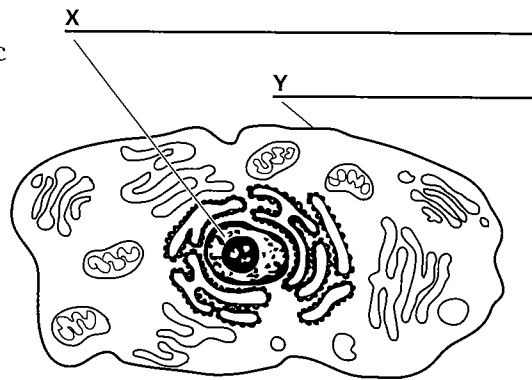
5. **Critical Thinking** When a spherical cell increases in diameter from $2\ \mu\text{m}$ to $20\ \mu\text{m}$, by what factor does its surface area change? By what factor does its volume change? (The surface area of a sphere $= 4\pi\ \text{radius}^2$, and the volume of a sphere $= 4/3\pi\ \text{radius}^3$. Remember that diameter $= 2 \times$ radius.)

STRUCTURES AND FUNCTIONS

1. These figures represent a eukaryotic cell and a prokaryotic cell. In the spaces below the diagrams, indicate which type of cell each diagram represents.



a _____



b _____

2. List two features that formed the basis for your identification of these cells.

3. Identify the structures labeled X and Y. _____



SECTION 4-2 REVIEW

PARTS OF THE EUKARYOTIC CELL

VOCABULARY REVIEW Distinguish between the terms in each of the following pairs of terms.

1. peripheral protein, integral protein _____

2. cytoplasm, cytosol _____

3. cilia, flagella _____

MULTIPLE CHOICE Write the correct letter in the blank.

- _____ 1. The cell membrane

<p>a. allows all substances to pass into and out of the cell.</p> <p>b. prevents all substances from passing into and out of the cell.</p>	<p>c. is composed mainly of a protein bilayer.</p> <p>d. is composed mainly of a lipid bilayer.</p>
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- _____ 2. Substances produced in a cell and exported outside of the cell would pass through the

<p>a. endoplasmic reticulum and Golgi apparatus.</p> <p>b. mitochondria and Golgi apparatus.</p>	<p>c. nucleus and lysosomes.</p> <p>d. vacuoles and lysosomes.</p>
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- _____ 3. Cells that have a high energy requirement generally have many

a. nuclei.	b. flagella.	c. mitochondria.	d. microfilaments.
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- _____ 4. Viruses, bacteria, and old organelles that a cell ingests are broken down in

<p>a. ribosomes.</p> <p>b. lysosomes.</p>	<p>c. the rough endoplasmic reticulum.</p> <p>d. the smooth endoplasmic reticulum.</p>
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- _____ 5. Organelles that are surrounded by two membranes and contain DNA are the

<p>a. nucleus, the endoplasmic reticulum, and lysosomes.</p> <p>b. nucleus, the endoplasmic reticulum, and chloroplasts.</p> <p>c. nucleus, chloroplasts, and mitochondria.</p>	<p>d. endoplasmic reticulum, mitochondria, and the Golgi apparatus.</p>
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SHORT ANSWER Answer the questions in the space provided.

1. What roles do membrane proteins play in making the cell membrane selectively permeable?

2. What are ribosomes made of? _____

What cellular function are they involved in? _____

3. What is the cytoskeleton, and what are two of its major components? _____

4. Describe the structural organization shared by cilia and flagella. _____

5. What are plant cell walls made of? _____

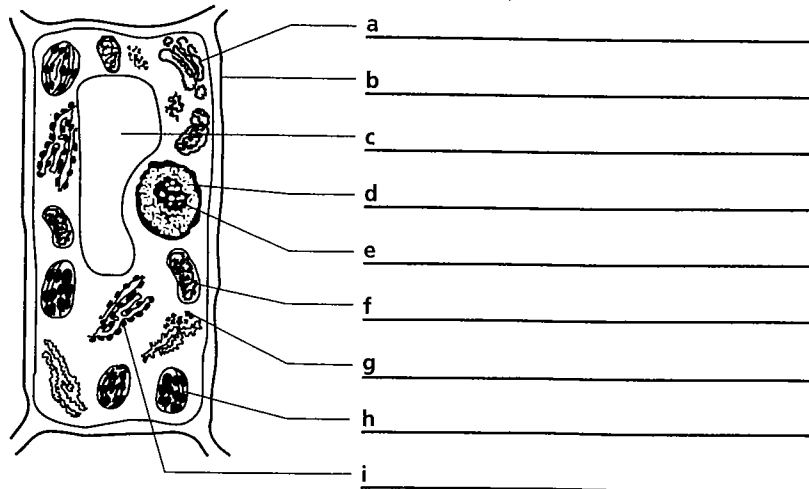
What is the function of cell walls? _____

6. **Critical Thinking** When lipid is added to a solution of a detergent in water, the detergent breaks up large globules of the lipid into much smaller globules. What effect do you think a detergent would

have on the integrity of cells? Explain your answer. _____

STRUCTURES AND FUNCTIONS Label each part of the figure in the spaces provided.

This diagram represents a typical plant cell.



SECTION 4-3 REVIEW

MULTICELLULAR ORGANIZATION

VOCABULARY REVIEW Define the following terms and provide one example for each.

- 1. animal tissue _____

- 2. animal organ _____

- 3. animal organ system _____

- 4. colonial organism _____

MULTIPLE CHOICE Write the correct letter in the blank.

- _____ 1. Cells that form the surface coverings of animal bodies constitute
a. connective tissue. b. epithelial tissue. c. muscle tissue. d. nervous tissue.
- _____ 2. Cells that transport water throughout a plant constitute
a. dermal tissue. b. ground tissue. c. vascular tissue. d. organ tissue.
- _____ 3. Fossil evidence suggests that the earliest cells on Earth were
a. simple prokaryotes. c. colonial eukaryotes.
b. simple eukaryotes. d. multicellular prokaryotes.
- _____ 4. The process in which cells become restricted to carrying out one or a few functions is called cell
a. reproduction. b. competition. c. specialization. d. transmission.
- _____ 5. The cells in the green alga *Volvox* are
a. not functionally specialized. c. arranged in tissues and organs.
b. genetically identical. d. arranged in tissues but not organs.
- _____ 6. Colonial organisms probably evolved into
a. only animals. c. only fungi.
b. only plants. d. animals, plants, and fungi.

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SHORT ANSWER Answer the questions in the space provided.

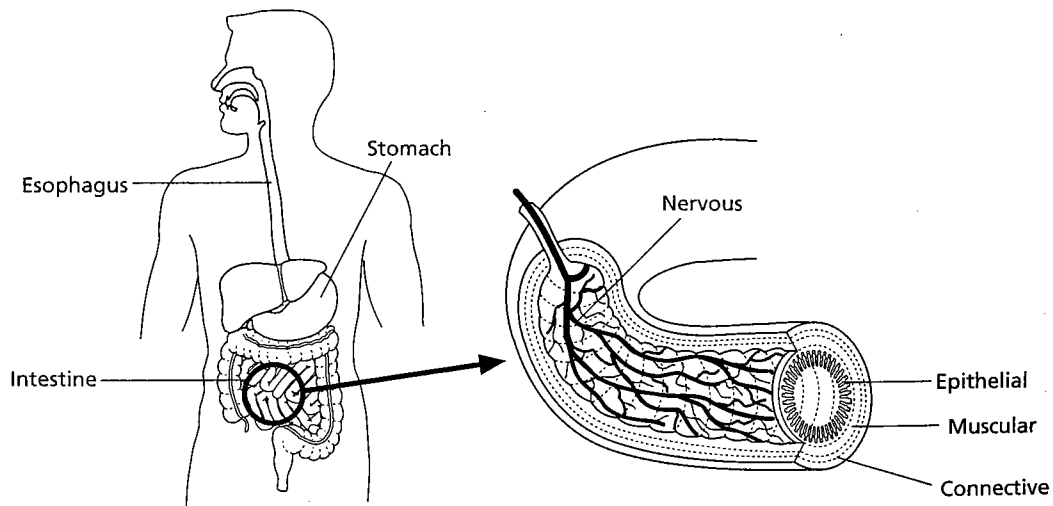
1. What kind of animal tissue functions in the support and linking of other tissues? _____

2. What kind of animal tissue functions in transmitting messages rapidly through the body?

3. What is thought to have been the order of evolution of organisms on Earth, from the earliest cells to the most-complex organisms existing today? _____

4. **Critical Thinking** A lichen is a close association between millions of fungal and algal cells that are specialized to perform different functions. Would you consider a lichen to be a colonial organism? Explain why or why not. _____

STRUCTURES AND FUNCTIONS Use the figure to answer the following questions.



1. The stomach is an example of the level of organization called _____
2. The esophagus, stomach, and intestine together are part of a level of organization called _____
3. The structures shown in the inset (right) show the level of organization called _____