NAME_____ DATE_____ SCORE_____

Cell Membrane Reading Guide & Coloring Worksheet

Composition of the Cell Membrane & Functions

The cell membrane, or the _____, forms a boundary between a cell and the outside environment and consists of a double layer of _____ interspersed with a variety of other molecules. A phospholipid is a molecule composed of three basic parts:

- _____
- _____
- _____

The _____ and the _____ groups form the "head" of a phospholipid; the _____ form the "tail". Because the head bears a charge, it is _____ and forms hydrogen bonds with _____ molecules. In contrast, the fatty acid tails are _____ and cannot form hydrogen bonds with water. As a result, the nonpolar tails are attracted to each other and repelled by water. SKETCH and LABEL a phospholipid coloring the heads red and the tails blue.

PHOSPHOLIPID

The properties of polar _____ and nonpolar _____cause the phospholipids to arrange themselves in layers, like a sandwich. The _____heads are like the bread. They form the _____surfaces of the membrane, where they interact with the _____environment both outside and inside a cell. The _____ tails are like the filling. They are sandwiched between the _____of polar heads, where they are protected from the watery environment.

Other molecules, which are embedded within the phospholipid layers, give the membrane properties and characteristics it would not otherwise have.

- _____ molecules strengthen the cell membrane.
- Some _____ extend through one or both phospholipid layers and help materials _____the membrane. Other proteins are key components of the _____. Different cell types have different membrane proteins.
- _____attached to membrane proteins serve as _____ tags, enabling cells to distinguish one type of cell from another.

Read Chapter 3.3 on pages 77 – 80 of your text to answer this worksheet.

ANALYSIS:

Q1. How are cytoskeleton proteins involve in the membrane?

Q2. What is the function of the protein channels?

Q3. Which part of the membrane is nonpolar?

List 3 functions of the cell or plasma membrane:

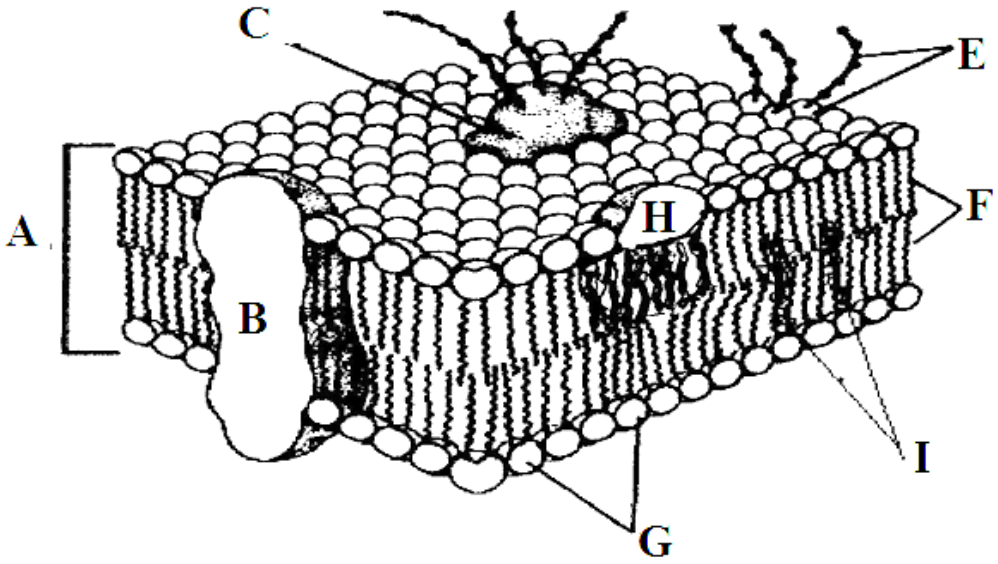
a. _____
b. _____
c. _____

Fluid Mosaic Model

The _____, which describes the arrangement of the molecules that make up a cell membrane based on two characteristics. First, the cell membrane is _____, not rigid. The _____ in each layer can move from side to side and slide past each other so the membrane behaves like a fluid. However, _____ embedded in the membrane do not flip vertically. Second, the variety of _____ studding the membrane is similar to the arrangement of colorful tiles with different textures and patterns that make up a dynamic _____.

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

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



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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 flexibility of membrane	_____	Make up the bilayer
_____	Involved in cell-to-cell recognition	_____	Help transport certain materials across the cell membrane

Selective Permeability

The cell membrane has the property of _____, which means it allows some, but not all, materials to cross. Selective permeability enables a cell to maintain _____ in spite of unpredictable, changing conditions _____ the cell.

Q4. Why should the cell control the import and export of certain molecules and ions?

Molecules cross the membrane in several ways. Some of these methods require the cell to expend _____; others do not. How a particular molecule crosses the membrane depends on the _____, _____, and _____inside versus outside the cell. In general, _____ molecules easily pass through the cell membrane, small polar molecules are transported via _____, and large molecules are moved in _____.

Redraw the diagrams in Figure 3.2, Figure 3.3 and Figure 3.4 in the boxes below. Color the appropriate structures, and write a description of the process drawn on the lines below each box. Mark the direction of molecular movement with a red arrow.

Outside Inside	Outside Inside	Outside Inside

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

Figure 3.2 Figure 3.3 Figure 3.4

Read Chapter 3.3 on pages 77 – 80 of your text to answer this worksheet.

Chemical Signals

A _____ is a protein that detects a signal molecule and performs an action in response. It _____ and _____to only certain molecules ensuring that the right cell gets the right signal at the right time. The molecule a receptor binds to is called a _____. When a receptor and a ligand bind they change _____.

There are _____ major types of receptors are present in your cells:

a) _____ receptors are located within a cell and bind to molecules that cross directly through the membrane
b) _____ receptors are located in the membrane, bind to molecules that cannot cross it, and transmit the signal to the cell interior by changing shape.

Q5. Why is it important for ligands and receptors to change shape when they bind?

Q6. Discuss how aldosterone maintain normal blood pressure by describing

- ***how the hormone crosses the cell membrane***
- ***what type of receptors are involved***
- ***which body cell and what body processes are affected***

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