

**MULTIPLE CHOICE**

1. All organic compounds contain the element
  - a. water.
  - b. oxygen.
  - c. carbon.
  - d. nitrogen.
2. Which term refers to proteins that speed up chemical reactions in living things?
  - a. carbohydrate
  - b. enzyme
  - c. amino acid
  - d. nucleic acid
3. DNA and RNA are
  - a. lipids.
  - b. enzymes.
  - c. amino acids.
  - d. nucleic acids.
4. Why is water important for a cell?
  - a. Water is the main ingredient in DNA.
  - b. All proteins require water to function.
  - c. Most chemical reactions in cells require water.
  - d. Water is an essential organic compound for the body.
5. Which term refers to the movement of molecules from an area of higher concentration to an area of lower concentration?
  - a. collision
  - b. diffusion
  - c. active transport
  - d. concentration
6. Which term refers to the movement of water molecules through a selectively permeable membrane?
  - a. osmosis
  - b. engulfing
  - c. active transport
  - d. passive transport
7. Which term refers to the movement of materials through a cell membrane when energy is required?
  - a. osmosis
  - b. diffusion
  - c. active transport
  - d. passive transport
8. One reason that cells are small is because they
  - a. lack food.
  - b. contain water.
  - c. use energy.
  - d. must remove wastes.

9. What are the products of photosynthesis?
  - a. carbon dioxide and water
  - b. oxygen and water
  - c. carbon dioxide and sugars
  - d. oxygen and sugars
10. What captures energy from sunlight during photosynthesis?
  - a. solar cells
  - b. stomata
  - c. chlorophyll and other pigments
  - d. carbohydrates
11. What happens during photosynthesis?
  - a. The cell uses oxygen to make food.
  - b. The cell uses the energy in sunlight to make food.
  - c. The cell uses glucose to make oxygen.
  - d. The cell uses the energy in sunlight to make carbon dioxide.
12. What product of photosynthesis do most living things need to survive?
  - a. water
  - b. oxygen
  - c. chlorophyll
  - d. carbon dioxide
13. What happens during respiration?
  - a. Oxygen is released into the air.
  - b. Glucose is broken down, releasing energy.
  - c. Carbohydrates are released into the bloodstream.
  - d. Water and carbon dioxide are converted into energy.
14. The stage of respiration that releases most of the energy in glucose occurs in the
  - a. nucleus.
  - b. chloroplast.
  - c. cytoplasm.
  - d. mitochondria.
15. Respiration in most cells requires
  - a. water.
  - b. oxygen.
  - c. chlorophyll.
  - d. carbon dioxide.
16. How are photosynthesis and respiration related?
  - a. They have opposite equations.
  - b. They have the same equation.
  - c. They both produce carbon dioxide.
  - d. They both produce oxygen.
17. Respiration and photosynthesis keep the levels of carbon dioxide and oxygen in the atmosphere
  - a. fairly constant.
  - b. constantly changing.
  - c. constantly increasing.
  - d. constantly decreasing.

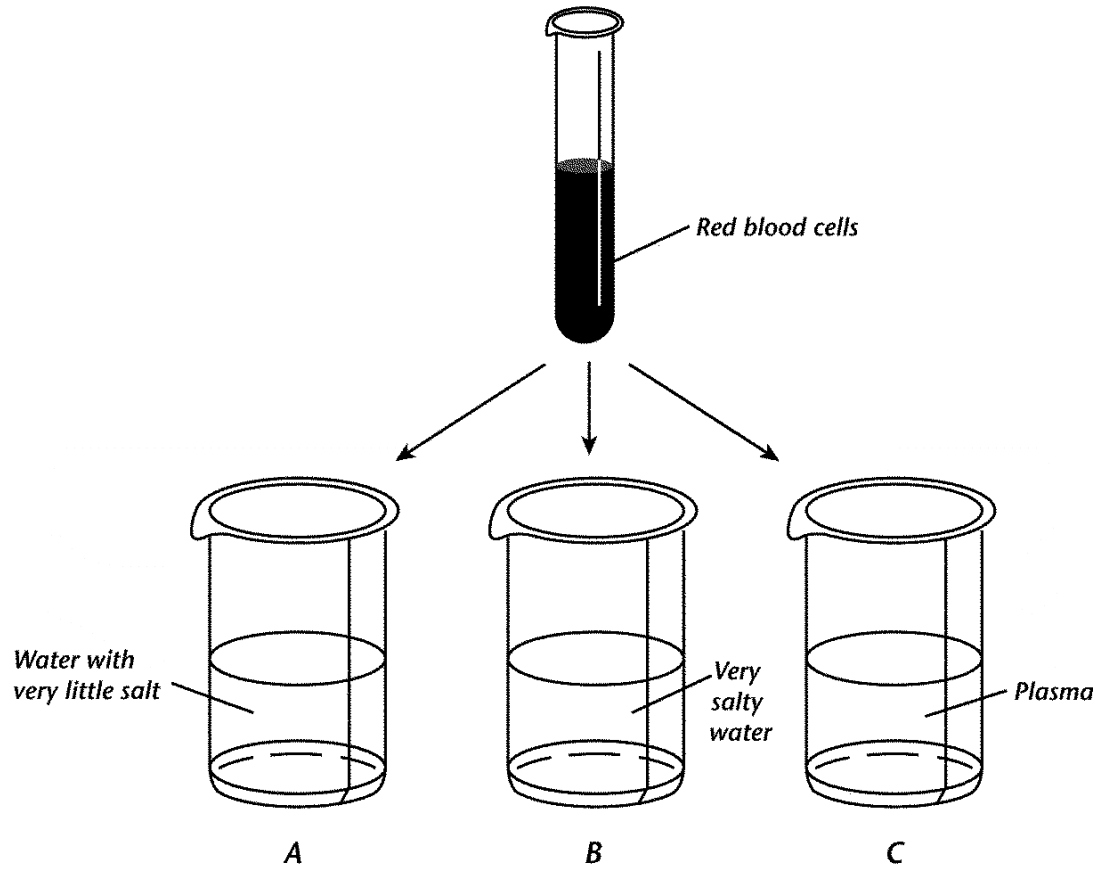
18. Which term refers to the production of energy by a cell without using oxygen?
  - a. photosynthesis
  - b. respiration
  - c. fertilization
  - d. fermentation
  
19. Which of these choices causes a form of alcoholic fermentation?
  - a. carbon dioxide
  - b. lactic acid
  - c. bread
  - d. yeast
  
20. What causes lactic-acid fermentation?
  - a. too little oxygen in muscle cells
  - b. too much oxygen in muscle cells
  - c. too little sugar in muscle cells
  - d. too much sugar in muscle cells
  
21. Mitosis is the stage during which
  - a. the cell's nucleus divides into two new nuclei.
  - b. the cell's DNA is replicated.
  - c. the cell divides into two new cells.
  - d. the cell's cytoplasm divides.
  
22. What are chromatids?
  - a. identical strands of chromosomes
  - b. identical daughter cells
  - c. doubled rods of condensed chromatin.
  - d. pigments that absorb the energy in sunlight
  
23. What forms around the chromatids during mitosis?
  - a. two new chromosomes
  - b. two new nuclei
  - c. two new cells
  - d. two new DNA molecules
  
24. Each rung of the DNA ladder is made of
  - a. a single nitrogen base.
  - b. a pair of nitrogen bases.
  - c. three nitrogen bases.
  - d. four nitrogen bases.
  
25. During DNA replication, adenine (A) always pairs with
  - a. guanine (G).
  - b. cytosine (C).
  - c. thymine (T).
  - d. adenine (A).

## COMPLETION

1. Sugars and starches are examples of organic compounds known as \_\_\_\_\_.
2. DNA and RNA belong to the group of organic compounds known as \_\_\_\_\_.
3. Most substances must be dissolved in \_\_\_\_\_ to be used by cells.
4. Unlike passive transport, active transport requires the cell to use \_\_\_\_\_.
5. The larger a cell is, the more \_\_\_\_\_ it takes for molecules to move through its cytoplasm.
6. Chloroplasts contain a pigment called \_\_\_\_\_ that captures the energy in light.
7. Small openings called \_\_\_\_\_ allow carbon dioxide to enter a leaf.
8. Plants make their own food using energy that comes from the \_\_\_\_\_.
9. Almost all living things depend on the process of \_\_\_\_\_ to supply them with the energy they need.
10. During respiration, glucose is combined with \_\_\_\_\_, releasing energy.
11. The main difference between respiration and fermentation is that respiration uses \_\_\_\_\_ to obtain energy from food.
12. The process in which yeasts break down sugars and produce carbon dioxide and alcohol is called \_\_\_\_\_ fermentation.
13. The products of respiration are energy, carbon dioxide, and \_\_\_\_\_.
14. The final stage of the cell cycle, during which the cytoplasm divides, is called \_\_\_\_\_.
15. A DNA molecule is often called a \_\_\_\_\_ because it twists like the threads of a screw.

**SHORT ANSWER**

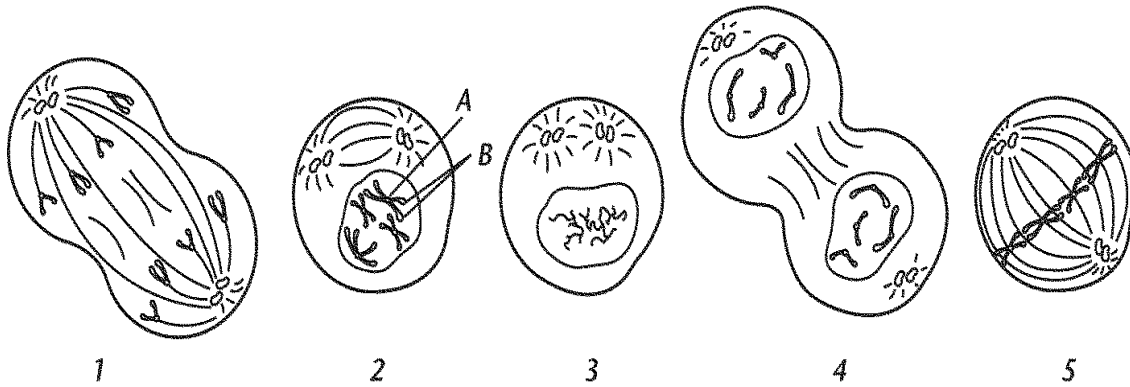
***Passive Transport in Red Blood Cells***



1. Explain what would happen if some of the red blood cells were placed in beaker A.

2. Explain what would happen if some of the red blood cells were placed in beaker B.

## The Cell Cycle



3. Identify the stages of the cell cycle represented by drawings 1-5.

4. List drawings 1-5 in their correct order, beginning with the drawing that represents interphase.

5. Explain what is happening in drawing 1.