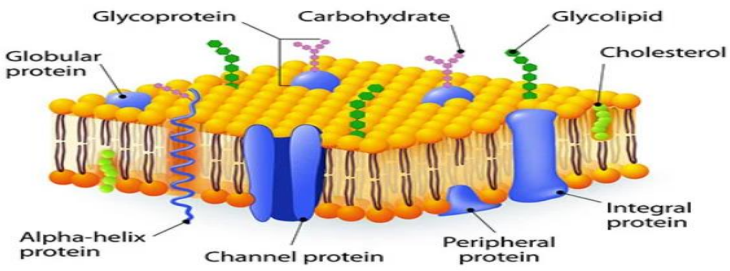
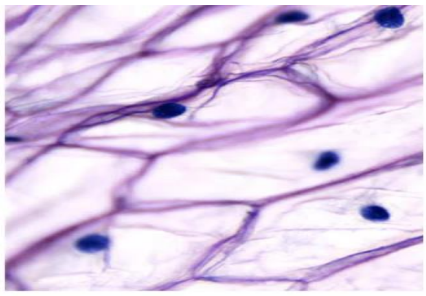
Name:_____ Period:_____ Date:_____
Score:_____

# Virtual Cell Membrane Lab



**NGSS Standard(s):**

- **HS-LS1.A** Structure and Function: Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells

## I. Introduction:

The cell membrane or plasma membrane protects cells. It also provides several different functions such as:

1. Transport oxygen, ions, and nutrients into the cell
2. Transport carbon dioxide, ions, and toxic substances out of the cell
3. Provides some structural support for the cell
4. Holds proteins like glycoproteins which interact with other cells
5. Separate vital but incompatible metabolic processes conducted within organelles

## Research the following types of transport:

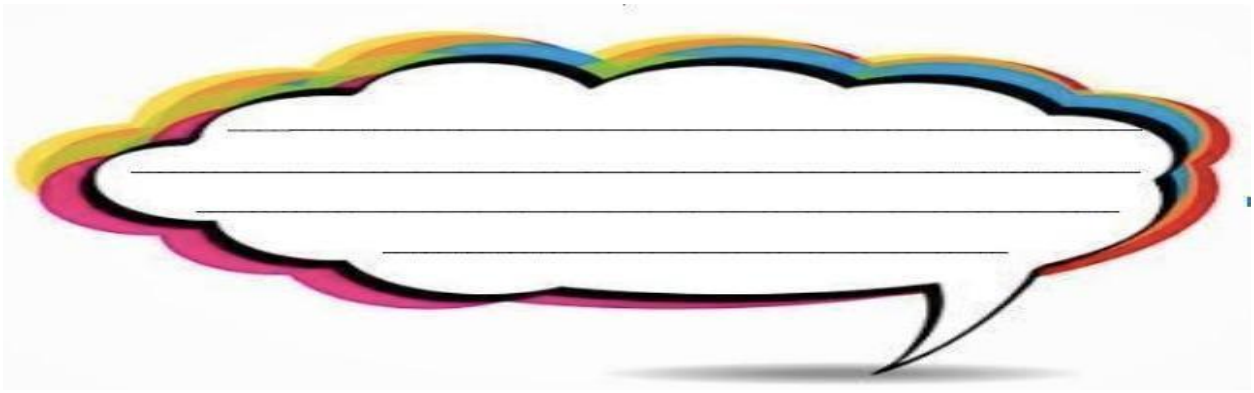
Describe diffusion.

How are osmosis and diffusion similar and different?

What is active transport?

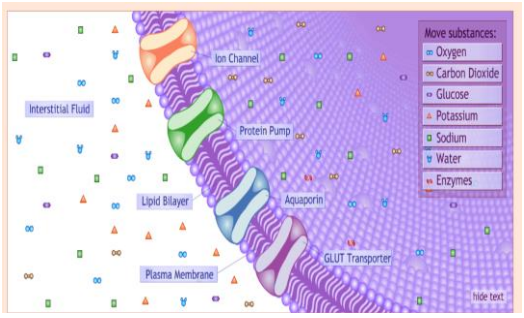
What are the types of bulk transport? Do they require ATP?

## II. Hypothesis: We understand that the cell membrane is like a gate that protects the cell. Predict how this process would evolve if each cell contained two cell membranes.



## III. Virtual Cell Membrane Lab Procedures:

1. Access Cell Membrane virtual lab website: https://contrib.pbslearningmedia.org/WGBH/conv19/tdc02-int-membraneweb/index.html
2. Click to complete the table using your knowledge to identify what happened to each substance (oxygen - enzymes) as it travels through the Cell Membrane.
3. Click on show text to check your answers after each substance (oxygen-enzymes) is completed.
4. Complete data tables.




## IV. Use the Virtual lab to complete the following data tables.

U.S. BIOLOGY TEACHING
Save Time, Engage Students, Love Teaching

| hide text mode: | **Amount of substance outside the cell (Interstitial fluid)** | **Amount of substance inside the cell (Cytosol)** | **Action that occurred:** diffusion, osmosis, or active transport | **Passageway:** Ion Channel, Protein Pump, Lipid Bilayer, Aquaporin, GLUT transporter or Endocytosis | **Amount or type of substance(s) relocated** |
|---|---|---|---|---|---|
| **Oxygen**  | | | | | |
| **Carbon Dioxide**  | | | | | |
| **Glucose**  | | | | | |
| **Potassium**  | | | | | |
| **Sodium**  | | | | | |
| **Water**  | | | | | |
| **Enzymes**  | | | | | |

| show text mode: | **Use the show text mode to review and describe the action of each substance into or out of the cell membrane. Describe your findings and conclusions.** |
|---|---|
| **Oxygen**  | |
| **Carbon Dioxide**  | |
| **Glucose**  | |
| **Potassium** | |

| | |
|---|---|
|  | |
| **Sodium**  | |
| **Water**  | |
| **Enzymes**  | |


**Robert Hooke was the first scientist who discovered the present-day cell membrane, but which team of scientists transformed our current knowledge of cell membrane with the discovery of lipid bilayer?**