SCRIPTED LESSONS

3RD TERM WEEK 3

BIOLOGY

S.S. 2

BIOLOGY SS2

3RD TERM WEEK 3

PERIOD 1

Theme	Continuity of life			
Topic	Pollination: features of cross pollination			
Class Level	SS2			
Lesson Duration	40 minutes			
Instructional Objectives/Learning Outcomes	Students should be able to: 1. List the features that aids cross pollination			
Instructional Resources/Material	• Marker board • Marker • Textbooks • Worksheets • Flowers of maize, hibiscus flower and pride of Barbados flowers			
Teacher Preparation for the lesson	Enough availability of the above mentioned flowers should be made available			
Teaching Method	Peer group Buzz group Class discussion Small group works.			
Lesson Procedure	**Time**	**Teacher Activity**	**Students Activity**	**Core Skills**
Step 1:	3 minutes	Ask students to turn and discuss with their partner what they learnt from the previous lesson (features of self-pollination: Call on one on two learners to tell the class what they discussed	Provide varied response Learners respond by giving some critical features of self-pollination on flowers such as homogenous and desinogamous cheers	Critical thinking

		Write learners response on the board Give immediate feedback		
Step 2	12 minutes	Introduce the topic to the students Display maize glower, hibiscus flower, pride of Barbados flower on the table and engage the students to discussion on features of cross pollination in relation to the position and structure of the stigma and stamen of there various flowers	Students listens Students observe critically the position of stamen and stigma of displayed flowers	Listening skills
Step 3:		Share the class into sizable groups, distribute flowers work sheets specimen to each group and ask students to: Indicate location of stamen and stigma of Hibiscus flowers, pride of Barbados flower and maize Make a sketch on worksheets provided to them, their observation	Student observe each flowers to group to location of stamen and stigma. Also to check their maturity stage. If the flower is protandrous, Dichogamy, Protogymous and Dimorphy A sketch drawing is	• Collaboration Critical thinking

		Select a scribe for each group to make presentation for their group work Gove feedback Copy lesson summary	made by each group Each group present their work Five a sound love cheers to best presentation Students copy lesson summary	
Step 4:	4 minutes	Ask the students the following questions State two features of cross-pollination State two examples of flowers that undergo cross-pollination	Students responds	
step 5:	3 minutes	Students to make a project model of a maize plant of cross-p[pollination (1 week project)		

BOARD SUMMARY

FEATURES OF CROSS-POLLINATION

Cross-pollination is when`` nature pollen grain of flower are transferred to the stigma of a flower of another plant of the same or closely related species. Features f cross-pollination includes

1. Location of male and female flowers are located in different plants (unsexually)
2. Different maturation of stamen and stigma of bisexual flower. (Dichogamy(. This can be inform of
   i. Protandrous: this is when the stems (anther and filament) matures first, the stigma immature and cannot receive pollen grains. Example crotalaria, sunflower OR
   ii. Protogynous- this is when the pistilmature before the stamen. The pollen grains becomes unusual examples is the Pistia (water lettuce) flower

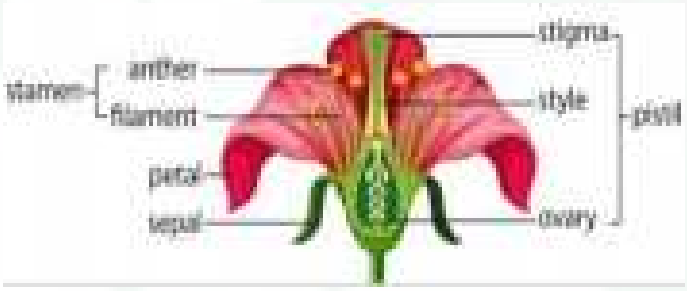
3. Incompatibility bad self-sterility of flowers pollen grains to be the stigma of a flower or another flower on the same plant. Gwen pollen grains falls on such stigma, no pollination and fertilization. Examples are tobacco, crotalana, some leguminous flowers
4. The position of stigma and anthers. The stigma are kept higher than the stamen. It is common with Bisexual flowers. Two flowers forms in different length of style. Dimorphy heterostyle examples if the Pink Bauhinia flower.

Advantages of cross-pollination

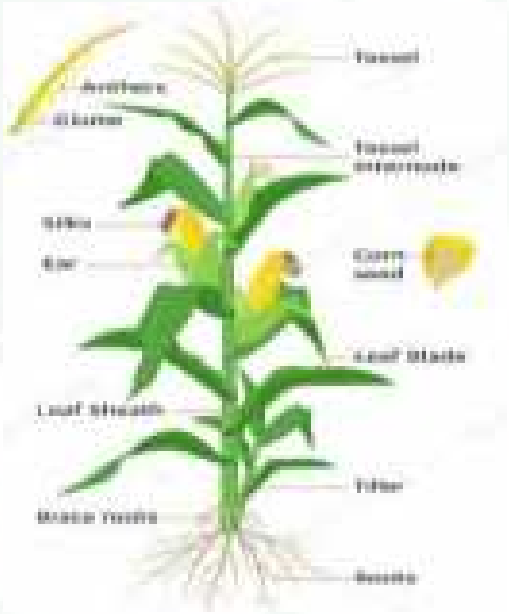
1. It leads to production of more seeds
2. It produces healthier seeds
3. The seeds develop[into stronger plants, which will produce more fertile offspring
4. Plants produced from cross likely have high level of survival to environmental changes
5. It leads to greater variation among species and a faster rate of evolution

Disadvantages of cross-pollination

1. Flowers are complicated and need special mechanism
2. There is likely wastage of pollen grains
3. It create great distance for pollination to occur



Hibiscus flower



maize plants

Period 2

Theme	Continuity of life			
Topic	Agents of Pollination			
Class Level	SS 2			
Lesson Duration	40 minutes			
Instructional Objectives/Learning Outcomes	Students should be able to State the agents of pollination			
Instructional Resources/Material	• Marker • Marker board • Textbook • Drawing book • The school garden • Charts of a garden			
Teacher Preparation for the lesson	The teacher ensure that there are enough charts on garden, a ttime allocated to visit the school garden			
Teaching Method	Peer group Buzz group Class discussion Small group works.			
Lesson Procedure	**Time**	**Teacher Activity**	**Students Activity**	**Core Skills**
Step 1:	5 minutes	The teacher asks the students If they have witnessed an insect on a flower If there was a display from the insect Write learners observation on the board	Give some response Students give response on clasping of wings Students observation on scent of the flowers, beautiful petals	•
Step 2	10 minutes	The teacher introduce the topic to the students as in agents of pollination	Students listens attentively	Critical thinking Collaboration

		Using the displayed charts she engage the student into discussion on the different agents of pollination such as water, wind, insects and animals	The students on serve carefully	
Step 3:		The teacher takes the students in groups to the school garden to observe insects active pollinating flowers as well as wind pollinating flowers Group to write comprehensive report of visit to the garden Give a cheer to the best report Copy the lesson on there marker board	The student critically observe the insect pollinating flower (his=discus flower) and wind pollinating flower (maize) The team lead of each group gives a report as in characteristics to aid insect and wind pollination Learners copy the lesson summary into their note books	• Critical thinking • Imagination • Collaboration • Creative
Step 4:	3 minutes	Ask students to State three agents of pollination	Response	Collaboration.
Step 5:	3 minutes	Ask students to make an album of an insect pollinated flowers (at least 2 flowers)		

BOARD SUMMARY

AGENT OF POLLINATION

Pollination occurs in flower and is brought about by esternal agents such as

1. Water
2. Wind
3. Insects
4. Animals

WATER: pollination by water occurs in aquatic plants such as pond weeds. Pollen grains are released directly into the water, drift along the water surface, until they reach other flowers such flowers are called hydromophrous

WIND: pollination by wind occurs when large numbers of pollen grains are released into moving air which carries them to other flowers. Such flowers are called anaemophilous

INSECTS: insects such as bees, butterflies and beetles usually visit flowers to feed on nectar or pollen thereby increasing the chances of pollination as the pollen gets rubbed on their bodies. When they visit another flower of the same kind, the pollen may get rubbed off on to a stigma such flowers are called Entomophilous flowers.

ANIMALS: animals such as bat and birds can pollinate flowers when they visit plant rt feed on their seeds. Such flowers are called zoomophilous flowers.

Period 3

Theme	Continuity of life
Topic	Characteristics of insect pollinated flowers and wind pollinated flowers
Class Level	SS 2
Lesson Duration	40 minutes
Instructional Objectives/Learning Outcomes	Students should be able to 1. State the characteristics of insects and wind pollinated insects
Instructional Resources/Material	• Marker board • Marker • Textbooks • Worksheets • Maize flower • Hibiscus flower • Pride of Barbados flower • Grass flower
Teacher Preparation for the lesson	Above mentioned flowers should be made available in more quantity
Teaching Method	Peer group Buzz group Class discussion Small group works.

Lesson Procedure	Time	Teacher Activity	Students Activity	Core Skills
Step 1:	3 minutes	Ask students to submit their assignment from last lesson Call on two learners to explain one of the agents of pollination as wind or insect or water	Learners does the following They submit their assignment/report Learners try to explain one of the agents pollination Students five a loud cheer to all that made attempt	• Critical thinking • Memory Drill • Communication
Step 2	10 minutes	Teacher explain the topic on characteristics of insects and wind pollination flowers Using the flowers pollinated, the teacher engage the students on the structure, size and quantitiers of the stigma and stamen of an insect pollinated flower and wind pollinated flower such as more pollen grains, sticky stigma,	Students listen attentively The students observe the flowers to understand these characteristics as in brightly coloured conspicuous petals, large petals, sticky stigma, few/more pollen grains etc	• Listening skills • Communication

		conspicuous petals etc		
Step 3:	12 minutes	Teacher distribute drawing sheets to all the students and Instruct them to highlight three characteristics of displayed flower specimens either on insect or wind pollination Give feedback Copy lesson summary on the board	Students puts down three features each on hibiscus flowers and maize flowers displayed on the table. Students submit their work Love cheers to the best Students copy notes into their lesson notes	• Retention • Collaboration • communication
Step 4:	4 Minutes	Ask students the following questions State three characteristics features of insects pollinated flower State three characteristics features of wind pollinated flower	Students respond	Communication
Step 5:	3 minutes	On a cardboard paper draw and label 20cm of an insects pollinated flower		

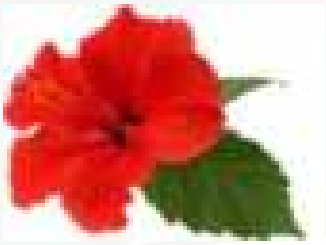
BOARD SUMMARY.

Characteristics of insects pollinated flowers

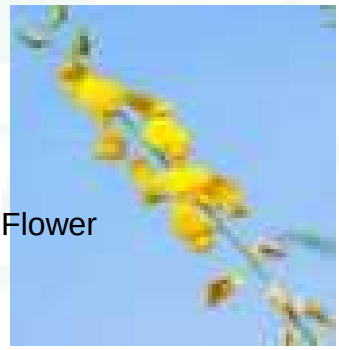
The following are characteristics of insects pollinated flowers

1. flowers are usually large, brightly coloured and scented to attract insects. Example is hibiscus flower, flamboyant flower or if small, many are arranged close together in an inflorescence so as to be conspecious example lantana
2. they have attractive scent- example those flower
3. flowers have nectar example is hibiscus flower
4. the pollen grains are rough, sticky and relatively few
5. stigma has small surface area which is sticky to hold pollen grains that falls from it.
6. Flowers are well displayed on long pedicel
7. Stamens are usually not pendulous (not long/ slender) and a short crorlla tube to allow insects into the flower example is the crotalana flower

Rose Flower



Hibiscus flower

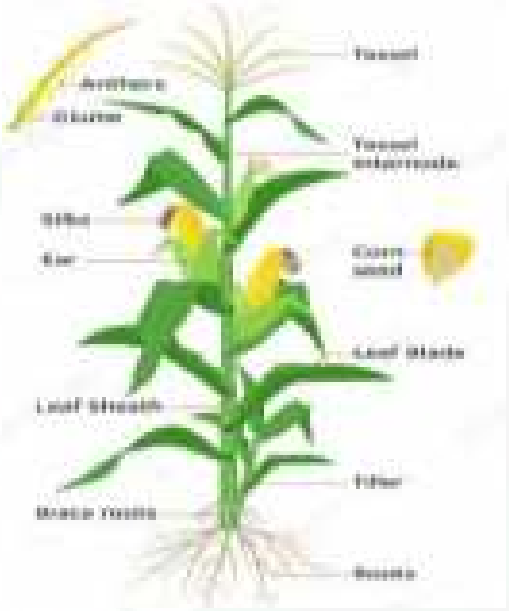


Crotalana flower

CHARACTERISTICS OF WIND POLLINATED FLOWER

The following are characteristics of wind pollinated flower

1. They are usually small and unattractive that is the petals are dull and inconspicuous
2. They have neither nectar nor scent
3. They produce large quantity of pollen grains
4. Pollen grains are light, small smooth and around
5. Floral part are not specially shaped and not well differentiated
6. Stigma are large and feathery with large surface area
7. Stamens are pendulous that is long and slender that sways in slightest wind



PERIOD 4

Theme	Continuity of life			
Topic	Description of an insect pollinated flower (hibiscus flower and Pride of Barbados) and description of a wind pollinated flower (Maize and Grass flower)			
Class Level	SS 2			
Lesson Duration	40 MINUTES			
Instructional Objectives/Learning Outcomes	Students should be able to 1. Describe pollination on a typical insects pollinated flower and wind pollinated flower			
Instructional Resources/Material	• Marker board • Marker • Text book • Worksheet • Maize flower • Hibiscus flower • Pride of Barbados and Grass Flower			
Teacher Preparation for the lesson	Flowers (Enough) should be made available			
Teaching Method	Peer group Buzz group Class discussion Small group works.			
Lesson Procedure	**Time**	**Teacher Activity**	**Students Activity**	**Core Skills**
Step 1:	3 minutes	Teacher does the following Ask students to submit their assignment Call on two learners to give two characteristics of an insect pollinated flower	Learners does the following They submit their assignment Learners highlights these characteristics as in brightly	• Critical thinking • Memory Drill • Communication

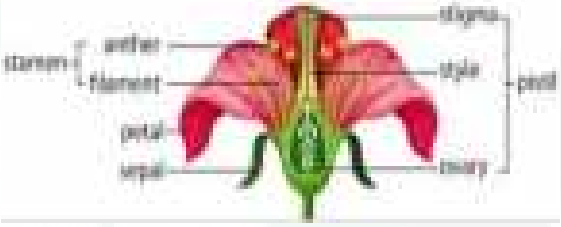
		Write learners report on the board	coloured petals, presence of Nectar eyc Cheers	
Step 2	10 minutes	Teacher gives a vivid description of an insect pollinated flower hibiscus flower Teacher gives a vivid explanation of a wind pollinated flower Maize plant Using the flower available, she explains thoroughly the topic	Students listen attentively Students listens attentively Students observed carefully and listens	• Listening skills • Communication
Step 3:	12 minutes	The teacher distribute flowers to the students and lead the students on the discussion of pollination on an insect pollinated flower and wind pollinated flower respectively Copy lesson summary on the board	Students show high rate of involvement as each of them holding a flower and being involved Cheers to best participants to show spikets, stamen etc Students copy lesson summary	• Retention • Collaboration • communication
Step 4:	3 minutes	Ask students to identify 3 major	Students respond	Communication

		parts in a wind pollinated flower		
Step 5:	3 minutes	On a cardboard paper, students to draw a named wind pollinated flower		

Description of typical insects pollinated flowers

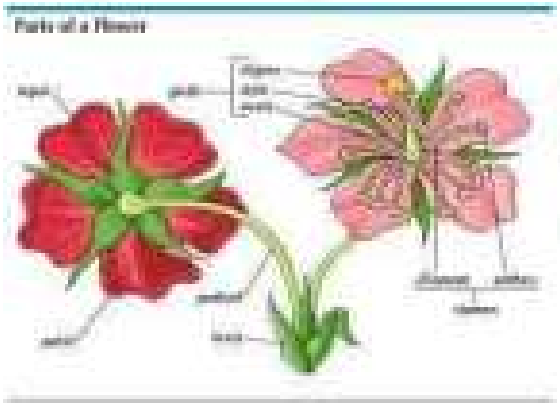
Hibiscus flower

Hibiscus flower is mostly pollinated by bees and birds. The petals are beautifully coloured and conspicuous to attract these pollinators. When this bird (humming bird) reaches for the nectar deep in the flower, its feathers becomes dusted with pollen. At the same time, some pollen that are carried from other hibiscus flower by the humming bird are transferred to the sticky stigma of the flower and pollination occurs.



Pride of Barbados

Pride of Barbados flower is pollinated by large butterflies. The butterfly is attracted b the beautifully coloured petals of the flower. The butterfly land on one of the fan shaped petals and insect its long proboscis into the tube of the folded standard petal which is to direct the proboscis to the nectar at the base of the ovary. During this process the body of the butterfly becomes dusted with pollen grains. The flower is protandrous that is, the stamen mature before the stigma. The butterfly carrries the pollen grains to another flower whose stigma is mature.



Description of a typical wind pollinated flower

Maize flower

The maize has male and female flowers separated on the same plant (Monoecious) the male flower is a panicle of inflorescence in the uppermost part of the plant and are made up of spikelet arranged in pairs. A single spikelet consists of two glumes (green when fresh and brown at maturity). Inside a glume are two sides of flowers covered with pales. At maturity, these pales opens one after the other to release three long stamens hanging freely in the air.

The female flowers are borne in a cob far below the male inflorescence. The cob has numerous green bracts (husk) covering the spiklets of flowers inside. A spikelet has also a glume with a flower made up of an ovary with a long-style ending in hairy stigma.

Pollination occurs as in cross pollination because it is a proteindrous flower. The elongated filament of the stamen hang on the ripe anther out of the glume. The slightest air current shackles the anther which release a cloud of powdery grains which are carried by wind these pollen grains land n hair

GRASS FLOWER

The grass flower is usually enclosed by leaf like structures called bracts. The inflorescence of the grass flower consists of short stalks bearing flowers which occurs in pairs. Each pair of flower is enclosed and protected by bracts to form a spikelet as in maize.

Pollination in Grass flower if effected by wind. The nature pendulous long filaments protrude out of the brait exposing the mature anther to the wind. Sways in every slightest breeze. The dust like pollen is taken free and carried away by the wind for the cross pollination