

3.1 - Photosynthesis	
Photosynthesis	A chemical reaction in which plants use energy to change carbon dioxide and water into glucose and oxygen . It occurs in chloroplasts .
Chlorophyll	Green pigment in chloroplasts. Absorbs light energy required for photosynthesis.
Uses of Glucose	For respiration to release energy . Stored as starch for using later. Making other substances e.g. cellulose, lipids and proteins .
Word Equation	carbon dioxide + water $\xrightarrow{\text{light energy}}$ glucose + oxygen
Symbol Equation	$6 \text{ CO}_2 + 6 \text{ H}_2\text{O} \xrightarrow{\text{light energy}} \text{C}_6\text{H}_{12}\text{O}_6 + 6 \text{ O}_2$
Limiting Factors	A factor that affects the rate of photosynthesis e.g. light intensity, carbon dioxide concentration and temperature .
Investigating Rate	Use pondweed . Count number of bubbles of oxygen produced in given time. More bubbles = faster rate.
3.2 - Testing Leaves for Starch	
Starch	Some glucose produced by photosynthesis is stored as starch for later use.
Iodine Solution	Red-brown liquid which turns blue-black in the presence of starch .
Testing Leaves	Heat in boiling water to soften . Heat in boiling ethanol to remove colour from leaves. Wash leaves. Add iodine solution with pipette.
Safety Precautions	Ethanol is highly flammable . Keep away from Bunsen flame.
Variegated Leaves	Green parts – have starch – photosynthesis occurring. Yellow parts – no starch – photosynthesis not occurring.

3.3 – Structure of Leaves	
Palisade Tissue	Where most photosynthesis occurs. Palisade cells are tightly packed and contain many chloroplasts .
Spongy Tissue	Cells are loosely packed and there are air spaces which allow carbon dioxide to diffuse throughout the leaf.
Stomata	Little holes in the underside of leaves. Allows carbon dioxide to diffuse into leaf.
Guard Cells	Control opening and closing of the stomata to control water loss .
Xylem Vessels	Transport water and minerals from roots to leaves.
Phloem Vessels	Transport sugars around the plant.
3.4 – Healthy Plant Growth	
Root Hair Cells	Absorb water and minerals from the soil. Have root hairs to increase surface area to increase rate of absorption.
Water	Needed for photosynthesis , keeping plant upright and rigid and cooling the plant when water evaporates .
Minerals	Nitrates, magnesium, phosphates and potassium .
Fertilisers	Chemicals containing minerals added to the soil .
Eutrophication	Fertilisers are washed into lakes . Algae grows and blocks sunlight . Other plants die and are broken down by bacteria . Bacteria reduce oxygen levels and other organisms die.
Pesticides	Toxic chemicals sprayed on crops to kill pests e.g. insects and weeds .
Bioaccumulation	Build-up of toxic chemicals as they are passed up a food chain as they cannot be broken down or excreted .

Y8 Science Cycle 2 - Sheet 3

Plants & Photosynthesis

