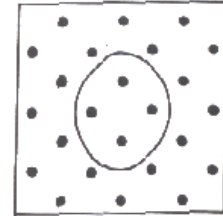
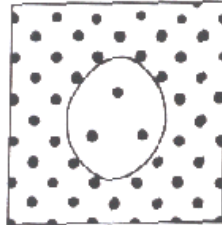
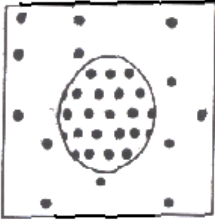


# Cellular Transport Worksheet

Answer the following questions using your notes and your textbook (mostly pp.201-206, but you may need information from other parts of the book).

## OSMOSIS

Copy the pictures below, and write the correct type of solution underneath (isotonic, hypertonic, or hypotonic)



\_\_\_\_\_

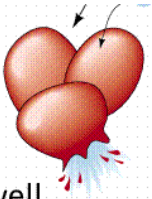
\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ tonic means there is a **GREATER** concentration of solute molecules **OUTSIDE** the cell than inside.

\_\_\_\_\_ tonic means there is a **LOWER** concentration of solute molecules **OUTSIDE** the cell than inside.

\_\_\_\_\_ tonic means there is the **SAME** concentration of solute molecules outside the cell as inside.



Cells swell and burst

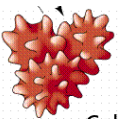
The **SWELLING AND BURSTING** of animal cells when water enters is called \_\_\_\_\_.

This happens when a cell is placed in a \_\_\_\_\_ tonic solution.



The **SHRINKING** of plant cells when water leaves so the cell membrane pulls away from the cell wall is called \_\_\_\_\_.

It happens when a plant cell is placed into \_\_\_\_\_ tonic solution.



Cells shrink and shrivel

The shrinking of **ANIMAL** cells that are placed in a **HYPERTONIC** solution is called \_\_\_\_\_.

Cells stay the same size when placed in an \_\_\_\_\_ tonic solution because the amount of water leaving the cell is the same and the amount of water entering.

**MULTIPLE CHOICE:** Circle and/or fill-in the answer(s) that best completes the sentence.

The substance that dissolves to make a solution is called the \_\_\_\_\_

- A. diffuser
- B. solvent
- C. solute
- D. concentrate

During diffusion molecules tend to move \_\_\_\_\_

- A. up the concentration gradient
- B. down the concentration gradient
- C. from an area of lower concentration to an area of higher concentration
- D. in a direction that doesn't depend on concentration

When the concentration of a solute inside and outside a cell is the same, the cell has reached \_\_\_\_\_.

- A. maximum concentration
- B. homeostasis
- C. osmotic pressure
- D. equilibrium

The diffusion of water across a selectively permeable membrane is called \_\_\_\_\_.

- A. active transport
- B. facilitated diffusion
- C. osmosis
- D. phagocytosis

Energy for active transport comes from a cell's \_\_\_\_\_.

- A. Golgi complex
- B. nucleus
- C. mitochondria
- D. lysosomes

\_\_\_\_\_ transport requires energy from ATP to move substances across membranes.

- A. Passive
- B. Active

In the iodine-starch experiment what did the plastic bag represent? \_\_\_\_\_

Which substance was able to pass through the plastic bag? \_\_\_\_\_ A. Iodine B. Starch

Why is it able to pass through the plastic bag? \_\_\_\_\_

All of the following are kinds of passive transport EXCEPT \_\_\_\_\_

- A. diffusion
- B. facilitated diffusion
- C. osmosis
- D. ion channels

When molecules move DOWN the concentration gradient it means they are moving from \_\_\_\_\_

- A. an area of low concentration to an area of higher concentration
- B. an area of high concentration to an area of lower concentration

The pressure exerted by water moving during osmosis is called \_\_\_\_\_ pressure.

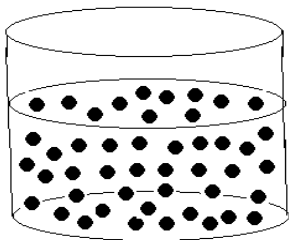
- A. tonic
- B. diffusion
- C. osmotic

Gases like oxygen and carbon dioxide move across cell membranes using \_\_\_\_\_

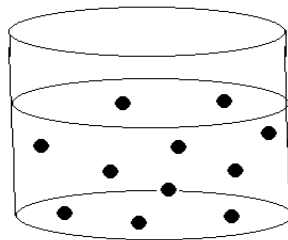
- A. ion channels
- B. diffusion
- C. facilitated diffusion

### Complete the transport terms. Some of the letters have been filled in!

1. Active transport requires E \_\_\_\_\_ to move molecules across membranes.
2. A \_\_\_\_\_ is the molecule that provides the energy for active transport.
3. D \_\_\_\_\_ moves oxygen and carbon dioxide molecules from a high concentration to a low concentration across membranes.
4. The cell organelles that burns glucose and provides ATP for active transport are the M \_\_\_\_\_.
5. Water moves across membranes by O \_\_\_\_\_.
6. A small membrane sac used to transport substances during exocytosis & endocytosis = V \_\_\_\_\_.
7. P \_\_\_\_\_ transport does NOT REQUIRE energy.
8. A cell placed in an I \_\_\_\_\_ solution neither swells or shrinks because the concentration of molecules outside the cell is the same as inside.
9. A solution in which there is a HIGHER concentration of molecules OUTSIDE the cell than inside = H \_\_\_\_\_.
10. A CONCENTRATION G \_\_\_\_\_ forms whenever there is a difference in concentration between one place and another.
11. A solution in which the concentration of molecules outside the cell is LOWER than inside = H \_\_\_\_\_.
12. When molecules move from high to low along a concentration gradient we say they are moving "D \_\_\_\_\_" the gradient.
13. O \_\_\_\_\_ pressure is caused by water inside a plant cell pushing against the cell wall.
14. The shrinking of a plant cell membrane away from the cell wall when placed in a hypertonic solution is called P \_\_\_\_\_.
15. The swelling and bursting of animal cells when placed in a hypotonic solution is called C \_\_\_\_\_.



A

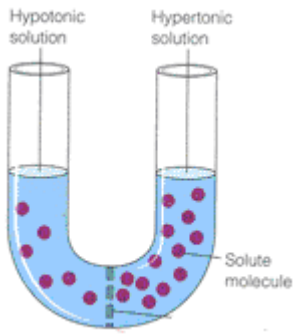


B

LOOK AT THE DIAGRAMS. The black dots represent solute molecules dissolved in water

In which beaker is the concentration of solute the greatest?

A or B



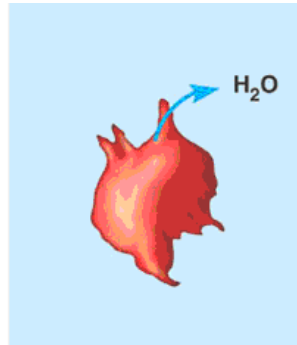
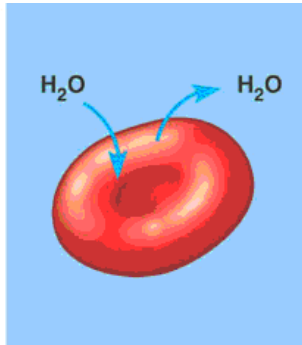
If the solute (dots) in this diagram is unable to pass through the dividing membrane, what will happen?

- A. the water level will rise on the right side of the tube
- B. the water level will rise on the left side of the tube
- C. the water level will stay equal on the two sides

Match the description with the solution type:

<b>A. Isotonic</b>	_____ solution with a lower solute concentration (more water)
	_____ solution in which the solute concentration is the same
<b>B. Hypertonic</b>	_____ condition plant cells require
	_____ condition that animal cells require
<b>C. Hypotonic</b>	_____ red blood cell bursts (cytolysis)
	_____ plant shrinks (Plasmolysis)
	_____ solution with a higher solute concentration (less water)
	_____ solution with a high water concentration

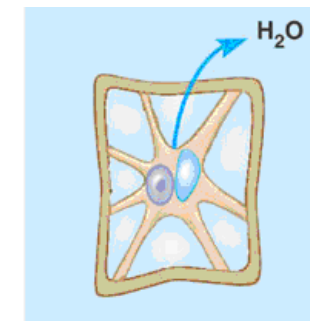
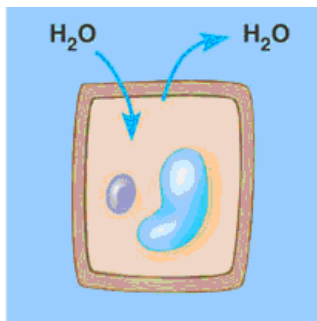
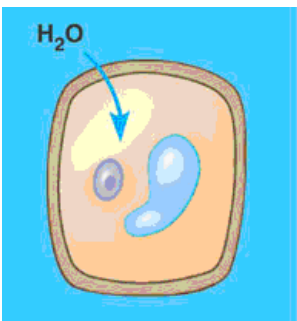
Label the tonicity for each solution (isotonic, hypotonic, or hypertonic):  
Pay close attention to the arrows!!!



\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_