

WEBQUEST: Cells and Cell Transport

In this webquest, you will be visiting various websites that will (A) review cells and the parts (“organelles”) of cells, and (B) demonstrate the different types of passive and active **transport** utilized by cells.

PART 1: CELLS and CELL PARTS!

SITE #1: Go to: <http://askabiologist.asu.edu/research/buildingblocks/cellparts.html>

1) How many different kinds of cells are in your body? _____

2) What parts of our bodies are made of dead cells? _____

SITE #2: Go to: http://www.wiley.com/legacy/college/boyer/0470003790/animations/cell_structure/cell_structure.htm

Click on “Animal Cell.” Read the text and follow the directions. (Click on each organelle and read about what it does)

3) Name and define 3 of the organelles that we are learning about.

a) _____ :

b) _____ :

c) _____ :

Click “continue” and answer the “Pop-up Questions.”

When you are finished, click on “Plant Cell” and read the text.

4) Which organelle, if empty, would cause the plant to wilt? Why is this? _____

5) Name an organelle that you see in the plant cell that you did not see in the animal cell. What is the function of this organelle in plant cells?

_____ :

6) Why do you think an animal cell does not have the part that you name in #5? _____

Now, click on “Construct a Cell.” First, construct an animal cell.

7) Name a part that does NOT BELONG in the animal cell (as you figured out during construction) Explain WHY this part does not belong in an animal cell.

_____ :

8) Construct the **plant cell** next. Name a part that DOES BELONG here but didn’t belong in the other cell. What is the function of this cell part?

_____ :

SITE #3: Go to http://www.cellsalive.com/cells/cell_model.htm and click on “Start the Animation.” Now at the bottom of the frame, click on “Plant Cell.”

Click around the plant cell and look/read about some other organelles. Then, click on the “Animal Cell.” Click on the different parts and read about them. Answer the following questions.

9) Why is the rough endoplasmic reticulum so “rough”? _____

10) What is the job of the nucleolus? _____

- 11) What is the job of the Golgi apparatus? _____
- 12) What is the job of the cytoskeleton (a.k.a. microtubules, microfilaments)? _____

Back on the Cells Alive Home page, click on “Tackle the Organelle Memory Match Game”...play the game!
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PART 2: CELL MEMBRANES and CELL TRANSPORT!

SITE #1: Cell Transport Overview and Membranes

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

- 1) What is meant by cellular transport? _____
- 2) What important substance must red blood cells be able to take up or release? _____

Press “continue” or select “membrane” from left side of the page

- 3) What is cell membrane primarily composed of? _____
- 4) Which two general characteristics will prevent a molecule from being able to pass through the cell membrane?
_____ & _____

SITE #2: Online Textbook Diffusion Tutorial

http://highered.mheducation.com/sites/0072495855/student_view0/chapter2/animation_how_diffusion_works.html

Click on “PLAY” and watch / listen to the animation.

NOTE: *If you have them, plug in headphones. Otherwise, simply read the text & watch the animation.*

Take the 5-question quiz underneath the animation screen & submit your answers!

Answer the following questions:

- 1) In terms of molecules and molecular motion, explain what happens to a sugar cube when it is placed into a beaker of water.

- 2) Define **DIFFUSION**. _____
- 3) Identify 3 factors that affect the **rate of diffusion**.
A) _____
B) _____
C) _____
- 4) **PREDICT:** what would happen if you drop the sugar cube into a beaker of hot water vs. into a beaker of cold water

SITE #3 - Facilitated Diffusion Tutorial

http://highered.mheducation.com/sites/0072495855/student_view0/chapter2/animation_how_facilitated_diffusion_works.html

Click on “PLAY” and watch / listen to the animation.

NOTE: If you have them, plug in headphones. Otherwise, simply read the text & watch the animation.

Take the 5-question quiz underneath the animation screen & submit your answers!

Answer the following questions:

- 1) What is **facilitated diffusion**? _____
- 2) Explain what it means to say these protein channels are selective in terms of what they allow into or out of the cell.
- 3) Facilitated diffusion involves the movement of particles (with / against) the concentration gradient. (CIRCLE the correct answer).
- 4) a) In what ways are simple diffusion and facilitated diffusion the same? _____

- b) How are they different? _____

SITE #4 – Online Textbook Osmosis Tutorial

http://highered.mheducation.com/sites/0072495855/student_view0/chapter2/animation_how_osmosis_works.html

Click on “PLAY” and watch / listen to the animation.

NOTE: If you have them, plug in headphones. Otherwise, simply read the text & watch the animation.

Take the 5-question quiz underneath the animation screen & submit your answers!

Answer the following questions:

- 1) Most _____ molecules cannot freely cross the cell membrane. Is this true for water molecules? _____
- 2) Define **OSMOSIS**: _____
- 3) In the animation, urea is added to one side of the membrane. In which direction do water molecules move? **WHY?** (include the word “concentration” in your answer!)

- 4) **CIRCLE** the appropriate word for each statement:
The solution with (higher / lower) solutes is **HYPERTONIC**.
The solution with (higher / lower) solutes is **HYPOTONIC**.

SITE #5 - Osmosis Scenarios:

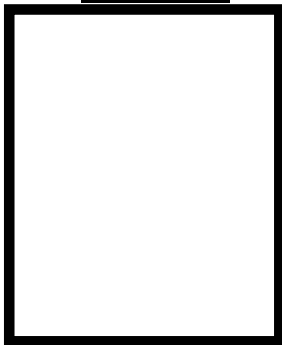
<http://www.nl.edu/jste/osmosis.htm>

Scroll down the page to the section that is titled "osmosis". There will be 3 beakers. Write down the concentrations of solute in each of the beakers in the table below. Then press the button that will place the animal cell into the 3 beakers.

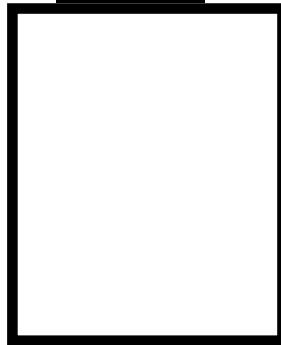
BEAKER 1 Solute / salt concentration: In beaker:_____ Animal cell:_____	BEAKER 2 Solute Concentration In beaker:_____ Animal cell:_____	BEAKER 3 Solute Concentration In beaker:_____ Animal cell:_____
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After placing the animal cells in the beakers, DRAW the results in the beakers below. Then match the following terms with the beakers' solutions (compared to the animal cell): **HYPERTONIC, HYPOTONIC, ISOTONIC**

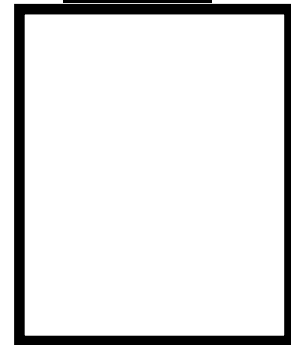
BEAKER 1



BEAKER 2



BEAKER 3



SITE #6 - Active Transport

http://www.phschool.com/atschool/phbio/active_art/active_transport/index.html

Read the "introduction" section at the top of the screen. You will have to use the scroll bar on the right side to scroll down and read the entire section. **Complete the following questions / statements.**

1) Sometimes cells must move materials in the "opposite direction" (i.e. from an area of low concentration to an area of high concentration). This is called _____
What does this process require? _____

Press Start. As you watch the animation, read the section "Molecular Transport". You may have to press pause in order to read the entire section.

2) Describe what is occurring during the sodium-potassium pump. _____

Continue the animation. Read the section "Endocytosis." You may have to press pause in order to read the entire section.

3) What is **ENDOCYTOSIS**? _____

4) Give two examples of endocytosis.

A) _____

B) _____

Continue the animation. Read the section "Exocytosis." You may have to press pause in order to read the entire section.

5) What is **EXOCYTOSIS**? _____

6) What are 2 things that can be moved out of the cell using exocytosis.

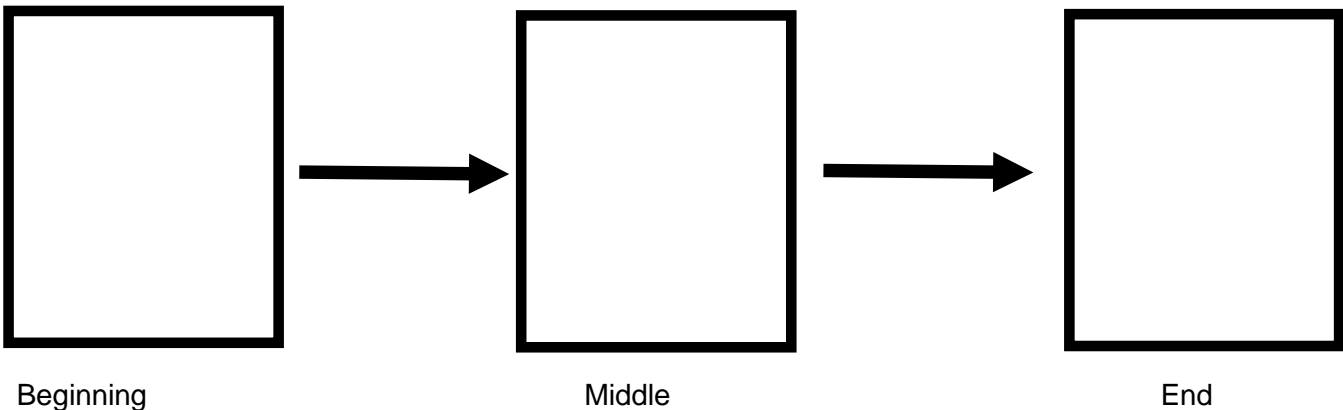
A) _____

B) _____

SITE #7 - Endocytosis and Exocytosis

<http://highered.mheducation.com/olcweb/cgi/pluginpop.cgi?it=swf::535::535::/sites/dl/free/0072437316/120068/bio02.swf::Endocytosis%20and%20Exocytosis>

Draw and summarize **ENDOCYTOSIS**:



Draw and summarize **EXOCYTOSIS**:

