Name: _____ Date: _____

Cell Transport WebQuest

Biomembranes I: Membrane Structure and Transport

Go to http://www.phschool.com/science/biology_place/biocoach/biomembrane1/intro.html

Concept 1: Membrane Structure

Membranes consist of a _____ _____ combined with a variety of _____ in a fluid _____ arrangement.

The surfaces of cell membranes are _____ (water-loving); the interiors are _____ (water-fearing).

Hydrophilic molecules tend to interact with _____ and each other. Hydrophobic molecules _____ interaction with water and tend to interact with other _____ molecules.

Concept 2: Osmosis

Osmosis (movement of _____ across membranes) depends on the relative _____ of solute molecules on either side of the _____.

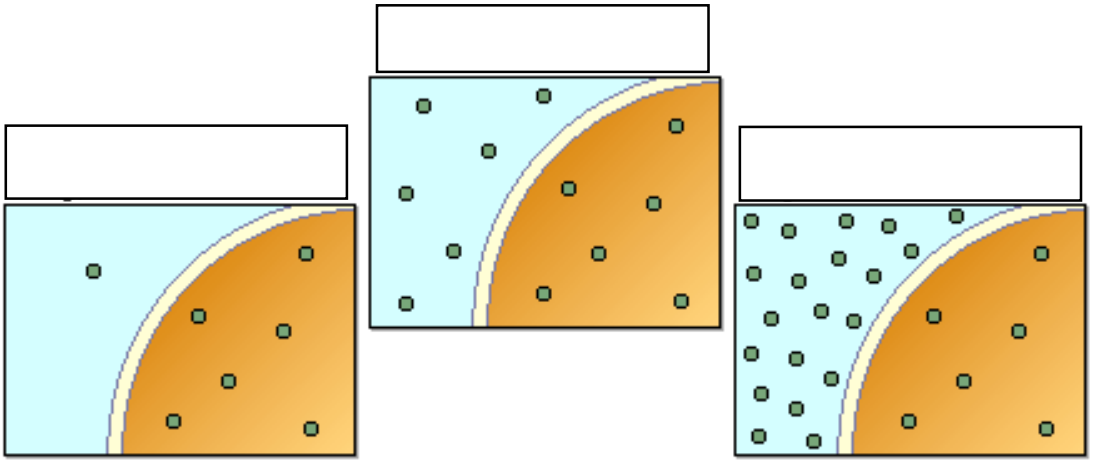
The presence or absence of cell _____ influences how cells respond to osmotic fluctuations in their environment.

Click on "Review" in the upper right hand corner. It will open up a new screen.

Concept 2 Review: Isotonic, Hypotonic, and Hypertonic Solutions

Water moves readily across cell membranes through special protein-lined _____, and if the total concentration of all dissolved solutes is not _____ on both sides, there will be net _____ of water molecules into or out of the cell. Whether there is net movement of water into or out of the cell and which _____ it moves depends on whether the cell's environment is isotonic, hypotonic, or hypertonic.

Label the three illustrations below as *isotonic*, *hypotonic*, or *hypertonic*.



Click "Next" on the bottom left side of the screen.

Concept 2 Review: Cells in Isotonic Solutions

When two environments are isotonic, the total concentration of dissolved solutes is the _____ in both of them.

When cells are in isotonic solution, movement of water out of the cell is exactly _____ by movement of water into the cell. A _____ solution of NaCl (saline) is isotonic to _____ cells.

Select "animate" to watch the movement of water molecules through protein channels in the cell membrane in an isotonic solution.

Make your own sketch of a cell in an isotonic solution:

Click “Next” on the bottom left side of the screen.

Concept 2 Review: Cells in Hypotonic Solutions

Hypotonic comes from the Greek “hypo,” meaning _____ and “tonos” meaning _____. In a hypotonic solution, the total concentration of all dissolved solute particles is _____ than that of another solution or less than that of a _____.

If concentrations of dissolved solutes are less _____ the cell than _____, the concentration of water outside is correspondingly greater. When a cell is exposed to such hypotonic solutions, there is net movement of water _____ the cell. Cells without cell _____ will swell and may _____(lyse) if excess water is not removed from the cell. Cells with cell walls often benefit from the _____ pressure that develops in hypotonic environments.

Select “animate” to watch the movement of water molecules across the cell in a hypotonic solution.

Make your own sketch of a cell in a hypotonic solution:

Select “A Closer Look” to see plant and animal cells in hypotonic environments on the bottom of the page.

Compare and contrast what happens when a plant cell and animal cell are placed in a hypotonic solution.

Click “Back to Review” and then select “Next” to view cells in hypertonic solutions.

Concept 2 Review: Cells in Hypertonic Solutions

Hypertonic comes from the Greek “hyper,” meaning _____, and “tonos,” meaning stretching. In a hypertonic solution, the total concentration of all dissolved solute particles is _____ than that of another solution, or greater than the concentration in a _____.

If concentrations of dissolved solutes are greater _____ the cell, the concentration of water outside is correspondingly _____. As a result, water inside the cell will flow _____ to attain equilibrium, causing the cell to _____. As cells lose water, they lose the ability to _____ or _____. Hypertonic environments, such as concentrated brines or _____, have been used for food preservation because microbial cells that would otherwise cause spoilage are _____ in these very hypertonic environments and are unable to function.

Select “animate” to watch the movement of water molecules across the cell in a hypertonic solution.

Make your own sketch of a cell in a hypertonic solution:

Select “A Closer Look” to see plant and animal cells in hypertonic environments on the bottom of the page.

Compare and contrast what happens when a plant cell and animal cell are placed in a hypertonic solution.

Close the review screen you are on to go back to the BioCoach Activity. You should still be on *Concept 2: Osmosis*. Click "Next Concept."

Concept 3: Selective Permeability of Membranes

Cell membranes are selectively permeable. Some solutes can cross the membrane _____, some cross with _____, and others do not cross at all.

A few lipophilic (lipid-loving) substances move freely across the cell membrane by _____ _____. Most small molecules or ions require the assistance of specific _____ _____ to transport them across the membrane. _____ molecules do not cross intact cell membranes, except in certain special cases.

Concept 4: Passive and Active Transport

Most biologically important solutes require _____ carriers to cross cell membranes, by a process of either _____ or _____ transport.

Active transport uses _____ to move a solute "uphill" against its gradient, whereas in facilitated diffusion, a solute moves _____ its concentration gradient and no _____ input is required.

In the illustration below, label which type of transport is shown: *facilitated diffusion* or *active transport*.