

PENANG SANGAM HIGH SCHOOL
P.O.BOX 44, RAKIRAKI
LESSON NOTES

Subject: Biology
Week 19

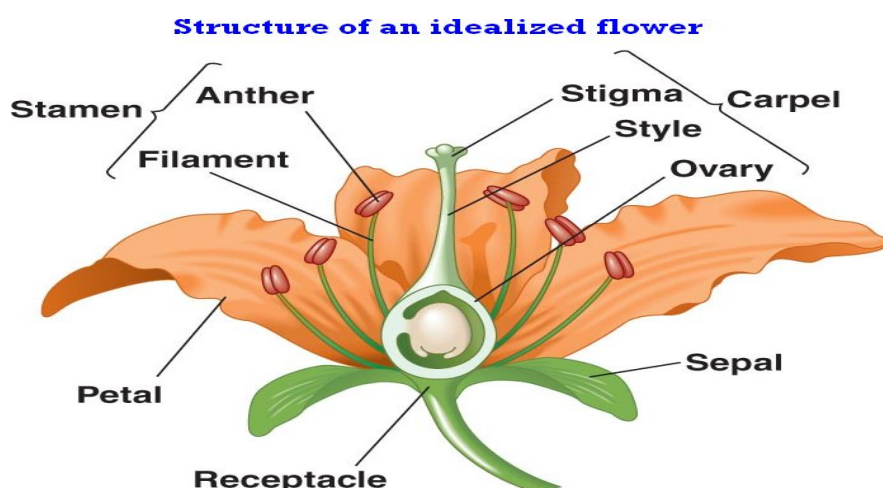
Year/Level: 11

Strand	1 Structure and Life Processes
Sub Strand	1.5 Structure And Functions In Plants
Content Learning Outcome	Discuss sexual reproduction in plants, different parts of flower with functions, pollination and difference between insect and wind pollinated flowers..

1. Sexual Reproduction

- Involves two individuals of different sexes, a male and a female.
- Is the fusion of the nucleus of the sperm with the nucleus of the egg to form a **zygote**.
- Zygote then develops into a new individual which is genetically different from both parents
- Sexual reproductive organs of higher plants (Angiosperms) are **flowers**.

Parts of a Flower



The Parts of a Flower and Functions

<u>Part</u>	<u>Function</u>
Pistil	The female part of the flower
Stigma	Sticky landing pad for flower
Style	Raises the stigma
Ovary with ovules	Ovule contains an egg; when fertilized by sperm, the ovules become a seed and the ovary becomes fruit.
Stamen	The male part of the flower
Anther	Makes pollen grains, which contains sperm
Filament	Raises the anther
Petals	Often colourful to attract pollinators
Sepals	Protect flower buds.

FACTORS AFFECTING FLOWER FORMATION

Two factors affecting flowering in angiosperms are:

1. Temperature:

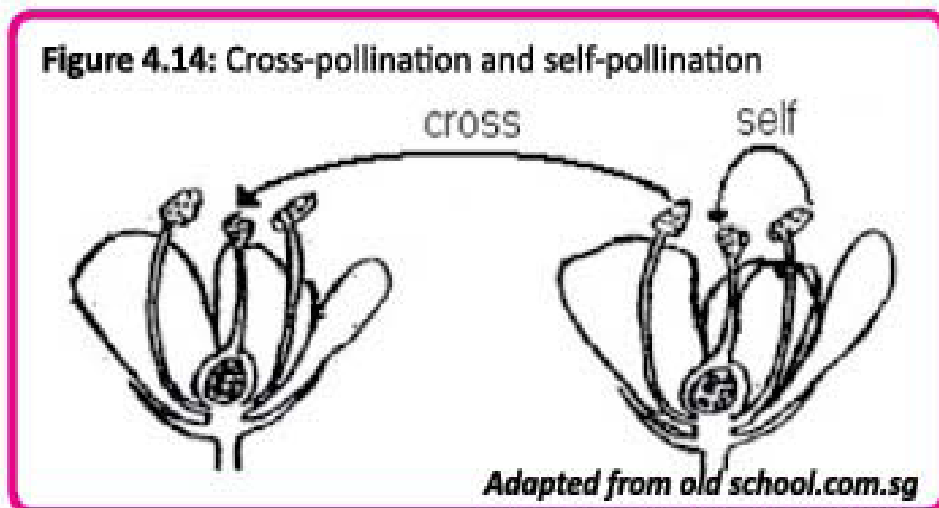
- Several seeds from biennial plants were soaked in water and placed in a refrigerator at 2°C – 5°C.
- After six weeks they germinated. The seeds were allowed to germinate and grow into plants.
- These plants produced flowers and seeds in the same condition in which they germinated first i.e. the temperature of the refrigerator instead of two different seasons.

2. Day length: **Photoperiodism**

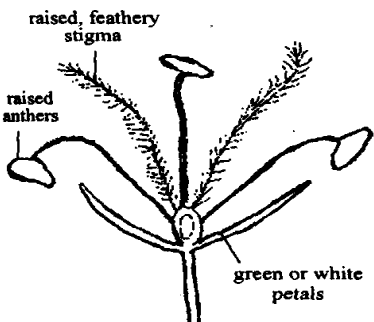
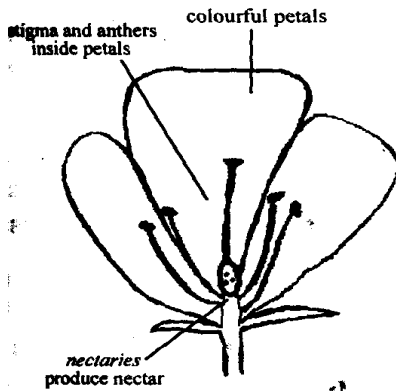
- Long-Day plants are those that flower during longer periods of day length or when night is shorter.
- Short-Day plants flower when the day length is short or when night is longer.

Pollination

- Is the transfer of pollen grains from the anther to the stigma of a plant.
- There are two types:
 1. **Self-pollination** – transfer of pollen grains from the anther to the stigma of the same flower.
 2. **Cross-pollination** – is the transfer of pollen grains from the anther of one flower to the stigma of another flower but of the same species. Cross-pollination creates variety.
- Pollen grains are transferred to the stigma in two ways:
 - I) **By wind** – wind pollination
 - II) **By insects** – insect pollination



The Differences Between a Wind Pollinated Flower and an Insect Pollinated Flower

<u>Wind pollinated flower</u>	<u>Insect pollinated flower</u>
Flowers are generally smaller and scentless with green or dull coloured petals	Flowers are generally large and scented with brightly coloured petals
Nectar present	Nectar present
Stamens and stigma usually hang out of the flower	Stamens and stigma usually hidden inside the petals
Filaments are long and pendulous	Filaments not pendulous
Stigma is larger with feathery branches for catching pollen grains. Not sticky	Stigma is sticky so that pollen grains that land on it cannot be easily shaken off.
Pollen grains are smaller, smoother and light, easily blown by wind	Pollen grains are large and heavy with rough surfaces for sticking to insects body
Large number of pollen grains produced	Small number of pollen grains produced
	

Activity

- Describe four investments that the flowering plants must make in order to be able to reproduce sexually.

- Pawpaw plants are either male or female, ie. they either produce flowers that have stamens or flowers that contains pistil. Mrs. Singh planted five pawpaw trees in her yard, but only two of them give fruits even though they all produce flowers. Suggest a reason why the other three are not producing fruits. _____
- Two different kinds of pollen grains were observed. Grain-A is large in size and grain –B is small and has spikes. Which do you think comes from a wind pollinated plant? Give a reason for your answer.
