**CELLULAR PROCESSES UNIT GUIDE Due November 11**

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| --- | --- | --- | --- | --- |
| **Monday** | **Tuesday** | **Wednesday** | **Thursday** | **Friday** |
| **October 26**  Cells and Viruses Test | 27  Test Correction  *Read Ch3.3-3.4* | 28  Cell Membrane | 29  Cell Membrane  **UG:Questions 1-5**  *Read Ch3.5 & 4.1* | 30  Active and Passive Transport |
| **November 2**  Active and Passive Transport | 3  Osmosis Lab Lab  **UG:Questions 6-10**  *Read 4.2* | 4  Osmosis Lab | 5  Plasmolysis Lab  **Quiz** | 6  Photosynthesis  **UG:Questions 11-15**  *Read 4.3* |
| **November 9**  Photosynthesis Lab | 10  Respiration/ Fermentation lab | 11  Respiration/ Fermentation Lab | 12  **Review**  **Unit Guide All questions Due** | 13  **Cellular Process TEST** |

**Read:** Chapters 3 and 4 **UNIT TEST:** November 13

**Watch (Supplemental Resource):**

**Cell Membrane (Crash Course):** [**https://www.youtube.com/watch?v=dPKvHrD1eS4**](https://www.youtube.com/watch?v=dPKvHrD1eS4)

**Osmosis (Amoeba Sisters):** [**https://www.youtube.com/watch?v=IaZ8MtF3C6M**](https://www.youtube.com/watch?v=IaZ8MtF3C6M)

**Photosynthesis and Respiration:** [**https://www.youtube.com/watch?v=JUmT24R8CyA**](https://www.youtube.com/watch?v=JUmT24R8CyA)

**Photosynthesis and Respiration:** [**https://www.youtube.com/watch?v=QMgCziQgrus**](https://www.youtube.com/watch?v=QMgCziQgrus)

**Animations -links will be on my website!**

**Osmosis:** [**http://highered.mheducation.com/sites/9834092339/student\_view0/chapter5/animation\_-\_osmosis.html**](http://highered.mheducation.com/sites/9834092339/student_view0/chapter5/animation_-_osmosis.html)

[**http://highered.mheducation.com/sites/9834092339/student\_view0/chapter5/how\_osmosis\_works.html**](http://highered.mheducation.com/sites/9834092339/student_view0/chapter5/how_osmosis_works.html)

**Diffusion**

[**http://highered.mheducation.com/sites/9834092339/student\_view0/chapter5/how\_diffusion\_works.html**](http://highered.mheducation.com/sites/9834092339/student_view0/chapter5/how_diffusion_works.html)

**Endocytosis**

[**http://highered.mheducation.com/sites/9834092339/student\_view0/chapter5/endocytosis\_and\_exocytosis.html**](http://highered.mheducation.com/sites/9834092339/student_view0/chapter5/endocytosis_and_exocytosis.html)

**Book online at :** [**http://my.hrw.com**](http://my.hrw.com)

Use your username and password to get to the biology book or

Username: student26761 Password: n8j2x

**Ms. Johnson’s website:** [http://classjump.com/j/janine\_johnson/](http://classjump.com/j/janine_johnson/%20%20%20%20)

**What the state of Texas wants you to know!**

* TEKS 4B- Investigate and explain cellular processes including homeostasis, energy conversions,

transport of molecules and synthesis of new molecules.

* TEKS 9B- Compare the products and reactants of photosynthesis and cellular respiration in terms of energy and products.

**Listen and Look**

Here is a list of key terms you will hear and see during the reading and video. Get to know them!

**Directions:** Your objective in this activity is to earn 100 points. Choose any activities you wish and complete by the due date assigned.

|  |  |
| --- | --- |
| **Activity** | **Points** |
| 1. Complete a Frayer diagram for each word. Divide your diagram into the following categories: definition, Sentence, Diagram, and Example. (Diagram is a labeled picture.) | 100 |
| 2. Create a Vocabulary Booklet. Each page must have the term at the top, the definition at the bottom, an example and an illustration in the middle with a sentence or description using the term. | 100 |
| 3. Word Detective for all words. Use your textbook and a dictionary…Do they provide the same definitions? (Make a chart that has the word, definition from book and page #, definition from dictionary, name of dictionary and page #, and sentence using word.) | 100 |
| 4. Complete a Vocabulary Log with all vocab words: (word, definition, and example or illustration). | 50 |
| 5. Create a rap, song, riddle, or poem including words and meanings. (25 points extra if you perform it for the class) | 50 |
| 6. Diagram representation of each word. Needs to be no more than 4 on a page (A diagram is a labeled picture) | 25 |
| 7. Create and complete a crossword puzzle including all words. You MUST give clues or definitions for the Across and Down Sections. You may not use the same clues or definitions as word search. | 50 |
| 8. Create and complete a word search including all words. You MUST give clues or definitions. DO NOT list the actual key word. You may not use same clues or definitions as the crossword puzzle. | 50 |
| 9. Write an essay or story including all words. Only one word per sentence. Words must be used correctly. Spelling and grammar will be considered. Essay/story must be at least 3 paragraphs long. | 50 |
| 10. Write a sentence for each word that shows the meaning of the vocabulary. This is NOT simply writing the definition. | 25 |
| 11. Create a detailed and logical concept or word map. Use linking words on the lines or arrows. Must show relationship between words. | 50 |
| 12. Create a set of flashcards. | 25 |

Visit: <http://bit.ly/1umMyTO> or

<http://lakeridgesciencelamkin.weebly.com/biology-vocab-templates.html>

to obtain templates and link to websites to help with your assignment.

VOCABULARY EXERCISES: **Due November 10**

VOCAB QUIZ: ….

* **Cellular Process :** activities occurring at the cell level.
* **Homeostasis:** regulation and maintenance of constant internal conditions in an organism.
* **Transport of molecules**: method by which molecules are moved in and out of the cell.
* **Phospholipid:** molecule that forms the double layered cell membrane; consisting of a glycerol, phosphate group and two fatty acids.
* **Fluid Mosaic Model**: model that describes the arrangement and movement of the molecules that makes up the cell membrane.
* **Selective Permeability:** condition or quality of allowing some but not all, materials to cross a barrier or membrane.
* **Diffusion:** movement of dissolved molecules in a fluid or gas from a region of higher concentration to a region of lower concentration.
* **Osmosis:** diffusion of water molecules across a semipermeable membrane from an area of higher water concentration to an area of lower water concentration.
* **Active Transport:** energy-requiring movement of molecules across a membrane from a region of lower concentration to a region of higher concentration.
* **Passive Transport:** movement of molecules across the cell membrane without energy input from the cell.
* **Concentration Gradient**: difference in the concentration of a substance from one location to another.
* **Energy Conversion:** the process of transforming energy from one form into another.
* **Reactant:** substance that is changed by a chemical reaction.
* **Product:** substance formed by a chemical reaction.
* **Photosynthesis:** process by which light energy is converted to chemical energy; produces sugar and oxygen from carbon dioxide and water.
* **Cellular Respiration:** process of producing ATP by breaking down glucose molecules when oxygen is present.
* **ATP:** Adenosine TriPhosphate- High energy molecule that contains, within its bonds, energy that cells can use.
* **Aerobic Respiration:** process that requires oxygen to occur.
* **Anaerobic Respiration:** process that does not require oxygen to occur.
* **Fermentation:** anaerobic process by which ATP is produced by glycolysis.
* **Chlorophyll:** light absorbing pigment molecule in photosynthetic organisms.
* **Light-Dependent Reaction**: part of photosynthesis that absorbs energy from sunlight and transfers energy to the light-independent reactions.
* **Light-Independent Reaction:** part of photosynthesis that uses energy absorbed during the light-dependent reactions to synthesize carbohydrates.
* **Glycolysis:** anaerobic process in which glucose is broken down into two molecules of pyruvate and two net ATP are produced

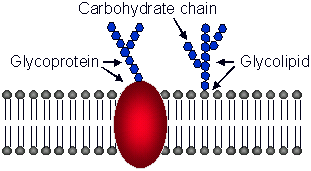
**Recall and Review: ANSWER ALL THE QUESTIONS IN COMPLETE SENTENCES.**

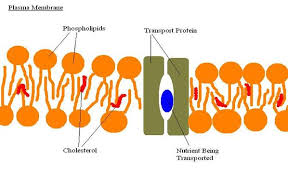
Use the video and your textbook to help you answer the following questions in your binder.

**Chapter 3 (Section 3)**

**1. Draw, color and identify** the following structures of the cell membrane: carbohydrate chain, cholesterol, phospholipid bilayer, transport protein.

carbohydrate chain





phospholipid bilayer

cholesterol

transport protein

2. **State** a function of each type of molecule that is embedded in the phospholipid bilayer:

Carbohydrate chain: **serve as identification tags, enabling cells to distinguish one type of cell from another.**

Cholesterol: **molecules that strengthen the cell membrane**

Phospholipid bilayer: **forms a boundary between a cell and the outside environment and controls the passage of materials into and out of a cell**

Transport proteins: **proteins that extend through the phospholipid bilayer and help materials cross the membrane.**

**Chapter 3 (Section 4)**

3. **Explain** what a concentration gradient is and what it means for a molecule to move down its

concentration gradient.

**A concentration gradient is the difference in the concentration of a substance from one location to another. Molecules diffuse down their concentration gradient from a region of higher concentration to a region of lower concentration.**

4. **Compare and Contrast** passive and active transport.

|  |  |  |
| --- | --- | --- |
| Passive Transport | Both | Active Transport |
| **does not requires energy**  **moves down/with the concentration gradient** | **move molecules into and out of cells** | **requires energy**  **moves up/against the concentration gradient** |

5. **Differentiate** between diffusion and osmosis.

|  |  |
| --- | --- |
| Diffusion | Osmosis |
| **movement of molecules in a liquid or gas from a region of higher concentration to a region of lower concentration** | **diffusion of water molecules across a semipermeable membrane from a region of higher concentration to a region of lower concentration** |

**Chapter 3 (Section 4)**

6. **Explain** the following terms: hypotonic, hypertonic, isotonic

Hypotonic: **solution has a lower concentration of dissolved particles than a cell.**

Hypertonic: **solution has a higher concentration of dissolved particles than a cell.**

Isotonic: **solution has the same concentration of dissolved particles as the cell.**

7. **Label** the following diagrams of Red Blood Cells and Plant Cells as being examples of cells contained in

Isotonic, Hypertonic and Hypotonic solutions.

|  |  |  |  |
| --- | --- | --- | --- |
| Type of cell Type of Solution | **isotonic** | **hypotonic** | **hypertonic** |
| **isotonic**  **hypertonic**  **hypotonic** | hyoertoni |  |  |
| **isotonic**  **hypertonic**  **hypotonic** |  |  |  |

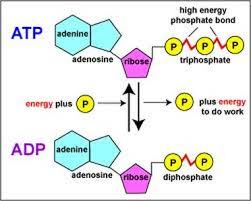
**Chapter 3 (Section 5)**

8. **Define** each of the following, and **describe/draw** a specific cellular example.

|  |  |  |
| --- | --- | --- |
| Exocytosis | **the release of substances out of a cell by the fusion of a vesicle with the membrane.** | http://www.quia.com/files/quia/users/biology70/exocytosis1.jpg |
| Endocytosis | **the process of taking liquids or fairly large molecules into a cell by engulfing them in a membrane.** | http://kenpitts.net/bio/images/endocytosis.gif |
| Phagocytosis | **a type of endocytosis in which the cell membrane engulfs large particles**. | Image result for phagocytosis |
| Pinocytosis | **a type of endocytosis in which the cell membrane engulfs large quantities of gases or liquids.** | http://www.differencebetween.info/sites/default/files/images/pinocytosis.jpg |

**Chapter 4 (Section 1)**

9. **Draw and label** an ATP molecule.



10. **Describe** the function of ATP.

**ATP transfers energy from the breakdown of food molecules to cell processes.**

11. **Compare** ATP and ADP.

|  |  |
| --- | --- |
| ATP | ADP |
| **transfers energy to cell processes**  **adenosine & 3 phosphates** | **a lower energy molecule that can be converted to ATP**  **adenosine & 2 phosphates** |

**Chapter 4 (Section 2)**

12. **Describe** the importance of producers and photosynthesis.

**Producers that are the main sources of chemical energy for most organisms on Earth. Photosynthesis is the process they use to capture energy from sunlight to make sugars that store chemical energy.**

13.  **State** the equation for photosynthesis. **Label** with the following: products, reactants

**6 CO2 + 6 H2O 🡪 C6H12O6 + 6 O2**

**reactants products**

14. **Describe** the role of a chloroplast in photosynthesis.

**Chloroplasts absorb energy from sunlight then use carbon dioxide and water to produce sugars and oxygen through the process of photosynthesis.**

15. **Explain** why photosynthesis is important for building the structure of plant cells.

**Plants need the simple sugars to build starch and cellulose molecules that are required for their growth and development.**

**Chapter 4 (Section 3)**

16.  **Explain** the function of cellular respiration.

**Cellular respiration releases chemical energy from sugars and other carbonbased molecules to make ATP when oxygen is present.**

17. **State** the equation for respiration. **Label** with the following: products, reactants

**6 O2 + C6H12O6 🡪6 CO2 + 6 H2O +ATP**

**reactants product**

18. **Describe** the role of mitochondria in cellular respiration.

**A mitochondrion is surrounded by a membrane. It has two parts that are involved in cellular respiration: the matrix (Krebs Cycle) and the inner mitochondrial membrane (Electron Transport).**

19. **Explain** the following statement: Cellular respiration is like a mirror image of photosynthesis.

**Chloroplasts absorb energy from sunlight and build sugars. Mitochondria release chemical energy to make ATP. The chemical equation of cellular respiration is also basically the reverse of photosynthesis**

**20-Practice Questions:**

1. Which of the following is NOT an example of active transport?  
a. facilitated diffusion

b. osmosis

c. endocytosis

d. both a & b

2. Which process always involves the movement of materials from inside the cell to outside the cell?

a. osmosis

b. exocytosis

c. phagocytosis

d. pinocytosis

3. Cell membranes are constructed mainly from:  
a. lipid bilayers

b. carbohydrate gates

c. protein pumps

d. free moving proteins

4. A substance that moves across a cell membrane without using the cell's energy tends to move:  
 a. away from the area of equilibrium  
 b. away from the area where it is less concentrated  
 c. away from the area where it is more concentrated  
 d. toward the middle of the cell

5. The movement of water across a selectively permeable membrane is called:  
a. exocytosis

b. endocytosis

c. phagocytosis

d. osmosis

**Notes:**