

<p>Q: What is the word and formula equations for photosynthesis?</p> <p>A: (light) + water + Carbon dioxide → oxygen and glucose.</p> <p>$H_2O + CO_2 \rightarrow O_2 + C_6H_{12}O_6$</p>	<p>Q: What is the role of light in photosynthesis?</p> <p>A: Light energy is needed to start the photosynthetic reaction.</p>
<p>Q: Compare autotrophs and heterotrophs and provide an example of each.</p> <p>A: Autotrophs make their own "food"; responsible for converting sun energy into chemical energy. Example: Tomato plant</p> <p>Heterotrophs obtain food from other sources. Example: Human</p>	<p>Q: Why can photosynthesis and cellular respiration be considered "opposite" of each other?</p> <p>A: Photosynthesis converts and stores energy; cellular respiration releases energy.</p>
<p>Q: How does changing light intensity affect the rate of photosynthesis?</p> <p>A: Increasing light intensity will increase the rate of photosynthesis. However, if the plant is limited by other factors (such as amount of carbon dioxide or water), the rate of increase will eventually level off.</p>	<p>Q: What product is present in the gas bubbles observed during your lab experiment that tested the rate of photosynthesis compared to light intensity?</p> <p>A: Oxygen was produced in the form of gas bubbles during your experiment.</p>
<p>Q: A bumblebee is sucking nectar out of a flower. Is this organism an autotroph or a heterotroph?</p> <p>A: Heterotroph because it is obtaining energy (nectar) from another organism.</p>	<p>Q: Photosynthesis occurs in which organelle?</p> <p>A: Chloroplast</p>

<p>Q: The molecule that stores energy in photosynthesis is:</p> <p>A: Glucose. Glucose is formed in the Calvin cycle portion of photosynthesis and stores energies in its bonds.</p>	<p>Q: Which organelle converts sunlight energy into chemical energy?</p> <p>A: Chloroplast. Chloroplasts are presently only in plant cells and contain photosynthetic pigments that capture sunlight energy and turn it into chemical energy (glucose) through a series of chemical reactions.</p>
<p>Q: Why does grass appear to be green?</p> <p>A: Grass appears to be green because the pigments in grass reflect green light and absorb all other colors of light (yellow-orange, red, blue).</p>	<p>Q: What is the relationship between photosynthesis and cellular respiration?</p> <p>A: Photosynthesis produces the reactants needed for cellular respiration and cellular respiration makes the reactants needed for photosynthesis.</p>
<p>Q: What do plant cells require for photosynthesis to occur?</p> <p>A: Plant cells require Carbon Dioxide (CO₂), Water (H₂O), and sunlight to begin photosynthesis.</p>	<p>Q: Why is photosynthesis necessary for life on earth?</p> <p>A: Photosynthesis produces oxygen which is necessary for most forms of life on earth. In addition photosynthesis captures and stores sunlight energy in the form of chemical energy.</p>
<p>Q: Trace the path of energy storage and release in a human being that eats an ear of corn.</p> <p>A: The corn plant absorbs and stores energy from the sun in the form of glucose which is a product of photosynthesis. The human then eats the corn and releases the energy stored in glucose through cellular respiration.</p>	<p>Q: An experiment is conducted in which a plant is placed in a beaker of water and then placed under a light. This is experiment is repeated, but different amounts of carbon dioxide is added to the water. Students observe the number of bubbles produced after 5 minutes. What are the independent and dependent variables and what question could be answered by this experiment?</p> <p>A: The independent variable is the amount of carbon dioxide and the dependent variable is the number of bubbles produced. The question being investigated could be: " what is the effect of changing carbon dioxide concentration on the rate of photosynthesis?"</p>

<p>Q: Compare cellular respiration and photosynthesis.</p> <p>A: Cellular respiration releases stored chemical energy, often in the form of glucose, while photosynthesis stores energy in the form of glucose. Cellular respiration occurs in the mitochondria while photosynthesis occurs in the chloroplast. Photosynthesis occurs only in plants while cellular respiration occurs in plants and animals.</p>	<p>Q: Describe the three stages of cellular respiration.</p> <p>A: The three stages of cellular respiration include glycolysis, the Krebs's Cycle, and the Electron Transport chain. Glycolysis produces 2 ATP and occurs in the cytoplasm. The Krebs's Cycle produces 2 ATP and occurs in the mitochondria. The Electron Transport Chain (ETC) produces 32 ATP and occurs in the mitochondria.</p>
<p>Q: What are the reactants and products of the cellular respiration reaction?</p> <p>A: Oxygen and glucose are the reactants and Carbon dioxide, Water, and ATP are the products of this reaction.</p>	<p>Q: What happens when ATP is converted to ADP?</p> <p>A: ATP has three phosphate bonds. When the bond that connect the second and third phosphate molecules is broken, energy is released and ADP formed.</p>
<p>Q: Compare and contrast cellular respiration and fermentation.</p> <p>A: Cellular respiration occurs in three stages: Glycolysis, Krebs Cycle, and Electron Transport Chain and produces a total of 36 ATP. Cellular Respiration occurs in the cytoplasm and the mitochondria. Fermentation results in the production of 2 ATP, and occurs in the cytoplasm. Glycolysis occurs in both processes.</p>	<p>Q: Write the word formula and the chemical equation for cellular respiration.</p> <p>A: Oxygen + Glucose → Carbon Dioxide + Water + 36 ATP</p> $O_2 + C_6H_{12}O_6 \rightarrow CO_2 + H_2O + ATP$

<p>Q: Compare lactic acid fermentation to alcoholic fermentation.</p> <p>A: Lactic acid fermentation occurs in mammals and produce lactic acid. Alcoholic fermentation occurs when making baked goods or alcoholic beverages and produces carbon dioxide and ethyl alcohol. Both of these processes occur in the absence of oxygen.</p>	<p>Q: Why is cellular respiration considered aerobic and fermentation anaerobic?</p> <p>A: Cellular respiration is considered aerobic because it requires oxygen. Fermentation is anaerobic because it occurs without the presence of oxygen.</p>
<p>Q: What makes the holes in bread when it is baked?</p> <p>A: Carbon dioxide is produced as a result of alcoholic fermentation that occurs during the baking of bread. The bubbles of carbon dioxide make small pockets of gas in the bread which create the holes in the bread.</p>	<p>Q: What organelle is responsible for the release of energy in cellular respiration?</p> <p>A: Mitochondria.</p>
<p>Q: Why is the mitochondria considered the powerhouse of the cell?</p> <p>A: Mitochondria is responsible for the majority of energy production in eukaryotic organisms as it produces 36 molecules of ATP for every 1 molecule of glucose.</p>	<p>Q: What gas is released during cellular respiration and alcoholic fermentation?</p> <p>A: Carbon Dioxide (CO₂)</p>