

Name: _____

Do Now # 3A
10 points

Base your answers to questions 1 and 2 on the word equations below and on your knowledge of biology. The equations represent two biochemical processes that occur in living organisms. The letter X represents a molecule produced from process 1.

Process 1: oxygen + glucose \rightarrow carbon dioxide + water + X (Respiration)

Process 2: carbon dioxide + water \rightarrow oxygen + glucose (Photosynthesis)

1. Identify the molecule represented by letter X in process 1. [1]

2. Which process occurs in the cells of a green plant leaf?

- (1) process 1, only
(2) process 2, only

- (3) neither process 1 nor process 2
(4) both process 1 and process 2

A student has a sandwich for lunch. The bread contains starch molecules and various other molecules. After chewing and swallowing some of the sandwich, the starch moves along the digestive system and is digested. The sequence below represents what takes place next.

digested starch \rightarrow bloodstream \rightarrow cell \rightarrow cell structure \rightarrow ATP

Explain what occurs, beginning with the digestion of starch and ending with ATP production. In your answer, be sure to:

3. identify the molecules that are used to digest the starch [1]
4. identify the molecules produced when starch is digested [1]
5. explain why starch must be digested before its building block molecules can enter the bloodstream [1]
6. identify the structure in the cell that will produce ATP from the starch building blocks [1]
7. state why ATP is important to cells [1]

3.

4.

5.

6.

7.

8. Organelle for autotrophic nutrition: _____

9. Raw materials for autotrophic nutrition: _____ and _____

10. Raw materials for respiration: _____ and _____

Name: _____

Respiration

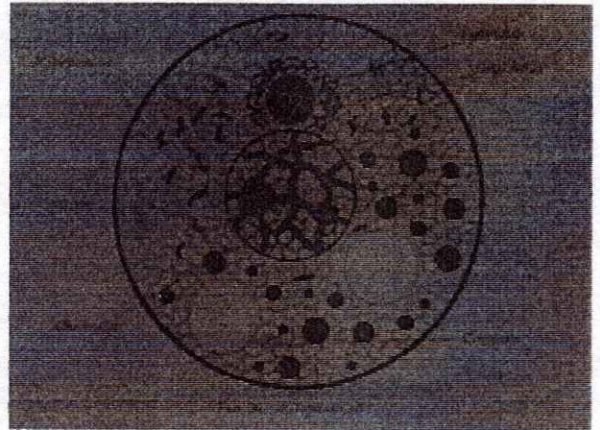
By Cindy Grigg

Activity 3A
10 Points

Highlight your answers!

1 Did you know there are two kinds of respiration? One kind of respiration is when we breathe air in and out of our lungs. The other kind happens in both plant and animal cells, including people's cells.

2 Animals and plants need oxygen. When an animal breathes, it takes in oxygen gas and releases carbon dioxide gas into the atmosphere. This carbon dioxide is a waste product produced by the animal's cells during cellular respiration.



3 Cellular respiration occurs in the individual cells. Digested foods have chemical energy stored in them. Energy to live comes from releasing this energy. Cells use oxygen to "burn" food for energy. Water and carbon dioxide are produced as wastes. The cells in both plants and animals perform respiration. Carbon dioxide is also released into the atmosphere when fuels are burned, such as in automobiles or factories. Plants take in carbon dioxide and release oxygen through their leaves.

4 Plants use a process called photosynthesis to make their own food. During photosynthesis, a plant uses light, water, and carbon dioxide to make its own food. Oxygen is given off during photosynthesis as a waste product.

5 The chemical equation for photosynthesis is:
 $\text{LIGHT (energy) + CO}_2 + \text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2$

6 This is the reaction that only plants and some algae and bacteria can do. They take sunlight and combine carbon dioxide (CO_2) and water (H_2O). They create glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) and oxygen gas (O_2). By this process, plants change energy from the sun into glucose.

7 The reverse of this process is cellular respiration. The sugars made from photosynthesis are broken down with oxygen to release energy. The waste products are carbon dioxide and water.

8 The equation for this is: $\text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2 \rightarrow \text{Usable Energy (ATP) + CO}_2 + \text{H}_2\text{O}$.

9 Cells then use that energy to power the functions of the cell. The energy has been stored in a compound called adenosine triphosphate (ATP). ATP is the molecule used by cells to power the secondary reactions that keep them alive.

10 Some other organisms such as algae, which are not classified as plants or animals,

also make their own food by photosynthesis. Most algae live in water. The amazing thing is that eighty percent of the oxygen on Earth is made by algae living in oceans. Plants living on land replace the remaining twenty percent of the oxygen used by animals. This is a vital reason we must protect our oceans from pollutants. The algae living in our oceans are crucial to life on Earth.

Respiration

<p>1. Photosynthesis is the process by which:</p> <p><input type="radio"/> A Plants break down food.</p> <p><input type="radio"/> B Animals break down food.</p> <p><input type="radio"/> C Plants make their own food.</p> <p><input type="radio"/> D Animals make their own food.</p>	<p>2. Respiration is the process in which:</p> <p><input type="radio"/> A Cells produce carbon dioxide and water</p> <p><input type="radio"/> B Cells use oxygen to burn food for energy</p> <p><input type="radio"/> C Both a and b</p> <p><input type="radio"/> D Neither a nor b</p>
<p>3. Where do most algae live?</p> <p>_____</p> <p>_____</p>	<p>4. What do you think would happen to the amount of oxygen in the atmosphere if all of Earth's algae suddenly died off?</p> <p>_____</p> <p>_____</p>
<p>5. Plants and animals perform respiration.</p> <p><input type="radio"/> A False</p> <p><input type="radio"/> B True</p>	<p>6. Once animals use oxygen, it can never be replaced.</p> <p><input type="radio"/> A False</p> <p><input type="radio"/> B True</p>
<p>7. Algae cannot make their own food.</p> <p><input type="radio"/> A False</p> <p><input type="radio"/> B True</p>	<p>8. Plants produce oxygen as a waste product of photosynthesis.</p> <p><input type="radio"/> A False</p> <p><input type="radio"/> B True</p>

Name _____

Date _____

Respiration

9. Explain what would happen to life on Earth if all the algae in the oceans suddenly died.

10. Describe the "cycle" of oxygen and carbon dioxide relating to photosynthesis and cellular respiration.
