

PRIMARY FIVE SCIENCE TOPICAL BREAKDOWN – TERM I
2023

THEME 1: Science in human activities and occupation

TOPIC 1: Poultry and Bee keeping

a) Poultry

Types of poultry

- External features of a domestic fowl and the uses of each part
- Types of chicken and their examples
- Breeds of chicken
- Uses of poultry/poultry farming
- Systems of keeping poultry
- Management of poultry

b) Bee keeping

- Types of bees and their duties
- Importance of bees to plants and people
- Lifecycle/life history of bees
- Bee hives
- Swarming
- Management of bees
- Harvesting of honey
- Bee farming as a business

THEME 2: Matter and Energy

TOPIC 2: Measurements

- Measuring mass and weight, volume and capacity
- Standard units for measuring mass, weight, volume and capacity
- Instruments used for measuring mass, weight and volume
- Behaviour of objects with water (floating and sinking)
- Buoyancy (upthrust force)
- Displacement method

- Finding density of different objects in relation to mass and volume
- Gravity

THEME 3: Immunisation and Immunity

- Immunity
- Immunisable diseases
- Vaccines and their administration
- Other immunisable diseases
- Roles of individuals, families and community in immunization
- Child health card
- Roles of UNEPI

THEME 4: Human body

TOPIC 4: Digestive system

- Parts of the digestive system and the alimentary canal
- Functions of different parts of the digestive system
- Actions of enzymes during peristalsis and the digestive juice produced
- Diseases and disorders of the digestive system
- Prevention and management of diseases and disorders of the digestive system
- Behaviour and habits of managing the efficiency of the digestive system

PRIMARY FIVE TERM ONE LESSON NOTES

THEME: SCIENCE IN HUMAN ACTIVITIES AND OCCUPATION

TOPIC: Poultry and Bee Keeping

THEME: MATTER AND ENERGY

TOPIC: Measurements

THEME: HUMAN HEALTH

TOPIC: Immunisation

THEME: HUMAN BODY

TOPIC: Digestive system

POULTRY AND BEE KEEPING

Poultry

Terms used in poultry

Hen – is a mature female chicken

Cock – is a mature male chicken

Cockerel – is a young male chicken

Capon – is a castrated male chicken

Caponisation – is the removal of testes from a young male chicken

Pullet – is a young female chicken

Fowl – is a domestic bird

Chick is a young one of a hen

Incubation – is the process by which fertilized eggs are given necessary conditions to young birds

Incubator – is a machine used to hatch fertilized eggs into young birds

Incubation period – is the time taken for a fertilised egg to hatch into a young bird

Brooding – is the giving care to young birds

Brooder – is a structure where chicks below 8 weeks are kept

Broody hen – is a hen sitting on its eggs to hatch them

Culling – is the removal of sick or unproductive birds from a flock

Moulting – is the process by which birds shed feathers from their bodies

Debeaking – is the shortening of the upper part of the bird's peak

Candling – is the checking for disorders in an egg using a candler

Poultry – are all kinds of domestic birds

Poultry

Poultry are domestic birds

Poultry keeping is the rearing of domestic birds

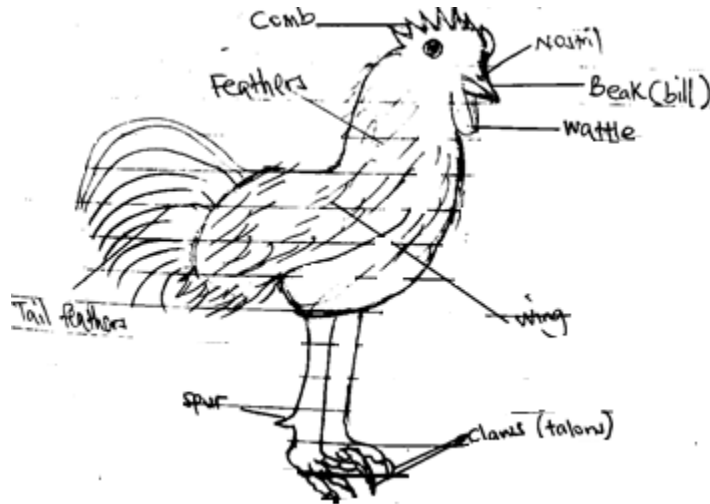
Types (examples of poultry)

- Chicken
- Ducks
- Turkeys
- Pigeons
- Geese
- Guinea fowls
- Quails

Importance of keeping poultry

- For meat
- For eggs
- For income when sold
- Their droppings are used as farmyard manure
- Their feathers are used for decoration
- For cultural practices like rituals, paying bride price

A drawing showing external parts of chicken



Functions of different parts of a bird

Beak (bill)

- For picking food
- For protection
- For turning eggs during incubation
- For arranging its body feathers (preening)
- For making their nests

Wings – for flying

Eye – for sight/seeing

Nostril – for smelling

Feathers – for keeping the body of a bird warm

Spur – for protection

- For support during mating

Comb and wattle – for attracting mates

Claws (talons) – for scratching the ground to get food

- For protection

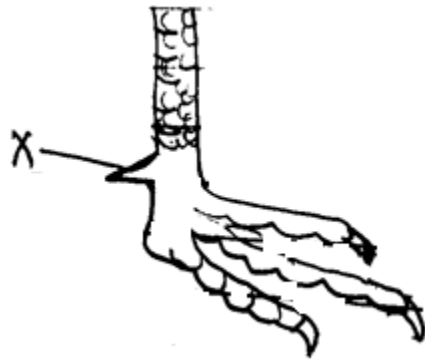
Earlobe – for hearing

Structural/Physical differences between a cock and a hen

- A cock has a big comb while a hen has a small comb
- A cock has a big wattle while a hen has a small wattle
- A cock has long tail feathers while a hen has short tail feathers
- A cock has a long spur while a hen has a short spur
- A cock has bright and long neck feathers while a hen has dull short neck feathers

Activity

1. What term describes the rearing of domestic birds?
2. Besides geese, give any other two examples of poultry
3. Why do cocks have bright and long neck feathers
4. Study the diagram below and use it to answer the questions that follow



- (a) Name the part marked x above
 - (b) How useful is part x to a bird?
5. Which type of manure is got from chicken droppings?
 6. In which two ways does poultry keeping benefit farmers in the community?
 7. Give any one physical difference between a cock and a hen.

Feathers

Feathers are light horny water proof structure that cover the bird's body

Types of feathers

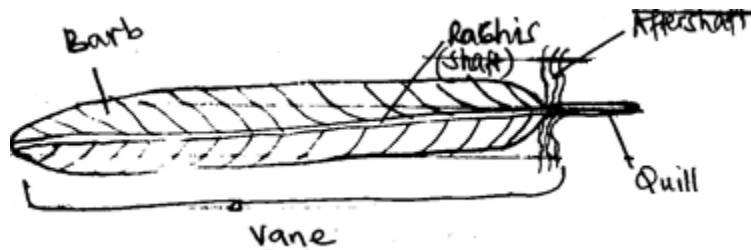
- Quill feathers
- Body feathers
- Down feathers
- Filoplume feathers

Quill feathers (flight feathers)

They are used for flying. They are found on the wings and tails

They are the largest on the body of a bird

Diagram showing parts of a quill feather



Body feathers (covert feathers)

They keep the body of the bird warm

Body feathers cover the biggest part of the bird's body

They are the second largest feathers on the body of the bird.

Diagram showing body feather



Down feathers (contour feathers)

- They keep the bird warm by preventing heat loss
- They are found all over the body
- They are the first feathers to appear on the body of the bird

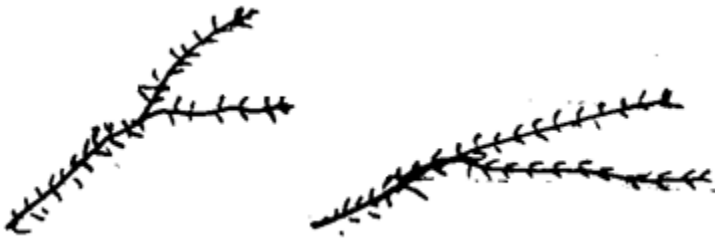
Diagram showing a down feather



Filoplume feathers (hair feathers)

- They are the finest/smallest feathers of the bird
- They are hairlike and nearest to the skin of the bird

Diagram of a filoplume feather



Importance of feathers to birds

- For warmth
- For flight
- For attracting mates
- For identification

Importance of feathers to people

- For decoration

- For making pillows
- For making costumes
- For income when sold

Chicken

Types of chicken – These are groups of birds kept for a particular purpose. They are

- Layers
- Broilers
- Dual purpose chicken

Layers

These are chicken kept for laying eggs

Examples of layers

- Brown egger
- Minorca
- White leghorn
- Ancona
- Sykes
- Phoenix chicken

Ways of improving egg production in layers

- Feeding them on layer mash
- Providing enough water to layers
 - Vaccinating them
- Treating them when they are sick
- Feeding them on food rich in calcium

Off layers

- Are birds whose egg production rate has reduced. They should be fed with broiler mash to make them grow fat

Broilers (Table birds)

These are chicken kept for meat

Examples of broilers

- Plymouth rock
- Jersey black giant
- Orpington
- Cornish white
- Cornish dark

Ways of improving broilers

- Feeding them with broiler mash
- Providing enough water to them
- Vaccinating them
- Treating them when they are sick

Dual purpose chicken

These are chicken kept for both eggs and meat production.

They are both layers and broilers

Examples of dual purpose chicken

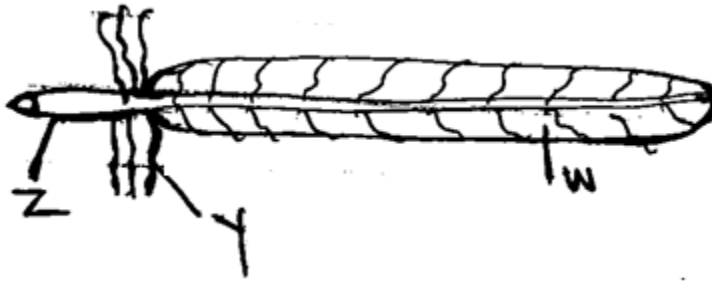
- Light Sussex
- Rhode island Red
- New Hampshire Red
- Black Australorp
- Wyandotte

Layers	Broilers	Dual purpose chicken
Brown egger Minorca White leghorn Ancona Sykes Phoenix chicken	Plymouth rock Orpington Jersey black giant Cornish white Cornish dark	Light Sussex Rhode Island Red New Hampshire Red Black Australorp Wyandotte

Activity

1. Mention any two items obtained from feathers
2. What will happen to a bird if all its feathers are removed?
3. How does feathers keep the birds' body warm?
4. Why are off layers fed on broiler mash?
5. Study, the diagram below about a feather of a bird and use it to answer questions that follow

Diagram of a feather



- (a) Name the type of feather above
- (b) Name the parts marked W, Y and Z
- (c) How is the above type of feather useful to a bird?

6. Mention any two breeds of chicken kept for;

- (a) Egg production
- (b) Meat production

7. What advice would you give to a poultry farmer whose birds lay eggs with soft shells?

Breeds of chicken

A breed of chicken is a group of chicken with similar characteristics and origin

Types of breeds of chicken

- Local breeds
- Exotic breeds
- Cross breeds

Local breeds (indigenous breeds)

These are breeds which have their origin in Africa

Characteristics of local breeds

- They grow slowly
- They are more resistant to diseases
- They are resistant to harsh weather conditions
- They lay few eggs
- They have different sizes and colours
- They incubate their own eggs

Advantages of rearing local breeds

- They are more resistant to diseases
- They produce high quality eggs and meat
- They are resistant to harsh weather conditions
- They can incubate their own eggs
- They care for their young ones
- They look for their own food

Disadvantages of rearing local breeds

- They grow slowly
- They lay few eggs
- They produce less meat

Exotic breeds

These are breeds of chicken imported from outside Africa like Italy, USA, Germany

Examples of exotic breeds

- | | |
|----------------|--------------------|
| - Light Sussex | - Plymouth rock |
| - Minorca | - Rhode Island Red |
| - Brown egger | - Ancona |
| - Orpington | - Sykes |

Characteristics of exotic breeds

- They grow faster
- They have the same size and colour
- They lay a lot of eggs
- They produce high quantity (more) meat
- They have the same ancestors

Advantages of exotic breeds

- They lay a lot of eggs (good layers)
- They grow faster
- They produce more meat

Disadvantages of exotic breeds

- They are less resistant to diseases

- They require special care on the farm
- They are expensive to maintain and feed
- They produce low quality eggs and meat
- They don't incubate their own eggs
- They don't brood their own chicks
- They are not resistant to harsh weather conditions

Differences between local breeds and exotic breeds

- Local breeds grow slowly while exotic breeds grow faster
- Local breeds produce less meat than exotic breeds
- Local breeds are more resistant to harsh weather conditions than exotic breeds
- Local breeds incubate their own eggs while exotic breeds do not
- Local breeds are smaller in size than exotic breeds

Cross breeds

Cross breeds are breeds got after mating local breeds and exotic breeds

Examples of cross breeds

- Kuroilers

Hybrids

Hybrids are breeds got after mating two pure different breeds

Examples of hybrids

- Thumper 404 – Black rock – Ross birds
- Thumper 707 – Black start – Shavers

Characteristics of hybrids

- Produce more meat
- Lay bigger eggs
- Lay more eggs
- They have improved growth rate

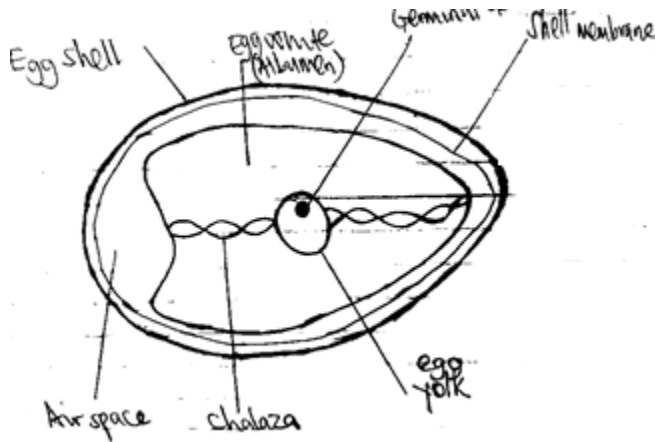
Ways of improving the quality of local breeds of chicken

- By crossbreeding
- By selective breeding
- By proper feeding

Reproduction in birds

Birds reproduce by laying eggs

Parts of an egg



Functions of each part of an egg

Eggshell

- Protects the inside part of an egg
- For gaseous exchange

The eggshell is made up of mineral salt called calcium and phosphorus

Adaptation of eggshell to its use

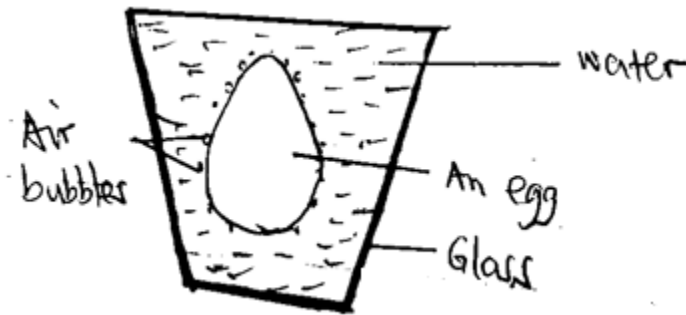
It has small holes called pores which allow exchange of gases

Question:

Why is an eggshell made porous?

To allow gaseous exchange

An experiment to show that an eggshell is porous



Materials

- Glass jar
- Water
- An egg

Steps

- Pour water into a glass jar
- Dip an egg into a glass jar

Observation

Air bubbles will be seen out of the egg

Conclusion

An egg shell is porous

Air space

- It stores and supplies air to the embryo

Shell membrane

- It protects the inside parts from bacteria

Egg white

- It supplies water and proteins to the embryo

Egg Yolk

- It provides proteins and fats to the embryo

Chalaza

- It holds the Yolk in position

- It is twisted to balance the Yolk in position to get equal temperature during incubation
- It transports fresh air to the embryo

Germinal disc

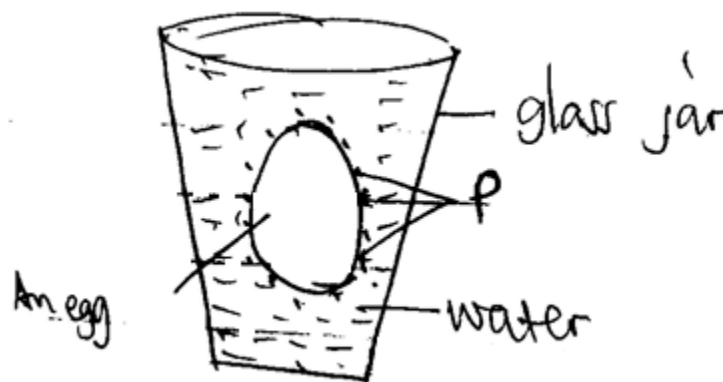
- It develops into a chick

Embryo

- Is a living part of a fertilized egg

Activity

1. In which way is a breed different from a type of chicken?
2. Why do most farmers prefer rearing exotic breeds to local breeds of chicken?
3. How can a poultry farmer improve on the quality of his local chicken?
4. Ssalongo was given a tender of supplying eggs to Hormisdallen schools.
 - (a) What type of chicken would you advice him to rear on his farm?
 - (b) How can we improve on the production of the type of chicken in (a) above?
5. What general name is given to birds obtained by mating local breeds with exotic breeds?
6. Study the diagram below and answer the questions that follow



- (a) Name the substance marked P
(b) What do substances marked P prove about an egg?
7. How is the chalaza adapted to its function?

INCUBATION

Incubation is the process by which a fertilized egg is given necessary conditions to hatch into a young one

Favourable conditions for eggs to hatch

- Warmth
- Oxygen
- Moisture

Factors that may make fertilized eggs fail to hatch

- Cracked eggshell
- Double yokes
- Dirty eggshell/blocked pores
- Overstayed eggs
- Low heat during incubation
- Overheating eggs during incubation

Qualities of eggs to be incubated

- Should be medium sized with oval shape
- Should be fertilized
- The Yolk should be centrally placed
- Should be clean, smooth and thick shelled
- Should be free from abnormalities

Candling

- Candling is the process of checking for disorders in an egg using a candler

A drawing showing candling

Importance of candling

- It helps in finding disorders/abnormalities in an egg

Incubation period

Incubation period is the time taken for a fertilized egg to hatch

Incubation period of different domestic birds

Bird	Incubation period
Pigeon	14 days
Hen	21 days
Duck	28 days
Turkey	28 days
Guinea fowl	28 days
Geese	30 days

Types of incubation

1. Natural incubation
2. Artificial incubation

Natural incubation

This is where a mother hen sits on her eggs until they hatch into chicks. The mother hen is called a broody hen

A broody hen is a hen which sits on her eggs for 21 days

A drawing of natural incubation



Advantages of natural incubation

- It is cheap
- Chicks hatched get extra care from the mother

- The incubating hen needs less attention
- All the necessary conditions are provided by the broody hen

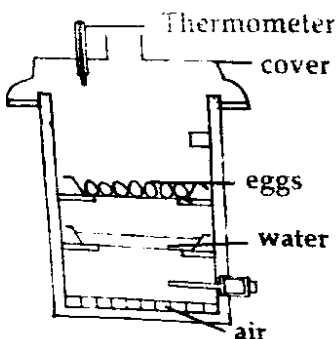
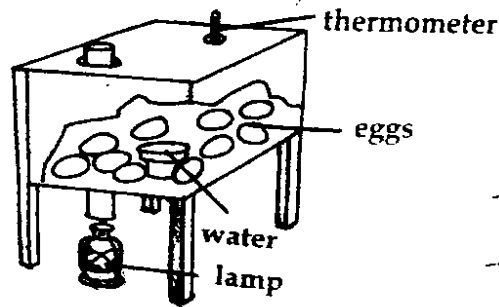
Disadvantages of natural incubation

- Few eggs are hatched at a time
- Broody hen can be attacked by vermins
- It is not good for commercial purpose because few chicks can be hatched at a given time
- Broody hen may not be good at incubating the eggs
- Broody hen may neglect the eggs when attacked/disturbed

Artificial incubation

This is a method where a machine is used to hatch eggs into chicks

The machine used to hatch the eggs is called an incubator

Electric incubator	Local incubator
 <p>The diagram shows a cross-section of an electric incubator. It has a thermometer at the top, a cover, a layer of eggs, a layer of water, and a layer of air at the bottom.</p>	 <p>The diagram shows a local incubator. It has a thermometer on top, a layer of eggs, a layer of water, and a lamp at the bottom.</p>

Uses of some parts of an incubator

Source of heat

- It provides warmth

Water

- It provides moisture
- It reduces temperature inside the incubator

Thermometer

- For measuring the temperature inside the incubator

Advantages of artificial incubation

- Many eggs are hatched at once
- Good for commercial purposes
- Limits breaking of eggs
- Eggs are protected from vermins during incubation

Disadvantages of artificial incubation

- It is expensive
- It needs a lot of attention
- It requires skilled labour
- It can lead to losses incase electricity goes off

Brooding

Brooding is the giving of care to chicks

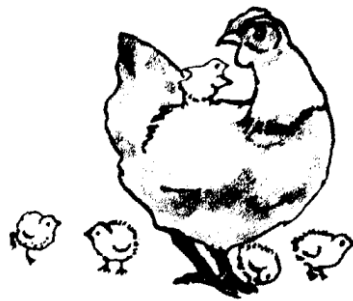
Types of brooding

- (a) Natural brooding
- (b) Artificial brooding

Natural brooding

This is where a mother hen takes care of her chicks

Illustration of natural brooding



Advantages of natural brooding

- The broody hen provides security to the chicks
- The mother hen provides food for the chicks
- It is cheap
- It limits toe pecking since the chicks move with their mother

Care provided by the mother hen to chicks during natural brooding

- Food
- Security
- Warmth
- Shelter

Disadvantages of natural brooding

- Chicks are eaten by predators
- Chicks may die if the mother hen is stolen
- Few chicks can be raised
- Chicks can get lost easily from their mother
- Not suitable for commercial purposes

Artificial brooding

This is where chicks are kept in a brooder.

A brooder is a structure where chicks below 8 weeks are kept

Care provided in a brooder

- Food
- Warmth
- Water
- Light

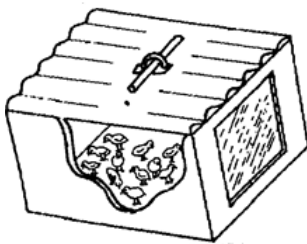
Types of brooders

- Infrared lamp brooder
- Kerosene brooder
- Charcoal brooder/pot brooder

Kerosene/paraffin brooder

Kerosene lamp is used to provide warmth and light

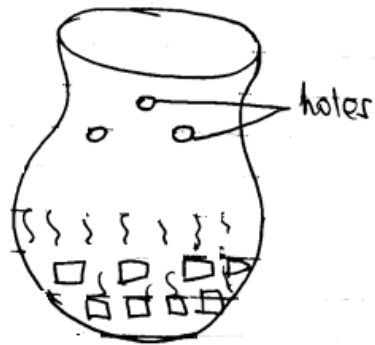
A drawing of a kerosene/brooder



Charcoal brooder/pot brooder

It is where a hot pot with charcoal is used to provide warmth.

A drawing of a pot brooder

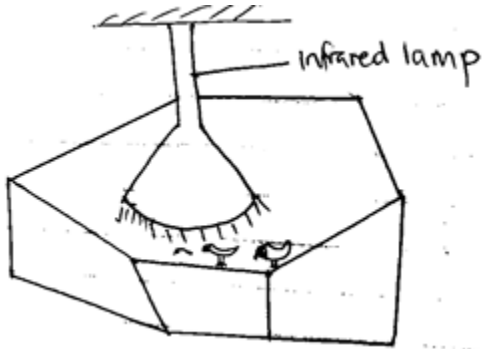


Infrared lamp brooder

An infrared lamp is used to provide heat and light.

Electricity is the source of heat and light in a brooder.

Illustration of an infrared lamp brooder



Advantages of artificial brooding

- Chicks are protected from predators
- Easy to feed chicks in one place
- Many chicks can be raised at once
- Good for commercial purposes
- Limits loss of chicks

Disadvantages of artificial brooding

- It is expensive
- Needs a lot of attention
- Toe pecking is common among chicks
- Incase of inadequate heat and warmth, chicks die

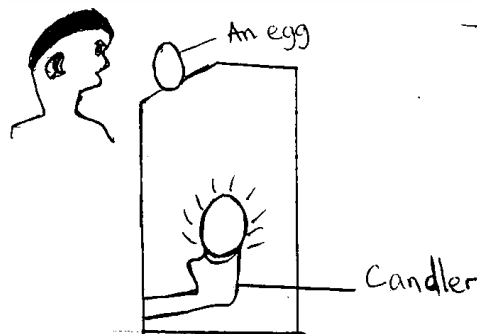
An infrared lamp is always hanged at the ceiling, the height of the lamp is adjusted upwards as the chicks grow.

Activity

1. Differentiate between incubation and incubation period
2. How is a thermometer useful in an incubator?
3. Suggest any two situations that may fail a fertilized egg to hatch
4. Name the type of incubation shown in the diagram below



5. State any two advantages of the above type of incubation
6. The diagram below shows a farm practice done by poultry farmers. Study it carefully and use it to answer the questions that follow



- (a) Name the farm practice in poultry shown above
 - (b) How is the above practice useful to a poultry farmer?
7. The diagram below shows a facility used in a poultry house. Study and use it to answer the questions that follow



- (a) Name the facility in a poultry house shown above
 - (b) State the importance of the facility in a poultry house
 - (c) How is a broody hen important to chicks?
 - (d) Apart from the facility shown above, give any one type of brooder
8. Suggest any two ways chicks benefit from natural brooding

SYSTEMS OF REARING POULTRY

There are four systems of rearing poultry namely;

- Free range system
- Fold/pen system
- Deep litter system
- Battery system/cage system

Free range system

This is where birds are left to move freely to look for their own food.

It is commonly practiced in rural areas because there is enough space for birds to roam.

Illustration of free range system



Advantages of free range system

- It is cheap
- Birds feed on a balanced diet
- Vices are reduced among birds
- Birds get enough physical exercise

- Manure is evenly distributed on the farm
- Birds do not need a lot of care and attention

Disadvantages of free range system

- Birds can easily get pests and diseases
- Chicken can destroy farmers crops
- Birds can easily get lost
- Birds can be eaten by predators
- It is difficult to collect eggs
- It requires a large piece of land

Deep litter system

This is a system where birds are kept indoors

It is common in urban areas

In a deep litter system, the floor is covered with litter

Facilities found in a deep litter house

- Litter
- Feeding trough
- Water trough/drinker
- Laying nests
- Perches

(a) Litter

Litter are soft materials used to cover the floor of a poultry house.

Materials used as litter

- Sawdust
- Coffee husks
- Wood shavings
- Crushed maize cobs
- chopped dry grass
- dried leaves
- rice husks

Importance of litter in a deep litter house

- Keeps the poultry house dry and warm by absorbing moisture from droppings.
- Controls eggs from breaking
- Keeps poultry busy

Importance of litter to a farmer

- It is used as manure

Disadvantages of litter

- Easily catches fire (fire hazard)
- Hides parasites
- Old litter produces bad smell

Ways of maintaining litter in a poultry/deep litter house

- Turning litter regularly
- Replacing old litter

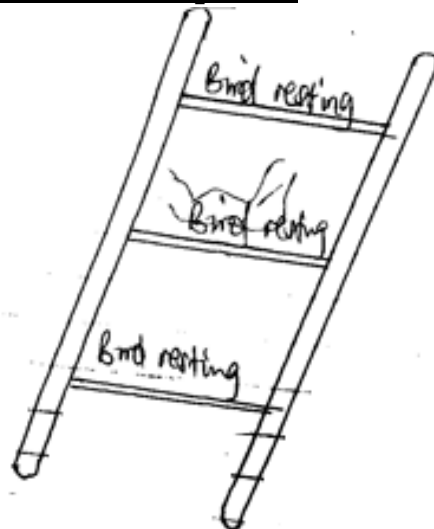
Questions:

1. Why should litter be replaced regularly in a poultry house?
 - It enables it absorb moisture from poultry droppings
 - To prevent litter from hardening
2. How does litter keep the poultry house dry and warm?
 - By absorbing moisture from the chicken droppings
3. Why is deep litter system suitable for commercial purposes?
 - Many birds can be kept in a small house

(b) Perches

A perch is a structure where birds play and rest from

Illustration of a perch



Importance of perches

- For keeping birds busy
- Enable birds to do physical exercise
- For resting and playing

(c) Laying nests/boxes

- For the birds to lay eggs

(d) Feeding trough

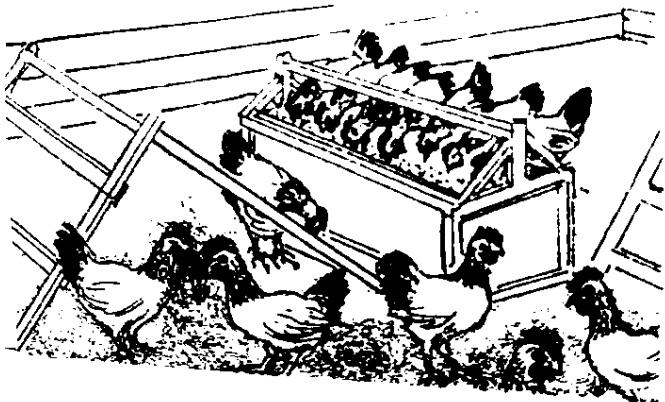
- For providing mash to birds

(e) Water trough/drinker

Illustration

- For providing water to birds

Illustration of a deep litter house



Advantages of deep litter system

- Many birds can be kept in a small house
- Easy to collect eggs
- Birds are protected from predators
- Birds do not destroy people's crops
- Manure can easily be collected
- Birds are protected from thieves
- Birds can not easily get lost

Disadvantages of deep litter system

- Expensive to buy feeds

- Diseases are easily spread from one bird to another in case of an outbreak.
- Birds do not get enough physical exercises
- It is not easy to identify a sick bird
- Birds have no choice of food
- Poultry vices are common
- Litter may be a fire hazard
- Difficult to keep records of individual birds

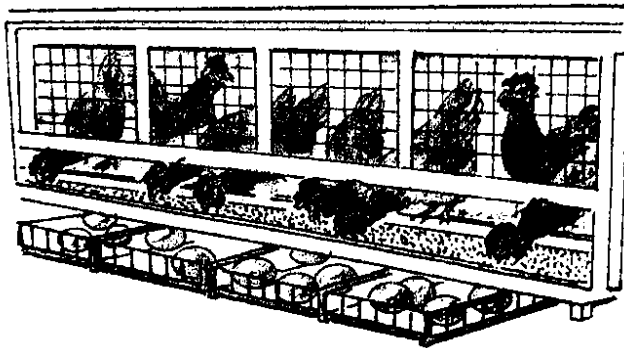
Battery system/cage system

This is a system where birds are kept in cages. In this system one to four birds are kept in each cage.

Cages are made of wires to allow free circulation of air.

The floor of a battery house is cemented to allow easy cleaning.

Illustration of a cage system



Advantages of battery/cage system

- Birds are protected from wild animals
- Easy to collect eggs
- Vices are controlled
- Easy to cull birds
- Easy to collect clean eggs
- Easy to keep individual bird's record
- Prevents contamination of food and water by droppings

Disadvantages of battery system/cage system

- The system is very expensive
- Requires a qualified person to manage it
- Birds do not get enough exercise

- Cages can injure the birds
- Tiresome to feed the birds

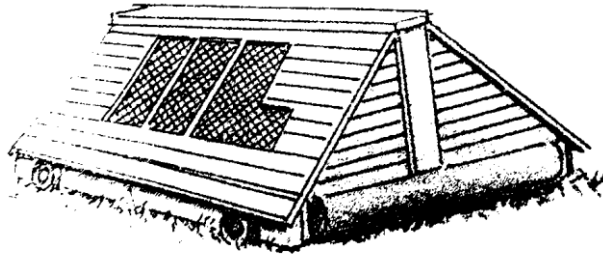
Fold system/pen system

This is a system where few birds are kept in small movable houses.

The small movable houses are called pens/folds/arks.

The small houses are moved to new places daily

Illustration of a movable pen



Advantages of fold system

- Manure is easily distributed on a farm
- Easy to control parasites and diseases
- Birds are protected from wild animals
- Movement of birds is restricted

Disadvantages of fold system/pen system

- Few birds can be kept
- Tiresome to move the pens
- Folds can easily get broken due to frequent movements
- Birds do not get enough physical exercise
- The system may not be good for swampy areas

Activity

1. Study the diagram below about a system of keeping poultry.
Use it to answer questions that follow

(a) Name the system shown above

- (b) Give any two advantages and disadvantages of the above system
- (c) Why is the above system commonly practiced in rural areas?

2. Suggest any two uses of litter in a poultry house
3. Suggest one way how a crop farmer can depend on poultry keeping
4. (a) Name the system of keeping poultry where few birds are kept in cages
5. Which deficiency disease is prevented when children feed on eggs and meat?

Products got from poultry

- Eggs
- Meat
- Feathers
- Droppings

Feeding poultry

Birds are fed on feeds called mash.

Reasons for feeding birds

- To enable them grow and fatten
- To enable them lay many eggs
- To keep the birds healthy

Mash

Mash is the food given to poultry

Components of mash

- Crushed egg shells
- Bran
- Mukene
- Common salt
- Cotton seed cakes
- Seashells

- Bone meal
- Blood meal

Types of mash

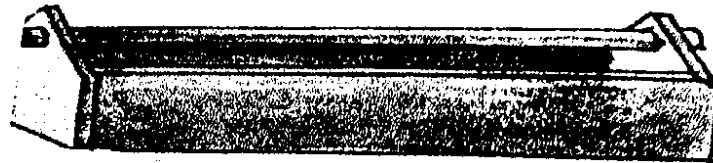
- Chick mash/starter mash
- Grower mash
- Broiler mash
- Layer mash

Different layers and broilers are fed on mash

Age	Type of mash
Layers	
1 day – 8 weeks	Chick or starter mash
8 weeks – 20 weeks	Grower mash
5 months onwards	Layer mash
After one year	Broiler mash
Broilers	
1 day – 2 weeks	Starter mash
3 weeks – 8 weeks	Broiler mash

Feeding containers

(a) Feeding trough – for providing mash to birds



Rotating handle – it prevents birds from contaminating the feeds

(b) Water trough – for providing water to birds

Classes of food needed in the bird's diet

- Proteins
- Carbohydrates

- Vitamins
- Mineral salts
- Fats and oils

Proteins

- Build the body of birds
- Help birds to grow

Sources of proteins

- | | |
|--------------|-----------|
| - Soya beans | - beans |
| - Cowpeas | - fish |
| - Groundnuts | - insects |

Carbohydrates

- Provide energy to birds

Sources of carbohydrates

- | | |
|-----------|------------------|
| - Bran | - sweet potatoes |
| - Cassava | - millet |
| - Sorghum | - maize |

Vitamins

- Keep the birds body healthy

Sources of vitamins

- Fruit
- Green vegetables

Mineral salts

- Help in formation of strong bones and eggshells egg calcium and phosphorus
- Help in formation of blood cells e.g iron

Sources of mineral salts

- Oyster shells
- Common salts
- Green vegetables

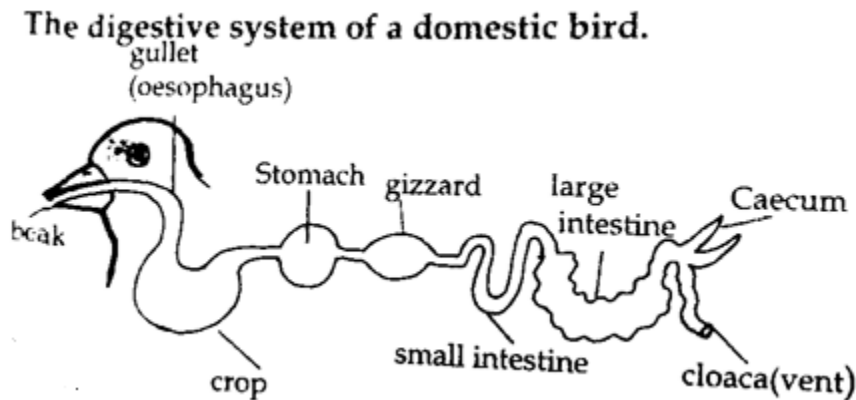
Fats and oils

- Provide energy and heat to the body of the birds

Sources of fats and oils

- Groundnuts
- Peas
- Meat
- Butter
- Magarine

The digestive system of a bird



Functions of each part of the digestive system of a bird

Beak – for picking food/mash

Gullet – it helps to pass food to the crop

Crop – stores and moistens food

- Softens food

Stomach (proventricullus) – mixes food with enzymes

Gizzard – stores small stones which crushes food into smaller particles. The small stones in a gizzard are called gastroliths

Small intestine - Absorbs digested food into the blood stream

- Its where digestion of food ends

Large intestine – Absorbs water from undigested food

Caeca – stores undigested food for a short period

Cloaca/vent – Passes undigested food (droppings)

Poultry vices (Fowl vices)

These are bad habits in poultry

Causes of poultry vices

- Overcrowding of birds/over crowdedness of birds
- Poor feeding
- Boredom
- Failure to collect eggs in time
- Too much light in the poultry house
- Introduction of new birds in the flock
- When the oviduct of a hen comes out (prolapse)

Examples of poultry vices/fowl vices

- Cannibalism
- Egg eating
- Feather pecking

(a) Cannibalism

This is where birds feed on the flesh of their fellow birds

Forms of cannibalism

- Vent pecking
- Skin pecking
- Toe pecking

Causes of cannibalism

- Prolapse
- Boredom
- Overcrowding of birds
- Lack of proteins in the diet
- Too much light in the poultry house
- Starvation
- Introduction of new birds in the flock

Signs of cannibalism

- Blood stains on the beak
- Fighting among birds
- Blood stains on litter
- Chicken bleeding at the vent

Ways of controlling cannibalism

- Debeaking birds/beak trimming
- Providing enough feeds
- Reducing the amount of light in the poultry house
- Providing enough space
- Feeding birds on food rich in proteins
- Isolation of pecked birds
- Hanging green leafy vegetables in the poultry house
- Putting perches in the poultry house

NB: The main cause of cannibalism is prolapse

(b) Egg eating

This is where some layers eat their eggs

Causes of egg eating

- Lack of calcium in the diet
- Over crowding of birds
- Boredom
- Too much light in the poultry house
- Failure to collect eggs in time

Signs of egg eating

- Yellow stains on the bird's peak
- Presence of egg shells in the poultry house
- Broken eggs in the poultry house

Ways of controlling egg eating

- Collecting eggs in time
- Debeaking birds
- Avoiding too much light in the poultry house
- Proper feeding of birds

(c) Feather pecking

This is the act where a bird pecks feathers from other birds using its beak

Causes of feather pecking

- Overcrowding of birds
- Boredom
- Bright light in the poultry house
- Absence of vitamins in the mash given to birds.

Ways of controlling feather pecking

- Debeaking birds
- Providing enough space
- Isolation of pecked birds
- Providing enough food
- Hanging vegetables in the poultry house
- Putting perches in the poultry house

Effects of poultry vices

- They lower production on the poultry farm
- They lead to death of birds
- They make birds have wounds on their bodies
- They lead to spread of diseases

Activity

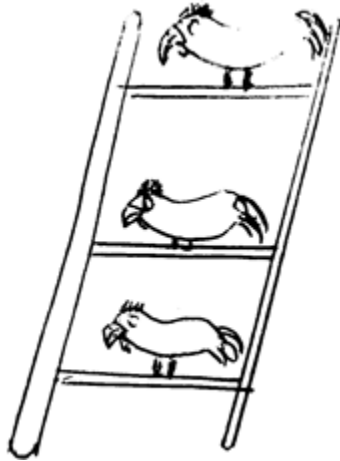
1. Name the type of mash fed to layers after one year
2. In which way is the function of a feeding trough different from that of a water trough?
3. How does debeaking control poultry vices on a farm?
4. Give any one class of food needed in the birds diet
5. The diagram below shows an item used in poultry management. Study and use it to answer questions that follow.



(a) Name the item shown above

(b) How do poultry farmers use the above named item?

6. The diagram below shows a facility commonly used on a poultry farm. Study it and answer questions that follow.



(a) Name the facility shown above

(b) In which way is the facility above useful in a poultry house?

7. Poultry vices are bad habits in poultry

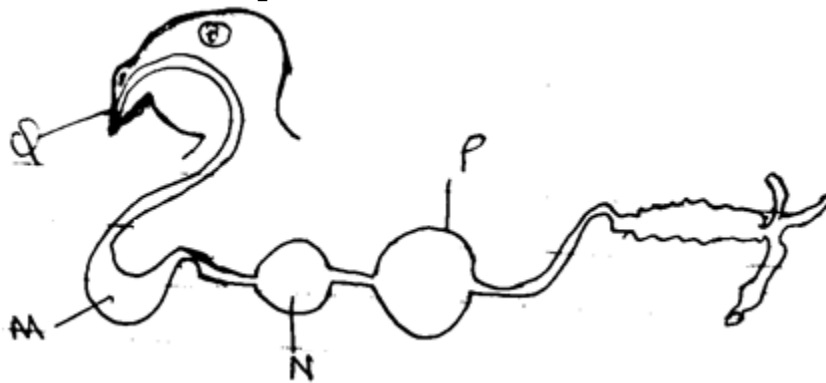
(a) Name any one poultry vice

(b) Mention any two causes of the above poultry vice

(c) Suggest any two ways of controlling the above habits on the poultry house

(d) Give any one effect of fowl vices in poultry

8. Study the diagram below of a digestive system of a bird and use it to answer questions that follow



- (a) Name the part marked N.
- (b) What happens to food when it reaches part M?
- (c) How is part marked P adapted to its use during crushing of food into small particles?
- (d) Give the function of part Q during digestion.

Poultry diseases and parasites

Poultry diseases

They are caused by;

- Viruses
- Protozoa
- Bacteria

Viral diseases in poultry

They are diseases caused by virus

They include;

- Gumboro
- Newcastle disease
- Fowl pox
- Bird flu (avian leucosis)

Bacterial diseases

These are diseases caused by bacteria.

They include;

- Fowl typhoid
- Pneumonia

Protozoan diseases

These are diseases caused by protozoa

They include;

- Coccidiosis
- Blackhead

Factors that lead to easy spread of diseases in a poultry farm

- Overcrowding of birds
- Poor feeding of birds
- Feeding birds with contaminated feeds and water
- Poor hygiene in the poultry house
- Poor ventilation

Coccidiosis

It is caused by protozoa

It affects the liver, small intestine and large intestine

It is common to poultry, rabbits, kids, lambs and calves

Spread of coccidiosis

Through feeding birds with contaminated feeds and water.

Signs and symptoms of coccidiosis

- Blood stained droppings
- Dullness and droopings of wings
- Rough feathers/ruffled feathers
- Loss of body weight
- Loss of appetite
- Loss of body shape

Prevention and control of coccidiosis

- Cleaning the poultry house regularly
- Culling sick birds
- Vaccinating birds with coccidiostats
- Feeding birds with clean food using clean containers

Blackhead

- It is caused by protozoa
- It affects the liver and caecum
- It is common in turkeys and wild animals

Signs and symptoms of blackhead

- dark purple comb
- yellowish diarrhoea
- dropping of wings
- loss of appetite
- swollen liver and legs

Control and prevention of blackhead

- Early vaccination of birds
- Provision of enough space to birds
- Isolation of turkeys from other fowls

Newcastle disease

It is a highly infectious disease caused by a virus.

The disease kills unvaccinated poultry birds

Signs and symptoms of Newcastle

- Fever
- Difficulty in breathing
- Staggering
- Dropping of wings
- Drop in egg production
- Twisting of bird's neck
- Poor egg formation
- Sudden death of birds
- Lameness

Prevention and control of Newcastle disease

- Culling infected birds
- Vaccinating birds with Newcastle vaccine
- Kill infected birds
- Bury or burn the carcass of dead infected birds

Fowl pox

It is an infectious disease caused by virus.

It enters the body of birds through wounds due to pecking and biting insects

Signs and symptoms of fowl pox

- Sudden death
- Severe sneezing
- Sores on the wattles, combs and around the eyes
- Difficulty in breathing
- Shedding feathers

Prevention and control of fowl pox

- Vaccinating birds
- Cleaning and disinfecting the poultry house
- Kill the infected birds
- Burn or bury carcass of dead infected birds

Bird flu (Avian leucosis)

It is caused by virus

Signs and symptoms of bird flu

- Paralysis of legs and wings
- Swollen legs, eyes, combs
- Mucus discharge from the nostrils, eyes and beak
- Reduced egg production
- Dehydration
- Pale combs

Prevention and control of bird flu

- Vaccination
- Keeping the poultry house clean
- Bury or burn dead infected birds
- Isolation of sick birds by culling
- Disinfecting the poultry equipment using disinfectants

Gumboro

It is caused by a virus

Signs and symptoms of gumboro

- Ruffled feathers

- Dropping of wings
- Pecking among birds
- Whitish watery diarrhoea
- Sudden death of chicken
- Loss of weight
- Loss of appetite

Prevention and control of gumboro

- Culling
- Vaccinating with gumboro vaccines at 2 – 4 weeks

Fowl typhoid

It is caused by bacteria called Salmonella typhi

It is transmitted to chicks by the eggs of hens

Signs and symptoms of fowl typhoid

- Pale wattle
- Ruffled feathers
- Fever
- Whitish yellowish diarrhoea
- Sleepy eyes
- Droppings wings
- Loss of appetite

Prevention and control of fowl typhoid

- Gulling
- Kill the infected birds
- Keeping the poultry house clean
- Vaccinating birds regularly

Pneumonia

It is a contagious disease caused by bacteria.

It is spread through air from an infected birds to another after sneezing

It affects the lungs of birds

Signs and symptoms of pneumonia

- Difficulty in breathing
- Coughing
- Loss of appetite
- Loss of weight
- Mucus discharge from nostrils and beak

Prevention and control of Pneumonia

- Treating with antibiotics
- Keeping the poultry house clean
- Proper ventilation of the poultry house
- Culling

Poultry parasites

Parasites are organisms that depend on other organisms for food and shelter.

The organism on which a parasite depends is called a host

Types of parasites

- External parasites
- Internal parasites

External parasites (Ecto parasites)

These are parasites that live outside the body of a host

Examples of ecto parasites

- Fleas
- Lice
- Mites

Ways of controlling external parasites

- Dusting laying nests and birds using pyrethrum powder, dudu dust
- Applying Vaseline jelly on spots with fleas
- Smearing the head of a bird with paraffin
- Ensuring good hygiene in a poultry house
- Dipping bird's feet in kerosene

Internal parasites (Endo parasites)

These are parasites that live inside the body of a host

Examples of internal parasites

- Tapeworm
- Round worms
- Liver flukes
- Gizzard worms

Signs of worms in poultry

- Diarrhoea
- White chalky droppings
- Few eggs are laid

Prevention of endo parasites

- Deworming birds
- Observing good hygiene in poultry house
- Feeding birds on clean feeds and water
- Cleaning the feeding troughs and drinkers regularly

Deworming

This is the giving of medicine to an organism to kill internal parasites

Types of deworming

- (a) Drenching - giving of liquid medicine to birds to kill internal parasites
- (b) Dosing - giving of solid drugs to birds to kill internal parasites

Ways in which drenching is done in birds

- Mixing the liquid medicine in water
- Applying liquid medicine in feeds
- Injecting them

Ways in which dosing is done in birds

- Putting the solid medicine in the mouth/beak

Effects of parasites

- They spread diseases

- They lower egg production
- They suck blood leading to anaemia
- They lead to stunted growth of birds
- They reduce the quality of meat

Poultry management practices

These are routine activities that a poultry farmer carries out to maintain good production on the farm

They include;

- Debeaking
- Feeding
- Deworming
- Dusting
- Vaccination
- culling
- record keeping
- egg collection

Egg collection

Reasons why eggs should be collected atleast 2-3 times a day

- To limit egg eating
- To limit breakage of eggs
- To enable collection of clean eggs

Culling

Culling is the removal of sick and unproductive birds from the flock.

Ways of culling birds

- By selling them
- By killing the infected birds
- By slaughtering unproductive birds

Importance of culling birds

- It controls poultry vices

- It controls poultry diseases from spreading

Vaccination

This is the introduction of vaccines into the body of birds

It helps to boost the immunity of the bird

Farm record keeping

This is the collecting and sorting of information about activities carried out on the farm.

Farm records

These are written information about all activities carried out on a farm

Types of farm records/examples of farm records

- Production records
- Health records
- Flock records
- Feeds records
- Inventory records
- Sales and expense records. (financial records)

Production records

They show the number of eggs laid per day and the number of chicks hatched and cared for.

Health records - They show the dates of vaccination

- Diseases vaccinated against and treated
- Number of death and dates of death

Flock records

These are records that show the number of birds kept on the farm.

They also show those that have died and those that have been culled or sold.

Inventory records – They show the property owned by the farm e.g water trough, feeding trough, incubators

Sales and expense records – They show income and expenditure on the farm

Feeds records – They show the types of feeds, quantity of feeds eaten and quantity of spoilt feeds.

Reasons for keeping farm records

- To plan for the farm
- To get loans easily from the bank
- To know profits and losses
- To know the expenditure
- For easy decision making
- To be taxed fairly by the government

Activity

1. (a) Give one example of poultry diseases caused by the following;
 - (i) Protozoa
 - (ii) Bacteria
 - (iii) Virus

(b) Identify any two signs of diseases among poultry

(c) State any two ways poultry farmers can control diseases in birds
2. (a) Name any one of external and internal parasites
 - (i) External parasite
 - (ii) Internal parasite

(b) Suggest any two dangers caused by parasites to poultry

(c) State any two methods poultry farmers control parasites
3. (a) Describe the following terms as used in poultry management

- (i) Culling
 - (ii) Beak trimming
 - (b) Give one importance of carrying out;
 - (i) Debeaking
 - (ii) Deworming
 - (c) Why should poultry farmers collect eggs from a poultry house in time?
4. (a) suggest any two kinds of records kept on a poultry farm
- (b) Which kind of records show;
 - (i) number of birds on a farm
 - (ii) Dates of vaccination
 - (iii) Profits or losses on the farm
 - (iv) Types and quality of feeds
5. (a) identify any two importance of farm records to a poultry farmer on his farm
- (b) What problem is a farmer who does not keep records on his farm likely to face?
6. (a) Suggest any two problems farmers face in keeping poultry
- (b) State any two ways farmers can overcome the problems mentioned in (a) above
7. (a) List down four requirements needed to start a poultry farm
- (b) How can a poultry farmer acquire capital and land?
 - (i) Capital
 - (ii) Land

BEE KEEPING

Introduction to bee keeping

Apiculture – rearing of honey bees

A piary – farm of bees

Colony – large group of bees living together

- An organized large group of bees living together

Swarming – massive movement of bees from one place to another looking for a hive

Royal jelly – special food for the queen bee

Beehive – home of bees

Ovipositor – an organ of insects for laying eggs

Buzzing – sound made by drone bees

Propolis – Red or brown substance collected by bees from plants

Nectar – sweet juice collected from flowers

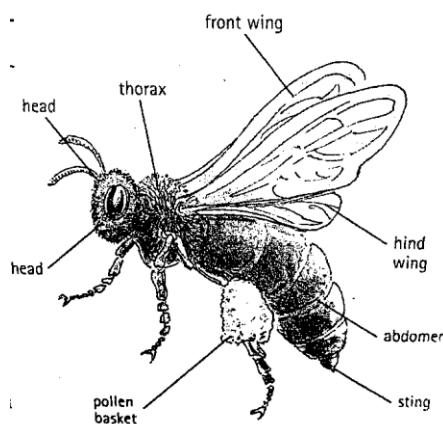
Sterile – not able to produce young ones

Beeswax – material obtained from bees for making candles and polish

Apiculture/bee keeping

Apiculture is the rearing of honey bees

Structure of a bee



Functions of each part of a bee

Sting – for protection

Ovipositor – for laying eggs

Pollen basket – for carrying pollen

Wings – for flying

Compound eyes – for seeing

It has many eye lenses which enables the insect to see

It has many simple eyes which enables them to see

Legs – for walking

Feelers – for feeling/sensing danger

Sperm sac – for storing sperms after mating

Halteres – for balancing the body during flight

Types of bees/custs of bees

- Queen bee
- Drone bee
- Worker bee

Queen bee

It is the female bee that lays eggs.

It lays eggs in special structures called cells

It is also called the master leader in a hive

Main role of a queen bee

To lay eggs

The queen bee mates once in her life time and stores sperms in a spermsac in the abdomen

The queen bee is fed on special food called royal jelly by worker bees.

It is larger than the drone bee and worker bee

Illustration



Drone bee

It is the only male bee in the hive

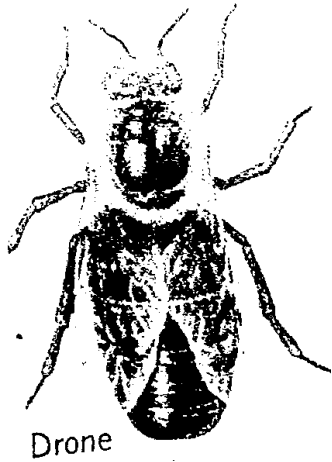
Role of drone bee

- To mate with the queen bee
- It hatches (developes) from unfertilized eggs
- It makes a buzzing sound while flying
- They have broad, blunt abdomen with no sting
- They are not often found in the hive because they are killed or chased away after mating flight.
- The drone bee that mates with the queen bee dies because its abdomen is damaged.
- The male organ (endophallus) breaks (raptures) and remains inside the queen bee damaging its abdomen

Wedding flight/maiden flight/marriage flight

This is a flight during which a drone bee mates with the queen bee.

Illustration of a drone bee



Worker bees

They are female sterile bees because they do not lay eggs. They are also called nurse bees.

They are the smallest in size but many in number

They have pollen baskets on their hind legs for carrying pollen

They do not have an ovipositor instead they have a sting for protection

Worker bees die after stinging their enemies because the abdomen is damaged

The sting gets stuck in the victims body and the abdomen gets damaged

Illustration of a worker bee



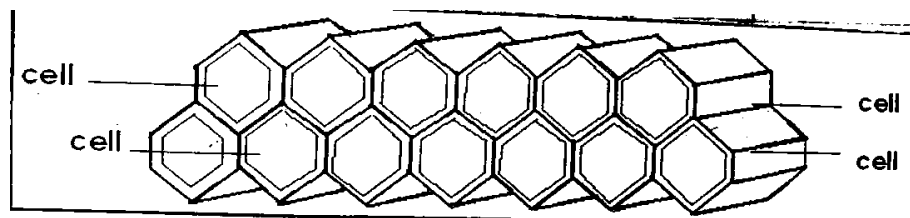
Duties of worker bees

- They clean the hive
- They feed the queen bee on royal jelly
- They feed the grub on honey
- They repair the hive
- They make honey
- They build honey combs
- They cool the hive by flapping their wings rapidly
- They protect the hive

Bee combs

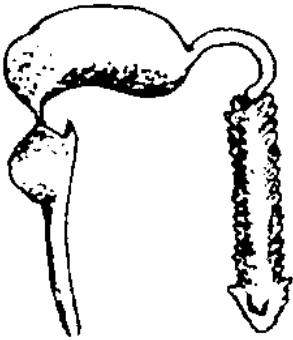
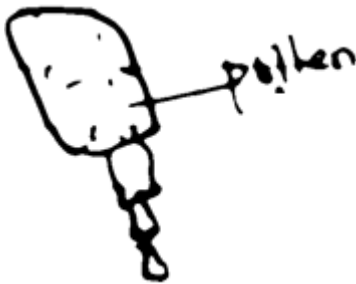
They are divided into small hexagonal apartments called cells.

Structure of a honey comb



Importance of honey combs to worker bees

They are used for storing honey.

A sting	Hind leg of a worker bee
	

Importance of bees to man

- They provide beeswax
- They provide honey
- They are source of income when sold

Importance of bees to plants

They help in pollination

LIFECYCLE OF BEE

Bees undergo complete life cycle

Egg → Larva → Pupa → Adult

The queen bee lays eggs in the cells

The eggs hatch into larvae (grubs)

The larvae are fed on honey by the worker bees and sealed in cells

The pupae develop into young bees (brood)

Lifecycle of bees

Other examples of insects with complete life cycles

- Tsetsefly
- Mosquito
- Housefly
- butterfly

Swarming in bees

Swarming is the massive movement of bees from one place to another looking for a new beehive.

A swarm is a large group of bees moving together.

Reasons why bees swarm

- Death of the queen bee

- Overcrowding of bees in the hive
- Bad smell around the hive
- Dampness of the hive due to leakage
- Shortage of food and water near the hive
- Too much noise around the hive
- Direct sunlight into the hive
- When the brood cells are damaged
- When the new queen is hatched
- Frequent attacks from enemies

Ways of preventing swarming

- By planting flowering plants near the hives
- By providing water near the hive
- By slashing tall grass near the hive
- By providing a sugar solution to bees during drought
- By raising bee hives

Bee hives

A home of bees

A piary – is a farm of bees. It is a place where beehives are set

Types of beehives

- Traditional beehives
- Modern beehives

Traditional beehives

These are beehives made from local materials

Materials used to make traditional beehives

- | | | |
|-------------|-----------------|-----------|
| - Logs | - small sticks | - papyrus |
| - Dry grass | - straws | - cowdung |
| - Mud | - banana fibres | |

Examples of traditional beehives

Kigezi beehive	Dugoutlog beehive	Clay pot hive

Advantages of traditional beehives

- They are cheap
- Easy to make
- Colony is always not disturbed by farmers

Disadvantages of traditional beehive

- They are always destroyed during harvesting
- Difficult to inspect
- Honey harvested is dirty
- They last for short time
- Difficult to prevent swarming

Modern beehives

Examples of modern beehives

- Box beehive
- Top bar beehive
- Tin beehive

Illustration of box beehive

Illustration of top bar beehive

Illustration of tin bee hive

Materials needed to make modern beehives

- Timber
- Nails
- Ironsheet

Parts of a modern beehive

Functions of each part of a modern beehive

Brood chamber – it is where the queen lays eggs

- It contains eggs, pupa, larva, queen and grubs

Honey chamber – store for honey and pollen

Queen excluder – it prevents the queen bee from laying eggs in the honey chamber. - it separates the brood chamber from honey chamber

NB: The small holes in a queen excluder limit the queen bee from passing through and only allows worker bees

Advantages of modern bee hives

- Easy to inspect
- They are durable
- Easy to control swarming
- Easy to harvest clean honey
- Bees build honey on top bar
- Colonies are not disturbed as they develop

Disadvantages of modern beehives

Expensive to make

Management of bees in bee keeping

Siting a hive – Is the selection of suitable places to set up a hive

Factors to consider when siting a hive

- The hive should be in a quiet place
- The hive should be near flowering plants
- The hive should be near water source
- The hive should be in a place free from bad smell
- The hive should be sheltered under the shade

Stocking a hive

This is a way of encouraging bees occupy empty hive

Methods of stocking a hive

- Using a swarm catching net
- Using baits like banana peelings, honey, propolis, beeswax
- Using swarm catcher box

Illustrations

Swarm catching net	Swarm catcher box

NB: A swarm catching net should have a long handle to catch even higher swarm.

Feeding – bees feed on nectar and honey

- They also feed on ordinary water mixed with sugar (syrup)

Situations in which bees need to be fed

- When they are new in the hive
- During dry season when there is no water
- In the absence of flowers

Activity

1. Define the following terms as used in bee keeping
 - (a) Apiculture
 - (b) Apiary
 - (c) Swarming
 - (d) Grub
2. Identify the three types of honey bees
3. Which part of a bee is used for balancing the body during flight?
 - (b) Apart from head, give any two other main body parts of a bee
 - (c) On which part of a bee are the following parts found;
 - (i) Feelers
 - (ii) Wings
 - (iii) Sting and ovipositor
4. State the role of a queen bee in a hive
 - (b) Name the special food a queen bee feeds on
 - (c) How is a sperm sac important to a queen bee?
 - (d) Which type of bees develop from unfertilized eggs?
5. Describe the term wedding flight
 - (b) Give the two types of bees majorly responsible for wedding flight
 - (c) Why are drone bees not commonly found in a bee hive?
6. Match the bees in A to their roles in B correctly

Bees (A)	Roles
Queen bees	Protect the hive
Drone bees	Lay eggs

Worker bees	Mate with the female bee
(i) Queen bees	
(ii) Drone bees	
(iii) Worker bees	

7. What kind of sound do drone bees make when flying?
 - (b) How useful is a sting to a worker bee?
 - (c) Give a reason why worker bees die after stinging their enemies.
 - (d) In which way do flowering plants benefit worker bees moving in the environment?

8. (a) How do worker bees reduce temperature in a hive?
 - (b) Of what benefit are bees to crop farmers?
 - (c) Identify the eggs which develop into queen bees
 - (d) Which part of the bee is used for sucking nectar from flowering plants?

9. The diagram below shows the life history of an insect. Use it to answer the questions that follow
 - (a) Name the type of life cycle shown above
 - (b) Identify the stages marked X and Y above
 - (c) Apart from bees, name any two other examples of insects that undergo the above life cycle
 - (d) How can a P.5 child benefit from adult bees during bee farming?

Harvesting honey

Honey harvesting is the removal of honey combs from a hive.

It should be done in the morning or evening due to the presence of cool temperatures which make bees settle inside the hive.

Methods of harvesting honey

- Traditional method
- Modern method

Traditional method – Is where burning fire is used to kill bees during honey harvesting

Dangers of traditional method

- Fire kill bees
- Fire burns the hive
- Fire melts the honey combs
- Leads to swarming of bees
- Fire spoils the quality of honey

Modern methods – Is where a smoker is used during honey harvesting.

The smoker produces smoke which calms the bees

Equipment for honey harvesting

Bucket – for collecting honey combs.

Knife – for cutting honey combs

Gloves – protect hands from bee stings

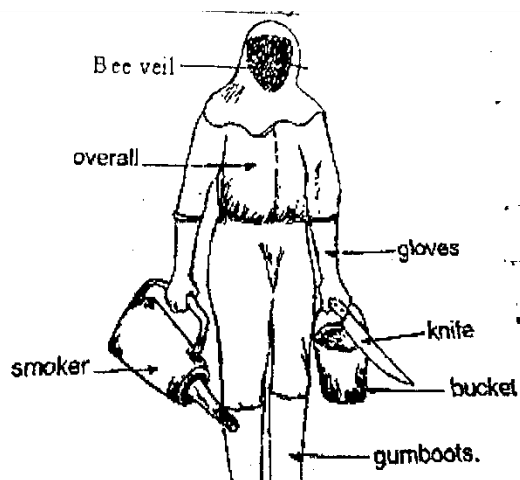
Overall – protect the rest of the body from bee stings.

Bee veil – protects the face from bee stings

Gumboots – protects the feet from bee stings and sharp objects.

Smoker – produces smoke which calms bees.

A person ready to harvest honey.



Materials used in a smoker

- Dry grass
- Wood shavings
- Old sacks
- Dry leaves

Procedure for harvesting honey

- Blow the smoke in to the hive through the entrance hole
- Lower the hive to the ground so that the combs are not broken.
- Lift the bars one by one to check the white combs where good quality honey is found.
- Cut the combs away from the bar and put it in a clear container.

Extraction of honey from honey combs

- Pressing method
- Floating the wax method
- Centrifuging method

Pressing method

- The honey combs are broken and placed in a clean cloth.
- They are wrapped and the honey is squeezed into clean containers.

Floating wax the wax

- The honey combs are broken into small pieces and placed into smaller saucepan.
- The smaller saucepan with honey is put into a larger saucepan containing boiling water.

- -Heat from the boiling water melts the honey and the wax
- The wax floats on top of the honey.
- Wax is then carefully removed using either a sieve or a clean piece of cloth.
- The final honey is then packed in clean containers

Illustration

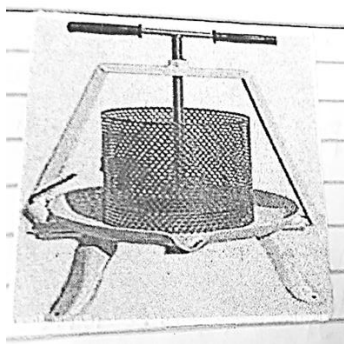
Centrifuging method

This is where a machine called a centrifugal honey extractor is used to extract honey.

The machine spins the honey combs at a high speed and forces the honey out.

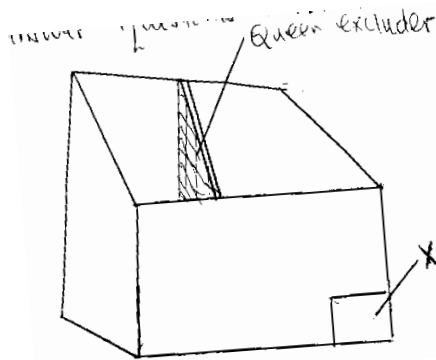
The honey is then separated from wax and stored in clean containers.

Illustration of a centrifugal honey extractor

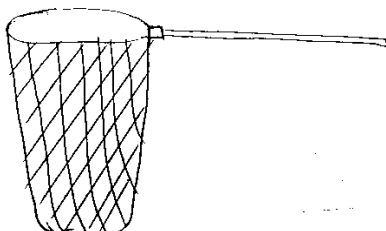


Activity

- 1 a). In which way is a colony different from a swarm in bees?
 - b) Swarming is the massive movement of bees from one place to another looking for a hive.
 - i. State two causes of swarming
 - ii. How can bee keepers prevent the problem of swarming in bee farming?
2. Study the diagram below and use it to answer the questions that follow.



- a. Name the type of bee hive shown above.
 - b. Which type of bee stays in a honey chamber?
 - c. Give any two materials used to make the above type of bee hive.
 - d. How useful is part X on a hive?
- 3 a) Suggest any two advantages using modern bee hives over traditional bee hives.
- b) state the functions of the following parts of a modern bee hive.
- i) Queen excluder
 - ii) Honey chamber
4. Mention any two factors bee keepers should consider before choosing a good site for an apiary
- 5.a) Give any two methods of stocking a hive.
- b) Why should beehives be constructed far away from roads and animal farms?
6. The diagram below shows an equipment used by bee keepers. Study it and answer the questions that follow.



- a. Name the equipment above.
- b. State the importance of the equipment above to be bee farmers.
- c. Apart from the equipment above, give any one other stocking tool used by bee keepers.
- d. Mention any one example of a bait used during stocking of bees.

7. a. Name any two protective gears worn during harvesting of honey.

b. Which equipment produces smoke that calms the bees.

c. Mention any one bee product got from the bees.

8 a. At what time of the day is honey harvested?

b. State any two situations in which bees need to be fed.

c. Cite out any two methods of extracting honey from honey combs.

d. Point out any two materials to produce smoke in a smoker.

Products got from bees

- Honey
- Bees wax
- Pollen
- Propolis
- Bee venom
- Honey comb
- Royal jelly

Components of royal jelly

- Water
- Pollen
- Sugar
- Nectar

Products bees get from plants

- Nectar
- Pollen
- Propolis

NB: Pollen is a source of proteins

Importance of honey to man

- It is eaten as food
- Source of carbohydrates
- Sweetens tea
- For income when sold
- For preserving food
- For making sweets in industries
- Used as medicine for cough
- For dressing wounds during surgery in hospitals

Industrial uses of honey

- Honey is used to make medicine e.g. cough syrups
- For making cakes, chocolates and sweets
- Used in fruit canning as a preservative
- Used for making cosmetics e.g. lip shiner

Beeswax

How to obtain beeswax

Honey combs are placed in a saucepan filled with warm water. The water may be heated not at boiling point.

The beeswax melts into the warm water.

After cooling, wax forms on top of the water

Importance of beeswax to man

- For making shoe polish
- For making crayons
- For making candle wax
- For making chewing gum.
- For making cosmetics like body creams, Vaselines
- For making varnish for furniture
- For making lip balms

Products obtained from beeswax

- Shoe polish
- Chewing gum
- Crayons
- Cosmetics
- Lip balms

Propolis

Uses of propolis to bees

- For smoothing the inside part of the hive.
- For repairing cracks in the hive
- For making brood cells water proof

Uses of propolis to man

- For treating scabies
- For treating burns and scalds
- For making antiseptics, anti-fungal and anti-viral medicines
- For income when sold.

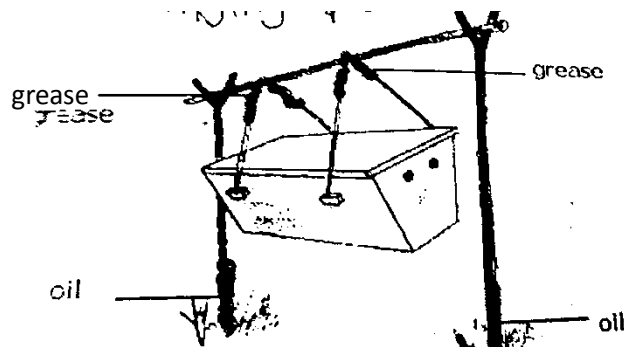
Bee enemies

- | | |
|-----------------|----------------|
| ▪ Bears | - Wood ants |
| ▪ Safari ants | - Pirate ants |
| ▪ Honey badgers | - Wax moths |
| ▪ Wasps | - Hive beetles |
| ▪ Hawk moth | - Mites |
| ▪ Birds | - Bee louse |
| ▪ Sugar ants | |

Ways of preventing ants from attacking bees

By hanging beehives between poles or branches.

By greasing and oiling wires or poles.



Ways of controlling bee enemies

- Oiling the base of poles on which hives are.
- Putting grease on the wires to prevent ants from climbing
- Slashing tallgrass around the beehive short.
- Hanging the bee hives in trees 100cm to 150cm high.
- Spraying insecticides at the base of the poles

Diseases of bees

- Nosema
- American foul brood
- European foul brood
- Stone brood
- Bald brood

Ways of caring for honey bees

Providing bees with water and sugar during hot days

Siting an apiary in a quiet place.

Removing weeds that grow below the hive.

Protecting bees from direct sunlight rain, pests and diseases

BEE FARMING AS A BUSINESS

Importance of bee farming as a business

- A farmer gets regular income from the sale of bee products.
- The farmer may use the honey as food for the family.
- Wax from bees is used to make candles
- Bee keeping creates employment opportunities to people who care for bees and those involved in production and selling of bee products.

Challenges faced by bee farmers

- Drought
- Bad weather
- Shortage of food for bees
- Thieves
- Lack of skilled labour
- Pests and diseases

Activity

1. Mention any two products got from bees
2. Suggest any two products that can be got from beeswax
3. Point out any two enemies of bees in a hive.
4. How can a P.5 child prevent ants from attacking bees?

Topical questions (poultry and bee keeping)

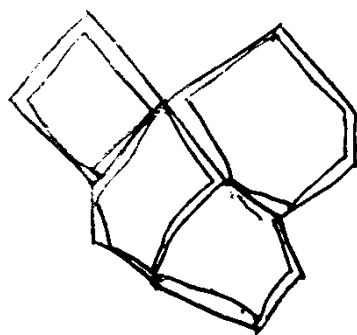
1. What is poultry?
2. In which way is a lamp useful in a brooder?
3. Mention the part of the digestive system of a domestic fowl where food is softened.
4. Name the poultry feeds prepared specially for broilers.
5. Describe a capon as used in poultry keeping.
6. In the space below, draw a beak of a bird debeaked.
7. Name the type of poultry record that shows the number of eggs collected daily.
8. How is chalaza useful in an egg of a bird?
9. Identify the poultry system that allows birds to roam about and look for their own food.
10. Name the poultry disease that attacks the lining of the small intestine.
11. How is fowl pox transmitted from one bird to another?
12. State the poultry vice where birds kill and eat fellow birds.
13. What name is given to the mouth part of a bird?
14. In which way is an incubator useful in poultry farming?
15. Which system in poultry keeping and management makes it hard for farmers to keep production records?
16. In which way are gastroliths useful to a bird?
17. How long will a hen take to incubate its eggs?

18. Why is the egg shell made porous?
19. What name is given to the container in which poultry feeds are put?
20. Why do most poultry farmers cross breed their local birds?
21. Name the type of mash given to chicks from one day old to about 8 weeks.
22. What are dual purpose breeds of chicken?
23. How can internal parasites be controlled in poultry?
24. Why is free range system most commonly practiced by rural poultry farmers?
25. Which part of an egg provide an embryo with proteins and fats?
26. State the name given to the small stones found in the gizzard of fowls.
27. What name is given to the machine used to hatch eggs?
28. What do we call an immature female domestic fowl?
29. Identify the two parts of the bird where quill feathers are found?
30. Give any one sign of cannibalism in poultry.
31. Why do some layers lay eggs with soft shells?

Topical questions (bee keeping)

1. Why are bees referred to as social insects?
2. Apart from bees, give any one other example of social insects.
3. Give any one example of solitary insects
4. Mention the types of bees found in a hive.
5.
 - a. What is the main role of a queen bee?
 - b. Identify the special food fed to a queen bee.
 - c. Why would it be difficult to find the drone bee in a hive?
6.
 - a. Name the sterile female bee in a hive.
 - b. What type of bees is usually seen around flowering plants.
 - c. Identify the food given to the larvae of bees.
 - d. Besides the pair of legs, give any one other characteristic of a bee as an insect.
7.
 - a. Name one bee product rich in carbohydrates.
 - b. Give a reason why bees swarm.
8.
 - a. State the difference between a swarm and swarming
 - b. Why do bees visit flowers?

c. The diagram below shows a structure found in a bee hive. Study it and use it to answer the questions that follow.



- i. Name the structure above.
 - ii. State the use of the structure above in a hive.
9.
 - a. What do bees use to protect themselves?
 - b. Which types of bees play a big role in guarding the beehive?
 - c. State the use of propolis in a hive.
 - d. Give any one material fed to bees during dry season.
 10.
 - a. How can a p.5 child identify a modern bee hive?
 - b. State the advantage of using a modern bee hive over a traditional bee hive.
 - c. Suggest any two ways of caring for honey bees.
 11.
 - a. State the importance of the following parts of a modern bee hive.
 - i. Queen excluder
 - ii. Honey chamber
 - b. Suggest any two challenges faced by bee farmers in Uganda today.

THEME: MATTER AND ENERGY

TOPIC: MEASUREMENTS

Introduction to measurements

Volume: Amount of space occupied by an object

Mass: Amount of matter contained in an object.

Density- mass per unit volume of a substance

Weight – is the gravitational pull on an object

Upthrust – force that makes objects weigh less when in water.

Floating – is when an object is placed on water and it remains on top

Sinking – is when an object is placed on water and it goes to the bottom.

Regular objects – objects with well-defined shape.

Irregular objects – objects without well-defined shape.

Gravity -a force that pulls objects towards the centre of the earth.

Grams - A basic unit for measuring mass

Kilograms – a standard unit for measuring mass.

Cubic units – unit for measuring volume

Newton- unit for measuring weight.

MASS

Mass is the amount of matter contained in a body.

Basic units for mass	Standard unit of mass
grams (g)	kilograms (Kg)

WEIGHT

Weight is the gravitational pull on an object.

Weight is the force of gravity acting on an object

The unit for measuring weight is Newton (N)

Gravity - is the force that pulls objects towards the centre of the earth.

Materials used for measuring weight and mass.

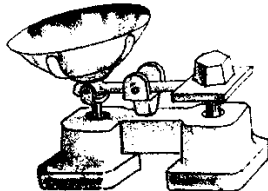
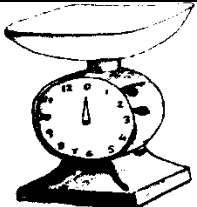
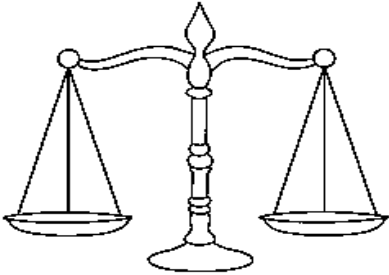

Mass

- Weighing scale (set of scales)
- Scale balance
- Beam balance

Weight

- Spring balance

Illustrations

set of scales	scale balance
	
beam balance	spring balance
	

Differences between mass and weight

- Mass is the amount of matter contained in the body while weight is the gravitational pull on the object
- Mass is measured in grams while weight is measured in Newtons
- Mass is constant while weight changes

Capacity

Capacity is the amount of liquid a container can hold. Capacity of liquids is measured in litres. (L)

Materials used to measure capacity

- Buckets
- Cups

- Jerrycans
- Tanks
- Bottles

Examples of liquids measured in litres

- Water
- Oil
- Paraffin
- Oil
- Diesel
- Petrol
- milk

VOLUME

volume is the amount of space occupied by an object.

Volume is measured in cubic units. Eg. M^3 , cm^3

The basic unit for measuring volume is cubic metres (m^3)

The standard unit for measuring volume is cubic centimetres (cm^3), mm^3 , dcm^3

Finding the volume of different objects

a) regular objects

These are objects which have proper shapes i.e length, width and height.

Examples of regular objects.

- Cuboids (bricks, blocks, books)
- Cubes (box, blocks)
- Cylinders (tins)

Volume of regular objects

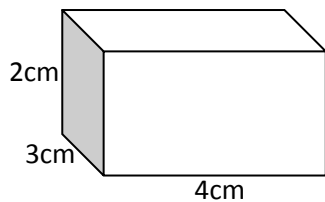
Using formular

the volume of regular objects can be found after knowing their length, width and height.

$$V = L \times W \times H$$

Examples

1. Find the volume of the cuboid shown below



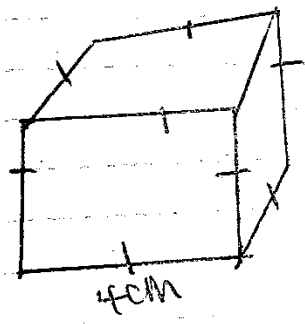
$$V = L \times W \times H$$

$$V = (4\text{cm} \times 2\text{cm}) \times 3\text{cm}$$

$$V = 8\text{cm}^2 \times 3\text{cm}$$

$$\underline{V = 24\text{cm}^3}$$

2. Find the volume of the cube below.



$$V = L \times L \times L$$

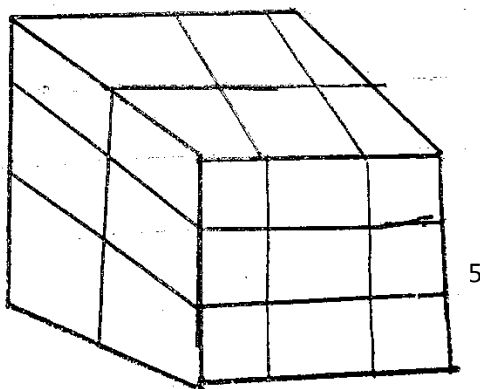
$$V = (4\text{cm} \times 4\text{cm}) \times 4\text{cm}$$

$$V = 16\text{cm}^2 \times 4\text{cm}$$

$$\underline{V = 64\text{cm}^3}$$

ii) Using cubes

How many cubic blocks makeup the figure below?



$$V = L \times W \times H$$

$$V = 3 \text{ units} \times 2 \text{ units} \times 3 \text{ units}$$

$$\underline{V = 18 \text{ cubic units}}$$

Irregular objects

These are objects which do not have proper shapes.

Examples of irregular objects

- Irish potato - Mango
- Pawpaw - Key
- An egg - Pineapples
- Stones - Cassava
- Broken bottles - padlocks

Volume of irregular objects

The volume of irregular objects that sink in water is measured using **displacement method**

It is called displacement method because when an irregular object is immersed in water, it displaces the amount of water equal to its volume.

Displacement method cannot be used to find the volume of objects like a leaf because they do not displace any amount of water.

Materials used when finding the volume of irregular objects.

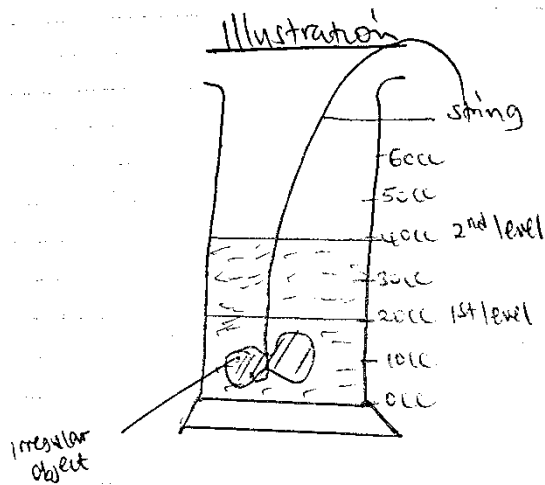
- Water
- Irregular object
- String
- Measuring cylinder
- Overflow can/eureka can/ displacement can

Finding the volume of irregular objects

a) Using a measuring cylinder.

- Pour water in a measuring cylinder so that it is about half full.
- Record the first volume of water.
- Get the irregular object and tie it with a string.

- Lower the object into the measuring cylinder so that the object is covered by water.
- Record the volume of water again in (2nd level)
- The volume of the stone will be equal to the 2nd level – 1st level



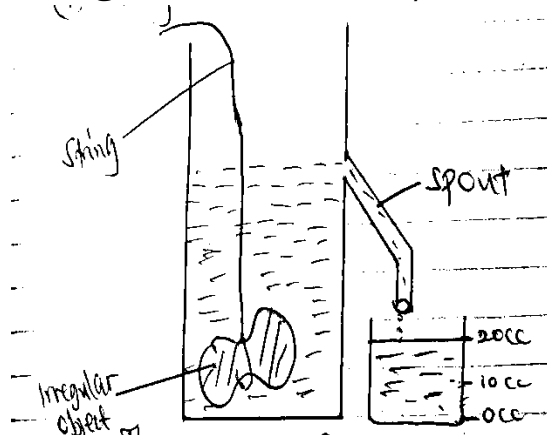
Volume = 2nd level – 1st level

$V = 400\text{cc} - 20\text{cc}$

$V = 20\text{cc}$

The volume of an irregular object is 20cc because when an object is lowered in water it displaces an amount of water equal to its volume.

Using an overflow can/ Eureka Can



The volume of the stone is 20cc

Functions of the parts

String – for lowering /immersing irregular object gently in water.

Measuring cylinder – for holding water

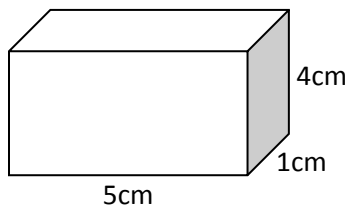
For showing the reading

Spout – for letting out water from the Eureka can.

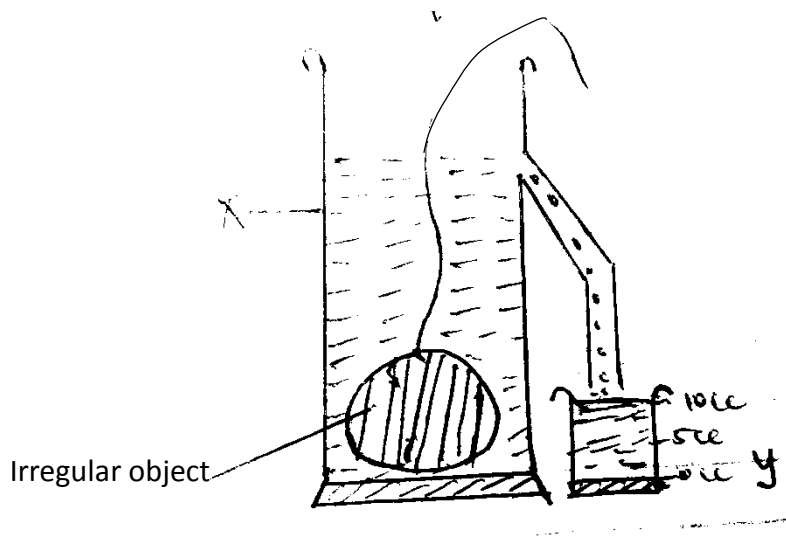
Eureka can – for holding water.

Activity

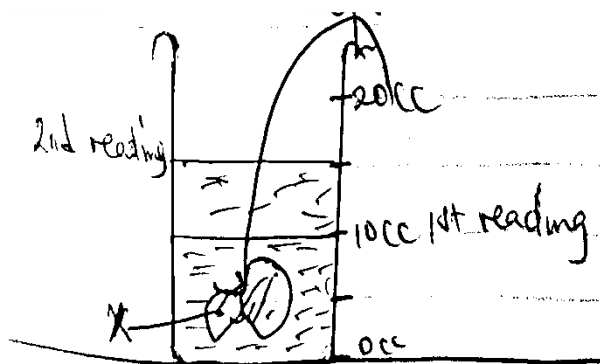
1. How is mass different from weight as used in measurement?
2. State the standard units for the following;
 - a. Mass
 - b. Weight
3. Name any two instruments used to measure mass of an object.
4. How can a p.5 child find the volume of an irregular object?
5. Find the volume of the figure below.



6. Why is a cassava tuber said to be an irregular object?
7. Below is a method used to find the volume of an irregular shaped object, study and use it to answer the questions that follow.



- a. Name the containers marked X and Y
 - b. What is the volume of an object equal to
 - c. Name the method used to find the volume of an irregular object above.
 - d. State the role of the string during the experiment.
8. The diagram below shows an experiment carried by P5 pupils. Study and use it to answer the questions that follow.



- a. When is the experiment above used?
- b. What scientific name is given to X?
- c. What is the role of the container used above?
- d. What does the first level of water show?
- e. Calculate the volume of the irregular object above.
- f. Why is the above method used to measure the volume of irregular objects?

BEHAVIOURS OF OBJECTS WITH WATER

Objects behave differently when placed in water. Some of them float while others sink and displace water.

Floating and sinking

Floating.

This is when an object is placed into water and it remains on top.

Floating objects

- These are objects that remain on top when placed in water.
- When objects float on water, they displace the amount of water equal to their weight.

Reasons why objects float on water

- Their density is less than the density of water.
- They are less dense than water
- Water is denser than those objects.

Examples of floating objects.

- Leaf
- Pencil
- Piece of paper
- Bottle top
- Feathers
- Plastics
- Cork
- Boat
- balloons

Note

Some objects with a higher density than water can also float on water surfaces if gently placed due to surface tension e.g. candle, razorblade.

Upthrust (buoyancy)

This is force that makes objects weigh less when put into water

Illustration

When an object is put in water, upthrust tends to push them upwards. This makes them weigh less when they are in water than when in air.

SINKING

This is when an object is placed on water and it goes to bottom.

Examples of sinking objects

- Nail
- Knife
- Padlock
- Sand
- Glass
- Stone
- Rubber
- Pin
- Soil
- Key

Reasons why objects sink in water

- The density of those objects is greater than the density of water.
- Objects are denser than water.
- They are denser than water.

Illustration of floating and sinking of different objects

Activity

1. State the difference between floating and sinking.
2. Give two examples of floating objects
3. Why do objects float on water?
4. Why do objects weigh more in air than in water?
5. What name is given to the force which makes objects weigh less when in water?
6. Mention any two examples of sinking objects
7. Why does a stone sink into water?

Density

- Density is mass per unit volume of a substance. The unit for measuring density is g/cc

Instruments used for measuring density of liquids

- Hydrometer

Finding density, mass and volume of objects

Finding density

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

$$D = \frac{M}{V}$$

Examples

1. What is the density of an object whose mass is 10g and volume of 5cc

Solution

$$\text{Mass} = 10\text{g}$$

$$\text{Volume} = 5\text{cc}$$

$$\text{Density} = ?$$

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

$$D = \frac{10\text{g}}{5\text{cc}}$$

2. Find the density of an object whose mass is 14g and volume 7cc

Solution

$$\text{Mass} = 14\text{g}$$

$$V = 7\text{cc}$$

$$D = ?$$

$$D = \frac{M}{V}$$

$$D = \frac{14\text{g}}{7\text{cc}}$$

$$D = \underline{\underline{2\text{g/cc}}}$$

Finding volume

$$\text{Volume} = \frac{\text{Mass}}{\text{Density}}$$

$$\text{Volume} = \frac{M}{D}$$

Example 1

Find the volume of an object whose mass is 14g density of 2g/cc

Solution

$$M = 14\text{g}$$

$$D = 2\text{g/cc}$$

$$V = \frac{\text{Mass}}{\text{Density}}$$

$$V = M \div D$$

$$V = 14\text{g} \div \underline{2\text{g}}$$

$$V = 14 \times \frac{\text{cc}}{2\text{g}}$$

$$\underline{V = 7\text{cc}}$$

Example 2

Find the volume of an object whose mass is 15g and density of 5g/cc

Solution

$$\text{Mass} = 15\text{g}$$

$$\text{Density} = 5\text{g/cc}$$

$$\text{Volume} = \frac{\text{Mass}}{\text{Density}}$$

$$V = M \div D$$

$$V = 15\text{g} \div \underline{5\text{g}}$$

cc

$$V = \frac{315\text{g}}{105\text{g/cc}} \times \frac{\text{cc}}{1}$$

$$\underline{\underline{V = 3\text{cc}}}$$

Finding Mass

Mass = Density X Volume

$$M = D \times V$$

Example 1

Find the mass of an object whose volume is 5cc and density of 10g/cc.

Solution

$$\text{Volume} = 5\text{cc}$$

$$\text{Density} = 10\text{g/cc}$$

Mass = Density X Volume

$$M = \frac{10\text{g}}{\text{cc}} \times 5\text{cc}$$

$$\underline{\underline{M = 50\text{g}}}$$

Example 2

Work out the mass of an object whose volume is 3cm³ and density of 6g/cc

Solution

$$\text{Volume} = 3\text{cm}^3$$

$$\text{Density} = 6\text{g/cc}$$

Mass = ?

$$M = D \times V$$

$$M = \frac{6\text{g}}{\text{cc}} \times 3\text{cm}^3$$

$$\underline{\underline{M = 18\text{g}}}$$

END OF UNIT

1. In the table below, part A shows some terms commonly used in measurements and part B shows their meanings. Match them correctly

A	B
----------	----------

Mass	Gravity acting on an object
Volume	Mass per unit volume of a substance
Density	quantity of matter in an object
Weight	amount of space occupied by matter

- i. Mass _____
- ii. Volume _____
- iii. Density _____
- iv. Weight _____

2a. What factor determines the sinking and floating of an object when put in water?

b. Bosco dropped a piece of paper in a basin full of water and it floated. Why did it float?

c. Why does a silver coin sink when placed in water?

d. Why does a needle float on water when gently placed?

3a. Mention any two liquids which sink in water

b. Name the instrument used for measuring the density of liquids.

c. Why do objects weigh less in water than air.

4. Study the diagram below of finding volume and use it to answer questions that follow.

a. When is the above method used to measure volume?

b. State the role of the string in the above process

c. Calculate the density of the stone

5. What enables a wooden boat float on water.

6. Name any two objects that settle at the bottom of a container with water.

7. Give any one daily application of floating by people.

8. Get a plastic container and half fill it with water. Put the objects below in water, one at a time. Use a tick to show objects that float or sink.

Object	Float	sink
Bird's Feather		
Nail		
Matchstick		
Coin		
Leaf		

9. Give any one example of an irregular object.
10. Write down any two containers that can be used in measuring volume of irregular object.
11. How is the thread or string useful during the process of finding volume of irregular object?
12. **The diagram below shows a method used to find the volume of an irregular object. Use it to answer the questions that follow.**

- a. Name the method to find the volume of irregular object above.
- b. What is the displaced amount of water equal to?
- c. If the mass of an object is 60g, find its density. (2marks)

IMMUNITY AND IMMUNISATION

Common terms used in immunity and immunization

Immunity – the ability of the body to resist disease causing germs.

Immunisation – The introduction of vaccines into the body to make it produce antibodies against certain diseases.

Vaccines – Are medical substances introduced into the body to make it produce antibodies against disease causing germs.

Antibodies- Are chemical substances produced by the white blood cells to defend the body against disease Causing germs.

Antigens – Are substances that stimulate the production of antibodies.

Toxin- Poisonous substance.

Immunity

Immunity is the ability of the body to resist disease causing germs.

Types of immunity

- Natural immunity
- Artificial immunity

Natural immunity

- This the type of immunity got without using vaccines.

Ways of acquiring natural immunity.

- After recovering from illness
- Through breastfeeding
- From the mother to the child through the placenta.

Artificial immunity

- This is the type of immunity got through immunization.

Ways of acquiring artificial immunity

- Through immunization/ vaccination

Importance of immunity

- It reduces death rate
- It strengthens the immune system
- It enables the body to fight against disease causing germs.
- It keeps the body healthy.

Immunization

Immunization is the introduction of vaccines into the body to make it produce antibodies to fight against disease causing germs.

Antibodies

Antibodies are chemical substances produced by white blood cells to defend the body against certain disease causing germs.

Antigens

Antigens are substances that stimulate the production of antibodies

Immunization is carried out free of charge in government health centres in Uganda to encourage all parents to take their children for immunisation

Methods of immunization

Oral method

Injection method

Importance of immunization

- It boosts the immunity of the body.
- It protects the children against the childhood immunisable diseases.
- It reduces the infant mortality rate.
- It prevents disabilities among people like incase of polio and tuberculosis
- It saves time and money.
- It promotes growth and development.

Vaccines

Vaccines are medical substances introduced into the body to make it produce antibodies against certain disease causing germs.

Importance of vaccines in the body.

They make the body to produce antibodies against certain disease causing germs.

Storage of vaccines

Vaccines are stored in;

- Cold chain boxes
- Refrigerators

Reasons for storing vaccines in cold chain boxes.

- To prevent contamination
- To maintain their effectiveness
- To keep germs dormant

Reasons why different diseases have different immunization sites

- For easy monitoring of immunization
- For easy uniformity among different places
- Some vaccines are injectables
- Some vaccines are taken orally.

Why immunization of children has different schedules

- The body needs time to produce antibodies (to enable the body to produce antibodies)
- The body needs time to recover from possible reaction of the previous vaccination before receiving another.

Types of vaccines

- Toxoid vaccines
- Attenuated vaccines
- Killed/dead vaccines

Toxoid vaccines

- These are vaccines made from toxins / poison produced by germs that cause a disease.
- They are made harmless before they are introduced in the body.

Examples of toxoid vaccines

- Tetanus toxoid vaccine
- DPT vaccine

Attenuated vaccine/ live vaccine

These are live bacteria or viruses which have been weakened and made non infectious in such a way that they cannot cause diseases but can cause antibody production.

Examples of attenuated vaccines

- BCG vaccine
- Measles Vaccine
- Rubella vaccine

- Yellow fever Vaccine
- Chicken pox vaccine

Killed /Dead Vaccines

These are vaccines made from killed bacteria or viruses. The dead organisms still have the ability to produce antigens which in turn produce antibodies.

Examples of killed / dead vaccines

- Cholera vaccine
- Polio vaccine
- Hpv vaccine
- Rabies vaccine
- Typhoid vaccine
- Hep .B vaccine
- Hib vaccine

Activity

1. What do we call the ability of the body to resist diseases?
2. What type of immunity is got without using vaccines?
3. Identify any two ways one can acquire natural immunity.
4. What type of immunity is got through immunization.
5. State any two importance of immunity.
6. What do we call chemical substances produced by the white blood cells to defend the body against certain disease-causing germs?
7. Identify any one type of vaccines.
8. Mention any one example of vaccines under each type below
 - (i) Toxoid vaccines _____
 - (ii) Attenuated vaccines
 - (iii) Killed vaccines

CHILDHOOD IMMUNISABLE DISEASES

These are diseases that attack children below the age of six years. They attack children below six years because they have weak immunity against them.

Examples of childhood immunisable diseases

- Polio (poliomyelitis)

- Tuberculosis
- Diphtheria
- Measles
- Whooping cough/pertussis
- Tetanus
- Hepatitis B
- Haemophilus Influenza type B

Polio (poliomyelitis)

- Polio is caused by a virus passed out through faeces
- It affects the limbs (legs and hands)

How it spreads

Through drinking contaminated water and eating contaminated food

Illustration of a child affected by polio,



Signs and symptoms of polio

- Paralysis of body muscles
- Weakness of bones especially limbs
- Lameness
- Fever

Effects of polio

- It weakens body muscles
- Causes lameness
- Leads to death
- Causes paralysis of limbs

Prevention and control of polio

- Immunization with polio vaccine
- Boiling drinking water

- Proper disposal of all faeces in latrines
- Keeping food covered
- Washing fruits and vegetables before eating them.
- Washing hands before eating food

Methods of administering polio vaccine

Oral method (through drops in the mouth).

The first dose of polio vaccine is given at birth and it is called Polio O followed by polio 1, polio2, and polio 3 the four doses of polio are given at an interval of one month from the previous ones.

Types of polio vaccines

- Salk polio vaccine (immunized by injection and not found in Uganda)
- Sabin polio vaccine (immunized orally and commonly done in Uganda).

Reasons why polio vaccine is given to babies at birth

It is because the baby is born with no immunity against polio

Tuberculosis

- It is caused by bacteria called mycobacterium.
- It attacks the respiratory system.

Types of mycobacterium

Mycobacterium tuberculosis which causes tuberculosis of the lungs

Mycobacterium bovis which causes tuberculosis of alimentary canal and skeletal system

How Tuberculosis is spread

- Through droplet infection
- Through breathing in contaminated air
- Through drinking unboiled milk from tubercular cows.

Signs and symptoms of tuberculosis

- Chronic / persistent cough
- sweating at night
- mild fever

- pain in the chest or upper back
- loss of body weight
- coughing and spitting mucus with blood stains
- pain in the bones joint and back bone
- general body weakness

Effects of tuberculosis

- It leads to death
- It damages the lungs
- It damages the bones
- It damages the lymphnodes

Prevention and control

- Immunization with BCG vaccine
- Drinking properly boiled milk
- Isolate infected people
- Always cover the mouth and nose while sneezing and coughing to prevent droplet infection

BCG vaccine stands for Bacillus Calmette Guerin

It is given through injection on the right upper arm at birth. This is because the baby is born with no immunity against tuberculosis

A diagram showing a child suffering from tuberculosis

Measles

It is caused by a virus

How it spreads

Through breathing in contaminated air.

Signs and symptoms of measles

- Sores in the mouth and throat.
- Red eyes

- Fever
- Rash all over the body
- Dry cough
- Runny nose
- Loss of appetite
- Itching skin

Effects of measles

- It slows down the child's normal growth
- It leads to blindness
- It leads to death

Prevention and control of measles

- Immunization with measles vaccine
- Isolating the infected person

Note

Measles vaccine is administered to babies through injection on the left upper arm at the stage of 9 months.

This is because the baby is born with natural immunity against measles that lasts up around nine months (270 days)

A diagram showing a child suffering from measles



Tetanus

It is also called Lock Jaw

It is caused by bacteria called **clostridium tetani**

How its spreads

Through fresh cuts and wounds

In new born babies, it can enter through the umbilical cord if it is cut with dirty or unsterilized instruments e.g. razorblade

Signs and symptoms of Tetanus

- Stiff muscles
- The baby stops suckling
- Fever
- Difficulty in breathing
- Spasms when touched
- Severe sweating
- Convulsions

Effects of tetanus

- It leads to death due to breathing failures
- It leads to convulsions
- It damages the nervous system
- It leads to blockage of lung arteries due to clots

Prevention and control of tetanus

- Immunization with DPT vaccine
- Using sterilized cutting tools to cut the umbilical cords of babies
- Give T.T vaccine to pregnant women, adolescent girls and accident victims
- Wounds and cuts should be dressed.

NOTE

DPT Vaccine is given to babies through injection on the left upper thigh at the age of 6 weeks, 10 weeks and 14 weeks. It is not given at birth because the baby is born with immunity against Tetanus which lasts for up to 6 weeks.

T.T vaccine is given to pregnant mothers to protect both the mother and the unborn baby from tetanus.

A diagram showing a child suffering from tetanus



Whooping cough

- It can also be called pertussis
- It is caused by bacteria

How it spreads

- Through breathing in contaminated air
- Through droplet infection

Signs and symptoms of whooping cough.

- Coughing spell which ends in vomiting
- Gasp for breath/ difficulty in breathing
- Fever at the beginning
- Colds
- Vomiting
- Runny nose

Effects of pertussis

- It damages the lungs
- It leads to death
- It leads to abdominal hernia
- It leads to broken blood vessels of the skin
- It leads to cracked ribs.

Prevention and control of pertussis

- Immunization with DPT vaccine
- Using antibiotics
- Isolating the infected person

A diagram showing a child suffering from pertussis



Diphtheria

It is caused by bacteria

How it spreads

Through breathing in contaminated air.

Signs and symptoms of diphtheria

- Swollen neck
- Sore throat
- Difficulty in breathing
- Fever
- Headache
- Bad breath

Effects of diphtheria

It leads to death

It damages the heart

It damages the lungs

Prevention and control of diphtheria

- Immunization with DPT vaccine
- Isolate the infected person

A diagram showing a child suffering from Diphtheria

Hepatitis B

- It is caused by hepatitis B virus which lives in body fluids and blood of an infected person.
- It affects the liver.

How it spreads

- Through body contact with an infected person
- Through drinking contaminated water
- Through unprotected sexual intercourse with an infected person.

Signs and symptoms of Hepatitis B

- Vomiting
- Tiredness

- Dark urine
- Eyes turn yellow
- Pale stool
- Loss of appetite

Effects of Hepatitis B

- It damages the liver
- It leads to inflammation of blood vessels
- It leads to skin diseases

Prevention and control of Hepatitis B

- Immunization with Hepatitis B vaccine

Note

- Hep B Vaccine is administered to babies through injection on the left upper thigh.
- In adults, Hepatitis B vaccines is given through injection on the left upper arm.

Hemophilus influenza type B

- It is caused by bacteria

How it is spread

- Through air after coughing and sneezing of infected persons
- In children, it can be spread through sharing materials like toys put in the mouth of a child to another's mouth through saliva.

Signs and symptoms

- Stiff neck
- Body weakness
- Fever
- Vomiting
- Cough
- Congested nose

Effects of Haemophilus influenza

- It leads to difficulty in breathing
- It causes death

Prevention and control

- Immunization with Hib Vaccine

Note

DPT vaccine is no longer called a triple vaccine because they have now added two more vaccines to make five vaccines in one single dose instead of the original three vaccines as they used to be.

Now it is DPT, Hep B + Hib meaning that it has five vaccines for diphtheria, pertussis, tetanus, Hepatitis B and Haemophilus influenza B

- It is now called pentavalent vaccine because it protects the body against five immunizable diseases.

Other immunisable diseases

- Pneumonia
- Rabies
- Plague
- Small pox
- Typhoid
- Typhus fever
- Rubella (German measles)
- Ebola
- Yellow fever
- Meningitis
- Influenza (flu)

- COVID 19
- Cervical cancer
- Mumps
- Chicken pox

Meningitis

It is caused by bacteria which attacks the membrane which covers the brain called meninges.

The bacteria are spread through air.

It can lead to blindness and deafness.

Signs and symptoms of meningitis

- Stiff neck
- Severe vomiting
- Convulsions
- The child lies with the head and neck bent backwards.
- Upward bulging of the fontanelle
- Severe headache
- Fever

How to prevent and control meningitis

- Through immunization with a meningococcus vaccine
- Living in well ventilated houses
- Any sign of meningitis should be reported to the hospital.

Yellow fever

- Yellow fever is caused by a virus
- It is spread by aedes or tiger mosquito

Signs and symptoms of yellow fever

- Yellowing of the eyes, palm and soles of our feet
- Dark urine
- Fever
- Headache
- Loss of appetite
- Nausea
- Stiffness of joints

Effects of yellow fever

- It damages the liver and the kidney

How to prevent and control yellow fever

- Immunization against yellow fever through injection on the left upper arm.
- Spraying insecticides to kill mosquitoes

Small pox

- It is caused by variola virus
- It is transmitted through saliva
- It is spread through breathing in contaminated air.
- This disease has been eradicated from the world through constant immunization.

IMMUNISATION SITES

IMMUNISATION SITES AND SCHEDULES

Age	Vaccine	Diseases	Mode of administration	Site
At birth	Polio 0	polio	drops	mouth
	BCG	tuberculosis	injection	right upper arm
6 weeks	polio 1	polio	drops	mouth
1.5 months (1 ½ months)	DPT Hep B +Hib (pentavalent 1)	- Diphtheria - Pertussis - Tetanus - Hepatitis B - Haemophilus Influenza b	injection	left upper thigh
	PCV 1 (Pneumococcal conjugate vaccine)	pneumonia	Injection	right upper thigh
10 weeks (2.5 months) (2 ½ months)	polio 2	polio	drops	mouth
	DPT- HEP B +Hib 2 (pentavalent 2)	- Diphtheria - Pertussis - Tetanus - Hepatitis B	injection	left upper thigh

		- Haemophilus Influenza b		
	PCV 2	- pneumonia	injection	right upper thigh.
14 weeks	polio 3	- polio	drops	mouth
(3.5 months) (3 ½ months)	DPT, Hep B +Hib3	- Diphtheria - Pertussis - Tetanus - Hepatitis B - Haemophilus Influenza b	injection	left upper thigh
	PCV3	- Pneumonia	injection	right upper thigh
9 months	measles vaccine	- measles	injection	left upper arm
girls between 15-49 child bearing age	tetanus toxoid vaccine	- Tetanus	injection	left upper arm
all pregnant women	T.T vaccine	- Tetanus	injection	left upper arm

Other immunisable diseases and their vaccines

cervical cancer	HPV vaccine
Pneumonia	PCV vaccine
Rabies	Anti rabies Vaccine
Small pox	small pox vaccine
Typhoid	typhoid vaccine
Rubella	MMR vaccine
Mumps	MMR vaccine
Meningitis	Meningococcus vaccine (MCV)
Yellow fever	Yellow fever vaccine
Chicken pox	Varicella vaccine
Watery diarrhoea	Rotavirus Vaccine
COVID – 19	Pfizer vaccine AstraZeneca Vaccine Sinovac Vaccine Moderna vaccine Johnson / Johnson's Vaccine
Ebola	Ebola vaccine

IMMUNISATION CARD / CHILD HEALTH CARD (CHC)

- This is a card given by the health workers at a health centre to every child (baby) who receives immunization.
- It is a written record that monitors the child health.

A child health card shows the following information about the baby.

- Date of birth
- Date of next visit for immunization
- Vaccine received and the date
- Birth weight of the child
- Child's name
- Place of residence
- Parents occupation
- Birth order
- Doctor's advice to health growth and nutrition of the child.
- Sex of the child

Importance of a child health card

To the parents

- It helps the parents to know when the next dose will be given.
- It helps the parents to monitor the growth of their child.

To the health workers

- It helps them to know the next vaccine to be given.
- It helps them to know the health history of the child.
- It helps them to identify the given vitamin supplement
- It provides information on the child's name, sex, date of birth, birth order, mother's name & occupation, fathers name, father's occupation and where the family live.

To the school committee

- To determine or know the child's age.
- To identify whether the child was fully immunized
- To identify the vaccine that were given to the baby.

ROLES OF INDIVIDUALS, FAMILIES AND COMMITTEE IN IMMUNISATION

INDIVIDUALS

- Help to inform other family members and neighbours on immunization dates and venue.
- Encourage others to take their children for immunization
- Assisting the health workers in arranging the places selected for immunization.
- Help to convince other people to accept immunization as an important program.

Family

- To take children for immunization
- To share all information, they know about immunization
- Ensure that all children and pregnant women are immunized.

Community

- Encourage members to take their children for immunisation
- To build immunisation centres
- To organize seminars, workshops, plays and concerts to educate others about immunisation
- To sensitize community members about the importance of immunisation
- Schools should perform plays and concerts about immunisation on open days and speech days.

Common immunisation centres in our communities

- Hospitals
- Clinics
- Health centres
- dispensaries

Common abbreviations used in immunisation

EPI – Expanded Program on Immunisation

UNEPI – Uganda National Expanded Program on Immunisation

NIDS – National Immunisation Days

NIPDS – National Immunisation Plus Days

WHO – World Health Organisation

RI – Routine Immunisation

DOH – Department of Health

Note

NIDS are days on which countrywide immunization is carried out.

ROLES OF UNEPI

To organize immunization days

To sensitise communities about the importance of immunization

THE WORLD HEALTH ORGANISATION

This is an international health organization in the whole world.

Roles of WHO

- Accepting and registering different drugs used in the whole world.
- Approving different vaccines used for different diseases in the whole world.
- Making sure that some diseases are eliminated from the whole world.
- Helping in research for new vaccines and treatment for different diseases in the world.

TOPICAL QUESTIONS

1. Name the organization responsible for immunization of children in Uganda.
2. In which way is immunization different from immunity
3. Mention the type of immunity got from the hospital.
4. How can an elderly acquire natural immunity.
5. What are vaccines?
6. Give one reason why vaccines should be kept at a required temperature.
7. What are vaccines made of?
8. List down any childhood killer diseases.
9. Patrick has weak immunity. What problem is he likely to face?
10. Identify one kind of virus that attacks the body immunity
11. Name the vaccine which is administered to mature girls and pregnant women to protect them from tetanus.
12. Point out one method of administering vaccines in the body.

13. Name one vaccine administered to babies through drops in the mouth.
14. Mention any two immunisable vaccines administered to children once through their immunisation cycle
15. At what age does a child complete his immunization cycle?
16. How is the administration of Polio vaccine different from that of BCG vaccine?
17. Write the following in their full form;
 - (i) UNEPI
 - (ii) NIDS
 - (iii) BCG
 - (iv) PCV
18. Why must babies be immunized at birth against tuberculosis?
19. State the roles played by the following during immunization programme.
 - (i) Individual
 - (ii) Family
 - (iii) Community
 - (iv) UNEPI
20. Name the vaccine given to children in control of;
 - (a) Measles
 - (b) Diphtheria
 - (c) Tuberculosis

THEME: HUMAN BODY

TOPIC: DIGESTIVE SYSTEM

Terms used in the digestive system

Digestion – the process by which food is broken down into smaller particles that can be absorbed into the blood stream.

Enzymes – chemical compounds that speed up the rate of digestion.

Ptyalin – Is an enzyme produced in the mouth.

Peristalsis – wave like movement of food through the alimentary canal.

Bolus – Is a small round soft mass of chewed food.

Chyme – Semi solid food found in the stomach mouth.

Emulsification – the breakdown of fats into tiny droplets.

Constipation – Condition where one passes out faeces with difficulty.

Egestion – passing out undigested food through the anus.

Ileum – The lower part of the small intestine.

Duodenum – The upper part of the small intestine

Indigestion – condition when food is not digested properly in the alimentary canal.

DIGESTIVE SYSTEM

Digestive system is the system of the body which works to digest food. It is a group of body organs that help in the digestion and absorption of food.

Digestion

Digestion is the process by which food is broken into simpler particles that can be absorbed into blood stream.

Types of digestion

Mechanical digestion – is where food is broken down into small particles by the help of the teeth.

Parts of the digestive system where mechanical digestion occurs

- Mouth

Chemical digestion

Is where food is broken down into small particles by the help of enzymes.

Parts of the digestive system where chemical digestion occurs

- Stomach
- Mouth
- Duodenum
- Ileum

Enzymes

Enzymes are chemical compounds which speed up the rate of digestion

Role of enzymes during digestion

They speed up the rate of digestion

Conditions under which enzymes work

- Acidic condition
- Alkaline condition

Characteristics of enzymes.

- They are protein in nature
- They are specific on a particular food.
- They are destroyed by heat.
- They work best under a certain PH
- They work best under a narrow temperature range (optimum temperature)

Examples of enzymes

- Salivary amylase (ptyalin)
- Pepsin
- Rennin
- Pancreatic amylase
- Lipase
- Trypsin
- Maltase
- Lactase
- Sucrase

- Peptidase

Activity

1. What is digestion?
2. Which type digestion is aided by the teeth?
3. State any two parts of the digestive system where chemical digestion occurs.
4. Give one role of enzymes during digestion.
5. Suggest one condition under which digestion occurs.
6. Give any two examples of enzymes found in the stomach.
7. Write down one characteristic of enzymes

Alimentary Canal

- Alimentary canal is the muscular tube that runs from the mouth to the anus
- It is about 10 metres long

The digestive system of humans.

Functions of the parts of the digestive system.

Teeth – they breakdown food into smaller particles

- Teeth help to increase the surface area for the action of enzymes.

Salivary glands – Produce saliva

Tongue – for tasting

- Rolls food into a bolus

- It pushes food into the gullet
- It mixes food with saliva
- It turns food during chewing

Epiglottis – it prevents foreign particles from entering the trachea.

Soft palate – it prevents food from entering the nasal cavity

Gullet/ esophagus – passage of food to the stomach during peristalsis

Peristalsis is the process by which food passes through the gullet.

Stomach – Stores food for a short time

- Produces gastric juice
- Produces hydrochloric acid
- Absorbs alcohol and medicine
- Digests proteins
- Churns food into chyme

Liver – Produces bile

Pyloric sphincter – It is a strong muscle which holds into the stomach and lets it into the duodenum at intervals

Gall bladder – stores bile

Bile duct – conducts bile to the duodenum

Pancreas – produces pancreatic juice

Pancreatic duct -conducts pancreatic juice into the duodenum.

Ileum – produces intestinal juice (succus entericus)

- It is where final digestion of food occurs
- Absorption of food occurs

Colon – absorption of water from undigested food.

Rectum – stores undigested food for a short time

Anus – it passes out undigested food as faeces.

Peristalsis

Peristalsis is the wave like movement of food through the alimentary canal

Illustration

Digestion in the mouth

- Digestion of food starts from the mouth. The mouth contains teeth, salivary glands and the tongue.
- In the mouth food is chewed and mixed with saliva.

Teeth

- They help to crush and grind food into smaller particles
- During digestion, the teeth help to break food into small particles
- They also protect the tongue.

Importance of chewing food properly.

- It makes food soft for easy swallowing
- Increases the surface area for the action of enzymes.

Salivary glands

- They are located under the tongue
- They produce saliva

Factors that stimulate the production of saliva

- Smell of food
- Sight of food
- Taste of food

Saliva is the juice produced in the mouth.

Roles of saliva in digestion

- It lubricates the food in the mouth

- Softens and moistens food for easy swallowing
- Cools down food incase it is hot
- Provides alkaline condition to the action of an enzyme
- The mouth contains salivary amylase which acts on cooked starch (carbohydrates and change to maltose.

Activity

1. State the importance of teeth in the process of digestion
2. By what process does food move down the alimentary canal?
3. In which way is an alimentary canal different from a digestive system?
4. Which digestive juice is produced in the mouth?
5. State roles of the juice produced in the mouth?
6. Suggest two factors that stimulate the production of the juice in the mouth?
7. Identify the part of the digestive system where the following take place
 - (a) Absorption of food
 - (b) Absorption of water
 - (c) Digestion of proteins

Digestion of food in the stomach

- The movement of muscles of the stomach
Churn the food into a semi liquid substance called chyme.
- The stomach walls secrete/ produce gastric juice and hydrochloric acid

The gastric juice contains two enzymes

- Pepsin
- rennin

Pepsin – breaks down proteins into particles and it's found in adults

Rennin – clots Proteins in the milk to separate them from fats. Rennin is found in the stomach of babies.

Functions of hydrochloric acid

- Helps to kill germs which escape with food.
- Stops the action of salivary amylase
- Activates pepsin and rennin
- Provides suitable acidic conditions in which pepsin works best

NB: Digestion of proteins start in the stomach. Absorption of alcohol, simple sugars and medicine take place in the stomach.

When digestion of food in the stomach is complete the pyloric sphincter relaxes at intervals to let chyme into the duodenum.

Activity

1. What name is given to the food that mixes with digestive juices in stomach?
2. Mention two substances produced by the stomach walls.
3. Apart from pepsin give any one other enzyme found in the stomach.
4. Identify one item absorbed in stomach.
5. Give the importance of hydrochloric acid found in the stomach.
6. Which enzyme is common in the stomach of young children?
7. How is the stomach useful in digestion?
8. Under which condition do enzymes in the stomach work.
9. Name the juice in the stomach.
10. Mention any two enzymes contained by the above juice.

Digestion of food in the duodenum

- Duodenum is the first part of the small intestine.
- It receives digestive juice from the liver and pancreas.
- The first food to be digested in the duodenum is fats.

Importance of the liver in digestion

Breaks down fats (emulsifies fats)

Neutralizes hydrochloric acid in chyme and makes it alkaline.

NB Emulsification is the breakdown of fats into tiny droplets.

Other uses of liver

- Stores food like vitamins
- Helps to detoxify harmful substances
- Regulates sugar levels
- Produces heat

Pancreas

Importance of the pancreas

It produces pancreatic juice

The duodenum receives pancreatic duct.

Enzymes contained by pancreatic juice

Trypsin – breaks down proteins to reptides and peptides to amino acids

Pancreatic amylase – breaks down carbohydrates to maltose to glucose.

Lipase – breaks down fats to fatty acids and glycerol.

Pancreatic juice also contains sodium hydrogen carbonate salts that neutralize hydrochloric acid.

Activity

1. Name the class of food digested in the duodenum
2. Identify the two body organs that aid secretions in the duodenum
3. State the role of bile in the liver
4. Give any two enzymes contained by pancreatic juice.
5. How does the duodenum receive pancreatic juice?

Digestion of food in the ileum

The ileum is the second part of the small intestine

Digestion of food is completed and ends in the ileum

The ileum secretes an intestinal juice called succus entericus which contains enzymes like;

Peptidase – breaks down peptides to amino acids

Lipase -breaks down maltose to glucose to glucose

Sucrase - breaks down sucrose to glucose

Lactase – breaks down to glucose

The ileum also produces mucus which lubricates the food passage and prevents enzymes from digesting the walls of the ileum.

Importance of mucus

Acts as lubricant

Prevents self-digestion by pepsin

The hepatic portal vein takes blood with digested food from the ileum to the liver.

Importance of ileum in food digestion

- Produces intestinal juice
- Final digestion of food takes place
- Absorption of food takes place

Absorption food in the ileum

- Absorption of digested food takes place in the ileum by the help of finger like structures called villi.

Illustration of an ileum

Adaptation of the ileum to absorption of digested food

- Fairly long to increase surface area for absorption.
- Has villi which increase the rate of absorption of digested food
- Thin walls to allow easy diffusion of food.
- Dense network of capillaries to easily absorb food
- Presence of secretory glands which secrete enzymes to complete food digestion.

Illustration of a villus

Activity

1. Complete the table below

food class	end products
_____	glucose
fats	_____
_____	amino acids

2. How are amino acids important to the body?
3. Apart from the ileum, give other two parts that make up small intestine
4. State the role of mucus produced by the small intestines.
5. Name the blood vessel which transports digested food from the ileum to the liver.
6. What name is given to the fingerlike structures in the ileum which help in the absorption of food?
7. State any two adaptations of the ileum to its function.

Colon

- Absorption of water takes place in the colon.
- Digestion does not take place in the colon and rectum because they do not secrete enzymes.

Rectum- it holds undigested food for some time

Anus - it passes out undigested food as faeces.

The passing out of undigested food from the alimentary canal is called **egestion**.

Components of faeces

- Water
- Dead cell
- Roughage
- Bacteria

Summary of the class of food and its end products

Class of food	End products
carbohydrates	Glucose
proteins	amino acids
fats	fatty acids and glycerol

Diseases of the digestive system

- Peptic ulcers
- Appendicitis
- Diarrhoea
- Cholera
- Typhoid
- Dysentery

Appendicitis

- It is caused by bacteria that enters the appendix.
- It leads to swelling of the appendix
- It causes too much pain on the lower right side of the abdomen.
- It can cause death if the appendix bursts
- It can be treated by cutting it off.

Peptic ulcers

They are wounds formed in the stomach (small intestines)

They cause a lot of pain especially when one is hungry

Ulcers are caused by bacteria

Dysentery

It is the frequent passing out of watery stool with blood.

Types of dysentery

Amoebic dysentery – caused by amoeba

Bacilli dysentery caused by bacteria

Mode of spread of dysentery

Drinking contaminated water

Eating contaminated food

Signs and symptoms of dysentery

- Diarrhoea with blood stains
- Abdominal pain
- Loss of appetite

Dangers of dysentery

- It leads to dehydration
- It leads to anaemia

Prevention and control of dysentery

- Covering food
- Washing hands
- Boiling water for drinking

Cholera

- It is caused by bacteria called **Vibrio cholerae**
- It is spread by houseflies and cockroaches
- It is also spread through drinking contaminated water and eating contaminated food.

Signs and symptoms of cholera

- Diarrhoea
- Abdominal pain
- Vomiting
- Loss of appetite

Prevention and control of cholera

- Boiling drinking water
- Washing hands before eating food
- Proper disposal of faeces

Typhoid

- It is caused by bacteria

Mode of spread of typhoid

- Through houseflies
- Through drinking contaminated water
- Through eating contaminated food

Signs and symptoms of typhoid

- Diarrhoea
- Abdominal pain (stomach ache)
- Headache
- Fever

Prevention and control of typhoid

- Boiling drinking water
- Hand washing after visiting the toilet (latrine)
- Proper disposal of human wastes
- Washing hands before eating food

Disorders of the digestive system

These are problems that make the alimentary canal fail to function well.

They include;

- Constipation
- Diarrhoea

- Intestinal obstruction
- Indigestion
- Vomiting

Constipation

This is the condition where one passes out faeces with difficulty.

Causes of constipation

- Lack of roughages in the diet
- Drinking little water
- Lack of physical exercise

Ways of preventing constipation

- Including roughage in the diet
- Doing physical exercise
- Taking enough water before and after eating food

Sources of roughages

- Cassava
- Oranges
- Pawpaws
- Sweet potatoes

Indigestion

This is when food is not digested properly in the alimentary canal

Causes of indigestion

- Over eating
- Improper chewing of food
- Eating hurriedly
- Too much drinking of alcohol
- Poor dental formula

Signs and symptoms of indigestion

- Stomach ache
- Heart burn
- Tiredness

- Belching
- Bloating
- Bringing up bad smell from the mouth

Prevention and control of indigestion

- Chewing food properly before swallowing
- Drinking enough water before and after eating food

Vomiting

- This is the bringing back of food from the stomach through the mouth.
- It is caused by eating poisonous food or over eating
- It is also caused by some diseases e.g. malaria.

Intestinal obstruction

- This is when the small intestine becomes narrow to allow proper passage of food and water.
- It causes vomiting and thirst.
- Death can occur within 45 hours.
- It can be solved through surgical operation.

How to maintain the efficiency of the digestive system

- Proper chewing of food
- Washing hands before eating food
- Washing hands after visiting the toilet.
- Eating well cooked food
- Having regular physical exercises.
- Eating food that make up a balanced diet
- Having regular meals
- Wash fruits and vegetables before eating
- Brushing teeth every after meal
- Avoid smoking

- Avoid drinking alcohol
- Having enough rest after meals.

TOPICAL QUESTIONS

1. What is meant by the term digestion?
2. Where in man does digestion begin?
3. In which part of the digestive system does digestion end?
4. Give one type of digestion
5. What type of digestion takes place in the mouth?
6. Give one importance of proper chewing of food
7. Give any one factor that stimulates the production of saliva
8. What is the importance of saliva in the mouth?
9. Of what use is the pyloric sphincter in the digestive system?
10. Bile contains bile salts. How are bile salts important during the process of digestion.
11. Under what condition does salivary amylase work best?
12. What digestive juice is produced by the stomach walls?
13. Give one use of hydrochloric acid in the stomach.
14. Suggest one cause of indigestion.
15. State one way the ileum is adapted to absorption of food.
16. Study the diagram and answer the questions that follow
 - a. Name the parts marked A and C
 - b. Give the function of part marked B
 - c. State any two diseases that attack the above system.
 - d. Mention any two disorders of the above system.
 - e. Give any two ways of caring for the above system.

17. In which part of the digestive system are following juices produced.
- i) Bile juice
 - ii) Gastric juice
 - iii) Saliva
 - iv) Pancreatic juice
18. What are enzymes?
19. Give one example of enzymes
20. Write two characteristics of enzymes.