

PLANTS

1. Identify the parts labelled A, B, C and D.

A –Petal B –Anther C –Sepal D –Carpel (ovary)

a) Explain how the flower is pollinated giving a reason for your answer.

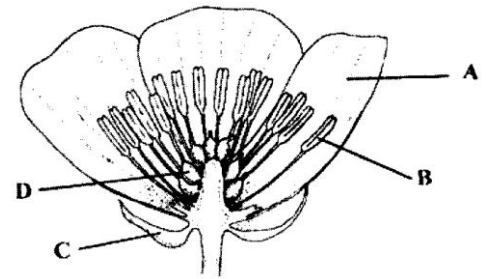
It is pollinated by animals (insects) – Brightly coloured petals, reproductive parts all inside, nectary present.

b) Where is the pollen produced in the flower?

In the anther.

c) Which part becomes the fruit?

The ovary.

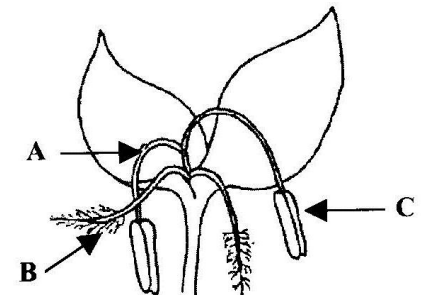


2. Name the parts labelled A, B and C in the diagram of a flower.

A –Filament B –Stigma C –Anther

a) State two ways in which this flower is adapted to wind pollination

Feathery stigma to catch pollen. Reproductive parts hanging outside the flower.



3. Identify the piece of apparatus shown in the diagram.

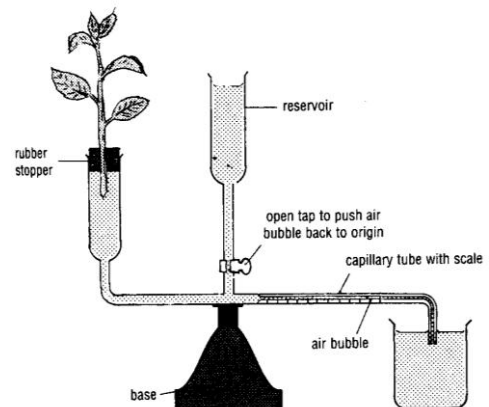
Ganong potometer.

a) Identify the process that this apparatus is used to demonstrate.

Transpiration

b) Describe two precautions that should be followed in setting up this experiment.

Cut stem at an angle underwater and insert underwater.



4. Distinguish between an annual and a biennial giving an example of each.

An annual completes its life cycle in one year. Barley

A biennial completes its life cycle in two years. Sugar beet.

5. Distinguish between a monocotyledon and a dicotyledon giving an example of each.

A monocotyledon has parallel venation and fibrous roots. Barley

A dicotyledon has netted/reticulate and tap root. Sugar beet

6. Write brief notes on the following:

a) Runner/stolon

An overground stem that contains nodes which will produce new plants when they come in contact with the soil. Creeping buttercup, silverweed and strawberries.

b) Tuber

A swollen plant part used for food storage. Stem tuber – potato. Root tuber – dahlia.

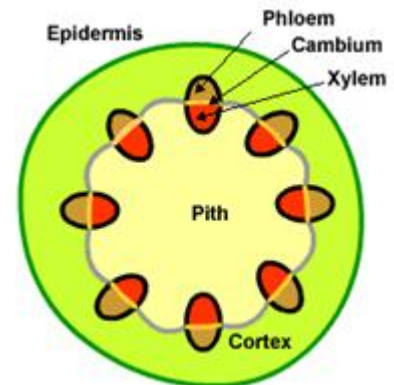
c) Tendril

A fine shoot structure produced by plants to wind around other plants in order to climb.
Peas and vetch have tendrils.

d) Rhizome

An underground stem which can produce new plants asexually at nodes along its length.
Yellow flag and couch grass are examples.

7. Draw a cross section of a dicotyledonous stem and label the epidermis, cortex, xylem and phloem.



8. Name a plant from each of the following families.

- | | |
|--------------------|-------------|
| i. Rosaceae | Silverweed |
| ii. Gramineae | Barley |
| iii. Lilaceae | Tulip |
| iv. Solanaceae | Potato |
| v. Ranunculaceae | Buttercup |
| vi. Compositae | Thistle |
| vii. Cruciferae | Charlock |
| viii. Umbelliferae | Cow parsley |
| ix. Leguminosae | Clover |

9. Seeds grow by epigeal or hypogeal germination.

a) Explain the underlined terms.

In hypogeal germination, the epicotyl elongates bringing the plumule above the ground leaving the cotyledons below ground. (hiding)

In epigeal germination the hypocotyl elongates carrying the cotyledons above the ground. (emerging)

b) Give one example for each of the explained terms.

Hypogeal – Broad bean

Epigeal – French bean

10. Which cell organelle is responsible for respiration?

Mitochondrion

11. Which cell organelle is responsible for photosynthesis?

Chloroplast

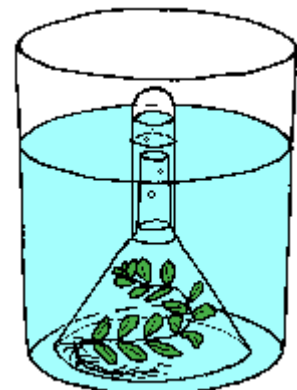
12. Describe an experiment to show that oxygen is produced during photosynthesis.

To show that Oxygen is produced by Photosynthesis

1. Photosynthesis occurs in light but not in darkness.

The procedure in light is the experiment - photosynthesis.

The same procedure in darkness is the control - no photosynthesis - cover the apparatus with a lightproof material.



2. Place a funnel over Elodea, pondweed, in a beaker of freshwater.
The funnel is raised off the bottom on pieces of blue-tack to allow unhampered diffusion of CO₂ to Elodea.
3. Invert a test tube full of water over the stem of the funnel to collect any gas from the Elodea.
4. Leave for 6 hours at room temperature (20°C).
5. A colourless gas is collected in each. Test to identify the gases.

Results:

Photosynthesis »» the gas ignites a glowing splint »» the gas is oxygen.

No photosynthesis »» the gas turns limewater milky »» the gas is carbon dioxide (produced by respiration).

Therefore, oxygen is produced by photosynthesis.

Give a scientific explanation for:

1. "Earthing up" around a potato.
Increases number of tubers, prevents greening, weed control, pest control, protection from frost, preventing zoospores of blight fungus entering the tubers.
2. The production of oxygen during photosynthesis.
Photosynthesis causes the splitting of water which releases oxygen. Do equation.
3. The importance of pollination in seed production.
Pollination is the transfer of pollen from the anther to the stigma. The pollen grain contains the male gamete which fertilises the egg in the ovule. When this happens the ovule becomes the seed. When this happens the ovule becomes the seed.
4. The importance of aphid control in a region where certified seed potatoes are grown.
Aphids carry diseases (viruses). They are vectors and must be controlled to prevent spread of disease.
5. A variation in the concentration of carbon dioxide in the atmosphere during a warm sunny day.
High light intensity means high rate of photosynthesis. The rate is slow in the morning building to noon and falling again. CO₂ is used in photosynthesis so levels decrease towards noon but start to build from then on.
6. The failure of plants to produce starch in a nitrogen filled atmosphere.
Photosynthesis needs CO₂ and cannot occur.
7. A slow rate of transpiration from plants during humid weather.
Transpiration is the loss of water vapour from the stomata to the surrounding air. If the air is humid, then the water vapour cannot come out.
8. The absence of flower head on sugar beet during 1st season
Sugar beet is a biennial, produces food storage in 1st year, flowers in second year, has not been subjected to adverse conditions (cold).
9. Potted plants losing turgidity on a very warm day
Limited amount of water in potted plants. Loss of water from plants (transpiration), factors influencing transpiration, increases with temperature, plant needs water to retain turgidity.
10. A variation in the number and size of the sprouts on potatoes exposed to a range of temperatures in the laboratory.
At 4°C the sprouts are small and many, these are used to produce seed potatoes as they yield a large number of small potatoes. At 15°C one large sprout is produced yielding a small number of ware potatoes.
11. The absorption of water by the root hairs of plants.
Root hairs have a semi-permeable membrane/ water diffuses to area of lower concentration (or moves from low solute concentration to high solute concentration)/ called osmosis.