Name _____ **Date** _____ **Period** _____

Biology 2nd 9 Weeks, Weeks 2.6-2.7 Homework 4
Plants, Photosynthesis and Cellular Respiration

The three main organs in a plant are the roots, stem, and leaves. **Roots** anchor the plant in the ground and absorb water and nutrients. There are two types of roots: tap roots and fibrous roots. Tap roots are one large root with many small, tiny roots. They do go very deep into the ground. Fibrous roots are made of many small, thin roots. They do not go very deep into the ground.

The **stem** connects the roots to the leaves, supports the leaves, and transports water and nutrients through vascular networks of specialized cells. Xylem and phloem are the two types of stem tissue.

Xylem transports water and minerals up from the roots to the leaves. **Phloem** transports sugar down from the leaves to the rest of the plant.

Finally the **leaves** are the site of photosynthesis. The driving force behind water movement in a plant is **transpiration**, the loss of water from a leaf. This movement of water from the leaf's surface pulls other water molecules from the root upward.

Water escapes from the leaf through pores or openings called **stomata**. Stomata are surrounded by **guard cells** which are plump when water is plentiful and allow the stomata to remain open. The stomata are also important for gas exchange, so that plants can take in carbon dioxide they need for photosynthesis, and remove the oxygen produced in photosynthesis. When too much water has been lost, the guard cells shrivel, which causes the stomata to close. The stomata must balance the need for gas exchange with prevention of excessive water loss.

The equations for photosynthesis and cellular respiration are shown below.

Photosynthesis $6CO_2 + 6\ H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

Cellular Respiration $C_6H_{12}O_6 + 6O_2 \rightarrow 6\ CO_2 + 6H_2O + 36\ ATP$

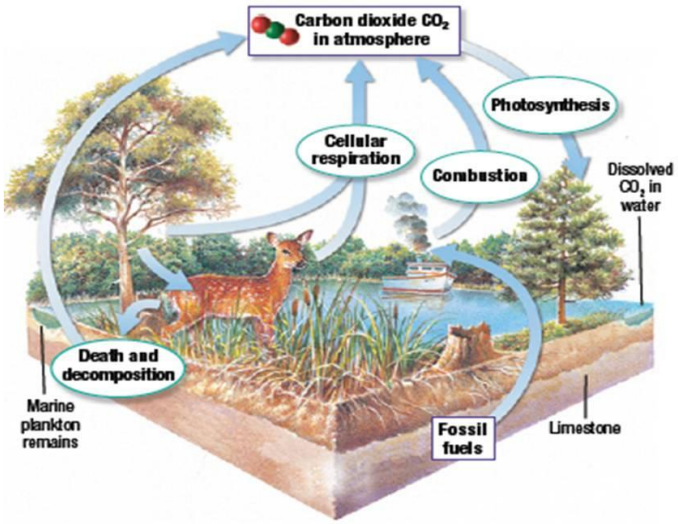
1. What carbohydrate is a product of photosynthesis and a reactant in cellular respiration?
   a. ATP
   b. Oxygen
   c. Glucose
   d. Carbon Dioxide

Justification –

2. Cellular respiration involves an energy conversion. Which of the following represents the energy conversion that occurs during cellular respiration?

a. ATP to glucose
b. light energy to glucose
c. glucose to ATP
d. ATP to light energy

Justification -



3. Which process in the picture removes carbon dioxide from the atmosphere?

a. Cellular Respiration
b. Combustion
c. Photosynthesis
d. Death and decomposition

Justification -

4. Which of the following pairings show the gas released during cellular respiration and the organelle responsible for the process?

a. O_2, chloroplast
b. Glucose, mitochondria
c. ATP, chloroplast
d. CO_2, mitochondria

Justification-

5. Match each leaf description to its corresponding structure.

____	Transports water and nutrients throughout the plant	a.	Cuticle
____	Controls the opening and closing of stomata	b.	Mesophyll
____	Allows gas exchange	c.	Stoma
____	Location of most photosynthesis	d.	Guard Cell
____	Waxy coating that prevents water loss	e.	Vascular Bundle

6. Identify each leaf structure using structures a. – e. in question 5 above.