

Osmosis & Diffusion Worksheet:

1. **Y** or **N**: Is water always able to diffuse through a cell's selective permeable membrane?
2. **Y** or **N**: Are solutes always able to diffuse through a cell's selective permeable membrane?
3. The movement of molecules across a cell membrane against its concentration gradient is called _____.

Below are animal cells placed in beakers of various concentrations

For each beaker:

- A. **Draw** an arrow to show which way the water would move by osmosis.
- D. **Draw and label** what would happen to the cell as a result of diffusion/osmosis (shrink, swell).
- E. **Name** the type of solution (hypertonic, isotonic, hypotonic).
- F. **If** there are any missing percentages, **fill** them in.

For cells 10-18, **the particle size of the solute is not able to diffuse** through the semi-permeable membrane.

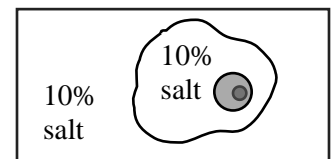
1.	2.	3.
<div style="border: 1px solid black; border-radius: 50%; width: 60px; height: 60px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> <div style="text-align: left; padding: 2px;"> %H₂O 10% solute </div> </div> <div style="margin-top: 10px;"> % H₂O 20% solute </div>	<div style="border: 1px solid black; border-radius: 50%; width: 60px; height: 60px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> <div style="text-align: left; padding: 2px;"> % H₂O 40% solute </div> </div> <div style="margin-top: 10px;"> % H₂O 30% solute </div>	<div style="border: 1px solid black; border-radius: 50%; width: 60px; height: 60px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> <div style="text-align: left; padding: 2px;"> 75% H₂O % solute </div> </div> <div style="margin-top: 10px;"> 80% H₂O % solute </div>
4.	5.	6.
<div style="border: 1px solid black; border-radius: 50%; width: 60px; height: 60px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> <div style="text-align: left; padding: 2px;"> % H₂O 43% solute </div> </div> <div style="margin-top: 10px;"> % H₂O 60% solute </div>	<div style="border: 1px solid black; border-radius: 50%; width: 60px; height: 60px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> <div style="text-align: left; padding: 2px;"> 60% H₂O 40% solute </div> </div> <div style="margin-top: 10px;"> 80% H₂O % solute </div>	<div style="border: 1px solid black; border-radius: 50%; width: 60px; height: 60px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> <div style="text-align: left; padding: 2px;"> % H₂O 10% solute </div> </div> <div style="margin-top: 10px;"> % H₂O 10% solute </div>
7.	8.	9.
<div style="border: 1px solid black; border-radius: 50%; width: 60px; height: 60px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> <div style="text-align: left; padding: 2px;"> %H₂O 15% solute </div> </div> <div style="margin-top: 10px;"> 80% H₂O % solute </div>	<div style="border: 1px solid black; border-radius: 50%; width: 60px; height: 60px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> <div style="text-align: left; padding: 2px;"> %H₂O 39% solute </div> </div> <div style="margin-top: 10px;"> % H₂O 20% solute </div>	<div style="border: 1px solid black; border-radius: 50%; width: 60px; height: 60px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> <div style="text-align: left; padding: 2px;"> 90% H₂O % solute </div> </div> <div style="margin-top: 10px;"> 35% H₂O % solute </div>

Matching

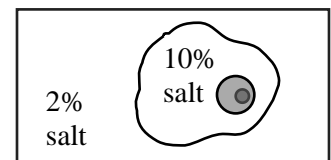
- | | | | | |
|--------------|--------------|------------|-------------------|---------------------------|
| a. away | d. low | g. high | j. hypertonic | m. hypotonic |
| b. diffusion | e. molecules | h. osmosis | k. vacuole | n. water |
| c. solute | f. permeable | i. towards | l. semi-permeable | o. concentration gradient |

1. The cell membrane regulates and controls what kind of _____ move in & out of the cell.
2. When molecules spread from an area of high to low concentration to, it is called _____.
3. As molecules diffuse, they create a _____, which is a difference in concentrations across space.
4. Cell membranes are _____. This means that they only allow certain things to pass through.
5. A membrane that would allow ANYTHING to pass through it would be called _____.
6. Diffusion is the movement of molecules. Osmosis is the diffusion of _____
7. _____ is the process of water molecules moving across a cell membrane.
8. The direction that water molecules move is determined by the difference in the concentration of _____ dissolved in the solvent inside and outside the cell.
9. Osmotic pressure, or osmosis, pushes water molecules _____ the area of greater solute concentration.
10. Water molecules are pulled _____ from areas of lower solute concentration.
11. The word hypertonic means _____ concentration of solutes.
12. The word hypotonic means _____ concentration of solutes.
13. A plant cell undergoes plasmolysis, or shrinking of the cell membrane, when it is placed in a solution with a HIGH concentration of solute. What type of solution causes plasmolysis? _____.
14. An animal cell undergoes cytolysis, or stretching of the cell membrane, when it is placed in a solution with a very LOW concentration of solute. What type of solution causes cytolysis? _____
15. Turgor pressure is the flow of water into a plant cell that causes the cell membrane to be pushed up against the cell wall and causes the sac in a plant cell to expand. What is this sac that holds this water from the turgor pressure? _____

16. _____ In the picture to the right, the movement of water across the membrane will be
(A) mostly out (B) mostly in (C) in and out equally



17. _____ In the picture to the right, the movement of water across the membrane will be
(A) mostly out (B) mostly in (C) in and out equally



18. _____ In the picture to the right, the movement of water across the membrane will be
(A) mostly out (B) mostly in (C) in and out equally

