THEME: SCIENCE IN HUMAN ACTIVITIES AND OCCUPATION

Lesson 1

TOPIC: KEEPING POULTRY AND BEES

SUB-TOPIC: KEEPING POULTRY

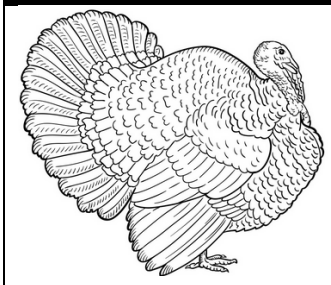
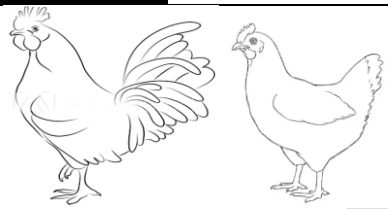
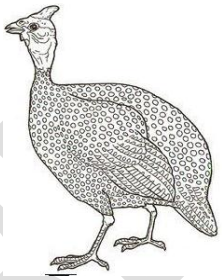
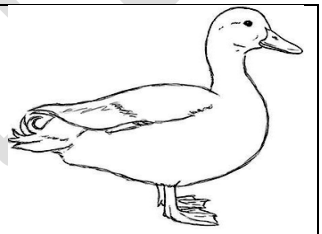
Read and spell

- poultry - domestic
- turkey - manure

Poultry keeping

- Poultry refers to all kinds of birds kept at home
- Poultry keeping is the rearing of domestic birds

Types/examples of poultry

			
turkey	chicken	guinea fowl	duck

Importance of keeping poultry

- It is a source of food
- It is a source of income when sold
- Poultry droppings can be used as manure.
- Poultry keeping provides employment to a people.
- Some are kept as pets.
- Feathers from poultry are used for decoration.

Activity

1. How is poultry keeping different from poultry**?**

   _____

   _____

2. Give any **two** examples of domestic birds.

   i) _____ii) _____

3. Mention any **one** importance of keeping poultry.

   _____

4. Identify any **two** products we get from poultry.

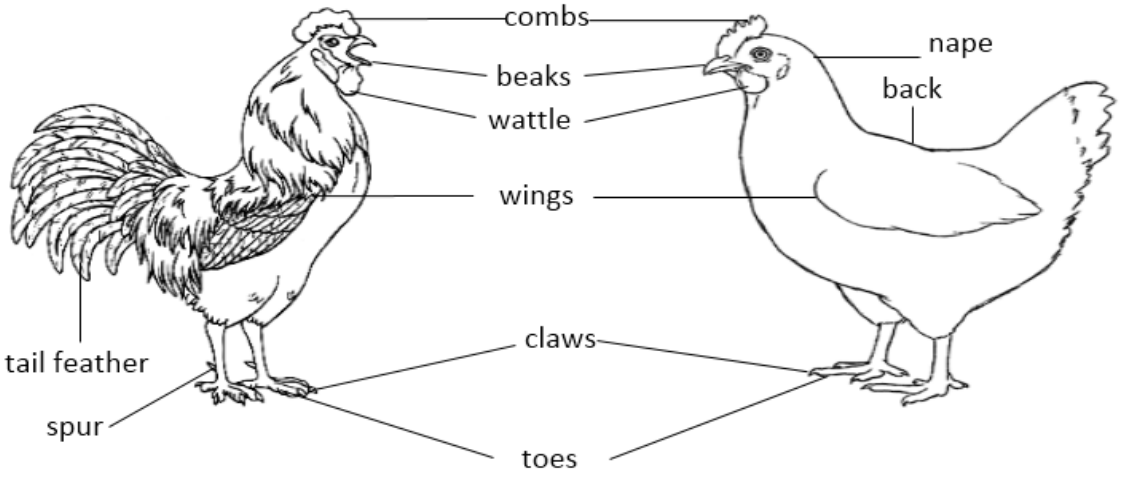
   i) _____ii) _____

Lesson 2

Read and spell

- wattle - claws
- spur - beak

Diagram of a cock and a hen



Functions

Spur

- For protection

Beak

- For picking food

Feathers

- They keep the bird warm
- They cover and protect the parts of the bird

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 a long spur while a hen has a short spur.
- A cock is bigger than a hen in size.
- A cock has dull bright feathers while a hen has dull coloured feathers

Activity

1. How important is a spur to a hen**?**

   _____

2. Mention any **two** external parts of a cock.

   i) _____ ii) _____

3. How do feathers keep birds warm**?**

   _____

4. State any **one** reason why a cock is unable to fly a long distance.

   _____

5. Give any **one** difference between a cock and a hen.

   _____

Lesson 3

Read and spell

- capon - cockerel
- moulting - roaster

Terms used

Chick: a young male or female below 5 weeks of age.
Pullet: a young female chicken which has not yet started laying eggs.
Hen: Is a mature female chicken
Roaster: A mature cock
Cockerel: A young male chicken
Capon: is a young castrated male chicken/cock
Moulting: The process of shading old feathers and growth of new feathers.

Types of chicken

Type of chicken is a class of chicken kept for a specific purpose.

- broilers
- layer
- dual purpose chicken

Broilers

- These are chicken kept for meat production.
- They are also called table chicken/birds

Examples of broiler breeds

- Light Sussex
- Cornish white
- New Hampshire

Layers

- These are chicken kept for egg production

Examples of layers

- Ancona
- Minorca

- White leghorn
- Rhode island red
- Brown egger

Dual purpose chicken

- They provide both eggs and meat

Examples of dual purpose breeds

- New Hampshire
- Rhode Island Red

Activity

1. State one reason why young cocks are castrated.

   _____

2. Mention the type of chicken which is regarded as table birds.

   _____

3. Mr. Okello keeps light Sussex birds on his farm. Mention the main poultry product that he sells in the neighbourhood.

   _____

4. State one way rearing layer birds prevents the outbreak of kwashiorkor.

   _____

Read and spell

Lesson 4

- exotic - hybrid
- ancona - minorca

Breeds of chicken:

- A breed of chicken is a family of chicken with similar characteristics e.g. colour, size and body shape.

Types of breeds of chicken

- Exotic breeds
- Local breeds
- Cross breeds

Local breeds

These are breeds which originally existed in the African traditional societies.

Characteristics of local breeds

- They grow slowly
- They lay few eggs

- They produce less meat
- They are more resistant to diseases

a) Exotic breeds

These are breeds of chicken which were imported from outside Africa.

Characteristics of exotic breeds of chicken

- Grow faster.
- They lay many eggs.
- They produce more meat.
- They are less resistant to diseases

Examples of exotic breeds

- light Sussex
- Rhode Island Red
- White leghorn
- New Hampshire

Activity

1. Give the meaning of the term a **breed.**
   _____
2. Identify any **two** breeds of chicken.
   i) _____ii) _____
3. State any **one** advantage of rearing local breed of chicken to exotic breeds.
   _____
4. How is rearing breeds of chicken like white leghorn disadvantageous to a farmer**?**
   _____
5. Identify any **one** way farmers can improve productivity in local breeds of chicken.
   _____

Read and spell

Lesson 5

- battery
- cage
- litter
- cannibalism

Systems of keeping poultry

- Free range system

- Battery cage system
- Deep litter system
- Fold pen system

Free range system

This is a system of keeping poultry where birds are allowed to move about looking for food. Most people in Uganda use this system since it is cheap.

Advantages of free range system

- This system is cheap to maintain
- The chicken get a balanced diet
- It helps to control some bad habits in poultry

Disadvantages of free range system

- Eggs can easy get lost
- Birds can easily be stolen
- Birds can easily be attacked by wild animals
- Birds can easily destroy people's crops
- It is not easy to collect manure
- It is not easy to keep production records

Activity

1. What is free range system**?**

   _____

   _____

2. Why is free range system commonly used in Uganda**?**

   _____

3. Write down any **two** advantages of using free range system.

   i) _____

   ii)_____

4. In which **one** way is free range system disadvantageous to poultry

farmers**?**

_____

Read and spell

Lesson 6

- cannibalism
- parasites
- battery
- drinker

Battery (cage) system

This is a system where birds are kept in cages or boxes, food and water are provided in each cage.

Advantages of battery system

- Bad habits such as cannibalism are reduced**.**
- It is easy to spot a sick bird.
- Eggs are obtained when they are clean
- It is easy to know unproductive birds.
- There is no loss of eggs because birds lay their eggs in boxes
- It is easy to control parasites and diseases among birds.

Disadvantages

- It is very expensive to build the cages.
- Birds do not get enough exercise
- Feeding the chicken can become expensive.

Activity

1. What is battery system of poultry keeping**?**

   _____

   _____

2. Identify any **two** advantages of battery system of keeping poultry.

   _____

3. Mention any **one** bad habit in poultry that can be controlled under battery system.

   _____

4. Why isn't battery system commonly used in Uganda**?**

   _____

5. Differentiate between free range system and battery system.

_____

_____

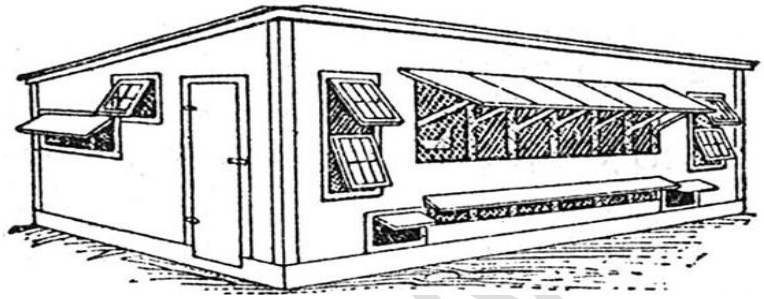
Lesson 7

Read and spell

- litter
- moisture
- husks
- droppings

Deep litters system

- This is a system where birds are kept inside a structure.
- The birds are given food and water in the house.
- The poultry house has litter material on the floor.
- Litters are materials placed on the floor of a poultry house.
- The litter removed from the house is used as manure.



Examples of litters materials

- wood shavings
- coffee husks
- rice husks
- sawdust

Importance of litter in a poultry house

- It absorbs moisture from the droppings of birds.
- It helps to keep the poultry house warm.
- It prevents eggs from breaking when laid.

Advantages of deep litters system

- Many birds are kept in small area.
- It is easy to collect eggs from laying boxes.
- The birds are protected from bad weather.

- Birds are protected for wild animals.

Disadvantages

- It may not be easy to identify sick birds.
- It is expensive to feed the chicken.
- Birds do not get enough exercise

Note: Deep litter system is suitable for commercial purpose.

Activity

1. How is litter put in a poultry house useful to layer farmers**?**

   _____

2. State any **one** poultry farmers benefit from carpenters.

   _____

3. Give **one** advantage of keeping poultry under deep litter system.

   _____

4. In which one way can deep litter system be disadvantageous**?**

   _____

5. Why do think deep litter system is suitable for commercial farming**?**

   _____

Read and spell

Lesson 8

- fold - predators
- additional - exercise

Fold (pen) system

This is a system where birds are kept in a movable structure called **fold/pen.**

- The chicken feed on plants and other foods.
- However, water and additional food must be provided for the chicken.

Advantages of a fold pen system

- Feeding the chicken is cheap.
- The chicken do not destroy the crops.

- The chicken are protected from predators.

Disadvantages of a fold pen system

- Few birds can be kept in a fold
- It is tiresome to move the cage every now and then.
- The birds can easily be attacked by parasites from the soil.
- Birds do not get enough exercises.

Activity

1. Write the meaning of fold system as used in poultry keeping.

   _____

2. Mention any **one** advantage of fold pen system**?**

   _____

3. In which **two** ways is fold pen system disadvantageous to poultry famers**?**

   i) _____

   ii) _____

Lesson 9

Read and spell

- management
- feeds
- intake
- calcium

Management of poultry.

This refers to ways of caring for poultry through proper feeding, housing and protecting them from pests and diseases.

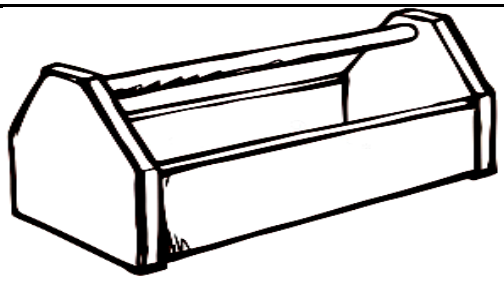
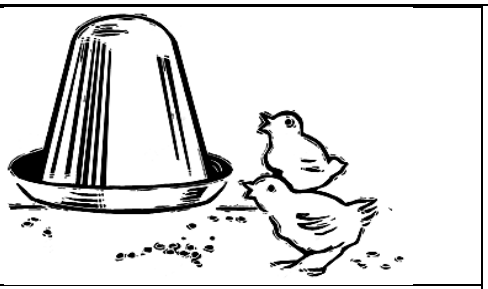
Feeding and watering

- Feeding in relation to poultry management is the act of giving feeds to birds.
- Watering is the act of providing drinking water to birds

Importance of feeding birds

- It makes them grow well
- It keeps them healthy
- It improves productivity
- Laying birds require enough calcium in their diet. Calcium helps to make the egg shell strong

Equipment used in feeding and watering poultry

	
Feeding trough	Water trough

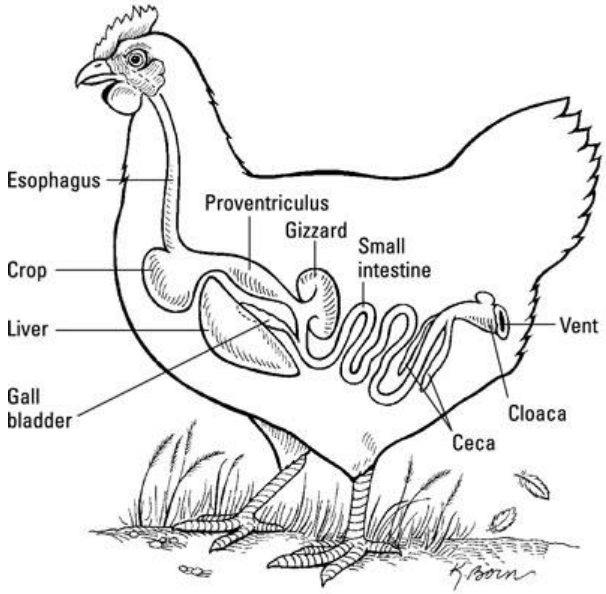
Types of feeds

Type of birds	Type of mash
Chicks (**under 4 weeks**)	chick mash
growers/ layers (**4-16 weeks**)	growers mash
layers	layers mash
broilers	broilers mash

Digestion in chicken

- In birds, digestion begins from the beak and ends in the small intestines.

Diagram of the digestive system of a bird



Functions of the parts

Beak

- For picking food

Gullet/oesophagus

- It is a passage of food to the stomach.

Crop

- In this part, food is moistened, softened and stored briefly before it is passed to the stomach.

Stomach

- It is where food is mixed with digested juices.

Gizzard

- It contains small stone called **grits** which crush food into small particles

Small intestines

- Food is digested completely.
- It is where absorption of digested food takes place.

Large intestines (colon)

- This is where absorption of water occurs.

Caeca

- This stores undigested food.

Vent/cloaca

- It is a passage of droppings.

Activity

1. State any one importance of feeding poultry properly.

   _____

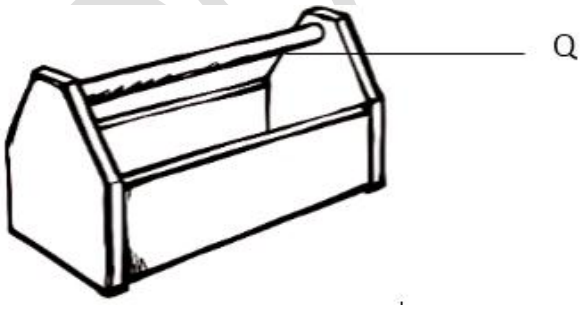
2. How is the gizzard an important part of the digestive system of birds**?**

   _____

3. Apart from picking food, how else are beaks important to birds**?**

   _____

   Use the diagram below to answer questions 4 and 5.



4. How is the above structure useful in a poultry farm**?**

   _____

5. Apart from handling the equipment safely, how else is part Q important**?**

Lesson 11

Read and spell

- excess
- vice
- cannibalism
- pecking

Housing poultry

- Housing refers to provision of shelter to animals.

Importance of housing

- Proper housing protects birds from bad weather conditions
- The house also protects birds from predators.
- The house protects birds from thieves.

Poultry vices

Poultry vices are bad habits practiced by birds.

Examples of poultry vices

- Egg eating
- Feather pecking
- Toe pecking
- Cannibalism

Causes of poultry vices

- Poor feeding
- Overcrowding
- Too much light in a poultry house
- Poor collection of eggs

Ways of controlling poultry vices

- By proper feeding of birds
- By de-beaking birds.
- By providing enough space for the birds.
- Regular collection of eggs.
- By allowing little light in a poultry house.

Activity

1. Give any **two** importance of housing in poultry management.
   i) _____
   ii) _____

2. What are poultry vices**?**

   _____

3. Which poultry vice is likely to reduce income earned from the sale of eggs.

   _____

4. Mention any **one** cause of poultry vices.

   _____

5. How does hanging greens in poultry houses reduce vices among birds**?**

   _____

Lesson 12

Read and spell

- parasites - de-worming
- protozoan - pneumonia

Poultry parasites and diseases

Parasites

A parasite is a living organism that depends on another organism for food and shelter.

Examples of poultry parasites

- Worms - Fleas
- Lice - Mites

Dangers of parasites to poultry

- Some parasites suck blood from birds
- Some parasites spread diseases to birds
- They reduce on the production of birds

Controlling of parasites in poultry

- By de-worming in case of intestinal worms
- Dusting the walls and nests
- Spraying the poultry houses regularly
- Maintaining high standard of hygiene

Diseases of poultry

Protozoan diseases

- Coccidiosis
- Black head

Bacterial diseases

- Pneumonia

- Fowl typhoid

Viral diseases

- New castle disease
- Fowl pox
- Avian luecosis
- Gumboro disease

Coccidiosis

- It is caused by a protozoan.
- It spreads through contaminated feeds and water.
- It affects the digestive system

Signs and symptoms of coccidiosis

- The birds pass out yellowish white droppings.
- Rough droopy wings.
- Weakness.

Control and prevention of coccidiosis

- By vaccinating the birds regularly.
- By keeping the poultry houses clean.
- High level of food and water hygiene
- Put coccidiostat in water or feeds

Activity

1. What are parasites**?**

   _____

2. Give any **one** example of a poultry parasite.

   _____

3. Identify any **one** effect of parasites to birds.

   _____

4. How can you control the dangers of parasites to birds**?**

   _____

5. Mention any **one** poultry disease.

   _____

Read and spell

Lesson 13

- fowl - bacterium
- temperature - diarrhoea

Fowl typhoid

- It is caused by the bacterium salmonella typhi
- It spreads through water or food contamination
- It affects the digestive system

Signs and symptoms of fowl typhoid

- Green to yellowish diarrhea.
- High body temperature.
- Ruffled feathers.

Prevention and Control of fowl typhoid

- By vaccinating birds regularly
- By killing all the infected birds
- Maintain high level of hygiene
- Culling

Fowl pox

- It is caused by a virus
- It is highly contagious among birds

Signs and symptoms of fowl pox.

- Difficulty in breathing.
- Sudden death of the infected birds.
- Mucus flow out from the mouth and nostrils.

Prevention and Control of fowl pox

- By vaccinating the birds regularly.
- By always keeping the poultry house clean.
- By killing all the infected birds.

Activity

1. How is the spread of typhoid similar in both birds and humans**?**

   _____

2. State **one** way proper hygiene prevents disease outbreak in poultry.

   _____

3. Why do think it is important to cull sick birds**?**

   _____

4. Write down any one way of improving hygiene in a poultry house.

   _____

Read and spell

- pneumonia - newcastle
- vaccination - difficulty

Pneumonia

- It is a bacterial disease which affects the respiratory system
- It spreads through the air

Signs and symptoms of pneumonia

- Difficulty in breathing.
- Body weakness.

Prevention and Control of pneumonia in poultry

- Routine vaccination of birds.
- By keeping the poultry house clean and dry.
- Proper ventilation in a poultry house
- Culling infected birds

Newcastle disease

- It is a viral disease
- It is highly contagious among birds

Signs and symptoms of Newcastle disease

- High temperature
- Loss of appetite
- Mucus discharge from the nose
- Abnormal breathing
- Yellowish green diarrhoea

Prevention and control of Newcastle disease

- Routine vaccination
- Killing all the infected birds

Activity

1. Mention any **one** bacterial disease of poultry.

   _____

2. What causes of New castle disease in poultry**?**

   _____

3. In which **two** ways can a P.5 learner control poultry diseases**?**
   i) _____
   ii) _____

4. How is vaccination of birds important in a poultry farm?

_____

Lesson 15

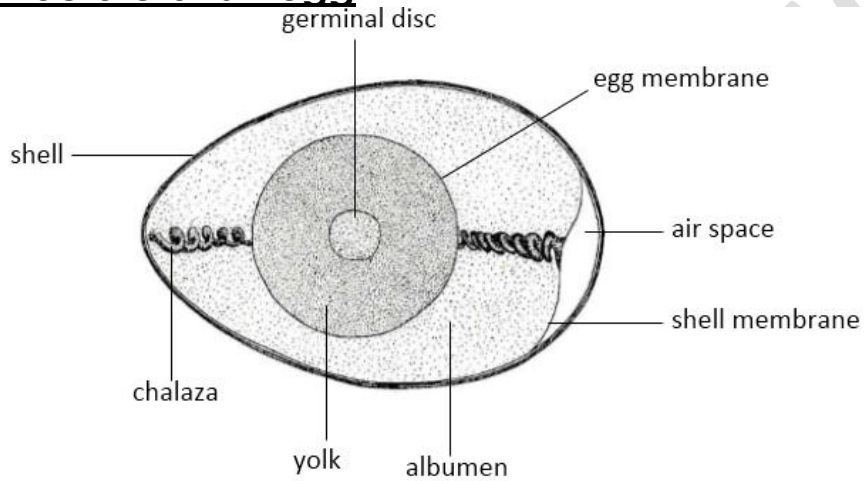
Read and spell

- breed - incubation
- chalaza - albumen

Breeding

- This is how birds reproduce and multiply in number.
- Birds usually reproduce by means of laying eggs.
- The birds' eggs are **fertilized internally.**
- Only fertilized eggs can hatch into chinks after **incubation.**

Structure of an egg



Function of the parts

Air space

- Provides fresh air to the embryo.

Egg shell

- It protects the inner parts of the egg
- It is porous to allow air to diffuse in and out of the egg.

Chalaza/twisted albumen

- It holds the yolk in one position.

Albumen

- It is a source of proteins and water to the embryo.

Germinal disc

- Develops into an embryo.

Egg yolk

- It is a source of proteins and fats to the embryo.

Activity

1. What is breeding**?**

   _____

2. How do birds reproduce**?**

   _____

3. Which type of fertilization do birds undergo**?**

   _____

4. How is the egg shell adapted to its function**?**

   _____

Lesson 16

Read and spell

- hatch
- incubate
- vermin
- warmth

Incubation

- This is the provision of necessary conditions for eggs to hatch.

Types of incubation

- Natural incubation
- Artificial incubation

Natural incubation.

- This is when a broody hen sits on its eggs until they hatch.
- The eggs hatch in or after 21 days.

Advantages of natural incubation

- It is cheap
- All the necessary conditions are provided by the hen
- It needs less attention from the farmer

Disadvantages

- Only few eggs can be hatched at a time
- Some hens are not good at incubating eggs
- The broody hen can be attacked by vermin

Artificial incubation

- This is the type of incubation where a machine called an **incubator**

is used to incubate eggs.

Advantages of artificial incubation

- Many eggs can be hatched at once
- It is good for commercial purposes

Disadvantages of artificial incubation

- It is expensive
- It needs skilled labour to manage
- It is tiresome to regulate temperature
- It cannot work without a source of heat

Reasons why some eggs do not hatch even if they are incubated

- When the egg is not fertilised
- When the egg has some abnormalities such as blood spot, meat spot and double yolk

Activity

1. What is incubation**?**

   _____

   _____

2. How is a hen able to pass heat from the body to the eggs during incubation yet it is covered with feathers which are insulators**?**

   _____

3. State one advantage of natural incubation to poultry farmers**?**

   _____

4. Why is artificial incubation said to be suitable for commercial purposes**?**

   _____

5. Write **one** important condition required when incubating eggs.

   _____

6. Why do the eggs of the common commercial layer birds do not hatch even if they are incubated**?**

   _____

Lesson 17

Read and spell

- brooding - warmth
- lantern - infrared

Brooding

Brooding is the giving of special care to chicks below eight weeks of age.

Conditions for brooding

- Warmth
- Food
- Security

Types of brooding

- Natural brooding
- Artificial brooding

Natural brooding

- In this method, the hen takes care of its chicks.
- The hen provides warmth, food and protection to the chicks.

Advantages of natural brooding

- The hen looks for food for its chicks
- The hen provides security to the chicks.
- It is cheap.

Disadvantages of natural brooding

- Some hens are not good at providing protection to the chicks.
- Few chicks are raised.
- The hen can easily be stolen.

Artificial brooding.

- This is a method where chicks are kept in a brooder.
- A brooder is a special structure where chicks below eight weeks are kept.

Examples of materials used for making a brooder.

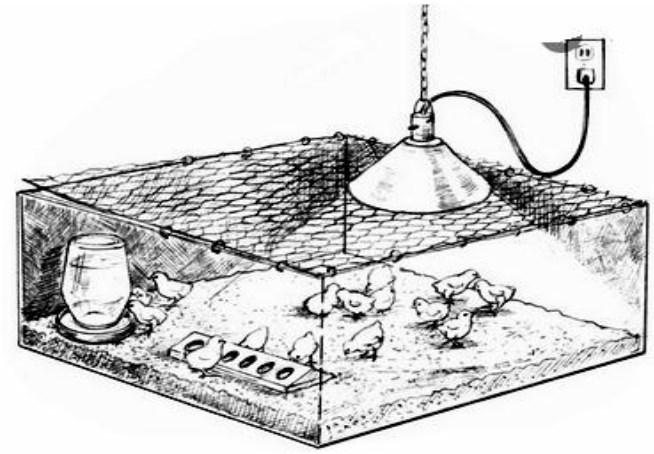
- plywood
- boxes

Qualities of a good brooder

- It should not be made with corners because chicks can crowd in the corners and suffocate to death.
- It should be well lit 24 hours a day to enable chicks see food and water in the brooder easily.
- It should have a reliable source of heat

Sources of heat in a brooder

- Paraffin - Lantern
- Infrared - Charcoal



Infrared brooder

lantern brooder

Advantages of artificial brooding.

- The chicks are protected from predators like kites, eagles, hawks, wild cats.
- Feeding the chicks in one place is easy
- Many chicks can be kept in this method
- It's good for commercial purposes

Disadvantages of artificial brooding

- Vices especially toe pecking is common among chicks
- It is an expensive method in terms of feeding
- It needs a lot of attention

Activity

1. Write any **two** sources of heat in an artificial brooder.
   i) _____ii) _____
2. Why is heat required when brooding chicks**?**
   _____
3. Why is a brooder not supposed to be built with corners**?**
   _____
4. How important is light in a brooder**?**
   _____
5. Give a reason why some formers choose to use natural brooding method.

6. Write the meaning of the word brooding**?**

_____

_____

_____

Read and spell

Lesson 18

- social insects
- solitary insects
- apiculture
- hive

Keeping bees

- Keeping bees is the rearing of honey bees for their products.
- Bees are social insects.
- Social insects are insects which live and work together.

Terms used

- **A colony**- is a group of bees living together.
- **An apiary** - is a place where many bee hives are found.
- **Apiculture** - is the art and science of keeping honey bees.
- **Apiarist** – a bee farmer
- **Swarm** – a group of bees moving together

Importance of bees to plants.

- Bees pollinate flowers.

Importance of bees to people.

- Bees provide honey to people which eaten as food.
- Bees provide bee wax for making candles, shoe polish, crayons etc.
- Honey got from bees can be sold to get money.

Activity

1. What do you understand by the term bee keeping**?**

   _____

2. How is the occupation of apiarists beneficial to crop farmers**?**

   _____

3. Identify any **one** product got from bees.

   _____

4. How is bee wax important to people**?**

5. How does bee keeping benefit people in a community**?**

Lesson 19

Read and spell

- drone bee - queen bee
- worker bee - mating

Types of bees

- Queen bee
- Worker bee
- Drone bee

Roles of each type of bee in a hive.

The queen bee

- The queen bee is the female bee in a hive.
- Its role is to lay eggs in a hive.

Diagram of a queen bee

Worker bee

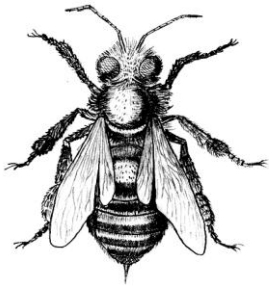
- Worker bees are sterile female bees
- They have stings
- They have pollen baskets on their hind legs

Duties of worker bees

- They feed the queen and the grubs
- They repair the hive
- They clean the hive
- They protect the hive
- They collect nectar and pollen

Note: pollen is collected in pollen baskets found on the hind legs

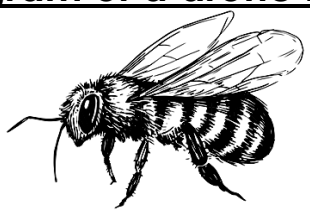
Diagram of a worker bee



Drone bees

- Drone bees are male bees.
- They develop from unfertilized eggs
- They usually live out of the hive in a drone congregation
- Their work is to mate with the queen bee.
- Mating takes place during the queen's nuptial flight
- The drone dies shortly after mating because the abdomen raptures.

Diagram of a drone bee



Activity

1. Mention the type of bee which regulates temperature in the hive.

   _____

2. Suggest a reason why worker bees can only sting once.

   _____

3. How are worker bees adapted to collecting pollen grains**?**

   _____

4. What do worker bees use for protection**?**

   _____

5. Why do you think drone bees die shortly after mating**?**

   _____

6. How do worker bees regulate temperature in a hive**?**

   _____

Read and spell

Lesson 20

- swarming
- leakage

- moths
- disturbance

Swarming

- swarming is the massive movement of bees from one place to another looking for a new hive

Conditions and reasons for swarming

- Direct sun light into the hive
- Overcrowding of bees in a hive
- Attack by enemies
- When the queen bee dies

Control/ prevention of bee swarming.

- Planting enough flowers around the hive
- Proving bees with enough water around the hive
- Repairing damages on the bee hives
- Providing sugar solution around the hive

Activity

1. How is swarming different from a swarm**?**

   _____

   _____

2. State any one danger of setting a bee hive near a busy road**.**

   _____

3. What happens to honey bees in a hive if the queen bee dies**?**

   _____

4. How can swarming be controlled in a bee keeping**?**

   _____

5. How does provision of sugar solution around an apiary control swarming**?**

   _____

Lesson 21

Read and spell

- modern
- traditional
- kigezi
- dug out

Hives

- A hive is a home for bees.

Types of hives.

- Traditional bee hive.
- Modern bee hive.

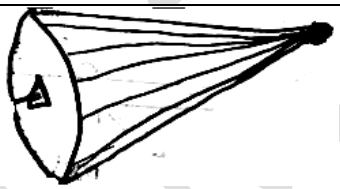
Traditional bee hive.

- These are hives usually made from locally available materials like mud, small sticks, grass etc.

Examples

- The log hive
- The grass hive
- The gourd hive
- Kigezi hive

Diagram

 Dug out log hive	 Kigezi bee hive

Advantages of using traditional bee hive

- They are cheap.
- The colony is not constantly disturbed by the farmer.
- They are durable

Disadvantages of using traditional bee hives.

- It is not easy to inspect.
- The hive is usually damaged during harvesting of honey
- Sometimes the honey collected contains grub

Activity

1. Explain he term a hive.

   _____

2. Mention the **two** main types of bee hives.

   i) _____ii) _____

3. Suggest any **two** examples of traditional bee hive.

   i) _____ii) _____

4. Give **one** advantage of using traditional bee hives.

Lesson 22

Read and spell

- Chamber
- Excluder
- Top bar
- durable

Modern hives

The hives are made from durable materials such as hard wood, metals etc.

Examples

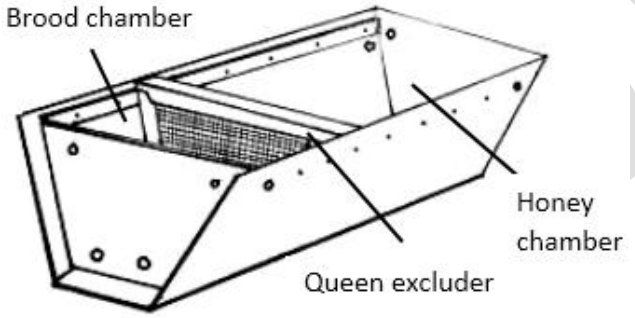
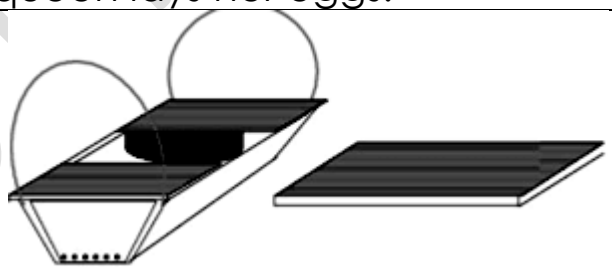
- Top bar hive
- Box hive

Part of a modern hive.

Queen excluder: Prevents the queen bee from going to the honey chamber.

Honey chamber: This is where the honey is stored.

Brood chamber: This is where the queen lays her eggs.

	
Box hive	Top bar hive

Advantages of a modern hive

- It is easy to inspect the colony
- Modern hive is long lasting
- The honey harvested is clean

Disadvantages of modern hives

- They are expensive to buy
- The materials used are expensive

Activity

1. What are modern hives**?**

2. Mention **two** examples of modern hives.
   i) _____ii) _____
3. State **two** advantages of modern hives.
   i) _____ii) _____
4. Give **one** disadvantage of modern hives.
   _____

Lesson 23

Read and spell
- removal
- combs
- modern
- equipment

Bee harvesting
- This is the removal of combs from the hive.

Methods of harvesting honey
- Traditional method
- Modern method

Traditional method
- Smoke from burning material is blown into the hive through the holes on the front of the hive
- The cover is removed so as to expose the honey combs
- Honey combs which contain honey are cut and removed
- After the combs are removed, the cover is put back

The modern method

In the modern method of harvesting, the harvester wears protective clothing such as;
- Face mask
- Gloves
- Gumboots
- Veil

Other equipment
- Knife
- Bucket
- Smoker

Procedures

- A smoker is used to put produce smoke into the hive to calm the bees
- The cover is then removed and combs with honey are cut out and removed
- The cover or bars are then placed back on the hive.

Activity

1. Mention the **two** methods of bee harvesting.
   i) _____
   ii) _____
2. What is bee harvesting**?**
   _____
3. How is a smoker useful during bee harvesting**?**
   _____
4. State any one advantage of harvesting honey using smoker**?**
   _____
5. Why is it dangerous to harvest honey using fire**?**
   _____
6. How does wearing bee veils protect honey harvesters**?**
   _____

Read and spell

Lesson 24

- extraction
- centrifugal
- squeezing
- sieve

Extraction of honey

- This is the removal of honey from honey combs.

Methods of extracting honey

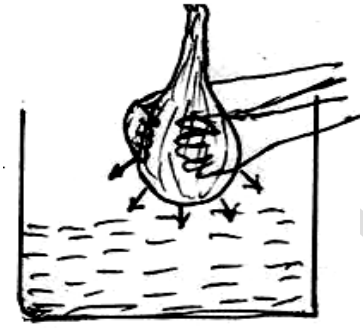
- Floating wax method.
- Pressing honey comb method
- Centrifugal method

Floating wax method.

- Honey combs are broken into small pieces and placed into a smaller saucepan
- The smaller saucepan with honey combs is placed into a large saucepan containing boiling water
- Heat from the boiling water melts the honey combs
- After cooling, condensed combs will float on the honey
- It is then sieved carefully to remove the combs
- The fine honey is then packed in clean containers ready for sale

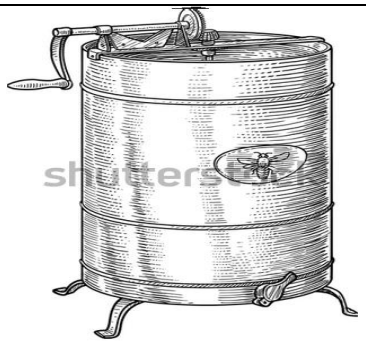
Pressing honey comb method

- In this method, honey combs are broken into small pieces
- The pieces are placed into a clean cloth
- It is then wrapped and squeezed into a clean containers
- The pressure forces the honey out of the comb into the clean container



Centrifugal method

- Honey combs are put in a machine called honey extractor
- The machine spins the honey combs
- The centrifugal force during spinning makes honey come out of the combs
- The honey combs however remain undestroyed



Activity

1. What is honey extraction?

   _____

2. Which method of honey extraction does not destroy honey combs**?**

   _____

3. Why is heat used during floating the wax**?**

   _____

4. Why does the condensed honey combs after melting float on liquid honey**?**

   _____

Read and spell

Lesson 25

- stocking
- suitable
- occupy
- noisy

Setting the hive

This means selecting a suitable place where to place a bee hive.

The hive should be placed;

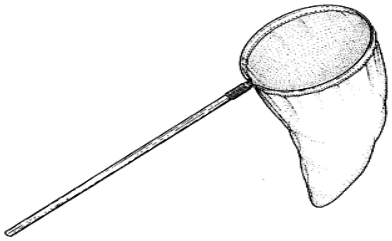
- In quiet places
- Away from homesteads
- Near flowering plants
- Close to water source

Stocking a hive

Stocking a hive means encouraging bees to occupy an empty hive

Ways of stocking the hive

- Smearing the wax in the hive
- Using a catcher box
- Using a swarm catching net



Activity

1. Define bee stocking.

_____

2. Why should a hive be set in a quiet place**?**

_____

3. What should a P.5 pupil consider when setting a hive in a place**?**

_____

4. How is a swarm catching net important to a bee farmer**?**

_____

Lesson 26

read and spell

- pests
- wasps
- sweeten
- anti-fungal

Bee pests/ enemies

- These are organisms which disturb bees in their habitat.

Examples of bee pests

- Honey badgers
- Wax moths
- Hive beetles
- Wasps
- Bears

Ways of controlling bee pests

- By spraying bee pests
- Raising up the hive to avoid honey badgers and ants
- Poles supporting hives should be painted

Uses of bee products

1. Honey

- Honey is eaten by people as food

- It is used as medicine
- It is used to sweeten drinks

2. **Bee wax**
- For making candles and shoe polish

3. **Pollen**
- It is eaten as food

4. **Propolis**
- For making antiseptics, antiviral medicines and anti-fungal medicine
- It treats scabies
- It can be used to treat burns and scalds

Activity

1. Write any **one** example of a bee pest.

_____

2. How can a farmer control bee pest on his farm**?**

_____

2. Identify any **one** bee product.

_____

3. Give any **one** use of honey to people.

_____

4. How is honey important in the control of deficiency diseases**?**

_____

THEME: HUMAN HEALTH
TOPIC: IMMUNISATION

Lesson 1

Read and spell
- Immunity
- Artificial
- Immunisation
- antibodies

Immunity
- Immunity is the ability of the body to resist disease germs

Types of immunity
- Natural immunity

- Artificial immunity

Ways of acquiring natural immunity

- Through breast feeding
- Through recovering from sicknesses
- From mother to unborn child through the placenta

Ways of acquiring artificial immunity

- Through immunisation

Importance of immunisation in the body

- It prevents immunisable diseases
- It boosts the body's immunity

Importance of immunity in the body

- It protects the body against diseases
- Reduces the cost of treating diseases

Activity

1. Define the term immunity.

   _____

2. Mention the type of immunity a baby gets through breast feeding

   _____

3. How is immunisation different from immunity**?**

   _____

   _____

4. State any one importance of immunising children in our community.

   _____

5. Name any **one** place where immunisation activities take place.

   _____

Lesson 2

Read and spell

- Polio
- Measles
- Virus
- paralyzed

Childhood immunisable diseases

- These are diseases which can be prevented by immunizing people in childhood

Examples of childhood immunisable diseases

1. **Polio**

- Polio is caused by poliovirus
- It affects bones and the spinal cord
- It spreads through drinking contaminated water

Signs and symptoms of polio

- Sore throats
- Paralysed limbs
- Fatigue

Effects of polio

- Permanent lameness/being paralysed

Measles

- Measles is caused by virus.
- It affects the respiratory system, immune system and the skin

How measles spread

- Breathing in contaminated air
- Contact with infected droplets

Signs and symptoms of measles

- Runny nose
- Sneezing
- Red watery eyes
- Skin rashes
- Coughing
- Fever

Effects of measles

- Measles can cause blindness, and otitis media.
- Measles interferes the normal functioning of the brain.

Activity

1. Which germ causes poliomyelitis**?**

   _____

2. Mention any **two** signs of polo in children.

   i) _____

   ii)_____

3. Suggest any **one** effect of polio on people.

   _____

4. Write down any **one** sign of measles infection in children.

   _____

5. How does measles spread among people in our community**?**

   _____

Lesson 3

Read and spell

- hepatitis
- influenza
- virus
- throat

Hepatitis B

- Hepatitis **B** is caused by hepatitis **B** virus.
- It affects the liver

How Hepatitis B Spread

- Through sharing skin piercing objects
- Through blood transfusion
- Through having unprotected sex with infected person
- Through body contact with an infected droplets

Signs and symptoms of hepatitis B

- Fever
- Abdominal pain
- General body weakness
- Yellow skin and eyes

Effects of hepatitis B

- It destroys liver causing liver cirrhosis

Haemophilus influenza B

- Haemophilus influenza is caused by bacteria
- It affects the respiratory system

How haemophilus spreads

- Contact with infected droplets in air

Signs and symptoms of haemophilus influenza B

- Sore throat
- High fever and chills
- Excessive tiredness
- Difficulty in breathing

Effects of haemophilus influenza

- Pneumonia
- Meningitis

Activities

1. Which germ causes Hepatitis B**?**

   _____

2. Mention any **two** ways Hepatitis B spreads from one person to another.

   i) _____

   ii) _____

3. How can one prevent oneself from contracting Hepatitis B**?**

   _____

4. Mention the liver disease caused by infection with Hepatitis B.

   _____

Lesson 4

Read and spell

- sputum
- tuberculosis
- bacterium
- whooping cough

Tuberculosis

- Tuberculosis is caused by bacteria called **mycobacterium tuberculosis**
- It affects the respiratory system, bones and the spinal cord

How tuberculosis spread

- Drinking un-boiled milk from infected cows
- Through breathing in contaminated air

Signs and symptoms of tuberculosis

- Chronic cough with sputum
- Fever
- Excessive sweating at night
- Chest pain
- Excessive loss of weight

- Fatigue

Effects of tuberculosis

- Lung damage
- Bending of bones especially of the ribs which leads to hunch back

Whooping cough (pertussis)

- Whooping cough is caused by bacteria
- It affects the respiratory system

Signs and symptoms of whooping cough.

- Runny nose with thick mucus
- Mild cold and dry cough
- Swelling of the eyes

Effects of whooping cough

- Chronic lung problems
- pneumonia
- Stroke
- Convulsions

Activity

1. How is tuberculosis similar to whooping cough in terms of their spread**?**

   _____

2. Write any **one** sign of whooping cough in children.

   _____

3. What are air borne diseases?

   _____

4. Mention any one danger of tuberculosis to the human skeleton?

   _____

5. Give any **one** effect of tuberculosis in children.

   _____

Lesson 5

Read and spell

- diphtheria - bacteria
- tiredness - stiff muscle

Diphtheria

- Diphtheria is caused by bacteria
- It affects the upper respiratory tract and sometimes the skin

How diphtheria spreads

- Through breathing in contaminated air
- Through contact with infected droplets

Sign and symptoms of diphtheria

- Headache
- Blood stained nasal discharge
- Painful swallowing
- Fever
- Bluish skin
- Sore throat
- Swelling of the neck

Effects of diphtheria

- Swelling of the neck
- Obstruction in the throat
- Heart failure
- Paralysed eye muscles, neck, throat and respiratory muscles

Tetanus (lockjaw)

- Tetanus is caused by a bacterium called clostridium tetani
- It affects the muscles and bones

How tetanus spreads

- Tetanus spreads through fresh cuts and wounds.
- Through cutting the umbilical cord using dirty instruments.

Signs and symptoms of tetanus

- Muscles of the jaw and neck become stiff
- Fever
- Sweating
- Convulsion

Effects of tetanus

- Muscle tears
- Fractures
- Uncontrolled urination and defecation
- Damage of the spinal cord

Activities

1. How is diphtheria different from tetanus in the way they spread**?**

   _____

2. Name the germ that causes tetanus to people.

   _____

3. Mention any **one** specific sign of each of the following diseases;
   a) Tetanus

      _____

   b) Diphtheria

      _____

4. Give any **two** effects of diphtheria to babies.
   i) _____
   ii) _____
5. What causes diphtheria**?**

   _____

Read and spell

Lesson 6

- toxins - host
- antibodies - vaccines

Vaccines

- Vaccines are chemical substances introduced in the body to make it produce antibodies.

Storage of vaccines

- Vaccines are stored in cold conditions (cold chain) to maintain their effectiveness

Types of vaccines

Killed vaccines

- These are vaccines made by weakening germs.

Examples of killed vaccines

- Polio vaccines

Attenuated vaccines

- These are vaccines made by growing the germs in the body of a host e.g. horses.

Examples of attenuated vaccines.

- BCG vaccines
- Measles vaccines
- Yellow fever vaccines

Toxoid vaccines

- These are vaccines made from toxins produced by germs.

Example of toxoid vaccine

Tetanus toxoid

Activity

1. What is a vaccine**?**

   _____

   _____

2. Give a reason why vaccines are stored in cold conditions.

   _____

3. Give any **one** example of attenuated vaccine.

   _____

4. How are antibodies useful in the human body**?**

   _____

Lesson 7

Read and spell

- injection - vaccines
- bacilli - orally

Administration of vaccines

Vaccine	**Disease**	**Administration**	**age/ when the vaccine is given**
Measles vaccine	Measles	- Injection on the left upper arm	- 9 months
Polio vaccine	Poliomyelitis (polio)	- Drops in the mouth	- 6,10 and 14 weeks
BCG(Bacilli Calmette Guerin)	Tuberculosis (TB)	- Injection on right upper arm	- At birth, 6, 10, and 14 weeks

Tetanus toxoid	Tetanus	- Injection on the right/left upper arm/thigh	- 1st at any age, 2nd 4weeks after the 1st , 3rd 6 weeks/months after the 2nd
DPT vaccine	Diphtheria, Whooping cough and tetanus	- Injection on the right/left upper thigh	- given at 6, 10 and 14 weeks
HEP B	Hepatitis B	- Injection on the right/left upper thigh	- given along with DPT
Hib B vaccine	Haemophilus influenza B	- Injection on the right/left upper thigh	- given along with DPT
PVC (Pneumococcal vaccine)	Pneumonia	- Injection on the right/left upper thigh	- at 6 and 14 weeks

Note: tetanus toxoid is also given if one gets cut with dirty instruments

Activity

1. State a reason why BCG vaccine is given at birth.

   _____

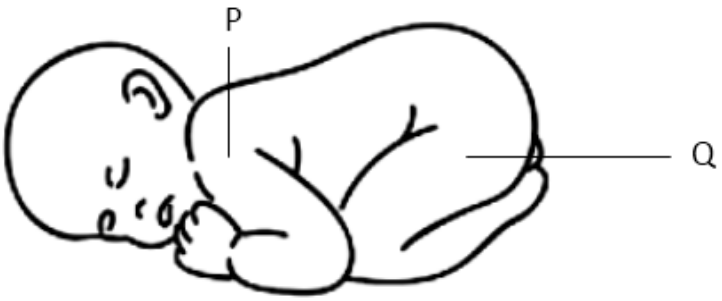
2. Why are vaccines usually administered at different sites**?**

   _____

3. Write BCG in full.

   _____

Use the diagram below to answer question 4, 5 and 6.



4. Use letter **X** to label on the diagram above the administrative site for polio vaccine.
5. Which vaccine is give at the site shown with letter Q**?**

   _____

6. Give a reason why the vaccine administered at the site P is done at 9 months.

   _____

Lesson 8

Read and spell

- rabies
- cockroach
- immunise
- meningitis

Other immunisable diseases

- These are diseases prevented in people by immunising them at any age.

Examples of other immunisable diseases

- Cholera
- Rabies
- Meningitis
- Yellow fever

Cholera

- Cholera is caused by the bacterium vibrio cholerae
- It affects the digestive system

How cholera is spread

- Through eating dirty contaminated food
- Through drinking contaminated water

Signs of cholera

- Severe diarrhea
- Vomiting
- Abdominal pain

Effects of cholera to a person

- Damage of the intestines
- Dehydration
- Death

How to control the spread of cholera.

- Drinking clean safe water
- Eating well and clean cooked food
- Proper disposal of human wastes

a) Yellow fever

- Yellow fever is caused by a virus
- It is spread through bites of aedes/tiger mosquitoes

Signs of yellow fever

- Fever
- Headache
- Nausea
- Back pains
- Jaundice

Effects of yellow fever

- Liver damage
- Kidney damage

How to control yellow fever.

- By immunising people using yellow fever vaccine.
- Spraying adult mosquitoes with insecticides.

Activity

1. Define the term other immunisable diseases.

   _____

2. Give any **two** examples of other immunisable diseases.

   i) _____ii) _____

3. Name the germ that causes cholera to people.

   _____

4. Give any **one** way cholera spreads among people.

   _____

5. Identify **one** other immunisable disease which is immunized against before leaving a country.

_____

Lesson 9

Read and spell

- meningitis - rabies
- virus - immunisation

Meningitis

- Meningitis can be caused by both bacteria and virus.
- It affects the meninges which surrounds the brain

How meningitis spread

- Through air (air borne)

Signs and symptoms of meningitis

- Stiff neck
- High fever
- Vomiting
- Severe headache
- Mental confusion
- Inability to tolerate light and noise

Effects of meningitis

- It can lead to blindness.
- It can lead to deafness.
- Mental confusion

Prevention and treatment of meningitis

- By immunizing using meningococcus vaccine

Rabies

- It is caused by virus.
- It affects the brain

How rabies spread.

- Through bites or scratches of infected cats, foxes, and dogs.

Signs and symptoms of rabies

- Violent body movements
- Uncontrolled excitement
- Fear of water
- Mental confusion
- Hallucinations

Effects of rabies

- Brain damage
- Death

Prevention and treatment of rabies.

- Immunisation using rabies vaccines.
- Killing all infected dogs and cats.

Activity

1. What causes meningitis in people**?**

   _____

2. Give any **one** animal that can spread rabies among people.

   _____

3. Mention **one** effect of meningitis to individuals.

   _____

4. Give a reason why it is dangerous to play with cats and dogs at home.

   _____

5. Why is meningitis called an air borne disease**?**

   _____

END

THEME: MATTER AND ENERGY
TOPIC: MEASUREMENT

Lesson 1

Read and spell

- gravity
- Newton
- kilograms
- matter

measurement

- Measurement refers to the process of finding the size, amount or degree of something
- When measuring, units are used to equate the magnitude of a quantity
- Unit is defined as the standard measure of a quantity

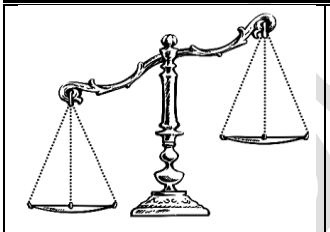
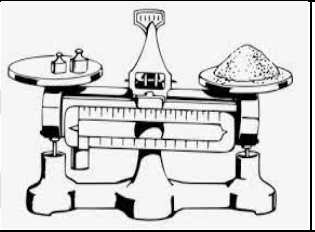
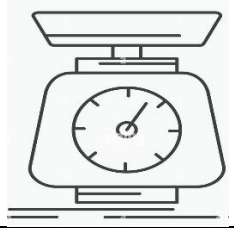
Measuring mass

- Mass is the amount of matter in an object
- Mass is measured in grams/ kilograms (kg)
- The standard unit for measuring mass is kilograms

Instruments used for measuring mass

- beam balance
- clock balance
- scale balance

Instrument for measuring mass

		
Beam balance	Scale balance	clock balance

Experimental work

Requirement

- Clock balance or (any other available instrument)

Procedure

- Use the available instrument to weigh available materials in class
- Record the readings of every material weighed

- Let children compare the different materials e.g. A is lighter than B or B is heavier than A

Conclusion

- The reading on the instrument is the mass of the materials measured

Activity

1. Write the meaning of the word mass.

   _____

2. What is the standard unit for measuring mass**?**

   _____

3. State any one application of measuring mass in daily life.

   _____

4. How is a scale balance useful to a shopkeeper**?**

   _____

5. Mention any one instrument which can be used to measure mass.

   _____

Lesson 2

Read and spell

- centre
- gravity
- weight
- heavy

Measuring weight

- Weight is the gravitational force acting on an object
- Gravity is the force that pulls objects towards the center of the earth
- The standard unit for measuring weight is Newtons (N)

Instrument for measuring weight

spring balance

Note: an object which weighs 1kg exerts 10N of weight
:. 1kg = 10N

Difference between mass and weight

Mass	Weight
- mass is the amount of matter in an object - mass is measured in kilograms - Mass of an object is constant	- Weight is the gravitational force acting on an object - Weight is measured in Newtons - Weight of an object can change

Activity

1. Why do objects weigh less in water than on land**?**
   _____
2. What makes objects thrown in air to fall down to the ground**?**
   _____
3. Write the meaning of the word weight.
   _____
4. State the standard unit for measuring weight.
   _____
5. Mention any **one** instrument used to measure the amount of matter in an object**?**
   _____
6. Identify any **two** differences between mass and weight.
   i) _____
   ii)_____

Lesson 3

Read and spell

- cubic centimeters - volume
- regular - irregular

Measuring volume and capacity

- Volume is the amount of space occupied by an object
- Volume is measured in cubic units
- Its standard unit is cubic metres

Measuring volume of objects

- Getting volume of an object depends on what kind of an object it

is.

Types of objects

- Regular object
- Irregular objects

Regular objects

- These objects have a defined shape

Examples of regular objects.

- Box
- Cube
- Cuboid
- House

Irregular objects

- These objects do not have definite shape

Examples of irregular objects

- Stones
- Key
- Lump of soil

Activity

1. Write the meaning of the term volume.

   _____

2. Identify any one example of a regular object.

   _____

3. Why is a stone regarded as an irregular object**?**

   _____

4. What is the standard unit for measuring volume of irregular objects**?**

   _____

Read and spell

Lesson 4

- height
- width
- length
- substitution

Measuring volume of regular objects

- Volume of regular objects is got by using the substitution method

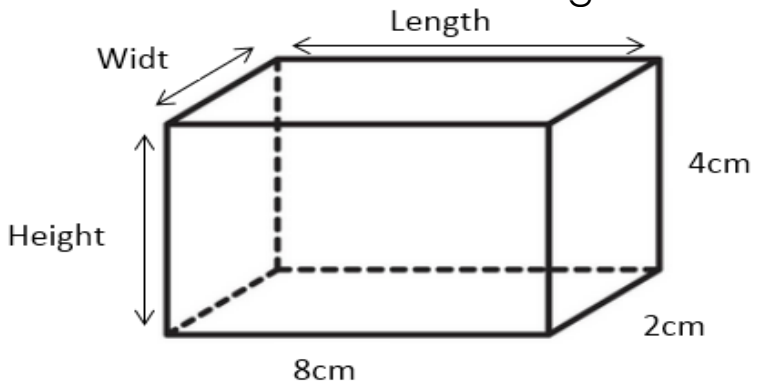
- We multiply the length, width and the height of the object

:.Volume = Length x Width x Height

V = L x W x H

Example1

Calculate the volume of the figure below



$\boldsymbol{V} = \boldsymbol{L} \times \boldsymbol{W} \times \boldsymbol{H}$

$\boldsymbol{V} = \boldsymbol{8cm} \times \boldsymbol{2cm} \times \boldsymbol{4cm}$

$\boldsymbol{V} = \boldsymbol{64cm^2}$

Activity

1. Differentiate between regular objects and irregular objects.

   _____

   _____

2. How can a P.5 child find the volume of a regular object**?**

   _____

3. What term describes the space occupied by an object**?**

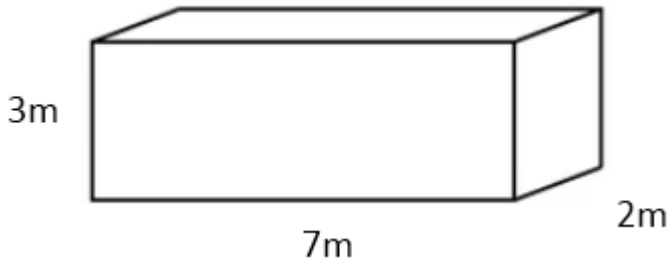
   _____

4. Why is a chalk box regarded as a regular object**?**

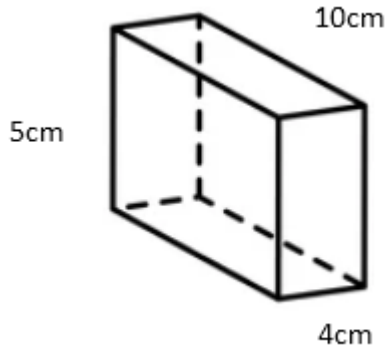
   _____

5. Find the volume of the figures below.

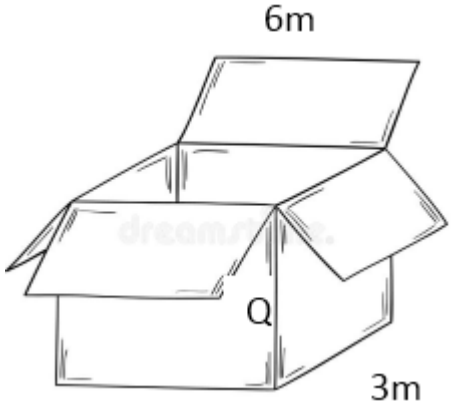
   a)



b)



c) Find the side marked Q if the volume of the object shown below is $90m^3$.



Lesson 5

Read and spell

- capacity
- litre
- paraffin
- centimetre

Capacity

- Capacity is the amount of liquid any container can hold

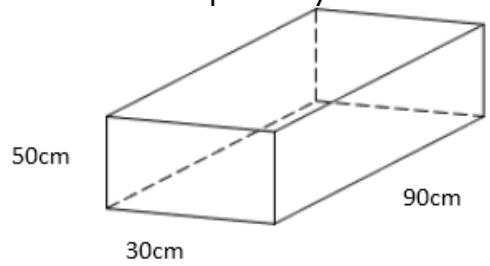
Measuring capacity

- The basic unit for measuring capacity is litres
- To get capacity, we change the volume of a container to litres
- 1 litre = 1000 cubic centimeters (cm^3 or cc)

$$\therefore Capacity = \frac{\text{volume}}{1000cm^3}$$

Example 1

Find the capacity of the object shown below.



$$V = L \times W \times H$$
$$V = 90 \times 30cm \times 50cm$$
$$V = 135{,}000cm^3$$
$$Capacity = \frac{\text{volume}}{1000cm^3}$$
$$capacity = \frac{135\cancel{000cm^3}}{1\cancel{000cm^3}}$$
$$capacity = 135\ litres$$

Activity

1. In which units is capacity measured**?**

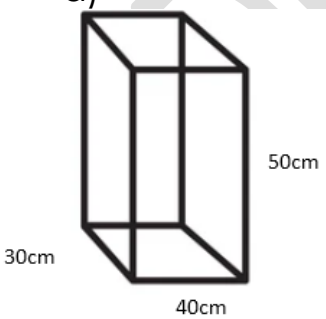
   _____

2. What is capacity**?**

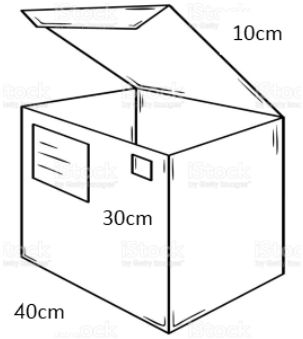
   _____

3. Find the capacity of the objects shown below.

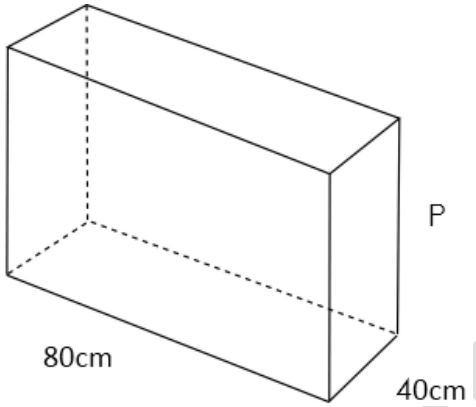
   a)



   b)



c) The capacity of the figure shown below is 192 litres. Find the side marked with letter P.



Lesson 6

Read and spell

- floating
- sinking
- bottom
- remain

Behaviour of the objects with water

Floating

- This is a state in which an object placed in water remains on top.

Characteristics of floating objects

- They are less dense than water
- They displace water equal to their weight
- Some of them have the same density with water

Examples of floating objects

- Papers
- Plastics
- Dry wood
- Polythene bags

The law of floatation

- The law of floatation states that floating objects displace water equal to their eight
- The law was stated by a Greek Scientist called Archimedes

Activity

1. Write down the meaning of the word floating.

   _____

2. What does the law of floatation state**?**

   _____

3. Why is Archimedes remembered in the world of Science**?**

   _____

4. Mention any one example of an object which floats on water.

   _____

5. Why does the object you have mentioned above float on water**?**

   _____

Lesson 7

Read and spell

- sink - bottom
- volume - denser

Sinking

- Sinking is a state in which an objects placed in water goes to the bottom.

Characteristics of sinking objects

- They are denser than water
- They displace water equal to their volume

Examples of sinking objects

- stone - coins
- pins - clay cup

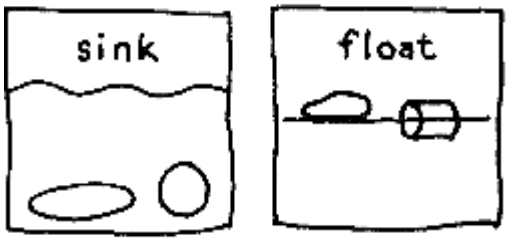
Practical work

Things needed

- Pencil, plastic cup, plastic ruler, stone, coins, pins, clay cup, etc.

Steps taken

- Fill a basin with water
- Put the objects listed above in the basin
- Watch carefully and describe how each object behaves in water



Observation

- Some objects remain on top of water while others go down at the bottom of water.

Conclusion

- Objects which remain on top of water are called floating objects while those which go down at the bottom are called sinking objects

Activity

1. What term describes the behaviour of objects that remain on top when dropped into water**?**

   _____

2. Give any **one** example of a sinking object.

   _____

3. What happens to a dry leaf when it is thrown in water**?**

   _____

4. Why does a nail sink in water**?**

   _____

5. Mention any **two** objects which can sink in water.

   i) _____

   ii) _____

Read and spell

Lesson 8

- measuring cylinder
- displacement
- eureka can
- thread

displacement method

- This is a method of finding the volume of irregular objects
- It involves displacing fluid in a container
- The method was discovered by Archimedes
- The method works on the law which states that sinking objects displace water equal to their volume

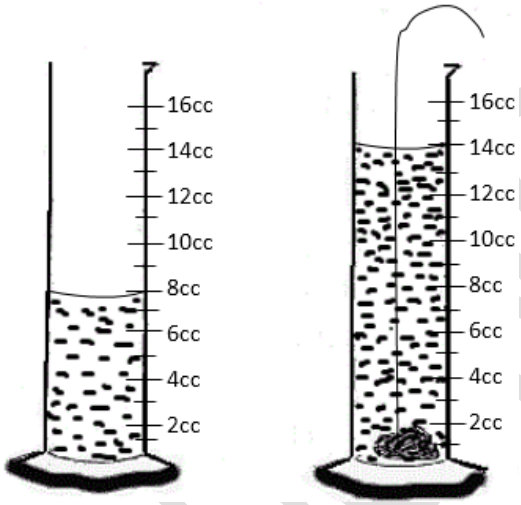
Displacement method using a measuring cylinder

Requirements

- Measuring cylinder
- Thread
- An irregular object e.g. stone
- Water

Procedure

- Pour water in the measuring cylinder to a desired level and record the readings.
- Tie the thread around the stone and gently lower it into the measuring cylinder
- Record the reading of the second level of water
- To find the volume of the irregular object, find the volume of water displaced
- The volume of displaced water is got by subtracting the 1st reading from the second reading



Volume = 2nd reading – 1st reading

V = 14cc – 8cc

V = 6cc

Activity

1. What is displacement method?

   _____

2. Why is displacement method used to find the volume of irregular objects?

   _____

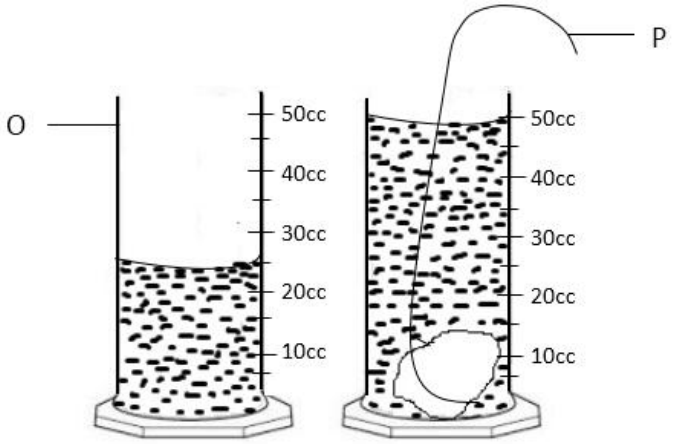
3. What contributions did Archimedes make towards finding the volume of irregular objects?

_____

4. Mention any one object whose volume can be got using displacement method.

_____

5. Study the diagram below carefully and use it to answer the questions that follow.



a) Name the instrument marked with letter O.

_____

b) How is part marked with letter P useful during the experiment**?**

_____

c) Work out the volume of the irregular object

Lesson 9

Read and spell

- eureka - overflow can
- displaced - volume

Finding the volume of irregular objects using an overflow can

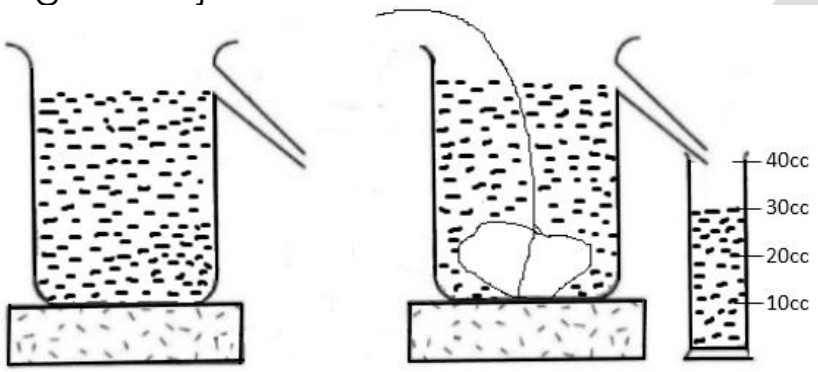
Requirements

- Eureka/overflow can
- Measuring cylinder
- Thread
- Water

- An irregular object

Procedure

- Fill the overflow can with water
- Let the water flow out until it stops on its own
- Put the measuring cylinder in place ready to collect water that will be displaced.
- Use the thread to lower the irregular object in the overflow can.
- Collect water until the last drop.
- Read the volume of the displaced water from a measuring cylinder.
- The volume of the displaced water is equal to the volume of the irregular object.



- The volume of the irregular object in the experiment above is 30cc

Activity

1. Write down **two** ways of carrying out displacement method.
   i) _____
   ii) _____
2. Why is displacement method called so**?**
   _____
3. What is the use of eureka can when finding the volume of irregular objects**?**
   _____
4. Why isn't there subtraction of readings when carrying out displacement method using eureka can**?**
   _____
5. Why do we need measuring cylinder when carrying out displacement method using eureka can**?**
   _____

Lesson 10

Read and spell

- mass
- volume
- density
- dense

Density

- Density is mass per unit volume.
- It is expressed in grams/kilograms per unit volume

Finding density of objects in relation to mass

Density (D) = $\frac{mass\ (M)}{volume\ (V)}$

worked examples

1. Find the density of an object of mass 24g and volume of 8cc

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

D = $\frac{\cancel{24}^{3}gm}{\cancel{8}cc}$

D = 3gm/cc

2. The mass of a bag of rice is 50g. If its volume is 10cc, calculate its density.

Density = $\frac{mass}{volume}$

D = $\frac{\cancel{50}g}{\cancel{10}cc}$

D = 5g/ cc

3. A block weighs 84g and density of 6g/cm^3. Find its volume.

$Density = \frac{\text{mass}}{\text{volume}}$

$\frac{6g}{cc} = \frac{84\text{g}}{\text{V}}$

$V \times 6g/cc = \frac{84\text{g}}{\cancel{\text{V}}} \times \cancel{V}$

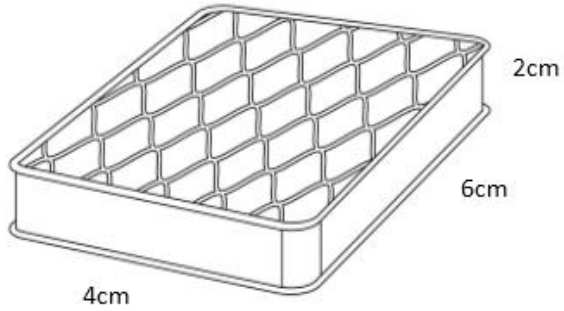
$V \times 6g/cc = 84\text{g}$

$\frac{V\cancel{6g/cc}}{\cancel{6g/cc}} = \frac{\cancel{84}^{14}\text{g}}{\cancel{6_1 g}/cc}$

$V = 14\text{cc}$

Activity

1. The mattress below has a density of 8g/cc. find its mass.



2. Find the density of the following objects;

a) Mass is 16gm and volume 4 cc

b) Mass 27gm and volume 9ml

3. Find the mass of an object whose density is 3g/cc.

4. A brick has a mass of 72g and density of 6g/cc. Calculate its volume

THEME: THE HUMAN BODY
TOPIC: THE DIGESTIVE SYSTEM

Lesson 1

Read and spell

- alimentary canal - ileum
- appendix - duodenum

Digestive system

- The digestive system is a group of organs and tissues which work together to break down food in the body.
- The path through which food passes in the human body is known as the alimentary canal

Digestion

- The process by which large food particles is broken down into soluble compounds

Types of digestion

- Mechanical digestion - Chemical digestion

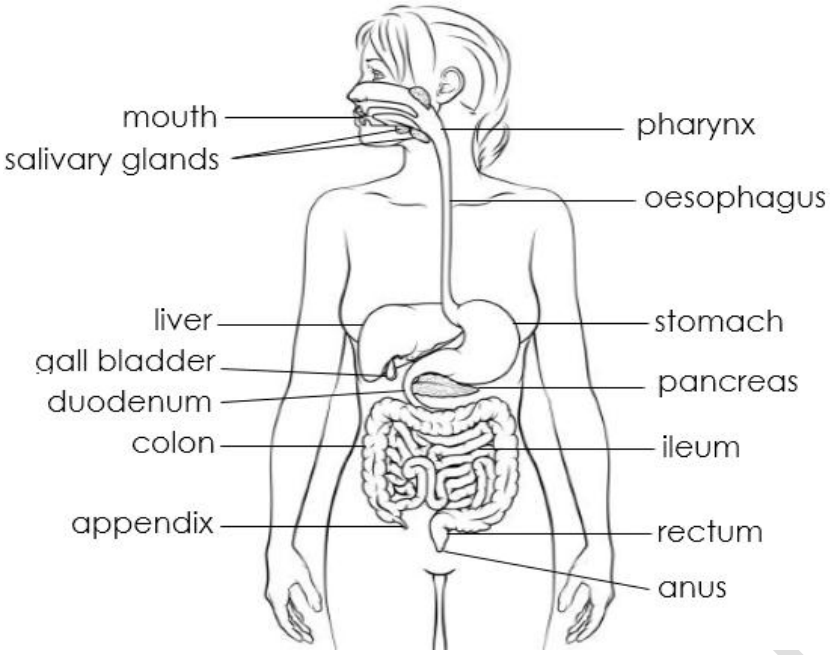
Mechanical digestion

- This is where food is broken down into smaller particles with the help of the teeth.

Chemical digestion

- This is where food is broken down into simpler particles by the help of enzyme.

Structure of the digestion



Activity

1. Give the meaning of the term digestion.

   _____

2. State any one difference that exist between the digestive system and the alimentary canal.

   _____

   _____

3. How is the digestive system important in the human body**?**

   _____

4. Mention any **two** parts that make up the large intestines.
   i)_____ii)_____
5. Which type of digestion do you think takes place in the ileum**?**

   _____

Lesson 2

Read and spell

- tongue - enzymes
- swallow - saliva

Digestion in the mouth

- Digestion of food begins in the mouth
- Food is broken both mechanically and chemically by the help of the teeth, saliva and tongue.

Teeth

- They break food to suitable sizes for easy swallowing
- Chewing also increases the surface area for action of enzymes on food

Tongue

- It mixes food with saliva
- It rolls the chewed food into a bolus form during swallowing

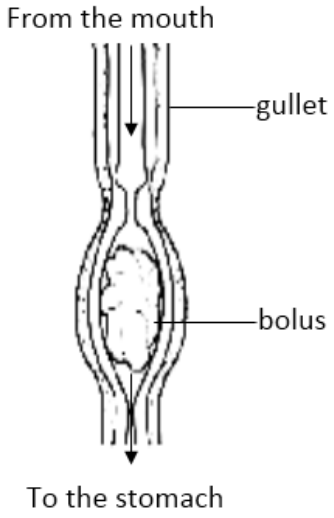
Saliva

- Saliva is the digestive juice in the mouth
- It is produced by salivary glands
- Saliva lubricates food in the mouth
- It contains the enzyme salivary amylase which acts on cooked starch

Note: in relation to digestion, an enzyme is a chemical substance which speeds up the rate of digestion

Oesophagus

- When the food is swallowed, it enters the oesophagus which connects the throat to the stomach.
- The food moves through the oesophagus into the stomach by peristalsis.
- Peristalsis is the wave- like contraction of the alimentary canal which allows food to move through it.



Summary table

Part	Gland/juice	Enzyme	Food acted on
Mouth	Salivary glands	Salivary amylase	Cooked starch

	(saliva)		

Activity

1. Where does digestion of food begin from**?**

   _____

2. Name the gland which produces saliva.

   _____

3. What are enzymes**?**

   _____

4. Which enzyme acts on cooked starch**?**

   _____

5. Name **one** digestive enzyme produced in the duodenum.

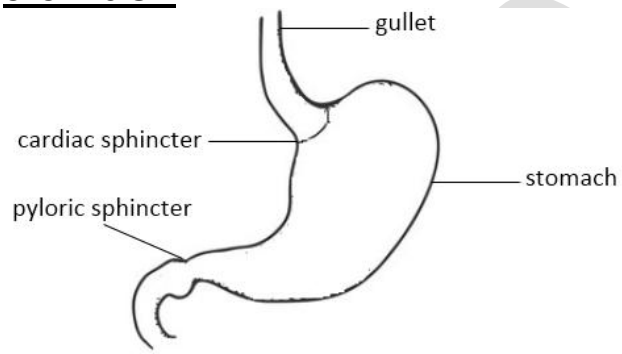
   _____

Lesson 3

Read and spell

- rennin - pepsin
- peptides - gastric juice

Stomach



- When food enters the stomach, the stomach muscles churn the solid food and liquid into a chyme
- A ring of muscle on the upper part of the stomach (cardiac sphincter)prevents swallowed food from going back to the gullet
- The muscle on the lower part (pyloric sphincter), controls passage of food into the duodenum
- The stomach walls produce hydrochloric acid and a digestive juice called gastric juice.
- Gastric juice contains the enzymes rennin and pepsin
- Pepsin begins to break down proteins into peptides

- Rennin helps in clotting milk proteins

Importance of the hydrochloric acid found in the stomach

- It kills germs swallowed with food
- It activates pepsin
- It softens bones swallowed with food

Summary table

Part	Gland/juice	Enzyme	Food acted on
stomach	Gastric gland (gastric juice)	Pepsin	Proteins
		Rennin	Clots milk proteins

Activity

1. How is rennin important in the digestive system of new born babies**?**

   _____

2. State any one way hydrochloric acid in the stomach can help in the control of diseases.

   _____

3. Give the meaning of the term chyme.

   _____

4. How is the cardiac sphincter important during digestion of food**?**

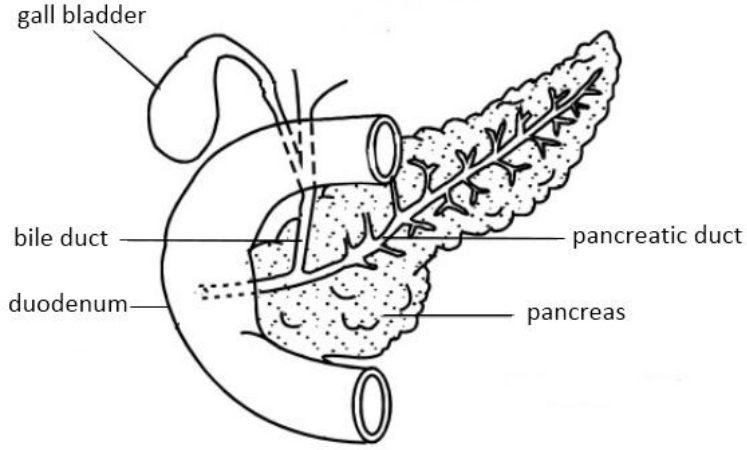
   _____

Lesson 4

Read and spell

- gall bladder - pancreatic
- chyme - carbohydrates

Duodenum



- The duodenum receives two digestive juices from the liver and the

pancreas
- The liver produces bile juice and stores it in the gall bladder
- The bile juice passes through the bile duct into the duodenum
- Pancreas produces pancreatic juice which is released into the duodenum through the pancreatic duct
- Pancreatic juice contains three enzymes, lipase, trypsin and pancreatic amylase
- Lipase begins the digestion of fats
- Trypsin digests proteins and peptides into amino acids
- Pancreatic amylase digests carbohydrates and maltose into glucose
- Bile juice emulsifies fats for easy digestion
- It also aids the absorption of fatty acids and glycerol.

Summary table

Part	Gland/juice	Enzyme	Food acted on
Duodenum	Pancreas (pancreatic juice)	Trypsin	Proteins
		Pancreatic amylase	starch
		Lipase	Fats and oils
	Liver (bile juice)	No enzyme	Fats (fats are broken into tiny droplets)

Activity

1. Name the **two** digestive juices secreted into the duodenum.
   i) _____ii) _____
2. How is the liver important during digestion of food**?**
   _____
3. Which part of the digestive system produces pancreatic juice**?**
   _____
4. What is the importance of bile juice during digestion of food**?**
   _____
5. Which class of food is digested for the first time in the duodenum**?**
   _____

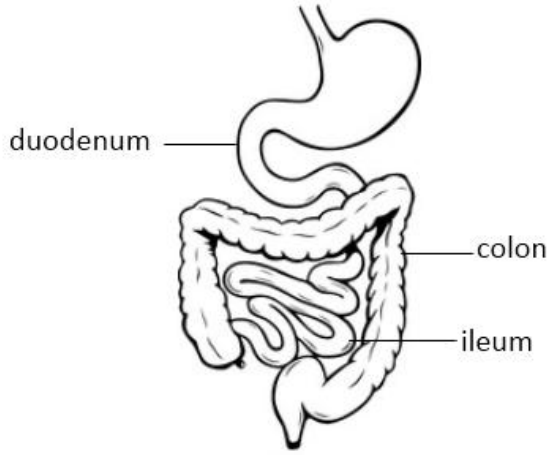
Read and spell

Lesson 5

- glycerol
- carbohydrates
- erepsin
- intestinal

Ileum:

- The walls of the ileum secrete an intestinal juice
- Digestion of food ends in the ileum by the help of the enzymes in the pancreatic juice and those of the intestinal juice
- All the three classes of food are broken to their simplest forms i.e. proteins to amino acid, fats to fatty acid and glycerol and carbohydrates to glucose



Summary table

Part	Gland/juice	Enzyme	Food acted on	End product
ileum	Intestinal walls (intestinal juice)	enterokinase	It activates pancreatic trypsin	
		Trypsin	Proteins	Amino acid
		Pancreatic amylase	Starch	glucose
		Lipase	Fats	Fatty acid and glycerol

Absorption

- Absorption is the process by which digested food enters into the blood stream.
- The process takes place in the ileum
- Absorbed food is taken to the liver through the hepatic portal vein

- The digested food is first taken to the liver for detoxification before circulation in the body

Note: absorption of alcohol begins in the stomach

Adaptations of the ileum to food absorption

- It is long to increase its surface area for food absorption
- It has the villi which absorbs digested food

The villi

- Villi are finger like projections found in the ileum
- They are able to absorb digested food because their walls are very thin and they have a rich supply of blood capillaries

Activity

1. Apart from digestion of food, mention any other process which takes place in the ileum.

   _____

2. How is the end product of digestion of starch useful to people laying bricks**?**

   _____

3. Apart from digesting proteins, mention any other importance of the stomach during digestion of food.

   _____

4. What is the end product of the digestion of proteins**?**

   _____

5. Why is digested food first transported to the liver after absorption**?**

   _____

6. State any **one** adaptation of the ileum to absorbing food.

   _____

Read and spell

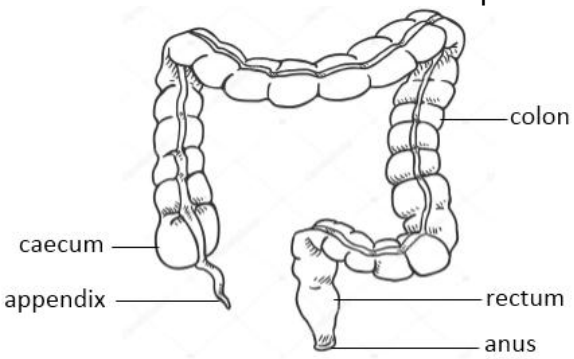
Lesson 6

- rectum
- undigested
- faeces
- absorption

large intestine

- The large intestine begins at the caecum which narrows downwards

into the appendix
- It continues upwards into the colon
- The colon curves around the small intestine and widens downward into the rectum which opens into the anus



Colon
- This is where absorption of water takes place
- It contains many bacteria some of which help to break down roughages
- Digestion does not take place in the colon because it lacks enzymes

Rectum
- It stores faces before they are passed out

Components of faeces
- Undigested food
- Bacteria
- Dead cells
- Roughages
- Moisture

Anus
- it is a passage of faeces out of the body

Activity
1. How is the colon important in the digestive system of a dehydrated person**?**

   _____
2. How are the villi found in the ileum important**?**

   _____
3. Give the reason why food is not digested in the colon.

   _____

4. How is the colon important to a P.5 child who is sleeping after taking supper**?**

   _____

5. Write down any one component of faeces.

   _____

Lesson 7

Read and spell

- diarrhoea - dysentery
- typhoid - appendicitis

Diseases of the digestive system

Diarrhoea

This is the frequent passing of watery stool

Causes of diarrhoea

- Diarrhoea is caused by viruses and bacteria
- The bacteria or virus causes inflammation of the inner lining of the colon
- The inflammation prevents the colon from absorbing much of the water

Signs and symptoms of diarrhoea

- Watery stool
- Dehydration
- General body weakness

Prevention of diarrhoea

- Washing hands before eating and after visiting the latrine
- Drinking safe water
- Cover leftover foods to control house flies
- Proper disposal of excreta

Typhoid

- Typhoid is caused by the bacterium salmonella typhi

Signs and symptoms of typhoid

- Diarrhoea
- Fever
- Headache

Prevention of typhoid

- Drinking safe water

- Wash hands before eating food and after visiting the latrine
- Cover left over foods
- Proper disposal of human wastes

Cholera

- diarrhoea
- Vomiting
- Dehydration

Prevention of cholera

- Washing hands before eating and after visiting the latrine.
- Proper disposal of human wastes.
- Drinking safe water
- Covering leftover foods

Dysentery

- This is the passing of watery stool with blood stains
- It is caused by bacteria and amoeba

Signs and symptoms of dysentery

- Stomach pain
- Diarrhea with blood stains
- Mild fever
- General body weakness

Prevention of dysentery

- Proper disposal of faeces and urine
- Washing hands before eating and after visiting the latrine
- Drinking boiled water
- Cover leftover foods to control house flies

Activity

1. List down any **two** diseases of the digestive system.
   i) _____ii) _____
2. What germ causes typhoid?
   _____
3. Give any **two** signs of a person with cholera.
   i) _____
   ii) _____
4. What is dehydration**?**

5. How is diarrhoea dangerous to the digestive system**?**

6. How does proper disposal of wastes prevent the spread of diseases of the digestive system?

Lesson 8

Read and spell

- oily
- wounds
- acids
- sticky

Peptic ulcers

- These are wounds formed in the stomach

Causes of peptic ulcers

- It is caused by a bacterium called helicobacter pylori

Conditions which can cause ulcers

- Missing food frequently
- Stress
- Diets with too much oil or other spices

Signs and symptoms of peptic ulcers

- Accumulation of gas in the stomach
- Passing out culled blood in stool
- Stomach pain
- Constipation

Prevention of peptic ulcers

- Eating food regularly
- Avoid eating spicy foods
- Avoid alcohol consumption

Appendicitis

- This is the inflammation of the appendix
- It is caused by the blockage of the appendix and multiplication of bacteria in it

Signs and symptoms of appendicitis

- Pain in the lower abdomen

- Swollen belly
- Loss of appetite

Control of appendicitis

- Surgery

Activity

1. What do you understand by the phrase peptic ulcers**?**

   _____

2. Mention any **two** ways of identifying peptic ulcers in people.

   i) _____

   ii) _____

3. Identify any **one** way of preventing peptic ulcers.

   _____

4. Why is it dangerous for a P.5 child to routinely skip meals**?**

   _____

5. How will **one** tell that he/she is having appendicitis**?**

   _____

Lesson 9

Read and spell

- indigestion - constipation
- intestinal obstruction - vomiting

Disorders of the digestive system

1. Indigestion

- This is a condition where food fails to be digested properly

causes of indigestion

- Eating excess food
- Failure to chew food properly
- Too much consumption of alcohol
- Poor body posture

Signs and symptoms of indigestion

- Diarrhoea
- Abdominal pain
- The stomach produces a lot of gas

Prevention of indigestion

- Chewing food properly before swallowing
- Cooking food properly
- Eating the right amount of food

- Avoid too much alcohol consumption

2. Intestinal obstruction

- This is when part of the intestines get blocked
- It can be caused by swallowing foreign bodies like coins, polythene and plastic materials

Activity

1. Mention any one disorder of the digestive system.

_____

2. State any one way excessive consumption of alcohol is dangerous to the digestive system.

_____

3. How can indigestion be prevented in weaning babies**?**

_____

4. Give a reason why people are advised to chew food properly before swallowing.

_____

Lesson 10

Read and spell

- constipation - expelled
- stool - forcefully

3. Constipation

- This is a condition when a person passes out very hard faeces

Causes of constipation

- Lack of roughages in the diet
- Too little water intake

Signs and symptoms of constipation

- Abdominal pain
- Passing out hard stool
- Taking long without going for defecation

4. Vomiting

- This is a condition where by food is forcefully expelled from the stomach through the mouth

Causes of vomiting

- Over eating
- Eating spoilt food

- Eating in a hurry
- Allergy
- Illnesses

Prevention of vomiting

- Eating fresh food
- Eating food in the right amounts

Activity

1. Which digestive disorder is caused by lacking roughages in the diet**?**

   _____

2. Mention any **one** sign which indicates that a P.5 child is suffering from the disorder you have mentioned above.

   _____

3. How does sufficient water intake control the disorder you have mention in number one above**?**

   _____

4. How is vomiting dangerous to the human body**?**

   _____

5. Identify any **one** way too much food intake is dangerous to the digestive system.

   _____

6. Mention any one disease that causes vomiting in people.

   _____

Lesson 11

Read and spell

- balance diet
- digestion
- vegetables
- prolapse

Disorders of the digestive system

5. Anal fissures

- These are tears in the muscles of the anus

Causes of anal fissures

- Constipation
- Prolonged diarrhoea

Signs and symptoms of anal fissures

- Pain in the anus while defecating
- Bright red blood in the stool
- Cracks in the anal muscles

Prevention and control of anal fissures

- Include roughages in the diet
- Drink plenty of fluids to soften the stool
- Routinely sit in a basin of warm salty water in case you have anal fissures

6. Rectal prolapse

- This is a condition in which the rectum falls out of its position due to weakness of the muscles holding it

Causes of rectal prolapse

- Constipation
- Prolonged diarrhoea
- Old age
- Anal damage

Signs and symptoms of rectal prolapse

- Pain in the anus or rectum
- The rectum comes out during defecation
- Leaking of blood from the rectum

Prevention and control of rectum prolapse

- Taking stool softeners
- Increasing fluid intake
- Surgery
- Increasing roughages in the diet

ways of maintaining the digestive system in a good working condition

- Eating a balanced diet
- Chewing the food properly for easy digestion
- Doing physical exercises
- Having enough rest
- Drinking safe water

Activity

1. Identify any **one** disorder of the digestive system which affects the anus.

   _____

2. State any **one** effect of constipation to the digestive system.

   _____

3. Write down any **one** way of keeping the digestive system in a good working condition.

   _____

4. How does keeping finger nails short and clean promote the health of the digestive system**?**

   _____

5. State any **one** advantage of drinking plenty of water to the digestive system.

   _____