wymondham high

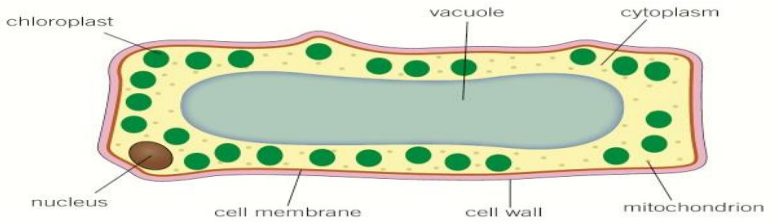
Yr 8 Science B2.2

Section 1- The photosynthesis reaction

- Plants make food through the process of **photosynthesis**
- Photosynthesis occurs in the chloroplasts of leaf cells
- Chloroplasts containing the green pigment **chlorophyll** transfer energy from the Sun to power the reaction.

Word Equation

carbon dioxide + water → oxygen + glucose



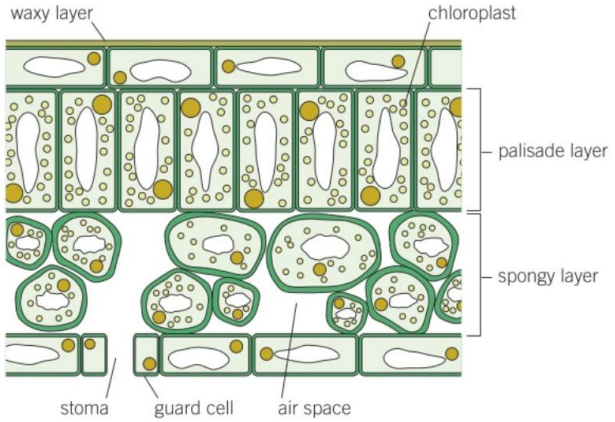
A plant cell.

Symbol Equation

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

Organisms which produce their own food are called producers.

Section 2 - Leaf structure & adaptations



Palisade layer – contains cells packed with lots of chloroplasts

Spongy layer – contains air spaces allowing carbon dioxide to diffuse quickly into cells

Adaptation	How adaptation aids photosynthesis
Leaf surface area	More sunlight will hit the leaf and be absorbed
Veins	Tubes tat transport chemicals around the plant. Xylem transports water. Phloem transports sugar.
Thin	Carbon dioxide has a short distance to travel to get into the leaf cells

On the underside of leaves are small holes, or pores, called **stomata**. A single hole is called a **stoma**. Each stoma is surrounded by two **guard cells**.

These open to allow gases in and out for photosynthesis and respiration.

Section 3- Plant mineral

Plant minerals are soluble (they can dissolve in water). They are taken into a plant via the root hair cells.

Mineral	Function (job) of mineral	Symptoms if deficient (lacking mineral)
Nitrates NO_3.	Makes protein for growth and repair of cells	Poor growth. Leaves are small & yellow
Phosphates PO_4	Needed for healthy roots	Purple leaves Small roots
Magnesium Mg	Needed to make chlorophyll	Yellow leaves - normal size
Potassium K	Needed for healthy leaves and flowers	Yellow leaves with dead patches

Fertilisers contain the minerals above and are added to the soil.

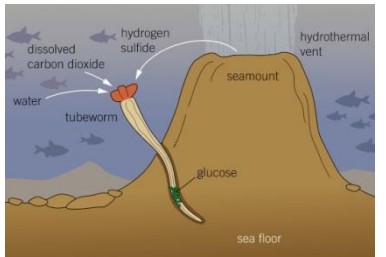
Section 4- Chemosynthesis

Chemosynthesis is where organisms use chemical reactions not light energy to make glucose. Chemosynthesis is only carried out by some types of bacteria. The two main types are sulphur bacteria and nitrogen bacteria.

Nitrogen bacteria live in the soil and plant roots.

Sulphur bacteria live at the bottom of the sea near volcanic vents.

	Photosynthesis	Chemosynthesis
Energy required	yes	yes
Energy source	light	chemical
Water required?	yes	not always
Carbon dioxide required?	yes	usually
Glucose produced?	yes	yes



The bacteria can live inside tubeworms. The tubeworm then uses some of the glucose made by the bacteria for its own food. In return the bacteria have a secure place to live inside the tubeworm's body. This type of relationship is called a symbiotic or mutualistic relationship