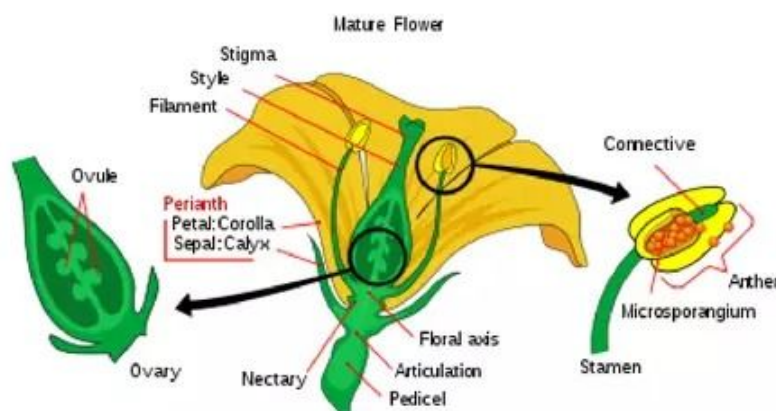


IGCSE Coordinated Science: Sexual Reproduction in Plants

Sexual Reproduction in Plants

1. Identify and draw, using a hand lens if necessary, the sepals, petals, stamens, anthers, carpels, ovaries and stigmas of one, locally available, named, insectpollinated, dicotyledonous flower, and examine the pollen grains under a light microscope or in photomicrographs.



2. Use a hand lens to identify and describe the anthers and stigmas of one, locally available, named, wind-pollinated flower.

3. State the functions of the sepals, petals, anthers, stigmas and ovaries.

Sepals : helps to protect the petals before it opens up and afterwards

Petals: Protect the flower. Help to visual attract animals for pollination.

Anthers: The male organ of the plant. On the anther are the pollen grains.

Stigma: Has a sticky liquid on it which helps to stick pollen grains.
Pollination occurs here.

4. Define pollination as the transfer of pollen grains from the male part of the plant (anther of stamen) to the female part of the plant (stigma).

When the examiners ask: Pollination happens when pollen grains from the anther of the stamen gets transferred to the female part of the plant ,the Stigma

From the anther....



....to the stigma

5. Name the agents of pollination.

Who are responsible for pollination?

Wind

Water

Birds

Mammals

Insects

6. Compare the different structural adaptations of insect-pollinated and wind-pollinated flowers.



The flower's petal acts as a landing platform which allows the bees to collect nectar from the flower. In return, the bee would collect pollen from the anther and help to pollinate the other flowers. Insect-pollinated flowers usually have a scent to attract the smell of animals and insects. Also, the flowers of animal-pollinated flowers are large and colourful to attract animals.

Adaptation of Animal-pollinated flowers:

- Have scents to attract the smell of animals
- Have large, colourful flowers to attract the attention of animals
- Have nectar to attract animals to come to the flower for food



Lots of pollen is generated in wind pollinated flowers. Many plants which are wind pollinated are adapted to have pollen grains which have air sacs.

Adaptations of wind pollinated plants

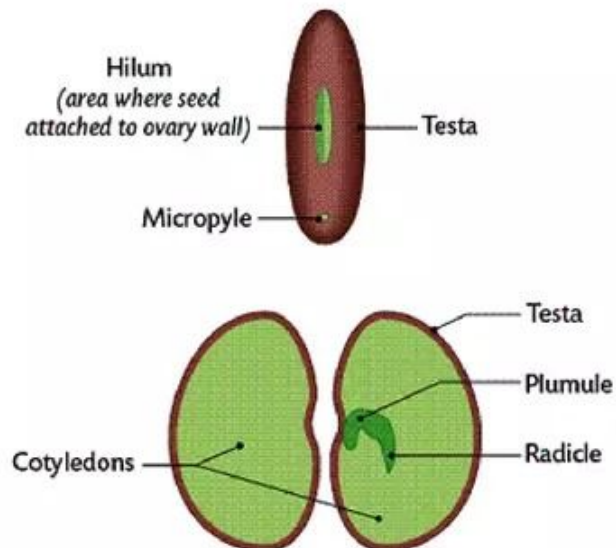
- Produce lots of pollen as seen in the picture
- Small petals to allow pollen to be blown away

7. Investigate and state the environmental conditions that affect germination of seeds : requirement for water and oxygen, suitable temperature.

Remember the conditions:

1. Water is needed for the seed to swell and burst open. It is also needed for stored food to be made soluble and moved to the growing embryo.
2. Oxygen is need for the embryo to respire. Respiration supplies energy to grow and develop.
3. Warmth is needed by most seeds. This is why seeds do not normally germinate till the spring or summer. The degree if warmth varies from one type of plant to another.

8. Investigate and describe the structure of a non-endospermic seed in terms of the embryo (radicle, plumule and cotyledons) and testa, protected by the fruit.



Remember these parts of the seed

Testa: Seed coat which protects the seed from damage

Cotyledon- swollen with stored starch, is the food source when bean/seed is growing

Plumule: (the nearest part to the edge of the bean, inside) New Shoot

Radicle: New root (furthest part to the edge of the bean, inside with plumule)

9. State that seed and fruit dispersal by wind and by animals provides a means of colonising new areas.

Fruit and seeds can be transported by wind and animals away from the plant.

This allows the new potential plants to be spread away from the main plant:

Allows plants to colonize new areas so that resources, such as water, soil nutrients and light are not fought over by the plants

10. Describe, using named examples, seed and fruit dispersal by wind and by animals.



Dandelion seeds have hairs which acts a parachute, which helps it fly.



A burr, small hooks on this plant allows it to be trapped onto the fur of animals such as dogs and rabbits.