**Virtual Lab: Passive and Active Transport**

**DIFFUSION**

Click on the link below to see information on diffusion:

<http://www.wisc-online.com/objects/index_tj.asp?objID=AP1903>

*\*\* Solutes are things that are dissolved and solvents are things that do the dissolving.\*\**

1. Is diffusion active or passive transport of particles across the cell membrane?

Diffusion is passive transport as it does not require energy to facilitate cell transport.

1. In the very beginning, how does the concentration of the blue particles on side A compare to that of side B?

The concentration of blue particles on side A is greater than that of side B.

1. What 3 things can molecules moving with kinetic energy do?

They may collide with a wall, each other, or go through a pore.

1. Net diffusion moves down the concentration gradient from areas of **high** concentration to areas of **low** concentration.
2. Eventually the two sides will come to equilibrium. What is equilibrium?

Equilibrium occurs when both sides of a membrane have the same concentration of solute.

1. What happens to the movement of molecules when their temperature is raised? Lowered?

Increasing temperature gives the molecules more energy, enabling them to move faster. As a result, diffusion or osmosis can occur faster. Conversely, lowering the temperature reduces their speed, slowing diffusion and osmosis.

Watch the video: <https://highered.mheducation.com/sites/9834092339/student_view0/chapter38/how_diffusion_works.html>

After the video scroll down and try the quiz to see how well you do.

**OSMOSIS**

Click on the link below to see information on osmosis: <http://www.wisc-online.com/objects/index_tj.asp?objID=AP11003>

1. What is osmosis?

Osmosis is the movement of water through a semipermeable membrane.

1. What does the dashed line in the beaker separating the two sides represent?

The dashed line represents a semipermeable membrane between the two sides.

1. Why are they assuming the large molecules will stay on their own side of the membrane?

These large molecules typically cannot cross through the semi-permeable membrane due to their size.

1. Because molecules will move from one side to another to come to an equilibrium, or balance of concentration, the **water** moves from side B to side A, so the water level on side A goes **up**.
2. In living things, cells must be in an isotonic solution where water leaves and enters the cell at the same rate.
3. What happens to a cell in a concentrated, hypertonic environment? Click on the “View Movie” icon to find out. Record your observations here.

The cell will shrink because water exits the cell to go into the hypertonic environment.

1. What happens to a cell in a concentrated, hypotonic environment? Click on the “View Movie” icon to find out. Record your observations here.

Water rushes into the cell from the hypotonic environment, possibly causing the cell to burst.

Watch the video: <https://highered.mheducation.com/sites/9834092339/student_view0/chapter38/how_osmosis_works.html>

After the video scroll down and try the quiz to see how well you do.

**THE ALIEN EGG EXPERIMENT**

Watch the video presentation: <http://tinyurl.com/lgffq7m> and complete the next series of questions:

1. What effect did the vinegar have on the eggs?

The vinegar dissolves the eggshell by turning it into calcium acetate and forming carbon dioxide.

1. Why did the mass of the egg increase after soaking in the vinegar solution?

The water in the vinegar solution was transported into the egg, making it larger.

1. Name the process that is occurring.

This is osmosis since the transport of water is passive.

1. What material seems to have moved through the membrane of the egg after it soaked in the corn syrup? In what direction did the material move?

The water flowed from the inside of the egg to the corn syrup because the corn syrup is hypertonic to the egg.

1. At what point was the egg in a hypertonic solution? Explain what happened in this process.

The egg was in a hypertonic solution when it was in corn syrup. Water from inside the egg rushed out to the corn syrup, deflating the egg.

1. At what point was the egg in a hypotonic solution? Explain what happened in this process.

The egg was in a hypotonic solution when in the vinegar. Water from the vinegar solution rushed into the egg, inflating the egg.

**TRANSPORT PROCESSES REQUIRING ATP**

Click on the link below to see information on transport processes requiring ATP: <https://www.wisc-online.com/learn/natural-science/life-science/ap11203/transport-processes-requiring-atp>

1. What does ATP energy stand for?

ATP = adenosine triphosphate

1. With ATP energy, the carrier transports the molecule from an area **high** concentration to an area of **low** concentration.
2. 40% of the cell’s ATP may be used in this type of transport across the cell membrane.
3. What is endocytosis?

Endocytosis is how cells transport molecules from the environment into the cell that are too large to enter through diffusion or passive transport. The molecule is enclosed by a vesicle formed by an indentation of the cell membrane. This process can occur for fluids as well.

1. In the top movie, **pinocytosis** process is being simulated. Explain what is occurring.

The cell deforms to surround the fluid and surrounds the fluid with a lipid bilayer to form a fluid-filled vesicle.

1. In the bottom movie **phagocytosis** process is being simulated. Explain what is occurring.

The cell deforms to surround the molecule and surrounds it with a lipid bilayer to form a vesicle.

1. Explain how the exocytosis works.

Molecules are transported to the Golgi body where they are packaged in vesicles. These vesicles are transported to the cell membrane to fuse with the membrane and eventually deliver the contained molecules to the extracellular space.

Watch the video: <https://highered.mheducation.com/sites/9834092339/student_view0/chapter38/how_the_sodium_potassium_pump_works.html>

After the video scroll down and try the quiz.