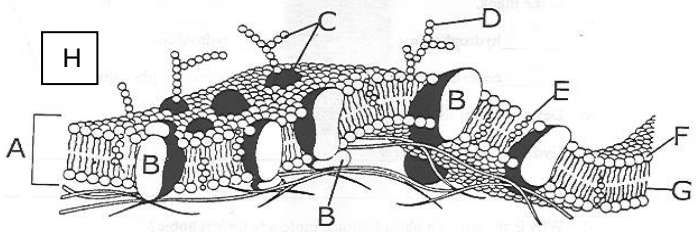
Class Notes **<u>Cell Membrane</u>** **Questions/Main Idea:**	Name: _____ Period:_____ Date: _____ **Notes:**

What are the major functions of the cell membrane?	• His friends call him the plasma membrane
	• He is thin and flexible
	• He has two main functions:
	  o Protection – protects the cell from the outside environment
	  o Regulation – controls what can enter and exit the cell
	• He is *selective:* allows some things to pass through more easily than others
	• He is *selectively permeable:* permeate is a fancy way to say "pass through."

What is the Fluid Mosaic Model?	• The cell membrane is NOT a rigid structure with immovable components! • The cell membrane is *fluid-like and flexible* • Within the membrane, molecules can move around

What is the Phospholipid bilayer?	• LIPIDS: Phospholipids make up the majority of the cell membrane
	  o Hydrophilic head made of phosphates (Phospho)
	  o Hydrophobic tail made out of fatty acids (Lipid)
	• To protect the hydroPHOBIC tails from water, they form a bilayer which keeps the tails huddled inside and the water-loving heads outside.

More parts of the cell membrane	• Also embedded within the lipid bilayer are proteins and carbohydrate chains • Protein molecules bring materials into the cell and receive signals from outside the cell • Carbohydrate molecules (attached to proteins or lipids) have antenna to help cells identify or recognize other cells
Match the cell membrane structure or function with the correct letter from the diagram	 ____Protein (only) ____Carbohydrate (only) ____Lipid bilayer ____Phosphate Head ____Fatty Acid Tail ____ Involved in cell recognition ____Carb. attached to a lipid (look for the sugar rings) ____ Helps move large material across the membrane ____Carb. attached to a protein ____Outside cell

What is a solution?	• Molecules dissolved in a liquid = SOLUTES
	• Liquid/fluid dissolving them = SOLVENT
	• These two together make a SOLUTION
	  o In a salt solution, _____ is the solute and _____ is the solvent
	  o In a sugar solution, sugar is the solute and water is the solvent.

What are concentration and equilibrium?	• Solutions will spread out their dissolved molecules until they are equal throughout.
	• EQUILIBRIUM = molecules are spread equally
	• CONCENTRATION = number of molecules in an area per unit volume.
	  o **High** concentration: more solutes per unit volume
	  o **Low** concentration: less solutes per unit volume

What happens with a barrier?	• If the solutions on either side of the barrier have the **same concentration** we call that being at **equilibrium**. • At equilibrium, both the solvent and solute move back and forth across the barrier: there is **always movement**.
Transport of Materials Across the Cell Barrier	• Materials move across the plasma • membrane in two ways: • Passive Transport – movement across the membrane ***without using energy*** • Active Transport – movement across membrane that ***requires energy***
Types of Passive Transport: 1. Diffusion	• Solutes move across a membrane from areas of high concentration (crowded) to low concentration • Because diffusion depends upon random particle movements, diffusion across cell membranes **does not** require the cell to use energy.
Types of Passive Transport: 2. Osmosis	• A special name for diffusion of water! • Water molecules (fast and small) pass through the cell's *selectively permeable* membrane • The solute molecule is too large to pass -- only the water diffuses until equilibrium is reached.
Types of Passive Transport: 3. Facilitated Diffusion	• Large molecules or those with a charge need the help of a protein to pass across a cell membrane • Proteins form a channel and molecules move through the "doorway" • Each channel is specific to a particular type of molecule • Doesn't require energy => passive transport
Active Transport	• Some movement across a cell membrane requires energy because it is AGAINST the concentration (it *moves solutes from low to high concentration*—where it's already crowded) • When there is a difference in solution concentrations we say that there is a concentration gradient. • Three types of active transport…
Active Transport 1. Pump	• **Pump –** a special type of protein is used to PUSH molecules to across the membrane • Ex: the Sodium and Potassium (Na/K) Pump.
Active Transport 2. Endocytosis	• **Endocytosis** (endo=in): a pocket (vacuole) forms around a large molecule **outside** the cell and buds inward to release the material **inside** the cell.
Active Transport 2. Exocytosis	• **Exocytosis** (exo=out): a vacuole **inside** the cell fuses with the cell membrane and forces the material **outside** the cell.
Summary:	