OPHS Biology Name: _____

# THE CELL MEMBRANE

***Composition of the Cell Membrane & Functions***

The cell membrane is made of a phospholipid _____. Phospholipids cam allow water and other _____ molecules to pass through into or out of the cell. This is known as simple _____ because it does not require _____.

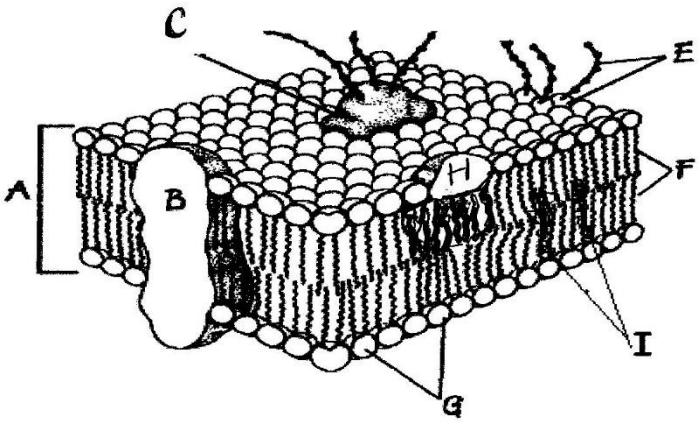
***SKETCH AND LABEL*** a phospholipid coloring the heads red and the tails blue. Draw two (showing how they arrange themselves in the cell membrane).

**PHOSPHOLIPID DRAWING:**

Proteins called _____ proteins go all the way through the bilayer, while _____ proteins are only on one side. Large molecules like carbohydrates use proteins to help move across the cell membrane.

Correctly ***color code and identify*** the name for each part of the cell membrane.

| Letter | Name/Color | Letter | Name/Color |
|---|---|---|---|
| _____ | Phospholipid bilayer (no color) | _____ | Phosphate heads (yellow) |
| _____ | Integral Protein (pink) | _____ | Cholesterol (blue) |
| _____ | Fatty acid tails (orange) | _____ | Glycoprotein (Carbohydrate) (green) |
| _____ | Peripheral protein (red) | _____ | Glycolipid (purple) |




***Match*** the cell membrane structure or its function with the correct letter from the cell membrane diagram.

| Letter | Structure/Function | Letter | Structure/Function |
|---|---|---|---|
| _____ | **Attracts water** | _____ | **Repels water** |
| _____ | **Helps maintain strength of membrane** | _____ | **Make up the bilayer** |
| _____ | **Involved in cell-to-cell recognition** | _____ | **Help transport certain materials across the cell membrane** |

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**Cell Transport Word Problems**

***Directions:*** *For each description of cell transport given below, circle the bold term that correctly completes the statement.*

1. Suppose you are trying to transport glucose across the cell membrane in red blood cells. Glucose is a large, polar molecule, so it must cross the membrane using **Diffusion / Facilitated Diffusion.**

2. Farming that is done in very dry regions of the world leaves salts (solutes) that build up in the soil. Excess salt in the soil (the environment surrounding plant cells) is bad because it causes water to move **Into / Out Of** the plant cells from a **High / Low** water concentration inside the plant cell to a **High / Low** water concentration in soil.

3. Last night, a skunk accidentally got locked in your friend's house. While it was in the kitchen, it heard the icemaker in the refrigerator and got scared. Instinctually, it sprayed its smelly mist over the kitchen. Within ten minutes, your friend (who was asleep in the bedroom) awoke to a terrible smell. The smell got into the bedroom by diffusing **Up / Down** its concentration gradient. This is an example of **Passive / Active** transport.

4. A cell needs to take in Na+ from its outside environment, but Na+ has a higher concentration inside the cell than in the outside environment. The only way to move Na+ into the cell is by **Passive / Active** transport using **Channel Proteins / Protein Pumps.**

5. A cell needs to send out large amounts of waste. The cell uses **Endocytosis / Exocytosis** to send this waste out of the cell using **Channel Proteins / Vesicles.**

6. You have a cell, with a semi permeable membrane and a 1.5% potassium concentration. You put it into a solution of 2% potassium. The outside solution is **Hypotonic / Hypertonic / Isotonic** to the cell. Water will move **Into / Out of** the cell and cause the cell to **Decrease / Increase / Stay Constant** in size.

7. You have a cell, with a semi permeable membrane and a 1.5% potassium concentration. You put it into a solution of 1.5% potassium. The outside solution is **Hypotonic / Hypertonic / Isotonic** to the cell. Water will move **Into / Out of** the cell and cause the cell to **Decrease / Increase / Stay Constant** in size.

8. You have a cell, with a semi permeable membrane and a 1.2% chloride concentration. You put it into a solution of 1.05% chloride. The outside solution is **Hypotonic / Hypertonic / Isotonic** to the cell. Water will move **Into / Out of** the cell and cause the cell to **Decrease / Increase / Stay Constant** in size.

9. You have a cell, with a semi permeable membrane and a 0.5% calcium concentration. You put it into a solution of 0.05% calcium. The outside solution is **Hypotonic / Hypertonic / Isotonic** to the cell. Water will move **Into / Out of** the cell and cause the cell to **Decrease / Increase / Stay Constant** in size.

10. You have a cell, with a semi permeable membrane and a 0.05% sodium concentration. You put it into a solution of 0.2% sodium. The outside solution is **Hypotonic / Hypertonic / Isotonic** to the cell. Water will move **Into / Out of** the cell and cause the cell to **Decrease / Increase / Stay Constant** in size.

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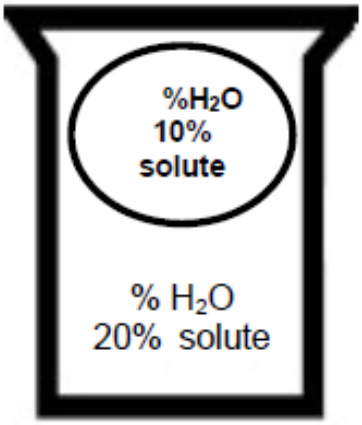
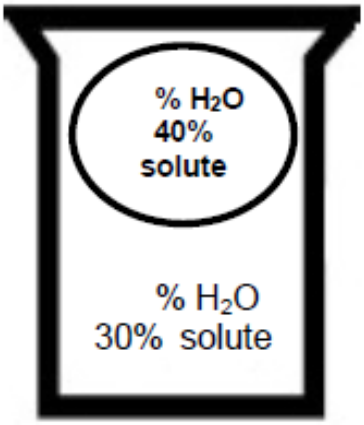
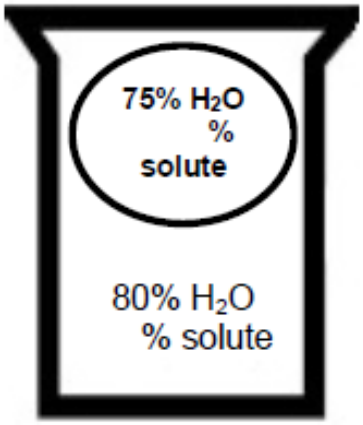
_____

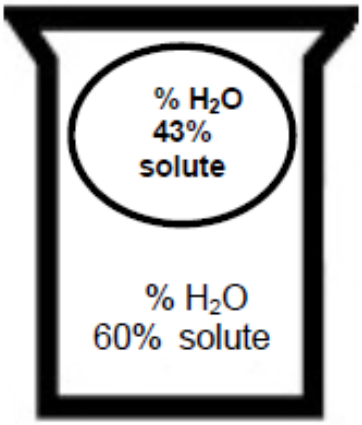
**Osmosis Beaker Practice Problems**

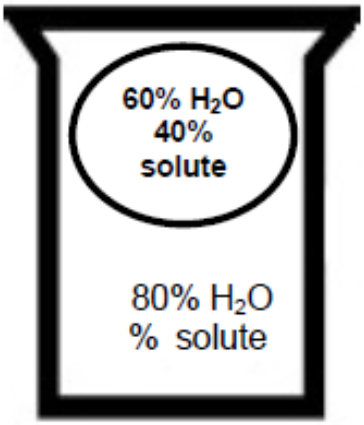
**Directions:** For each diagram, fill in the missing %s, record what type of solution it is and draw arrows representing the direction of water.

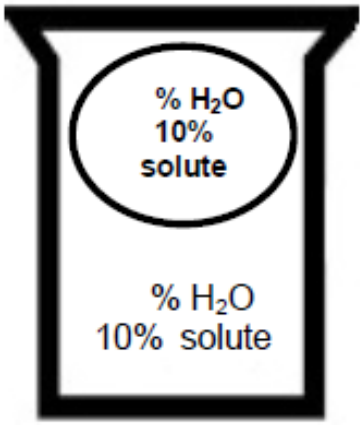


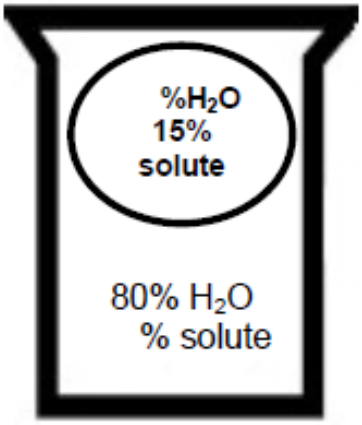



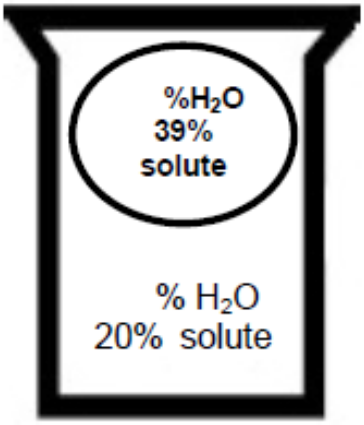



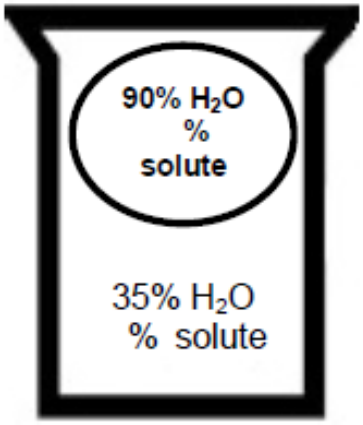



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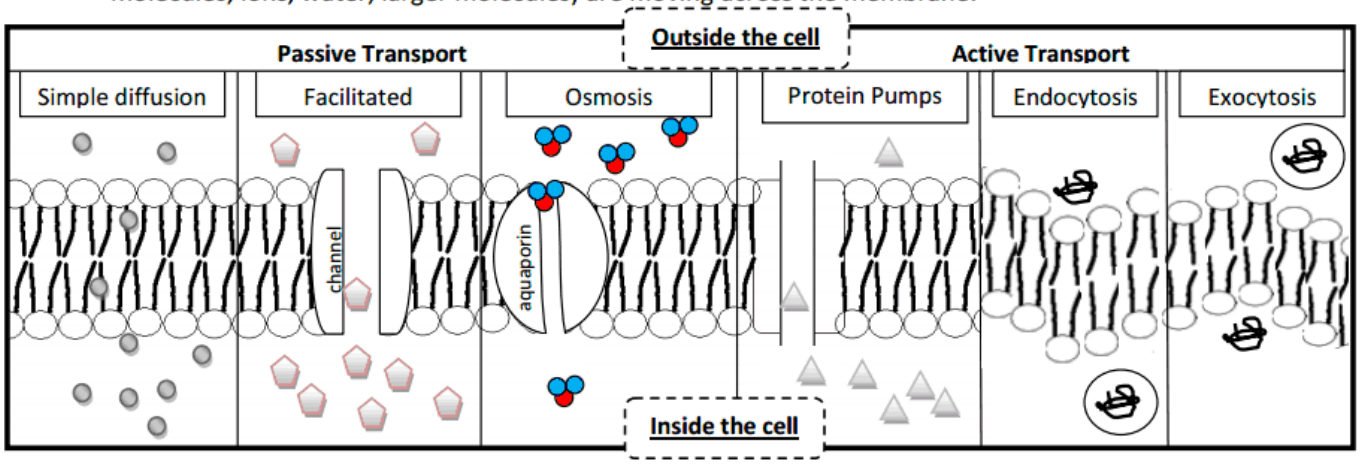
# Cell Transport G.O.

- ✓ **Circle** one **phospholipid** and label – **hydrophilic heads**, **hydrophobic tails**.
- ✓ For each type of transport, use an **arrow** to show the direction the **substances** (small molecules, ions, water, larger molecules) are moving across the membrane.




| | | | | | |
|---|---|---|---|---|---|
| **Uses Energy?** Yes / No | Yes / No | Yes / No | Yes / No | Yes / No | Yes / No |
| **Summary:** | | | | | |

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# Cellular Transport Diagrams

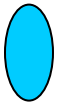
**Key:**

 Large Solute

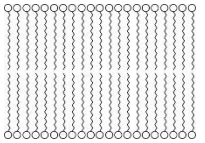
 Small Solute

 Water Molecule

 Channel (Transport) Protein

 Protein Pump

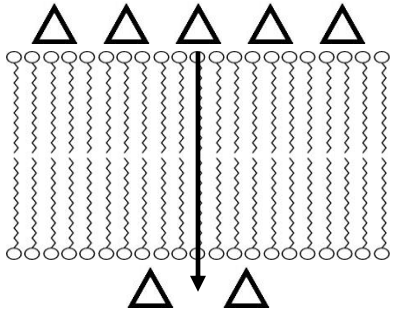
 Energy

 Phospholipid Bilayer in Cell Membrane

*Directions: Four types of cell transport are shown below. Circle the terms that make each statement correct for each type of transport.*

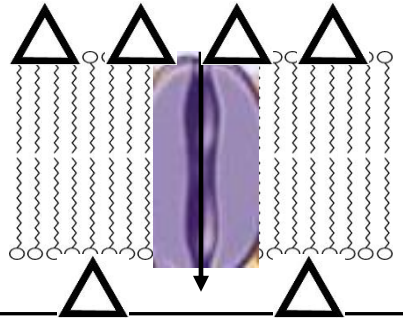
## Diffusion:

1. Solutes move from **high to low / low to high** concentration.
2. Solutes move **down / up** the concentration gradient.
3. **Passive / Active** transport.



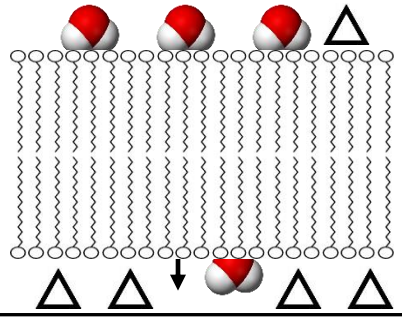
## Facilitated Diffusion:

1. Solutes move from **high to low / low to high** concentration.
2. Solutes move **down / up** the concentration gradient.
3. **Passive / Active** transport.



## Osmosis:

1. Water moves from **high to low / low to high** concentration.
2. Water moves **down / up** the water concentration gradient.
3. **Passive / Active** transport.



## Active Transport:

1. Solutes move from **high to low / low to high** concentration.
2. Solutes move **down / up** the concentration gradient.
3. **Requires / does not require** energy.