



JABchem

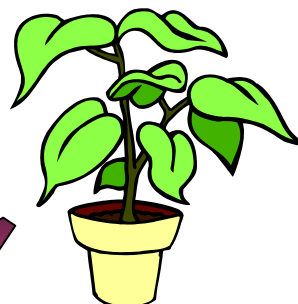


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Intermediate 1

Int 1

Chemistry



Section 9

Photosynthesis and Respiration

Intermediate 1 Chemistry Unit 3: Chemistry And Life

Section 9: Photosynthesis & Respiration

LO	Lesson	Text Book	Learning Outcome	Int1 Only
1	9.1	p142	Plants make their own food by taking in substances from the environment.	
2	9.2	p142	Plants use light energy to produce glucose from carbon dioxide and water in a process called photosynthesis; oxygen gas is also produced.	
3	9.1	P142	During photosynthesis carbon dioxide is absorbed through the leaves of plants.	
4	9.1 9.2	p142 p144	a) Water is drawn up through the roots b) oxygen gas is released into the air through the leaves.	
5	9.2	p142	The light energy required for photosynthesis is absorbed by the chlorophyll in the leaves.	
6	9.4	p144	Animals require sources of energy for use in a number of ways, including warmth and movement.	
7	9.5	p144	Animals can obtain energy by the reaction of glucose with oxygen to produce water and carbon dioxide in a process called respiration.	
8	9.4	p144	Animals obtain glucose by eating food which has come from plants.	
9	9.5	p144	Respiration is the reverse of photosynthesis.	
10	9.6	p146	The processes of photosynthesis and respiration maintain constant amounts of oxygen and carbon dioxide in the air.	
11	9.7	p148	Carbon dioxide in the atmosphere causes the greenhouse effect.	
12	9.6	p147	Extensive clearing of forests reduces the amount of carbon dioxide removed from the atmosphere by photosynthesis.	
13	9.6	p147	Increased levels of carbon dioxide in the air may also be due to increased combustion of fuels.	
14	9.7	p148	An increase in the level of carbon dioxide in the atmosphere could cause the atmosphere to retain more of the sun's energy as heat, a process known as global warming.	

Additional Learning Outcome from Section 11: Food & Diet

LO 11.18	9.3	p161	Plants convert the glucose into starch for storing energy.	
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9.1

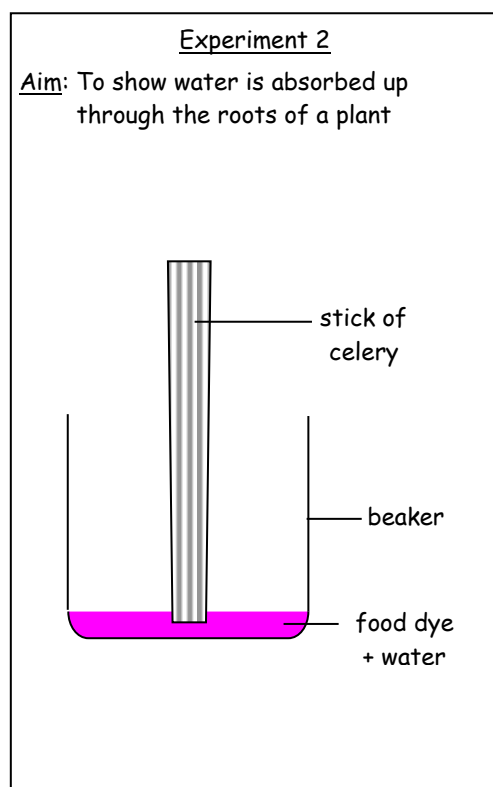
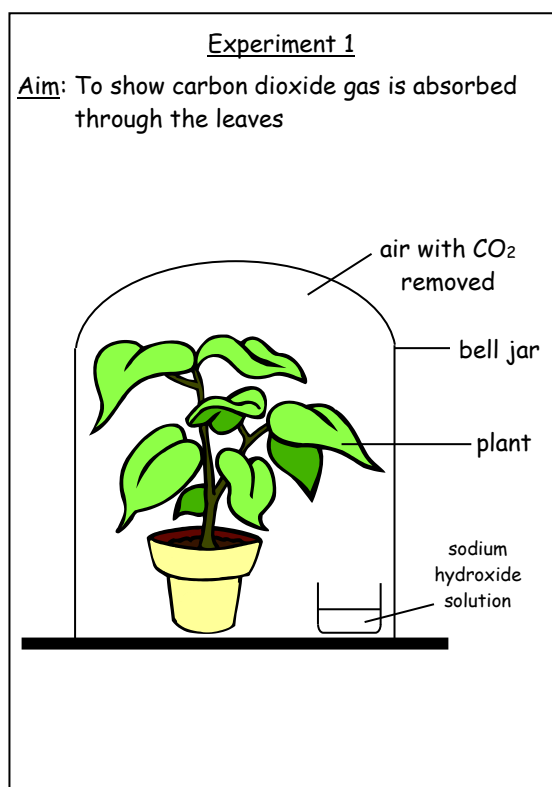
Plants Make Their Own Food

a) **Copy** the following passage into your jotter.

Living organisms can be split into two main types.

1. **Plants:** make their own food by taking substances from the environment
2. **Animals:** Eat plants (or other animals) to get the energy they need to survive.

b) **Observe** the following experiments.



c) **Copy and complete** the following sentences in your jotter.

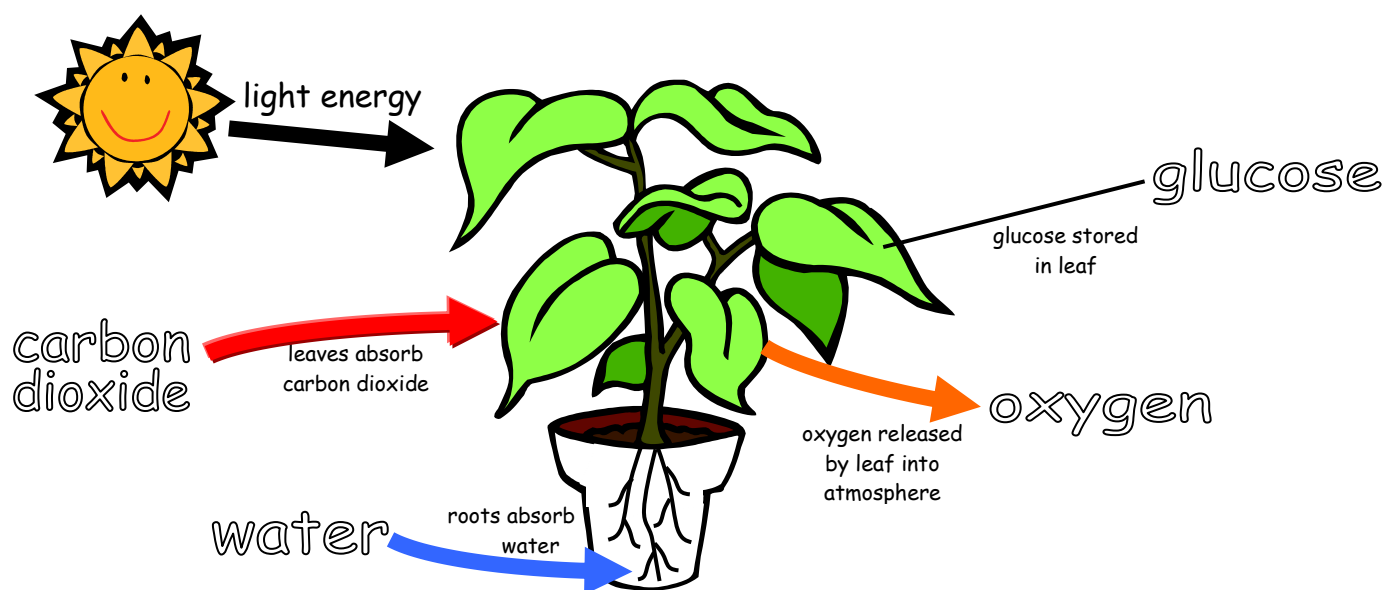
Plants need carbon dioxide and water to make food.

- Carbon dioxide gas is absorbed through the
- Water is absorbed through the

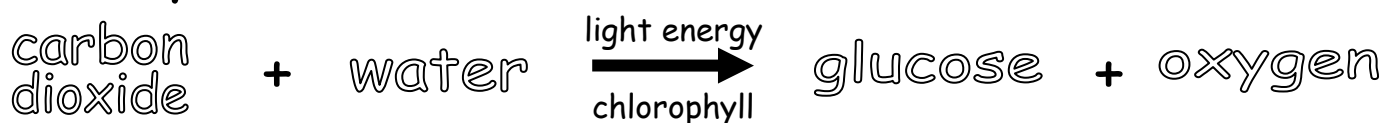
a) **Copy** the following passage into your jotter.

Green plants make their own food by a process called *photosynthesis*.

b) **Collect** a copy of the following diagram and **stick** it into your jotter.



Photosynthesis:



c) **Copy** the following passage into your jotter.

Light energy is absorbed by the chemical *chlorophyll*.

- Green coloured chlorophyll is found in leaves of plants
- Light energy is required to catalyse the chemical reactions of photosynthesis.

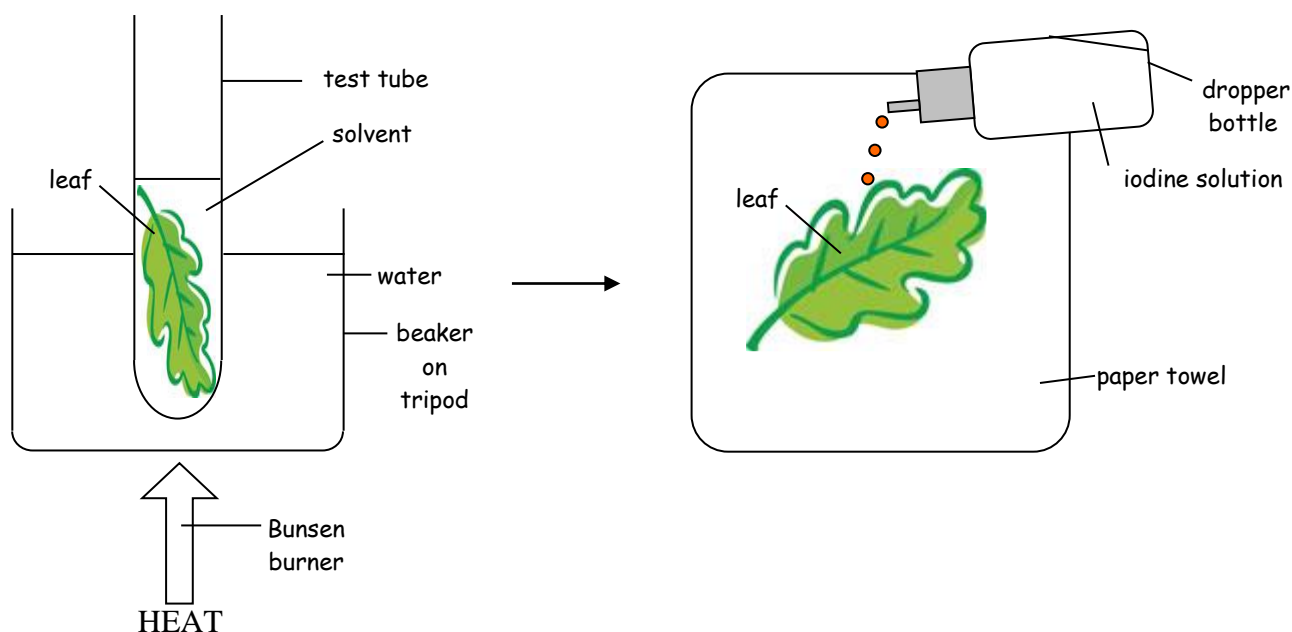
a) **Copy** the following passage into your jotter.

Photosynthesis: carbon dioxide + water \longrightarrow glucose + oxygen.

Plants does not store the glucose produced by photosynthesis but turn the glucose into starch for long term storage.

b) **Carry out** the following experiment.

- Prior to Experiment
- Place plant in dark for 5 days
 - Cover part of leaf (top and bottom) with shaped card.
 - Leave plant with partially covered leaves in light for 2 days



c) **Copy and complete** the following passage into your jotter.

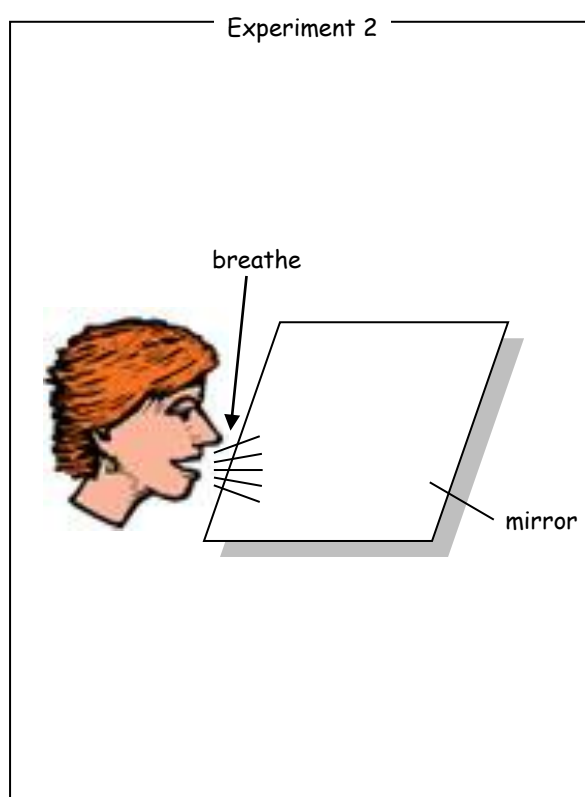
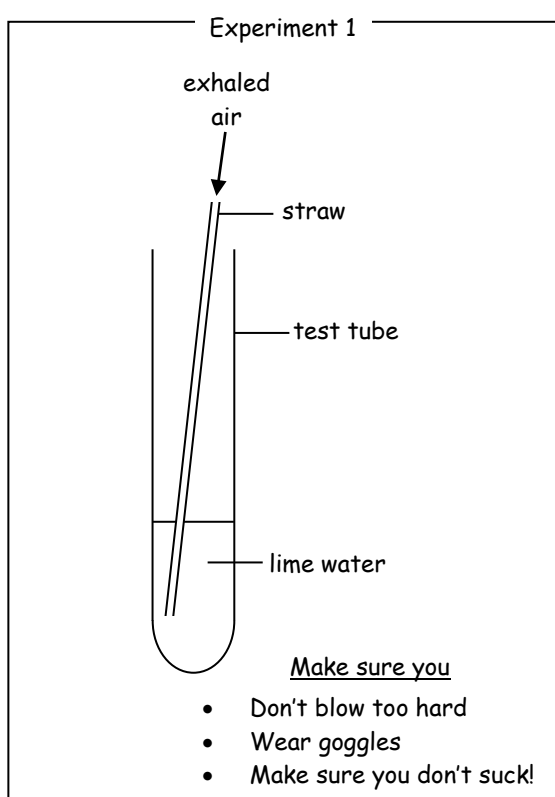
During photosynthesis, plants make and turn it into for long term storage in leaves.

Starch turns when iodine solution is added.

a) **Copy** the following passage into your jotter.

Plants make their own food by photosynthesis. Animals can't make their own food so they eat plants (or other animals that eat plants!)

b) **Carry out** the following experiments.



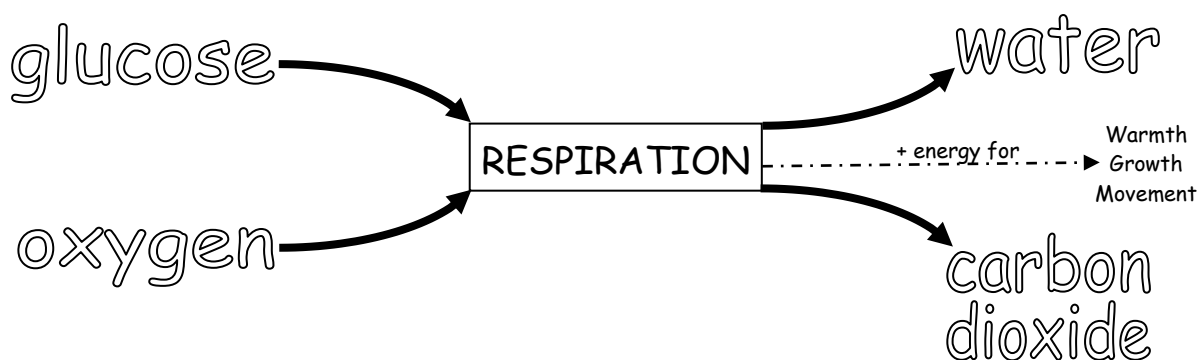
c) **Answer** the following questions in your jotter.

1. When animals eat food, name 3 things the energy obtained is used for.
2. What chemical do animals obtain from eating plants?
(NB. Plants make this chemical by photosynthesis)
3. Which two chemicals are released by animals back into the environment after breaking down food?

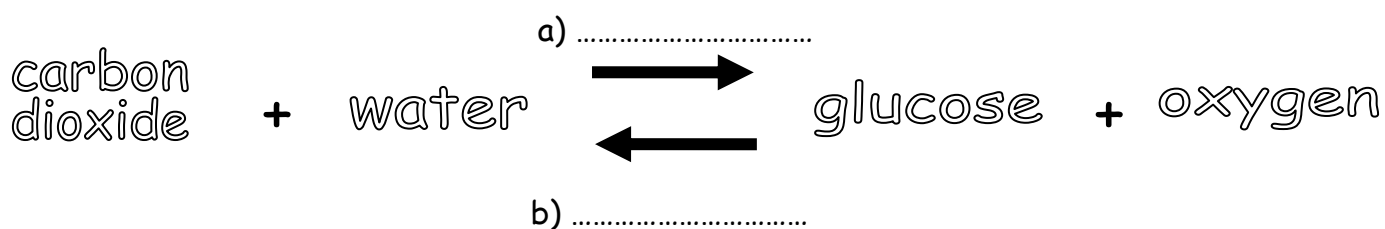
a) **Copy** the following passage into your jotter.

Animals get the energy they need from breaking down the chemical glucose. The glucose was originally made by plants.

b) **Copy** the following diagram into your jotter.



c) **Copy** and **complete** the following summary equation into our jotter.



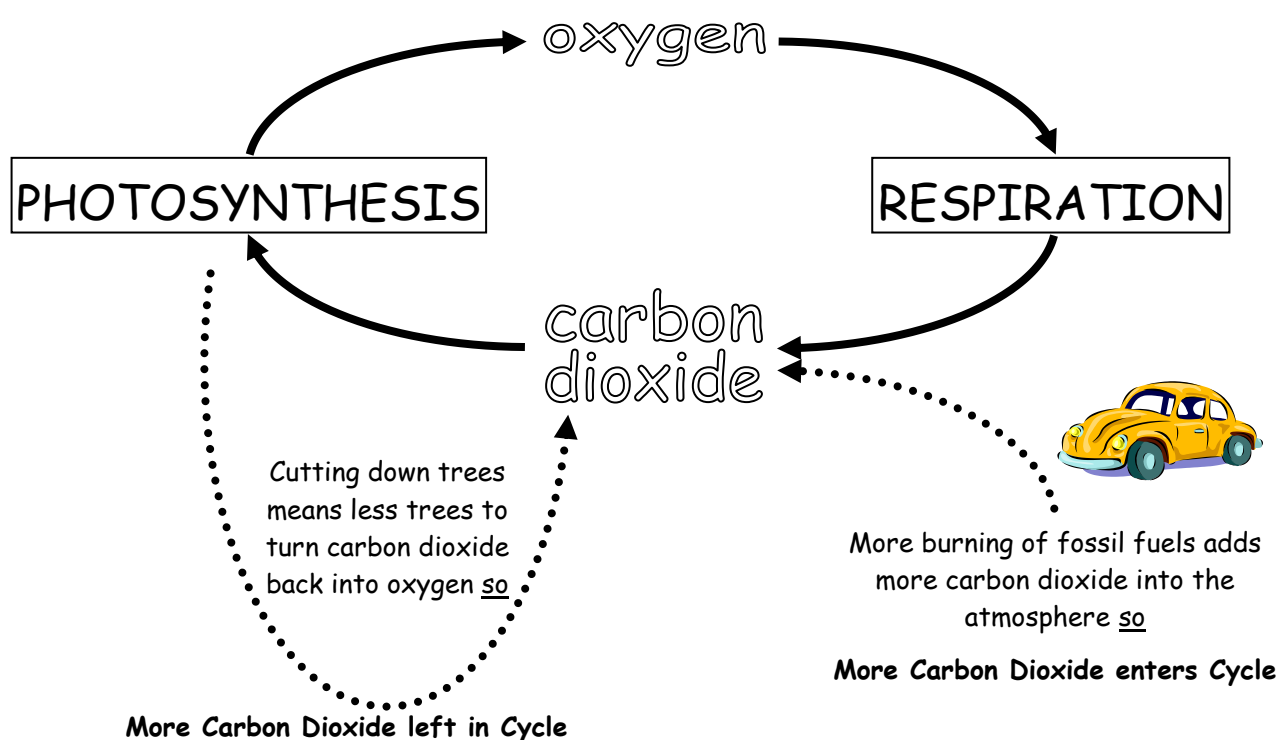
a) **Copy** the following passage into your jotter.

Respiration in animals turns oxygen into carbon dioxide.

Photosynthesis in plants turns carbon dioxide back into oxygen.

Fortunately the two processes can be kept in balance with one another.

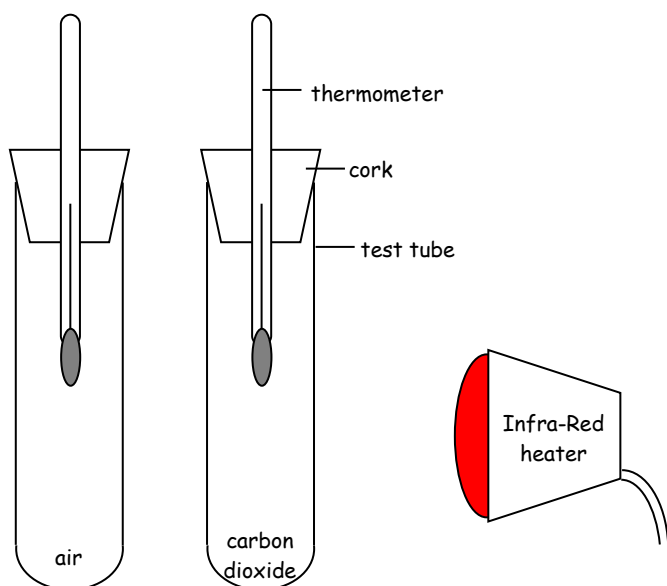
b) **Copy** the following diagram into your jotter.



a) **Copy** the following passage into your notes.

Too much carbon dioxide in your atmosphere causes the Greenhouse Effect. The Greenhouse effect is also known as Global Warming or Climate Change.

b) **Draw** the following diagram and table into your jotter.



Time (minutes)	Temperature of air (°C)	Temperature of carbon dioxide (°C)
0	22	22
2	28	30
4	32	36
6	35	41
8	37	45
10	38	48
12	38	51
14	38	52
16	38	52

c) **Draw** a line graph of both sets of results on the same piece of graph paper.

d) **Copy** the following passage into your jotter.

Higher amounts of carbon dioxide gas in the atmosphere traps heat from the sun and increases the temperature of planet Earth.



Access 3 level Revision Questions

1. During respiration, which gas is produced?

oxygen or carbon dioxide

2. Light energy is required for

photosynthesis or respiration

3. Global Warming is increased by

planting more trees or cutting down more trees

4. During photosynthesis, which gas is used up?

oxygen or carbon dioxide

5. Global Warming is caused by an increase in

increased levels of oxygen or increased levels of carbon dioxide

6. Glucose is produced by

photosynthesis or respiration

7. Water is absorbed by plants

through the leaves or through the roots

8. Using cars more often causes

an increase in carbon dioxide levels or an decrease in carbon dioxide levels

Intermediate 1 level Revision Questions

1. Which gas is responsible for global warming?

- A. carbon monoxide B. carbon dioxide C. oxygen D. nitrogen

2. The energy released during respiration is **NOT** used for

- A. movement B. warmth C. growth D. light

3. Which of the following is produced by respiration

- A. light energy B. carbon dioxide C. oxygen D. glucose

4. Which of the following is **NOT** required for photosynthesis to occur?

- A. light energy B. carbon dioxide C. oxygen D. water

