**Biology 1** Name:

Tonicity and Osmosis Worksheet Date:

Hour:

**Part I. Fill in the blanks:**

A \_\_\_\_\_\_\_\_\_\_\_\_\_ is a fluid in which a substance is dissolved.

A \_\_\_\_\_\_\_\_\_\_\_\_\_ is a substance dissolved in a solvent.

A \_\_\_\_\_\_\_\_\_\_\_\_\_ is a combination of solute and solvent.

The process by which H20 diffuses across a membrane is called \_\_\_\_\_\_\_\_\_\_\_\_ .

**Part II. Look at the solutions illustrated below and fill in the blanks.**

1. **Solution B** is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to **solution A**. This is because **solution B** has a greater concentration of \_\_\_\_\_\_\_\_\_\_\_ in it than does **solution A**. **Solution C** has no solutes dissolved in it, therefore it is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to both **Solutions A** and **B**.
2. As the relative concentration of **solutes** in two solutions increases, of necessity the relative concentration of **water** in the same two solutions \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. **Solution A** has a lower concentration of \_\_\_\_\_\_\_\_ than does **Solution C**; **Solution A** is also **hypertonic** to **Solution C**.
3. If you wanted to make **Solution A isotonic** to **Solution B**, you could add **water** to Solution \_\_\_\_ **or** you could add **solute** to Solution \_\_\_\_ . If you took all three solutions, put them into a large container and mixed them thoroughly, then redistributed the solution among the three containers, **Solution A** would be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to **Solution B**. **Solution A** would also be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to **Solution C**, and **Solution C** would be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to **Solution B**.

**A B C**



**Part III.** Below are represented a **plant cell** and an **animal cell**. Refer to the **key** at the top left of page one and fill in the blanks below. (If you find yourself counting solute dots, you’re working **much** too hard!) **Assume that the cell membranes allow only water (not the solutes) to pass through.**

**animal cell plant cell**



**A B C**

1. Because the **cytoplasms** of the plant and the animal cell have **equal** concentrations of solutes, we can say that their cytoplasms are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to each other. If we put both the plant and the animal cells into **Solution A**, we would expect **no change** in the cells, because **Solution A** is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the cytoplasm of each cell.
2. Let’s put both cells into **Solution B**. Because **Solution B** is **hypertonic** to the cytoplasms of the cells, we would expect **water** to \_\_\_\_\_\_\_\_\_\_\_ the cells through the process of \_\_\_\_\_\_\_\_\_\_\_\_ . This would result in the cytoplasm of both cells shrinking.
3. Now we’ll put both the plant and the animal cell into **Solution C**, which, because it contains **no solutes** at all, is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the cytoplasm of both cells. \_\_\_\_\_\_\_\_\_\_\_\_ will enter both cells through **osmosis**. The **animal cell** is likely to \_\_\_\_\_\_\_\_\_\_\_\_\_\_, unfortunately. The **plant cell**, however, is protected from this because of the presence of its \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_, which is lacking in the animal cell.

WORD BANK FOR THIS ASSIGNMENT:

A

B

C

Osmosis Increases

Diffusion Decreases

Solvent Water

Solute

Solution

More

Less

Higher

Lower

Cell Wall

Cell Membrane

Hypertonic

Hypotonic

Isotonic

Move in/Enter

Move out/Leave

Swell (Turgor or Cytolysis)

Shrivel (Plasmolysis)