

## CELL BIOLOGY: BIOLOGY HSA REVIEW

**A. Cell Structure and Function:** On the lines provided, match the appropriate cell structure with its function.



- |              |                  |
|--------------|------------------|
| a. cell      | f. cell membrane |
| b. cell wall | g. nucleus       |
| c. cytoplasm | h. prokaryote    |
| d. eukaryote | i. organelle     |
| e. chromatin | j. phagocytosis  |

- \_\_\_\_\_ 1. An organism whose cells contain a nucleus
- \_\_\_\_\_ 2. Granular materials visible within the nucleus
- \_\_\_\_\_ 3. The basic unit of life
- \_\_\_\_\_ 4. Specialized structures within a cell that perform important cell functions
- \_\_\_\_\_ 5. An organism whose cells do not contain a nucleus
- \_\_\_\_\_ 6. Strong layer around the cell membrane that protects the cell
- \_\_\_\_\_ 7. Process by which extensions of cytoplasm engulf particles
- \_\_\_\_\_ 8. Large structure that contains the genetic information of the cell
- \_\_\_\_\_ 9. Thin, double-layered sheet surrounding the cell
- \_\_\_\_\_ 10. Portion of the cell outside the nucleus

**B. Eukaryotic Cell Structure:** Use the chart to identify the structure and specific function for the various parts of a eukaryotic cell.

Eukaryotic Cell Structure		
Cell Part	Structure	Function
Cell wall		
Chromatin		
Nucleus		
Nucleolus		

<b>Ribosome</b>		
<b>Cytoplasm</b>		
<b>Nuclear envelope</b>		
<b>Endoplasmic reticulum</b>		
<b>Golgi apparatus</b>		
<b>Vacuole</b>		
<b>Lysosome</b>		
<b>Mitochondria</b>		

**C. Transportation:** In the following paragraph, identify the correct mode of transportation into and out of the cell. Complete each sentence using the terms below.

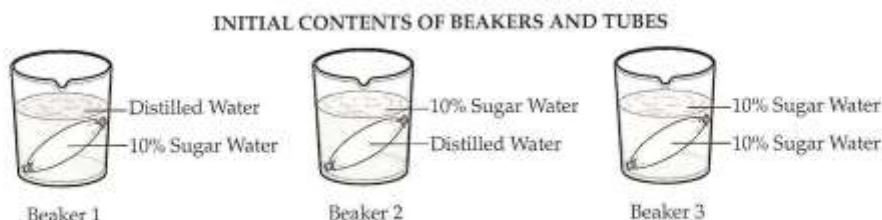
<b>diffusion</b> <b>osmosis</b> <b>concentration gradient</b>	<b>active transport</b> <b>passive transport</b> <b>active transport</b>
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In order to carry out the many functions needed to sustain life, cells must be able to take in nutrients. They must also be able to release wastes. One way that materials enter and leave a cell is through (1) \_\_\_\_\_, defined as the movement of particles from an area where their concentration is high to an area where their concentration is lower. In other words, particles travel from areas where they are crowded to areas where they are less crowded. Because this is a natural movement of particles, this process does not require the cell to expend any energy. The most important substance that passes through the cell membrane is water. Water passes through the cell membrane by a special process known

as (2) \_\_\_\_\_. In this process, water molecules move from a place of higher concentration to a place of lower concentration-either into or out of the cell. Both diffusion and osmosis are examples of (3) \_\_\_\_\_ transport since no energy is needed to move materials into or out of the cell. Passive transport is made possible by the difference in the (4) \_\_\_\_\_ of particles between two side-by-side regions. In (5) \_\_\_\_\_, materials move against a concentration gradient or from a region of lower concentration to a region of higher concentration. This type of movement requires energy. It's like pumping something up hill.

#### D. BCR

**A student is setting up an experiment using a type of bag that is permeable to water, but not to sugar. She will fill and weigh three bags and place each bag in a different beaker. The diagram below shows the contents of the bags and the beakers at the start of her experiment.**



- Predict whether after 15 minutes each bag will weigh less, the same, or more than it did at the beginning of the experiment.
  - Provide reasons for each of your predictions.
  - Use appropriate scientific terminology in your response.
- Write your answer on a separate sheet of paper.**

**E. True/False:** Indicate whether the sentence or statement is true or false. If false, change the underlined word or phrase to make the statement true.

- \_\_\_\_\_ 1. As the size of a cell increases, its ratio of surface area to volume increases.
- \_\_\_\_\_ 2. The smaller a cell is, the more difficult it is for the cell to move enough materials across its cell membrane.
- \_\_\_\_\_ 3. A cell's chromosomes are replicated during interphase.
- \_\_\_\_\_ 4. Typically, the longest phase of mitosis is metaphase.
- \_\_\_\_\_ 5. Cancer is a disorder in which some of the body's cells lose the ability to control growth and division.

\_\_\_\_\_ 6. A cell splits into two daughter cells during telophase.

**F. Organization:** On the lines provided, arrange the following terms in order from smallest to largest level of organization.

- \_\_\_\_\_ 1. Tissues
- \_\_\_\_\_ 2. Organ systems
- \_\_\_\_\_ 3. Organs
- \_\_\_\_\_ 4. Individual cells



**G. Reading Passage:** Use the reading passage below to answer the questions which follow.

### CELL SPECIALIZATION

As an organism develops, it changes shape and organization. During the stages of development, the cells begin to differentiate and form specialized regions of the body. Each organ or type of tissue is formed from a group of cells that have a similar structure and function. The four main types of tissues are epithelial tissue, connective tissue (including cartilage and bone), muscular tissue, and nerve tissue.

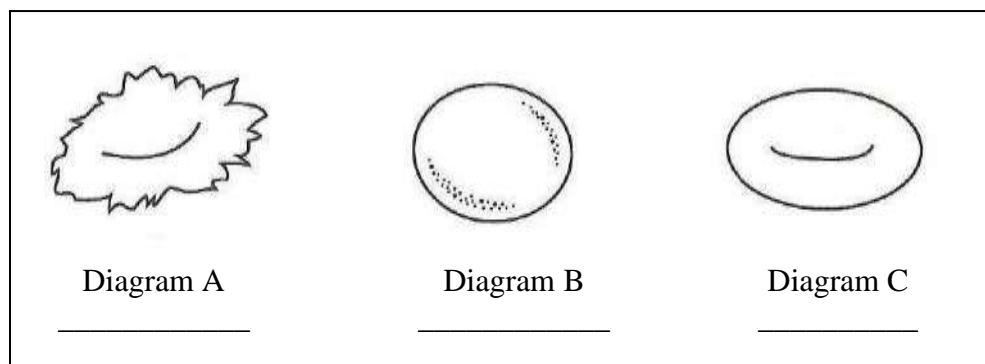
Epithelial tissue is formed by sheets of cells that act as a lining or covering inside or outside of the body. For example, your skin is composed of epithelial cells. Connective tissue is formed by cells that are joined together with fluid, semifluid, or solid substances. Your heart and lungs are surrounded by connective fibers. Many of your bones are capped in cartilage. Bone is the material that supports your skeletal structure. Bone contains solid materials, and there are many types of bones.

Muscular tissue is composed of specialized cells that contract in response to stimuli. Individual muscle fibers can be as long as several centimeters. Nerve tissue is made of nerve cells that consist of cell bodies and fibers. Nerve tissue coordinates the body by transmitting messages from all of its parts to and from the brain.

- \_\_\_\_\_ 1. According to the passage, how does a cell differentiate to form specialized regions of the body?
  - a. An organism develops and changes shape and organization .
  - b. Cells begin to differentiate and form specialized regions of the body.
  - c. A tissue is formed from a group of cells that have similar structure and function.
  - d. Cells differentiate into four different types of tissues.
  - e. all of these
- \_\_\_\_\_ 2. Body structures that are composed of layers are most likely formed from which of these types of tissues?
  - a. epithelial
  - b. connective
  - c. muscle

- \_\_\_\_\_ 3. d. nerve  
Based on the description, blood is a type of
- a. epithelial tissue
  - b. nerve tissue
  - c. connective tissue
  - d. muscle tissue

**H. Effect of Osmosis on Cells:** Identify the effect of osmosis on human blood cells.  
Label the diagram(s) as either a hypotonic, hypertonic, or isotonic environment.



**I. Concept Map:** Use the words provided to complete the concept map below.

a. Plant cells	d. Mitochondria
b. Chloroplast	e. Ribosome
c. Cell wall	f. Genetic information/DNA

