



# Year 8 Science knowledge organiser

**Module** – Ecosystems

**Topic** – Photosynthesis and Respiration

**Length of topic** – Approx. 12 lessons

**Method of assessment** – Summative assessment

## Links to prior learning

KS2 Year 6 Animals including humans topic

- Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood

KS3 Year 7 topic Organisms

- Structure of plant and animal cells

## Knowledge to be taught.

- Respiration is a series of chemical reactions, in cells, that breaks down glucose to provide energy and form new molecules.
- Most living things use aerobic respiration but switch to anaerobic respiration, which provides less energy, when oxygen is unavailable.
- Plants and algae do not eat, but use energy from light, together with carbon dioxide and water to make glucose (food) through photosynthesis.
- Plants and algae use the glucose as an energy source, to build new tissue, or store it for later use.
- Plants have specially-adapted organs that allow them to obtain resources needed for photosynthesis.

## Skills to be covered

- Utilising word equations to explain similarities and differences between photosynthesis and respiration
- Collecting data and examining consequences on how particular conditions affect plants and humans
- Graph work

## Working scientifically strands covered

Analyse patterns	✓
Discuss limitations	✓
Draw conclusions	✓
Present data	✓
Communicate ideas	✓
Construct explanations	✓
Critique claims	
Justify opinions	
Collect data	✓
Devise questions	✓
Plan variables	✓
Test hypothesis	✓
Estimate risks	✓
Examine consequences	✓
Review theories	
Interrogate	

## Assessment

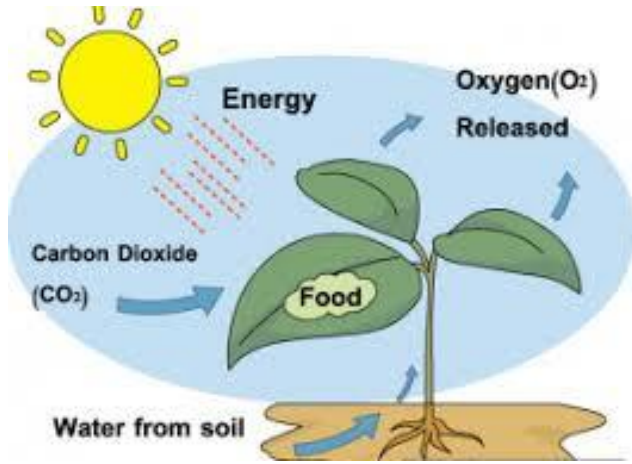
Summative assessment based on knowledge taught through the topic



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## Facts

Plants are green because they contain a pigment called chlorophyll.

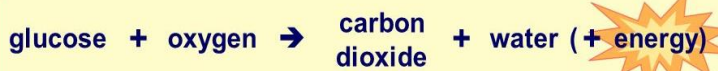


Green plants and algae make their own food in a process called photosynthesis.



Iodine is used to test for the presence of starch – a carbohydrate most plants use to store the glucose they have made.

Aerobic respiration uses glucose and oxygen to produce energy, water and carbon dioxide.



Anaerobic respiration breaks glucose down without the need of oxygen.



Cramp is caused by the build-up of lactic acid in your muscles during anaerobic respiration.

Yeast fermentation is used in brewing and bread making.



## Keywords

**Aerobic respiration:** Breaking down glucose with oxygen to release energy and producing carbon dioxide and water.

**Anaerobic respiration (fermentation):** Releasing energy from the breakdown of glucose without oxygen, producing lactic acid (in animals) and ethanol and carbon dioxide (in plants and microorganisms).

**Chlorophyll:** Green pigment in plants and algae which absorbs light energy.

**Chloroplast:** Contains the green pigment chlorophyll; the site of photosynthesis.

**Diffusion:** The movement of molecules from an area of higher concentration to an area of lower concentration.

**Fertilisers:** Chemicals containing minerals that plants need to build new tissues.

**Lactic acid:** A toxic chemical produced during anaerobic respiration.

**Mitochondria:** Structures in the cytoplasm of all cells where aerobic respiration takes place (singular is mitochondrion).

**Photosynthesis:** A process where plants and algae turn carbon dioxide and water into glucose and release oxygen.

**Stomata:** Pores in the bottom of a leaf which open and close to let gases in and out.