

Photosynthesis and Plant Responses

Photosynthesis

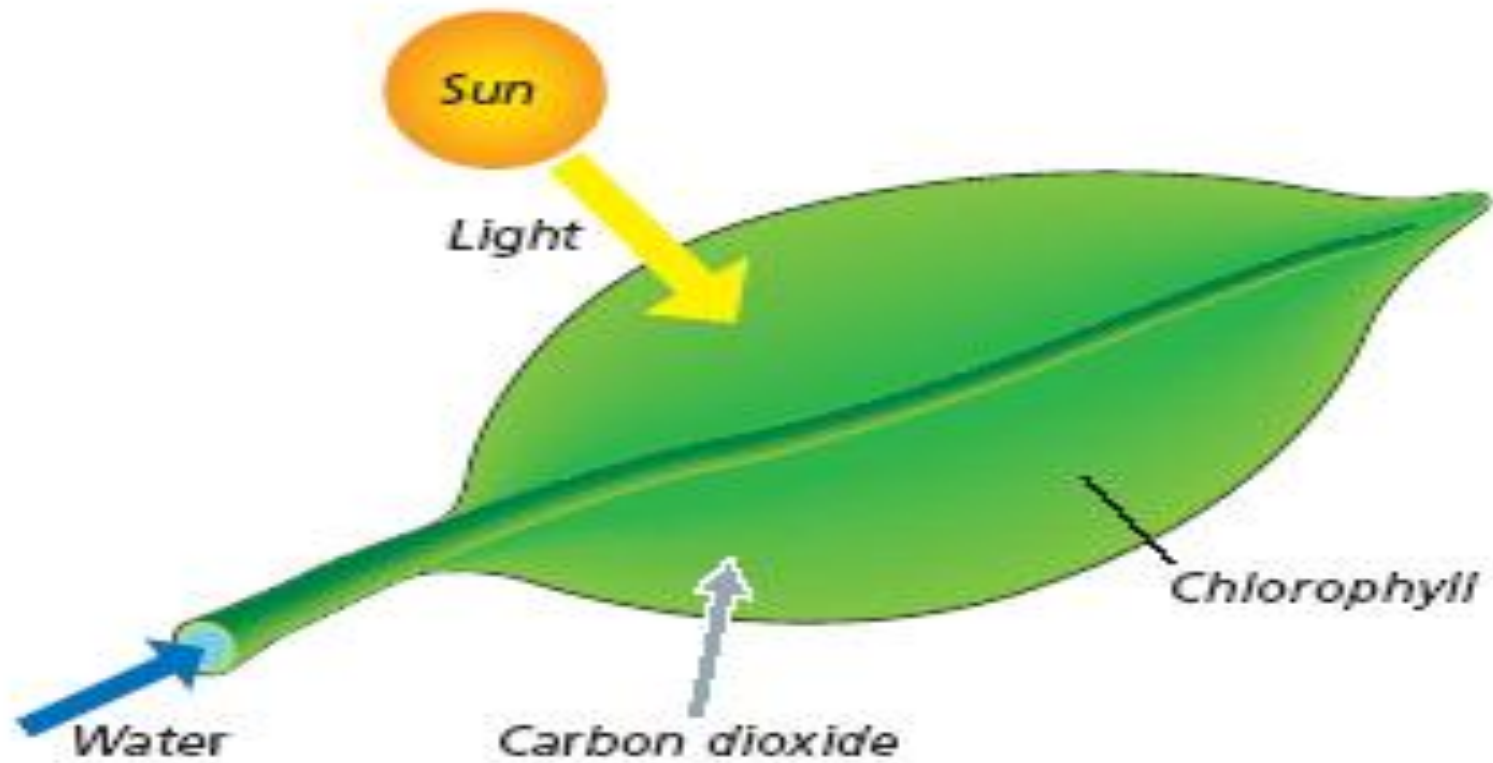
Photosynthesis

- **Photosynthesis is** the way plants make their own food

Factors needed for Photosynthesis

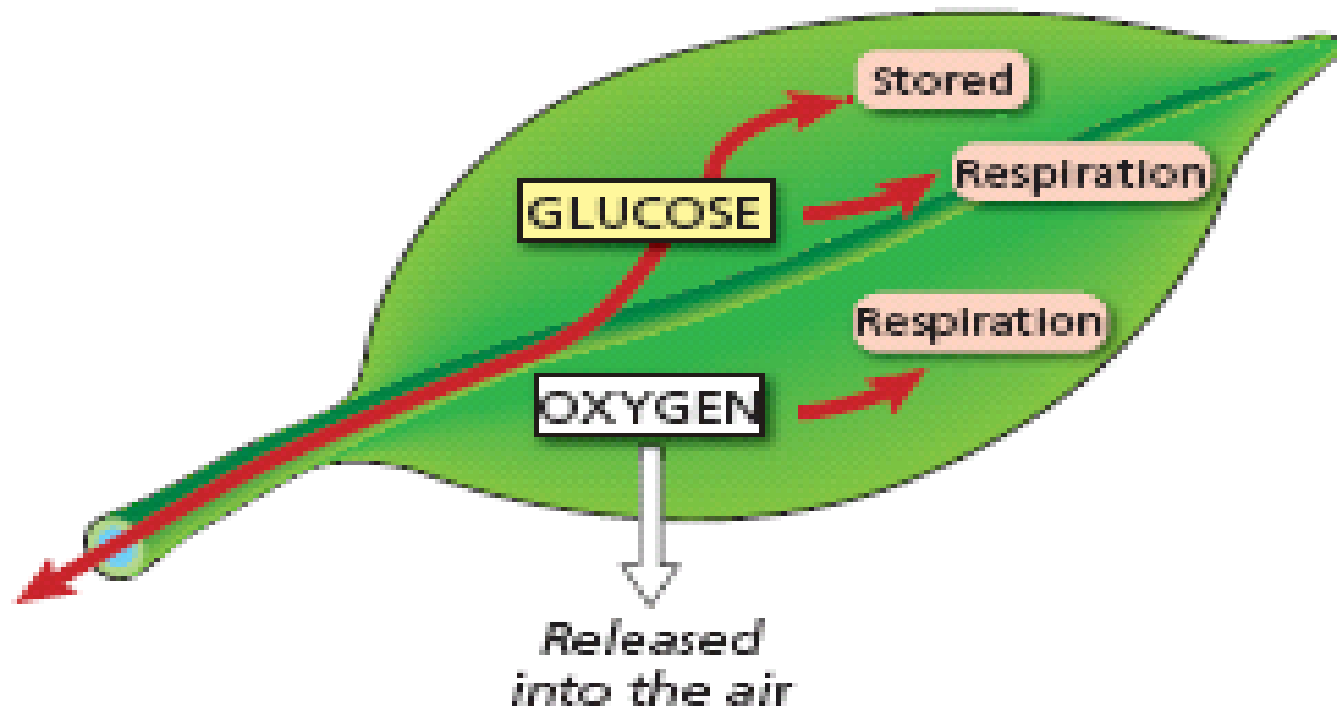
- Plants need 4 things for Photosynthesis to happen. These are:
 1. Carbon Dioxide
 2. Water
 3. Light
 4. Chlorophyll

Factors needed for



Products of Photosynthesis

- Plants make 2 things during Photosynthesis. These are:
 1. Glucose
 2. Oxygen



Equation for Photosynthesis

Carbon Dioxide

Glucose

Sunlight

+



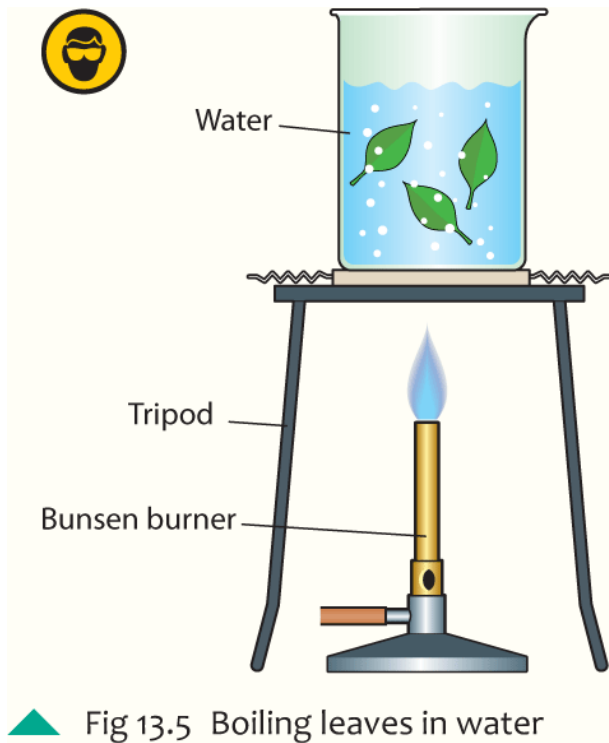
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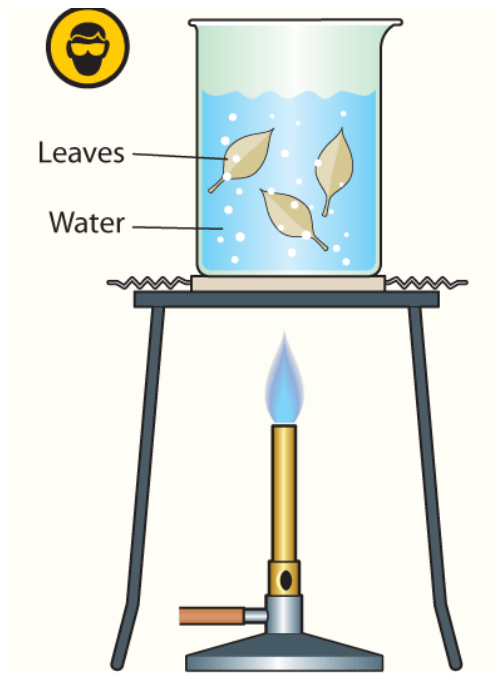
Chlorophyll

Water

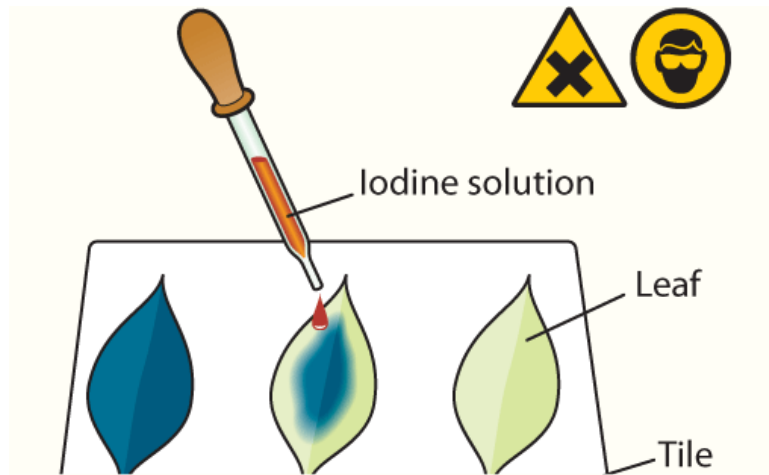
Oxygen

- To test a leaf for starch involves the following four steps:
 1. Boil the leaf in water- this kills and softens the leaf.
 2. Soak the leaf in hot alcohol - this removes the
chlorophyll (green colour)
 3. Place the leaf in boiling water- to re-soften the leaf
 4. Add iodine – to test for starch



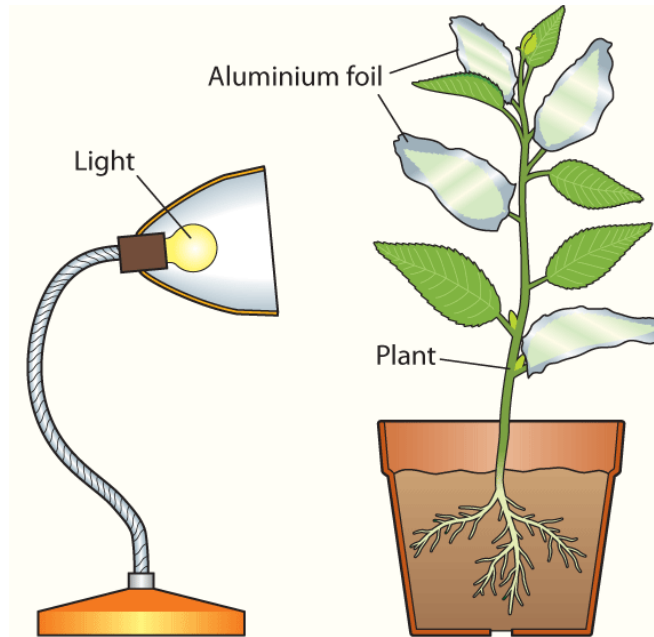


▲ Fig 13.7 Re-softening leaves



▲ Fig 13.8 Add iodine solution to leaves

- To show that starch is made by a plant in photosynthesis:
 - Put a plant into the dark for two days.
 - Cover some of the leaves with aluminium foil.
 - Leave the plant in bright light.



▲ Fig 13.4 To show that starch is made in photosynthesis

- Test the covered and uncovered leaves for starch.
- The uncovered leaves turn blue-black (starch made in photosynthesis).
- The covered leaves remain red-yellow (no starch made as photosynthesis does not happen in the dark).



Plant Responses

Phototropism

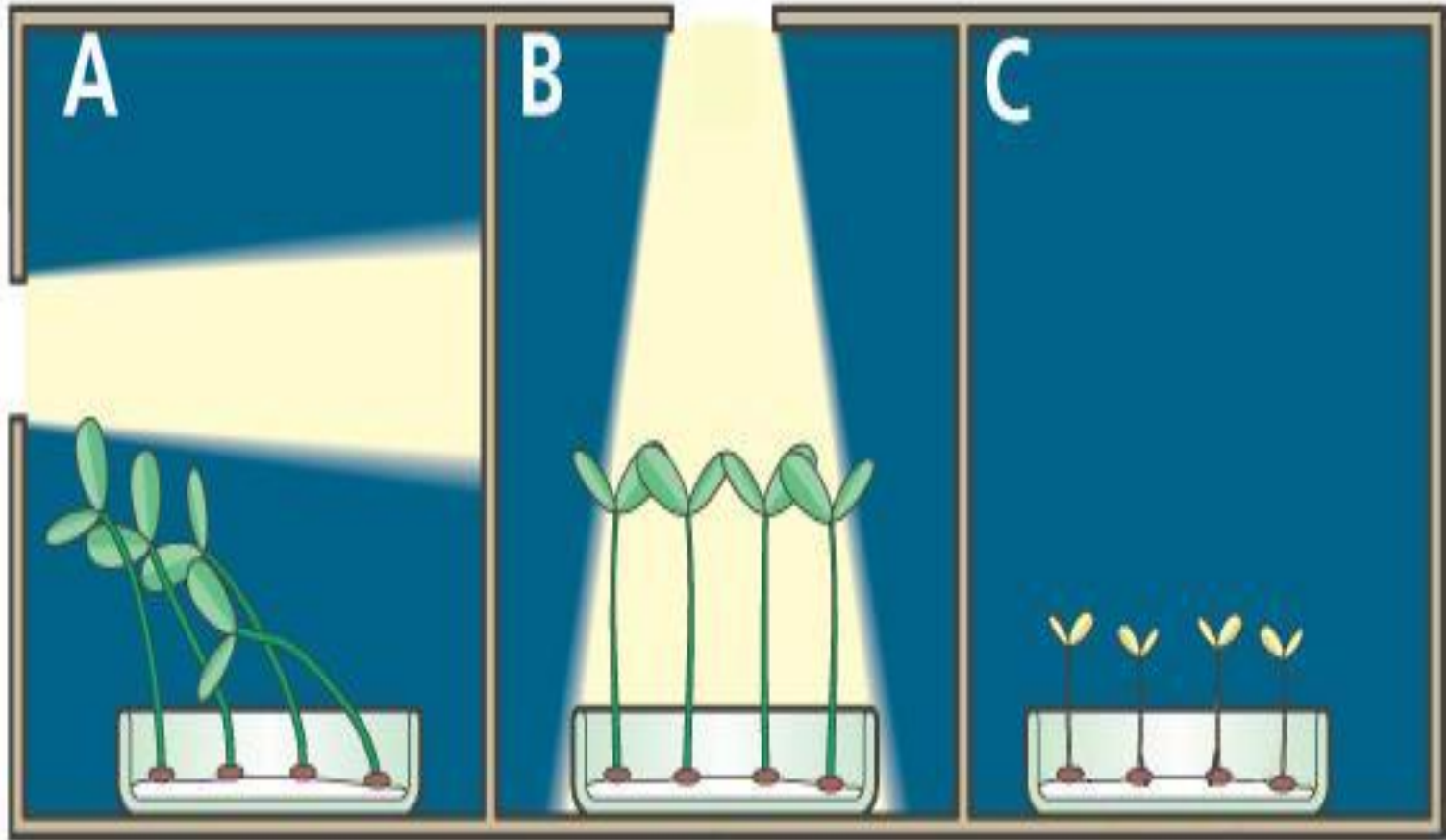
- **Phototropism** is
when a plant grows towards the light



A Demonstration to investigate Phototropism

A Demonstration to investigate Phototropism

- Divide a cardboard box in 3
- Place seeds in each section
- Leave for a week
- **Results:** The seeds have grown in different directions
- **Conclusion:** Seeds grow towards the light (Phototropism)



- Phototropism can be investigated in the following way:
 - Grow some seedlings in lightproof boxes with holes cut in different positions.
 - The shoots of the seedlings are seen to always grow towards the light.

Geotropism

- **Geotropism** is
when a plant grows down towards gravity

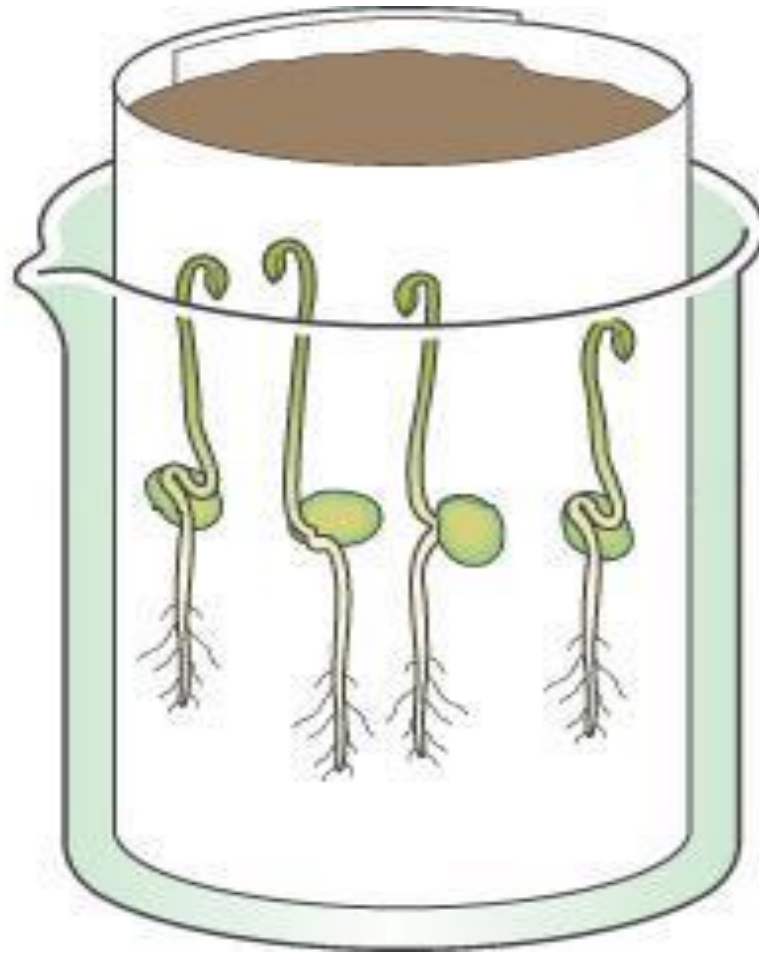


A Demonstration to
investigate
Geotropism

A Demonstration to investigate Geotropism

- Place a number of seeds in a clear jar with soil
- Leave for a week
- **Results:** The roots on all seeds have grown downwards
- **Conclusion:** Seeds grow in response to gravity (Geotropism)

- Geotropism is the way in which a plant changes its growth in response to gravity:
 - The shoots of a plant grow away from gravity.
 - The roots of a plant grow towards gravity



- Geotropism can be investigated in the following way:
 - Plant some seeds in different positions.
 - The shoots always grow upwards (away from gravity)
 - The roots always grow downwards (towards gravity).

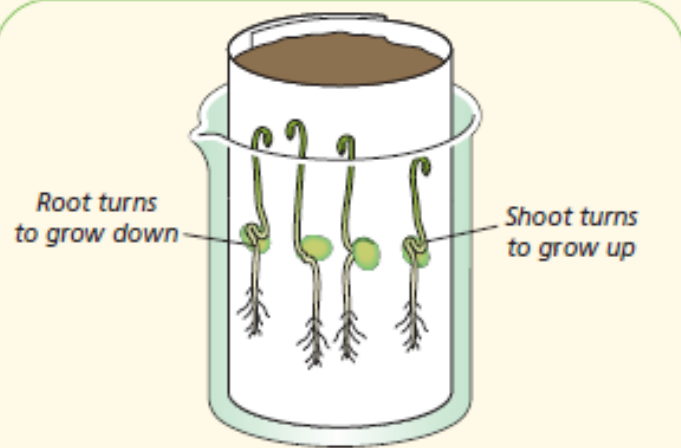


Fig 13.10 The positions of the roots and shoots after germination

A Demonstration to test leaves for starch

- Boil some green leaves in water. This kills and softens them
- Soak the leaves in hot alcohol for 10 minutes. This removes the Chlorophyll and they turn white and very hard
- Put the leaves back into the boiling water. This re-softens them
- Put iodine onto the leaves

A Demonstration

- **Results:** The leaves turn blue-black

