

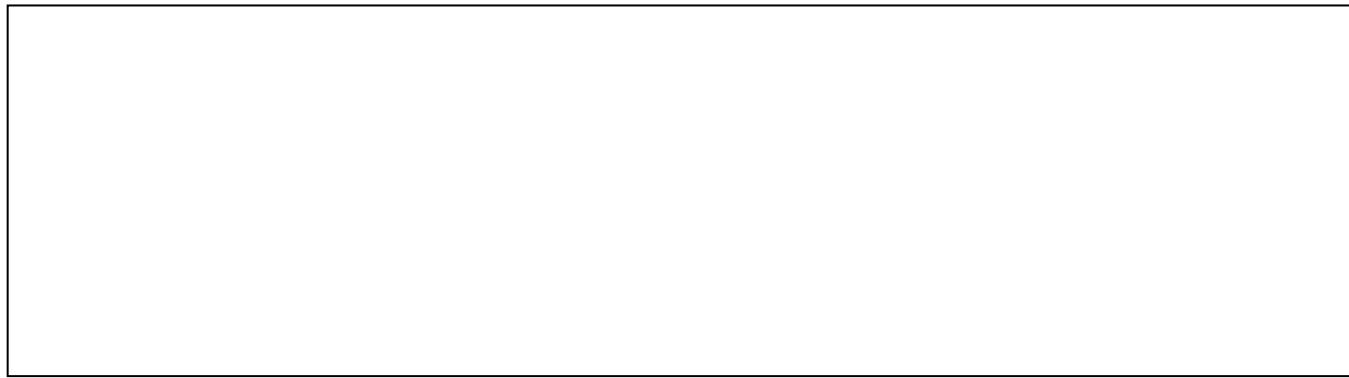
In & Out of the Cell (cell transport) Web Quest

Objectives: Understand the structure and function of the cell membrane. Understand how organisms maintain homeostasis using cell transport mechanisms.

Part 1 Cell Membrane

<http://www.susanahalpine.com/anim/Life/memb.htm>

- Step through the animation once to get an overview of a cell membrane.
- Draw a cell membrane and label all the parts as you step through the animation a second time



Components of a Cell Membrane

http://www.wisc-online.com/objects/index_tj.asp?objID=ap1101

The structure & function of cell membranes

1. Complete the computer based activity to construct a Cell Membrane.
2. Name and describe the function of the five types of compounds that make up the cell membrane.

Part 3 Diffusion and Osmosis

http://www.mun.ca/biology/Osmosis_Diffusion/tutor2.html

8. Read the overview and define the following terms

- Diffusion -
- Osmosis -
- Passive Transport -
- Concentration Gradients -
- Biological Membranes -

9. Scroll down to example #1 (how perfume spreads throughout a room) and read it.

10. Next scroll down to example #2 (salt dissolving in water) and read it.

11. Next scroll down to example #3 (diffusion will occur through a permeable membrane)

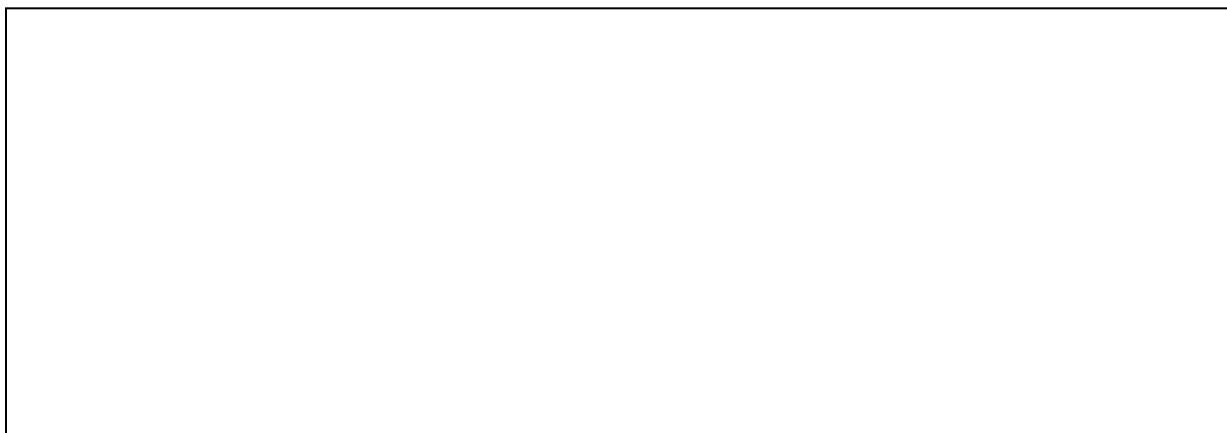
12. What is the solute concentration in side A? _____

13. What is the solvent concentration in side A? _____

14. What is the solute concentration in side B? _____

15. What is the solvent concentration in side B? _____

16. Draw a diagram of the two sides (A and B) and show the movement of solute and solvent across the permeable membrane. Label the concentrations of solute and solvent under both sides.



http://www.wiley.com/legacy/college/boyer/0470003790/animations/membrane_transport/membrane_transport.htm

25. Observe "Osmosis and Diffusion". Why does the balloon on the left get larger?

26. Click "Continue" to observe "Passive Transport". NOTE: Osmosis and diffusion are forms of passive transport. This animation describes a special case of passive transport called *facilitated diffusion*. Larger molecules such as glucose can then enter the cell by means of a special pathway. Sketch how glucose molecules can pass through a cell membrane.

http://highered.mcgraw-hill.com/sites/0072495855/student_view0/chapter2/animation__how_the_sodium_potassium_pump_works.html

27. Observe "Active Transport":

a. What ion is moved into the cell? _____

b. What ion is moved out of the cell? _____

- c. How many sodium ions are move out of the cell during each cycle? _____
- d. How many potassium ions are moved into the cell during each cycle? _____
- e. Does the cell become more positively charged or does the surrounding solution become more positively charged? Explain!

Part 4 Tonicity

http://biology.about.com/od/cellularprocesses/ss/diffusion_3.htm

<http://www.zerobio.com/flashmx/tonicity.swf>

Read about isotonic, hypotonic and hypertonic solutions and their effect on cells (first site). Then run the animation (second web site). Use the information to answer these questions.

28. A hypertonic solution has a _____ concentration of _____ relative to another solution.
29. What happens to a cell when it is placed in a hypertonic solution? _____
- Which way does the water move? _____
 - What happens to the cell? _____
30. A hypotonic solution has a _____ concentration of _____ relative to another solution.
31. What happens to a cell when it is placed in a hypotonic solution? (Run the animation)
- Which way does the water move? _____
 - What happens to the cell? _____
32. An isotonic solution has the _____ concentration of _____ as another solution like the cytoplasm of the cell.
- Which way does the water move? _____
 - What happens to a cell when it is placed in an isotonic solution? _____

Part 5: Active Transport

http://www.wiley.com/legacy/college/boyer/0470003790/animations/membrane_transport/membrane_transport.htm

33. The movement of substances across a cell membrane requiring energy expenditure by the cell is _____.
34. Active transport moves solute from areas of _____ concentration to areas of _____ concentration.