

Photosynthesis Worksheet

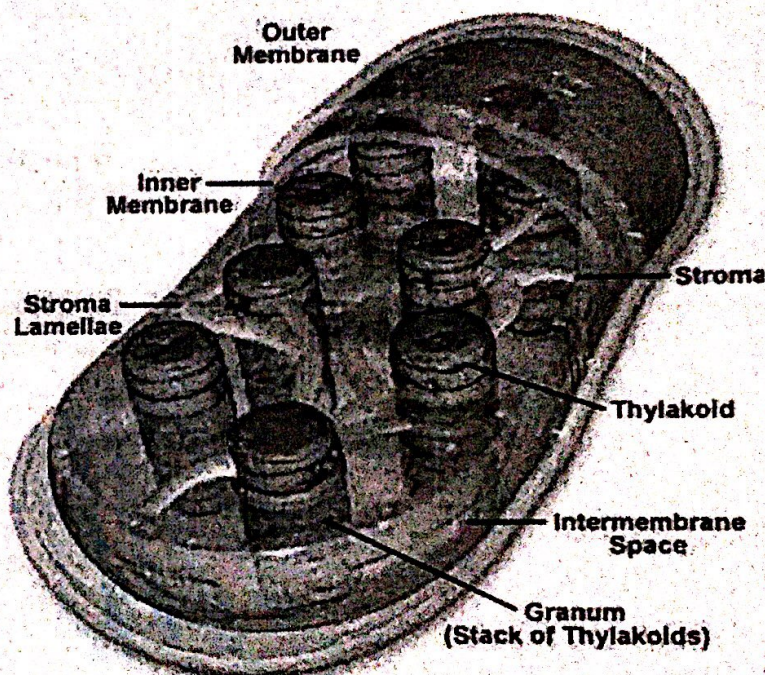
Part A:

Fill in the blanks with the appropriate word.

Word Bank				
Chlorophyll	glucose	organelle	photosynthesis	sunlight
pigment	sugar	chloroplast	$C_6H_{12}O_6$	water

Photosynthesis is a process in which sunlight energy is used to make glucose. The site of photosynthesis is in the chloroplast – a organelle found in the leaves of green plants. The main functions of chloroplasts are to produce food (glucose) during photosynthesis, and to store food energy. Chloroplasts contain the pigment, chlorophyll. Chlorophyll absorbs most of the colors in the color spectrum, and reflects only green and yellow wavelengths of light. This is why we see leaves as green or yellow – because these colors are reflected into our eyes.

Plant Cell Chloroplast



Answer the following questions below:

1. What is photosynthesis and where does it occur?

Process by which organism captures the energy of the sun to convert $CO_2 + H_2O$ into glucose

2. What are chloroplasts and where are they found? What is their function in a plant cell?

Tiny organelle found in plant cells only.

Produce chlorophyll which is needed for photosynthesis and provide space for process to occur -

↓
occurs
in
chloroplast

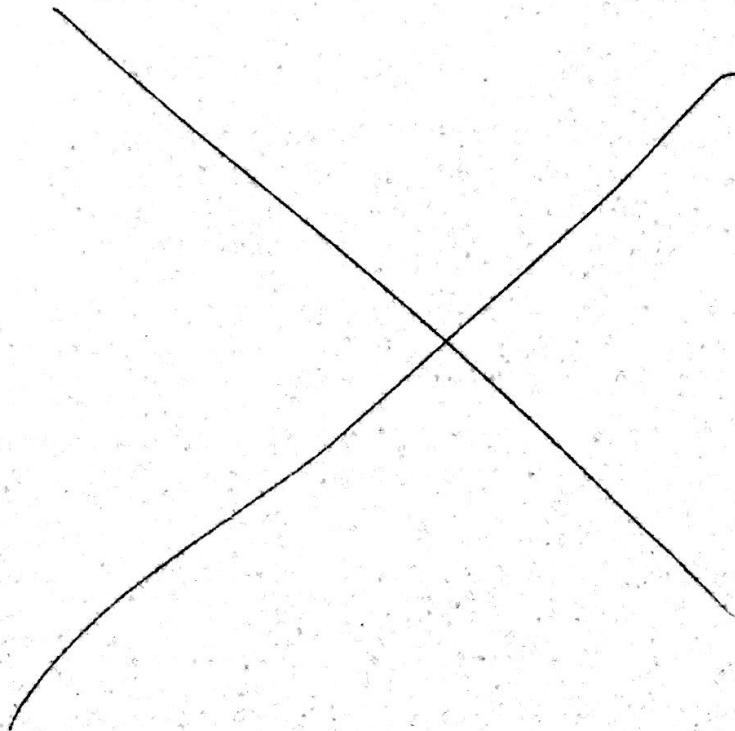
Part B:
Photosynthesis

Glucose is another name for sugar. The molecular formula for glucose is $C_6H_{12}O_6$. Plants make sugar by using the energy from sunlight to transform CO_2 from the air with water from the ground into glucose. This process, called photosynthesis, occurs in the chloroplast of the plant cell. During this process, oxygen (O_2) is created as a waste product and is released into the air for us to breath. The formula for photosynthesis is:



This formula says that carbon dioxide and water molecules are combined with the energy from sunlight to produce sugar and oxygen. The reactants in photosynthesis (what is used) are CO_2 , water and sun. The plant gets water from the ground through its roots. The plant collects carbon dioxide from the air. Much of the carbon dioxide comes from living organisms that exhale it, but some also comes from factory smokestacks and car fumes.

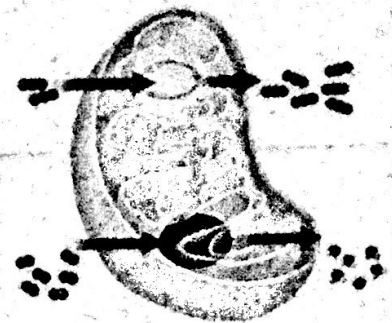
1. What is the formula for photosynthesis? $CO_2 + H_2O \xrightarrow[\text{chlorophyll}]{\text{Sunlight}} C_6H_{12}O_6 + O_2$
2. What three things are used to make glucose in photosynthesis? Carbon dioxide, water, sunlight (and chlorophyll)
3. Look at the image below, in two or more paragraphs, write the relationship you see between the different groups of organisms. How are all the organisms connected?



Overview of Cellular Respiration and Fermentation

KEY CONCEPT

The overall process of cellular respiration converts sugar into ATP using oxygen.



MAIN IDEA: Cellular respiration makes ATP by breaking down sugars.

1. What is function of cellular respiration?

Releasing energy within a cell
(convert glucose to ATP)

2. Does glucose actually react with oxygen during cellular respiration? Explain

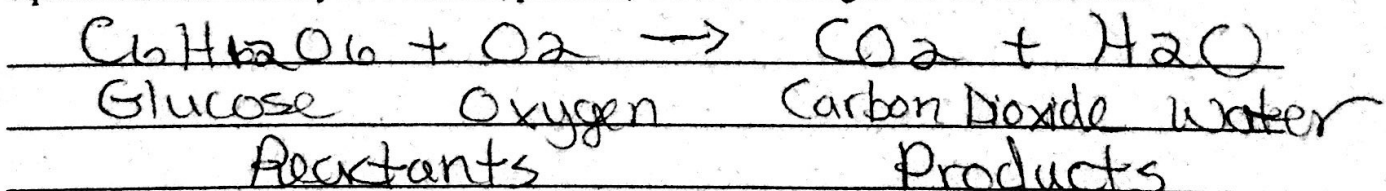
No. Glucose breaks down quicker
and more readily when oxygen is present.

MAIN IDEA: Cellular respiration is like a mirror image of photosynthesis.

3. In what two ways does cellular respiration seem to be the opposite of photosynthesis?

Opposite reactants / products
One uses energy, one creates energy

4. Write the chemical equation for the overall process of cellular respiration. Explain what the equation means. Identify the reactants, products, and the meaning of the several arrows.



5. The prefix glyco- comes from a Greek word that means "sweet." The suffix -lysis comes from a Greek word that means "to loosen." How are the meanings of these word parts related to the meaning of glycolysis?

Glycolysis breaks down sugar (glucose)

6. What does it mean to say that glycolysis is an anaerobic process?

It does not require oxygen

Cellular Energy Review Worksheet

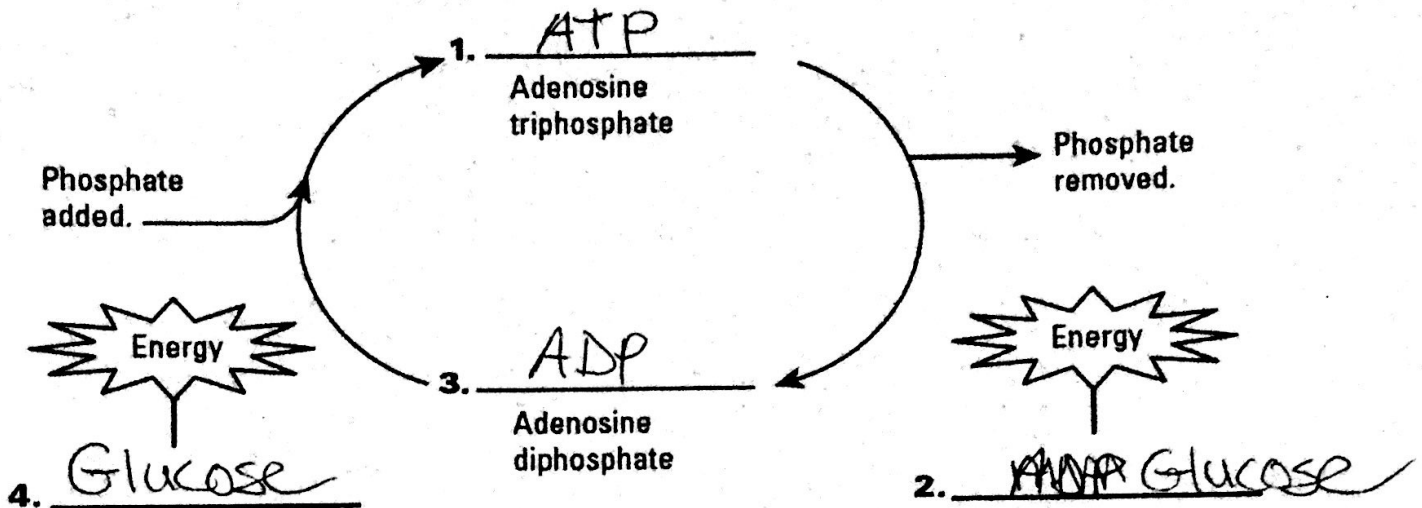
What do all cells use for energy?

ATP

What is ATP?

High energy chemical compound found in cells (1 adenine) (3 phosphate)

Complete the following diagram about the formation of ATP and ADP with the following terms: ADP, Energy from breakdown of molecules, ATP, Energy released for cell processes



Read the following paragraph and answer the following questions:

Different types of carbon-based molecules (carbohydrates, lipids, and proteins) can be broken down to produce ATP. The breakdown of the different molecules produces different amounts of ATP. Carbohydrates, especially the simple sugar glucose, are most commonly broken down to make ATP. The breakdown of a lipid produces many more ATP molecules than does the breakdown of a sugar. Proteins are the molecules least likely to be broken down, but they store about the same amount of energy as carbohydrates.

1. What types of molecules are broken down to make ATP? Which are most often broken down to make ATP?

Carbon based molecules - carbohydrates

2. Which type of organic compound supplies the most ATP to cells?

Lipids (fats)

3. Apply. Describe how you do not get energy directly from the food that you eat.

Energy from food is glucose. Our cells cannot use glucose so it must be broken down & converted to ATP so that we can use it.