
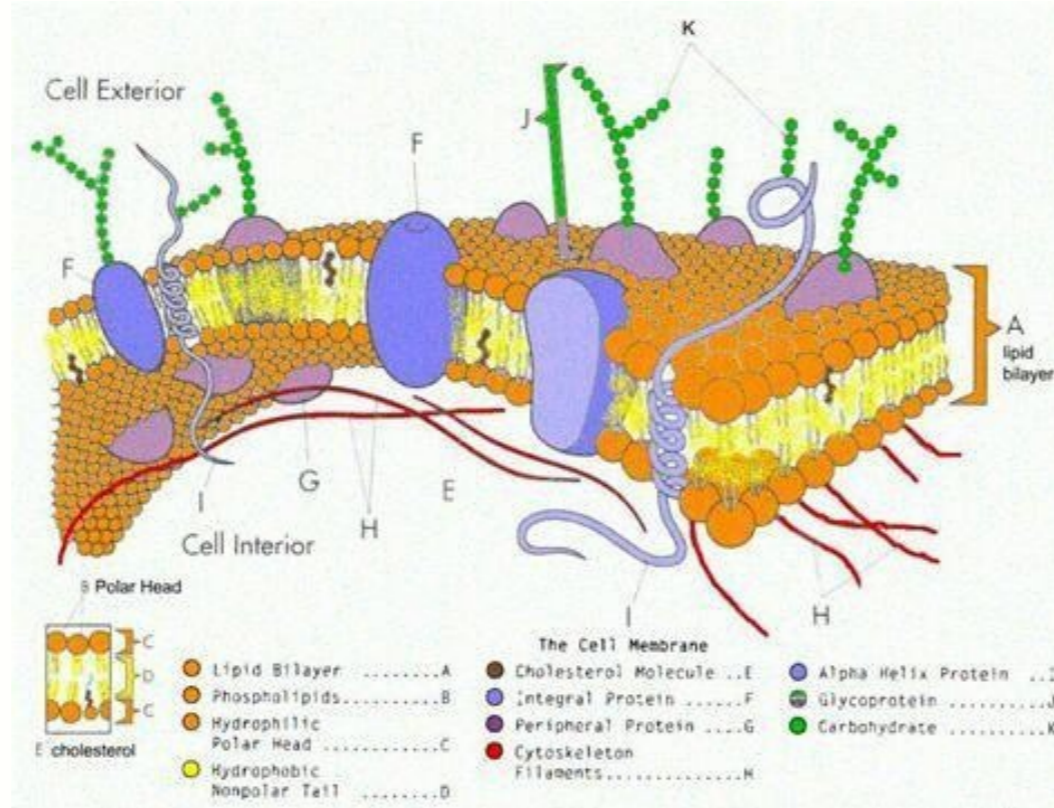


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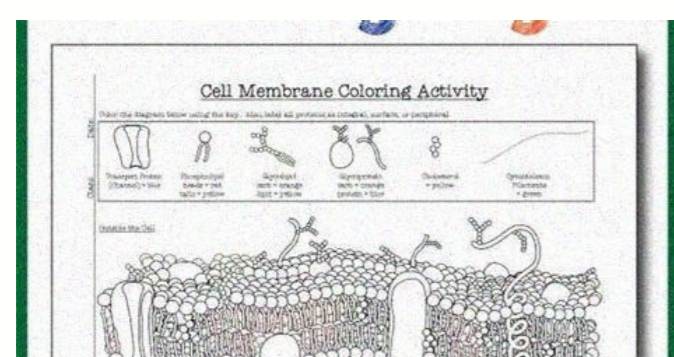
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Cell membrane structure and function coloring worksheet

DATE _____ PERIOD _____ Cell Membrane & Tonicity Worksheet
 Composition of the Cell Membrane & Functions The cell membrane is also called the PLASMA membrane and is made of a phospholipid BI-LAYER. The phospholipids have a hydrophilic (water attracting) HEADS and two hydrophobic (water repelling) TAILS. The head of a phospholipid is made of an alcohol and GLYCEROL group, while the tails are chains of FATTY ACIDS.



SELECTIVE TRANSPORT C.



Some of the membrane proteins have carbohydrate PARTS attached to help cells in recognize each other and certain molecules. List 4 functions of the cell or plasma membrane: a. CELL SIGNALING b. SELECTIVE TRANSPORT c. EXCRETION OF WASTES d. STRUCTURAL SUPPORT
 Correctly color code and identify the name for each part of the cell membrane. Letter Name/Color Letter Name/Color A Phospholipid bilayer (no color) H Peripheral protein (red) B Integral protein (pink) I Cholesterol (blue) F Fatty acid tails (orange) C Glycoprotein (green) G Phosphate heads (yellow) E Glycolipids (purple)
 Match the cell membrane structure or its function with the correct letter from the cell membrane diagram. Letter Structure/Function Letter Structure/Function G Attracts water F Repels water I Helps maintain flexibility of membrane G & F Make up the bilayer C & E Involved in cell-to-cell recognition B Help transport certain materials across the cell membrane
 Define osmosis. THE MOVEMENT OF WATER ACROSS A SELECTIVELY PERMEABLE MEMBRANE FROM AN AREA OF HIGH CONCENTRATION TO AN AREA OF LOW CONCENTRATION. In which direction does water move across membranes, up or down the concentration gradient? DOWN Define these 3 terms: a. isotonic- THE CONCENTRATION OF DISSOLVED PARTICLES ARE THE SAME INSIDE AND OUTSIDE THE CELL - THERE IS NO OVERALL CHANGE IN THE CELL SIZE b. hypertonic THE CONCENTRATION OF DISSOLVED PARTICLES ARE HIGHER OUTSIDE THE CELL THAN INSIDE THE CELL- WATER WILL LEAVE THE CELL IN AN ATTEMPT TO DILUTE THE OUTSIDE CONCENTRATION c. hypotonic THE CONCENTRATION OF DISSOLVED PARTICLES ARE LOWER OUTSIDE THE CELL THAN INSIDE THE CELL- WATER WILL ENTER THE CELL IN AN ATTEMPT TO DILUTE THE INSIDE CONCENTRATION Use arrows to show the direction of water movement into or out of each cell. Color and label the cell in an isotonic environment light blue, the hypotonic environment yellow, and the hypertonic environment light green. Match the description or picture with the osmotic condition: A. Isotonic C solution with a lower solute concentration A solution in which the solute concentration is the same B. Hypertonic A condition plant cells require A condition that animal cells require C. Hypotonic C red blood cell bursts (cytolysis) C plant cell loses turgor pressure (Plasmolysis) B solution with a higher solute concentration A plant cell with good turgor pressure C solution with a high water concentration Label the tonicity for each solution (isotonic, hypotonic, or hypertonic): HYPOTONIC ISOTONIC HYPERTONIC HYPOTONIC ISOTONIC HYPERTONIC As a relative concentration of solutes in two solutions increases, of necessity the concentration of water in the same two solutions INCREASES. Solution A has a lower concentration of SOLUTE than does Solution C; Solution A is also hypertonic to Solution B; Solution A would be ISOTONIC to Solution C, and Solution C would be ISOTONIC to Solution B. Part III - Look at the solutions and cells illustrated above and fill in the blanks. Because the cytoplasm of the plant and the animal cell have equal concentrations of solutes, we can say their cytoplasm are ISOTONIC to each other. If we put both the plant and the animal cells into Solution A, we would expect no change in the cells, because Solution A is ISOTONIC to the cytoplasm of each cell. Let's put both cells into Solution B. Because Solution B is hypertonic to the cytoplasm of the cells, we would expect water to LEAVE the cells through the process of OSMOSIS.

Multiple Choice Circle the best possible answer to the question and label the answer.

1. Which of the following is NOT a function of the cell membrane?
 a. cell signaling b. selective transport c. excretion of wastes d. structural support

2. The phospholipid bilayer is made of:
 a. phospholipids b. cholesterol c. integral proteins d. peripheral proteins

3. The hydrophilic part of a phospholipid is:
 a. the head b. the tail c. the phosphate group d. the glycerol backbone

4. The hydrophobic part of a phospholipid is:
 a. the head b. the tail c. the phosphate group d. the glycerol backbone

5. Which of the following is NOT a function of a protein in the cell membrane?
 a. transport b. signaling c. structural support d. enzymatic activity

6. The primary function of cholesterol in the cell membrane is to:
 a. provide structural support b. regulate fluidity c. transport molecules d. signal to other cells

7. The fluid mosaic model of the cell membrane suggests that:
 a. the membrane is a static structure b. the membrane is a fluid structure c. the membrane is a solid structure d. the membrane is a gel structure

8. The movement of water across a membrane from an area of high concentration to an area of low concentration is called:
 a. osmosis b. diffusion c. active transport d. facilitated diffusion

9. In an isotonic solution, a cell will:
 a. swell b. shrink c. remain the same d. burst

10. In a hypertonic solution, a cell will:
 a. swell b. shrink c. remain the same d. burst

11. In a hypotonic solution, a cell will:
 a. swell b. shrink c. remain the same d. burst

12. The process by which a cell takes in large molecules is called:
 a. endocytosis b. exocytosis c. osmosis d. diffusion

13. The process by which a cell releases large molecules is called:
 a. endocytosis b. exocytosis c. osmosis d. diffusion

14. The primary function of a glycoprotein in the cell membrane is to:
 a. transport molecules b. signal to other cells c. provide structural support d. regulate fluidity

15. The primary function of a channel protein in the cell membrane is to:
 a. transport molecules b. signal to other cells c. provide structural support d. regulate fluidity

Some of the membrane proteins have carbohydrate PARTS attached to help cells in recognize each other and certain molecules. List 4 functions of the cell or plasma membrane: a. CELL SIGNALING b. SELECTIVE TRANSPORT c. EXCRETION OF WASTES d. STRUCTURAL SUPPORT
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 Define osmosis.

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Cell Membrane Coloring Worksheet

Composition of the Cell Membrane & Functions
 The cell membrane is also called the _____ membrane and is made of a phospholipid _____. The phospholipid has a hydrophilic (water attracting) _____ and two hydrophobic (water repelling) tails. The head of a phospholipid is made of an alcohol and _____ group, while the tails are chains of _____. Phospholipids can move _____ and allow water and other molecules to pass through into or out of the cell. This is known as simple _____ because it does not require _____ and the water or molecules are moving _____ the concentration gradient.
SKETCH AND LABEL a phospholipid coloring the heads red and the tails blue. PHOSPHOLIPID

Another type of lipid in the cell membrane is _____ that makes the membrane more fluid. Embedded in the phospholipid bilayer are _____ that also aid in diffusion and in cell recognition. Proteins called _____ proteins go all the way through the bilayer, while _____ proteins are only on one side. Integral proteins are also called _____ proteins. Large molecules like _____ or carbohydrates use proteins to help move across cell membranes. Some of the membrane proteins have carbohydrate _____ attached to help cells in recognize each other and certain molecules.

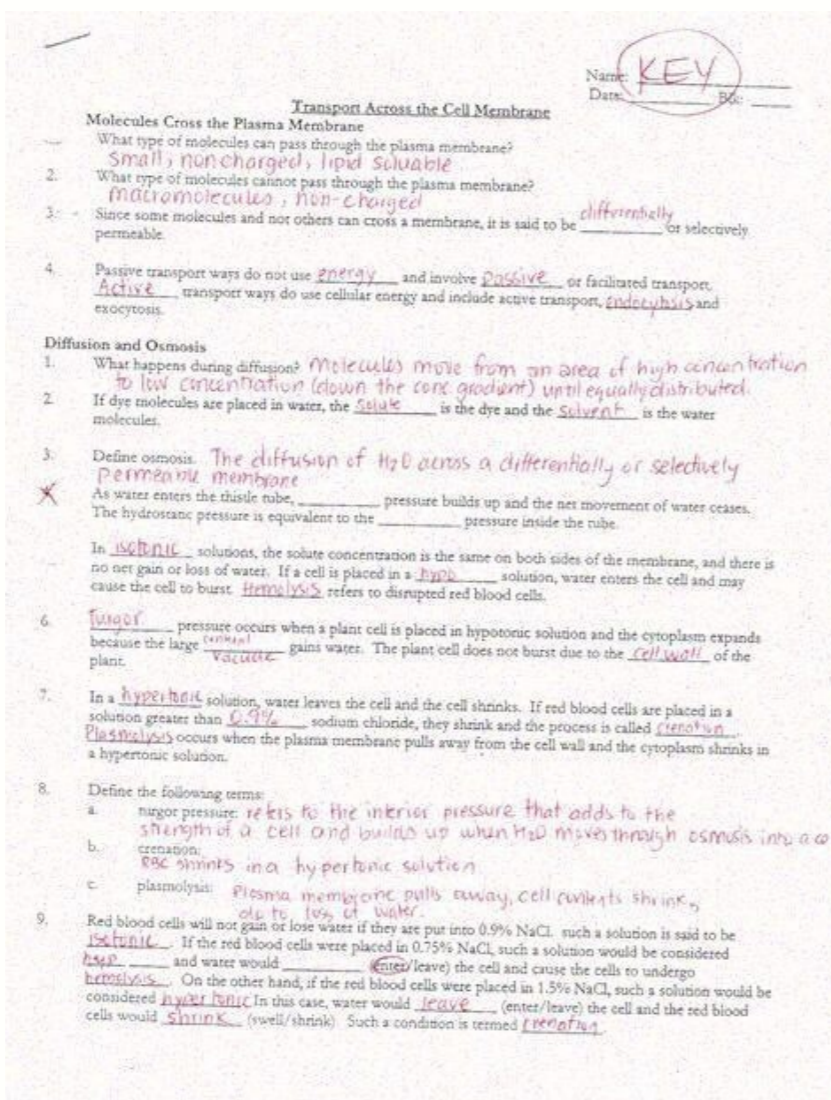
List 4 functions of the cell or plasma membrane:
 a. _____
 b. _____
 c. _____
 d. _____

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

Some of the membrane proteins have carbohydrate PARTS attached to help cells in recognize each other and certain molecules. List 4 functions of the cell or plasma membrane: a. CELL SIGNALING b. SELECTIVE TRANSPORT c. EXCRETION OF WASTES d. STRUCTURAL SUPPORT
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because of the presence of its CELL WALL. Refer to the U-tube pictures above when answering the questions below.

Why did the number of water molecules on each side of the membrane change, whereas the number of sugar molecules stayed the same? WATER MOLECULES ARE SMALL ENOUGH TO PASS THROUGH THE PORES OF THE MEMBRANE. HOWEVER, THE SUGAR MOLECULES ARE NOT. How does the plasma membrane of a cell compare with the membrane in the U-shaped tube? THEY ARE BOTH SELECTIVELY PERMEABLE BASED ON SIZE OF PARTICLES Explain the behavior of water molecules in the isotonic solution. WATER MOLECULES WILL MOVE INTO AND OUT OF THE CELL CONTINUOUSLY, HOWEVER, THERE WILL BE NO OVERALL CONCENTRATION CHANGE SINCE THE MOVEMENT SHOULD BE EQUAL. Does osmosis occur if a cell is placed in an isotonic solution? NO, BECAUSE THERE IS NO CONCENTRATION GRADIENT (AREA OF HIGH TO AREA OF LOW - ISOTONIC IMPLIES EQUAL CONCENTRATIONS) Why does water enter a cell that is placed in a hypotonic solution? BECAUSE THE CONCENTRATION OF SOLUTE IS LOWER OUTSIDE THE CELL THAN IT IS INSIDE THE CELL, SO THE WATER ENTERS THE CELL TO TRY TO DECREASE/EQUALIZE THE CONCENTRATIONS ON BOTH SIDES OF THE MEMBRANE.



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Solution A would also be ISOTONIC to Solution C, and Solution C would be ISOTONIC to Solution B. Part III - Look at the solutions and cells illustrated above and fill in the blanks. Because the cytoplasm of the plant and the animal cell have equal concentrations of solutes, we can say their cytoplasm are ISOTONIC to each other. If we put both the plant and the animal cells into Solution A, we would expect no change in the cells, because Solution A is ISOTONIC to the cytoplasm of each cell. Let's put both cells into Solution B. Because Solution B is hypertonic to the cytoplasm of the cells, we would expect water to LEAVE the cells through the process of OSMOSIS. This would result in the cytoplasm of both cells shrinking. Now we'll put both the plant and animal cell into Solution C, which, because it contains no solutes at all, is HYPOTONIC to the cytoplasm of both cells. WATER will enter both cells through osmosis. The animal cell is likely to BURST, unfortunately. 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Transport Protein = dark blue (Channel) tails = yellow heads = red Phospholipid Glycolipid lipid = yellow carb = orange carb = orange Glycoprotein protein = light blue Cholesterol = yellow Cytoskeleton = green Filaments Inside the Cell Outside the Cell Color the diagram below using the key. Also, label all proteins as integral, surface, or peripheral Other Membrane Proteins = light blue (C) 2014 Bethany Lau Name: _____ Class: Date: _____ Cell Membrane: Structure and Function Matching: Match the cell membrane component with a description of its function. © 2014 Bethany Lau 1 Membrane Protein A. Lipids with carbohydrate chains that can serve as cell recognition markers 2 Cytoskeleton Filaments B. Proteins with carbohydrate chains that can serve as cell recognition markers and can help neighboring cells interact or stick to each other 3 Cholesterol C. Proteins that can send to nearby cells or receive signals from outside their cell. They can also serve as anchors for other proteins inside the cell. 4 Phospholipid D. Proteins that help carry substances across the membrane or allow molecules to pass through a channel. 5 Transport or Channel Proteins E. Lipids with hydrophobic tails and hydrophilic heads that form two layers in the membrane 6 Glycolipid F. A hydrophobic lipid molecule that changes the fluidity of the membrane 7 Glycoprotein G. Long protein chains that help the cell hold its shape. Organelles and other large molecules can travel along these chains like super highways in the cell. Short Answer Questions 40s: Explain the differences between integral, peripheral, and surface proteins. Look at the protein below. Label the diagram on the right and show which part of the protein has hydrophobic amino acid residues and what part of the protein has peripheral, integral, or surface proteins. I recently added in a page of questions that asks students matching questions about the cell membrane components' functions! There are also two open-ended questions for students to answer. If you have any questions, suggestions, or corrections, please leave a question on the question and answer section of my store and I will get back to you quickly! If you like this resource, please let me know and leave feedback here! © 2014 Bethany Lau Terms of use: Purchasing or downloading my teaching resources allows you to: * Make copies for your own classes only. * Place this file on your own password-protected class page or server (Blackboard, Google Drive, etc.) AS LONG AS no other teacher has access to that class webpage. If you and a team of teachers would like to use this resource together, please purchase additional licenses on the resource purchase page. 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