LESSON 2

What Are Chloroplasts and Mitochondria?

Special organelles called **chloroplasts** are found in the cells of a plant's leaves and stems. These chloroplasts contain special molecules that help the plant make food in the process called **photosynthesis**.

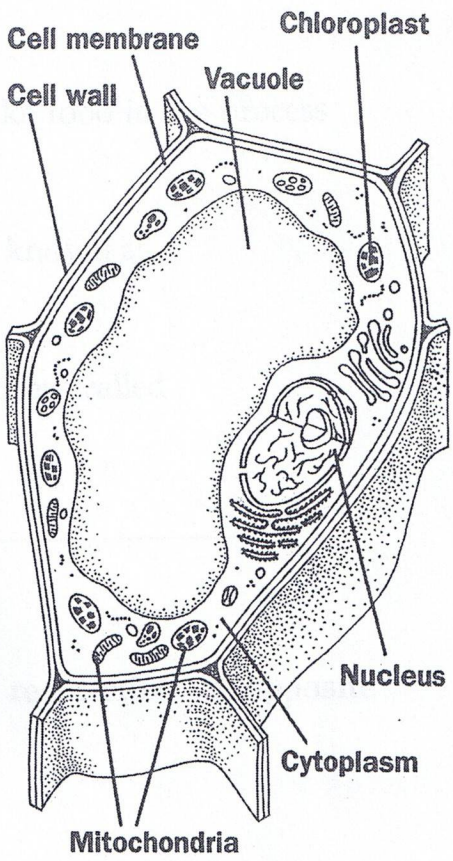
For photosynthesis, a plant cell needs water, carbon dioxide, and light. Water and carbon dioxide enter a cell through the cell wall and membrane. Inside the chloroplasts, a special green molecule called **chlorophyll** takes in light energy from the sun. The cell uses this energy to change carbon dioxide and water into sugar and oxygen. Much of the oxygen leaves the cell and enters the atmosphere. The sugar remains in the plant.

Some of the sugar may be stored in a **vacuole**, a large organelle that holds materials and water for the cell. Some of the sugar combines to form new materials like **starch**. Think of starch as food the plant stores until it is needed. Starches are stored in different parts of the plant, such as the roots.

Plant cells use the food they make and store to meet their energy needs. Food made during photosynthesis is taken apart in a process called **respiration**. All plant cells have many small organelles called **mitochondria**. The mitochondria are often called the power plants for the cell. This is because respiration takes place in these organelles. The mitochondria use oxygen and sugar to produce energy molecules for the plant cells.

You can see, then, that photosynthesis and respiration are opposite processes. Photosynthesis uses carbon dioxide and water to make sugar and oxygen and to store energy. Respiration uses sugar and oxygen to make carbon dioxide and water and to release energy.

Plant Cell



A.

Write the word that best completes each sentence.

chlorophyll	**mitochondria**	**respiration**
chloroplast	**photosynthesis**	

1. In a plant cell, an organelle where food is made is the _____.
2. Carbon dioxide, water, and light are used to make food in the process called _____.
3. The green molecule that takes in light energy is known as _____.
4. The plant cell uses food to make energy in a process called _____.
5. The power plants of a cell are called _____.

B.

Fill in the blanks to show how photosynthesis and respiration are opposite processes.

Photosynthesis

_____ + water + light energy →

_____ + oxygen

Respiration

sugar + _____ → carbon dioxide +

_____ + energy

C.

Write one or more sentences to answer the question.

Could the mitochondria do their job in the plant cell if there were no chloroplasts? Explain.

_____

_____