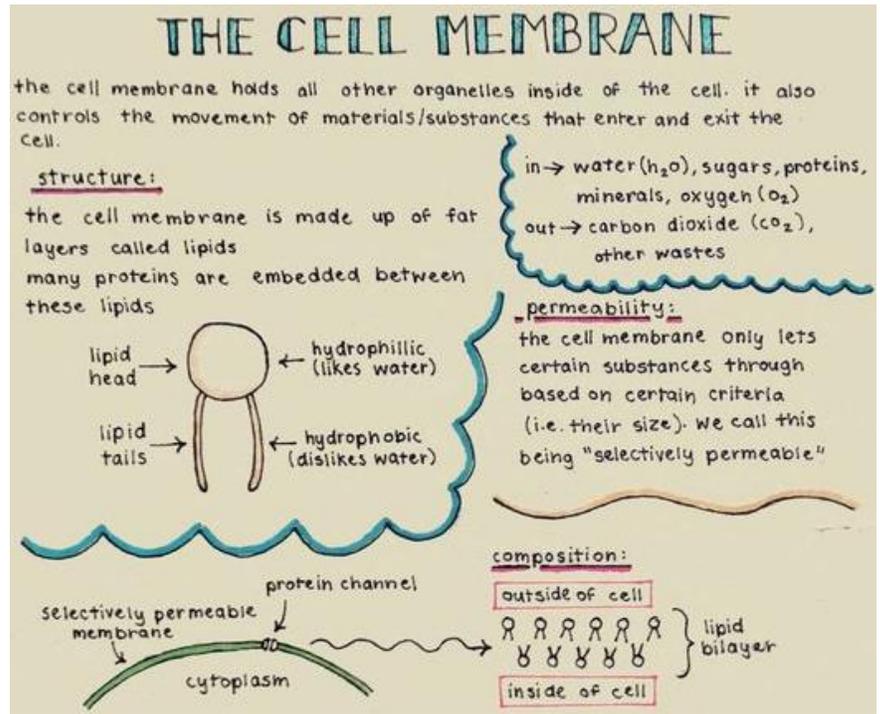


Key Terms:

- Plasma membrane homeostasis
- phospholipid bilayer hydrophilic head
- Hydrophobic tail fatty acid
- cholesterol semi-permeable
- Selectively permeable
- carbohydrate ion
- polar/nonpolar Channel protein
- simple diffusion facilitated diffusion
- Concentration gradient
- passive diffusion active transport
- carrier proteins ATP
- glycoproteins immune system

PART ONE: Model Analysis.

Directions: Observe what is going on in the diagrams and fill in the table with your assessments.



Simple Diffusion (Passive) – non-carrier mediated diffusion	
Along which concentration gradient do the molecules move (from <i>low to high</i> or from <i>high to low</i> concentration)	
Which molecules can cross the membrane freely? (water, glucose, polar, non-polar)	
Which types of molecules are unable to cross the membrane freely? (water, glucose, polar, non-polar)	
Are membrane transport proteins needed for these molecules to cross (yes/no)	
Where in the body would you predict this might happen?	

Osmosis	
Along which concentration gradient do the molecules move (from <i>low to high</i> or from <i>high to low</i> concentration)	
Which molecules can cross the membrane freely? (water, glucose, polar, non-polar)	
Types of solutions. Does water enter or leave or both the inside of the cell?	Diagram A: Diagram B: Diagram C:
How might this be different between animal and plant cells (you saw plant cells the other day!)	
Where in the body would you predict this might happen? Why do you say this?	

Passive Transport – Facilitated Diffusion	
Along which concentration gradient do the molecules move (from <i>low to high</i> or from <i>high to low</i> concentration)	
Which molecules can cross the membrane freely? (water, glucose, polar, non-polar)	
Are membrane transport proteins needed for these molecules to cross (yes/no). What types of membrane proteins are needed, if present?	
What are examples of molecules that use a protein channel? Look at diagram...	
What are examples of molecules that use a carrier protein? Again...diagram.	
What unique set of steps do you see in the membrane proteins? Which protein does this and what do you observe about this action?	
Where in the body might this take place? (Research)	

Active Transport	
Along which concentration gradient do the molecules move (from <i>low to high</i> or from <i>high to low</i> concentration)	
Which molecules can cross the membrane freely? (water, glucose, polar, non-polar)	
Are membrane transport proteins needed for these molecules to cross (yes/no)	
What new molecule is present during active transport? Where do you remember seeing this molecule this year?	
What are the similarities/differences between the proteins in active transport vs. facilitated diffusion?	
Where in the body would you predict this might happen?	

PART TWO. Comparing Passive vs. Active Transport ([video link here](#)) or ([webpage link here](#))

RULE: Active transport moves substances from an area of _____ concentration to an area of _____ concentration that requires the use of _____ to do so.

Label the diagram below:

A: _____

A1: _____

A2: _____

B: _____

C: _____

D: _____

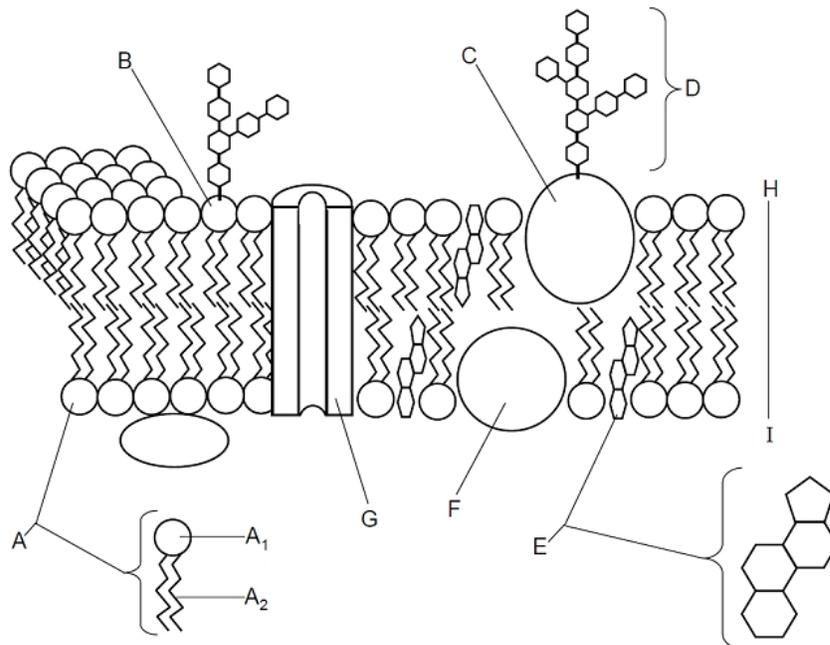
E: _____

F: _____

G: _____

H: _____

I: _____



Cell Defense: The Plasma Membrane ([Link to simulation](#))

Directions: Read the steps here and all the information on the screen. Follow all the steps carefully filling in all the blanks.

Step 1: Use the link on the class website to go to the “Cell Defense” Simulation. You want to move to the “Choose Your Challenge!” menu. From the menu choose “Build a Membrane!” Dr. Vial has a vile weapon (note the play on words) that destroys plasma membranes. Without a _____ cells of living things will die because they are unable to maintain _____.

Step 2: Zoom in on the plasma membrane. From the “Urgent Message” you learn that phospholipids made up of a _____ head and two _____ tails.

The heads are _____ which means _____.

The tails are _____ which means _____.

The heads face out towards the _____ and the tails facing _____.

Draw and label the phospholipid in the box:

Step 3: Repair the phospholipid membrane.

How many phospholipids did it take? _____

Step 4: What do you have to put into

the membrane to help stabilize it? _____ . How many did you add? _____

Step 5: What is another word for selectively permeable? _____ .

What does that mean? _____



Step 6: What 2 molecules easily pass through the membrane? Record why for each.

Molecule 1	Molecule 2
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Step 7: What 3 molecules cannot easily pass through the membrane? Record why for each.

Molecule 1	Molecule 2	Molecule 3
------------	------------	------------

What does polar mean? _____

Step 8: Insert channel proteins into the membrane. Transport substances across the membrane. Note: You can only transport substances using channel proteins until there were _____

_____. What is this process called? _____

Step 9: Moving from _____ to _____ concentration requires the use of energy to _____ substances. This is called _____ transport and uses: (place answer in table)

1.	2. Which is cell _____
----	---------------------------

Step 10: Carbohydrates are like identification badges. Cells that have different membrane carbohydrates do different _____ . The immune system uses the carbohydrates to

_____ that your cells belong to _____ and are not _____, _____, or other foreign cells.

What does the immune system do to foreign invaders? _____

What kind of cell does this? _____

Step 11: Next take the "Membrane Structure Challenge!"

Step 12: Take the "Diffusion Challenge!"

Step 13: Take the “Energy and Transport Challenge!”

How many ATP did you use? _____ What type(s) of protein(s) were used? _____
_____ Explain when each type was used. _____

Step 14: Take the “Osmosis Challenge!”

What is Osmosis? _____

What is the name of the special proteins that let water pass through? _____

Is this passive or active transport? _____

Step 15: From your Scores Sheet record the following:

Lab Score (% correct): _____ Number Correct: _____ Number Incorrect: _____

Reflection:

The chemical that was responsible for the Chicago Tylenol murders we covered was _____.

Discuss your thoughts on what type of molecule that was and why it was able to do so much harm to the 8 people who were murdered. _____
