P.6 SCIENCE EXTRA 11(MONDAY)

PROCESSES THAT OCCUR IN LEAVES

- Photosynthesis
- Transpiration
- Breathing (gaseous exchange)
- Guttation: loss of water in form o f water droplets from the plant leaves

PHOTOSYNTHESIS

- This is the process by which plants make their ow n food (glucose/starch)
- It is a biochemical process in plants
- It mainly takes place in the leaves
- It can also occur in green stems and in cotyledons o f seedlings
- Photo – means light
- Synthesis – means to build up (to make)

1. On which part of a plant does photosynthesis mainly occur?

- Leaves

2. Where in the plant leaves does photosynthesis occur?

- In the chloroplasts

SUMMARY SHOWING PHOTOSYNTHESIS

Sunlight

Water + carbon dioxide. → starch+ oxygen

Chlorophyll

RAW MATERIALS FOR PHOTOSYNTHESIS.

Water

Carbon dioxide

CONDITIONS FOR PHOTOSYNTHESIS

Chlorophyll

Sunlight

PRODUCTS OF PHOTOSYNTHESIS

- Glucose/starch (it is the main/useful product)
- Oxygen (it is the by product/waste product)

REQUIREMENTS FOR PHOTOSYNTHESIS

- Water
- Carbon dioxide Chlorophyll

- Sunlight

IMPORTANCE OF THE REQUIREMENTS FOR PHOTOSYNTHESIS

- Water
- Water is got from the soil
- It provides the hydrogen needed to form glucose
- Carbon dioxide
- Carbon dioxide is got from air in the atmosphere
- It provides carbon needed to form glucose

3. By what process does carbon dioxide enter the stomata of the leaf?

- By diffusion
- Chlorophyll
- This is the green pigment in plants
- It traps sunlight
- Sunlight
- It helps to splits water into hydrogen and oxygen

4. Why can't photosynthesis occur at night?

- There is no sunlight

Importance of glucose produced by plants during photosynthesis

- It is used for respiration to produce energy.
- It is used to make insoluble starch for storage.
- It is used to make cellulose which builds cell walls.

ADAPTATIONS OF LEAVES FOR PHOTOSYNTHESIS

- They are broad and flat
- To trap sunlight easily
- They have thin walls
- To allow easy diffusion of carbon dioxide
- They have chlorophyll
- To trap sunlight
- They have stomata
- To allow in carbon dioxide
- They have veins
- To transport water to all leaf cells
- They are w ell arranged on the stem
- To get sunlight easily

FACTORS THAT AFFECT PHOTOSYNTHESIS

- Light intensity

- Carbon dioxide

concentration

- Optimum temperature

5. How do plants benefit from photosynthesis?

- Plants get food

6. How do animals benefit from photosynthesis?

- Animals get oxygen for respiration
- Some animals get food e.g herbivores and omnivores

7. How does photosynthesis purify air (control global warming)?

- It uses carbon dioxide and gives out carbon dioxide

STEPS OF TESTING A GREEN LEAF FOR STARCH

- Boil the leaf in water for some minutes
- To kill the cells
- To break the cell w all of a leaf
- Boil the leaf in alcohol (ethanol/methylated spirit)
- To remove chlorophyll
- Wash the leaf with hot water
- To remove alcohol and soften the leaf
- Put drops of iodine solution on a leaf

- It starch is present, iodine turns blue black (dark blue)
- If starch is absent, iodine will remain brown

NOTE:

- Killing the cells helps to stop all the chemical reactions in a leaf
- Breaking the cell w all enables easy removal of chlorophyll
- Removing chlorophyll enables clear observation of colour changes of iodine solution
- Making the leaf soft enables easy diffusion of iodine

Activity

a) Give the meaning of term photosynthesis.
b) Mention to raw materials for photosynthsis.
c) Name the main product for photosynthsis
d) State the by product for photosynthsis.
e) Mention any one factor that affects photosynthsis.
f) How useful is sunlight energy during photosynthsis ?

g) State one adaptation of plant leaves to help in making starch.

h) Apart from transpiration, give one other process that takes place in plant leaves.