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Theme: Diversity Living Things

S1 New Curriculum Biology-Chapter 4 - Class Insecta



Characteristic

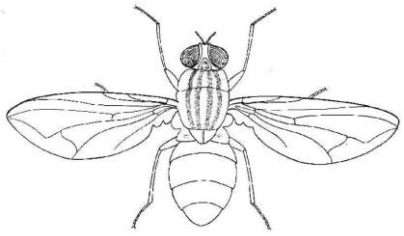
- has three main body parts; head, thorax and abdomen.
- Has three pairs of legs.
- Thorax is divided into pro-, meso-, and metathorax.

Order: Diptera

Characteristics of order diptera

- one pair of wings
- hind wings are reduced to small knob-like structures or halters for balancing.

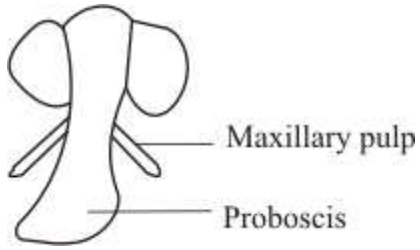
(a) housefly



Characteristics of housefly

- has a pair of compound eyes for wide field of vision.
- has expanded or club shaped proboscis to absorb food materials
- has simple eyes (Ocelli)
- has a pair of wings and a pair of halters for balancing.
- The body is hairy.
- Has a pair of short hairy antennae.

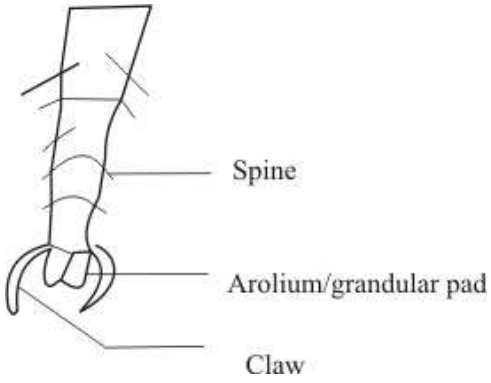
A drawing of mouthpart of housefly



Adaptation of housefly mouth parts

- maxillary pulps are flexible for handling and tasting food.
- Proboscis is expanded to increase absorptive surface.
- Proboscis is tubular to suck liquid food

A drawing showing the tarsus of the hind limb of a housefly

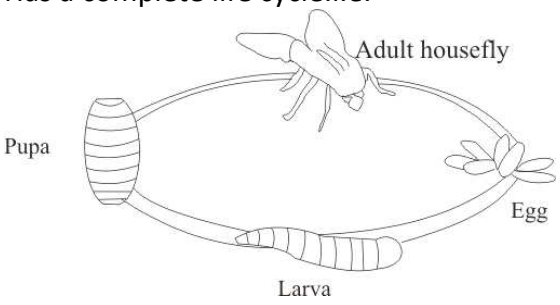


Ecological significance of the structures of a tarsus of housefly

(a) claws are for griping on to the surface during walking
(b) hairs increase sensitivity
(c) jointed legs increase flexibility
(d) Arolium secrete a sticky substance that allows them to stick on smooth surface during walking.

Life cycle of a housefly

Has a complete life cycle.i.e.



Economic importance of housefly

Transmits diseases e.g. dysentery, cholera, trachoma, typhoid fever and poliomyelitis.

Control of spread of diseases by housefly
General cleanness and hygiene
Cover food
Eat hot food.
Use insecticides.

Cockroach

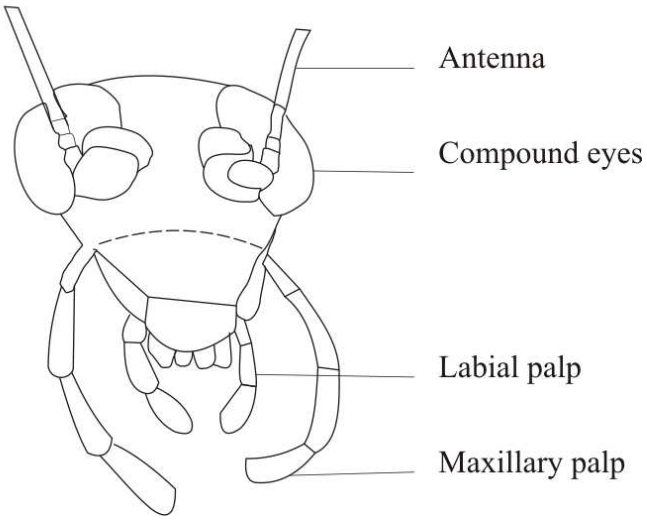


Order: Diptera **Characteristics of the order** - has biting mouth parts - has threadlike antennae - has a pair of anal cerci	Characteristics of a cockroach Has a long dorso-ventrally flattened body. Has three main body parts: head, thorax, abdomen.

The head of cockroach

It is triangular

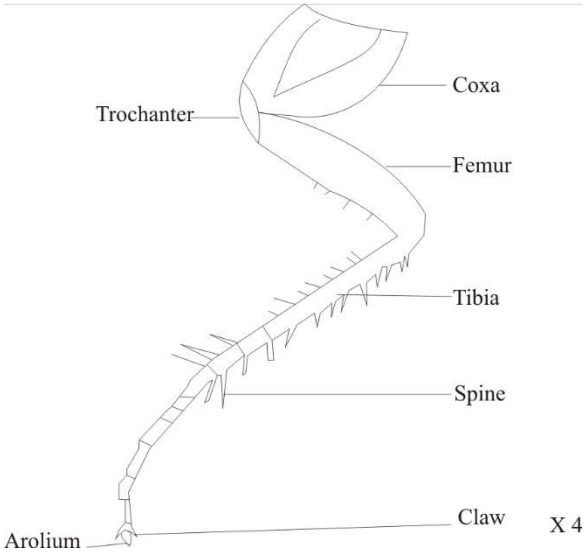
Anterior View of cockroach head showing structures for sensitivity



Adaptations of the cockroach head for its ecology

- has two pairs of compound eyes dorso-laterally located on head for a large angle of vision.
- Ha modified mouth parts with strong mandibles for feeding
- Has a pair of long antennae for sensitivity
    - the antennae are segmented to increase flexibility
    - tapers from the head to reduce weight.
    - Antennae are hairy to increase sensitivity
    - Has broad base for firm attachment
- the thorax has two pairs of legs

A drawing of the leg of a cockroach



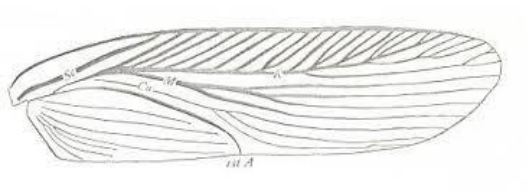
Adaptations of hind limb to its function

- jointed for flexibility during movement.
- Long for quick movement.
- Has spine for defense: to pinch the enemy.
- Has areola to grip on smooth surface during movement.
- Has claws to grip cracked surface during movement.

Wings

The cockroach has two pairs of wings, outer and inner wing

Differences between outer and inner wings

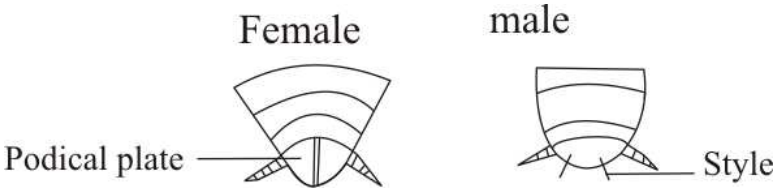
 Outer wing	 Inner wing
1. Dark colored 2. inflexible 3. not folded 4. Thick 5. narrow 6. opaque	1. Light in color 2. flexible 3. folded 4. membranous 5. broad 6.transparent

Adaptations of outer wings to their function	**Adaptations of the inner wings to their functions**
1. it is hard or stiff for protection 2. dull / dark colored for camouflage 3. slippery for protection against grip of predator 4. has veins for strengthening the wing	1. broad to generate repulsive force for flight 2. flexible not to break in strong wing 3. has veins for circulation of gases and strengthening the wing

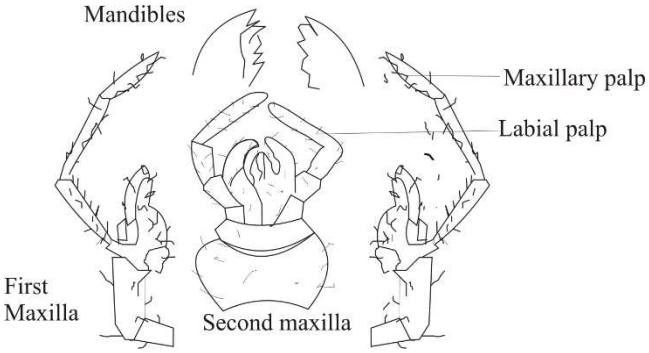
Identifications of the sex of a cockroach

Structures on ventral side of the last segments are used:

Male cockroach has styles while female cockroach has podical plates.



Mouth parts

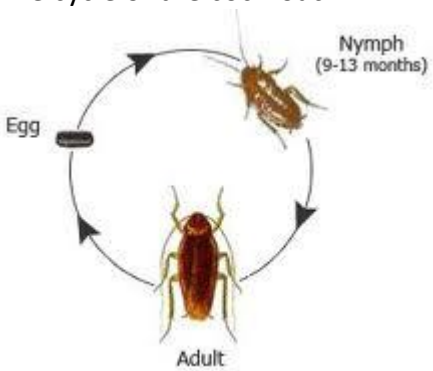


Functions of mouth parts of a cockroach

A table below shows the functions and adaptations of the mouth parts of a cockroach

Parts	Functions	Adaptations
Mandible	Cutting and masticating food	Strong and sharp edges
Maxillae	Cutting and chewing food	Have sharp edges
Maxillary palp	Taste food	- sensitive to food - jointed for flexibility - hairy to increase sensitivity
labium	Taste food	Hairy to increase sensitivity

Life cycle of the cockroach



Economic importance

- Transmit germs from the toilets
- Their feces stain clothes
- Destroy document and clothes

Bee

Order: Hymenoptera

Characteristics of the order

a. have two pairs of membranous wings
b. have a waist between the thorax and abdomen
c. They live in colonies

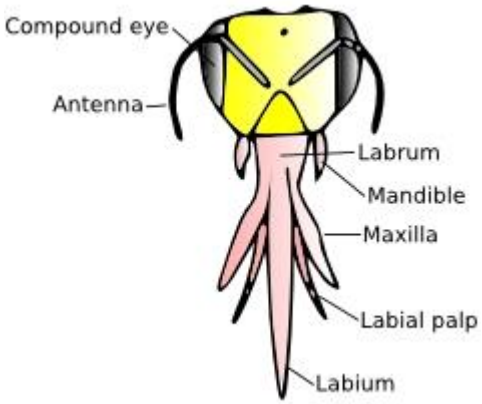


Other characteristics of the bees

a. have hairy bodies
b. has segmented, smooth (without hairs) uniform sized antennae.
c. Has a pair of compound eyes

Mouth parts

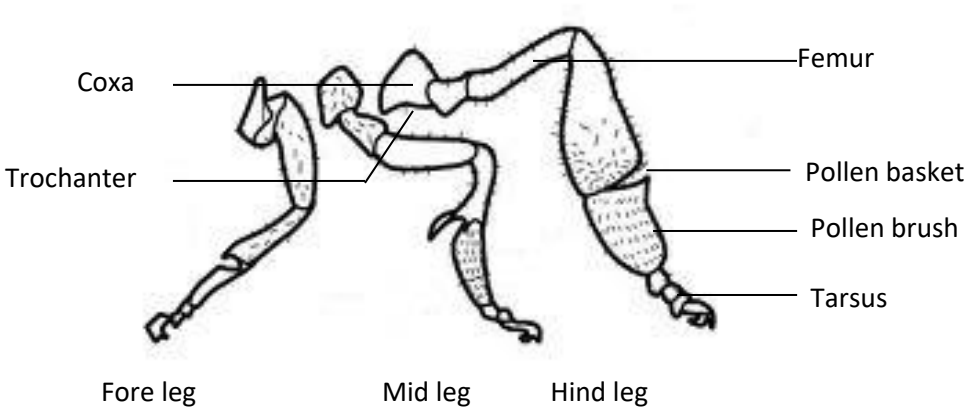
Consist of elongated proboscis tapering towards the apex, blunt ended mandible; labial pulp is segmented.



Thorax of a bee

a) Bears 3 pairs of legs
b) Has hymen between the thorax and abdomen
c) The third pair of legs have the tibia deeply grooved to form a pollen basket that retain pollen

Legs of a bee



Abdomen of Bee
- abdomen constricts anteriorly to form a waist but tapers at the posterior end
- the last segment has a sting
- it is hairy

Uses of a bee
- pollinate flowers
- make honey
- sting people

Differences between a bee and a housefly

Bee	Housefly
2pairs of wings	One pair of wings
Lack halteres	Has a pair of halteres
Hind limb has pollen basket	Hind limbs lack pollen basket
Has enlarged /thickened tibia	Tibia shorter/not enlarged
Abdomen cuticle thickened/hardened	Abdomen cuticle thin
Has proboscis and mandible	Has only proboscis
Pointed proboscis	Expanded proboscis
Has sting on last segment of abdomen	Lacks sting
Has no simple eyes	Has simple eyes
Has tapering abdomen	Has rounded abdomen

Order: Isoptera

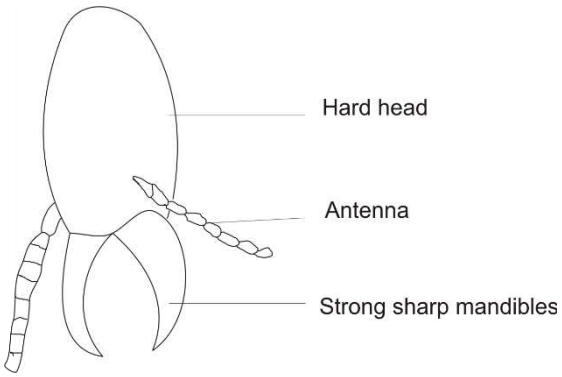
Soldier termite

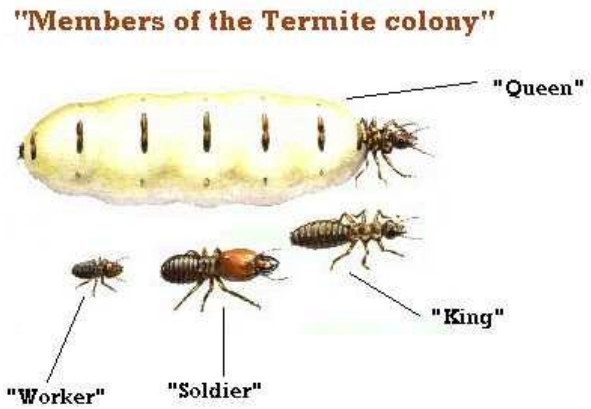


Characteristics of soldier termite
- It has a massive enlarged head with
* prominent sharp mandibles for cutting food and defense.
* short segmented antennae.
* long segmented maxillary palps
- has flattened body.
- has smooth body without hairs.

Function in caste : protection

A drawing of a head of soldier termite





Worker termite



Economic importance

1. turns the soil over to keep it loose and aerated
2. source of food

Characteristics

- Has biting mouth parts.
- Lack compound eyes.
- Has three pairs of legs.
- Has a rounded abdomen
- Its dark for camouflage

Grasshopper



Order: orthoptera

- has threadlike antennae
- has a pair of anal cerci.

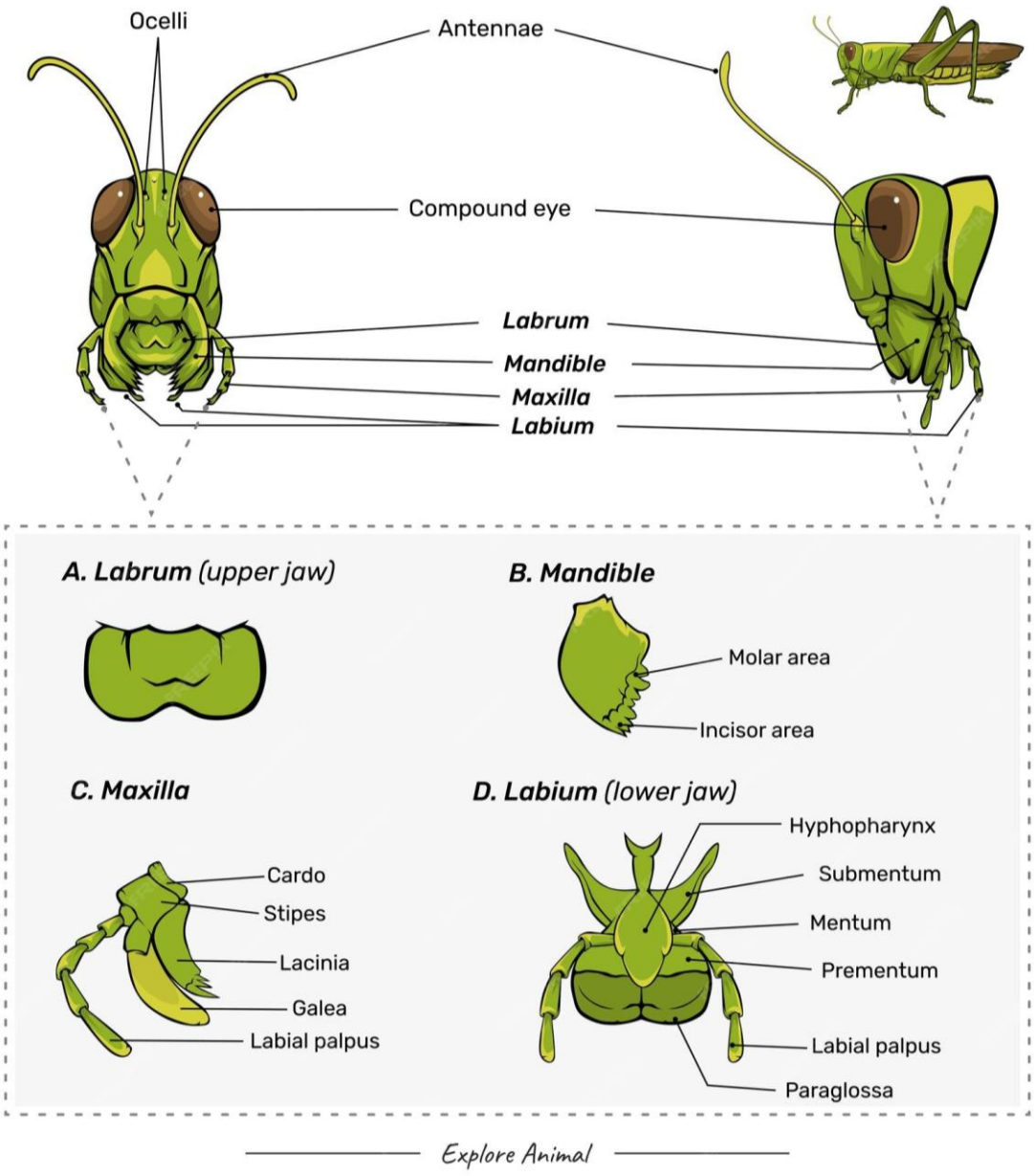
Appearance

- Some are green while others have shades of grey and brown for hiding.
- The exoskeleton is waxy to reduce water loss.
- The body is laterally flattened and tapering posteriorly.

Significance

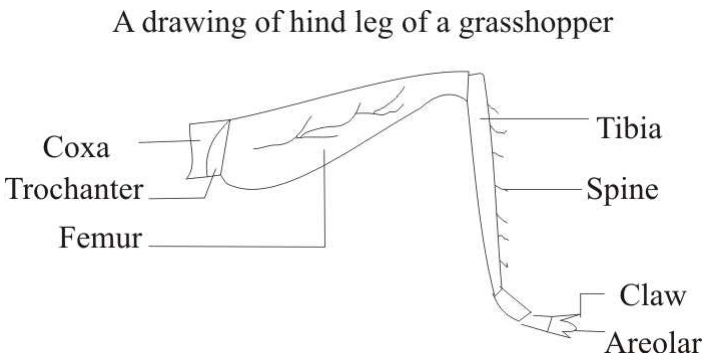
- the lateral flatness enables the grass hopper to penetrate grass for hiding away from predators.
- The tapering nature makes the grasshopper streamlined.

The head of grasshopper



- Has big compound eyes for effective sight and wide field of view.
- Long antennae sense far objects.
- Has biting mouth parts for effective feeding.
- Has strong mandibles for cutting food and enemy.

Leg of grasshopper





Adaptations of hind limbs to its function

a. muscles to create a repulsive force during movement
b. jointed for flexibility
c. long for quick movement
d. arolium allow grip on smooth surface
e. craws enable the grasshopper to grip to cracked surface
f. spines pinch the enemy during defense

Difference between the hind limbs of a bee and grasshopper

Hind limb of grasshopper	**Hind limb of a bee**
No pollen basket	Has pollen basket
No pollen comb	Has pollen comb
Has spine	Has no spines
hairless	Has hairs
Thick and expanded femur	Has thin and short femur

Wasp

Order: hymenoptera





Characteristics

- has two pairs of membranous wings
- has a narrow waist between the thorax and abdomen
- has three main body parts; head, thorax and abdomen.
- Dark colored for camouflage

Sugar ant



Characteristics

- lack wings
- has three main body parts; head, thorax and abdomen
- has three pairs of legs
- has biting mouth parts
- has thin waist between thorax and abdomen
- dark coloured for camouflage.

Mosquito

Order: diptera



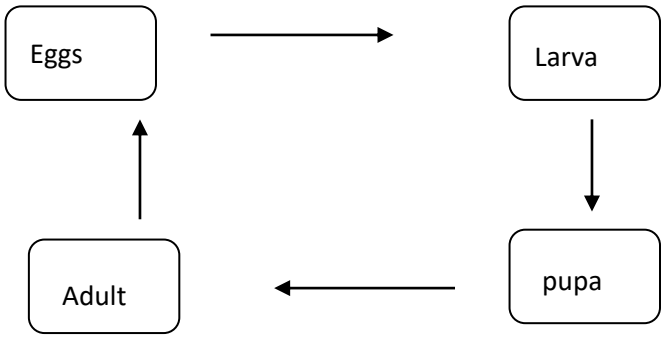
Importance of mosquitoes

They transmit diseases.

Table showing diseases carried by mosquitoes.		
Mosquito	Diseases	Causative organism
Female anopheles	malaria	plasmodium
Aedes	Yellow fever, dengue fever	Virus virus
Culex	Elephantiasis	Filarial worm

Mosquitoes undergo

complete lifecycle



Control of malaria

- Sleep in a mosquito net
- Draining stagnant water
- Removing bush in and around the house
- Close the house to prevent entry of mosquitoes

Butterfly



Order: Lepidoptera

Importance

- Pollinate flowers
- Larva stage (caterpillar) are pest
- Larva stage harms human skin

Lifecycle: undergo complete metamorphosis i.e. eggs → larva → pupa → adult,

Summary

Uses of insects

- Bees make honey which is a sweetening agent and medicinal
- Pollinate flowers
- Termites aerate soil

- When they die, they decompose into manure.

Hamful effects of insects

- Butterfly (catapilar/larva)destroy crops
- Mosquitoes (Adult) transmit diseases i.e. malaria, elephantiasis, and yellow fever.
- Termites destroy crops such maize and wooden farm structure
- Tsetesefly transmit sleeping skiness

Methods of controlling harmful effects of insects

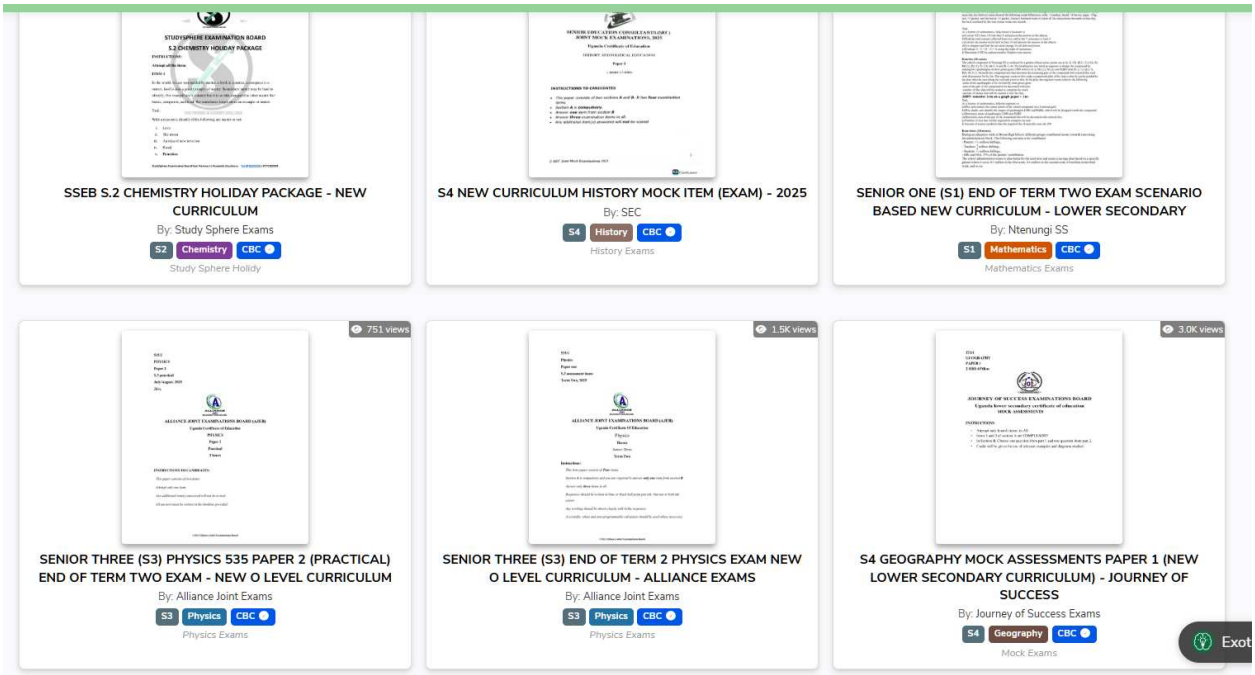
- Draining stagnant water to kill mosquito larva
- Use of traps for tsetsesly
- Use of insecticides
- Sleeping under mosquito nets
- Burning rubbish to kill housefly larvae.

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