



4. **Irregular bones** -Bones of the neck **vertebra**, sacrum.

Question.

1. Briefly explain the term bone.
2. Write down the three types of bones in one's body.
3. Why do babies have many bones than adults?
4. State any examples of each of the bones below
  - a) Long bones
  - b) irregular bones

4. How are the bone marrows important to us?

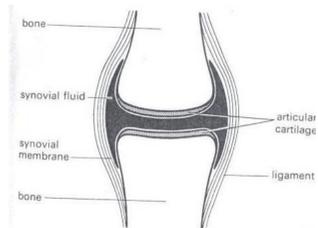
### **JOINTS(lesson three) WEEK TWO**

A joint is a place in a body where two or more bones meet.

**How is a joint adapted to a friction free movement?**

-It contains synovial fluid which reduces friction at the joint.

-The bones are covered with cartilage at the ends.



**Structure of a joint.**

**A Tendon** is a tough fibrous tissue that connects muscles to bones.

**A Ligament** is a fibrous elastic tissue that joins a bone to a bone.

**Cartilage** prevents the bone ends frictional damage after rubbing directly onto each other.

Inside a joint is a **lining of synovial membrane** which secretes **synovial fluid**.

**Synovial fluid** reduces **friction** in a joint.

**Classification of joints:**

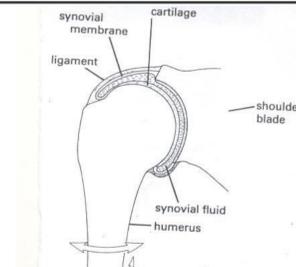
**Types of joints**

Joints may be either Movable, immovable or slightly movable

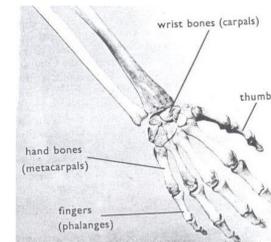
However, the principle types of joints are: Ball and socket joints, hinge joint, pivot joint, gliding joint.

**Examples of movable joints**

1. **Hinge joint**-It allows movement in one plane e.g. knee, elbow, knuckle
2. **Ball and socket**- It allows movement in three planes e.g. shoulder, hip



3. **Gliding joint**- They allow flat bones to slide over one another. eg wrist/ ankle



4. **Pivot joint**- e.g. the neck.

**Example of immovable joint.**

Suture joints in the skull.

**Questions**

1. How are joints important to a boy of 4 years?
2. What is a joint?
3. Write down one way joints are similar to muscles.
4. Write down any one example of a hinge joint.
5. Why is a shoulder joint said to be a movable joint?
6. State the substance in the human body that helps to reduce friction.

**Muscles (lesson five , week two)**

- A muscle is an elastic bundle of flesh under the skin that is attached to bones.
- A muscle is a special elastic tissue that contracts and relaxes to produce movement.

**There are two types of muscles.**

- i. Voluntary muscles.
- ii. Involuntary muscles.

**Voluntary muscles / skeletal muscles.**

Voluntary muscles are **muscles** whose action is normally controlled by an individual's will.

**Examples of voluntary muscles include:**

- i. Biceps (flexor)
- ii. Triceps (extensor)

**Involuntary muscles smooth muscles.**

Involuntary muscles whose movement is not under our will.

**Examples of involuntary muscles:**

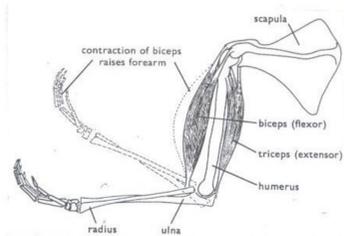
- i. Cardiac muscles of the heart.
- ii. Muscles of the eye lids.
- iii. Muscles of the stomach and intestines

**Antagonistic muscles**

These are muscles that work in pairs but have an opposite effect to each other.

**Examples of antagonistic muscles include:**

- i. Biceps (flexor)
- ii. Triceps (extensor)



**Questions**

1. What is a muscle?
2. State the two types of muscles in our bodies.
3. Why the triceps and biceps are called antagonistic muscles?
4. How are muscles useful in our bodies?
5. Cite any one disorder to the body muscle.

**Functions of the muscular skeletal system.(lesson six)week two**

1. Protects the delicate body organs.

- The **skull** protects the **brain**, the **eyes**, and the **middle** and **inner ears**.
- The **vertebrae** (backbone) protect the **spinal cord**.

- The **rib cage**, **spine**, and **sternum** protect the **lungs**, **heart**.

2. It provides supports to the body.
3. It helps in movement.
4. Storage of minerals like calcium and phosphorus.
5. The bone marrows are used to produce blood cells.
6. Provides room for attachment of muscles.

**Diseases and disorders of bones, muscles and the system(lesson seven)week two.**

**Disorders of the muscular skeletal system.**

- ✓ Fractures
- ✓ Sprain
- ✓ Spinabifida -The spinal cord does not form properly.
- ✓ Cuts
- ✓ Strains
- ✓ Dislocation

**Diseases of the muscular skeletal system.**

- ✓ **Rickets**-causes bowed legs in children due to lack of Vitamin D.
- ✓ **Poliomyelitis**- Cause by polio virus which attacks the nerve cells and spinal cord causing paralysis.
- ✓ **Arthritis**-pain, stiffness and swelling of joints.
- ✓ **Scurvy**- caused by lack of ascorbic acid (vitamin C) in the diet.

**Prevention of diseases and disorders of bones, muscles.**

- i. Boil water for drinking to prevent polio.
- ii. Prepare and eat a balanced diet.
- iii. Do physical exercises.
- iv. Keep sharp cutting objects far from children's reach.
- v. Go for dental checkups *regularly*.
- vi. Put on shoes while walking.

**Health habits that help to keep the system in a healthy working condition**

1. Do daily physical exercises.
2. Eat a balanced diet.
3. Ensure proper body posture.
4. Brush and floss your teeth twice a day.

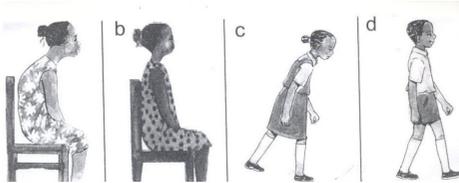
**POSTURE.**

- ✓ It is a way a person positions his body when sitting, standing or walking

**The correct sitting Posture.**

- ✓ Sit up straight on the chair.
- ✓ Place both feet on the floor.

- ✓ Put all your weight on both bottoms.
- ✓ Do not tighten your ankles and knees.



**Importance of correct posture**

- I. Prevents body aches.
- II. It prevents one from growing bent bones.

**Topical questions.**

1. Which class of food is necessary for proper growth of bones?
2. Write down one example of each of the following
  - a) Skeletal muscles      b) Smooth muscles
3. What is the functional difference between ligaments and tendons?
4. State one disorder to each of the following
  - a) Ligaments      b) tendons.
5. Which part of the skeleton protects the following?
  - a) Brain      b) tendons
6. State one health habit that can keep one's skeleton in a healthy working condition.

**Topic 2: ELECTRICITY AND MAGNETISM (lesson one) week two**

**VOCABULARY**

- |               |                  |
|---------------|------------------|
| • Electricity | Fuse             |
| • Circuit     | Switch           |
| • Insulator   | Magnet           |
| • Dynamo      | Electro – magnet |
| • Device      |                  |

**Electricity**

Electricity is a form of energy produced by the flow of electrons.

**Sources of electricity.**

- Cells i.e. Dry cell, Simple cell, chemical batteries, solar cell accumulators.
- Running water
- The sun.
- Fossil fuels.
- Wind.

**ELECTRIC CELLS**

Types of cells

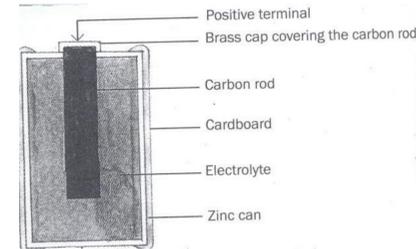
1. **Primary cells** e.g.), Dry cells, a simple cell(wet cell)
2. **Secondary cells/accumulators/storage cells.** E.g. lead batteries, solar cells.

**The dry cell.**

**Dry cell**

A dry cell is an electric cell.  
It stores chemical energy.

**Structure of a dry cell**



**Functions of each parts of a dry cell**

- 1.**Bras cap:** it acts as the positive terminal and contact.
- 2.**Carbon rod:** It is a non metallic conductor of electricity that acts as a positive pole.
- 3.**Electrolyte:** A liquid that conducts electricity.
- 4.**Zinc can:** a container in which the dry cell content is put and It acts as a negative terminal.
5. **Insulating top seal:** It prevents the jelly from drying up.

**N.B:** I. A dry cell has voltage of 1.5 volts

The energy needed to push an electric current through a electric circuit is called voltage. Voltage is measured in volts.

A dry cell stores chemical energy which is later changed to electric energy.

### Calculating voltage.

#### **Exercise:**

1. Juliet's radio uses **seven** dry cells.

How many volts are needed if he is to use it to listen to news.

Solution:

**1 dry cell= 1.5 volts**

**7 dry cells= ?**

**7dry cells X 1.5 Volts.**

**=10.5 volts**

**2.How is the carbon rod useful in a dry cell?**

**3.Suggest any one cause of dry cells losing their energy.**

**4.What is the difference between electricity and electric energy/**

**5.Identify any one source of electricity.**

### Simple cell (Wet cell): lesson two, week two

It consists of a zinc plate and a copper plate dipping in dilute sulphuric acid.

The zinc plate acts as the **negative** pole.

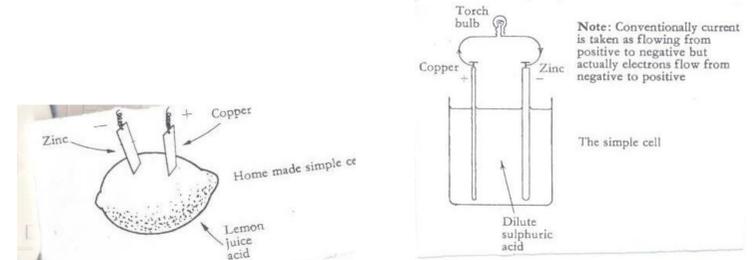
The copper plate acts as the **positive** pole.

Sulphuric acid acts as the **electrolyte**.

The zinc and copper are called **electrodes**

**An electrode** is a piece of metal that allows electric current to pass through it when placed in an electrolyte.

HOME MADE



The bulb connected across the cell, begins to glow but after only a few minutes it becomes dimmer until it finally lights off.

#### Disadvantages of using a wet cell.

- i. It is not very efficient.
- ii. It can only be used in an upright position.
- ii. It works for a short time

Questions.

1. What is the importance of the dilute sulphuric acid in a wet cell?
2. Why do wet cells lose their magnetism easily?
3. State one disadvantage of using wet cells?
4. What acts as the electrolyte in a locally made wet cell?
5. Why does a wet cell light for a shorter time?

### Chemical Battery( lesson three), week two.

A Car battery is an example of chemical batteries.

It has the positive (+) **{anode}** and negative (-) terminals {cathode} called **electrodes**

Chemical batteries convert **chemical energy** into **electric energy**.

#### Advantage of using a chemical battery.

i. It can be recharged and used again when it has run down.

#### Running water

It produces hydro electricity (H.E.P).

For example electricity produced at Nalubale AND Bujagali Dams in Jinja.

### The sun

The sun produces light which is converted into solar electricity using solar cells.

A number of solar cells put together form a solar battery.

Solar electricity is used for lighting and cooking.

### **Fossil Fuels.**

Fossil fuels used in production of electricity are coal, petrol and diesel.

**Coal / oil** can be burnt to produce Thermal electricity.

Coal stores chemical energy.

**Petrol and diesel** are used to run fuel generators.

### **Uranium**

It is burnt to produce to produce nuclear energy.

Uranium stores chemical energy.

### **Wind**

The wind turns windmills to produce electricity.

### **Questions**

- 1.Cite any three sources of electricity.
- 2.How is the sun useful in the environment?
- 3.How is wind able to produce electricity?
- 4.Give one difference between wind and air
- 5.State any one example of a fossil fuel.

### **Types of electricity.(lesson four)**

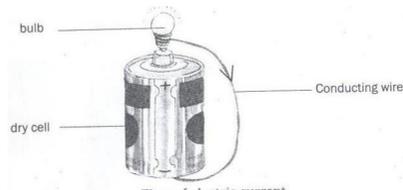
There are two main types of electricity;

1. Current electricity
3. Static electricity.

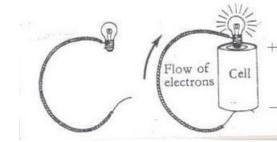
### **Current electricity**

This is the electricity where there is flows of electrons.

**The diagram showing the flow of current/ electricity/ electric current.**



### **The diagram showing the flow of electrons**



### **Types of current electricity.**

**1.Direct current (DC)** - The current flows in one direction. I e from the source to the appliance.

**Sources:** chemical batteries and dry cells.

**2.Alternating Current (AC)** - current flows in two directions. I e from the source to the appliance and the back.E.g. that one produced at **Nalubale dam in Jinja, generator**

### **Forms of electricity.**

- a) Hydro electricity;** produced from water turning turbines at a dam.
- b) Thermal electricity;** Produced from fossil fuels.
- c) Solar electricity;** Produced from the sun.
- d) Nuclear electricity;** Produced from nuclear power stations.
- e) Geo thermal electricity;** Produced from hot rock in the earth.

### **QUESTION**

1. Write down the types of electricity
2. State any two forms of electricity
3. Draw a diagram to show flow of electricity
4. What type of electricity is commonly used by most urban areas in Uganda?
5. Briefly explain the term alternating current.

### **Conductors of electricity ( lesson four , week two)**

Conductors are materials that allow electricity to pass through them .

### **Examples of conductors of electricity.**

1. Metals like; Iron, copper, Tin, Silver, zinc, lead, brass.
- ii. Materials like; spoons, pair of compasses, razor blades e.t.c.
- iii. Water from rivers, lakes, springs and wells.
- iv. Carbon (non metallic conductor)
- v. Salt solution.
- vi. Wet wood.

### **N.B:**

1. Wet wood is a good conductor of electricity because it contains minerals.
2. Pure water does not conduct electricity because it doesn't contain minerals.

3. **Silver** is the best conductor of electricity.

4. We use aluminum to make electric wires because silver is expensive and rare.

#### Insulators of electricity.

These are materials that do not allow electricity to pass through them easily.

#### Examples of insulators:

i. Rubber, plastic, dry wood, dry paper, dry cloth, air and porcelain

#### Importance of insulators

1. Used to insulate flat irons to prevent electric shocks.
2. Prevent conductors from meeting to cause short circuits.

#### Electric circuit (lesson five)

An electric circuit is a path through which an electric current flows.

#### Components of an electric circuit.

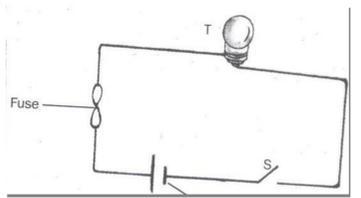
- A switch.
- A torch bulb
- A conductor (wire)
- Dry cells
- The conducting wire.
- Fuse

Questions.

1. How are insulators different from conductors of heat?
2. Give any two examples of insulators.
3. How are insulators important in our daily life?
4. State any two components of an electric circuit.
5. Why is wood said to be 'bad conductor of electricity'?

#### A simple Electric circuit. (lesson five week two)

#### In symbol form



#### In diagram form



#### Uses of parts of an electric circuit.

1. **Switch:** This breaks and completes the circuit at the users wish.

2. **Battery/dry cells:** These provide electric energy in the circuit.

3. **Conducting wire:** Transmits electric energy through the circuit.

4. **Fuse:** It breaks the circuit when there is too much current flowing.

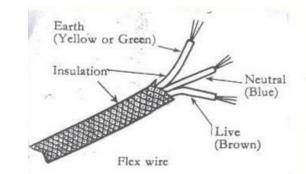
It is a thin wire(alloy) with a low melting point.

5. **Bulb:** It gives out light.

#### Symbols used in an electric circuit.

Item	Symbol
Battery	
Light bulb	
Switch	
Fuse	
ammeter	
voltmeter	

#### The conducting wire



#### Uses of each component of a conducting wire

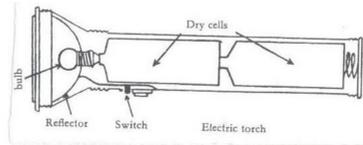
- i. **Earth (yellow or green):** Minimizes excess current to prevent us from electric shocks.
- ii. **Neutral (Blue/black):** Takes back current to the source.
- iii. **Live (Red/brown):** brings current from the source to the appliance.
- iv. **Insulation:** prevent electric shocks.

Questions

1. How are the following important in a circuit?

- a) Switch
  - b) Fuse
2. How is a fuse similar to a switch?
  3. How is a red wire useful in an electric circuit?
  4. Draw a diagram of a bulb.

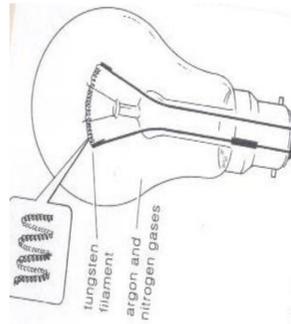
#### The torch/flash light (lesson six), week two



#### Uses of parts of a torch

1. **Reflector:** Directs lights into a **parallel** beam of light.
2. **Bulb:** It produces light.  
It changes electric energy to heat then to light.
3. **Dry cells:** It is the source of electric energy.
4. **Glass:** It protects the bulb and reflector.
5. **Switch:** Breaks and completes the circuit at the users wish.
6. **Cover and springs:** Keep the dry cells tightly together.

#### The Electric Bulb. (lesson seven) week two



#### Uses of parts of a bulb

1. **Filament:** It produces light.  
It is made of **tungsten** from a mineral called **wolfram**

#### Adaptation of the filament for its function.

- ✓ It has a high melting point.
  - ✓ It is coiled to increase electric resistance
2. **Conducting wire:** It conducts electricity to the filament.
  3. **Glass:** Protects the inside parts of the bulb.

It prevents nitrogen and argon gases from escaping.

It is transparent to allow light to pass through.

4. **Filament support:** It supports the filament.
5. **Contact:** It allows electricity into the bulb.
6. **Insulating material:** It separates the conducting wires.

#### Question

1. Why is a filament of an electric bulb coiled?
2. State any component of a circuit that use an alloy.
3. How is the reflector important in an electric torch?
4. Which gas is commonly used in electric bulbs?
5. Give one reason why the glass of a bulb is transparent?

#### Short circuits.(lesson eight) week two.

A short circuit is a path of low resistance towards flow of current through circuit.

#### Causes of short circuit

- ✓ Poor wiring when installing electricity in buildings.
- ✓ Pushing metallic objects in electric sockets.
- ✓ When bare electric wires get into contact.
- ✓ Wrong connection of wires in electric equipment.
- ✓ Overloading sockets.

#### Effects of short circuit.

- Destruction of electrical equipment.
- Fire that may burn the building.
- Lead to death of people and animals.

#### How to avoid short circuit

- Electric wires should be covered with an insulating material.
- Installation should be done by experts only.
- Repair of electric appliances should be done by experts.

**STATIC ELECTRICITY (lesson 9) week two**

- It is the type of electricity where there is no flow of electrons.
- It is formed when two insulators are rubbed against each other.
- In nature static electricity can be seen when lightning occurs.

**Lightning.**

- This is static electricity in nature.
- When a positively charged cloud meets a negatively charged cloud, a huge spark is formed and may pass to the ground.
- During the passage of lightning, the surrounding air is heated strongly, expands suddenly and then contracts quickly as it cools.
- This air vibrates to produce the sound called **thunder**.

**Advantage of lightning.**

- Lightning fixes nitrogen into the soil.

**Preventing effects caused by lightning.**

- Avoid sitting under tall trees when it is raining.
- Install lightning conductors on buildings.

**How lightning conductors reduce risks to the building.**

- They provide route for electrons to pass into the ground without damaging the building.

**Differences between static electricity and current electricity**

	<b>Static</b>	<b>Current</b>
1	Takes place in insulators.	Takes place in conductors.
2	The charge is on the surface.	Charge is inside the conductor.
3	The charge does not flow.	Charge flows through the conductor from one place to another.
4	Protons (+) and electrons (-) are both necessary for this type of electricity.	Only electrons flow.

**Importance of electricity.** (lesson ten), week two.

- Cooking
- Lighting
- Run machines like radios,

**Advantages of electricity in solving everyday problems.**

- It is quick.
- It is clean.
- Easy to use.

- Conserves the environment.

**Disadvantages of electricity.**

- It is expensive to install.
- Electricity can shock.
- It can burn buildings.

**Safety precautions in handling electricity and electrical appliances.**

- Never touch a switch with wet hands
- Avoid over loading the socket.
- Avoid repairing the appliance when not trained.
- Avoid pushing metallic objects into sockets.
- Never open anything that uses electricity if not an expert.
- Never touch an electric wire that has fallen from an electric pole.
- Never take shelter under tall trees during thunderstorm.

**Topical questions**

1. Briefly explain the term electricity.
2. Why electricity is called a form of energy?
3. Give any one way in which electricity can prevent deforestation.
4. Why is it important to properly handle electric appliances?
5. Draw a symbol of an electric bulb.
6. Suggest any one way in which we can prevent our electric appliances from being destroyed by electricity.
7. State any one difference between conductors and insulators.
8. Why are electric wires carrying current from the source raised some meters high from the ground?
9. Cite any one disadvantage of using electricity in the environment
10. Draw a diagram to show the flow of current.
11. Cite any one danger of lightning to the environment.
12. State the static electricity in nature.
13. Briefly explain how to overcome the dangers of caused by short circuits in the environment.
14. Why is the filament of an electric bulb coiled?
15. How is a fuse important in an electric circuit?

**Magnetism (lesson one), week three**

Is the property of a magnet which enables it to attract or repel other metals.

**Magnet**

Is a piece of metal that attracts other magnetic substances.

**What are magnetic materials?**

Are materials that can be attracted by a magnet.

They can easily be magnetized.

**Examples of magnetic materials**

- > Iron (most common magnetic substances)
- > Nickel
- > Cobalt

> **What are non magnetic substances?**

Are substances that cannot be attracted by magnets.

**Examples of non magnetic substances.**

- > Dry wood
- > Plastic
- > Lead
- > Glass
- > Cloth
- > Copper
- > Paper
- > Aluminium
- > Brass

**Types of magnets.**

There are two main types of magnets;

**i. Artificial magnets.**

**ii. Natural magnets.**

**a) Artificial magnets ( lesson two )week three**

These are magnets made by people.

**Examples of artificial magnets and their shapes.**

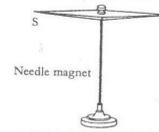
- > **Bar magnet:** This is a bar of uniform cross section. It may be rectangular or circular.



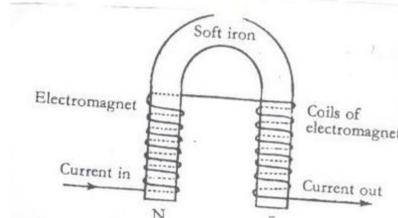
- > **Horse shoe magnet:** It has u shape.



- > **Needle magnet:** It has a thin pointed at both ends and balanced at the centre.



- > **Electromagnet**

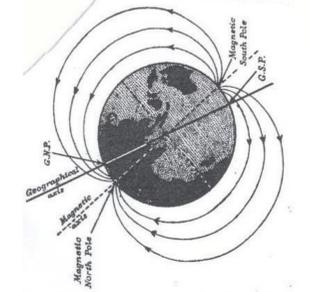


**b) Natural magnets**

They don't lose magnetism.

**Examples of natural magnets.**

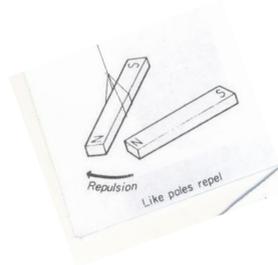
- > **The Earth:** It is a huge natural magnet. Its magnetic field is weak, that is why you can't feel it.



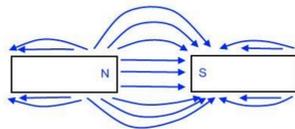
- **Lodestone/magnetite:** Lodestone is a magnetic ore which occurs naturally in the earth. It was discovered near the ancient city of magnesia in Asia Minor. It was the first magnet to be discovered by people.

**Properties of magnets(lesson four week three.**

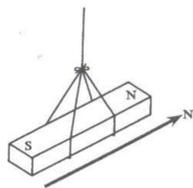
- Like poles of a magnet repel.



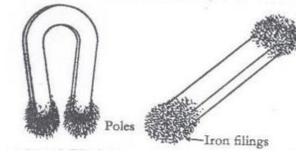
- Unlike poles attract each other.



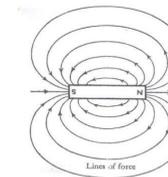
- When a magnet is freely suspended by a piece of thread it will always rest in the north-south direction.



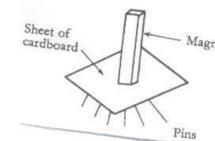
- The poles are the strongest part of the magnet.



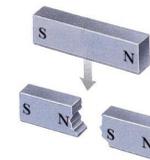
- Magnets have magnetic fields around them.



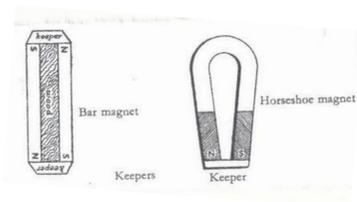
- Magnetism passes through **non magnetic materials** like wood and paper.



- Broken pieces of magnets regain their poles.



- Magnets become weaker with age.
- **Preventing magnets from losing magnetism.**
- Keep them using iron keepers.



(Lesson four) week three

**Laws of magnets**

- Like poles of a magnet repel each other while unlike poles attract each other.

**What is magnetic field?**

It is the area around the magnet in which it can attract other magnetic materials.

**Properties of magnetic fields.**

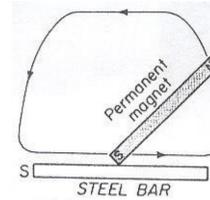
- ❖ They originate from **North Pole** and end at the **South Pole**.
- ❖ The lines forces do not intersect with each other.
- ❖ A line of force is continuous; it starts from the North Pole and ends at the south pole.
- ❖ There is no line of force within the magnet itself

**Methods of making magnets.**

- **Stroking by single touch:**

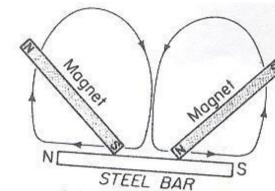
It is stroking by single touch method because one magnet is used.

Note. **The end after the stroke becomes the opposite pole of the magnet being used.**

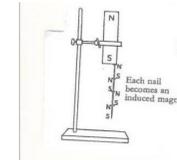


**Stroking by double/divided touch**

It is so because two magnets are used.



- **By induction** A magnetic object becomes magnetized by induction when it is nearer or contact with a magnet.

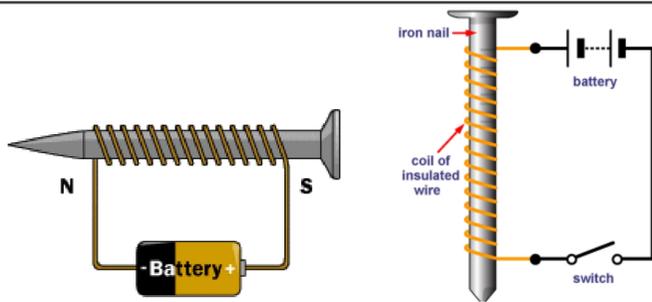


Lesson five and six ) week three

- **By electrical method**

This is a method of making magnets using electricity

A magnet made by using electricity is **electro- magnet.**



Electro magnets are made stronger by;

- By increasing the coils around the soft iron
- By increasing the voltage (electrical strength)

**Determining the poles an electromagnet.**

**i. The direction of flow of current.**

- Looking at it from either end;
- If current flows in an **anticlockwise** way through the solenoid, the pole is **North (N)**
- If current flows in a **clockwise** way through the solenoid, the pole is **South(S)**.

**ii. Using the right hand grip rule.**

- ❖ Grasp the solenoid in the **right hand** with **thumb pointing in the direction of current.**
- ❖ The thumb points to **the North Pole.**

**Demagnetizing a magnet(lesson seven) week three**

- It is making a magnet lose its magnetism.
- It is weakening or destroying a magnet.

**Ways of demagnetizing a magnet**

- Hammering/hitting strongly.
- Strong heating.
- Leaving a magnet in an east-west direction for a very long time.
- By keeping the magnets with like poles together.
- By passing an **alternating current** through a magnet.
- Leaving it to rust.

**Uses of magnets in modern world of work.**

- Magnets are used in compasses by sailors, pilots and explorers.
- Electromagnets are used in industries to collect heavy scrap iron.

- An electric bell is also built on the principle of magnets.
- Magnets are used in telecommunication devices.
- Electric motors which produce electricity use magnets.
- They are used in loud speakers.
- They are used on doors of fridges.

**Appliances that use electricity**

- Flat irons
- Heaters
- Driers.
- Washing machines
- Electric fans
- Cooker

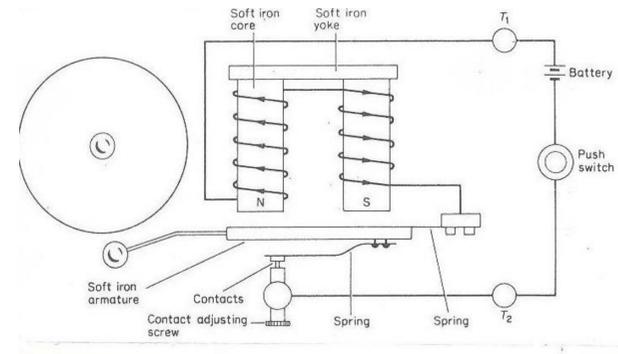
**Appliances that use magnetism**

- Magnetic compasses.
- Magnetic tapes.

**Appliances that use both electricity and magnetism.**

- Fridges.
- Radios
- Televisions
- Mobile phones
- Electric bells

**An Electric bell(lesson eight and nine) week three**



**How it works**

- ❖ When the contact is made the soft iron becomes magnetized.
- ❖ It pulls the soft iron strip with the hammer.
- ❖ The hammer hits the gong producing sound.

- ❖ When the strip is pulled the soft iron loses its magnetism and the contact is broken because current is not flowing.

**Generating electricity using a dynamo.**

**Dynamo.**

A dynamo is a device which converts mechanical energy into electrical energy. A dynamo uses a **permanent magnet** and a coil of wires on electro magnets. During the turning, the **mechanical energy** is turned into **electric energy**.

**Generator**

The type of current electricity produced is **A.C**. They change **Mechanical energy** to **electric energy**.

**Uses of dynamos and generators**

- Provide electricity for light.
- Provide energy to run machines.
- Provide energy for cooking
- Generators are used in hospital theatres incase power goes out.

**Topical questions**

1. How is magnetism different from magnets?
2. State the any one law of magnetism
3. How are magnets important to the following?
  - a) Doctors
  - b) pilots
  - c) teachers
4. Cite one item that uses both magnets and electricity.
5. How are magnets found in radios important?
6. In four sentences, briefly explain how an electric bell works.
7. Write the term AC in full.
8. What is the importance of the hammer found on an electro magnet?
9. State one way of making magnets.
10. In which one way can a p7 child make a magnet lose its magnetism?
11. Briefly explain how strong heating a magnet can make it lose its magnetism?

LESSON ONE WEEK FOUR

**TOPIC 3: ENERGY RESOURCES IN THE ENVIRONMENT.**

**VOCABULARY**

- Resource
- Hydro

- Tidal
- Coal
- Bio gas
- Wood fuel
- Fossil
- Petroleum
- Bio fuel

**A RESOURCE**

This is anything that people uses to satisfy their needs.

**ENERGY RESOURCE**

It is anything that provides people with useful energy.

**TYPES OF RESOURCES.**

1. Renewable resources. – Things that can be replaced naturally when used up.

**Examples:** Plants, animals, land( soil), water, air,

2. Non renewable resources.- Things that cannot be replaced when used up.

Examples: Minerals, rocks, fossil fuels.

**Energy resources .**

-Sun, Water, Minerals, Air or wind, Plants and Animals.

**The sun as major source of energy in the environment (solar energy).**

**THE SUN**

The sun is the main source of heat and light as forms of energy on earth.

**Importance of the sun to people and environment**

- The sun helps in rain formation.
- Preserve our food by sun drying.
- Helps the human skin to make vitamin D
- Helps to disinfect beddings
- Light from the sun helps us to see.
- Light from the sun is used to make solar electricity.
- Light from the sun enables plants to make food.
- Dry our clothes.

**Water as an Energy resource:**

It helps people to get the following form of energy.

- **Hydro electricity:**

It is the form of electricity produced by the power of running water at a fall.

When waterfalls at a greater height, **potential energy** is changed to **kinetic energy**.

**Kinetic energy** turns the turbines connected to a generator with powerful magnetic field and a coil of wire turning it. In this way HEP is produced.

➤ **Steam**

Steam with Kinetic energy helps to power **steam engines**.

LESSON TWO WEEK FOUR

➤ **Tidal energy**

This is the form of energy got from **water tides** on the sea shores.

Tides are periodic rises and falls of large bodies of water.

The tides are caused by gravitational interaction between the earth and the moon.

**Importance of water as an energy resource to people and environment**

- Fast running water at a fall turns turbines to produce HEP.
- Used to cool machines in industries.
- Used for bathing and drinking.
- Tidal energy is used to produce electricity.

**Fossil fuels (coal, petroleum, Uranium) as energy resources.**

**Importance**

**Examples of fossils.**

- Coal
- Petroleum
- Petroleum/crude oil

It is an energy resource from the ground formed from animals that died many years ago.

The changes in the earth created a lot of heat and pressure on them hence turning into petroleum.

Examples of petroleum.

- Petrol, diesel, oil, jet fuel, paraffin
- These fuels are got from crude oil by the process called fractional distillation.

**Importance of petroleum products**

- Used to generate power that can run machines and vehicles.
- They are burnt to produce light and heat.

**Importance of coal.**

- Used as fuel in steam engines.
- Coal is burnt to produce thermal electricity
- It is used to make tar for surfacing roads.

**Other products from petroleum.**

- Plastics, polythene paper, tar, dye, detergents, Vaseline, mattresses, grease, paint, fertilizers, etc

**Other products from coal**

- Paints, fertilizers, perfumes.

**Uses of uranium**

- It is used to make atomic bombs.
- It is used as fuel in nuclear powered sub marines.
- Uranium is burnt to produce atomic electricity.

**Geothermal energy**

- It is got from hot springs// thermal springs where steam is trapped to turn turbines to produce electricity.

LESSON THREE AND FOUR WEEK FOUR

**ANIMALS AS ENERGY RESOURCES.**

- Animals like oxen are used to plough land.
- Some animals like the donkeys are used for transport.
- Some animals are used as source of food.
- Some animals like oxen and ass are used to pull carts.

**PLANTS AS ENERGY RESOURCES.**

- They are source of food.
- They are source of wood fuel.
- They are source of building materials.
- They are used as shelter by some animals.

**How to conserve plant resources.**

- Through a forestation.
- Use fuel saving stoves.
- Use other //alternative sources of fuel like biogas.
- Educate people about the advantages of plants in the environment.

**Wind as energy resources.**

**AIR/WIND**

**Importance.**

- Used for winnowing
- Used to turn wind mills to produce electricity.
- Used to sail boats
- Helps to disperse seeds
- Used in pollination.
- Used to fly kites.
- Speed up evaporation and hence increases the speed to dry things.

**Plants (wood fuel, food) as energy resources.**

LESSON FIVE AND SIX WEEK FOUR

**Animals as energy resources.**

**Biogas production from plants**

**What is biogas?**

It is a methane that is produced from the rotting organic matter.

**The waste plant materials.**

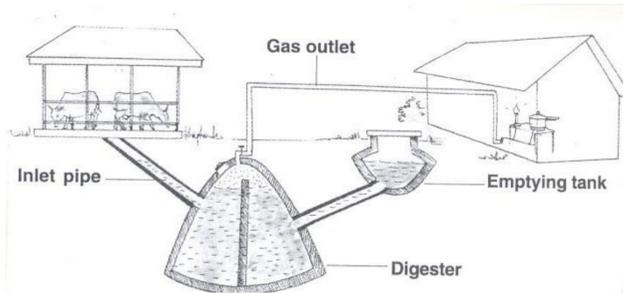
1. Cow dung.

2. Plant materials.
3. Animal urine.

**Steps of making biogas digester.**

The above materials are put into an air-tight container called a biogas digester, where they are worked on by anaerobic bacteria to ferment and biogas is formed. When the gas formation stops, the remains can be used as manure.

**Structure of Biogas digester**



**Uses of the parts.**

- Inlet: For inserting in plant and animal matter.
- Inlet pipe: allows plant and animal matter into the digester.
- Outlet: For removing old used up matter to the garden.
- Emptying tank: Where used up matter is collected before it is taken to the garden.
- Biogas tube: It traps biogas and takes it to the heating or lighting equipment.

**Uses of biogas**

1. For cooking
2. For lighting
3. For heating.

**Advantages of using biogas**

1. It is cheaper than using natural gas
2. It does not pollute the environment.
3. The materials are readily available in the environment.

**TOPICAL QUESTIONS**

1. In which one way do plants depend on?
  - a) Cattle b) human beings c) goats
2. Mention any one advantage of using biogas over using firewood.
3. How is a biogas digester important in the production of biogas?
4. Cite any one thing used in the making of biogas.

5. Write down any three ways how animals depend on non living things in the environment.
6. In what way can a farmer use the residue left after making bio gas.
7. State any two uses of biogas to human beings.
8. Why is wind said to be a form of energy?
9. How does use of biogas contribute towards the control of environmental degradation?
10. What danger caused when biogas containers are kept near the reach of young children?

(WRITING, MARKING AND GOING THROUGH MID TERM EXAMINATIONS IN WEEK FOUR LESSONS 7,8,9,WEEK FIVE LESSONS: 1,2,3,4,5,6 and 7)

**Topic 4: Simple Machines and Friction**

**VOCABULARY**

- |                        |         |
|------------------------|---------|
| • Friction             | Force   |
| • Nuisance             | Moments |
| • Mechanical advantage | Wedges  |
| • Inclined Plane       | Axles   |
| • Screws               |         |

**LESSON 8 AND NINE WEEK FIVE**

**FRICION**

- Is the force that opposes movement of objects.

**Types of friction**

1. **Static friction:** It is found in objects which are fixed in one position.
2. **Sliding or rolling friction:** It is found in moving objects.
3. **Viscosity friction:** This occurs in liquids and gases.

**Properties of friction.**

- i. There is more friction with rough surfaces than with smooth or slippery ones.
- ii. The greater the load, the greater the friction force (weight increases friction)
- iii. Whenever friction occurs heat is produced.

**Friction as a useful force in our daily life.**

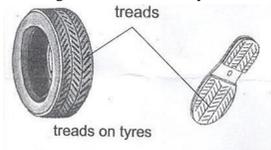
1. It helps in moving and stopping vehicles.
2. It helps when writing.
3. It helps when sharpening objects.
4. It helps when walking.
5. It helps in lighting match sticks.

**Friction as a nuisance force/ disadvantages.**

1. It wears away things e.g. shoe soles, parts of engines.
2. It hinders work as it makes us use a lot of force.
3. It produces unnecessary heat and noise.

**How to increase friction.**

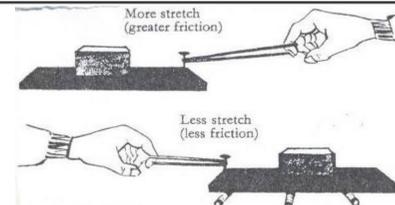
- i. Making smooth surfaces rough.
- ii. Putting treads on vehicle tyres / on shoe soles.



- iii. Putting spikes on sports boots.
- iv. Putting grips on handles of bicycle.

**How friction can be reduced.**

- i. **Using rollers;** they decrease areas of contact between moving parts.



- ii. **Using ball bearings;** these are round metallic balls they reduce friction by keeping moving parts separated.



- iii. **Lubricating;** This involves using oil or grease. Oil and grease are referred to as **lubricants**.
- iv. Stream lining objects like planes, cars



- v. Making rough surfaces smooth.

**Questions.**

1. State a brief meaning to the term friction.
2. In one way explain how friction can be increased on a slippery surface.
3. Write down any two advantages of friction in our lives.
4. Why is friction said to be a nuisance force?
5. Why are some objects stream lined?
6. State any two items that are stream lined?

**WEEK SIX LESSON 1 AND 2**

**MACHINES**

It is a device that simplifies work.

**How do machines simplify work**

1. By changing the direction of force.

2. By reducing the effort required to do work
3. By increasing the speed of work.

**Types of machines**

1. Simple machines.
2. Complex machines.

**A complex machine**

It is a machine that is made up of many parts and simplifies work. When two or more simple machines (tools) are put together a complex machine is made

**Examples of complex machines**

Tractor, Bicycle, Sewing machine, Car, Aero plane etc.

**Simple Machine.**

It is a device that is made up of few parts and simplifies work.

**Examples of simple machines.**

A hoe	See saw	Claw hammer	Nut cracker.	Human arm.	Nut cracker.
A wheel barrow	Pincers.	Water pump	Sugar tongs.	Spade.	Sugar tongs.
A pair of scissors	Crow bar.	Bottle opener	Fishing rod	Ladder.	Stairs.

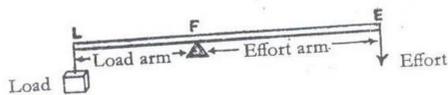
**Classes of simple machines.**

1. Levers
2. Inclined planes/slope
3. Pulleys.
4. Screws.
5. Wheel and axle
6. Wedges

**Levers**

Is a stiff rod that turns on a fixed point called a pivot or fulcrum.

**Parts of a lever**



1. **Effort:** is the force exerted on a machine to overcome the load.
2. **Load / resistance:** it is the weight of the body to be lifted.
3. **Fulcrum or Pivot:** is the turning point of a machine.
4. **Load arm** is the distance between the fulcrum and the load.
5. **Effort arm** is the distance between the fulcrum and the effort.

**WEEK SIX LESSON THREE AND FOUR**

**Classes of levers.**

There are three classes of levers depending on the position of the fulcrum(f), Load(l) and effort(E)

**First class levers**

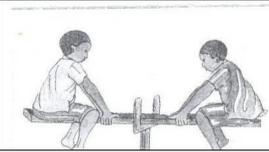
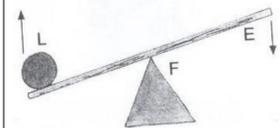
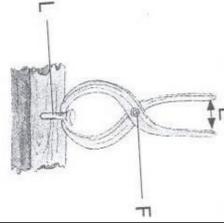
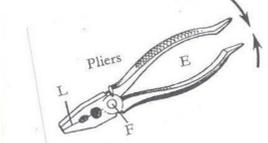
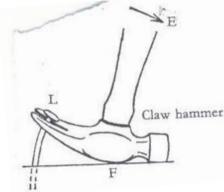
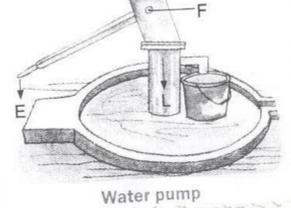
Fulcrum/pivot is between the load and effort

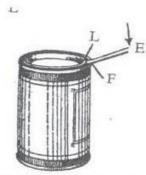
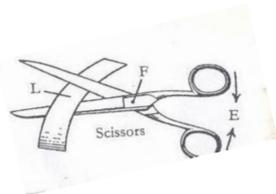
In this class, the effort arm is longer than the load arm.

The longer the effort arm, the smaller the effort applied.

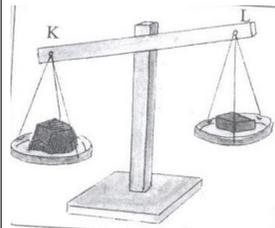
The advantage of the first class lever is that less effort is used.

**Examples of first class levers.**

1	See saw	5	Crow bar
			
2	pincers	6	pliers
			
3	Claw hammer	7	Water pump
			
4	scissors	8	Lid opener



9 scales



**Second class lever**

**Load** is between the **fulcrum** and **effort**.

The fulcrum and the effort are on either side. (FLE OR ELF)

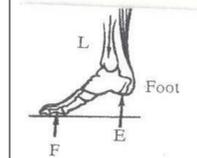
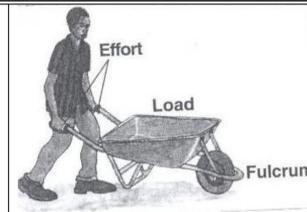
The load is closer to the fulcrum than the effort

The effort applied is smaller compared to the load.

First and second class levers are referred to as force multipliers

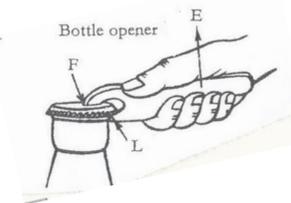
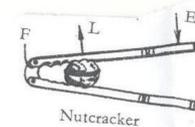
**Examples of second class levers.**

1	Wheel barrow	3	Human Foot
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2 Nut cracker

4 Bottle opener



**Questions.**

- Write down any two examples of each of the following.
  - 1<sup>st</sup> class lever
  - second class lever
- State any one advantage of using first class lever?
- Draw one any two items in 1<sup>st</sup> class lever.
- How are machines important in life?
- State any two ways in which machines are able to improve on the efficiency of a machine

**WEEK SIX LESSON FIVE AND SIX**

**Third class levers**

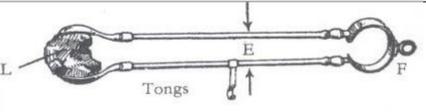
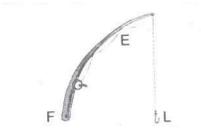
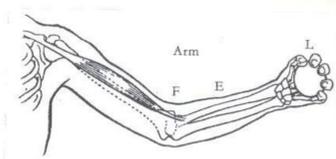
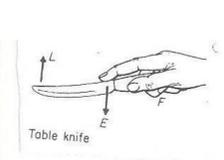
Effort is between fulcrum and load

The fulcrum and the load are on the either side. (FEL)

The effort is closer to the pivot than the load  
 The effort used is greater than the load.  
 Third class levers are referred to distance multipliers.

The advantage of using this class is that the effort moves through a shorter distance

**Examples of third class levers**

<p>1 Sugar tongs</p> 	<p>3 Fishing rod.</p> 
<p>2 Human arm.</p> 	<p>4 Spade.</p> 
<p>5 Table knife</p> 	<p>6. Tweezers</p> 

**N.B**

The formula PLE or FLE can help to determine the class of lever

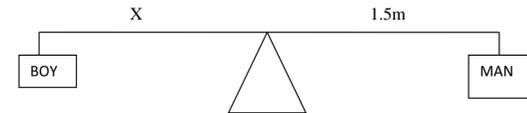
**The principle of moments. (The law of the lever)**

The load force multiplied by the load arm is equal to the effort force multiplied by the effort arm.// it

states that clock wise moments are always equal to anti-clock wise moments

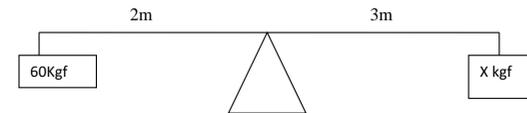
**Examples**

1. A man weighs 60 kgf. He sits 1.5 metres from the fulcrum of the see saw. How far from the fulcrum will the boy whose weight is 30 kgf sit in order to balance the man.  
 Let the man be the effort and the boy be the load.  
 Let the load be x metres.



$$\begin{aligned} \text{Load} \times \text{Load arm} &= \text{Effort} \times \text{effort arm.} \\ 30\text{Kgf} \times X &= 60\text{kgf} \times 1.5\text{m} \\ \frac{30x}{30} &= \frac{90}{30} \\ x &= 3 \text{ metres} \end{aligned}$$

2. A boy weighing 60kgf sits 2 metres away from the fulcrum of the see saw. A girl sits on the other side at a distance of 3 metres from the fulcrum in order to balance the see saw. Find the weight of the girl.



Let the boy be the effort and the girl the load.  
 Let the girl's weight be y  
 Then, Load x Load arm=Effort x Effort arm  

$$\begin{aligned} y \times 3\text{m} &= 60\text{Kgf} \times 2 \text{ metres.} \\ \frac{3y}{3} &= \frac{120}{3} \\ y &= 40\text{kgf} \end{aligned}$$

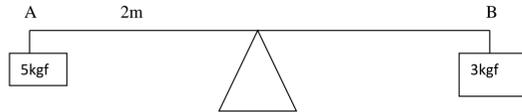
3. A weight of 120 grams at a distance 3cm from the fulcrum is balanced by a weight of 30g on the other side. Find the distance from the 30kg weight to the fulcrum.

Take 120kgf as the effort and 30kg as the load.  
 Let y be the distance of the load from the fulcrum.  
 Then Load x load arm=Effort x Effort arm.  

$$\begin{aligned} 30 \times y &= 120\text{gf} \times 3\text{cm} \\ 30y &= 360 \end{aligned}$$

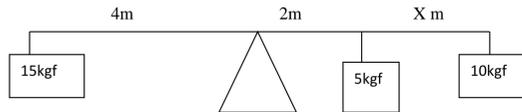
$$\frac{30}{y} = \frac{30}{12\text{cm}}$$

4. Using a see-saw shown below, find the length of the wooden plank AB.

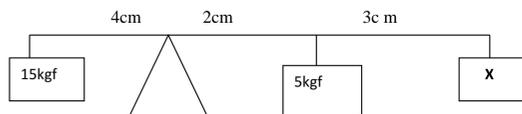


**WEEK SIX LESSON SEVEN AND EIGHT**

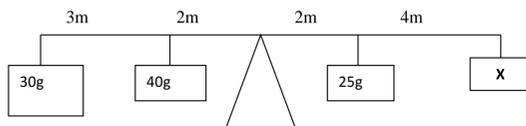
1. Find the value of X



2. Find the weight at X



3. Find the weight at X



**WEEK SIX LESSON NINE AND TEN**

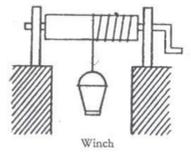
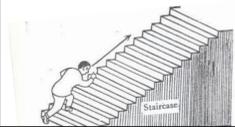
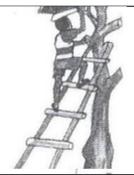
**The inclined plane (slope)**

An inclined plane is a slanting surface.

**Importance of an inclined plane.**

- It enables heavy loads to be raised using a lesser effort.

**Examples of inclined plane**

1	Winding road	3	Winch
			
2	Stairs/ steps.	4	Ladders
			

**Mechanical Advantage of machines.**

Mechanical Advantage is the ratio of the load to effort. i.e.  $M.A = \text{Load/effort}$ .

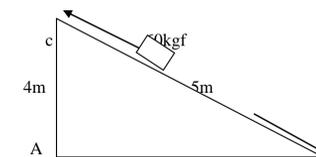
M.A is the number of times a machine simplifies work.

M.A has no units since it is a ratio.

Friction lowers M.A.

Example;

John used a slope to raise a load of 60kgf from the ground to the higher level as shown below.



Work out the following

The effort distance

$$= 5\text{m}$$

The load distance

$$= 4\text{m}$$

Work done

$$W = FXD$$

$$M.A = \frac{\text{Load}}{\text{Effort}}$$

$$= \frac{\text{Distance effort moves}}{\text{Distance load moves}}$$

$$= \frac{5}{4}$$

$$= \frac{5}{4}$$

### Work

Work is a product of force and the distance moved.

Work = Force x Distance moved.

Work done by the effort = effort x effort arm.

Work done by the load = load x load arm.

The unit of work is a joule.

The unit of force is the Newton.

The standard unit of distance is the metre.

$$1 \text{ kgf} = 10\text{N}$$

1 joule (of work) is done when one newton (of force) moves through one metre (of distance)

$$1 \text{ joule} = 1 \text{ N} \times 1 \text{ m}$$

$$1 \text{ joule} = 1 \text{ Nm}$$

### Questions

From comprehensive science book seven.

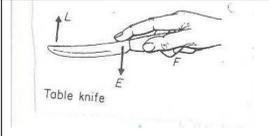
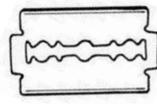
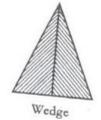
### WEEK SEVEN LESSON ONE

#### WEDGES

A wedge is a cutting tool. It is double inclined plane/slope.

#### Examples of wedges

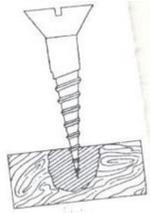
1	Knife edge.	5	Axe blader
---	-------------	---	------------

			
2	Hoe	6	Razor blade
			
3	Nail.	7	Needle.
			
4	A wedge 		

### LESSON TWO

#### SCREWS

#### DIAGRAM SHOWING A SCREW.

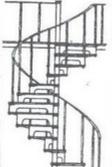
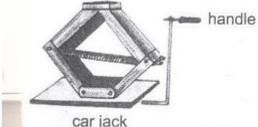


A screw is an inclined plane wound round  
We use it to make our work easier.

**USES OF SCREWS**

1. Lifting very heavy things e.g. screw jack.
2. It makes movement upstairs easier e.g. using a spiral staircase
3. Used to fasten things together.

EXAMPLES OF SCREWS

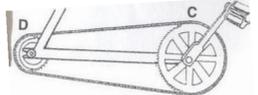
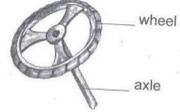
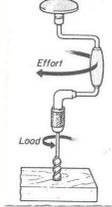
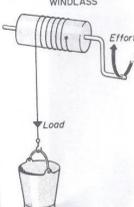
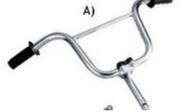
1	Spiral staircase	3	Screw jack
			
2	Screw nails		
			

**WEEK SEVEN LESSON THREE**

**Wheel and axle**

An axle is a rod passed through a wheel.  
The wheel rotates on an axle.

Examples of devices that use wheels and axles.

1	Door Knobs	5	Pedal wheels
			
2	steering wheel	6	Egg beaters
			
3	Screw drivers	7	Brace
			
4	Windlass		Handles of a bicycle.
			

**USES OF WHEEL AND AXLE**

1. Drawing water from underground tanks using windlass/winch.

2. Drilling holes in wooden materials using the brace
3. Turning screws to fix things together using a screw jack.
4. It helps in loosening the screws.
5. Preparing eggs for frying using egg beaters.

#### Questions

1. Give any two examples of each of the following:
  - a) Wheels and axles
  - b) screws
2. How are screws important to people?
3. Give any two uses of screws.
4. Give any two examples of screws.
5. How are inclined planes important to human beings?

#### WEEK SEVEN LESSON FOUR AND FIVE

#### PULLEYS

A pulley is a wheel with grooved rim that rotates freely about an axle through a centre.  
A rope or chain passes over the pulley and is prevented from slipping by the grooved

The frame which holds the pulley is called block.

#### IMPORTANCE OF PULLEYS.

1. They help in lifting objects from the lower level to higher level.
2. They help in lifting heavy loads during building.
3. They help in off loading heavy vehicles.
4. They help in towing vehicles.
5. They are used to raise flags on the poles.
6. Help to move window curtains.

#### TYPES OF PULLEYS.

1. Single fixed pulley
2. Single movable pulley.
3. Block and Tackle system.

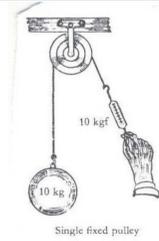
#### SINGLE FIXED PULLEY.

The effort applied is equal to the load.

It changes the direction of force

Boy applying the down ward force, work becomes easier.

The M.A of a single fixed pulley is one (1).



#### **Example;**

If a load of 30kgf is to be raised using a single fixed pulley, find the effort needed

$$M.A = 1$$

$$L = 30\text{kgf}$$

$$E = ??$$

$$M.A = \text{load/Effort}$$

$$1 = 30/E$$

$$E \times 1 = 30$$

$$E = 30\text{kgf.}$$

#### LESSON SIX

#### SINGLE MOVABLE PULLEY

It is supported on two ropes.

The rope is pulled up wards.

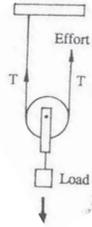
The pulley moves with the load.

Each of the ropes share a half of the effort needed.

The rope moves twice as far as the load.

The M.A advantage of single movable pulley is 2 (two)

Effort applied is half the load force. (It reduces the effort needed)



**Example.** If a load of 30kgf is to be raised using a single movable pulley, Find the effort needed.

$$M.A = 2$$

$$L = 30\text{kgf}$$

$$E = ??$$

$$M.A = L/E$$

$$2 = 30/E$$

$$2 \times E = 30$$

$$\frac{2E}{2} = \frac{30}{2}$$

$$E = 15\text{kgf.}$$

#### DIFFERENCES BETWEEN FIXED AND MOVABLE PULLEY

Fixed pulley	Movable pulley
Work is done faster	Work is slower
Change direction of force	No change of in direction of force
Force used is equal to the load.	Effort applied is half the load force.

#### WEEK SEVEN LESSON SEVEN

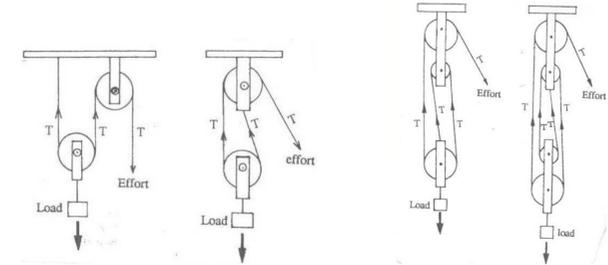
##### BLOCK AND TACKLE SYSTEM.

It does work more easily because it is a combination of both fixed and movable pulleys.

It changes direction of force.

It reduces effort needed.

The ratio of load to Effort is determined by the number of pulleys.



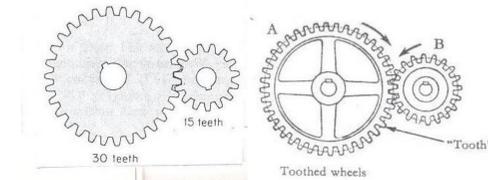
#### GEARWHEELS/COG WHEELS OR TOOTHED WHEELS

A gearwheel is a special form of the wheel

It has teeth around its edge.

These teeth interlock with the teeth of another gear wheel.

When one turns it causes the other one to turn.



If A has 30teeth and B has 15 teeth, how many rotations does B make in one revolution?

30divided by 15

=2 turns.

Questions.

1. Give any two types of pulleys.
2. How are pulleys important at school?
3. Calculate the Mechanical Advantage of a machine that needs an effort of 20kg to over come a load of 60 kg.
4. State one difference between a single fixed pulley and a single movable pulley.
5. Cite any two importance of the rope on a pulley.

**WEEK SEVEN LESSON 8 AND 9**

**Topic 5: EXCRETORY SYSTEM**

**VOCABULARY**

- Excretion Ureter
- Urinary system Wastes

Excretory system that collects waste products in the body cells and removes them from the body.

**Importance of the excretion.**

- Maintains homeostasis by keeping the body's internal environment stable and free from dangerous substances.

**EXCRETION:**

It is the process by which harmful materials are removed from the body.

The removal of harmful substances from the body.

**EXCRETORY PRODUCTS FROM THE BODY.**

Excretory organ	Excretory products
Lungs	Carbon dioxide ,water
Kidneys	Uric acid, excess water ,salts, urea
Skin	Water, salt
Liver	Bile pigments

Note: Urea, inactive hormones, excess salts and water are waste products in Urine.

Water and salts are waste products in sweat

**WEEK EIGHT: LESSON ONE AND TWO.**

**THE HUMAN SKIN**

It is the largest organ of the body.

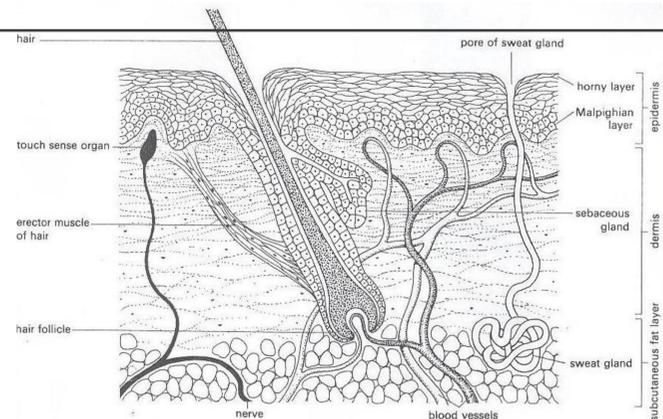
It covers most part of the body.

It is a sense for feeling

The skin removes sweat from the body.

Through sweating, the body cools down.

**STRUCTURE OF THE SKIN.**



**The skin consists of two main layers.**

- ❖ Epidermis.
- ❖ Dermis layer.

**Epidermis.**

- It is the outer layer.

**The layers that make up the epidermis.**

- a) Cornified layer.
- b) Granular layer
- c) Malpighian layer.

**Cornified layer**

It is the tough outer most layer with dead cells.

- ❖ It prevents bacteria/germ invasion to the skin.
- ❖ It provides resistance to damage.
- ❖ It reduces excessive loss of water by evaporation.

**Granular layer**

It contains living cells and produces new cells which die continuously to form the cornified layer.

**Malpighian layer.**

It is made up of young cells.

It contains melanin that determines skin colour and hair colour.

Melanin also protects the skin against strong radiation from the sun.

- ❖ NB: When you lack melanin, you become an albino
- ❖ On the finger nails are cells called keratin that helps to produce toes and finger nails.

### Dermis.

It is the inner layer of the skin.

### Parts of the dermis.

Capillaries, Sweat glands, Hair follicle, Sebaceous glands, Sweat duct, Pore,

- ❖ Erector muscles, Nerves, Subcutaneous fat .

### Uses of some parts of the skin.

- ❖ **Hair:** For keeping the body warm.
- ❖ **Sweat glands:** They produce and store sweat  
Absorbs sweat from blood.
- ❖ **Pore:** It lets sweat out of the body.
- ❖ **Capillaries:** Transport food and oxygen to all parts of the skin.
- ❖ **Sebaceous glands:** Produce an oily substance called sebum.  
Sebum protects, lubricates and water proofs the skin, helps repel water, damaging chemicals and microorganisms.
- ❖ **Erector muscle:** It keeps the hair standing.
- ❖ **Nerves:** Conduct sensations of pain and touch.
- ❖ **Subcutaneous fat:** It contains fat cells where fat is stored.

### Function of human skin.

- Excretes salts, water and urea (sweat).
- Stores fat for keeping the body warm.
- Prevents the entry of germs in the body.
- It regulates the temperature of the body.
- It is a sense organ for feeling.
- It water proofs the body.
- It helps in making vitamin D
- Protects the body from mechanical injury.

### **How does the body regulate body temperature?**

#### **When it is hot, the skin regulates the body temperature through:**

- ❖ Sweating.
- ❖ Vasodilation- widening of arterioles to allow blood flow to the skin surface.

#### **When it is too cold, it regulates the temperature by:**

- ❖ Shivering
- ❖ Vasoconstriction- arterioles become narrow to reduce the flow of blood to the skin surface.
- ❖ Furry mammals and birds fluff out fur of feathers to improve insulation and reduce heat loss from the body.
- ❖ Production of goose pimples in man.

### LESSON THREE AND FOUR

### Diseases of the human skin.

- ❖ Scabies- caused by itch mites.
- ❖ Athlete's foot- caused by fungus.
- ❖ Dhobi itch- caused by fungus
- ❖ Leprosy- Caused by bacteria.
- ❖ Impetigo- Caused by bacteria
- ❖ Boils- Caused by bacteria.
- ❖ Skin cancer- using strong chemicals on the skin.
- ❖ Chicken pox- caused by a virus.
- ❖ German measles- Caused by a virus.
- ❖ Scurvy- Lack of vitamin c

### Disorders of the human skin.

- ❖ Albinism: Lack of colour in the skin.
- ❖ Burns.
- ❖ Scalds
- ❖ Cuts

### Care of the human skin.

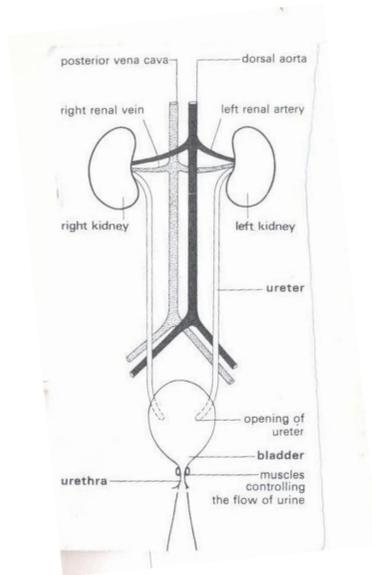
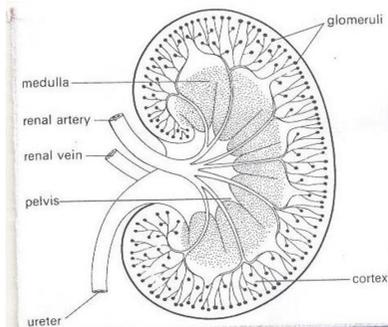
- ❖ Wash the body with clean warm water and soap.
- ❖ Smear the body with Vaseline to make it soft.
- ❖ Avoid sharing clothes towels, basins and sponges.
- ❖ Wash and iron clothes before wearing them.
- ❖ Eating foods rich in a balanced diet.
- ❖ Avoid playing with sharp cutting materials.
- ❖ Do regular physical exercises.

### KIDNEYS

- ❖ They remove nitrogenous compounds from the body.
- ❖ Regulate the amount of water and salt in the body.
- ❖ They belong to the excretory and urinary systems.

### LESSON FIVE AND SIX

#### **Structure of the kidney**



#### FUNCTIONS OF THE PARTS OF THE KIDNEY.

- ❖ **Kidney wall:** It protects the internal parts of the kidney.
- ❖ **Cortex:** For filtration of blood.

- ❖ **Medulla:** Re absorption of water, salt and other substances.  
The process of re absorption of water from urine is known as **osmoregulation**.
- ❖ **Pyramid:** A hole through which urine from the cortex pours into pelvis.
- ❖ **Pelvis:** receives urine from the cortex before it goes down to the urinary bladder.
- ❖ **Ureter:** It is a passage of urine from pelvis to the urinary bladder.
- ❖ **Renal artery:** It carries oxygenated blood from the aorta to the kidney.
- ❖ **Renal Vein:** It carries deoxygenated blood from the kidney to the vena cava.
- ❖ **Kidney-** It filters blood to remove urine// regulate amount of salt and water.
- ❖ **Urethra-**It is a tube through which urine is passed out of the body.
- ❖ **Sphincter muscle-**They control the flow of urine out of the urinary bladder.
- ❖ **Urinary bladder-**It stores urine before it is passed out of the body.

#### Functions of the kidney.

- ❖ Filters blood
- ❖ Regulates the level of water, sugars and salts in the body.

#### Good habits for the kidney

- ❖ Doing daily physical exercises.
- ❖ Avoid holding back urine for a long time.
- ❖ Go for medical examination in case of long time back pains
- ❖ Drink boiled water.

#### Why do we urinate frequently on a cold day than a hot day?

On a hot day, you sweat a lot, therefore there is less work of kidneys  
On a cold day, there is less or no sweating as the pores are half or fully closed.  
So, the kidneys take over the work of removing excess water from the body.

#### Why do you pass out of urine when you drink a lot fluids?

Kidneys keep a constant amount of water in the blood.

#### Why is the left kidney located slightly higher than the right kidney?

- ❖ The right kidney is found under the liver which is the largest internal organ than the left kidney which is under the spleen.

#### DISEASES OF THE KIDNEY AND THE URINARY SYSTEM.

- ❖ Kidney stones.
- ❖ Kidney failure
- ❖ Bilharzia.
- ❖ Nephritis: this is an inflammation of the kidney

#### THE LUNGS AS EXCRETORY ORGANS.

- ✓ The Lungs remove carbon dioxide and water from the body.
- ✓ Lungs are both **excretory and respiratory organs**.
- ✓ As air goes through the nose it is warmed, moistened and cleaned. (filtered)
- ✓ When we breathe through the mouth we take in cold air which may affect our lungs.
- ✓ Gaseous exchange takes place in the alveoli.

#### DISEASES OF LUNGS.

- Diphtheria, Lung cancer, Asthma, Pneumonia, Bronchitis, Tuberculosis Whooping cough

- Haemophilus influenza, Laryngitis, Emphysema, Pleurisy

**DISORDERS OF THE LUNGS.**

- Choking
- Hiccups
- Yawning

**LESSON 8 AND 9**

**LIVER**

It is the largest internal body organ.

**Function of the liver.**

- Regulation of blood sugars.
- Produces bile salts which aid absorption of fats.
- Stores iron.
- It reduces on excess amino acids in the body (deamination)
- Manufacture of plasma proteins.
- It burns fats to forms glucose and release energy.
- It converts poisonous compound into harmful substances (Detoxication)
- It stores vitamin A, D and B12
- It produces heat.

**Circulation to and from the liver.**

- **Hepatic artery:** It supplies oxygenated blood to the liver.
- **Hepatic portal vein:** It supplies blood with digested food from the stomach and intestines to the liver.
- **Hepatic vein:** Carries deoxygenated blood from the liver to the venacava.

**Diseases of the liver.**

- **Hepatitis:** Caused by a virus spread by contaminated water.
- **Cirrhosis:** Hardening of liver tissue as a result of alcoholism.

**Abscesses** There are pus filled sacs on the liver.

Questions.

- How are the following important in our bodies:
  - Kidneys
  - Lungs
  - liver
- State any two excretory organs.
- Write down any one waste material from the body.
- Why is it important to keep our bodies clean?
- State any one disorder of the following:
  - Skin
  - kidneys.
- State any two ways of keeping the following in good working conditions
  - Skin
  - lungs
  - liver
- Why is the skin called an excretory organ?
- Write down any two diseases of the following:

a) Skin

b) lungs

**WEEK NINE: Lesson one and two**

**Topic 6: Light Energy**

**VOCABULARY**

- Beams
  - Opaque
  - Eclipse
  - Lunar
- Translucent  
Shadows  
Solar  
Periscope

- Optical Prism
- Spectrum

### LIGHT

Light is a form of energy that enables us to see.

**NB:** We see things around us because light **from them** is reflected into **our eyes**.

#### Light as a form of energy.

Light is a form of energy because it is capable of doing work.

#### **Importance of light in the environment.**

- ✓ Sunlight enables plants to make their own food.
- ✓ It enables us and other animals to see
- ✓ Our skins are able to make vitamin D.
- ✓ It is used for photography.
- ✓ We use artificial light on the streets to control traffic

#### SOURCES OF LIGHT.

1. Natural sources of light.
2. Artificial sources of light.

##### Natural sources of light

These are sources of light provided by nature.

##### Examples of natural sources of light include

- ✓ Sun, Star, Erupting volcanoes, Lightning, Glow worms, Fireflies

**Nb:-** Of the above, some are very hot e.g. sun and stars, erupting volcanoes.

- Others are not hot at all e.g. fireflies, glow worms

##### ii. Artificial sources of light

These are sources which are made by people.

##### Examples of artificial sources of light.

- ✓ Solar lamps, Electric lamps, Fluorescent tubes, Electric tubes, Hurricane lamps, Fire

Objects that produce light are divided into two;

- i) Luminous objects
- ii) Non luminous objects.

##### Luminous objects/ Direct sources.

These are objects that produce their own light

Examples are sun, stars, erupting volcanoes, lamps, torches, hot charcoal etc

##### Non luminous objects/ indirect sources.

These are objects that reflect light from other sources of light.

Examples of non luminous are the moon, the planets, and mirrors.

#### **The speed of light**

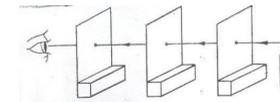
The speed of light in normal air is 300000km/sec.

Light travels faster in materials less dense than air e.g. warm and slowly in materials that are denser than air e.g. glass, water.

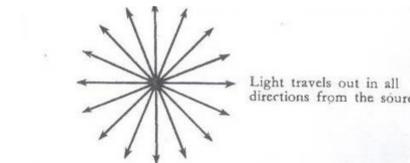
#### LESSON THREE

##### Propagation/properties of light.

##### 1. Light travels in a straight line



##### 2. Light travels from a source in all directions.



##### RAYS

A ray is a path taken by light.

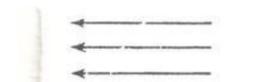


##### BEAMS OF LIGHT

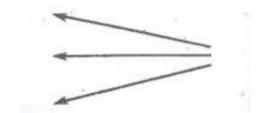
A beam is a group of light rays traveling in the same direction.

##### **Types of beams**

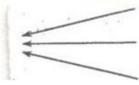
##### i. Parallel beam



##### ii. Divergent beam



##### iii. Convergent beam



**EFFECTS OF DIFFERENT MATERIALS ON LIGHT.**

✓ **Transparent objects**

These are materials that allow all light to pass through them

**Examples of transparent materials**

- i. Clear glass
- ii. Clear still water.
- iii. Air.

✓ **Translucent materials**

These are objects which allow little light to pass through them.

We can't see through translucent objects because they scatter light passing through them.

**Examples of translucent materials.**

- i. Frosted glass
- ii. Ground glass.
- iii. Coloured glass.
- iv. Oiled paper.
- v. Smoky air.
- vi. Thin cloth.
- vii. Tracing paper.

**Effects of translucent objects on light.**

They allow little light to pass through them.

They diffuse the light

✓ **Opaque objects**

An opaque object is that which does not allow any light ray to go through it.

**Examples of opaque objects**

- 1. A wall.
- 2. A hard paper.
- 3. Wood.
- 4. Stones.
- 5. Human Body
- 6. Metals.

**Effects of opaque objects in light**

They obstruct light and form shadows.

**LESSON FOUR AND FIVE**

**SHADOWS**

A shadow is a region of darkness caused by obstruction of light.

**Formation of a shadow**

a) **Shadow formed from a point of source of light.**

A total shadow is formed.

b) **A shadow formed from a source of light bigger than a point.**

Each point on the source produces its own shadow

All these shadows overlap to give a single shadow.

This single shadow has a darker inner portion and less dark outer portion

**Parts of a shadow**

i. **Umbra**- It is the darker part of a shadow.

It is formed by total obstruction of light

ii. **Penumbra**- It is the lighter part of a shadow.

Penumbra is formed by partial obstruction of light.

**ECLIPSE**

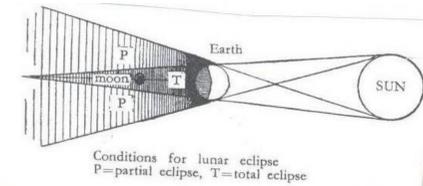
Is a total/ partial blocking of sunlight when the earth/moon is between the other bodies. The sun, the moon and the earth are the bodies commonly involved in the eclipse.

**Types of eclipse**

**i. Solar eclipse**

This is the eclipse of the sun.

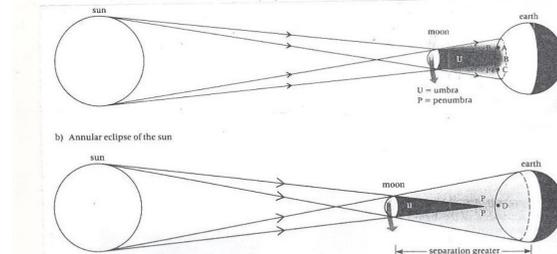
It occurs when the moon comes between the sun and the earth (SME)



**ii. Lunar eclipse**

This is the eclipse of the moon

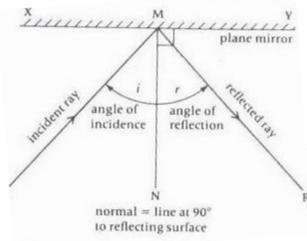
It occurs when the earth comes between the moon and the sun (MES/SEM).



**LESSON SIX AND SEVEN**

**REFLECTION**

Is the bouncing back of light.



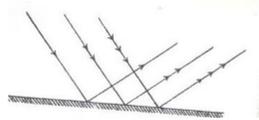
- The ray that hits the surface is **incident ray**.
- The ray that bounces off the surface is **reflected ray**.
- **The normal** is perpendicular between the incident ray and reflected ray.
- The angle between the normal and the incident ray is **angle of incidence**.
- The angle between the normal and the reflected ray is **angle of reflection**.

**Types of reflection.**

- Regular reflection.
- Irregular reflection/Diffuse reflection.

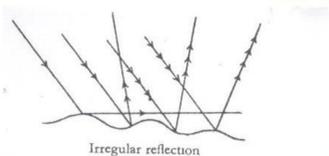
**REGULAR REFLECTION.**

It occurs on shiny smooth surfaces.  
The reflections are regular.

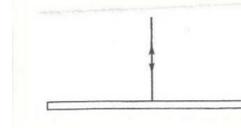


**IRREGULAR/DIFFUSE REFLECTION**

It occurs in shiny rough surfaces  
The reflections are irregular



**NORMAL REFLECTION**



**The laws of reflection.**

- The incident ray, the reflected ray and the normal all lie in the same plane.
- The angle of incidence is equal to the angle of reflection.
- The ray travelling along the normal is reflected back along itself.
- An object appears a certain color because it reflects that color and absorbs the other colors.

**LESSON 8 AND 9**

➤ **REFLECTION AND LIGHT**

- Light coloured objects reflect more light than the dull ones.
- White light contains all the three primary colours of light.
- A white object absorbs no colour but reflects all.
- A black object absorbs all the primary colors and reflects none.
- An object which absorbs all the primary colors appears black.
- Black light means absence of any color.

**When light falls on an object, the following can happen to it.**

- It is reflected either regularly or irregularly.
- It can pass through a body totally or partially.
- It is either refracted or diffused.
- It can be absorbed either partially or completely.

**The table shows why certain colours appear the way they appear**

colour	Absorbs	Reflects	Appears as
Red object	Green, Blue	Red	Red
Blue object	Red, green	Blue	Blue
Green object	Red, blue	Green	Green
Black object	Red, Blue, Green(all)	None	Black.
White object	None	Red, Blue, Green(all)	White

**Uses of reflection in our daily life.**

- People can watch football match over the heads of the crowd using a periscope.
- Soldiers can see enemies without exposing themselves to them using periscopes.
- Submariners can see ships on the surface of the sea using periscopes.
- Mirrors are used on vehicles to see traffic behind and avoid causing accidents.
- Torches, car headlamps have concave reflectors.
- Solar cookers use a concave mirror to focus sunlight on spot and use it for cooking.

- Some shaving mirrors are concave as they magnify the image.

**WRITING, MARKING AND GOING THROUGH END OF TERM ONE EXAMINATIONS IN WEEK TEN ALL LESSONS)**

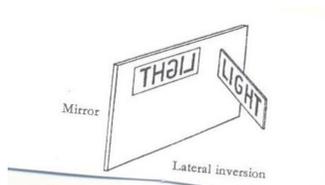
**Simple optical instruments.**

Optical instruments are instruments which use light for their functioning. Examples of simple optical instruments are **plane mirrors** and **lenses**.

**Plane mirrors.**

**Characteristics of images formed in a plane mirror.**

- They are erect/upright.
- They have the same size as the object.
- The image is laterally inverted. (the right appears to be left in the mirror).
- Image distance is equal to the object distance from the mirror
- The image is virtual. (not formed on the screen)



**Uses of plane mirrors**

- They are used in periscopes
- They are used as dressing mirrors.
- They are used by dentists.
- They are also used in saloons

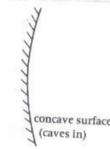
**Curved Mirrors**

These have their reflecting surfaces form a hollow sphere.

**Types of curved mirrors**

**Concave mirrors:** It is coated on the outside of the spherical surface.

- ✓ They are used as reflectors in head light of cars and torches.
- ✓ Used by dentists.
- ✓ They are used in solar cookers to focus light on one spot.
- ✓ Used as shaving mirror



**CHARACTERISTICS OF IMAGES IN CONCAVE MIRRORS.**

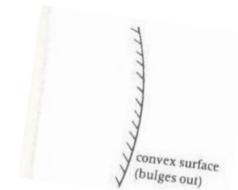
- They are real.
- They are upright.

**Convex mirror:** It is coated on the inside of the spherical surface.

- ✓ They are used as driving mirrors because they a clear view of the traffic behind.

Characretistics of images formed in convex mirrors.

- ✓ The images are upright
- ✓ The images are virtual.
- ✓ The images are smaller than the objects.



**Real and virtual images**

Virtual images are not formed on screen.

Virtual images are cast by plane mirrors, concave lens, convex lens.

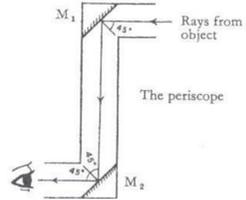
**Periscope**

They are instruments used to see objects overhead.

It is used by soldiers, sub mariners etc.

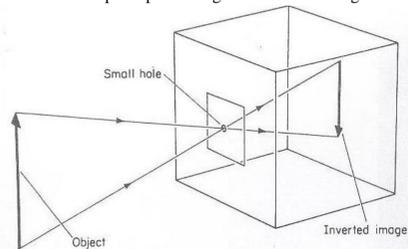
A ray of light from the object strikes mirror one at 45 degrees and then turned through 90 degrees to strike mirror two until the object is seen by the observer.

**Illustration of a periscope.**



### Pinhole camera

It works on the principle that light travels in a straight line.



### Characteristics of images formed with a pin hole camera

- The image is smaller than the object/diminished.
- The image is upside down./inverted
- The image formed is real.

**NB:-** If the distance between the object and camera is increased, the image becomes smaller and blurred.

- If the distance between the object and the camera is decreased, the image becomes larger and blighter.
- When the hole is too big, the image is blurred.

### Refraction of light

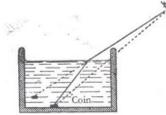
Refraction means the bending of a light ray as it moves from one transparent medium to another.

### Principle/law of refraction.

- The incident ray, the refracted ray and the normal all lie on the same plane.
- A ray of light travelling along the normal will not get refracted and will pass unchanged.

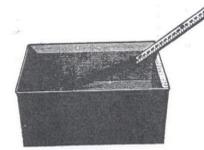
### Effects of refraction

- Fish in water appears shallower than they are.



- A pool appears shallower than it really is.
- Refraction produces colors e.g. spectrum

IV. An object put in water appears bent.

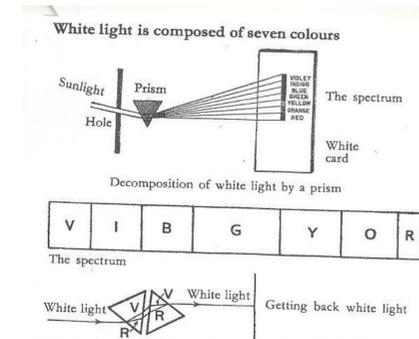


### Prisms and Light spectrum. Spectrum

Is a band of seven colours.

### Dispersion of light.

- Is the splitting of light into different colours.
- Dispersion is caused by refraction of light rays at different angles in glass prism.
- Dispersion/ Refraction of white light by glass prism. (ROYGIBIV)**
- Light rays in a glass prism bend at different angles because they move at a different speed.
- The fastest ray bends most (violet) and it has a short wave length.

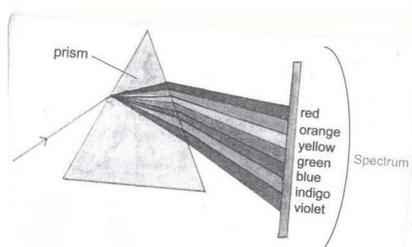


- The slowest ray bends least.(red) and it has a long wave length.

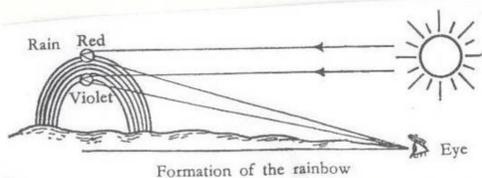
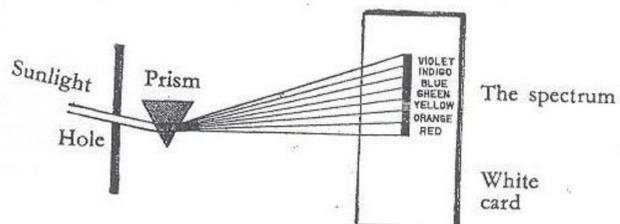
- The order of the colours of the spectrum from top to bottom is Red, Orange, yellow, Green, Blue, Indigo, Violet.
- It can be memorized in the sentence Richard Okello Your Girl Benita Is Vomiting.

### THE RAINBOW

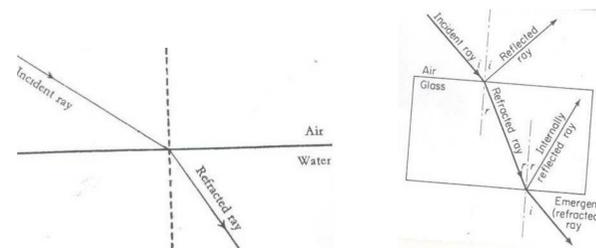
- It is a natural spectrum in the sky.
- It is formed when light rays from the sun pass through rain drops.
- The inner colour of the rainbow is violet.
- The outer colour of the rainbow is red.



### White light is composed of seven colours



### Refraction through a rectangular glass prism.



- **I** - Angle of incidence
- **R** - Angle of refraction
- Angle  $i$  is greater than angle  $r$ .

**Qn. What happens to the ray of light when it moves from one medium with fewer molecules to another one with more molecules?**

- Its speed slows down.
- It bends towards the normal

**Qn. What happens to the ray of light when it moves from one medium with molecules to another with fewer molecules?**

- Its speed increases.
- The light ray bends away from the normal.

### COLOURS OF LIGHT

#### TYPES OF COLOURS.

- Primary colours
- Secondary colours.
- Complementary colours.

**Primary colors** of light are the colours got without mixing any other colour.

**Examples of primary colours.** Red, Blue and Green

**Secondary colours** are the colours formed by mixing two primary colours.

Examples of secondary colours are Yellow, Magenta and cyan.

- i.e. Red + Green = White
- Red + Blue = Magenta
- Blue + Green = Cyan

**Complementary colours.** Are the two colours of light which when mixed give white light

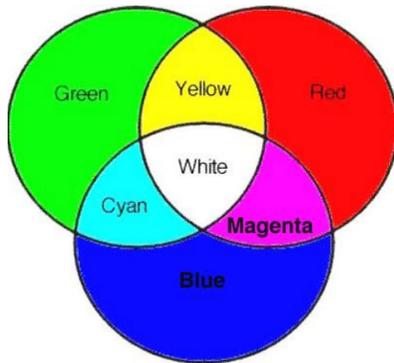
Examples of complementary colours are

Blue + Yellow = White

Red + Cyan = White

Green + Magenta = White

Red + Green + Black = White light.



#### LENSES

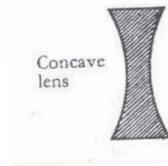
- > Lenses are optical instruments used to focus or defocus.
- > The surface of the lens may be convex, concave, plane or a combination of these.
- > Lenses are used in materials like; cameras, microscopes, binoculars.

#### Types of lenses

##### Convex (converging) lens



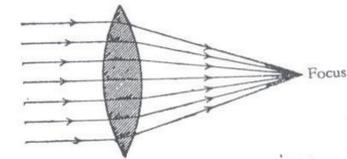
##### Concave (diverging) lens.



#### > The effect of lenses on beams of light.

##### Convex (converging) lens.

It refracts light to meet at one point (focal point)

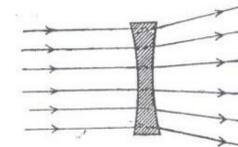


##### Characteristics of images by convex lenses

- > It is inverted.
- > It is magnified.
- > It is real
- > It is formed in infinity.

##### Concave (diverging) Lens

It refracts light and spread it out in different directions.



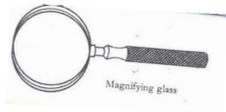
##### > Characteristics of images formed by concave lens.

- > Are erect/upright
- > Are virtual.
- > Image is diminished/reduced in size.

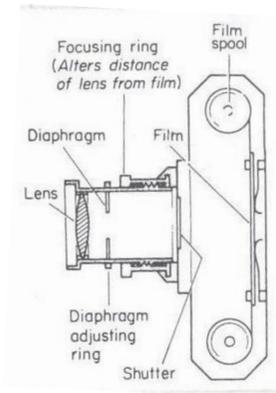
##### Uses of lenses

- > Lenses are used in optical instruments like telescopes, camera, and microscopes etc
- > Lenses are used in spectacles.
- > Lenses are used in magnifying glasses.

##### The magnifying glass



### The lens camera



#### Parts of the camera and their functions.

- **Lens:** It focuses light to the film.
- **Film:** The image is formed there.
- **Diaphragm:** Controls the amount of light entering the camera.
- **Shutter:** It uncovers the diaphragm to allow light into the camera. It blocks light entering the camera.
- **Bellows(screw mounting):** Adjusts the distance of the lens from the film to obtain the sharp image. When the film is developed in a chemical a **negative** is got. On the negative the **bright** part appears **dark** and vice versa. That is the reason why it is called **negative**.
  - **Aperture:** It allows light into the camera.

#### **Characteristics of images formed by the lens camera**

- They are real (they are formed on the film.)
- They are smaller than the object.
- They are inverted

#### **Telescope:**

It is used to look at distant objects.

#### **Microscope:**

It is used to look at very small objects e.g. bacteria, amoeba, cells etc.

#### **Spectacles**

#### **Projectors.**

It casts images from films and slides to the screen.

It consists of a source of light, a concave reflector and a condenser.

The condenser focuses the rays through the film or slide.

#### **Episcopes.**

#### **The human eye**

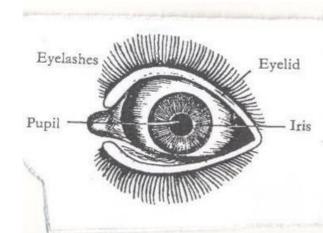
The eye is the sense organ for sight.

The complete eye is called the **eyeball**.

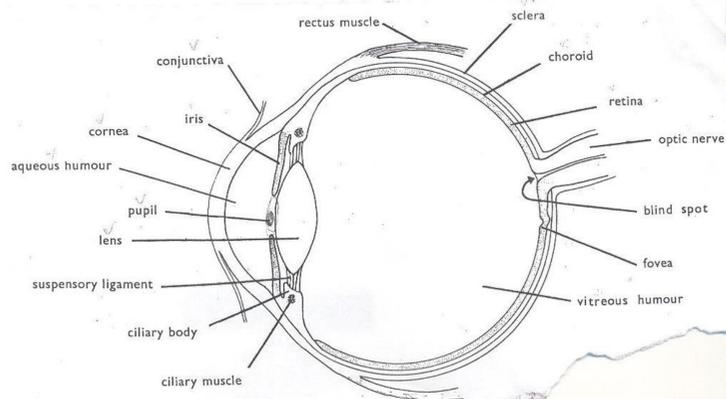
The eye ball is protected by the socket of the skull.

#### **A structure of a mammalian eye**

##### **Front view**



##### **Cross section view**



**Uses of the parts of the eye**

**i. Cornea:** It aids refraction of light rays to begin converging as it passes through it.

**ii. Conjunctiva:** It covers the front part of the eye.

**iii. Aqueous humour:** It maintains the shape of the eye.

It helps to refract light and form an image on the retina.

**iv. Iris:** It controls/regulates the amount of light entering the eye.

It expands and contracts to reduce the size of the pupil.

**v. Pupil:** It lets enough light into the eye.

**vi. Convex Lens:** It focuses light on to the retina (accommodation)

**vii. Ciliary muscles:** These change the shape of the lens for accommodation.

**viii. Vitreous humour:** It maintains the shape of the eye.

It helps to refract light and form an image on the retina.

**ix. Retina:** It is where the image is formed.

It has the rods (light sensitive cells that are responsible for dim light) and the

cones (light sensitive cells that are responsible for bright light)

**x. Optic nerve:** It transmits light messages to the brain.

**xi. The eye lids:** Prevent foreign bodies from entering the eye

**xii. Eye rashes:** Prevents water and other particles from entering the eye.

**xiii. Fovea:** It gives the most accurate interpretation of an image.

**xiv. Blind spot:** Has no light sensitive cells. If part of an image falls on it no impression is recorded in brain.

**xv. Ciliary body:** It contains blood vessels which supply blood to the eye.

**xviii. Choroid:** a black pigment under the sclera that prevents **internal reflection** in the eye.

**xv. Tear glands:** produces a solution that keeps the eye moist and washes dust from them.

**xvi. Sclera:** It is a tough, non elastic and fibrous coat round the eyeball

**How is regular blinking important to the eye?**

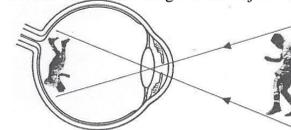
It distributes the fluid over the surface of the eye and prevents it from drying up.

**Characteristics of images formed by the eye.**

- i. It is upside down/inverted.
- ii. Smaller than the object/diminished.
- iii. The image is real.

**Normal vision.**

In normal vision, the image of the object seen is formed on the retina.



The Lens in the person's eye is **convex**.

**Compare a mammalian eye and a lens camera.**

**DIFFERENCES**

Eye	Camera
Lens focuses light on the retina	Lens focuses light on the film
Iris controls light intensity.	Diaphragm controls light intensity
Eyelids block light from entering the eye	The shutter blocks light into the camera
The images are formed on the retina	The images are formed on the film
The pupil allows light into the eye	The aperture allows light into the eye.
The choroid prevents internal reflection	The black inside parts prevents internal reflection

**SIMILARITIES BETWEEN IMAGES FORMED IN A CAMERA AND EYE.**

The images are real, diminished and upside down

**Compare a mammalian eye and a pinhole camera.**

Eye	Pin hole camera
Focusing is done by changing the shape of the lens.	Focusing is done by moving the camera forwards or backwards
Image is formed on the retina.	Image is formed on the screen
Iris controls light entering the eye	No control of light.
The eye can be covered by eyelids.	The pinhole is always exposed to light.

**Similarities.**

The image formed is upside down  
The image is diminished  
The images formed are real

**The parts of the eye and Camera with similar functions.**

Eye	Camera
1. Convex Lens	convex Lens
2. Iris	Diaphragm
3. Eye lid	Shutter
4. Retina	Film
5. Pupil	Aperture
6. Choroid	The black inside part of the camera.

**Diseases and disorders of the human eye.**

**Eye diseases**

**1. Conjunctivitis (Red eyes/pink eyes)**

**Cause**

It is caused by **bacteria or viruses**.

**Spread**

It is spread by finger and face towels.

**Signs and symptoms**

- Red eye/pink eye.
- Mild burning in the eyes.
- Eyelids stick together during sleep.
- Watery fluid discharge.

**Control**

- Isolation of the sick.
- Avoid sharing towels, handkerchiefs and bathing containers.
- Always wash hands with clean water.
- Treat pregnant mothers with gonorrhoea.

**2. Trachoma**

**Cause:** It is caused by a bacterium called **Chlamydia**.

**Spread:** It is spread by houseflies, hands and face towels.

**Signs and symptoms**

- The eye turns red.
- The eyes produce watery fluids.
- Irritation in the eyes.
- Small lumps under the upper eyelids.
- The white part swells.

**Control**

- Wash hands and eyes regularly.
- Do not shake hands during the outbreak.
- Do not share hankies and face towels.
- Treat the infected ones.

**3. River Blindness**

It is caused by **onchocerca**

It is spread by black flies/simulids /Jinja fly.

**Signs and symptoms.**

- The eyes turn red
- Tears flow.
- Inflammation of the iris.
- The skin gets rough.
- Enlargement of lymph nodes.
- Itching on the trunk.
- Lumps from under the skin.

**Control**

- Clear vegetation on banks of rivers.
- Spray the larva of Jinja fly.

**Other eye diseases.**

- Blepharitis.
- Cataracts-clouded lenses
- Glaucoma- damage to the optic nerve from too much pressure in the eye.

**Eye defects/disorders, cause and correction.**

**i.Short sight (myopia)**

It is where a person is able to see nearby objects clearly but not far off objects.

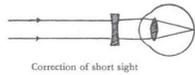


**Causes of short sight.**

- Large/elongated eyeballs.
- Eye diseases

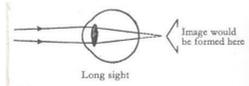
**Correction.**

Wear spectacles with concave lens



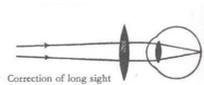
**ii. Long sightedness.** (Hypermetropia)

Is where a person can see distant objects clearly but not nearby objects.



**Correction.**

Wear spectacles with convex lens.



**iii. Astigmatism.** (distorted vision at all distances)

It is a condition in which one is unable to see both vertical and horizontal objects clearly at the same time.

Astigmatism is common during old age.

**Causes of astigmatism.**

Having irregular cornea.

**Correction**

Wearing glasses with cylindrical lenses.

**Care of the human eye**

- > Wash eyes with soap every day.
- > Don't look directly at very bright light e.g. sun.
- > Don't share face towels.
- > See the optician in case of a problem.
- > Avoid reading on dim light.
- > While reading, let the light come from over the shoulders.
- > Avoid rubbing your eyes.
- > While reading don't be too close to the source of light.

**TOPICAL QUESTIONS**

1. State any two sources of light.
2. How is the sun useful to human beings?
3. Suggest any two types of lenses.
4. Why is it important to keep our body organs used for seeing clean?
5. How can we keep our eyes clean?

6. Why is it important to use clean water when cleaning our eyes?
7. Draw a diagram showing the effect on translucent objects on light.
8. How does light move from one place to another?
9. Draw the following:
  - a) Diverging beam of light
  - b) converging beam of light
10. State types of reflection
11. How is reflection important to us?
12. How are periscopes useful to sub mariners?
13. State the way one can correct the following eye defects:
  - a) Myopia
  - b) Hypermetropia.
14. State any one reason why it important to keep our eyes clean always.
15. How are translucent objects important in our daily life?

**Topic 7: INTERDEPENDENCE OF THINGS IN THE ENVIRONMENT.**

**VOCABULARY**

- Dependence
- Agro forestry
- Pollarding
- Lopping
- Coppicing
- Welfare

**Interdependence:**

It the way things benefit from each in the environment.

**Environment:**

It refers to things surrounding people.

**Components of the environment**

They are divided into two groups:

- i. Living things eg plants, animals
- ii. Non living things eg water bodies, air, soils

**How plants depend on animals.**

- i. Plants get carbon dioxide.
- ii. They get manure.
- iii. They are pollinated
- iv. They get care.
- v. Plants are dispersed.

**How animals depend on plants.**

- i. They get Oxygen.
- ii. They get food.
- iii. They get habitat.
- iv. People get fire wood from them.
- v. They get building materials.
- vi. They get herbal medicine.

**Animals depend on other animals in the following ways;**

- i. Some feed on others(predators)
- ii. Some animals live in/on others.eg internal parasites and external parasites.
- iii. Some provide transport to others.eg Donkey, Ass, Camels
- iv. Some provide security e.g. Dog

**Plants depend on other plants in the following ways.**

- i. The weak get support from other plants.eg Morning glory
- ii. Some parasitic plants obtain food from the host plants.
- iii. Some tall plants provide shade to small trees.
- iv. Some plants protect small trees against strong wind.

**Interdependence of living things and non living things****A. Animals depend on non living things (air, water, soil)**

- i. Termites / earthworms live in the soil.
- ii. People use soil to build houses, pottery etc
- iii. People get rocks for construction of roads, houses etc
- iv. Animals drink water.
- v. Animals breathe in air.
- vi. Animals get heat and light from the sun.

**B. Plants depend on non living things (air, water, soil)**

- i. Plants breathe in air.
- ii. Plants get heat and light from the sun.
- iii. Plants grow on soil.
- iv. Plants use water to make food.

**Non living things benefit from living things.**

- i. Plants purify air by absorbing carbon dioxide from it.
- ii. Plants control silting of water bodies.
- iii. People add manure to the soil.

**AGRO FORESTRY****Agro forestry.**

- The growing of trees along side crops.

**Importance of growing crops and trees together.**

- Trees provide shelter to other crops.
- Trees control soil erosion.
- Crops get protection from wind and strong sunshine.
- Some trees have nitrogen fixing bacteria that make the soil fertile.
- Double income e.g. food and timber.
- Reduce global warming as trees use carbon dioxide.
- Trees contribute to rainfall formation.

**Growing trees and keeping animals on the same farm**

- Trees provide shade to animals.
- Trees provide oxygen to animals.
- Trees purify the environment by using the carbon monoxide gas.
- Some leguminous trees are used as animal feeds.
- The farmer can get double income.

**Rearing animals and growing crops on the same farm.**

- Animals get food.
- Crops get manure.
- The farmer can get double income.
- Animals give carbon dioxide to crops.
- Crops provide oxygen to animals

**Rearing and caring for animals, growing crops and trees on the same farm.**

- Some trees are used to make live fences(hedge)
- Some leguminous trees may be used as sources of animal feeds.
- Trees provide oxygen to animals.
- Animals give carbon dioxide to plants.

### Tree growing

- Trees grow from seeds.
- The seeds selected should be healthy.

### Indigenous trees

These are trees that have been growing in Uganda for many years.  
Examples include.

- Musizi
- Acacia
- Mvule
- Mahogany

### Characteristics of indigenous trees;

- Produce hard wood.
- Take long to mature.
- Can withstand rough soil and weather.
- Grow in the wild.

### Exotic trees:

These are the recently introduced species of trees.

They include;

- Cypress, Pine, Cedar, Mango, Black wattle, Eucalyptus, Jack fruit tree and Ficus tree.

### Characteristics of exotic trees

- They produce soft wood.
- They mature faster than the indigenous trees.
- Need proper care.
- Some cannot withstand harsh weather.

### Starting a tree nursery bed.

#### What is a nursery bed?

A nursery bed is a small piece of land prepared for raising seedlings.

#### Reasons for growing crops in a nursery bed.

- It protects seedlings from bad weather conditions.
- It makes it easy to care for seedlings e.g. weeding, thinning, spraying etc.
- It enables the seeds to germinate well as the soil is loose and moisture.

#### TYPES OF NURSERIES

- Nursery bed-raised on the ground.
- Seed boxes-Wooden boxes filled with soil.
- Soil blocks-Soil put in polythene bags and sacks.

### Care for seedlings in the nursery bed.

- Watering.
- Thinning.
- Spraying.
- Hardening off seedlings.

#### A seed bed

It is a large piece of land where seedlings are planted for further growth.

#### Steps taken when starting a nursery bed.

- Choose a good site, clear the land and dig deep to make the soil fine.
- Add manure in the nursery bed and mix it well with soil.
- Furrow the soil using a stick and plant the seeds you have selected.
- Cover the prepared area with mulches, provide a shade and water.  
NB: Remove the shade when the seedlings are about to be transplanted.

#### What is hardening off?

It is the making of seedlings gets used to garden conditions.

#### At this time the following are done.

- Shelter is removed.
- Watering is reduced.  
The garden conditions are rain, sunshine and pests.

#### Transplanting.

It is the process of moving seedlings from the nursery bed to the main field.  
(seed bed)

It should be done in the evening when the weather is cool and wet to prevent the plants from losing a lot of water due to transpiration of water.

#### Ways of caring for trees in agro forestry

- Watering:** this is the application of water to plants.
- Fencing:** the construction of wooden fence around the gardens or individual plants.
- Transplanting:** the removal of seedlings from the nursery bed to a seed bed.
- Spraying:** the application chemicals to plants to kill pests
- Mulching:** The covering of top soil with dry plant materials.

**Pruning:** The cutting of excess branches of a plant.

#### Advantages of pruning.

- Reduce competition for air.
- Controls pests by removing hiding places for pests.
- Eases harvesting.
- Reduces transpiration.
- Reduces weight of a plant.

- Pruned materials can be used for mulching.

**Thinning:** The removal of excess or poorly growing seedlings from the garden.

**Advantages of thinning.**

- Gives enough space for other crops to grow.
- Control the spread of diseases.
- Control the spread of pests.
- Eases spraying.
- Improves yields and quality of harvest.

**Staking:** the providing of support to plants with weak stems.

**Why staking?**

- Controls ground pests.
- Eases weeding.
- Eases harvesting.
- Eases pruning.
- Eases spraying.
- Improves plant access to sunlight.

**Crop spacing:** the leaving of open spaces between individual plants. It is the planting of crops leaving spaces between individual crops.

**Importance of crop spacing.**

- Reduces competition for water and space.
- It ensures proper circulation of air to the plant.
- Plants get enough sunlight.
- Easy weeding.
- Easy harvesting.

**Weeding:** the removal of unwanted plants in the garden.

**How bad are weeds?**

- Hide pests.
- Weeds compete with crops for sunlight and other nutrients.
- Some weeds are poisonous to plants and live stock. E.g. tick berry bush.
- Increase the cost of farm management.

**Advantages of weeds**

- Leguminous weeds fix nitrogen in the soil and increase soil fertility.
- Weeds can be used as animal feeds.
- Source of herbal medicine.

- Weeds rot to form manure.
- Weeds can be used as mulches.

**How to control weeds.**

- Uprooting and burning the weeds.
- Cutting with a hoe.
- Spraying with herbicides.
- Mulching.

**Tree pests and their control.**

**What is a pest?**

A pest is a living organism that destroys crops.

A vermin is an animal pest.

Examples of vermin include; rats, monkeys, elephants etc.

**Examples of crop pests.**

PEST	CROPS ATTACKED	DAMAGE.
Mealy bug	Pineapples, coffee	Leaves turn yellow or pink.
Aphids	Oranges, coffee, cabbages etc	Wilting back of terminal bud.
Banana weevils	Bananas	Leaves turn yellow Bananas fall easily.
Codling moth.	Citrus fruits like oranges and mangoes	Fruits fall off.
Thrips	bananas	Premature ripening of bananas Banana fruits burst.
Moles, rats, squirrels, mice, cane rats.	Cereals	Direct consumption of seeds an stems.
Citrus black fly.	Citrus fruits	The flies suck sap from leaves and tender shoots.
Leaf miners	Coffee, cocoa, pineapples, aloe vera, sisal	Plant's ability to make sugar is reduced.
Cut worms	vegetables	Leaves are destroyed.
Locusts	All crops	
Army worms	Cereals and grasses	
Maize stalk borer	Maize	
Boll worm	Cotton	
Antestia bug	Coffee	
Game animals e.g. monkeys	Oranges, mangoes	
Birds.	Maize, sorghum.	

**Methods of controlling pests.**

- Early planting.
- Spraying with pesticides.
- Use of birds to eat lady birds. (Biological method)

- Crop rotation.
- Weeding.(methods)
- Plant clean materials.

**Crop diseases.**

DISEASE	CROP	CAUSE	SIGN	CONTROL
Panama disease	Bananas		Plant Banana Wilts	Burn entire stock Plant healthy suckers
Cigar End rot	Banana	Bacteria	Banana tips resembles burning cigar	Burn infected crops.
Banana bacterial wilt	Banana	Bacteria	Banana stem rots and falls down	
Powdery mildew.	Mangoes	Fungi	Powdery patches on leaves	Spray with fungicides
Green mould	Citrus fruits	Fungi	The stem dries with a green powder	Spray with fungicides.
Stem pitting	Citrus fruits	Fungi	Dry patches on the stem.	Spray with fungicides.
Tomato blight	Tomatoes, potatoes	Bacteria	Yellow leaves	
Crown gall	fruits	Bacteria	Leaves shrink	
Fire blight.		Bacteria	wilting	
Rust fungus	Cereals	Fungi	Black spot on leaves	
Root rot	Tea plants	Fungi		
Coffee berry diseases(CCB)	Coffee	fungi	Brown spots appear on berries.	

**Factors that affect crop production**

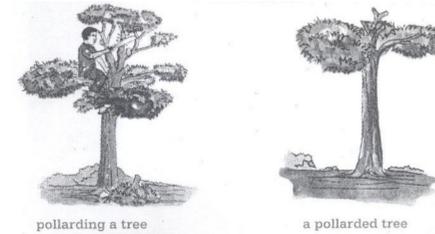
- Crop pests and diseases.
- The use of poor methods of farming.
- The harvesting of immature seeds.

**Proper ways of harvesting trees.**

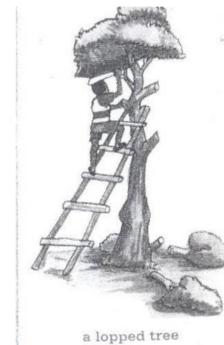
1. **Coppicing**-Cutting of the whole tree but leaving room for it to sprout again.



2. **Pollarding**- The cutting of the top part of a tree allowing new branches to develop.



3. **Lopping**- Cutting of the side branches from the truck.



**Advantages of Starting and managing a school/home wood project.**

- Production of food for the family.
- Source of income.
- Practicing the science learnt in class.

- Trees provide shelter.
- Trees are source of wood fuel.

**Consideration when starting a tree and crop growing project.**

- Site-near your home.
- Soil drainage.
- Nearness to the water source.
- Fertility of the soil.
- Security.
- Accessibility.
- Nearness to the home/school.

**Factors considered when choosing crops or trees for planting.**

- Those which mature faster
- Those that give high yields.
- Those that are not easily attacked by disease
- Those which are multipurpose.

**Preparing wood for different purposes and proper storage.**

**Uses of wood**

- For charcoal.
- For fire wood.
- For medicine.
- For timber.
- To make electricity and telephone poles.
- For increase/produces a pleasant smell when burnt.

**Wood for firewood.**

- It is split, dried and then kept in a shed.
- Trees store much water inside their cells.
- When is split water evaporates from it.

**Wood for electricity and telephone poles.**

- Poles are treated with chemicals known as wood preservatives.  
A strong salt can act as a **wood preservative.**
- The bark is first removed then soaked.

**Wood for timber**

- Trees are cut into different pieces.
- The pieces are put under shade to dry at slow pace.

**Seasoning.**

It is the putting of pieces of timber under shed to dry at slow pace.  
If timber is dried under direct sunshine it gets twisted/out of shape.

The twisting of the pieces of timber is referred to as **warping.**

**Reasons for seasoning timber.**

- To prevent it from splitting.
- To prevent it from warping/bending.

**Record keeping**

It the gathering and storage of information about farm activities.

**Farm records:**

These are written information showing different out puts and inputs on a farm.

**Types of records kept on a farm.**

- i. Inventory records e.g. farm tools, farm machinery,
- ii. Production records
- iii. Health records
- iv. Breeding records
- v. Feeding records
- vi. Income and expenditure records.

**Importance of keeping farm records.**

- i. To know the income and expenditure and avoid losses.
- ii. To know whether they are making profits or losses.
- iii. Identify areas of development and investment.
- iv. To budget for the farm.

**Young farmers, club.**

It is a club in a school in which members learn practical skills about keeping animals and growing crops.

**Promotion of Young farmers club.**

- Some schools have gardens where they practice farming.
- They organize trips to agriculture research stations.

**QUESTIONS.**

1. What is agro forestry?
2. Suggest any one importance of keeping animals and growing crops on the same piece of land at the same time?
3. Suggest one method of properly harvesting trees.
4. Why is it important to treat wood for electric poles before planting them?
5. How are young farmers clubs important in schools?
6. Why is it important to keep records on farms?
7. Give any one reason why it is important to keep trees.
8. Write down any one disease that affects bananas.
9. How important are the following farm practices important on a farm.
  - a) Thinning
  - b) staking
  - c) pruning
10. How are vermins different from vectors?

11. Why is it important for farmers to plant their crops in nursery beds?
12. State any three crops that can be planted in a nursery bed.
13. State one thing done to seedlings in a nursery bed that are about to be transplanted.
14. Why watering seedlings important when they are in a nursery bed
15. Mention any one characteristic of exotic trees.

#### Topic 8: POPULATION HEALTH

##### VOCABULARY

- Health concerns
- Community
- Health surveys
- Demography
- Health data
- Population.

##### Community Health and social problems

##### Community

It is a group of people living or working together having common needs, interests and problems.

##### Health

Health is a state of being physically, socially, economically and mentally well.

##### Community Health

- It refers to the essential health conditions in which individuals and families within a community live.

##### Examples of communities

1. A home
2. A school
3. A town

4. A village

##### Examples of common health and social problems in communities;

1. Smoking
2. Alcohol and drug abuse
3. Poor sanitation standards
4. Malnutrition
5. Disease outbreak
6. Anti Social behavior

##### Types of common sickness in a home.

1. Immunisable diseases
2. Deficiency diseases
3. Communicable diseases
4. Self inflicted diseases
5. Sexually Transmitted diseases
6. Hereditary (genetic) diseases

##### IMMUNISABLE DISEASES

These are diseases which can be prevented through immunization.

##### Immunisable diseases are in two categories;

1. Childhood immunisable diseases e.g. polio, measles, tuberculosis, tetanus, whooping cough (pertussis), diphtheria, hepatitis B, Haemophilus Influenza b.
2. Non childhood immunisable diseases e.g. typhoid, meningitis, cholera, yellow fever, small pox, german measles (rubella) e.t.c.

##### DEFICIENCY DISEASES

These are diseases that are caused by lack of some food values in our daily diet.

##### Examples of deficiency diseases

Deficiency disease	Due to lack of
Night blindness	Vitamin A
Beriberi	Vitamin B <sub>1</sub>
Pellagra	Vitamin B <sub>2</sub>
Scurvy	Vitamin C
Rickets	Vitamin D
Infertility	Vitamin E
Poor blood clotting (haemorrhage)	Vitamin K
Goitre	Iodine
Marasmus	Carbohydrates
Kwashiorkor	Proteins
Anemia	Iron

##### COMMUNICABLE DISEASES

These are diseases which can be spread from one infected person to a healthy person.

They are caused by **germs**

**Examples of communicable diseases**

Bacteria	Virus	Protozoa	Worm infections	Fungal
Gonorrhoea	HIV/AIDS	Malaria	Round worms	Athletes foot
Syphilis	Measles	Sleeping sickness	Tape worms	Ring worm
Trachoma	Polio	Amoebic dysentery	Flat worms	
Diphtheria	Influenza		Thread worms	
Bacillary dysentery	Common cold		Hook worms	

**SELF INFLICTED DISEASES**

These are diseases which people get due to poor health life styles. E.g. Smoking, alcoholism, over eating, lack of exercises, prostitution etc.

**Examples of self inflicted diseases;**

1. Lung cancer
2. Sexually Transmitted Infections.
3. Emphysema
4. Obesity

**SEXUALLY TRANSMITTED DISEASES (VENEREAL DISEASES)**

These are spread through having unprotected sexual intercourse with infected persons.

**Examples**

1. HIV/AIDS
2. Gonorrhoea
3. Syphilis
4. Genital warts
5. Candida

**HEREDITARY (GENETIC) DISEASES**

These are diseases that are passed on from parents to off springs through genes.

Examples include;

1. Sickle cell anemia
2. Diabetes
3. High blood pressure

**Causes of sicknesses in the home and community**

1. Poor disposal of human and industrial wastes.
2. Alcohol and drug abuse.
3. Poor nutrition
4. Some diseases are inherited from parents eg sickle cell.

**Controlling common sicknesses in a home and community.**

1. Proper sanitation.
2. Family planning
3. Good nutrition.
4. Brushing the teeth after every meal
5. Doing daily physical exercises.

**How to avoid health and social problems.**

1. Proper sanitation
2. Proper waste disposal
3. Keep our homes and water sources clean.
4. Proper feeding.
5. Avoid drug abuse
6. Abstain from sex if not married

**Methods of preventing diseases in the community.**

- > Immunization
- > Through proper nutrition
- > Personal hygiene
- > Boiling water for drinking.
- > Good food hygiene.
- > Proper rubbish disposal.

**How young people can avoid social and health problem**

1. Avoiding bad peer groups.
2. Form clubs such as young farmers club, drama and music.
3. Join church choirs
4. Participating in sports activities such as football, netball, swimming and athletics.
5. Attending youth seminars and conferences on morals, drug abuse, HIV/AIDS
6. Using their leisure time to learn practical skills e.g. weaving, tailoring, computer use.

**Life skills of avoiding social and health problems**

1. Critical thinking
2. Decision making
3. Problem solving

4. Self awareness
5. Effective communication
6. Creative thinking

#### **ANTI SOCIAL BEHAVIOURS.**

These are unacceptable behavior in the society.

**Delinquency** is a bad act performed by a juvenile and is punishable by law.

**Juvenile delinquency** is a bad act performed by a juvenile and is punishable by law.

**A Juvenile** is person below 18 years

**A delinquent** is a young person who commits an act punishable by law.

#### **EXAMPLES OF ANTISOCIAL BEHAVIOURS.**

- Lying, Truancy, Stealing, Arson (fire setting), Sex offences, Wandering, Telling lies.
- Fighting, Teasing in school/bullying, Murder, Drug abuse. E.g. smoking.
- Child prostitution, Raping, Aggression/violence

#### **CAUSES OF ANTISOCIAL BEHAVIOURS.**

- Disturbed homes.
- Bad peer influence
- Poor social environment.
- Poor home atmosphere like fighting by parents.
- Over strictness by both parents and teachers.
- Unfulfilled expectations.
- Pampering children.
- Failure to enforce rules in the community.
- Poor family back ground.
- Poor social environment.

#### **Effects of antisocial behaviours.**

- Many delinquent children may become adult criminals.
- Individuals suffer from pain, injury and death.
- Sex offences may result into sexually Transmitted Diseases.
- Fire setting leads to destruction people's property.
- Drug abuse may be a bad example to the children.
- Leads to School dropout.
- Causes Shame to parents.
- May lead to Death.
- The family may disown the child.
- Weaken the custom, religion and organization.

#### **How to prevent and control antisocial behaviours.**

- All parents should create stable families.
- Parents should take children through counseling and guidance lessons.
- Children should join youth clubs and societies.
- Children should avoid bad peer groups.
- Children should be exposed to sex education.
- Punish wrong doers and praise good behavior.
- Equal treatment should be given to all children.

- Elders should be exemplary.
- Children should engage in gainful activities during free time
- Avoid setting too high standards of behavior.
- Children should join youth and sports clubs and societies.

#### **VIOLENCE**

This is a state in which a person is aggressive and has destruction behaviour.

#### **Types of violence**

- ✓ Sadism: an extreme motive to harm others.
- ✓ Masochism: an extreme motive to harm oneself

#### **SEXUAL DEVIATIONS**

-It is an abnormal sexual practice.

#### **Give the forms of Sexual deviations:**

- Bestiality
- Homosexuality,
- Masturbation,
- Oral sex
- Lesbianism,
- Incest
- Fellatio

#### **Reasons why people practice sexual deviations.**

- For personal satisfaction
- As an effect of drugs.
- As an effect of pornography consumption
- Bad peer influence.
- As a result of broken homes

#### **Ways of avoiding sexual deviations.**

- Avoid bad peer groups
- Avoiding drug abuse
- Through guidance and counseling.
- Avoid watching pornography.
- Avoid incentives from strangers.
- Join gainful clubs during leisure.

#### **Population and health concerns.**

#### **What is population?**

This is the number of people living in an area or country

#### **Health concerns.**

These are health problems that affect the us and need immediate solutions.

#### **Population and health concerns.**

- Poor sanitation.
- Anti social behavior.
- Poor water supply.
- Inadequate food.

#### **Poor sanitation.**

It is the improper disposal of human waste and other waste products into the environment.

##### **Indicators of poor sanitation.**

- Poor ventilation of houses.
- Bushes around homes.
- Poor disposal of faeces and urine.
- Sharing houses with animals.

#### **The following should be observed when constructing a dwelling house.**

- It must be constructed downhill.
- Ten metres from the latrine and **30m** from the water source.
- Below the water level.
- In a home there should be a **rubbish pit** to hold refuse.

##### **Activities or solutions to poor sanitation.**

1. Construct rubbish pits in a home
2. Construct pit latrines
3. Sweeping the compound
4. Picking rubbish around homes.
5. Cut grass around our homes short
6. Build well ventilated houses
7. Avoid sharing houses with domestic animals.

#### **Poor water supply**

It is when the community receives little or dirty water for use.

#### **Water associated diseases;**

Categories of water associated diseases.

##### **i. Water borne diseases**

These are diseases spread through drinking contaminated water.

##### **Examples include:**

- Cholera
- Typhoid
- Bilharzia
- Polio
- Dysentery.

- Hepatitis.
- Diarrhoea.

##### **ii. Water contact diseases**

These are diseases which spread when our bodies get into contact with contaminated water.

##### **Examples of water contact diseases**

- Bilharzia
- Swimmer's itch
- Ear, eye and nose infections

##### **Water cleaned diseases**

These are diseases we get when we don't have enough water to use.

##### **Examples of water cleaned diseases include;**

- Scabies.
- Impetigo.
- Trachoma
- Conjunctivitis
- Eczema.

##### **Water habitat vector diseases**

These are diseases which spread by vectors which spend part of their life cycle in water.

##### **Examples of water habitat vector diseases include;**

- Malaria.
- Bilharzia.
- River blindness.
- Dengue fever.
- Yellow fever.

##### **Ways of making dirty water safe for drinking**

-Boiling.

-Use chemicals like chlorine, calcium chloride, potassium permanganate.

##### **Processes at national water sewerage co-operation. (NWSC)**

- Sedimentation, Filtration, Coagulation, Chlorination.

#### **Activities to address poor water supply.**

1. Construct wells.
2. Cut bushes around wells
3. Fencing the water sources
4. Treating water

#### **Inadequate food**

This is the situation in which a family or community members lack enough food

#### **Causes of inadequate food**

- High population increase.
- Laziness and inability to grow crops.

- Poverty.
- Ignorance of good farming methods.
- Drought.
- Wars.
- Floods.
- Poor attitude towards farming
- Pests and diseases.

#### **Food security**

It is having enough food for future use.

#### **Effects of malnutrition in people**

- Chronic fatigue.
- Low concentration at work.
- Poor spirit of doing things.
- Loss of interest at work

#### **Activities to address inadequate food supply.**

- Seek advice on good methods of farming from agricultural officers.
- Construct valley dam to trap water for irrigation during drought.
- Avoid draining wetlands to avoid floods.
- Introducing agriculture schools.
- Digging should not be given as punishment in schools.
- Grow crops which are resistant to diseases.

#### **Activities to address health concerns.**

##### ➤ **Care for a home**

A home is a place where people stay and live.

#### **How to care for a home**

- Slash tall grass around homes
- Drain stagnant water around our homes.
- Construct a pit latrine
- Have a rubbish pit

#### **Healthy life styles;**

These are

#### **Examples of healthy life styles include;**

- Doing physical exercises.
- Resting after meals
- Bathing daily.

- Eating a balanced diet.
- Going for medical checkups.

#### **Importance of resting after meals**

- Digestion of food is carried out smoothly.
- The brain rest and gets refreshed.
- The body is able to repair worn out cells.

#### **Reasons for doing daily physical exercises**

- For body flexibility.
- Strengthen body muscles.
- For proper functioning of the body organs and systems
- Reduce excess fats in the body.

#### **Health education.**

It is the making of the community get aware of the matters concerning diseases and how to prevent them.

#### **Ways of educating people**

- Through Songs, plays, storytelling.
- Through Radios, newspapers, talks
- School pupils pass information to their parents, brothers, sisters and relatives.

#### **Having a family budget.**

##### **A family budget.**

It is an advance plan of how the expected family income is to be spent.

#### **Advantages of family budgeting**

- i. It helps to cater for all family needs.
- ii. It helps to avoid over spending.
- iii. It avoids debts.

#### **Collecting information/data on human population.**

#### **Demography**

This is the study of the changing numbers of births, deaths and diseases in a community.

Information can be collected from hospitals and by going to homes.

#### **Importance of demography**

- To plan for the community services e.g. health centres, markets and water.
- The government is able to know the general health of people.

#### **Housing information**

This is the finding out of the number of people who sleep in permanent or temporary houses to estimate the poverty line of the people.

#### **Available health services**

The government needs information on these services to be able to deliver medical services quickly and monitor the health of its population

**Information available on health services include**

- Immunization.
- Family planning.
- Treatment of infections.
- Provision of water.
- Control of epidemic diseases.

**Immunization**

The introduction of vaccines into the body to produce anti bodies against certain diseases.

**Collecting information on immunization**

Information includes.

- Number of immunization centers.
- People involved in carrying out immunization.
- Days and time on which immunization is done.

**Importance of immunization**

- To protect children against the childhood immunisable diseases.
- To boost the immunity.
- Reduce the rate at which children die / reduces infant mortality rate.

**A child health card.**

It is a document given by the government to every child with information about his/her immunisation.

**Importance of a child health card.**

- To know the date of the next dose.
- To monitor the growth(looking at the growth curve)
- It shows the child's name, sex, date of birth, birth order, mother's name, mother's occupation, father's name and where the family lives.

**Collecting information on available health services.**

**Advantage of collecting information on available health services.**

-It helps in quick delivery of medical services.

-Control of epidemic diseases.

-It helps the government to monitor the health of people.

**Health surveys**

A health survey is a strategy of finding out health problems and solve them.

The information obtained from a healthy survey is called health data

The health survey is carried out by village health committee and government officials.

**Nature of questions asked.**

i. What are the common sicknesses in the community?

ii. What kind of treatment is given for each sickness?

iii. What are the Causes of the sickness

**A health club**

It is an association of members in a school or community who voluntarily wish to promote community health.

**Activities of health clubs include;**

- Promotion of personal hygiene in a community/school.
- Educating members of the community about sanitation.
- Encourage the community to participate in community basic health programmes.
- Caring for those in poor health.
- Getting health information from technical personnel and distributing to the community.

**TOPICAL QUESTIONS**

1. State any one type of common sickness in a community.
2. What is a health parade?
3. State one cause of common illness in our communities.
4. Why is it important to collect information about immunization in our community?
5. State any one activity done during a health survey.
6. How are health clubs useful in our community?
7. Cite any one importance of health surveys in our community.
8. Why is it importance of health education to children ion schools?
9. Write down any two examples of water borne diseases.
10. What are anti social behaviours?
11. Give any two examples of antisocial behaviours.
12. How can antisocial behaviours be controlled in our community.
13. Write any two indicators of poor sanitation in a home.
14. Briefly explain the term health.
15. State any two ways we can contribute towards the reduction of proper functioning of our health.

# P.7 math notes

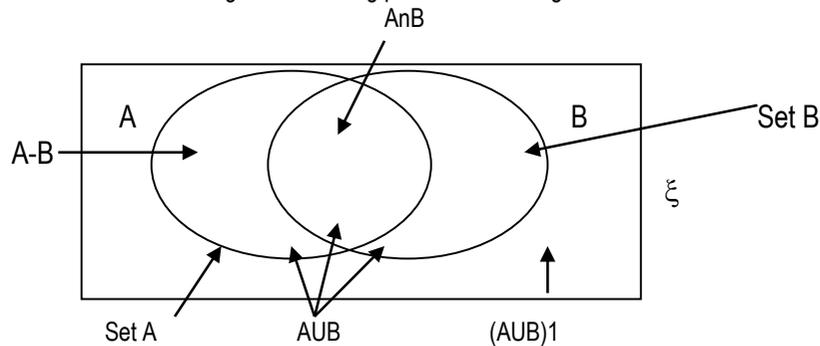
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**TOPIC ONE:**

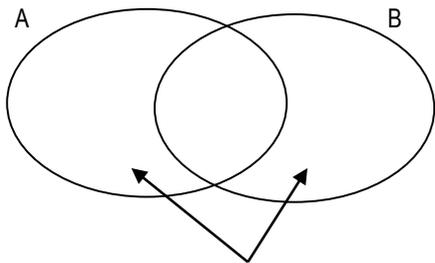
TOPIC: SET CONCEPTS

LESSON 1:  
SUB TOPIC: REVIEW OF SETS

CONTENT: Regions/describing points of venn diagram



Learners will be guided in describing the different regions on venn diagrams.



**EVALUATION ACTIVITY:**

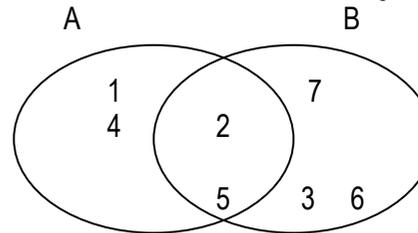
MK New Edition BK 7 Pg 5 and Pgs 12 – 13/Fountain bk/NCDC bk

**Remarks:**

LESSON 2:

SUB TOPIC: LISTING ELEMENTS

CONTENT: Given the venn diagram below:



List members of the following using the above venn diagram:

- (i) Set B
- (ii) Set A<sup>c</sup>
- (iii) (B∩A)
- (iv) (A∪B)
- (v) A-B

**EVALUATION ACTIVITY:**

Mathematics Revision Hand Book Primary 5, 6, & 7 Pg 18 Exercise 1:2

**Remarks:**

LESSON 3:

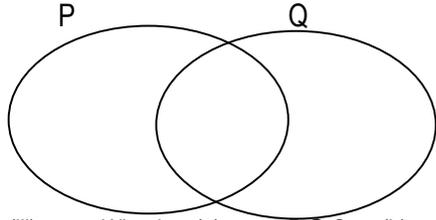


SUB TOPIC: REPRESENTING SETS ON VENN DIAGRAM

CONTENT:

Example:

- If  $P = \{\text{Factors of } 24\}$   
 $Q = \{\text{Multiples of } 4 \text{ less than } 25\}$
- (i) List elements of:  $P = \{1, 2, 3, 4, 5, 6, 8, 12, 24, \}$   
 $Q = \{4, 8, 12, 16, 20, 24\}$
- (ii) Represent the above sets on a venn diagram below:



(iii) What is: (a)  $P \cap Q$  (b)  $(P \cup Q)$

**EVALUATION ACTIVITY:**

1. Given that set  $A = \{\text{Even numbers less than } 15\}$   
 $B = \{\text{Composite numbers less than } 15\}$
- (a) List down the members of the above sets.  
(b) Represent the above sets on a venn diagram
2. Given that  $\epsilon = \{\text{whole numbers less than } 15\}$   
Set  $P = \{4, 6, 14, 8, 0, 12, 3, 7\}$   
Set  $Q = \{1, 3, 5, 7, 9, 11, 13\}$   
Write down the numbers of  $P \cap Q$   
Represent the above sets on a venn diagram

Remarks:

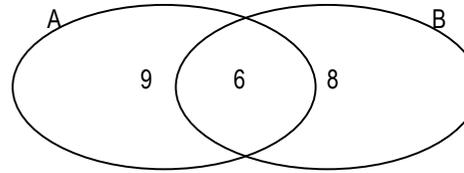


LESSON 4:  
SUB TOPIC: NUMBER OF ELEMENTS ON VENN DIAGRAMS

CONTENT:

Example:

The diagram below shows the number of pupils who eat apples (A) and beans (B). Use it to answer questions that follow:



- (i) How many pupils eat both apples and beans?  
(ii) How many pupils eat beans  $n(B) = 6 + 8 = 14$   
(iii) How many pupils eat apples?  
(iv) How many pupils eat only one type of food?  
(v) Find the number of pupils in the whole class.

**EVALUATION ACTIVITY:**

A New MK Maths Revised Edition Bk 7 Pg 9 Exercise 1:6 and exercise 1:9 Pg 14

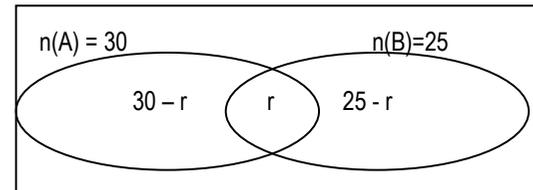
Remarks:



LESSON 5:

SUB TOPIC: SOLVING PROBLEMS USING VENN DIAGRAM

CONTENT: Given that  $n(A) = 30$ ,  $n(B) = 25$  and  $n(A \cup B) = 45$ .  
(a) Draw a venn diagram to show the above information.

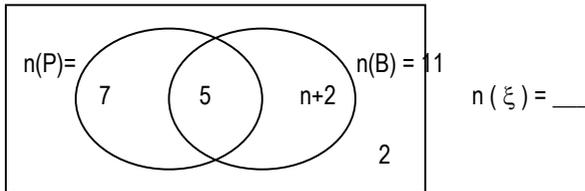


- (b) Find  $n(A \cap B)$   
Let the number in  $(A \cap B)$  be  $r$ .  
 $30 - r + r + 25 - r = 45$   
 $30 + 25 + r - r - r = 45$   
 $55 - r = 45$   
 $55 - 55 - r = 45 - 55$   
 $-r = -10$   
 $-r = -10$   
 $-1 - 1$



$$\begin{array}{r} \text{Difference} = 764 \\ - 467 \\ \hline 297 \end{array}$$

- (b) Find the value of  $y$ .  
 (c) What is the probability of picking a pupil who likes only one subject?
8. In a class of 20 pupils where two languages are spoken, 14 speak Luganda (L), 15 speak Kiswahili (K).  
 (a) Draw a venn diagram and show the information given.  
 (b) Find the number of pupils who speak both Luganda and Kiswahili.  
 (c) Find the number of pupils who speak only one language.
9. Use the venn diagram below.



- (a) Find the value of (i)  $h$   
 (ii) Universal set  
 (iii)  $n(P \cap B)$
10. In a class of 60 pupils, all enjoy eating beans, 33 enjoy eating meat (M), 35 enjoy eating fish (F), If P pupils enjoy all the three while 2 enjoy eating beans only.  
 (a) Represent the information on a venn diagram.  
 (b) Find the value of P.  
 (c) How many pupils enjoy only fish?
14. Given that Set  $X = \{a, d, c, d\}$  Find the number of:  
 (i) Sub sets  
 (ii) Proper subsets

TOPIC TWO:

**TOPIC: WHOLE NUMBERS**

**LESSON 1:**

**SUB TOPIC: FORMING NUMERALS USING GIVEN DIGITS**

**CONTENT:** Using digits to form smallest and largest numbers.  
 Finding the sum of/difference between the smallest and largest numbers formed from the given digits.

Examples:

- Write down all 3-digit numerals that can be formed using the digits; 4, 6, 7  
 Solution: (i) 476 (ii) 764 (iii) 467 (iv) 647, etc
- Find the difference between the smallest and highest numerals formed.  
 Solution: Smallest = 467  
 Largest/biggest numeral – 764

**EVALUATION ACTIVITY:**

Exercise 2:1

Mathematics Revision Hand book for P.5 , P.6 and P.7 Pg 40

A New Mk Book 5 Pg

**Remarks:**

**LESSON 2:**

**SUB TOPIC: PLACE VALUES OF DIGITS IN NUMERALS**

**CONTENT: The place value chart**

- Definition of place value.

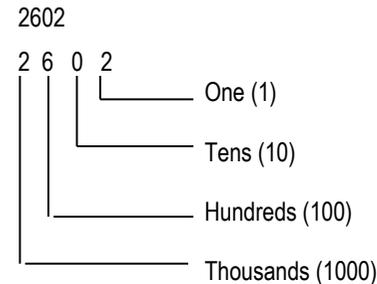
Million			Thousands			Units		
H	T	O	H	T	O	H	T	O
2	4	1	0	6	3	1	2	2

- Identify the place value of each digit in the number above both in word and in figure.

**Values:**

- Meaning of value
- Finding values of digits in a given numeral.
- Operations on values of digits.

Example: Find the value of 6 in the number





- Value of 6 =  $6 \times 100$  = 600

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Book 6 (Old Edition)  
Exercise 2:1 Pg 23  
2:2 Pg 24

Remarks:

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**LESSON 3:**  
**SUB TOPIC: READING AND WRITING VALUE IN WORDS TO (100 MILLION)**

**CONTENT: Writing in words**

**Examples:**

(i) Write 20,480 in words.

Thousand	Units
20	480

(ii) Twenty thousand four hundred eighty.  
60,808,040

Million	Thousand	Units
60	808	040

Sixty million, eight hundred eight thousand forty.

**EVALUATION ACTIVITY:**

A New MK Primary Mathematic Bk 7 Exercise 2:2 Pg 22 (New Edition)

Remarks:

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**LESSON 4:**  
**SUB TOPIC: READING AND WRITING NUMERALS IN FIGURES**

**CONTENT: Examples:**

Write in figures:

(i) Fifty seven million four hundred twenty one thousand nine hundred five.

Solution:

57 million = 57,000,000

421 thousand + 421,000

905                      905

57,421,905

(ii) A quarter of a million

A million = 1,000,0000

$\frac{1}{4}$  of 1,000,000

$\frac{1 \times 1,000,000}{4}$

4

= 250,000

**EVALUATION ACTIVITY:**

A New MK Primary Mathematic Bk 7 Exercise 2:1 Pg 21 (New Edition)

Remarks:

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**LESSON 5:**  
**SUB TOPIC: EXPANDED NOTATION**

**CONTENT: Expanding numerals using:**

- Place values

- Values

- Powers of ten/exponents

**Examples:**

Expand: 5624 using:

Place values:  $5624 = (5 \times 1000) + (6 \times 100) + (2 \times 10) + (4 \times 1)$

Values:  $5624 = 5000 + 600 + 20 + 4$



**Powers:**  $5624 = (5 \times 10^3) + (6 \times 10^2) + (2 \times 10^1) + (4 \times 10^0)$

$10^3$	$10^2$	$10^1$	$10^0$
5	6	2	4

$$\begin{array}{r} 4000 \\ 700 \\ 6 \end{array}$$


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$$204706$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematic Bk 6 Pg 37 Exercise 2:4  
Mathematics Revision Hand book P.5 – P.7 Pg 27

**Remarks:**

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**LESSON 6:**

**SUB TOPIC: FINDING THE EXPANDED NUMBERS (SHORT FORM)**

**CONTENT: Examples:**

Write as a single number.

(i)  $(6 \times 10,000 + (4 \times 10) + (5 \times 1))$

Solution:

$$(6 \times 10000) + (4 \times 100) + (5 \times 1)$$

$$= 60,000 + 400 + 5$$

$$= 60000$$

$$400$$

$$+ 5$$

---


$$60405$$

(ii)  $9000000 + 700\ 00 + 50000 + 1000 + 30 + 8$

$$= 9\ 000\ 000$$

$$700\ 000$$

$$50\ 000$$

$$1\ 000$$

$$30$$

$$8$$

---


$$9\ 750\ 038$$

(iii)  $(2 \times 10^5) + (4 \times 10^3) + (6 \times 10^0) + (7 \times 10^2)$

$$= (2 \times 10 \times 10 \times 10 \times 10 \times 10) + (4 \times 10 \times 10 \times 10) + (6 \times 1) + (7 \times 10 \times 10)$$

$$= 200,000 + 4000 + 6 + 700$$

$$= 200\ 000$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematic Bk 6 Pg 37 Exercises 2:5 (Old Edition) Pg 58

**Remarks:**

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**LESSON 7:**

**SUB TOPIC: STANDARD FORM/SCIENTIFIC NOTATION**

**CONTENT: Writing whole numbers in Scientific notation**

**Examples:**

(i) Write 453 in standard form

x 100

$$4.53 \times 10 \times 10$$

$$4.53 \times 10^2$$

(ii) Express 650000 in Scientific notation.

$$650,000 = 6.5 \times 100,000$$

$$= 6.5 \times 10 \times 10 \times 10 \times 10 \times 10$$

$$= 6.5 \times 10^5$$

Finding numbers expressed in standard form.

**EVALUATION ACTIVITY:**

A New MK Primary Mathematic Bk 6 Pg 60 (Old Edition)

Macmillan Primary Mathematics Bk 7 Pg 56 Exercise 10 Pg 58 Exercise 11

**Remarks:**

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**LESSON 8:**

**SUB TOPIC: ROUNDING OFF WHOLE NUMBERS**

**CONTENT: Examples:**

Review – rounding off scale

Round off the following as instructed.

(i) 3864 to the nearest hundred.

H - R P V

$$\begin{array}{r} 3864 \\ + 1 \\ \hline \end{array}$$

$$390$$

TH	H	T	O
3	8	6	4

$$\begin{array}{r} + 1 \\ \hline 3900 \end{array}$$

(ii) 214 (nearest tens) ...  $3864 = 3900$

Tens - RPV

$$\begin{array}{r} 214 \\ + 0 \\ \hline 210 \end{array}$$

H	T	O
2	1	4

$$\begin{array}{r} + 0 \\ \hline 210 \\ 214 = 210 \end{array}$$

**EVALUATION ACTIVITY:**

A New MK Pupils Bk 6 Pg 161 Exercise 18:1  
Macmillan Primary Mathematics Bk 7 Exercise 6 Pg 23

Remarks:

**LESSON 9:**

**SUB TOPIC: ROMAN NUMERALS; CONVERTING HINDU ARABIC NUMERALS TO ROMAN NUMERALS**

**CONTENT:**  
Revise basic Roman symbols (IXLCDM)  
Example

1. What 124 in Roman numerals

H	T	O
1	2	4

$$\begin{array}{r} H \quad T \quad O \\ 1 \quad + \quad 2 \quad + \quad 4 \\ 100 \quad 20 \quad 4 \\ 100 + 20 + 4 \\ 100 = C \\ 20 = XX \\ 4 = IV \\ = CXXIV \end{array}$$

ii) 1962

$$\begin{array}{l} 1000+900+ 60 +2 \\ 1000 = M \\ 900 = CM \\ 60 = LX \\ 2 = II \\ = MCMLXII \end{array}$$

**EVALUATION ACTIVITY:**

Macmillan Pri MTC pupils bk 7 pg 16 exercise 1  
A New MK Primary Mathematic Bk 7 pg 23

Remarks:

**LESSON 10:**

**SUB TOPIC: ROMAN NUMERALS (CONVERSION OF ROMAN NUMERALS TO HINDU ARABIC)**

**CONTENT: Example**

Write the following numbers in Hindu Arabic numerals

- (i) MXLV  
M + XL + V  
M – 1000  
XL – 40  
V – 5

- (ii) MXLV = 1045  
CDXCiv  
CD + XC + iv  
CD – 400  
XC – 90  
iv – 4

$$\overline{CDXCIV} = 494$$

- (iii) A temple had MDCCLXIV written on top of it showing the year it was built. Which year is this in Hindu Arabic

**EVALUATION ACTIVITY:**

A New MK Primary Maths Pupils Bk 7 Pg 24 Exercise 2:6  
Macmillan Primary Maths Pupils' Bk 7 Pg 16 exercise 1.

**LESSON 11:**

**SUB TOPIC: OPERATION ON ROMAN NUMERALS**

**CONTENT: Example**

- (i) Add CCXLIII + DCLXXV (answer in Roman numerals)

**Solution:**  
CCXLIII – Hindu Arabic  
CC + XL + III  
CC – 200

XL - 40  
 III - 3  
 243  
 DCLXXV  
 DC + LXX + V  
 600 + 70 + 5  
 675

243 + 675 = 918

918 – Roman numerals  
 900 + 10 + 8  
 900 = CM  
 10 = X  
 8 = VIII                      918 = CMXVIII

Find the difference between MMCMLX and MCDXL answer in Hindu Arabic numerals.

**EVALUATION ACTIVITY:**

Teacher designs his or her own suitable activity.

Remarks:

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**LESSON 12:**

**SUB TOPIC: BASES (CHNAGING FROM DECIMAL BASES TO NON-DECIMAL BASES)**

**CONTENT:**

Review the following:

- Name of bases and digits used.
- Place values of bases.

Example:

Change 25 to base seven

Solution:

7	25	rem 4	↑	25 = 34 seven
7	3	rem 3		

What base eight numeral is equal to 54 ten?

Express 83 nine to nonary base.

**EVALUATION ACTIVITY:**

A New MK Primary Maths Pupils' Bk 6 Pg 39 exercise 5:8

Remarks:

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**LESSON 13:**

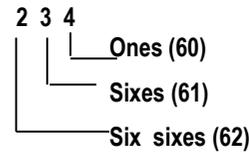
**SUB TOPIC: BASES (CHANGING FROM NON DECIMAL BASES TO DECIMAL BASES)**

**CONTENT:**

Example:

(i) Change 234 six to base ten

Solution:



(2 x 6<sup>2</sup>) + (3 x 6<sup>1</sup>) + (4 x 6<sup>0</sup>)  
 (2 x 6 x 6) + (3 x 6) + (4 x 1)  
 12 x 6 + 18 + 4  
 72 + 22  
 94 ten

**EVALUATION ACTIVITY:**

A New MK Primary Maths Pupils' Bk 6 Pg 40 exercise 5:10

Remarks:

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**LESSON 14:**

**SUB TOPIC: BASES (CHANGING FROM NON DECIMAL BASES TO NON DECIMAL BASES)**

**CONTENT:**

Example:

(i) Change 123 five to base six

Solution:

123<sub>five</sub> base ten  
 123  
 One (5<sup>0</sup>)

Fives (5<sup>1</sup>)  
Five fives (5<sup>2</sup>)

$$(1 \times 52) + (2 \times 51) + (3 \times 50)$$

$$(1 \times 5 \times 5) + (2 \times 5) + (3 \times 1)$$

$$(5 \times 5) + 10 + 3$$

$$25 + 10 + 3$$

$$35 + 3$$

$$38_{\text{ten}}$$

38 ten to base six

	B	N	R
6	3	8	2
6	6	0	
6	1	1	
		0	

102<sub>six</sub>

123<sub>five</sub> = 102<sub>six</sub>

(ii) 2t eleven to base nine

**EVALUATION ACTIVITY:**

A New MK Primary Maths Pupils' Bk 6 Pg 39 exercise 5:8

Remarks:

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**LESSON 15:**

**SUB TOPIC: BASES (OPERATION ON BASES – ADDITION)**

**CONTENT:**

**Example:**

$$225_{\text{six}} 9 \div 6 \text{ 1 rem 3}$$

$$+ 434_{\text{six}}$$


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$$1103_{\text{six}}$$

143<sub>five</sub> + 11<sub>five</sub> (answer in base ten)

23<sub>seven</sub> + 12<sub>six</sub> (answer in base five)

**EVALUATION ACTIVITY:**

A New MK Primary Maths Pupils' Bk 7 Pg 38 exercise 3:2

Remarks:

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**LESSON 16:**

**SUB TOPIC: BASES (SUBTRACTION OF BASES)**

**CONTENT:** Examples:

(I) 671<sub>nine</sub> – 285<sub>nine</sub>

Solution:

$$\begin{array}{r} 671_{\text{nine}} \\ - 285_{\text{nine}} \\ \hline 375_{\text{nine}} \end{array}$$

9 + 1 = 10  
9 + 6 = 15

(II) 345<sub>six</sub> – 234<sub>six</sub> (answer in base six)

**EVALUATION ACTIVITY:**

A New MK Old Edition Pupils Bk 7 Pg 39 exercise 3:3

Remarks:

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**LESSON 17:**

**SUB TOPIC: MULTIPlication OF BASES**

**CONTENT:** Example:

(i)

$$\begin{array}{r} 121_{\text{three}} \\ \times 2_{\text{three}} \\ \hline 1012_{\text{three}} \end{array}$$

1 x 2 = 2  
2 x 2 = 4  
4 ÷ 3 = 1 rem 1  
1 x 2 = 2 + 1  
3 ÷ 3 = 1 rem 0

(ii)

$$\begin{array}{r} 33 \\ \times 14_{\text{six}} \\ \hline \end{array}$$

5 x 2 = 20  
20 ÷ 6 = 3 rem 2



$$\begin{array}{r} \underline{\quad\quad\quad} \\ 2312 \\ \underline{345} \\ 10202 \text{ six} \end{array}$$

$$\begin{array}{l} 4 \times 4 = 16 + 3 \\ 10 \div 6 = 3 \text{ rem } 1 \\ 3 \times 4 = 12 + 3 \\ 15 \div 6 = 2 \text{ rem } 3 \end{array}$$

**EVALUATION ACTIVITY:**

Exercise 2:1  
A New MK Primary Maths Pupils' Bk 7 Pg 40 exercise 3:4

Remarks:

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**LESSON 18:**

**SUB TOPIC: DIVISION OF BASES**

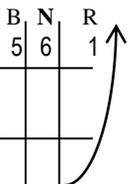
**CONTENT:**

Examples:

(i)  $204_{\text{five}} \div 14_{\text{five}}$ .  
Solution:  
 $204_{\text{five}}$  – base ten  
 $(2 \times 5^2) + (0 \times 5^1) + (4 \times 5^0)$   
 $(2 \times 5 \times 5) + (0 \times 5) + (4 \times 1) + (10 \times 5) + 0 + 4$   
 $50 + 4$   
 $54_{\text{ten}}$

$14_{\text{five}}$   
 $(1 \times 5^1) + (4 \times 5^0)$   
 $(1 \times 5) + (4 \times 1)$   
 $5 + 4$   
 $= 9_{\text{ten}}$   
 $5 \div 9_{\text{ten}}$   
 $6_{\text{ten}}$

6ten – base five



$$\begin{array}{r} 5 \ 1 \ 1 \\ 0 \\ 11 \text{ five} \\ \text{(ii) } 448 \text{ nine } \div 17 \text{ nine (answer in Septenary base)} \end{array}$$

**EVALUATION ACTIVITY:**

A New MK Old Edition Pupils Bk 7 Pg 41 - 42 exercise 3:5

Remarks:

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**LESSON 19:**

**SUB TOPIC: FINDING THE UNKNOWN BASE (MISSING BASE)**

**CONTENT:** Examples:

(i) If  $44p = 35_{\text{nine}}$   
Solution:  
 $(4 \times 0^1) + (4 \times p^0) = (3 \times 9^1) + (5 \times 9^0)$   
 $(4 \times p) + (4 \times 1) = (3 \times 9) + (5 \times 1)$   
 $4p + 4 = 27 + 5$   
 $4p + 4 = 32$   
 $4p + 4 - 4 = 32 - 4$   
 $4p + 0 = 28$   
 $\frac{4p}{4} = \frac{28}{4}$   
 $p = 7$

(ii)  $X2 = 71_{\text{nine}}$   
 (iii)  $325_{\text{six}} = q3$

**EVALUATION ACTIVITY:**

A New MK Old Edition Pupils Bk 7 Pg 43 exercise 3:7

Remarks:

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**TOPIC 3:**

**TOPIC: OPERATION ON NUMBERS**

**LESSON 1:**

**SUB TOPIC: ADDITION OF LARGE NUMBERS**



**CONTENT:** Examples:

Add correctly:

$$\begin{array}{r} \text{(i)} \quad 615\ 146\ 144 \\ + 320\ 005\ 614 \\ \hline 935\ 151\ 758 \end{array}$$

(ii) The population in four countries of a district shows that county A is 23,467, county B is 21 602, county C is 19466 and county D is 25 102. What is the total population in the district?

County A	23467
County B	21602
County C	19466
County D	25012
	89 547

Emphasis on place value arrangement and re-grouping.

**EVALUATION ACTIVITY:**

A New MK Bk 7 exercise 3:1 Pg 45  
Primary School Mathematics Bo 7 exercise 2 Pg 11.

**Remarks:**

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**LESSON 2:**

**SUB TOPIC: SUBTRACTION OF LARGE NUMBERS**

**CONTENT:** Examples:

Subtract correctly:

$$\begin{array}{r} \text{(i)} \quad 596\ 148\ 320 \\ - 239\ 610\ 510 \\ \hline 356\ 537\ 810 \end{array}$$

(ii) What is the difference between 3060 and 186?

$$\begin{array}{r} 3\ 0\ 6\ 0 \\ - 186 \\ \hline 2874 \end{array}$$

(iii) Emphasis on place value arrangement and regrouping.

**EVALUATION ACTIVITY:**

A New MK Bk 7 exercise 3:1 Pg 45  
Primary School Mathematics Bk 7 exercise 2 Pg 11.

**Remarks:**

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**LESSON 3:**

**SUB TOPIC: MULTIPLICATION OF LARGE NUMBERS**

**CONTENT:** Examples: Multiply:

$$\begin{array}{r} \text{(i)} \quad 214\ 032 \times 1324 \\ \times 1324 \end{array}$$

$$\begin{array}{r} 856128 \\ 4280640 \\ 64209600 \\ +214032000 \end{array}$$

$$\hline 283378368$$

(ii) A store can hold 1973 boxes each containing 34 pairs of shoes. How many pairs of shoes are in the store?

$$\begin{array}{r} 1973 \\ \times 34 \\ \hline 7892 \\ +59190 \end{array}$$

$$\hline 67082 \text{ pairs}$$

**EVALUATION ACTIVITY:**

New MK Bk 7 exercise 3:2 Pg 46

**Remarks:**

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**LESSON 4:**  
**SUB TOPIC: DIVISION OF LARGE NUMBERS**

**CONTENT:** Examples:  
 (i) Divide 3816648 by 132

$$\begin{array}{r}
 28914 \\
 132 \overline{) 3816648} \\
 \underline{-264} \phantom{00} \\
 1176 \phantom{00} \\
 \underline{-1056} \phantom{00} \\
 1206 \phantom{00} \\
 \underline{-1188} \phantom{00} \\
 184 \phantom{00} \\
 \phantom{184} \underline{132} \phantom{00} \\
 \phantom{184} \phantom{132} 528 \\
 \phantom{184} \phantom{132} \underline{-528} \\
 \phantom{184} \phantom{132} \phantom{528} 0
 \end{array}$$

= 28914

(ii) There are 6315 books to be packed in 15 boxes. How many books should be packed in each box?

$$\begin{array}{r}
 421 \\
 15 \overline{) 6315} \\
 \underline{60} \phantom{00} \\
 31 \phantom{00} \\
 \underline{-30} \phantom{00} \\
 15 \phantom{00} \\
 \underline{-15} \\
 0
 \end{array}$$

**EVALUATION ACTIVITY:**

A New MK Bk 7 exercise 3:2 Pg 46

**Remarks:**

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**LESSON 5:**  
**SUB TOPIC: DISTRIBUTIVE PROPERTY**

**CONTENT:** Examples:  
 Use the distributive property to work out:

(i)  $(379 \times 27) + (27 \times 21)$   
 Re-arrange  $(27 \times 379) + (27 \times 21)$   
 $= 27 \times (379 + 21)$   
 $= 27 \times (400)$   
 $= 27 \times 400$   
 $= 10800$

(ii)  $(137 \times 42) - (37 \times 42)$   
 $(137 \times 42) - (37 \times 42)$   
 $= (42 \times 137) - (42 \times 37)$   
 $= 42 \times (137 - 37)$   
 $= 42 \times 100$   
 $= 4200$

**ASSOCIATIVE PROPERTY**

Example

Use the associative property to workout  
 $(5+8)+2=5+(8+2)=(5+2)+8$  the alteration of the position of the brackets does not change the  
 $13+2=5+10 = 7+8$  result  
 $15 + 15 = 15$

$(5 \times 8) \times 2 = 5 \times (8 \times 2) = (5 \times 2) \times 8$  ) The alteration of the position of the brackets does not change the  
 $40 \times 2 = 5 \times 16 = 10 \times 8$  result.  
 $80 \quad 80 = 80$

Conclusion : the associative property holds for both addition and multiplication.

**Commutative property**

Example

$4+3 = 3+4$  What you start with does not affect the result  
 $7 \quad 7$   
 $4 \times 3 = 3 \times 4$  (What you start with does not affect the result  
 $12 = 12$

Conclusion: The commutative property holds for both addition and multiplication

Given that  $t \times y = ty$

Find;  
 i)  $2 \times 3$   
 ii)  $5 \times 7$

**EVALUATION ACTIVITY:**

A new MK pri MTC bk 7 exercise 3:3 pg 47 (new edition)

Remarks:

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**LESSON 6:**

**SUB TOPIC: LAWS OF INDICES IN MULTIPLICATION AND DIVISION**

**CONTENT:** Examples:

- (i) Evaluate:  $4^2 \times 4^4$   
 Method 1:  $4^2+4$  using index rule  
 $= 4^6$   
 Method 2: Using expanded form  $4^2 \times 4^4$   
 $= 4 \times 4 \times 4 \times 4 \times 4 \times 4 \times 4$   
 $= 4^6$
- (ii) Work out:  $43 \div 42$   
 Method 1: Using the index rule.  
 $43 \div 42$   
 $= 4^{3-2}$   
 $= 4^1$   
 $= 4$   
 Method 2:  $43 \div 42 = 4 \times 4 \times 4$   
 $= \frac{4 \times 4}{1} = 4$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 3:8 and 3:9 on Pg 51 & 52.

Remarks:

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**LESSON 7:**

**SUB TOPIC: APPLICATION OF INDICES**

**CONTENT:** Solving multiplication equations.  
 Finding missing indices by multiplication.

Examples: Solve:

- (i)  $2^x = 3^2$   
 Factorize 32 using 2.

2	32	$2^x = 2 \times 2 \times 2 \times 2 \times 2$
2	16	$2^x = 2^5$
2	4	$\therefore X = 5$
2	2	
	1	

- (ii)  $3^y \times 3 = 81$   
 Factorise 81 using 3.

3	81	$3^y \times 3^1 = 3 \times 3 \times 3 \times 3$
3	27	$3^y \times 3^1 = 3^4$
3	9	$3^{y+1} = 3^4$
3	3	$Y + 1 = 4$
	1	$Y - 1 = 4 - 1$
		$\therefore Y = 3$

- (iii)  $2t \times 33 = 108$   
 Factorize 108 using 2 and 3.

2	108	$2^t \times 3^3 = 2 \times 2 \times 3 \times 3 \times 3$
2	54	$2^t \times 3^3 = 2^2 \times 3^3$
3	27	$2^t \times 3^3 \div 3^3 = 2^2 \times 3^3 \div 3^3$
3	9	$2^t = 2^2$
3	3	$t = 2$
	1	

**EVALUATION ACTIVITY:**

Mathematics Bk 7 exercise 3:10 Pg 53

Remarks:

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**LESSON 8:**

**SUB TOPIC: APPLICATION OF INDICES**

**CONTENT:** Finding missing indices by division

Examples: Solve:

(i)  $2^x \div 2^1 = 8$

Factorize 8 using 2.

$2 \overline{) 8}$	$2^x \times 2^1 = 2 \times 2 \times 2$
$2 \overline{) 4}$	$2^x \times 2^1 = 2^3$
$2 \overline{) 2}$	$2^{x-1} = 2^3$
	$x - 1 = 3$
1	$x - 1 + 1 = 3 + 1$
	$\therefore x = 4$

(ii)  $4^y \div 4^x = 256$

Factorise 256 using 4.

$4 \overline{) 256}$	$4^{3x} \div 4^x = 4 \times 4 \times 4 \times 4 \times 4$
$4 \overline{) 64}$	$4^{3x} \div 4^x = 4^4$
$4 \overline{) 16}$	$4^{3x} - x = 4^4$
$4 \overline{) 4}$	$3x - x = 4$
1	$2x = 4$
	$\frac{2x}{2} = \frac{4}{2}$
	$x = 2$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 3:11 Pg 54

Remarks:

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**LESSON 7:**

**SUB TOPIC: SQUARE NUMBERS AND SQUARE ROOTS**

**CONTENT:**

Examples:

(i) Find the square of 4.

Square of 4 =  $4^2 = 4 \times 4 = 16$

(ii) Find the square root of 4.

$$4 = \frac{2 \overline{) 4}}{2 \overline{) 2}} = \sqrt{2 \times 2} = 2$$

(iii) Find the square root of  $7 \frac{1}{9}$

First change it to improper fraction:  $\frac{(7 \times 9) + 1}{9}$

$$\frac{63 + 1}{9} = \frac{64}{9}$$

$2 \overline{) 64}$	$3 \overline{) 9}$	Therefore $\frac{64}{9} = \frac{8}{3}$
$2 \overline{) 32}$	$3 \overline{) 3}$	$\frac{8}{9 \times 3}$
$2 \overline{) 8}$	1	$= 2 \frac{2}{3}$
$2 \overline{) 4}$		
$2 \overline{) 2}$		
1		

$$\frac{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3}{2 \times 2 \times 2 \times 2} = 8$$

(iv) Find the square root of 0.36

**EVALUATION ACTIVITY:**

A New MK Pupils Bk 6 (Old Edition) Pg 90 – 92 exercise 9:23, 9:24, 9:25 & 9:26

Remarks:

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**LESSON 8:**

**SUB TOPIC: CUBE ROOTS**

**CONTENT:**

Example:

Find the cube root of 8.

${}^3\sqrt{8}$

2	8	
2	4	
2	2	
		1

${}^3\sqrt{8} = 2 \times 2 \times 2 = 2$

Method 2:

$${}^3\sqrt{8} = (2^3)^{1/3}$$

$$2^{(3 \times 1/3)} = 2^1 = 2$$

### EVALUATION ACTIVITY:

Teachers' collection  
 Mathematics Revision Hand Book for Primary 5, 6 & 7 Pg 60

Remarks:

## LESSON 9:

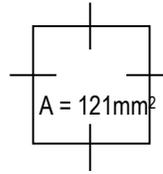
### SUB TOPIC: APPLICATION OF SQUARE AND CUBIC NUMBERS

#### CONTENT:

Example:

- (i) The area of a square is  $121 \text{ mm}^2$ . Find the length of each of its sides.  
 Sketch: Area of a square =  $S^2$

$S^2 = 121 \text{ mm}^2$



$\sqrt{S^2} = \sqrt{121 \text{ mm}^2}$

$\sqrt{S \times S} = \sqrt{11 \text{ mm} \times 11 \text{ mm}}$

$S = 11 \text{ mm}$

- (ii) The volume of a cube is  $64 \text{ m}^3$ . Find the length of one side.

$\text{Vol of a cube} = L^3 = 64 \text{ m}^3$

${}^3\sqrt{L^3} = {}^3\sqrt{64 \text{ m}^3}$

2	64
2	32
2	16
2	8
2	4
2	2
	1

$64 = 2^6$

$= 2^6 \times 1/3$

$2^2 = 2 \times 2 = 4$

$L = 4 \text{ m}$

### EVALUATION ACTIVITY:

A New MK Primary Mathematics Bk 6 Pg 102 exercise 4:43.

Remarks:

### TOPICAL EXERCISE:

1. Add:  $426 + 1519 + 3$
2. Subtract 105 from 200
3. Evaluate  $3^x \div 3^2 = 27$
4.  $5^3 \times 5^{-2} \div 5^1$
5. There were 32 apples in each box and 12 boxes in each carton. How many apples did Annet get if she bought 124 cartons?
6. What is the sum of 8456 litres of petrol and 45631 litres?
7. There were 38600 chicken on the teacher's farm. 12364 were sold on ldd day. How many remained?
8. At a party, 4848 people were served with sodas each. How many crates of soda were bought if each crate contains 24 bottles?

9. Work out (a)  $2.5 \times 13 + 2.5 \times 7$   
 (b)  $4.5 \times 75 - 4.5 \times 25$
10. What number must be added to 54068 to give 60000?

## TOPIC 4: PATTERNS AND SEQUENCES

### LESSON 1:

#### SUB TOPIC: DIVISIBILITY TESTS

**CONTENT:** Divisibility tests of 2, 3, 4 and 5.

#### Divisibility for 2.

A Number is divisible by 2 if the digit in the one's place is 0, 2, 4, 6, or 8 eg 1460

Test for 3:

A number is divisible by 3 if the sum of its digits is divisible by 3 eg  $741 = 7 + 4 + 1 = 12$

Test for 4:

A number is divisible by 4 if the number formed by its last two digits is divisible by 4. eg 572. The last two digits are 7 and 2 therefore the number formed is 72 which is divisible by 4. Hence 572 is divisible by 4.

Test for five (5):

A number is divisible by 5 if the last digit in the ones place is either 0 or 5. eg 360 or 805.

#### EVALUATION ACTIVITY:

A New Edition MK Primary Maths Pupils BK 7 Pg 60 exercise 4:1

Remarks:

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### LESSON 2:

#### SUB TOPIC: DIVISIBILITY TESTS

**CONTENT:** Divisibility tests for numbers 6 to 10.

#### Test for 6:

A number is divisible by 6 if it is divisible by 2 and 3. In other words a number is divisible by 6 if it is even and the sum of its digits is divisible by 3.

Example:

618 is divisible by 6 since it is an even number and the sum of its digits  $6 + 1 + 8 = 15$  is divisible by 3.

738 is divisible by 6 since it is an even number and the sum of its digits  $7 + 3 + 8 = 18$  is divisible by 3. Therefore 738 is divisible by 6.

#### Test for 7:

When the last digit of a number is doubled and the result is subtracted from the number formed by the remaining digits, the outcome is divisible by 7.

Example: Take the number 861. the last digit is 1 and the number formed by the remaining digits is 86, double 1 to give  $(1 \times 2) = 2$

Subtract 2 from 86 to give  $(86 - 2) = 84$

84 is divisible by 7. Hence 861 is also divisible by 7.

#### Test for 8:

A number is divisible by 8 if the number formed by the last three digits is divisible by 8.

Example:

In the number 7960,760 is number formed by the last three digits. It is divisible by 8 therefore 7960 is divisible by 8.

#### Test for 9:

A numbers is divisible by 9 if the sum of its digits is divisible by 9.

Example: 198 the sum of 198 is  $1+9+8 = 18$

18 is divisible by 9 therefore 198 is divisible by 9.

#### Test for 10:

A number is divisible by 10 if the digit in the ones place is 0 eg 70, 60, 120, 3010.

A number which is divisible by 10 is also divisible by 2 and 5.

#### Test for 11:

A number is divisible by 11 if the difference between the sum of the digits in even places and the sum of the digits in the odd place is zero (0) or divisible by 11.

eg Even position:  $\begin{array}{ccccccc} & & \downarrow & & \downarrow & & \downarrow \\ 7 & 3 & 3 & 6 & 8 & 9 & \\ \uparrow & & \uparrow & & \uparrow & & \\ & & & & & & \end{array}$

Odd position

Sum of the numbers in odd positions =  $7 + 3 + 8 = 18$

Sum of the numbers in even positions =  $7 + 3 + 0 = 10$

Difference between sums =  $18 - 10 = 8$

Since difference is not divisible by 11

$\therefore$  the number 733689 is not divisible by 11.

**EVALUATION ACTIVITY:**

A New Edition MK Primary Maths Pupils BK 7 Pg 63 exercise 4:2

**Remarks:**

**LESSON 3:**

**SUB TOPIC: WHOLE, NATURAL, ODD, EVEN AND PRIME NUMBERS**

**CONTENT:** Definition of:

**(i) Whole numbers:**

All positive numbers with zero (0) inclusive form a set of whole numbers  
eg 0, 1, 2, 3, 4, 5, 6, 7, 8, 9,.....

**(ii) Natural numbers:**

Natural numbers are counting numbers. The first natural number is 1  
eg 1, 2, 3, 4, 5, 6, 7, 8, 9, .....

**(iii) Odd numbers:**

Any number which is not exactly divisible by 2  
eg 1, 3, 5, 7, 9, .....

**(iv) Even numbers:**

Any number which is exactly divisible by 2. The first even number is 0  
eg 0, 2, 4, 6, 8,

**(v) Prime numbers:**

Numbers with only two factors. One and itself. The first prime number is 2. 2 is the only even/prime number.  
eg 2, 3, 5, 7, .....

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 4:5 Pg 68

**Remarks:**

**LESSON 4:**

**SUB TOPIC: COMPOSITE, TRIANGULAR, SQUARE, CUBE NUMBERS**

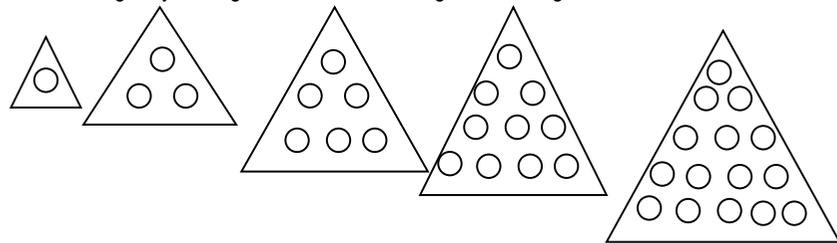
**CONTENT:** Definition of:

**(i) Composite numbers:**

Numbers with more than two factors. Eg 4, 6, 8, 9, 10, 12,.....

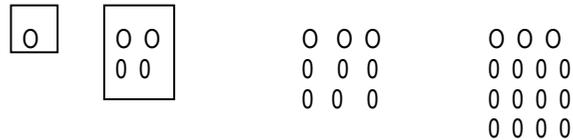
**(ii) Triangular numbers:**

Numbers got by adding consecutive counting numbers eg 1, 3, 6, 10, ....



**(iii) Square numbers:**

Numbers got by adding consecutive odd numbers starting from 1.



1      1 + 3      1 + 3 + 5      1 + 3 + 5 + 7  
1      4      9      16

**(iv) Cube numbers:**

Numbers got by multiplying a number by itself three times.

Eg      1 x 1 x 1 =      1<sup>3</sup> = 1  
         2 x 2 x 2 =      2<sup>3</sup> = 8  
         3 x 3 x 3 =      3<sup>3</sup> = 27



$$4 \times 4 \times 4 = 4^3 = 64$$

$$5 \times 5 \times 5 = 5^3 = 125$$

(v)

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 4:3 Pg 65

**Remarks:**

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**LESSON 5:**

**SUB TOPIC: MULTIPLES, FACTORS**

**CONTENT:** Definition of:

- (i) **Multiples:**  
These are numbers which are obtained by multiplying a number by consecutive counting numbers ie.  $1 \times 2 \times 3$ , etc

Examples:

(i)  $M_6 = \{6 \times 1, 6 \times 2, 6 \times 3, 6 \times 4, 6 \times 5, 6 \times 6, 6 \times 7, \dots\}$   
 $6 \quad 12 \quad 18 \quad 24 \quad 30 \quad 36 \quad 42$

(ii)  $M_8 = \{8 \times 1, 8 \times 2, 8 \times 3, 8 \times 4, 8 \times 5, 8 \times 6, 8 \times 7, \dots\}$   
 $8 \quad 16 \quad 24 \quad 32 \quad 40 \quad 48 \quad 56$

(ii)  $M_9 = \{9 \times 1, 9 \times 2, 9 \times 3, 9 \times 4, 9 \times 5, 9 \times 6, 9 \times 7, \dots\}$   
 $9 \quad 18 \quad 27 \quad 36 \quad 45 \quad 54 \quad 63$

- (ii) **Factors:**  
Any one of a pair of numbers which when multiplied gives the same multiple is called a Factor.

List examples:

All factors of 6

$6 \div 1 = 6$

$6 \div 2 = 3$

$6 \div 3 = 2$

$6 \div 6 = 1$

$F_6 = 1, 2, 3, 6$

Note  $F_6$  means factors of 6.

$1 \times 6 = 6$

$2 \times 3 = 6$

$F_6 = \{1, 2, 3, 6\}$

Find factors of 9.

$1 \times 9 = 9$

$3 \times 3 = 9$

$F_9 = \{1, 3, 9\}$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 4:7 Pg 81

**Remarks:**

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**LESSON 6:**

**SUB TOPIC: L.C.M AND H.C.F**

**CONTENT:**

Examples:

- (i) Find the LCM of 24, 36 and 40.

2	24	36	40
2	12	18	20
2	6	9	10
3	3	9	5
3	1	3	5
5	1	1	5
	1	1	1

$$= 2 \times 2 \times 2 \times 3 \times 3 \times 5$$

$$= 4 \times 6 \times 15$$

$$= 4 \times 90$$

$$= 360$$

(ii) Find the HCF of 6, 8 and 12.

2	6	8	12
	3	4	6

$$= 2$$

**EVALUATION ACTIVITY:**

Mathematics Revision Hand Book for Primary 5 – 7 exercise 4:1 Pg 62  
A New MK Primary Six Mathematics

**Remarks:**

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**LESSON 7:**

**SUB TOPIC: APPLICATION OF LCM AND GCF**

**CONTENT:**

Examples:

- (i) Find the least number which is exactly divisible by 6, 8 and 12.
- (ii) What is the smallest number of sweets that can be shared by 3, 4 or 6 pupils leaving 5 sweets as a remainder?
- (iii) Two bells are used in Sir Apollo at intervals of 30 minutes and 40 minutes respectively. They are first rung together at 8:45 am, when will the two bells ring together again?
- (iv) The product of two numbers is 240. One of them is 60, work out their:
  - (a) LCM
  - (b) GCF
- (v) The LCM of x and y is 48 and HCF is 4. If x 16 find y.

**EVALUATION ACTIVITY:**

MK Primary Mathematics Bk 6 exercise 9:20 Pg 85 (Old Edition)  
Oxford Primary Mathematics Bk 6 Pg 35

**Remarks:**

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**LESSON 8:**

**SUB TOPIC: APPLICATION OF NUMBER PATTERNS; NATURAL, ODD AND EVEN NUMBERS**

**CONTENT:** Examples:

The sum of three consecutive counting numbers is 18. Find the numbers.

Solution: Let the first number be r.

1 <sup>st</sup> No.	2 <sup>nd</sup> No.	3 <sup>rd</sup> No.	Sum
R	R + 1	R + 2	18

$$R + r + 1 + r + 2 = 18$$

$$R + r + r + 1 + 2 = 18$$

$$3r + 3 = 18$$

$$3r + 3 - 3 = 18 - 3$$

$$3r = 15$$

$$3r = 15$$

$$3 \quad 3$$

$$R = 5$$

$$1^{\text{st}} \text{ no.} = r = 5$$

$$2^{\text{nd}} \text{ No.} = r + 1 \text{ but } r = 5$$

$$5 + 1 = 6$$

$$3^{\text{rd}} \text{ No.} = r + 2$$

$$\text{Where } r = 5$$

$$5 + 2 = 7$$

The numbers are  
5, 6, and 7

Example ii.  
The sum of 3 consecutive odd numbers is 15. Find the numbers:

Solution:  
Let the first number be y.

1 <sup>st</sup> No.	2 <sup>nd</sup> No.	3 <sup>rd</sup> No.	Total
Y	Y + 2	Y + 4	15

$$y + Y + 2 + y + 4 = 15$$

$$y + y + Y = 2 + 4 = 15$$

$$3y + 6 = 15$$

$$3y + 6 - 6 = 15 - 6$$

$$3y = 9$$

$$\frac{3y}{3} = \frac{9}{3}$$

$$y = 3$$

1<sup>st</sup> No.  $y = 3$   
 2<sup>nd</sup> No  $y + 2 = y$   
 Where  $y = 3$   
 $3 + 2 = 5$   
 3<sup>rd</sup> No.  $= y + 4$   
 where  $y = 3$   $3 + 4 = 7$   
 The numbers are 3, 5, and 7

Example 3:  
 The sum of 4 consecutive even numbers is 76. What are the numbers?

Example 4:  
 The sum of three consecutive integers is 84. Find them.

**EVALUATION ACTIVITY:**

A New MK Primary Bk 6 Pg 76 exercise 9:8 9Old Edition)

Remarks:

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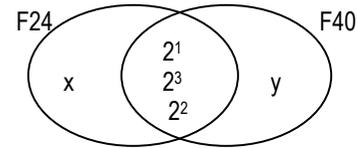


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**TOPICAL EXERCISE:**

- Find the sum of even numbers between 13 and 31.
- List down all the composite numbers between 2 and 15.
- Find the G.C.F of 8 and 12.
- What is the Lowest Common Multiple of 6, 8 and 16?
- Workout the square root of 961.
- The sum of 3 consecutive natural numbers is 63. Find the numbers.
- Find the next number in the sequence: 4, 7, 6, 9, 8, 11, ...
- What is the Smallest number which when divided by 9 and 11 leaves a remainder of 2?
- Bulangiti buses leave for Kasese every 3 hours and Gateway buses leave for Soroti every four hours. Two buses set off from Kampala's bu park at 7:30am. When will the two buses leave together again?

- The G.C.F of two numbers is 2 and their L.C.M is 24. If one of the numbers is 8, find the second number.
- The sum of 3 consecutive even numbers is 36. Find their range.
- Find the cube root of 64.
- The area of a square garden is 169m<sup>2</sup>. Fin dits perimeter.
- Find the square root of 0.81.
- Find the area of a square flower garden whose one side is 0.16.
- Use the venn diagram below to answer the questions about it.



- Find the value of x and y.
- Find the G.C.F and the L.C.M of 24 and 40.

**TOPIC 5:**

**TOPIC: FRACTIONS**

**LESSON 1:**

**SUB TOPIC: TYPES OF FRACTIONS**

**CONTENT:**

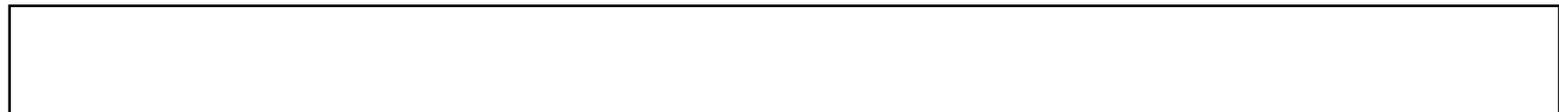
Proper –  $\frac{5}{7}$   
 Improper –  $\frac{7}{5}$   
 Mixed numbers –  $2 \frac{1}{2}$

Expressing improper fractions as mixed numbers.

Examples: Express as mixed numbers:

$$1 \quad 14/9 = 9 \frac{1}{9}$$

$$2 \quad 211 = 14 \frac{15}{14}$$



$$\begin{array}{r} 5 \\ \hline \end{array} \quad \begin{array}{r} 71 \\ 70 \\ \hline 1 \end{array}$$

$$\therefore \frac{14}{9} = 1\frac{5}{9} \qquad \therefore \frac{211}{14} = 15\frac{1}{14}$$

Express as improper fractions:

$$\begin{aligned} 1. \quad 6\frac{2}{3} &= \frac{6 \times 3 + 2}{3} \\ &= \frac{18 + 2}{3} = \frac{20}{3} \\ \therefore 6\frac{2}{3} &= \frac{20}{3} \end{aligned}$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 5:1 Pg 73

Remarks:

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**LESSON 2:**

**SUB TOPIC:** CHANGING FRACTIONS TO DECIMALS AND VISE VERSA

**CONTENT:** Changing fractions to decimals and decimals to fractions

Examples:

- Changing fractions to decimals:

$$\begin{array}{r} 0.625 \\ \hline 5 = 8 \sqrt{50} \\ - 48 \\ \hline 20 \\ - 16 \\ \hline 40 \\ - 40 \\ \hline - \end{array} \qquad 2. \quad \begin{array}{r} 0.3333 \\ \hline 1 = 3 \sqrt{10} \\ - 9 \\ \hline 10 \\ - 9 \\ \hline 1 \end{array}$$

$$\frac{5}{8} = 0.625 \qquad \frac{1}{3} = 0.33\ldots$$

- Changing decimals to fractions:

$$(i) \quad \begin{array}{r} 1 \\ 0.25 = \frac{25}{100} \\ \hline 0.25 = \frac{1}{4} \end{array} \qquad 2. \quad \begin{array}{r} 1 \\ 0.125 = \frac{125}{1000} \\ \hline 0.125 = \frac{1}{8} \end{array}$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 5:20 Pg 88

Remarks:

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**LESSON 3:**

**SUB TOPIC:** CHANGING RECURRING DECIMALS TO RATIONAL NUMBERS AND VISE VERSA

**CONTENT:** Changing recurring decimals to rational numbers and rational numbers to recurring decimals.

Examples:

- Changing recurring decimals to rational numbers:

$$\begin{array}{ll} 1. \quad 0.33\ldots & 2. \quad 0.45\ldots \\ \text{Let the No. be } y & \text{Let the No. be } t \\ Y = 0.33\ldots & t = 0.45\ldots \\ 10 + y = 0.33\ldots \times 10 & 100 \times t = 0.45\ldots \times 100 \\ 10y = 3.33\ldots & 100t = 45.45\ldots \\ 10y = 3.33\ldots & \underline{-t} \quad \underline{-0.45\ldots} \\ - y - 0.33\ldots & 99t = \frac{45}{100} \\ \hline \frac{9y}{9} = \frac{3}{9} & \frac{99t}{99} = \frac{45}{99} \\ Y = \frac{1}{3} & y = \frac{5}{11} \end{array}$$

F

3. 0.1666.....  
 Let the No be a  
 $a = 0.1666\dots$   
 $10 \times a = 0.1666\dots$   
 $10a = 1.666\dots$   
 $100 \times a = 0.166\dots \times 1000$   
 $100a = 16.666\dots$   
 $100a = 16.666\dots$   
 $\underline{-10a} = \underline{-1.666\dots}$   
 $90a = 15$   
 $\underline{90a} = \underline{15}$   
 $90 = 90$   
 $a = \frac{1}{6}$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 5:22 Pg 91

**Remarks:**

**LESSON 4:**  
**SUB TOPIC: CHANGING RATIONAL NUMBERS TO DECIMALS**

**CONTENT:** Changing rational numbers to decimals

Examples:

<p>1. <math>\frac{3}{11} = 0.2727\dots</math></p> $\begin{array}{r} 11 \overline{) 30} \\ \underline{22} \\ 80 \\ \underline{-77} \\ 30 \\ \underline{-22} \\ 80 \\ \underline{-77} \\ 2 \end{array}$	<p>2. <math>\frac{1}{12} = 0.08333\dots</math></p> $\begin{array}{r} 12 \overline{) 100} \\ \underline{-96} \\ 40 \\ \underline{-36} \\ 40 \\ \underline{-36} \\ 40 \\ \underline{-36} \\ 4 \end{array}$
---	--

**EVALUATION ACTIVITY:**

Macmillan Primary Mathematics Bk 7 exercise 1 Pg 81.

**Remarks:**

**LESSON 5:**  
**SUB TOPIC: OPERATIONS OF FRACTIONS**

**CONTENT:** Addition and subtraction

Examples:

<p>1. <math>\frac{1}{3} + \frac{1}{2} = \frac{2+3}{6}</math>  <math>= \frac{5}{6}</math></p>	<p>2. <math>\frac{13}{4} + \frac{15}{6}</math>  <math>\frac{7}{4} + \frac{11}{6}</math>  <math>\frac{21}{12} + \frac{22}{12} = \frac{43}{12}</math>  <math>= 3 \frac{7}{12}</math></p>
<p><b>Subtract:</b></p> <p>1. <math>\frac{3}{4} - \frac{1}{3}</math>  <math>= \frac{9-4}{12}</math>  <math>= \frac{5}{12}</math></p>	<p>2. <math>3\frac{5}{6} - 1\frac{4}{5}</math>  <math>= \frac{23}{6} - \frac{9}{5}</math>  <math>= 115 - 54</math>  <math>\frac{61}{6}</math>  <math>\frac{30}{6}</math>  <math>= 2 \frac{1}{30}</math></p>

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercises 5:2 and 5:3 Pg s73/74

**Remarks:**

**LESSON 6:**

**SUB TOPIC: OPERATION ON FRACTIONS**

**CONTENT:** Multiplication of fractions

Examples:

<p>1. <math>\frac{1}{5} \times 3</math>  <math>= \frac{3}{5}</math></p>	<p>2. <math>\frac{1}{3} \times \frac{3}{4} = \frac{1}{4}</math>  <math>= \frac{1}{3} \times \frac{3}{4} = \frac{1}{4}</math></p>
<p>2. <math>2\frac{1}{4} \times 1\frac{1}{5}</math>  <math>\frac{9}{4} \times \frac{6}{5} = \frac{27}{10}</math>  <math>= 2 \frac{7}{10}</math></p>	

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercises 5:4 and 5:5 Pgs 75/76

**Remarks:**

**LESSON 7:****SUB TOPIC: OPERATION ON FRACTIONS****CONTENT:** Division of fractions

Examples:

$$\begin{array}{l}
 1. \quad \frac{2}{5} \div 2 \\
 = \frac{2}{5} \times \frac{1}{2} \\
 \frac{1}{5}
 \end{array}
 \qquad
 \begin{array}{l}
 2. \quad \frac{3}{4} \div \frac{1}{2} \\
 = \frac{3}{4} \times \frac{1}{2} \quad \text{LCM} = 4 \\
 \frac{(3 \times 4)}{4} \div \frac{(1 \times 4)}{2} \\
 3 \div 2 = \frac{3}{2} \\
 = 1 \frac{1}{2}
 \end{array}$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercises 5:9 and 5:5 Pg 80

**Remarks:****LESSON 8:****SUB TOPIC: USE OF BODMAS TO SIMPLIFY MIXED FRACTION****CONTENT:** Combined operations

Brackets  
Of  
Division  
Multiplication  
Addition  
Subtraction  
Examples:

$$\begin{array}{l}
 1. \quad \frac{2}{3} \text{ of } \frac{3}{4} - \frac{1}{3} \\
 \frac{2}{3} \times \frac{3}{4} - \frac{1}{3} \\
 \frac{2}{4} - \frac{1}{3}
 \end{array}
 \qquad
 \begin{array}{l}
 2. \quad \frac{5}{6} - \frac{3}{4} \quad 1 \frac{1}{2} \\
 \frac{5}{6} - \frac{3}{4} \div \frac{3}{2}
 \end{array}$$

$$\begin{array}{l}
 \frac{1}{2} - \frac{1}{3} \\
 \frac{3-2}{6} \\
 = \frac{1}{6}
 \end{array}$$

$$\begin{array}{l}
 \frac{5}{6} - \frac{3}{4} \times \frac{2}{3} \\
 \frac{5}{6} - \frac{1}{2} = \frac{5-3}{6} \\
 = \frac{2}{6} = \frac{1}{3}
 \end{array}$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercises 14:11 Pg 127 (Old Edition)

**Remarks:****LESSON 9:****SUB TOPIC: APPLICATION OF FRACTIONS IN REAL LIFE SITUATION****CONTENT:** Word problems

Examples:

- (i) A boy had a jerry can full of water. He used  $\frac{13}{20}$ . What fraction remained?  
 $1 - \frac{13}{20} = \frac{20}{20} - \frac{13}{20} = \frac{7}{20}$
- (ii) A, B and C contributed to start a Company. A paid  $\frac{3}{10}$  of the cost and B contributed  $\frac{5}{10}$  of the cost.  
 (a) What fraction did C contribute?  
 (b) If C contributed shs 30,000 what was their total contribution?
- (iii) John spent  $\frac{1}{3}$  of his money on books and  $\frac{1}{6}$  of the remainder on transport.  
 (a) What fraction of his money was left?  
 (b) If he was left with shs 15,000, how much did he have at first?

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercises 5:6 and 5:7 and 5:5 Pgs 74 - 78

**Remarks:****LESSON 10:**

**SUB TOPIC: APPLICATION OF FRACTIONS****CONTENT:** Word problems

Examples:

1. Tap A can fill the tank in 6 minutes and tap B can fill the same tank in 3 minutes. How long will both taps take to fill the tank if they are opened at the same time?

Method 1:

Tap A Tap B

 $\frac{1}{6}$   $\frac{1}{3}$ 

$$\text{Tap A and B} = 1 + 1 = 1 + 2 = 3 = 1$$

$$\frac{6}{6} \frac{3}{3} \frac{6}{6} \frac{6}{6} \frac{2}{2}$$

$$\text{In 1 minute the tank will be } 1 \frac{1}{2} = 1 \times 2$$

$$1 = 2 \text{ minutes.}$$

i.e  $\frac{1}{2}$  (1 part is filled in 1 minute)  
 $\frac{2}{2}$  (2 parts are filled in 2 minutes).

Method 2: Product

Time taken by

The two taps

Sum

$$= \frac{\text{Tap A} \times \text{tap B}}{\text{Tap A} + \text{tap B}}$$

$$= \frac{6 \times 3}{6 + 3}$$

$$= \frac{18}{9}$$

**EVALUATION ACTIVITY:**

MK Bk 7 Pg 79 exercise 4:8

**Remarks:****LESSON 11:****SUB TOPIC: APPLICATION OF FRACTIONS****CONTENT:** Word problems

Examples:

1. Twaha spent  $\frac{1}{3}$  of his money on books and  $\frac{1}{6}$  of the remainder on transport.

- (i) What fraction of his money was left?

Fraction spent on books  $\frac{1}{3}$ 

$$\text{Remained fraction: } 1 - \frac{1}{3} = \frac{3}{3} - \frac{1}{3} = \frac{2}{3}$$

$$\text{Fraction spent on transport: } \frac{1}{6} \text{ of } \frac{2}{3} = \frac{1}{6} \times \frac{2}{3}$$

$$= \frac{1}{9}$$

Total fraction spent on transport and books:  $1 + 1$  $\frac{3}{3}$   $\frac{9}{9}$ 

$$\frac{3+1}{9} = \frac{4}{9}$$

$$\text{Remained fraction} = 1 - \frac{4}{9} = \frac{9}{9} - \frac{4}{9} = \frac{5}{9}$$

- (ii) If he was left with shs 15,000= how much did he have at first?

Let the total be y.

$$\frac{5}{9} \text{ of } y = 15,000 =$$

$$\frac{5}{9} \times y = 15,000 =$$

$$\frac{5y}{9} = 15,000$$

$$\times \frac{9}{5} = 15000 \times \frac{9}{5}$$

$$Y = 3000 \times 9$$

$$= \text{shs } 27,000 =$$

He had shs 27,000 at first

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 5:7 Pg 78

**Remarks:****LESSON 11:****SUB TOPIC: DECIMAL (PLACE VALUES AND VALUES)****Content: place value chart for decimals**

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TH	H	T	O	T <sup>th</sup>	H <sup>th</sup>	TH <sup>th</sup>
4	3	7	8	2	5	9

Place values are:

- 4 Thousand (1000)
- 3 Hundreds (100s)
- 7 Tens (10s)
- 8 Ones (1s)
- 2 Tenths (1/10)
- 5 Hundredths (1/100)
- 9 Thousandths (1/1000)

Values of digits

Value of 7 =  $7 \times 10$   
= 70

Value of 2 =  $2 \times 1/10$   
=  $2/10$   
= 0.2

Operation on values of digits in decimals

Evaluation

A new MK pri mtc bk 6

Mtc revision hand bk 5 – p.7 pg25

**LESSON 12:**

**SUB TOPIC:** reading and writing decimals in words

**CONTENT:**

Examples:

Write the following decimals in words

232.76

T	O	T <sup>th</sup>	H <sup>th</sup>	TH <sup>th</sup>
2	3	2	.7	6

Twenty three and two hundred seventy six thousand

378.01

H	T	O	T <sup>th</sup>	H <sup>th</sup>
3	7	8	.0	1

Three hundred seventy eight and one hundredths

Writing decimals in figures

Thirty six and seventeen hundredths

Thirty six 36

Seventeen hundredths =  $\frac{17}{100}$       0.17

$36 + 0.17$

36.017

3600

+0.17

36.17

**LESSON 13:**

**SUB TOPIC:** EXPANDING DECIMALS USING VALUES AND POWERS/EXPONENTS OF 10

**CONTENT:** Expand 486.5729 using:

(a) **Values:**

$(4 \times 100) + (8 \times 10) + (6 \times 1) + (5/1 \times 1/10) + (7/1 \times 1/100) + (2/1 \times 1/1000) + (9/1 \times 1/1000)$

$400 + 80 + 6 + 5/10 + 7/100 + 2/1000 + 9/10,000$

$486.5129 = 400 + 80 + 6 + 0.5 + 007 + 0.002 + 0.0009$

(b)  $10^2 \ 10^1 \ 10^0 \ 10^{-1} \ 10^{-2} \ 10^{-3} \ 10^{-4}$

4 8 6 . 5 7 2 9

$(4 \times 10^2) + (8 \times 10^1) + (6 \times 10^0) + (5 \times 10^{-1}) + (1 \times 10^{-2}) + (2 \times 10^{-3}) + (9 \times 10^{-4})$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematic Pupils Bk 7 Pg 90 Exercise 7:11.

**Remarks:**

**LESSON 14:**

**SUB TOPIC:** WRITING DECIMALS IN SHORT FORM

**CONTENT:** Find the number expanded:

(i)  $600 + 70 + 8 + 0.2 + 0.003$

**Solution:**

$$\begin{array}{r}
 600.000 \\
 70.000 \\
 8.000 \\
 0.200 \\
 + 0.003 \\
 \hline
 678.203
 \end{array}$$

(ii)  $(5 \times 10^3) + (7 \times 10^2) + (3 \times 10^1) + (4 \times 10^0) + (9 \times \frac{1}{10}) + (6 \times \frac{1}{100})$

**Solution:**

$$\begin{array}{r}
 (5 \times 1000) + (7 \times 100) + (3 \times 10) + (4 \times 1) + (9 \times 0.1) + (6 \times 0.01) \\
 (5000 + 700 + 30 + 4 \times 0.9 + 0.06) \\
 5734.96
 \end{array}$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Pupils Bk 7 (Old Edition) Pg 92 Exercise 7:12.

**Remarks:**

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**LESSON 14:**

**SUB TOPIC:** WRITING DECIMALS IN SCIENTIFIC FORM OR STANDARD NOTATION

**CONTENT:**

Express the following decimals in standard notation/Scientific form.

**Example:**

(i) 365.72  
 $3.6572 \times 10^2$

(ii) 0.67  
 $6.7 \times 10^{-1}$

(iii) 0.00098  
 $9.8 \times 10^{-4}$

Finding decimals expressed in Scientific notation.

**EVALUATION ACTIVITY:**

1. Express the following in standard notation/Scientific form

2. Find the decimal number expressed in standard form.

(a)  $2.34 \times 10^{-2}$

(b)  $6.1 \times 10^{-2}$

Ref: MTC Revision Hand Book P.6, 6, P.7 Pg 29

**Remarks:**

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**LESSON 16:**

**SUB TOPIC:** ROUNDING OFF DECIMALS

**CONTENT:**

**Example:**

Round off the following decimals as instructed:

4.78516 to the nearest thousandths.

**Solution:**

0	Tth	Hth	Hth	Tth
4.	7	8	5	6
			0	
4.	7	8	5	

4.78516 to the nearest thousandths = 4.885

(ii) 75.634 to the nearest whole number nearest whole number place value = ones

T	TO	Tth	THth	Hth
7	5.	6	3	4
7	6.			

75.634 to the nearest whole number = 76

**EVALUATION ACTIVITY:**

Macmillan Primary Mathematics Pupils' Bk 7 Pg 24 Exercise 7

Remarks:

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Remarks:

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**LESSON 17:**  
**SUB TOPIC:**      **DECIMALS**  
**CONTENT:**        Addition and of decimals

Examples:

<p>1.      <math>3.4 + 0.23</math></p> $\begin{array}{r} 3.4 \\ + 0.23 \\ \hline 3.63 \end{array}$	<p>2.      <math>5 - 0.03</math></p> $\begin{array}{r} 5.00 \\ - 0.03 \\ \hline 4.97 \end{array}$
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3.       $8 - 5.16 + 3.07$   
 Re-arrange first  $8 + 3.07 - 5 - 1.16$

$\begin{array}{r} 8.00 \\ + 3.07 \\ \hline 11.07 \end{array}$	$\begin{array}{r} 11.07 \\ - 5.16 \\ \hline 5.91 \end{array}$
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Emphasis on:

- (i)      arrangement of numbers according to place value.
- (ii)     re-arrange when two signs are given.

**EVALUATION ACTIVITY:**

**LESSON 18**  
**SUB TOPIC:**      **ORDERING DECIMALS**  
**CONTENT:**        (i)      Ascending order  
                          (ii)     **Descending order**

Examples:

1.      Arrange 0.36, 0.054, 0.07 and 0.8 in descending order.  
 Express decimals as fractions

$0.36 = \frac{36}{100}$	$0.054 = \frac{54}{1000}$	$0.07 = \frac{7}{100}$
$0.8 = \frac{8}{10}$		

Find the LCM which is 1000.

$\frac{36}{100} \times 1000$	$\frac{54}{1000} \times 1000$	$\frac{7}{100} \times 1000$	$\frac{8}{10} \times 1000$
$36 \times 10$	$= 54$	$7 \times 10$	$8 \times 100$
$= 360$		$= 70$	$= 800$

∴ Order = 0.8, 0.36, 0.07, 0.054

**EVALUATION ACTIVITY:**  
 New MK Primary Mathematics Bk 7 exercise 7:14 Pg 95 (Old Edition)

Remarks:

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**LESSON 19**  
**SUB TOPIC:**      **DECIMALS**

E

**CONTENT:** Multiplication of decimals

Examples:

<p>1. <math>27.36 \times 6</math></p> $\begin{array}{r} 27.36 \\ \times 6 \\ \hline 164.16 \\ \hline \end{array}$	<p>2. <math>11.9 \times 0.3</math></p> $\begin{array}{r} 119 \times 3 \\ 10 \quad 10 \\ \hline 357 \\ 100 \\ \hline = 3.57 \end{array}$
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**EVALUATION ACTIVITY:**

New MK Primary Mathematics Bk 7 exercise 7:15 Pg 96 (Old Edition)

**Remarks:**

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**LESSON 20**

**SUB TOPIC:** DECIMALS

**CONTENT:** Division of decimals

Examples:

<p>1. <math>0.72 \div 9</math></p> $\frac{72}{100} \div \frac{9}{1}$ $\frac{0.8}{100}$ <p>= 0.8</p>	<p>2. <math>0.12 \div 0.3</math></p> $\frac{12}{100} \div \frac{3}{10} = \frac{4}{10}$ <p>= 0.4</p>
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**EVALUATION ACTIVITY:**

New MK Primary Mathematics Bk 7 exercise 7:16 Pg 97 (Old Edition)

**Remarks:**

**LESSON 20**

**SUB TOPIC:** DECIMALS

**CONTENT:** Multiplication and division of decimals

Examples:

1.  $0.24 \times 0.3$

$$\begin{array}{r} 0.8 \\ = \left( \frac{24}{100} \times \frac{3}{10} \right) \div \frac{(8)}{10} \\ = \frac{24}{100} \times \frac{3}{10} \times \frac{10}{8} \\ = \frac{3 \times 3}{100} = \frac{9}{100} \\ = 0.09 \end{array}$$

**EVALUATION ACTIVITY:**

New MK Primary Mathematics Bk 7 exercise 14:19 Pg 135 (Old Edition)

**Remarks:**

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**LESSON 22**

**SUB TOPIC:** RATIOS

**CONTENT:** Definition

- A ratio is a comparison of objects
- Forming ratios

Examples:

A class has 20 boys and 30 girls. What is the ratio of boys to girls?  
The ratio of boys to girls.

$$= \frac{\text{Number of boys}}{\text{Number of girls}}$$

$$= \frac{20}{30} \quad \text{lowest terms} \quad \frac{2}{3}$$

The ratio of boys to girls is 2:3 and the ratio of girls to boys is 3:2

**EVALUATION ACTIVITY:**

New MK Primary Mathematics Bk 7 exercise 7:1 Pg 96 (Old Edition)

**Remarks:**

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**LESSON 23**

**SUB TOPIC: INCREASING AND DECREASING QUANTITIES IN A GIVEN RATIO**

**CONTENT:** Increasing and decreasing quantities in a given ratio

**Examples:** Increase 80kg in the ratio of 5:4

New : old  
5 : 4  
? : 80kg

4 parts make 80kg  
1 part makes  $\frac{80}{4} = 20$

5 parts make  $\frac{20}{1} \times 5 = 100\text{kg}$

Example 2: Decrease 2000= in the ratio of 3:5

New old  
3 5  
? 2000

5 parts make 2000=  
1 part makes  $\frac{2000}{5} = 400$

3 parts make  $400 \times 3 = 1200=$

**EVALUATION ACTIVITY:**

New MK Primary Mathematics Bk 7 exercise 7:2 Pg 97 Nos 1 -6 (Old Edition)

**Remarks:**

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**LESSON 24**

**SUB TOPIC: FINDING RATIO OF INCREASE OR DECREASE**

**CONTENT:** Finding ratio of increase or decrease

**Examples:**

In what ratio must 30 be decreased to 24?

New : old  
24 : 30  
 $24 \div 6 : 30 \div 6$   
 $= 4 : 5$

**EVALUATION ACTIVITY:**

New MK Primary Mathematics Bk 7 exercise 7:2 Pg 97 Nos 10, 111 & 12

**Remarks:**

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**LESSON 25**

**SUB TOPIC: SHARING IN RATIOS**

**CONTENT:** Sharing quantities in ratios

**Examples:**

1. Share 18 in the ratio 4:5  
Total ratio =  $4 + 5 = 9$   
1<sup>st</sup> share =  $\frac{4}{9} \times 18 = 4 \times 2$   
2<sup>nd</sup> share =  $\frac{5}{9} \times 18 = 5 \times 2$

= 10

**EVALUATION ACTIVITY:**

New MK Primary Mathematics Bk 7 exercise 7:3 Pg 99 (Old Edition)

**Remarks:**

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**LESSON 26**

**SUB TOPIC: RATIOS**

**CONTENT:** Finding the number shared in the given ratio

Examples:

1. Mary, Jane and shared money in the ratio 2:3:1 respectively. If Mary got shs 12,000= how much money did they share?

Total ratio =  $2 + 3 + 1 = 6$

Mary had 2 parts

1 part =  $\frac{12000}{2}$

6 parts =  $\frac{12000 \times 6}{2}$

=  $12000 \times 3$

= 36,000=

They shared sh 36,000=

**EVALUATION ACTIVITY:**

New MK Primary Mathematics Bk 7 exercise 9:3 Pg 112 (Old Edition)

**Remarks:**

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**LESSON 27**

**SUB TOPIC: PROPORTION**

**CONTENT:** Direct proportion

Examples:

1. Two books cost shs 2000= Find the cost of 6 similar books.

2 books cost sh 2000=

1 book costs sh 2000=

$$6 \text{ books cost shs } 2000 \times \frac{6}{2}$$

$2000 \times 3$

Shs 6000=

**EVALUATION ACTIVITY:**

New MK Primary Mathematics Bk 7 exercise 9:4 Pg 115 (Old Edition)

**Remarks:**

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**LESSON 28**

**SUB TOPIC: PROPORTION**

**CONTENT:** Direct proportion

Examples:

1.  $\frac{2}{3}$  of the books in the book shop are school text books. How many books are in the book shop altogether if the school textbooks are 240?

Method 1:

2 pairs make 240 books

= 1 part makes  $\frac{240}{2}$

$\therefore 3 \text{ parts make } 240 \times \frac{3}{2}$

=  $120 \times 3$

= 360 books

Method 2:

Let all the books be a  $\frac{2}{3}$  of a

= 240 books

$2a = 240$

$\frac{2a}{2} = \frac{240}{2}$

$3 \times 2a = 240 \times 3$

$\frac{2 \times 3}{2} a = \frac{240 \times 3}{2}$

$\therefore a = 120 \times 3$

= 360 books

**EVALUATION ACTIVITY:**

New MK Primary Mathematics Bk 7 exercise 7:5 Pg 102 (New Edition)

**Remarks:**

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**LESSON 28**

**SUB TOPIC: PROPORTION**

**CONTENT:** Indirect/inverse proportion

Examples:

1. 4 men take 9 days to complete a job. How long will 12 men take to finish the job at the same rate?

4 men take 9 days

1 man take  $9 \times 4$  days

$\frac{3}{12} \times \frac{1}{3}$  days

= 3 days

**EVALUATION ACTIVITY:**

New MK Primary Mathematics Bk 7 exercise 7:6 Pg 104 (New Edition)

**Remarks:**

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## LESSON 29

**SUB TOPIC:** CONSTANT PROPORTION

**CONTENT:** Constant Proportion

Definition of:

Constant proportion: Neither direct nor inverse proportion. The proportion is always constant.

Example:

A bus carrying 30 people take 2 hours to reach Jinja. How long would it take if it carried 10 people and was driven at the same speed?

Solution: Since the speed driven at is the same, it would take: 2 hours to reach Jinja.

**EVALUATION ACTIVITY:**

Primary Mathematics for Uganda Pg 6 exercise 4.

**Remarks:**

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## LESSON 32

**SUB TOPIC:** FRACTIONS - Changing percentages to fractions

**CONTENT:** Meaning of percentages

- Changing percentages into common fractions.

Examples:

Express 35% as a common fraction:

$$35\% = \frac{35}{100} \qquad 120\% = \frac{120}{100}$$

$$= \frac{35}{100} \div 5 \qquad = \frac{6}{5}$$

$$= \frac{7}{20} \qquad = 1\frac{1}{5}$$

Changing fractions into percentages:

Examples:

Write  $\frac{1}{3}$  as a percentage.

Solution:

$$= \frac{1}{3} \times 100\% \qquad \frac{2}{5} = 2 \times 100\%$$

$$= \frac{100\%}{3} \qquad = 2 \times 20\%$$

$$= 33\frac{1}{3}\% \qquad = 40\%$$

Changing percentage to decimals:

25% as a decimal  $\qquad$  112% as a decimal

$$25\% = \frac{25}{100} \qquad 112\% = \frac{112}{100}$$

$$= 0.25 \qquad = 1.12$$

Changing decimals to percentages:

$$0.2 = \frac{2}{10} \qquad 1.5 \text{ as a percentage}$$

$$= \frac{2}{10} \times \frac{10}{10} \qquad 1.5 = \frac{15}{10} \times \frac{10}{10}$$

$$= \frac{20}{100} \qquad = \frac{150}{100}$$

$$= 20\% \qquad = 150\%$$



$$\frac{4}{5} \times \frac{20}{20} = \frac{80}{100} = 80\%$$

$$\frac{3}{4} \times 100\% = 3 \times 25\% = 75\%$$

**EVALUATION ACTIVITY:**

Primary School Maths Bk 7 Pg 105 – 106 exercise 1 and 2.  
A New MK Primary Mathematics 2000 Bk 7 Pg 105 – 106 exercise 8:1 and 8:2 & 8:4, 8:5  
Primary Maths Revision and Practice (Gladys Wambuzi) Pg 70/71

**Remarks:**

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**LESSON 33**

**SUB TOPIC: CHANGING PERCENTAGES TO RATIOS AND VISE-VERSA**

**CONTENT:** Changing percentage to ratios

Examples:

Express the following as ratios:

1.  $\frac{5\%}{5\%} = \frac{5}{100} = \frac{1}{20}$   
Ratio = 1:20

2.  $33 \frac{1}{3}\% = \frac{100}{3} \times \frac{1}{100} = \frac{1}{3}$   
Ratio = 1:3

Changing ratios to percentages:

Examples:

Express as a percentage.

(i)  $\frac{4.5}{5} = \frac{45}{50} = \frac{9}{10} = 90\%$   
Ratio = 4:5  
Fraction =  $\frac{4}{5}$

(ii)  $\frac{1}{4} : \frac{1}{3} = \frac{3}{12} : \frac{4}{12} = 3:4$

(iii) 1:8

**EVALUATION ACTIVITY:**

New MK Primary Mathematics Bk 7 exercise 8:3 and 8:6 Pg 106 & 108.

**Remarks:**

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**LESSON 34**

**SUB TOPIC: PERCENTAGES**

**CONTENT:** Finding percentages of quantities

Examples:

1. Find 40% of 150  
 $\frac{40}{100} \times 150 = 4 \times 15 = 60$
2. A piece of land is 200 hectares. A farmer used 60% of it for cultivation. How much land is used for cultivation  
Cultivation = 60% of 200  
 $= \frac{60}{100} \times 200$   
 $= 60 \times 2$   
= 120 hectares
3. If 20% of a number is 40, what is the number?  
Solution:  
Let the number be x  
 $20\% \text{ of } x = 40$   
 $\frac{20}{100} \times x = 40$   
 $x \times 5 = 40 \times 5$   
 $x = 200$
- or:  
 $20\% \text{ of a number} = 40$   
 $1\% \text{ of a number} = \frac{40}{20}$   
 $100\% \text{ of the number} = \frac{40 \times 100}{20}$   
 $= 40 \times 5 = 200$

**EVALUATION ACTIVITY:**

New MK Primary Mathematics Bk 7 exercise 8:9 and 8:10 Pg 111 and 112 (New Edition)

**Remarks:**

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**LESSON 35**

**SUB TOPIC: FINDING THE REMAINING PERCENTAGES**

**CONTENT:** Examples

- If 40% of a class is absent, what percentage is present?  
What percentage is a present?  
Those absent = 40%  
Those present =  $100\% - 40\%$   
= 60%
- 35% of the pupils in a school like rice while 10% like potatoes. If the rest like posho, what percentage of pupils like posho?  
%ge for rice and potatoes =  $35\% + 10\%$   
= 45%  
Percentage for posho =  $100\% - 45\%$   
= 55%

3. Expressing quantities and percentages:  
Examples:

- (i) Write 20 as a percentage of 80.

$$\begin{aligned} \text{Fraction} &= \frac{20}{80} \\ &= \frac{1}{4} \\ &= \frac{1}{4} \times 100\% \\ &= \frac{100}{4} \end{aligned}$$

$$= 25\%$$

- (ii) Amos got 12 out of 25 in a Maths test. Express his mark as a percent.

$$\begin{aligned} \text{Fraction} &= \frac{12}{25} \\ \text{Percentage} &= \frac{12}{25} \times 100\% \\ &= \frac{12}{25} \times \frac{4}{1} \\ &= 12 \times 4\% \\ &= 48\% \end{aligned}$$

**EVALUATION ACTIVITY:**

New MK Primary Mathematics Bk 7 exercise 8:7 and 8:8 Pg 109 - 110 (New Edition)

**Remarks:**

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**LESSON 37**

**SUB TOPIC: PERCENTAGES**

**CONTENT:** Application of percentages

Examples:

- Nanyonjo earns shs 12,000. She spends 75% and saves the rest.
  - How much does she spend?  
Solution:  
= 75% of 12,000=  
=  $\frac{75}{100} \times 12,000$   
=  $75 \times 120$   
= 9,000
  - How much does she save?  
(100% - 75%) of 12,000  
= 25% of 12,000  
=  $\frac{25}{100} \times 12,000$   
= 25 x 120=  
= 3000

Or  $\begin{array}{r} 12,000= \\ - 9000= \\ \hline 3000= \end{array}$
- If 30% of my salary is spent on food and I save shs 21,000. What is my salary?  
Solution:  
Let the salary be P.
 

Method I		Method II
Total	Food	Savings
100%	30%	100% - 30% = 70%

$$\begin{aligned} 70\% \text{ of } P &= 21,000 \\ 70 \times P &= 21,000 \\ \frac{70}{100} \times P &= 21 \\ \frac{7P}{10} \times 10 &= 210,000 \\ 7P &= 210,000 \\ \frac{7P}{7} &= \frac{210,000}{7} \\ P &= 30,000= \end{aligned}$$

Percentage saved.  
100% - 30% = 70%  
70% of salary = 21,000  
10% of salary =  $\frac{21,000}{70} = 300$   
100% of salary = 300 x 100  
= 30,000=





**LESSON 41**

**SUB TOPIC: FINDING THE ORIGINAL NUMBER AFTER %age INCREASE**

**CONTENT:**

Examples:

- Percentage after increase:
- What amount of money when increased by 20% becomes 1440?  
Let the amount be x.  
New amount = (100% + 20) of x  
 $120\%x = 1440 =$   
 $\frac{120}{100}x = 1440$   
 $10x \frac{12x}{10} = 1440 \times 10$   
 $\frac{12x}{12} = \frac{14400}{12}$   
 $x = 1,200$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 6 & 7 Pg 118 exercise 8:15

**Remarks:**

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**LESSON 42**

**SUB TOPIC: FINIDNG THE ORIGINAL NUMBER AFTER THE DECREASE**

**CONTENT:**

Examples:

- A worker's salary was decreased by 35% to shs 1560.  
Let the old salary be x.  
New salary = (100% - 35%) of x

$$1560 = \frac{65x}{100}$$

$$1560 \times 100 = \frac{65}{100}x \times 100$$

$$\frac{1560 \times 100}{65} = \frac{65x}{65}$$

$$\frac{1560 \times 100}{65} = x$$

$$2400 = x$$

Method II:

Percentage after decrease  
100% - 35 = 65%

65% of the salary = 1560

$$\frac{65}{100} \times \text{salary} = 1560$$

$$\frac{1560}{65} = \frac{\text{salary}}{100}$$

$$\frac{1560 \times 100}{65} = \text{salary}$$

$$2400 = \text{salary}$$

- What number when decreased by 25% becomes 30,000?

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 Pg 119 exercise 8:16

**Remarks:**

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**LESSON 35:**

**SUB TOPIC: FINDING PERCENTAGE INCREASE AND DECREASE**



**CONTENT:**

**Examples:**

- By what percentage will 480 be increased to become 540?  
 Old number = 480  
 New number = 540  
 Increase = 540 – 480  
           = 60  
 Percentage increase:  
 =  $\frac{60}{480} \times 100\%$   
    =  $\frac{100}{8}\%$   
    = 12 ½ %
- When 240 is decreased, it becomes 192. Calculate the percentage decrease.  
 Solution:  
 Old number = 240  
 New number = 192  
 Decrease = 240 – 192  
           = 48  
                                   1 20  
 Percentage decrease =  $\frac{48}{240} \times 100\%$   
                                   -240  
                                   5  
                                   = 20%

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 6 & 7 Pg 121 - 122 exercise 8:18 and 8:19

**Remarks:**

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**LESSON 43**

**SUB TOPIC:** PERCENTAGE PROFIT AND LOSS

**CONTENT:** Percentage profit

**Examples:**

- An article was bought at 100,000 and sold at shs 120,000. Calculate the percentage profit.  
 Solution:  
 Cost price = 100,000  
 Selling price = 120,000  
 Profit = 120,000 – 100,000  
       = 20,000  
                                   Percentage profit  
                                   = Profit x 100%  
                                   CP  
                                   =  $\frac{20,000}{100,000} \times 100\%$   
                                   = 20%
- I bought a house at \$ 120,000 but I was forced to sell it at \$ 100,000. Find my percentage loss.  
 Solution:  
 Buying price = 120,000  
 Selling price = \$ 100,000  
 Loss = BP – SP  
       120,000 – 100,000  
       = \$ 20,000  
                                   Percentage loss:  
                                   =  $\frac{\text{loss}}{\text{cost price}} \times 100\%$   
                                   =  $\frac{20,000}{120,000} \times 100\%$   
                                   =  $\frac{100}{6}\%$  = 16 2/3%

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 Pg 123 – 124 exercise 8:20/8:21  
Mathematics Revision Hand book P.5 – P.7 Pg 104

**Remarks:**

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**LESSON 44**

**SUB TOPIC:** FINDING COST PRICE FROM PERCENTAGE PROFIT/LOSS

**CONTENT:**

**Examples:**

- After selling a pair of shoes at shs 21,000, a trader made a profit of 20%. Find the buying price of the pair of shoes.  
 Cost price as a percentage = 100%  
 Selling price as a percentage = 100% + 20% = 120  
 120% represents = shs 21,000  
 1% represents = 21,000  
                                   120

$$100\% \text{ represents } = \frac{700 \times 25}{120} \times 100$$

$$= \frac{17500}{120} \times 100$$

$$= \frac{1750000}{120}$$

$$= 14583.33$$

2. By selling his cow at shs 34,000, Obala made a loss of 15%. How much did the cow cost?

Loss = 15%	$\frac{86}{100} \text{CP} = 34,000$
CP = 100%	$\frac{100}{100} \quad 400$
SP = 100% - 15%	$\frac{85}{100} \text{CP} = \frac{34,000 \times 100}{85}$
= 85%	$\frac{85}{85} \quad \frac{85}{85}$
85% of CP = 34,000	CP = 400 x 100 =
	Cost price = 40,000 =

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 Pg 125 – 126 exercise 8:22  
 Mathematics Revision Hand book P.5 – P.7 Pg 106 - 107

Remarks:

**LESSON 45**

**SUB TOPIC: APPLICATION OF PERCENTAGE PROFIT AND LOSS**

**CONTENT:** Examples:

1. The cost price of a 50kg bag of sugar is shs 45,000. At what price must he sell each kilogram in order to make a profit of 20%.

Cost price for 50kg = 45,000	Selling price for 1kg
Cost price for 1kg = 45,000	$\frac{120}{50} \times 900$
	$\frac{120}{50} \quad 900$
	$\frac{120}{50} \quad 900$
%age profit = 20%	(120 x 9)
Selling price as percentage = 100 + 20%	1080 =
= 120	

2. Kakeeto bought three bags of soya beans at shs. 21,000 each. If each bag weighed 70kg and sold each kg at shs 250.

- (a) Calculate his percentage gain or loss.
- (b) At what price must he sell each kg in order to make a profit of 20%?

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 Pg 123 – 124 exercise 8:20/8:21  
 Mathematics Revision Hand book P.5 – P.7 Pg 104

Remarks:

**LESSON 46**

**SUB TOPIC: DISCOUNT**

**CONTENT:** Meaning of discount  
 Finding discount

**Example:**

1. The market price of a shirt was shs 1500. After a discount, a customer paid shs 1200. How much was the discount?

$$\text{Discount} = \text{Marked price} - \text{cash price}$$

$$= 1500 - 1200 =$$

$$= 300 =$$

Express the discount as a percentage  
 Percentage discount = discount x 100%

$$\frac{300}{1500} \times 100\%$$

$$= \frac{300}{15} \times 100\%$$

$$= 20\%$$

2. The marked price of a bicycle is shs 60,000. A customer is offered a discount of 15%. How much money does the customer pay?

Discount = 15% of marked price	Amount paid = 100% - 15% = 85%
= 15 x 60,000	= 85% of 60,000
100	95 x 60,000
= 9000 =	100
Amount paid = 60,000 =	= 85 x 600 =
= - 9,000	= 51,000 =
51,000 =	

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 Pg 129  
 Mathematics Revision Hand book P.5 – P.7 Pg 109

Remarks:

**LESSON 47**

**SUB TOPIC: FINDING ORIGINAL PRICE WHEN GIVEN PERCENTAGE DISCOUNT**

**CONTENT:**

**Example:**

1. Cissy paid shs 18,000 for a hand bag after being a discount of 10%. Calculate the marked price.

Solution:

Cost price as %age = 100%

Discount offered = 10%

$$\begin{aligned} \text{Cissy paid} &= 100\% - 10\% \\ &= 90\% \end{aligned}$$

$$\frac{90}{100} \times x = \text{shs } 18,000$$

$$90x = 18,000 \times 100$$

$$\frac{90x}{90} = \frac{18,000 \times 100}{90}$$

$$x = \frac{18,000 \times 100}{90}$$

$$x = 20,000$$

$$x = 20,000$$

$$x = 20,000$$

$$x = 20,000$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 Pg 130-131 exercise 8:25

Remarks:

**LESSON 48**

**SUB TOPIC: FINDING MARKED PRICE AND SELLING PRICE WHEN GIVEN DISCOUNT (%ge DISCOUNT & AMOUNT DISCOUNT)**

**CONTENT:**

**Example:**

1. Kanya was given a discount 17% of the marked price which amounted to 8500=. Calculate the marked price and selling price.

Solution:

%age discount – 17%

Discount – 8500=

Marked price = 100%

But 17% rep 8500

1% rep 8500

17

100% rep (8500 x 100)

17

$$500 \times 100$$

$$50,000=$$

Selling price

$$100\% - 17\%$$

$$= 83\%$$

$$83 \times 50,000$$

$$100$$

$$83 \times 500$$

$$= 41,500=$$

$$\text{Or } 50,000 - 8500$$

$$= 41,500=$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 Pg 131 exercise 8:35 Qns 5, 7 & 9

Remarks:

**LESSON 49**

**SUB TOPIC: COMMISSION**

**CONTENT: Meaning of commission  
Finding commission**

**Example:**

1. A Salesman is paid a salary of 10,000 he sold worth shs 6500. How much money did he get altogether?

Solution:

Salary = 10,000

Commission = 10% of 6500=

$$\frac{10}{100} \times 6500$$

$$= 650$$

Amount he got altogether = 10,000 + 650

$$\frac{10,000}{100}$$

$$= 100$$

$$= 650$$

$$= \text{shs } 10,650$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 Pg 132 - 133 exercise 8:26

Remarks:

**LESSON 50**

**SUB TOPIC: SIMPLE INTEREST**

**CONTENT: Review the following:**

- Terms used

- Simple interest – Time (T)

- Principle (P) – Rate (R)

**Example:**

1. A Man deposited shs 40,000 for 5 years at a simple interest rate of 2 ½ % per year. Calculate his simple interest and the total amount after 5 years.

Solution:

Simple interest (SI)

The simple interest:

$$\begin{aligned}
 SI &= PTR \\
 &= 40,000 \times 5 \times 2 \frac{1}{2} \% \\
 &= 40,000 \times 5 \times \frac{5}{200} \\
 &= 40,000 \times 5 \times \frac{5}{200} \\
 &= 200 \times 25 \\
 &= \text{shs } 5,000
 \end{aligned}$$

is shs 5,000  
 Amount = principle interest  
 = shs (40,000 + 5000)  
 = shs (45,000)

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 Pg 132 - 133 exercise 8:26

**Remarks:**

**LESSON 51**

**SUB TOPIC: FINDING THE PERCENTAGE RATE**

**CONTENT:**

**Example:**

1. Calculate the rate of interest if shs 30,000 can yield a simple interest of shs 1,125 in 9 months.

Solution:

Method 1  
 PTR = SI  
 $\frac{30,000 \times 9 \times R}{1 \times 12 \times 100} = \text{sh } 1,125$   
 $\frac{30,000 \times 9 \times R}{12 \times 100} = 1125$   
 $\frac{25 \times 9R}{25 \times 9} = \frac{1125}{25 \times 9}$

$\frac{25 \times 9R}{25 \times 9} = \frac{1125}{25 \times 9}$   
 $R = 5\%$

Method 2:  
 Rate =  $\frac{SI \times 100}{P \times T}$   
 $\frac{1125 \times 100}{30,000 \times 9}$   
 $\frac{1125}{300 \times \frac{3}{4}}$   
 $\frac{1125}{375} = 3$

$\frac{1125 \times 4}{300 \times 3}$   
 $\frac{1125}{75 \times 4}$   
 $\frac{1125}{300} = 3$   
 Rate = 5%

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 Pg 138 - 139 exercise 9:2

**Remarks:**

**LESSON 52**

**SUB TOPIC: CALCULATING PRINCIPAL**

**CONTENT:**

**Example:**

1. What principal will yield shs 6,000 at 5% per year for 3 years?

Solution:

SI = 6000  
 R = 5% per year  
 T = 3 years  
 P x R x T = Simple interest

$P \times 5 \times 3 = 6000$   
 $\frac{15P}{100} = 6000$

$\frac{15P}{100} = 6000$   
 $100 \times \frac{15P}{100} = 6000 \times 100$   
 $15P = 600,000$   
 $\frac{15P}{15} = \frac{600,000}{15}$   
 P = 40,000  
 Principal = 40,000=

2. A farmer borrowed money at 12 ½ per year. After 2 years, a simple interest of shs 8,000 was paid. Find the amount borrowed.

Solution:

SI = 8,000=  
 T = 2 years  
 R = 12 ½ %  
 P =  $\frac{SI \times 100}{R \times T}$   
 P =  $\frac{8,000 \times 100}{12 \frac{1}{2} \times 2}$

$P = 800,000 \frac{25}{2} \times 2$   
 $\frac{800,000}{25} = 32,000$   
 Principal = 32,000

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 Pg 140 exercise 9:3

**Remarks:**

**LESSON 53**

**SUB TOPIC: CALCULATING TIME**

**CONTENT:**

**Example:**

1. In what time will shs 12,000 yield an interest of shs 1,800 at 5% per year.

$$P \times T \times R = SI$$

$$SI = 1800 =$$

$$P = 12,000$$

$$R = 5\%$$

$$P \times R \times T = SI$$

$$12,000 \times 5\% \times T = 1800 =$$

$$\frac{100}{600} T = \frac{1800}{600} \quad 3$$

$$T = \frac{1800 \times 100}{600 \times 600} = 3$$

$$T = 3 \text{ years}$$

2. How long will 48,000= take to yield shs 5400 at 15% per year?

Solution:

$$P = 48,000$$

$$R = 15\% \text{ per year}$$

$$SI = 5400 =$$

$$P \times R \times T = SI$$

$$48,000 \times 15\% \times T = 5400 =$$

$$100$$

$$480 \times 15T = 5400 =$$

$$7200T = 5400$$

$$\frac{7200}{7200} T = \frac{5400}{7200}$$

$$T = \frac{3}{4} \text{ years}$$

$$= (3/4 \times 12)$$

$$= 9 \text{ months}$$

### EVALUATION ACTIVITY:

A New MK Primary Mathematics Bk 7 Pg 142 exercise 9:4

Remarks:

### TOPICAL EXERCISE ON FRACTIONS

1. Name the types of fractions and give an example on each.
2. Divide:  $2/3 \div 1/3$
3. Simplify:  $1/2 - 1/4 - 1/3$
4. Salim's bicycle got spoiled after he had covered a distance of 20km which was  $1/4$  of his journey. How long was the journey?
5. In a class of 120 pupils, the ratio of girls to boys is 4:2. Find the number of boys.
6. Work out:  $1/4 + 3/5$ .
7. Simplify:  $0.27 \times 0.06$   
 $0.9 \times 0.3$
8. Work out:  $1/4 - 1/8$
9. Otim had 30km still to cover after traveling  $3/5$  of the journey. How was the journey?
10. Simplify:  $1/2 \div 1/4$
11. Subtract:  $1/2 - 1/4$
12. In Sir Apollo Schools,  $3/4$  of the pupils who sat for the Primary Leaving Examination passed.
  - (a) If those who failed were 30, find the number of pupils who passed.
  - (b) What percentage of pupils failed the examination?
13.  $2/3 - 1/2$
14. Add:  $35.7 + 0.35$

15. A bus broke down after covering  $5/7$  of the journey. The remaining distance to complete the journey was 140km. How long was the whole journey?
16. Divide:  $4.2 \div 0.03$
17. Add:  $4.05 + 11.4 + 2.36$
18. Usamah spent  $1/4$  of his salary on food,  $1/3$  of the remainder on debts and saved shs 3,600=.
  - (a) How much did he spend on paying debts?
  - (b) What are his earnings per month?
19. Arrange in ascending order:  $1/2, 3/4, 0.03$  and  $2/3$ .
20. Tap A takes 9 minutes to fill in the tank. Tap B takes 12 minutes and Tap C takes 18 minutes. How long will A, B and C take to fill the tank if opened together?
21. The cost of 4 rulers is shs 800. What is the cost of 6 similar rulers?
22. 5 handkerchiefs take 30 minutes to dry when exposed to the sunshine. How long will 12 handkerchiefs take to dry if exposed to the same sunshine?
23. 12 men can build a classroom in 5 days.
  - (a) How many men are needed to do the whole job in 1 day?
  - (b) How long will 10 men take to do the job?

Fractions (Percentages) Topical questions:

1. Express 2:5 as a percentage.
2. Change 0.8 as a percentage
3. Express 66.6% as a fraction to the lowest terms.
4. Express 40cm as a percentage of 2M.
5. What is 10% of 2200 pencils?
6. A bag of cement cost shs 5,600. How much will it cost after a 30% increase?
7. Asiimwe deposited shs 50,000 in Uganda Commercial Bank which offers an interest of 30% per year. How much money will Asiimwe have in the Bank after six months?
8. Okello bought a car at shs 2,500,000 and sold it to Otim at a profit of 20%. Otim then sold it to Tumwine at a loss of 15%. How much did Tumwine pay for the car?
9. If 280 is increased by x it becomes 392. Find the value of x.
10. Decrease 65kg by 5.
11. A farmer has the following animals:

Chicken	= 30
Goats	= 35
Sheep	= 15
Rabbits	= 10

What percentage of the total animals are rabbits?
12. Milk was mixed with water to make tea. If 14 litres of milk was used and this was 40% more than the amount of water in the tea, how tea was prepared?
13. Mugisha bought about at shs 200,000 and sold it as shs 180,000 what was his percentage loss?

14. (a) Okello's wage was increased by 10% to shs 77,000 per month. Find his salary?  
 (b) If his new wage of shs 77,000 was decreased by 5%, find his final wage.
15. A man spent 20% of his salary on food, 10% on transport, 40% on medical care and the rest on rent.  
 (i) Find the percentage of his salary spent on rent.  
 (ii) How much does he spend on medical care if he earns 800,000 as his salary?  
 (iii) How much more is spent on food than transport?
16. Fatuma had shs 5,000 if she used 10% of her money to buy soap what was her balance?

A New MK Primary Mathematics 2000 Bk 7 exercise 13 Nos 1, 2 & 3 Pg 348 (New Edition)

Remarks:

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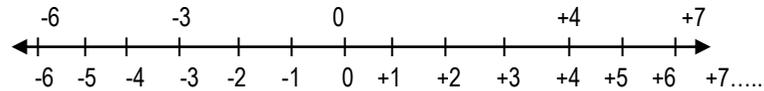
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**LESSON 2:**

**SUB TOPIC: ORDERING INTEGERS ON A NUMBERLINE**

**CONTENT:**

The number line:



- Note: - (i). All integers to the left of zero are -ve.  
 (ii) All integers to the right of zero are +ve  
 (i) Any integer is less than that on its right.  
 (ii) Any integer is more than that on its left.

Examples

1. Use  $>$ ,  $<$  or  $=$  to compare the pair of integers. Given:  
 (i)  $-6 < -3$   
 (ii)  $-3 < 0$   
 (iii)  $0 < +4$   
 (iv)  $0 > -6$   
 (v)  $-3 > -6$   
 (vi)  $+7 > +4$   
 (vii)  $+4 = +4$   
 (viii)  $-8 = -8$
2. Arrange in descending order/decreasing order the following integers:  
 $-6, 0, +7, -3, +4$   
 Solution:  $+7, +4, 0, -3, -6$

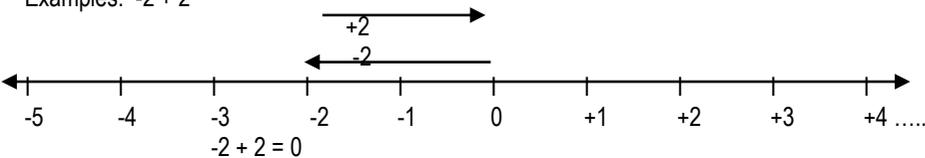
**TOPIC 9: INTEGERS**

**LESSON 1:**

**SUB TOPIC: OPPOSITES/INVERSES/ADDITIVE INVERSES**

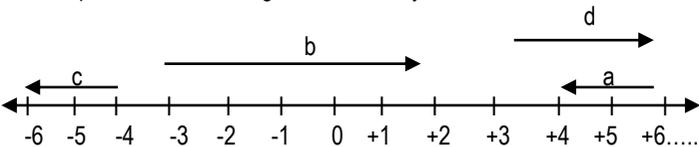
**CONTENT:**

Examples:  $-2 + 2$



- Note: - Arrows pointing to the positive direction are positive arrows.  
 - Arrows pointing to the negative direction are negative arrows.

Example 1. Give the integers indicated by arrows on the number line below.



Example 3. What is the additive inverse of  $+6$

Let the inverse be  $x$ .

$$+6 + x = 0$$

$$+6 - 6 + x = 0 - 6$$

$$X = -6.$$

**EVALUATION ACTIVITY:**

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 13 Nos 4 and 5 Pg 348 (New Edition)

Remarks:

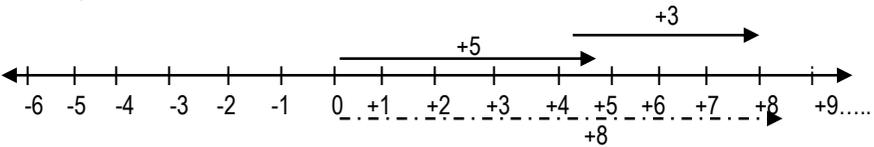
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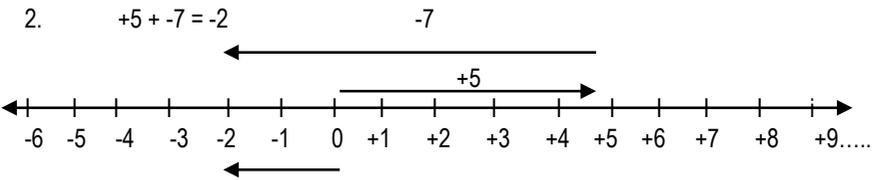
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**LESSON 3:**  
**SUB TOPIC: ADDITION OF INTEGERS USING A NUMBER LINE**

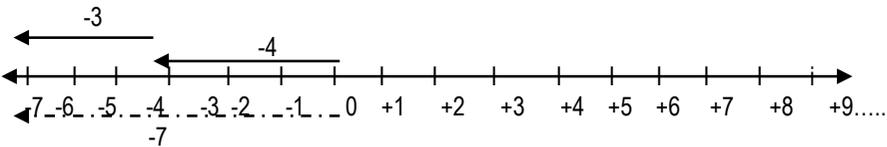
**CONTENT:**  
 Example 1.  $+5 + +3 = +8$



2.  $+5 + -7 = -2$



3.  $-4 + -3 = -7$



**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 1 a, b, c, dPg 346 (New Edition)

**Remarks:**

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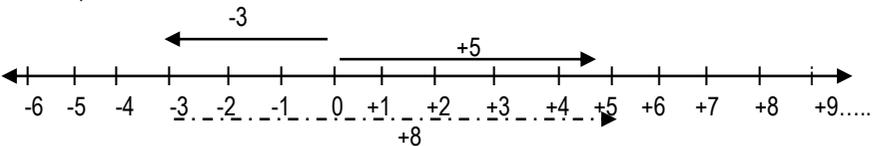


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**LESSON 4:**

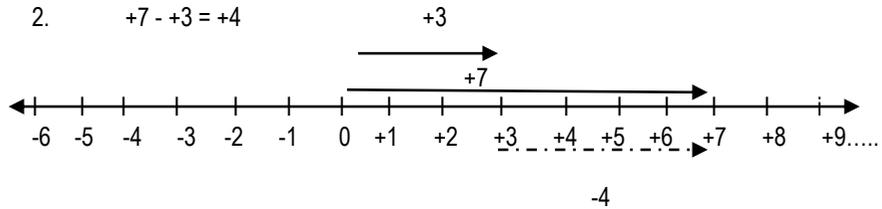
**SUB TOPIC: SUBTRACTION OF INTEGERS USING A NUMBERLINE**

**CONTENT:**  
 Example 1.  $+5 - -3 = +8$



(-) Means start from where the first arrow started and move in the direction of the second integer. How far are you from the end point of the first integer.

2.  $+7 - +3 = +4$



**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 19:2 No 2. Pg 356 (New Edition)

**Remarks:**

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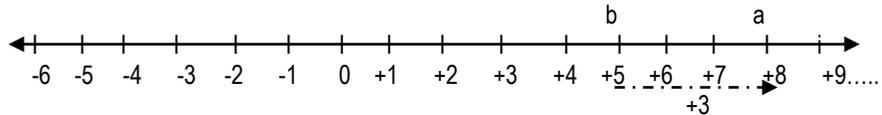


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**LESSON 5:**

**SUB TOPIC: SUBTRACTION OF INTEGERS BY NAMING THE INTEGERS USING LETTERS**

**CONTENT:**  
 Example 1.  $+8 - +5 = +3$   
 Naming the integers +8 as a and +5 as b.



Subtraction means moving backwards.  
 The arrow shows the answer.

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 19:4Pg 358 (New Edition)

**Remarks:**

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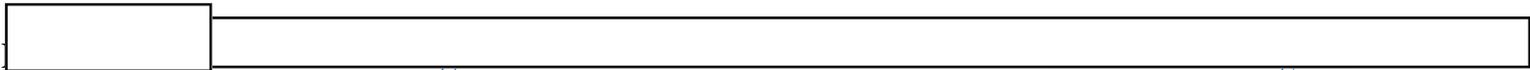


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**LESSON 6:**

**SUB TOPIC: SUBTRACTING INTERGERS WITHOUT NUMBER LINES**

**CONTENT:**  
 Example 1.  
 1.  $+8 - +7$  Note  $=x + = -$   
 $+8 - 7$   
 $= +1$



2.  $-8 - +3$   
 $= -8 - 3$   
 $= -11$

3.  $-5 - -2$   
 $= -5 + 2$   
 $= +2 - 5$   
 $= -3$

Note  $-x - = +$

$-ve \times -ve = +ve$

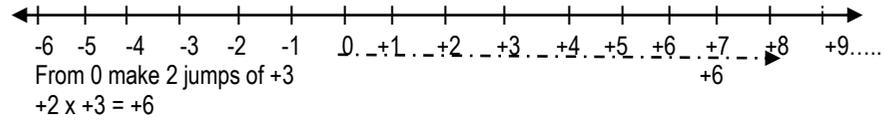
Examples:

1.  $+2 \times +6 = +12$
2.  $+2 \times -6 = -12$
3.  $-2 \times -6 = +12$

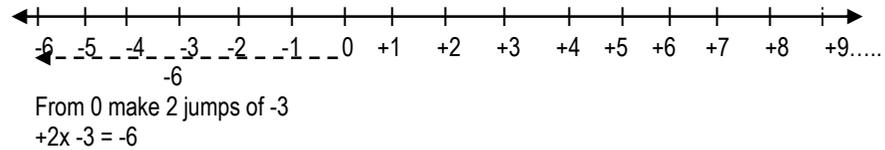
Multiplication of integers on a number line:

Examples:

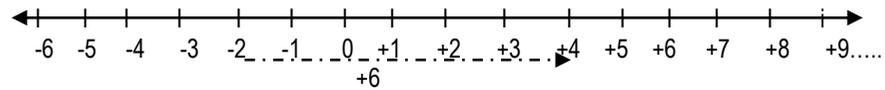
1.  $+2 \times +3$



2.  $+2 \times -3$



3.  $-2 \times -3$



Standing at -2 facing in the  $-ve$  direction, make two jumps of 3 backwards. How far are you from -2 to the final point and which direction.

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 19:2Pg 356 (New Edition)

Remarks:

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**LESSON 7:**

**SUB TOPIC: ADDING INTEGERS WITHOUT USING A NUMBERLINE**

**CONTENT:**

Example 1.

1.  $+7 + +2$   $+ve \times +ve = +ve$   
 $= +7 + 2$   
 $= +9$
2.  $+7 + -2$   $+ve \times -ve = -ve$   
 $= +7 - 2$   
 $= +5$
3.  $-7 + -2 = -7 - 2$   $-ve \times -ve = +ve$   
 $= -9$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 19:1 Nos 1 and 2 Pg 352 (New Edition)

Remarks:

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**LESSON 8:**

**SUB TOPIC: MULTIPLICATION OF INTEGERS**

**CONTENT:**

Example 1.

- Note:  $+ve \times +ve = +ve$   
 $+ve \times -ve = -ve$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 19:6 Pg 352 (New Edition)

Remarks:

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**LESSON 9:**

**SUB TOPIC: DIVISION OF INTEGERS**

**CONTENT:**

- ve ÷ -ve = +ve
- ve ÷ +ve = -ve
- +ve ÷ -ve = -ve
- +ve ÷ +ve = +ve

**Examples:**

- $+16 \div +2 = +8$
- $+16 \div -2 = -8$
- $-16 \div +2 = -8$
- $-16 \div -2 = +8$

Check:  $-16 \div -2 = +8$   
 $-16 = +8 \times -2$   
 $-16 = +8 \times -2$

Also  $-16 = +8 \times -2$   
 $+8 \quad +8$   
 $-16 \div +8 = -2$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 19:7 Pg 361 (New Edition)

**Remarks:**

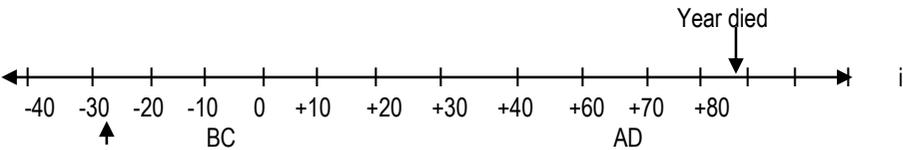
**LESSON 10:**

**SUB TOPIC: APPLICATION OF INTEGERS**

**CONTENT:**

Bc, LOSS, Time before debts, below sea level are -ve.  
 AD, profit, time after, above sea level are +ve.

Example 1:  
 A Scientist was born in 30BC and died immediately after his birthday in 76AD. How old was he when he died?



The man lived from -30 to +76

The Scientist lived from  $+76 - (-30)$   
 $= 76 + 30$   
 106 years

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 Pg 362 - 363 (New Edition)

**Remarks:**

**LESSON 11:**

**SUB TOPIC: FINITE/MODULAR SYSTEM (ADDITION)**

**CONTENT:** Review the following digits used in the different finite system.

**Examples:**

- (i) Add  $6 + 7 = \_\_\_$  (finite 9)  
 $6 + 7$   
 $13 \div 9 = 1 \text{ rem } 4$   
 $\therefore 6 + 7 = 4$  (finite 9)
- (ii)  $8 + 6 + 3 = \_\_\_$  (finite 13)  
 $(8 + 6) + 3$   
 $14 + 3$   
 $17 \div 13 = 1 \text{ rem } 4$   
 $\therefore 8 + 6 + 3 = 4$  (finite 13)
- (iii)  $3 + 4 + 5 = x$  (finite 7)

**EVALUATION ACTIVITY:**

A New MK Old Edition Pupils Bk 6 Pg 47 exercise 6:2

**Remarks:**

**LESSON 12**

**SUB TOPIC: SUBTRACTION IN THE FINITE SYSTEM**

**CONTENT:** Examples:

- (i)  $1 - 3 = \_\_\_$  (finite 4)  
 $(1 + 4) - 3$   
 $5 - 3$   
 $= 2$

$$\therefore 1 - 3 = 2 \text{ (finite 4)}$$

(ii)  $2^2 - 5 = \underline{\quad}$  (finite 7)  
 $(2 \times 2) - 5 = \underline{\quad}$  (finite 7)  
 $4 - 5 = \underline{\quad}$  (finite 7)  
 $4 + 7 - 5$   
 $11 - 5$   
 $= 6$   
 $\therefore 2^2 - 5 = 6 \text{ (finite 7)}$

(iii)  $2 - 6 - 4 - 8 = \underline{\quad}$  (finite 9)

**EVALUATION ACTIVITY:**

A New MK Pupils Bk 7 Pg 48 exercise 4:1

Remarks:

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**LESSON 13**

**SUB TOPIC: MULTIPLICATION USING THE FINITE SYSTEM**

**CONTENT:** Examples:

(i)  $5 \times 7 = \underline{\quad}$  (finite 9)  
 $= 5 \times 7$   
 $= 35 \div 9$   
 $3 \text{ rem } 8$   
 $\therefore 5 \times 7 = 8 \text{ (finite 9)}$

(ii)  $2^3 = \underline{\quad}$  (finite 7)  
 $= 2^3$   
 $= 2 \times 2 \times 2$   
 $= 4 \times 2$   
 $= 8$   
 $= 1 \text{ rem } 1$   
 $\therefore 2^3 = 1 \text{ (finite 7)}$

(iii)  $4 (5 \times 2) = \underline{\quad}$  (mod 6)

**EVALUATION ACTIVITY:**

A New MK Primary Maths Pupils Bk 7 Pg 50 exercise 4:4

Remarks:

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**LESSON 14**

**SUB TOPIC: SOLVING EQUATIONS USING THE FINITE SYSTEM**

**CONTENT:** Examples:

(i)  $x - 4 = 3 \text{ (mod 7)}$   
 $x - 4 + 4 = 3 + 4 \text{ (mod 7)}$   
 $x + 0 = 7 \text{ (mod 7)}$   
 $x = 7 \div 7 \text{ (mod 7)}$   
 $x = 1 \text{ rem } 0 \text{ (mod 7)}$   
 $x = 0 \text{ (mod 7)}$

(ii)  $m + 4 = 3 \text{ (mod 5)}$   
 $m + 4 - 4 = 3 - 4 \text{ (mod 5)}$   
 $m + 0 = (3 + 5) - 4 \text{ (mod 5)}$   
 $m = 8 - 4 \text{ (mod 5)}$   
 $m = 4 \text{ (mod 5)}$

(iii)  $2x - 3 = 3 \text{ (finite 4)}$   
 $2x - 3 + 3 = 3 + 3 \text{ (finite 4)}$   
 $2x + 0 = 6 \text{ (finite 4)}$   
 $\frac{2x}{2} = \frac{6}{2} \text{ (finite 4)}$   
 $x = 3 \text{ (finite 4)}$

(iv)  $2(2x - 1) = 4 \text{ (finite 7)}$   
 $2 \times 2x - 1 \times 2 = 4 \text{ (finite 7)}$   
 $4x - 2 = 4 \text{ (finite 7)}$   
 $4x - 2 + 2 = 4 + 2 \text{ (fin 7)}$   
 $4x = 6 \text{ (finite 7)}$   
 $4x = 6 + 7 \text{ (finite 7)}$   
 $4x = 13 + 7 \text{ (fin 7)}$   
 $\frac{4x}{4} = \frac{20}{4} \text{ (fin 7)}$   
 $X = 5 \text{ (finite 7)}$

**EVALUATION ACTIVITY:**

A New MK Primary Maths Pupils Bk 7 Pg 49 - 50 exercise 4:2, 4:3

Remarks:

## LESSON 15

### SUB TOPIC: DIVISION IN THE FINITE SYSTEM

**CONTENT:** Review use of dial clock in dividing numbers

Example:

Divide  $2 \div 5 = \underline{\quad} \pmod{7}$

Solution:

$$\begin{aligned} 2 \div 5 &= \underline{\quad} \pmod{7} \\ &= 2 + 7 \ 5 \\ &= 9 \div 5 = \underline{\quad} \pmod{7} \\ &= 9 + 7 \ 5 \\ &= 16 \div 5 = \underline{\quad} \pmod{7} \\ &= 16 + 7 \ 5 \\ &= 23 \div 5 = \underline{\quad} \pmod{7} \\ &= 23 + 7 \ 5 = \underline{\quad} \pmod{7} \\ &= 30 \div 5 = 6 \text{ rem } 0 \pmod{7} \\ \therefore 2 \div 5 &= 6 \pmod{7} \end{aligned}$$

### EVALUATION ACTIVITY:

A New MK Primary Maths Pupils Bk 7  
Maths Revision Hand Book 5, 6 & 7 Pg 35  
Primary Maths Revision & Practice for Uganda Pg 19

**Remarks:**

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## LESSON 16

### SUB TOPIC: APPLICATIONS OF THE FINITE SYSTEM (FINITE 7 AND FINITE 12)

**CONTENT:** Review the idea of the finite system as applied to days in a week.  
**Review the application of finite system in months of a year.**

Example:

(i) Today is Thursday, what day of the week will it be 82 days from today?

Solution:

Thursday stands for 4

$$4 + 8 = \underline{\quad} \pmod{7}$$

$$86 = \underline{\quad} \pmod{7}$$

$$86 \div 7 = \underline{\quad} \pmod{7}$$

$$12 \text{ rem } 2$$

2 stands for Tuesday

It will be Tuesday.

(ii) Today is Tuesday what day of the week was it 85 days ago.

Solution:

2 represents Tuesday

$$2 - 85 = \underline{\quad} \pmod{7}$$

$$85 - \pmod{7}$$

$$85 \div 7 = 12 \text{ rem } 1$$

$$85 = 1 \pmod{7}$$

$$2 - 1 = \underline{\quad} \pmod{7}$$

$$2 - 1 = 1 \pmod{7}$$

1 stands for Monday

The day was Monday.

### EVALUATION ACTIVITY:

A New MK Primary Maths Pupils Bk 7 Pg 53 exercise 4:5

**Remarks:**

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## LESSON 17:

### SUB TOPIC: APPLICATION OF FINITE 12

**CONTENT:** Months of the year  
**Digits representing specific months in the year.**  
**Finite 12 (0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11)**  
**1 – January**  
**2 – February**  
**3 - March**  
**4 – April**  
**5 – May**

Example:

(i) It is July now, which month of the year will it be after 2132 months?

Solution:

7 represents July  
 $7 + 2132 = \underline{\quad}$  (finite 2)  
 $2139 = \underline{\quad}$  (finite 12)

178

12	2139	
	12	
	93	178 rem 3
	- 84	
	99	= 33 stands for March
	- 96	
	3	

So the month will be March.

(ii) It is April now, which month of the year was it 346 months ago?

Solution:  
 4 stands for April  
 $4 - 346 = \underline{\quad}$  (finite 12)  
 $346 - \underline{\quad}$  (finite 12)

28

12	346	
	24	346 = 10 (fin 12)
	106	
	- 96	
	10	

$4 - 10 = \underline{\quad}$  (fin 12)  
 $(4 + 12) - 10 = \underline{\quad}$  (fin 12)  
 $16 - 10 = 6$  (fin 12)  
 6 stands for June  
 So the month was June

**EVALUATION ACTIVITY:**

A New MK Primary Maths Pupils Bk 7 Pag 54 – 55 exercise 4:6

**Remarks:**

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**LESSON 18**  
**SUB TOPIC:** APPLICATIONS OF THE FINITE SYSTEM 12  
**CONTENT:** The 12 hour clock

Example:

(i) It is 7:00 am. What time will it be after nine hours from now?

Solution:  
 $7 + 9 = \underline{\quad}$  (fin 12)  
 $16 = \underline{\quad}$  (fin 12)  
 $16 \div 12 = 1$  rem 4  
 It will be 4:00pm  
 (It will change to pm if the quotient is an odd number)

(ii) It is 11:00 pm what time will it be nineteen hours from now?

Solution:  
 $11 + 19 = \underline{\quad}$  (fin 12)  
 $30 = \underline{\quad}$  (fin 12)  
 $30 \div 12 = 2$  rem 6  
 It will be 6:00pm  
 (it will remain in pm since the quotient is an even number.)

**EVALUATION ACTIVITY:**

A New MK Primary Maths Pupils Bk 7 Pg 55- 56 exercise 4:7

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**LESSON 19**  
**SUB TOPIC:** APPLICATION OF FINITE 24 IN 24 HOUR CLOCK SYSTEM

**CONTENT:** Example:

(i) It is 5:00pm now what time will it be after 1340 hours?

Solution:  
 $5:00 \text{ pm} = 24 \text{ hr clock}$   
 $12:00 + 5:00 = 17:00 \text{ hours}$   
 $1340 \text{ hours } 24$   
 $\underline{\quad}$   
 $55 \text{ rem } 20$

24	1340	
	120	
	140	
	120	
	20	

55 days rem 20 hours

$\therefore 17:00 + 20:00 \text{ hours}$   
 $= 37:00 \text{ hours}$   
 $= 37:00 \text{ hours } 24$   
 $= 1 \text{ rem } 13$   
 $13:00 \text{ hours or } 1:00\text{pm}$

**EVALUATION ACTIVITY:**

A New MK Primary Maths Pupils Bk 7 Pg 56-57 exercise 4:8

**Remarks:**

**LESSON 20**

**SUB TOPIC: APPLICATION OF THE FINITE SYSTEM IN GROUPIN ITEMS**

**CONTENT:**

Example:

A Headmaster bought some pens. Teachers grouped them in groups of nines but seven pens were left and if they grouped them in groups of 8's, 4 pens were left. If they grouped them in 3's only 1 pen is left. How many pens were bought by the headmaster?

Solution:

7 (finite 9) = 7, 16, 25, 34, 43, 52, 61.....

4 (finite 8) = 4, 12, 20, 28, 36, 44, 52, 60....

1 (finite 3) = 1, 4, 7, 10, 13, 16, 19, 22, 25, 28, 31

34, 37, 40, 43, 46, 49, 52, 55....

The common number for all is 52 so they were 52 pens.

**EVALUATION ACTIVITY:**

A New MK Primary Maths Pupils Bk 7 Pg 57 exercise 4:9

**Remarks:**

**TOPICAL EXERCISE:**

1. Find the value of 4 in the figure 78, 421.
2. Find the place value of 6 in 71.867.
3. Write down all 3 digit numerals that can be formed using the digits 7, 1, 6.
4. Find the product of the values of 2 and 4 in 823.45.

5. Write in figures: Sixty thousand sixteen.
6. Write 454 in Roman numerals.
7. Change 15 ten to binary base.
8. Change 101 two to decimal base.
9. Add 111 two to 11 two.
10. Multiply 1001 two  
X 10 two  
\_\_\_\_\_
11. What numeral has been expanded to give:  
 $(2 \times 10) + (6 \times 1) + (x \times 1/10) + (2 \times 1/100) + (5 \times 1/1000)$
12. Round off to the nearest hundred thousandths 0.422563.
13. Round off 43,256 to the nearest ten thousands.
14. Solve for the unknown: if  $44x = 35$  nine.
15. Simplify  $2 - 4 = \underline{\hspace{1cm}}$  (finite 5)
16. Solve (i)  $y - 5 = 4$  (finite 5)  
(ii)  $2(x - 2) = 3$  (finite 6)
17. Divide  $15 = \underline{\hspace{1cm}}$  (finite 6)
18. Today is Tuesday. What day of the week will it be after 46 days
19. Today is Friday. What day of the week was it 37 days ago?
20. A Plane left Entebbe airport at 1100 hours and arrived at New Park after 27 hours. At what time did it arrive. (Give your answer in 24 hour clock).
21. How many objects are there in 2 grosses.
22. Express LXIX into Hindu Arabic Numerals.
23. Evaluate  $33 = \underline{\hspace{1cm}}$  (mode 7)
24. (a) Express 1534 in standard form  
(b) Express 0.006 in Scientific notation

**TOPIC 6:****TOPIC: GRAPHS AND INTERPRETATION OF INFORMATION****LESSON 1:****SUB TOPIC: PICTO GRAPHS****CONTENT: 0.3**

Definition:

A picto graph is where we use pictures to represent quantities of actual items.

Example:

The graph below shows the number of books that were given to different schools.

Kyengera P/s	
Nakasero P/S	
Mengo P/s	
Old Kampala P/s	
Winston P/s	

Given that stands for 100 books and for 50 books.

- How many more books did Mengo pupils get than Kyengera?
- Which school had the maximum number of books?
- Find the total number of books that were given out to the five schools.
- Calculate the average number of books that were distributed to the five schools.

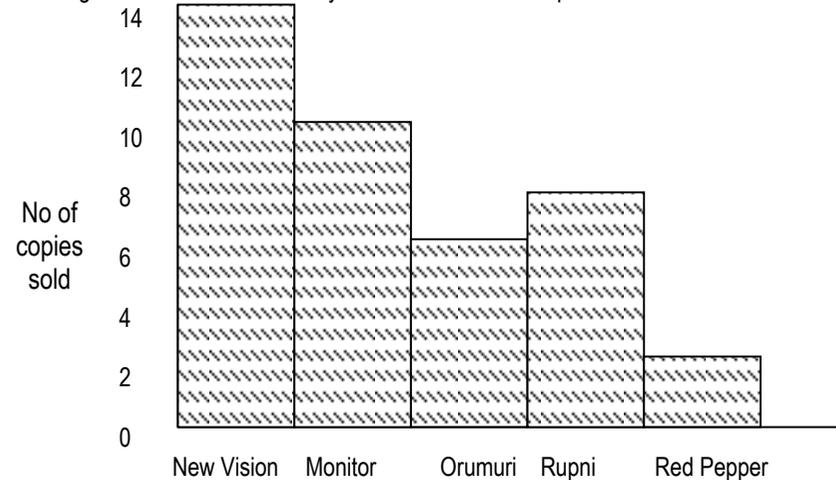
**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 10:1 Pg 146

**Remarks:****LESSON 2:****SUB TOPIC: BAR GRAPHS****CONTENT:**

Example:

The bar graphs represents the copies of Newspapers which were sold to the Education Manager's office on a certain day. Use it to answer the questions that follow:



- Which Newspaper was sold in the biggest number?
- How many copies were sold altogether?
- Which newspaper was bought by the least number of people?
- How many more copies of New Vision were sold than the Red Pepper?

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 10:2 Pg 147

**Remarks:****LESSON 3:**

**SUB TOPIC: BAR GRAPHS**

**CONTENT:** Using given data to draw bar graphs

**Example:**

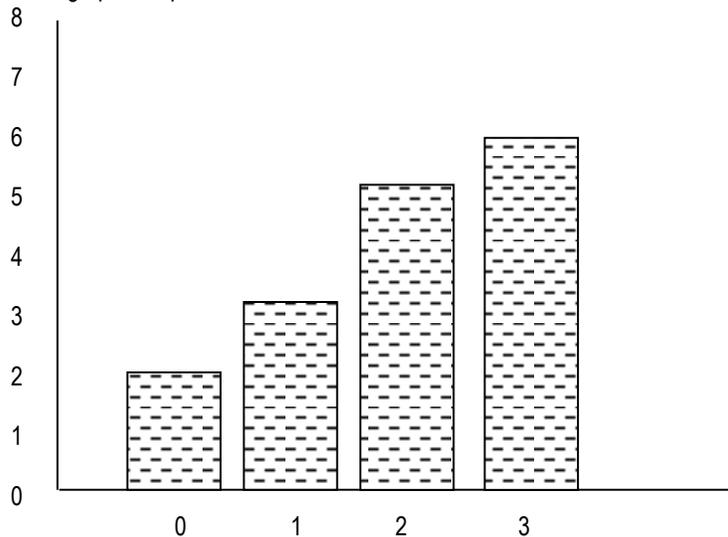
1. The table below represents points scored by 30 players.

Points scored	0	1	2	3	4	5
Frequency	2	3	5	6	9	5

Frequency table:

No	Tallies	Frequency
0	//	2
1	///	3
2	////	5
3	//// /	6
4	//// ///	9
5	////	5

A bar graph to represent the above information:



**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 Pg 149 exercise 10:3

**Remarks:**

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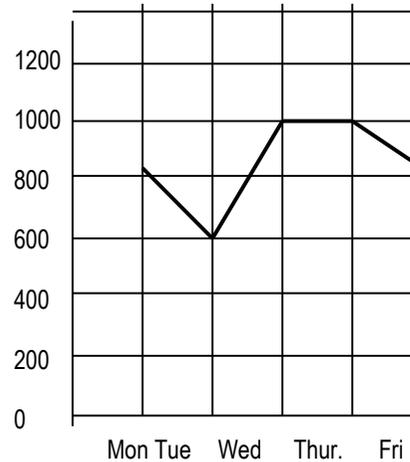
**LESSON 4:**

**SUB TOPIC: LINE GRAPHS**

**CONTENT:**

Example: The graph represents the schools' daily attendance for a week.

Use the information on the graph to make a table showing the daily attendance.



- (i) On which day was the attendance very poor?
- (ii) On which day was the attendance 600?
- (iii) How many pupils attended on Wednesday?
- (iv) What was the average attendance that week?
- (v) How many more pupils attended on Wednesday than Tuesday?

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 10:4 Pg 150

**Remarks:**

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**LESSON 5:**

**SUB TOPIC: TEMPERATURE GRAPHS**

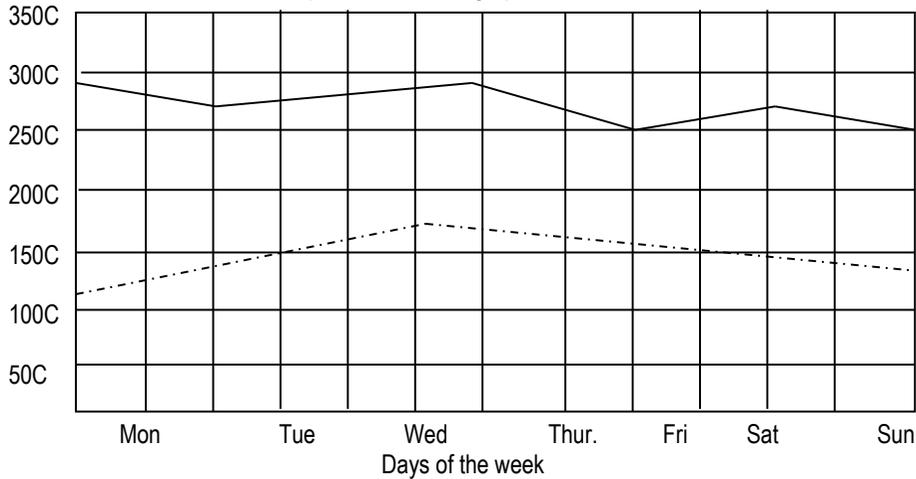
**CONTENT:** Interpreting temperature graphs

Example:

Study the table below:

Days	Mon	Tue	Wed	Thur	Fri	Sat	Sun
Maximum Temp	28°C	27°C	29°C	30°C	26°C	29°C	27°C

The same information can be represented on the graph as shown below.



---- Minimum temperature  
 \_\_\_\_\_ Maximum temperature

- What was the highest temperature of the week?
- Which day was the minimum temperature?
- What was the median for the maximum temperature?

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 10:11 Pg 165

**Remarks:**

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**LESSON 6:**

**SUB TOPIC: TRAVEL GRAPHS**

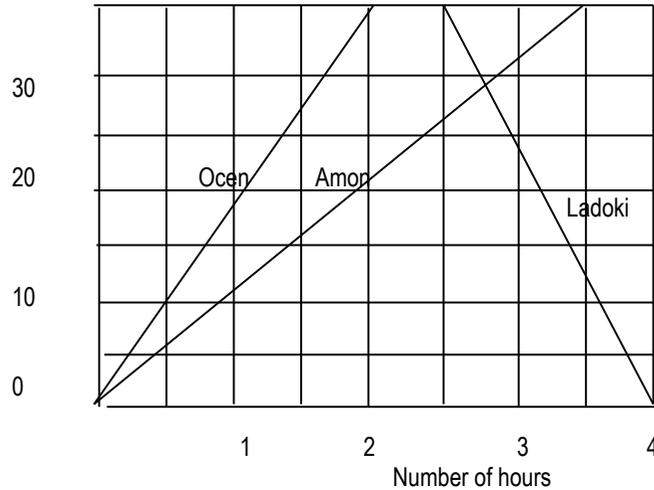
**CONTENT:**

A travel graph is one which shows the distance traveled and time taken.

Time is shown on the horizontal axis and distance is shown on the vertical axis.

Example:

The graph below shows 3 people moving between Kampala and Mpigi



- What is the scale on the horizontal axis.
- What is the scale on the vertical axis?
- Find the average speed of each person.
- Who is moving all the highest speed?
- Where was Amon after 2 ½ hours?
- How many hours did Amon take to complete her journey?
- Where was Ladoki after 2 hours?
- Where did Amon meet Ladoki
- How many hours earlier did Ocen arrive at Mpigi before Amon?
- How long did Ocen take to cover 30km?

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 12:9 Pg 185

**Remarks:**



**LESSON 7:**

**SUB TOPIC: DRAWING TRAVEL GRAPHS**

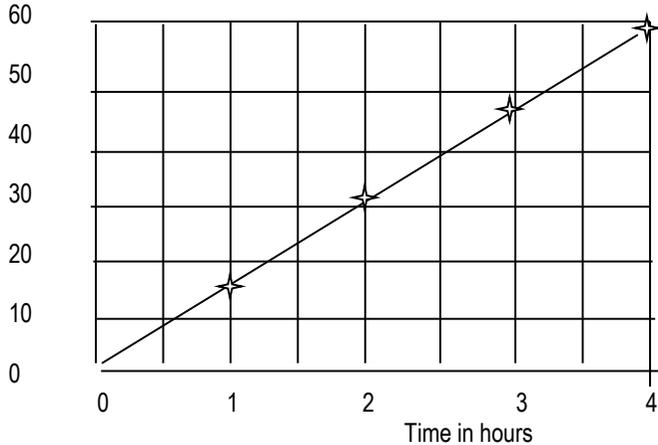
**CONTENT:**

Example:

Mukasa covered a journey in 4 hours traveling at 15 K.P.H. Show the journey on the grid.

KM	0 <sup>+15</sup>	15km <sup>+15</sup>	30km <sup>+15</sup>	60km
Time	0 <sup>+1</sup>	1 hr <sup>+1</sup>	2hrs <sup>+1</sup>	4 hrs

A graph representing Mukasa's journey.



**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 10:14 Pg 173 - 174

Remarks:

**LESSON 8:**

**SUB TOPIC: COORDINATE GRAPHS**

**CONTENT:**

Example:

Plot the following points

A = (-1, 4)

B = (5, 4)

C = (5, 0)

D = (-1, 0)

Join the points name the figure formed and find its area.

2. P = (-2, 3) Q = (2, 3) R = (3, -2) S = (-4, -2)

Join the points, name the figure formed and find its area.

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 10: 20 Pg 183

Remarks:

**LESSON 9:**

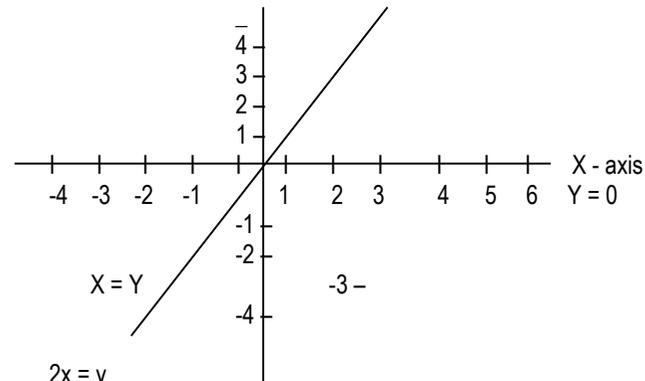
**SUB TOPIC: GRAPHS OF EQUATIONS**

**CONTENT:**

Example:

1. Given that  $x = y$ . Complete the table.

(a) Draw a graph for the equation.



2.  $2x = y$

3.  $y = x + 4$

4.  $y = 2x - 1$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 10:22 Pg 182

Remarks:

**LESSON 10:**

Email:

**SUB TOPIC: GRAPHS OF EQUATIONS**

**CONTENT:** Complete the table of the given equation

Example:

If  $2x + y = 10$ . Complete the table.

$X = 0$	$x = 1$	$x = 3$
$2x + y = 10$	$2x + y = 10$	$2x + y = 10$
$2x0 + y = 10$	$2x1 + y = 10$	$2x3 + y = 10$
$0 + y = 10$	$2 + y = 10$	$6 + y = 10$
$Y = 10$	$2 - 2 + y = 10 - 2$	$6 - 6 + y = 10 - 6$
	$Y = 8$	$Y = 4$

$X = 2$
$2x + y = 10$
$(2 \times 2) + y = 10$
$4 + y = 10$
$4 - 4 + y = 10 - 4$
$Y = 6$

**EVALUATION ACTIVITY:**

1.  $Y = 2x - 1$  Complete the table.

X	0	1	2	3	4
Y					

2. Complete the table  $y = 3x - 5$

X	4	_____	1/3	_____	3
Y	_____	-2	_____	-8	_____

3.  $3x + y = 5$  Complete the table

X	0	1	2	_____	6	_____
Y	5	_____	_____	7	_____	3

Remarks:

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**LESSON 11:**

**SUB TOPIC: LINES FORMED BY ORDERED PAIRS ON A GRAPH**

**CONTENT:** Example:

1. Line A in the graph passes through (3 -3), (-2, -2) (-1, -1), (0, 0), (1, 1), (2, 2), (3, 3), etc  
The table shows the x and y coordinates from line A.

X	-3	-2	-1	0	1	2	3
Y	-3	-2	-1	0	1	2	3

In comparison x coordinates are equal to the y coordinates

$Y = x$

The equation of line A is  $Y = x$

2. Line B passes through (-3, -2), (-2, -1), (-1, 0), (0, 1), (1, 2), (2, 3), (3, 4), etc

X	-3	-2	-1	0	1	2	3
Y	-2	-2	0	1	2	3	4

$Y = x + 1$

$-2 = -3 + 1$

$-1 = -2 + 1$

$0 = -1 + 1$

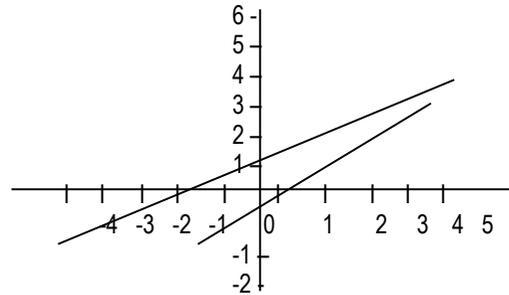
$1 = 0 + 1$

$2 = 1 + 1$

$3 = 2 + 1$

The equation for line B is  $y = x + 1$

Represent the above lines on a coordinate graph



**EVALUATION ACTIVITY:**

MK Bk 7 Pg 185 exercise 10:21

Remarks:

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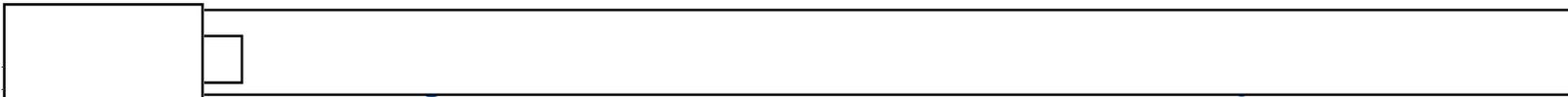


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**LESSON 12:**

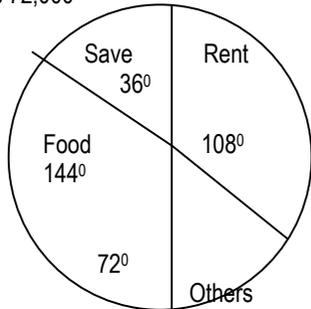
**SUB TOPIC: PIE CHARTS**

**CONTENT:**



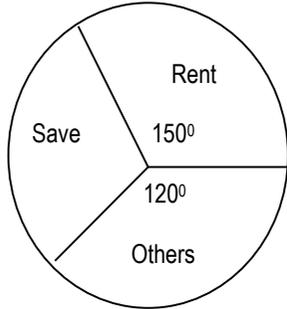
Example:

1. The pie chart below shows the monthly expenditure and savings of Mr Mugisha who earns 72,000=



- (a) How much does he spend on each item?
- (b) Change the given degrees to percentages.

2. The pie chart below shows a man's expenditure and savings if he earns 10,800=



- (a) How much does she spend on rent?
- (b) Express the savings as a percentage of the total.
- (c) How much more does he spend on other than he saves.

**EVALUATION ACTIVITY:**

MK Bk 7 Pg 192 exercise 12:11

Remarks:

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**LESSON 13:**

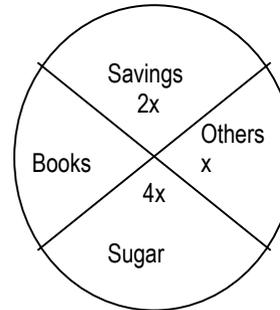
**SUB TOPIC: PIE CHARTS**

**CONTENT:**

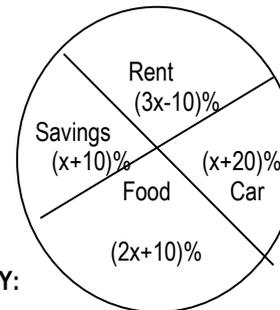
Example:

1. Mukasa was given 12,000= for his pocket money and spent it as shown on the pie chart below.

- (a) Find the value of x in degrees.
- (b) How much does he spend on each item?



2. With unknown percentage. A circle graph shows the expenditure and savings of a family which earns 96,000= How much is spent on a car and rent?



**EVALUATION ACTIVITY:**

MK Bk 7 195 exercise 12:12

Remarks:

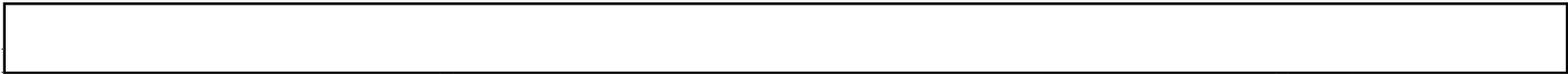
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**LESSON 14:**

**SUB TOPIC: CONSTRUCTION OF PIE CHARTS**

**CONTENT:**

Example:



1. Mukiibi spent 70% of his salary on rent 50% of the remainder on others. He was left with 3,000=

- (i) What did he have at first?
- (ii) Draw a pie chart using the information above.

2. The table below shows how Mr Mwanje spends his salary.

Items	School fees	Food	Transport	Others	Car expenses
Percentages	15%	20%	X%	10%	15%

- (i) Calculate the value of x.
- (ii) If he spends 60,000 on others, calculate his salary.
- (iii) Draw a pie chart to represent the information above.

**EVALUATION ACTIVITY:**

**MK Bk 7 196 - 197 exercise 12:12**

**Remarks:**

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**LESSON 15:**

**SUB TOPIC: PROBABILITY**

**CONTENT:** Probability is a measure of the likelihood of an event.

**Probability:** Desired chance  
Total chance

**Example:** A basket has 2 ripe mangoes and 6 raw mangoes. What is the probability of Twaha picking a ripe mango at random?

**Solution:** Total number of events is picking whatever is in the basket, whether ripe or not. So the number of chances is raw + ripe. Then the desired chance are the ripe mango.

**Probability:**

$$\begin{aligned} \text{Desired chance} &= \frac{2}{2 + 6} \\ \text{Total chance} &= \frac{2}{8} = \frac{2}{8 \div 2} \\ &= \frac{1}{4} \end{aligned}$$

What is the probability that a baby will be produced by a pregnant mother?

**EVALUATION ACTIVITY:**

**A New MK Primary Maths Bk 7 Pg 189 exercise 10:23.**  
**Primary Mathematics for Uganda Pg 57 exercise 1**

**Remarks:**

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**LESSON 16:**

**SUB TOPIC: TOSSING A COIN AND A DICE**

**CONTENT:**

**Example:**

If a coin is tossed once, what is the probability of getting a head on the top?

Total chance = {H, T}

Number of possible outcomes = 2

Expected out comes = {H}

∴ Number of expected outcome = 1

Hence Probability =  $\frac{n(E)}{n(s.s)}$   
=  $\frac{1}{2}$

**Example 2:**

When a die is rolled once, what is the probability of getting an even number on top?

Probability space = {all expected out comes}

n(s.s) = {1, 2, 3, 4, 5, 6}

n(s.s) = 6

Expected outcomes = {all desired chances}

n(E) = {2, 4, 6}

N(E) = 3

Probability =  $\frac{\text{All expected outcomes (desired chances)}}{\text{All possible outcomes.}}$

Probability =  $\frac{n(E)}{n(s.s)}$   
=  $\frac{3}{6}$

**EVALUATION ACTIVITY:**

**A New MK Primary Bk 7 Page 189 exercise 10:23**

**Remarks:**

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**LESSON 17:**

**SUB TOPIC: CARTESIAN PRODUCTS AND PROBABILITY SPACE**

**CONTENT:** Two coins, die and a coin

Example:

If two coins are tossed at once, what is the probability of two heads showing up?

Probability space =

1 <sup>st</sup>	H	T	
2 <sup>nd</sup>	H	HH	HT
Coin	T	TH	TT

n(s.s) = 4

Expected outcome = {H H}

n(E) = 1

Probability =  $\frac{n(E)}{n(s.s)} = \frac{1}{4}$

Example II

What is the probability that an even number and a tail will show up?

	Coin	
Dice	H	T
1	1, H	1, T
2	2, H	2, T
3	3, H	3, T
4	4, H	4, T
5	5, H	5, T
6	6, H	6, T

n(E) = {2, T, 4, T, 6, T}

n(E) = 3

Probability space = 12

Probability of even and tail =  $\frac{3}{12} = \frac{1}{4}$

**EVALUATION ACTIVITY:**

**A New MK Primary Maths Bk 7 Pg 189 exercise 10:24**  
**Primary Mathematics for Uganda Pg 57 exercise 1**

Remarks:

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**LESSON 18:**

**SUB TOPIC: TOSSING TWO DIES (DIE AND DIE)**

**CONTENT:**

Example:

1. When two dies are tossed once what is the probability that the sum is 8?

	DIE A					
Die B	1	2	3	4	5	6
1	1,1	1,2	1,3	1,4	1,5	1,6
2	2,1	2,2	2,3	2,4	2,5	2,6
3	3,1	3,2	3,3	3,4	3,5	3,6
4	4,1	4,2	4,3	4,4	4,5	4,6
5	5,1	5,2	5,3	5,4	5,5	5,6
6	6,1	6,2	6,3	6,4	6,5	6,6

Possible pairs (out come) = (2, 6, 3, 5, 4, 4, 5, 3, 6, 2)

N(E) = 5 pairs giving the sum

Sample space = 36

Probability (sum 8) = n(E)

Prob space  
 $= \frac{5}{36}$

2. When two dies are tossed once, what is the probability that the product of 20 appears on top?

**EVALUATION ACTIVITY:**

**MK Bk 7 Pg 191 exercise 10:24**

Remarks:

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**LESSON 19:**

**SUB TOPIC: STATISTICS**

**CONTENT:** Mode, medium, range and mean

Example:

1. The table below represents the goals scored by different teams.

Goals scored	2	3	6	7	10
Number of teams	4	1	2	1	2

- (a) Find the mode score.
- (b) What was the modal frequency?
- (c) Calculate the medium

(d) Calculate the mean and range.

2. Find the medium of the following scores 3, 1, 2, 0, 6, 1, 4

**EVALUATION ACTIVITY:**

**MK Bk 7 Pg 156 exercise 10:7**

**Remarks:**

**LESSON 20:**

**SUB TOPIC: COMPLEX AVERAGE/INVERSE OF AVERAGE**

**CONTENT:**

Example:

The average of 4 boys in a group is 12 years. A young boy os 4 years joined the group. Find the average age of the 5 boys.

$$\begin{aligned} \text{Mean} &= \frac{\text{Total}}{\text{Number of boys}} \\ \text{Total age of 4 boys} &= \text{Mean age} \times \text{number of boys} \\ &= 12 \times 4 \\ &= 48 \\ \text{Mean age of 5 boys} &= \frac{\text{Sum of ages}}{\text{Number of boys}} \\ &= \frac{48 + 4}{5} \\ &= \frac{52}{5} \\ &= 10 \frac{2}{5} \end{aligned}$$

The mean age of the 5 boys =  $10 \frac{2}{5}$  years.

Example 2:

The average mark of 36 pupils in a class is 5. Two pupils whose marks are 20 and 24 leave the group. Find the average mark of the remaining pupils.

**EVALUATION ACTIVITY:**

**Macmillan Primary Maths Bk 7 Pg 148 exercise 12**

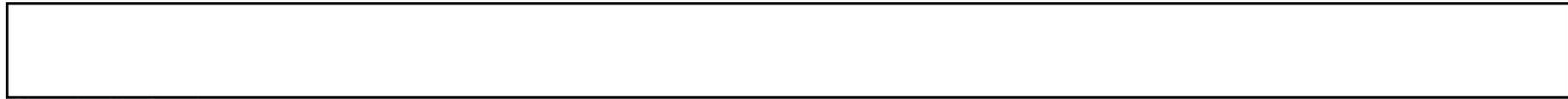
**Remarks:**

**TOPICAL EXERCISE ON GRAPHS**

- Hamisa kept the following daily record of the number of people who visited their home in a week: 3, 5, 3, 2, 0, 3, 5. Find the mean.
- A die is rolled once. What is the probability that a composite number will show on top?
- The average height of Peter, James and John is 51cm. If the height of Peter is 53cm and that of James is 46cm Find the height of John.
- Mary kept the following record of rainfall in centimeters 4, 3, 6, 5, 3, 0. Find the mode.
- a FOOT BALL TEAM CAN WIN, DRAW OR LOSE A March. What is the probability that it will win a March?
- The mean of the scores: 8, 7, 6, 5, (a – 5) is 6
  - Find the value of a.
  - Find the range of the scores.
- Sumaya scored the following marks in her homework exercises: 2, 5, 7, 3, 10, 4, 7, 11, 8, 3
  - Find her median mark
  - Find the mean mark
  - Find the probability that Sumaya scored a mark above her mean mark
- The equation of a line is  $2x + 1 = y$ . Make a table for the coordinates of x and y with the coordinates of x between -2 and +3. Show the line on a graph.
- Given that  $x = 2y + 1$  Complete the table below.

X	1	_____	5	_____	9
Y	_____	1	_____	3	_____

- Draw a grid and plot the following points:
    - A (-4, 3)
    - B (0, 3)
    - C (2, -3)
    - D (-4, -1)
  - Join the points A to B, B to C, C to D, D to A
  - Name the quadrilateral formed.
  - Find the area of the quadrilateral formed above.
- Find the mean of x, 4, 2x, 6 and 2x.
- What number is mid way of  $\frac{1}{2}$  and  $\frac{1}{3}$ ?
- A cyclist traveled from town P to R as follows. For 2 hours, he cycled from P to town Q a distance of 30km and then rested for 1 hour from Q. He continued for another 1 hour to town R at a speed of 40km/hr.
  - Draw a travel graph to show his journey



14. Given that  $Y = 2x - 1$

(a) Complete the table below.

X	0	1	2	3	4	5
Y	-1	1	___	___	___	___

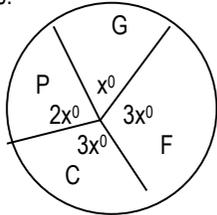
(b) Plot the points given in the table above on a graph.

15. The average of 3, 5, 4, 7, 9, 5 and y is 5. Find:

- (a) the value of y
- (b) the median
- (c) the mode

16. The average speed of a car is 60km/hr for 30 minutes. What distance is covered?

17. The pie chart below shows how a farmer has divided his land. C is for cash crops, G is for grazing, F is for food crops and for other purposes. The land available is 720 hectares.



- (a) How many hectares are left for grazing?
- (b) If he pays rent of shs 200 per hectare per year, how much will he pay for land reserved for cash crops?

18. In a Mathematics test given to a class, the marks scored frequency and total marks scored are shown in the table below.

Marks scored	Frequency	Total marks
4	4	16
___	9	45
6	___	84
7	8	___
9	5	45

- (a) Complete the table
- (b) What was the mode?
- (c) How many pupils were in the class?
- (d) What was the average mark scored?

19. Study the frequency table and answer the questions that follow:

Marks scored	20	40	70	50
No. of children	2	3	1	1

- (a) How many pupils did the test?
- (b) Find their mean mark.
- (c) Calculate their median mark.
- (d) What was the modal mark.
- (e) Workout the range

20. When two dice are tossed, what is the probability of even numbers showing on top?

## TOPIC 8 GEOMETRY LESSON 1:

### SUB TOPIC: LINES ((MEASURING, DRAWING AND CONSTRUCTING))

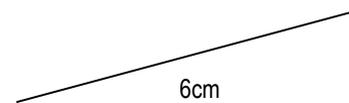
#### CONTENT:

Review:

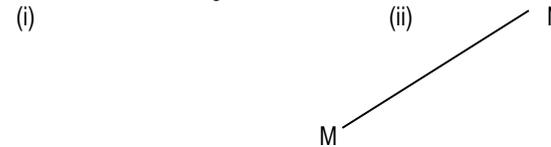
- Measuring line segments
- naming line segments (AB)
- types of lines
- (Parallel, not parallel, intersecting, etc)

Drawing line segments:

1. Draw a line segment measuring 6cm.



2. Measure the following lines:



3. Construct the following line segments:

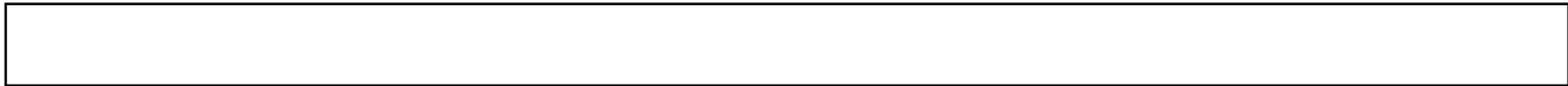
- (i)  $AB = 7.5\text{cm}$
- (ii)  $DE = 8.3\text{cm}$
- (iii)  $TB = 3.2\text{cm}$

#### EVALUATION ACTIVITY:

A New MK Primary Mathematics 2000 Bk 7 Trial exercise Pg 287 (New Edition)

Remarks:

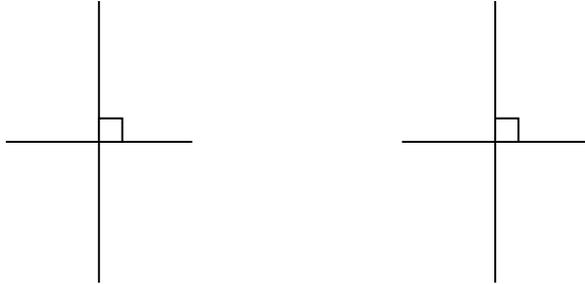
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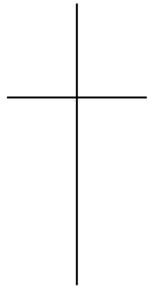
**LESSON 2:**

**SUB TOPIC: LINES (BISECTING LINES)**

**CONTENT:** Steps to follow



Dropping perpendicular lines given points.  
Drop a perpendicular line from point X to meet line AB



Droop a perpendicular line from point t.

**EVALUATION ACTIVITY:**

Pupils will bisect lines and drop perpendicular lines from points to meet known line segments.

**Remarks:**

**LESSON 4:**

**SUB TOPIC: MEASURING AND DRAWING ANGLES**

**CONTENT:** Measure the size of angles below.

(i) (ii) (iii)

Draw the following angles:  
 (a) 40° (ii) 53° (iii) 107° (iv) 235°

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 Exercise 28:9 28:10, 28:11 Pg 277 - 279 (New Edition)

**Remarks:**

**LESSON 4:**

**SUB TOPIC: CONSTRUCTING ANGLES**

**CONTENT:** Review bisecting angles

- Construct the following angels:
  - 60
  - 300



(c) 750 60°, 30°, 15° 75° 150° 120° 165°

2. (a) 90° (b) 45°

(Use the very method to construct 90°, 45°, 135°, 75°, 22 ½ °)

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 Exercise 28:9 28:10, 28:11 Pg 277 - 279 (New Edition)

**Remarks:**

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**LESSON 6:**

**SUB TOPIC: CONSTRUCTING REFLEX ANGLES**

**CONTENT:** Construct an angle of 210°  
 $210^\circ = 180^\circ + 30^\circ$

210

2100

3000

**EVALUATION ACTIVITY:**

Construct the following angles:

1. 225°
2. 195°
3. 240°
4. 270°

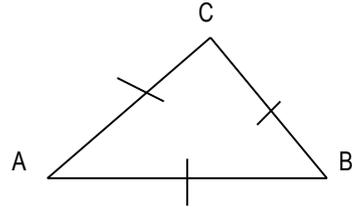
**Remarks:**

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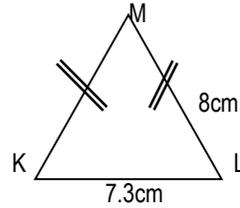
**LESSON 7:**

**SUB TOPIC: CONSTRUCTING OF TRIANGLES SSA, SAS,, ASA**

**CONTENT:** Construct an equilateral triangle ABC of side 6cm



Construct an isosceles triangle KLM in which KL = 7.3cm KM = LM = 8cm



**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7

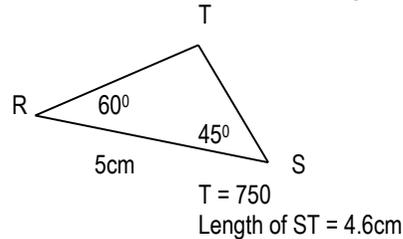
**Remarks:**

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**LESSON 7:**

**SUB TOPIC: CONSTRUCTING TRIANGLES**

**CONTENT:** Construct a triangle RST where angle R = 60° angle S = 45° and RS = 5cm  
Measure the length of ST and angle T.



Drop a perpendicular line from point T to meet RS at point O, measure OT and work out the area. OT = 3.2cm

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 6 Exercise 28:25 Pg 301 (New Edition)

Remarks:

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**LESSON 1:  
SUB TOPIC: ANGLES**

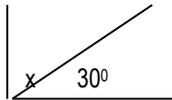
**CONTENT:** Complementary angles

- An angle with 90° is called a right angle.
- Any two angles that add up to 90° are complementary angles.

Examples:

1. What is the complement of 30°?

Let the complement be x  
 $X + 30^\circ = 90^\circ$   
 $X + 30 - 30 = 90 - 30$   
 $x = 60$



2. Find the complement of  $(x + 40)^\circ$

Comp of  $(x + 40)^\circ$   
 $= 90^\circ - (x + 40)^\circ$   
 $= 90^\circ - x + 40^\circ$   
 $= 90^\circ - 40^\circ - x$   
 $(50 - x)^\circ$

3. What angle is  $\frac{1}{2}$  of its complement?

Let Y represent the complement  
Y is  $\frac{1}{2}$  of  $(90 - y)^\circ$   
 $Y = \frac{1}{2}(90 - y)$   
 $2y = (90 - Y) \times 2$   
 $2y = 90 - y$   
 $2y + y = 90$   
 $3y = 90$   
 $3 \quad 3$   
 $Y = 30^\circ$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 11:5 Pg 202-203 (New Edition)

Remarks:

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**LESSON 2:  
SUB TOPIC: SUPPLEMENTARY ANGLES**

**CONTENT:** Supplementary angles add up to 180°.

$X + Y = 180^\circ$  (supp. S)

Examples:

1. In the above figure, if  $x = 48$ , find y.

$X + y = 180^\circ$   
 $Y + 48^\circ = 180^\circ$   
 $Y + 48^\circ - 48^\circ = 180^\circ - 48^\circ$   
 $Y = 132^\circ$

2. What angle is  $\frac{1}{4}$  of its supplement?

$X = \frac{1}{4}(180^\circ - x)$   
 $X = \frac{(180^\circ - x)}{4}$   
 $4x = (180^\circ - x) \times 4$   
 $4x = 180^\circ - x$   
 $4x + x = 180^\circ$   
 $\frac{5x}{5} = \frac{180^\circ}{5}$   
 $X = 36^\circ$

3. What angle is 5 times its supplement?

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 11:56 Pg 204 (New Edition)

Remarks:

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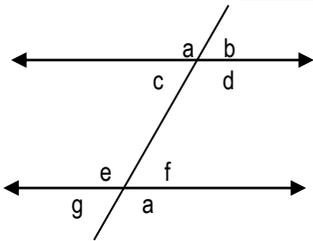


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**LESSON 3:  
SUB TOPIC: ANGLES ON PARALLEL LINES**

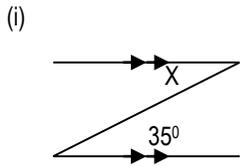
**CONTENT:** Properties of angles on parallel lines

Illustration:

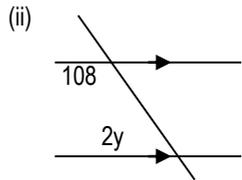


- $a + b = 1800$  (supp.  $\angle$ S)
- $a = d$  (vertically opp  $\angle$ S)
- $a = e$  (corresp  $\angle$ S)
- $d = h$  (")
- $b = f$  ("
- $c = F$  &  $d = e$  (att. Int  $\angle$ S)
- $a = h$  &  $b = g$  (Alt. ext. S)
- $c + e = 180^\circ$  (co.int.  $\angle$ S)
- $d + f = 180^\circ$
- $a + g/b + h = 1800$  (co.ext S)
- $a + b + c + d = 3600$  (S at a point)

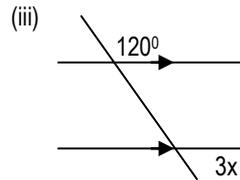
Examples:



$X = 35^\circ$  (Alt, int  $\angle$ S)



$2Y = 108^\circ$  (co.int  $\angle$ S)  
 $\frac{2y}{2} = \frac{108}{2}$   
 $Y = 54^\circ$



$3x = 1200$  (co.ext  $\angle$ S)  
 $\frac{3x}{3} = \frac{120}{3}$   
 $x = 40^\circ$

(iv)  $(6x-20)^\circ = (2x+80)^\circ$  (veric.opp  $\angle$ S)  
 $(6x-20)^\circ = 2x+80^\circ$   
 $4x = 100^\circ$   
 $4x = 100$   
 $\frac{4}{4} = \frac{100}{4}$   
 $X = 25^\circ$

$7x^\circ + 3x^\circ + 70 = 360^\circ$   
 $\angle$ S at a point  
 $10x + 70 = 360^\circ$   
 $10x + 70^\circ - 70^\circ = 360^\circ - 70^\circ$   
 $10x = 270$   
 $10x = 270$   
 $\frac{10}{10} = \frac{270}{10}$   
 $X = 27^\circ$

**EVALUATION ACTIVITY:**

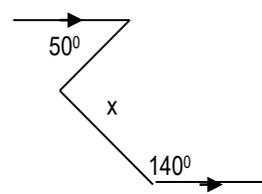
A New MK Primary Mathematics 2000 Bk 7 exercise 13:10 Pg 216 - 218 (New Edition)  
 Mathematics Revision Handbook Bk 5 - 7 Pg 209 - 120

**LESSON 4:**

**SUB TOPIC:** ANGLS ON PARALLEL LINES  
**CONTENT:** More about angles on parallel lines

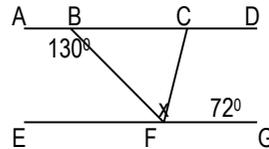
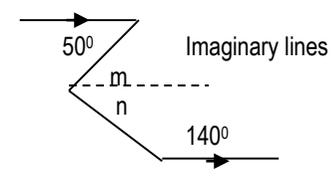
Examples:

1. Find the value of x.



Draw imaginary lines and rename the S.

$M = 50^\circ$  (Alt. int  $\angle$ S)  
 $N + 140^\circ = 180^\circ$  (Co. int.  $\angle$ S)  
 $N + 140^\circ - 140^\circ = 180^\circ - 140^\circ$   
 $N = 40^\circ$



$\angle ABF = \angle BFG$  (Alt. Int.  $\angle$ S)  
 $X + 72^\circ = 130^\circ$   
 $4 \times 72^\circ = 130^\circ - 72^\circ$   
 $X = 58^\circ$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 11:11, 11:12, 12:6 Pg 213 (New Edition)

Remarks:

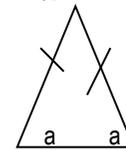
**LESSON 5:**

**SUB TOPIC:** ANGLES OF TRIANGLES

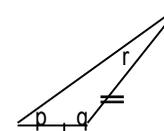
**CONTENT:** Types of triangles and their angel properties.



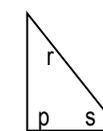
Equilateral  
 All  $\angle$ S are equal



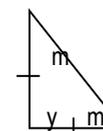
Isosceles  
 Base  $\angle$ s are equal



Scalene  
 $P \neq r \neq q$

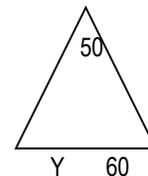


Right d scalene  
 $P = 90$



ed Isosceles  
 $\angle y = 90$   $m = 45$

Examples:



**Interior angle sum of a triangle**

$Y + 50 + 60 = 180$  (sum of a triangle)  
 $Y + 110 = 180$

$Y + 110 - 110 = 180 - 110$



$$Y = 70$$

**Interior and exterior angles of a triangle**Find the value of  $y$ .

$$Y + 60^\circ = 140^\circ \text{ (2 int. S = 1 opp ext)}$$

$$Y + 60^\circ - 60^\circ = 140^\circ - 60^\circ$$

$$Y = 80^\circ$$

**Exterior angles of triangles**Find the value of  $x$ 

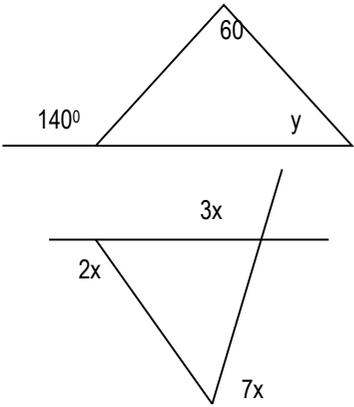
$$2x + 3x + 7x = 360^\circ$$

(sum of ext. S of any polygon)

$$12x = 360^\circ$$

$$\frac{12x}{12} = \frac{360}{12}$$

$$X = 30^\circ$$

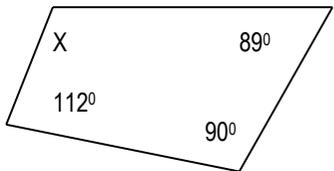
**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 12:1/12:2/12:3/12:4/12:5 Pg 229-235 (New Edition)

**LESSON 6:****SUB TOPIC: ANGLES OF QUADRILATERALS****CONTENT:** Angle properties of quadrilateralsThe interior angle sum of a quadrilateral is  $360^\circ$ .

Example:

(i)



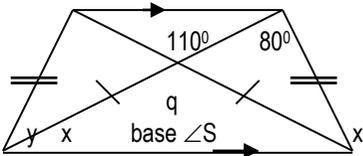
$$x = 112^\circ + 90^\circ + 89^\circ = 360^\circ$$

$$X + 291^\circ = 360^\circ$$

$$X + 291^\circ - 291^\circ = 360^\circ - 291^\circ$$

$$X = 69^\circ$$

(ii)



$$q = 110^\circ \text{ (vert. opp } \angle\text{S)}$$

$$X + x + 110 = 180 \text{ (int } \angle\text{sum)}$$

$$2x + 110^\circ = 180^\circ \text{ (of )}$$

$$2x + 110^\circ - 110^\circ = 180^\circ - 110^\circ$$

$$2x = 70^\circ$$

$$\frac{2x}{2} = \frac{70^\circ}{2}$$

$$X = 35^\circ$$

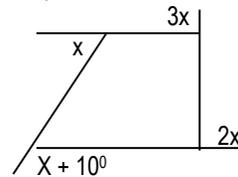
**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 Pg 237-241 (New Edition)

**Remarks:****LESSON 7:****SUB TOPIC: PROPERTIES OF REGULAR POLYGONS****CONTENT:** Exterior angles of polygons

- The number of centre, exterior or interior angles is equal to the number of sides.
- The centre angle is equal to the exterior angle in a regular polygon.
- Interior angle plus exterior angle is equal to 180.
- All exterior angles of a regular polygon add up to 360.

Examples:



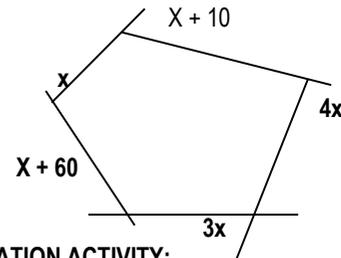
$$2x + x + 10^\circ + 3x + x = 360^\circ$$

$$7x + 10^\circ = 360^\circ$$

$$7x + 10^\circ - 10^\circ = 360^\circ - 10^\circ$$

$$\frac{7x}{7} = \frac{350^\circ}{7}$$

$$X = 50^\circ$$



$$X + 4x + x + 10^\circ + x + 60^\circ = 360^\circ$$

$$7x + 70^\circ = 360^\circ$$

$$7x + 70^\circ - 70^\circ = 360^\circ - 70^\circ$$

$$7x = 270^\circ$$

$$\frac{7}{7} \quad \frac{7}{7}$$

$$X = 30^\circ$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 Pg 242 – 244 (New Edition) Exercise 12:9

**Remarks:****LESSON 8:****SUB TOPIC: ANGLES OF REGULAR POLYGONS****CONTENT:** Calculating the number of sides of a polygon

Examples:

1. Calculate the number of sides of a regular polygon whose exterior angle is 30.

Solution:



**CONTENT:** Polygon

Examples:

- The interior angle of a regular pentagon is 108. Calculate the sum of all interior angles of the polygon.

Solution:  
 A pentagon has 5 sides.  
 Each int angle = 108  
 The sum of interior angles =  $108 \times 5$   
 =  $540^\circ$ .

- Calculate the interior angle sum of a regular polygon with 7 sides.

Solution:  
 Int angle sum =  $180(n-2)$   
 $180(7-2)$   
 =  $180 \times 5$   
 =  $900^\circ$

- Each exterior angle of a polygon is 30. Calculate the sum of the interior angles of a polygon.

All ext. S	The sum of int S
Each ext	$180^\circ(n-2)$
301	$180^\circ(12-2)$
30	$180 \times 10$
= 12 sides	= $1800^\circ$

- The sum of interior angles of a regular polygon is 1440.

- How many sides has the polygon?
- What is the size of each exterior angle of the polygon?

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 Pg 252 - 257 (New Edition) Exercise 12:16/12:17/12:18

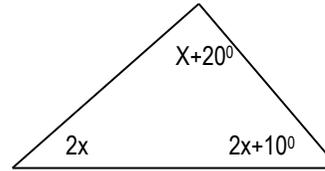
**Remarks:**

**LESSON 11:**

**SUB TOPIC: MORE ABOUT INTERIOR ANGLE SUM OF POLYGONS**

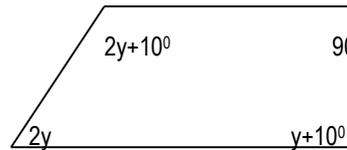
**CONTENT:** Examples

- Find the value of x in the figure.



$$\begin{aligned} \text{Sum of int S of triangle} &= 180^\circ \\ X + 20^\circ + 2x + 2x + 10 &= 180^\circ \\ 5x + 30^\circ &= 180^\circ \\ 5x + 30^\circ - 30^\circ &= 180^\circ - 30^\circ \\ 5x &= 150^\circ \\ 5x &= 150^\circ \\ \frac{5}{5} & \quad \frac{5}{5} \\ &= 30^\circ \end{aligned}$$

- Find the value of y.



$$\begin{aligned} 2y + y + 10 + 2y + 10 + 90^\circ &= 360^\circ \\ 2y + y + 2y + 10 + 10 + 90^\circ &= 360^\circ \\ 5y + 110 &= 360^\circ \\ 5y + 110 - 110 &= 360^\circ - 110 \\ \frac{5y}{5} &= \frac{250^\circ}{5} \\ &= y = 50^\circ \end{aligned}$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 Pg 258 (New Edition) Exercise 12:19

**Remarks:**

**LESSON 8**

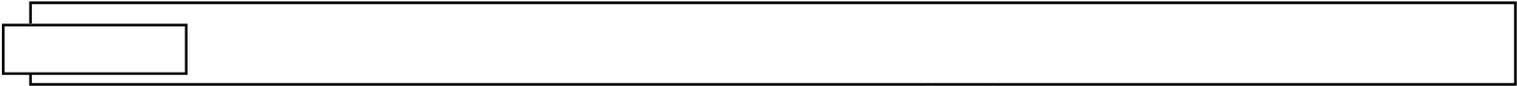
**SUB TOPIC: CIRCUMSCRIBING AND INSCRIBING TRIANGLES**

**CONTENT:** A triangle PQR is equilateral. Each side measures 5cm using a ruler and a pair of compasses only, draw a circle around the triangle.

Steps for circumscribing:

- Construct a triangle PQR of side 5cm.
- bisect any 2 of the sides.
- Identify the centre of the circle as the meeting point of the 2 bisectors.
- draw a circle around touching the vertices of the triangle

Inscribing:



Steps:

- Construct a triangle
- bisect any 2 of the angles.
- Identify the centre of the circle as the meeting point of the circle.
- Draw the circle inside touching all the sides of the triangle.

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 Exercise 13:7Pg 212 & Pg 214 exercise 13:8(New Edition)

Remarks:



**LESSON 9**

**SUB TOPIC: CONSTRUCTION OF REGULAR POLYGONS OF GIVEN RADII OR LENGTH OF SIDE**

**CONTENT:** Constructing regular polygons with given radii

- Sketch the polygon.
- Calculate the centre angle.
- Draw a circle of the given radius
- Draw the radius line
- Measure and draw the centre angle
- Mark the points of intersection of angle arms to circumference A and B respectively.
- Open the pair of compasses along arc AB and use the pair of compasses to mark off other arcs. (name the arcs C,D,E)
- Join the adjacent points BCDEA to form the polygon.

Constructing regular polygon when given length of its side.

- Construct a line segment of the given length.
- Determine the base angles and draw them at both points of the line segment.
- Draw a circle through the points on the line segment.
- Open the pair of compasses to the radius of the line segment continue to draw arcs on circumference.
- Join the adjacent points to form a figure/polygon.

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 Pg 314 - 315 (New Edition)

Remarks:



**LESSON 10**

**SUB TOPIC: CONSTRUCTION OF QUADRILATERALS (SQUARE, RECTANGLE, RHOMBUS & PARALLELOGRAM)**

**CONTENT:** Square & rectangle

Constructing square PQRS of side 4cm.

- Draw sketch of the square to be constructed.
- Draw line PQ = 4cm
- Through point P construct a line perpendicular to PQ.
- With the centre P and radius PQ, make an arc on the perpendicular line cutting it at points.
- With centre S and Q and with the same radius make arcs to cut each other at R.
- Join SR and QR

Constructing of rectangles ABCD of length 7cm and width 4cm:

- Draw a sketch of the rectangle ABCD
- Draw line AB = 7cm
- At A construct a line perpendicular to AB.
- Place the compass at A and with a radius of 4cm make an arc on the perpendicular cutting it at point D.
- Place the compass at B and with the same radius make an arc above AB.
- With a radius of 7cm, place the compass at D and make an arc to cut the previous arc at point C
- Join DC and BC

**EVALUATION ACTIVITY:**

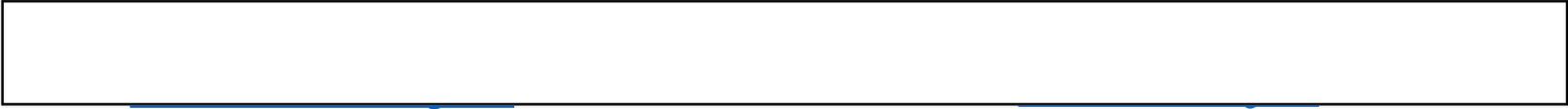
Maths Revision Hand Book Pupils Bo 5, 6, and 7 Pg 264.

Remarks:



**LESSON 11**

**SUB TOPIC: CONSTRUCTION OF RHOMBUS AND PARALLELOGRAM**



**CONTENT:** Construction of a rhombus

**Example:**

Using a ruler and a pair of compasses only, construct a rhombus ABCD of side 5cm and angle ABC 60°.

**Steps:**

1. Draw a sketch
2. Draw line BC = 5cm
3. Construct an angle of 60° at B and mark line AB = 5cm.
4. With centres A and C and with the same radius 5cm, mark arcs to cut each other at D.
5. Join A to D and C to D.

**Construction of parallelogram:**

6. Draw a sketch of the parallelogram
7. draw line ST = 6cm
8. Construct an angle of 60° at S and mark off 4cm at R.
9. With centre T and radius line ST.
10. With centre R and radius equal to ST draw an arc to cut the first arc at U.
11. Join TU and RU to form the required parallelogram

**EVALUATION ACTIVITY:**

Maths Revision Hand Book Pupils Bo 5, 6, and 7 Pag 267-269.

**Remarks:**

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## LESSON 12

**SUB TOPIC: DIRECTION, BEARING AND SCALE DRAWING**

**Review clockwise and anticlockwise.**

**Complete rotation/turn/revolution is 360°.**

- Angles covered by a minute hand on a clock face.
- Turns and angles and the vice versa
- Angle on compass

**Example:**

**Find the angle made in each of the following:**

- (a) 3 rotations      (b) 1 ½ turn      (c) What angle does a minute hand turn in:  
 1 rotation = 360°      1 turn = 360°

$$3 \text{ rotations} = 3600 \times 3 \\ = 1080^\circ$$

$$1 \frac{1}{2} \text{ turn} = 1 \frac{1}{2} \times 3600 \\ \frac{3}{2} \times 360 \\ 3 \times 180^\circ \\ = 540^\circ$$

(i) 10 minutes  
 Complete turn of a minute hand is 60 minutes and 3600  
 60 minutes = 360  
 1 minute =  $\frac{360}{60}$   
 10 minutes =  $\frac{360 \times 10}{60}$   
 = 6 x 10  
 = 60°

- (b) What is the smaller angle between North and East

**EVALUATION ACTIVITY:**

A New MK Primary Maths Pupils Bk 7 Pg 333 - 334 & 335 exercise 18:1

**Remarks:**

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## LESSON 13

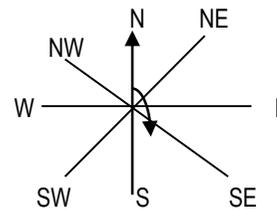
**SUB TOPIC: ORDINARY BEARING (DIRECTION)**

**CONTENT:** Direction and angles made by clockwise and anti clock wise turns

**Example:**

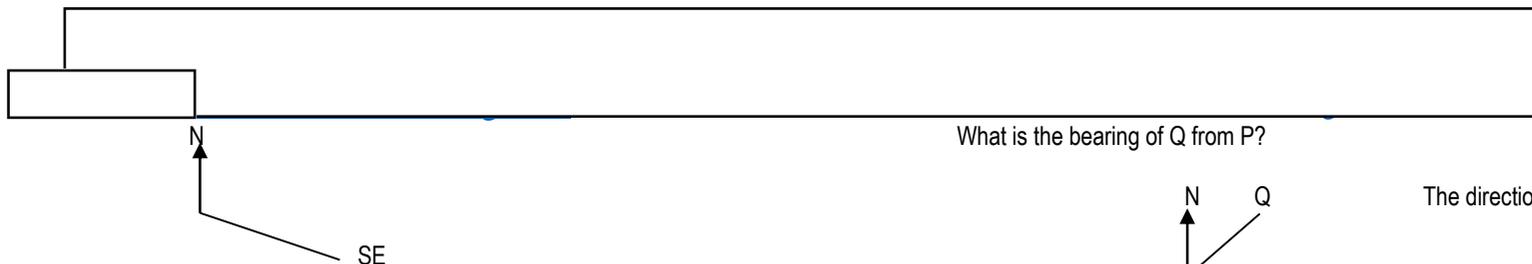
In which direction will I face if I turned anti clock wise through an angle of 135° from South.

**Solution:**

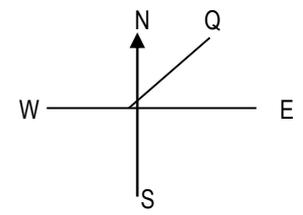


I will face NE direction.

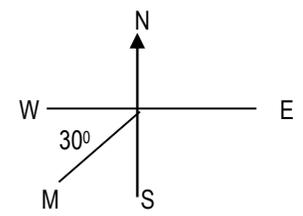
- State the angle made through the following turns.



What is the bearing of Q from P?

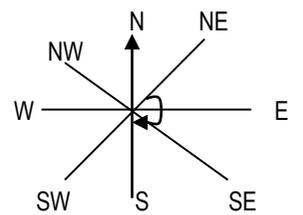


The direction of Q from P is N 70°E



$90 - 30 = 60$   
 Direction of M  
 M is 70° West of South  
 S 70°W

- A boy was facing North. He turned clockwise to face SW. what angle did he make?  
 $45^\circ + 45^\circ + 45^\circ + 45^\circ + 45^\circ = 225^\circ$   
 From North to SW clockwise he turned through  $225^\circ$ .



**EVALUATION ACTIVITY:**

A New MK P.6 Maths Pupils Bk 7 (New Edition) Pg 288 – 289 Exercise 15:3 and 15'4

**Remarks:**  
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**EVALUATION ACTIVITY:**

A New MK Primary Maths Pupils Bk 7 Pg 290 exercise 15:5

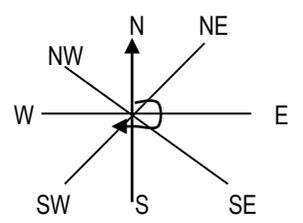
**Remarks:**  
 \_\_\_\_\_  
 \_\_\_\_\_

**LESSON 14**

**SUB TOPIC: ORDINARY BEARING (DIRECTION)**

**CONTENT:**

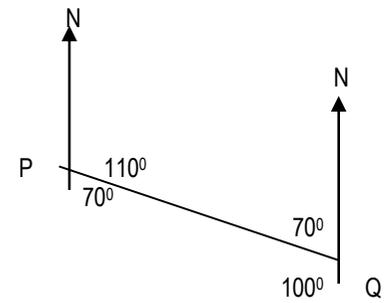
Example:



**LESSON 15**

**SUB TOPIC: MORE ABOUT ORDINARY BEARING**

**CONTENT:** Find the direction of Q from P and P from Q using the figure below.



The direction of Q from P is S 70°E  
 The direction of P from Q is N 70°W.

SW S SE

**EVALUATION ACTIVITY:**

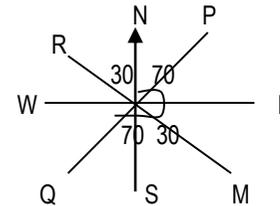
A New MK Primary Maths Pupils Bk 7 Pg 292 exercise 15:6

**Remarks:**

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Point P is N 70° E opp. to Q (S 70° W)  
 Point R is N 30° W opp. to M (S 30° E)

**EVALUATION ACTIVITY:**

A New MK Primary Maths Pupils Bk 7 Pg 293 - 294 exercise 15:7

**Remarks:**

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**LESSON 16**

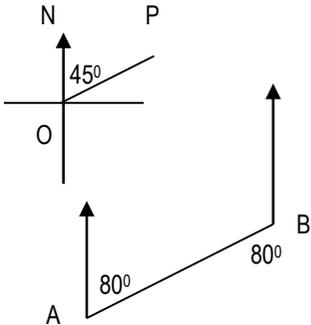
**SUB TOPIC: TRUE BEARING**

**CONTENT:**

Example:

True bearing is measured from North in clockwise direction.

Angles less than 100° must be written in 3 digits without letters N., S, E or W.



Bearing of P from O is 045°.

Bearing of B from A is 080°  
 Bearing of A from B is 180° + 80°  
 = 260°

**EVALUATION ACTIVITY:**

A New MK Primary Maths Pupils Bk 7 Pg 295 - 296 exercise 15:9 & 15:10

**Remarks:**

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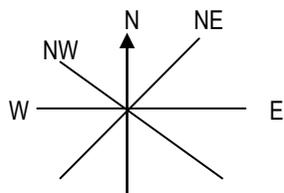


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**LESSON 17**

**SUB TOPIC: OPPOSITE DIRECTIONS AND BEARING**

**CONTENT:** Opposite direction



Opp of NE is SW  
 Opp of W is E  
 Opp of SE is NW

**LESSON 18**

**SUB TOPIC: OPPOSITE BEARING**

**CONTENT:**

Table showing opposite bearing

Bearing	Opposite bearing
045°	225°
090°	270°
135°	315°
225°	045°

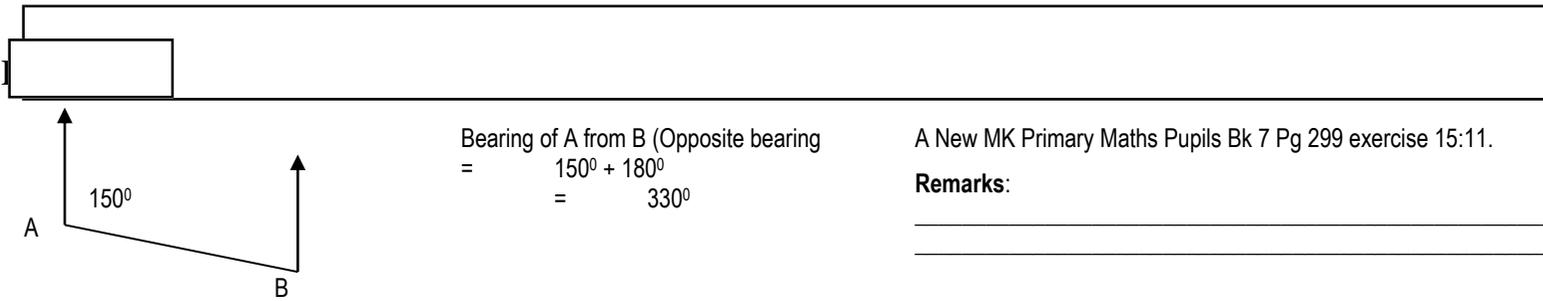
Examples:

- If the bearing P from Q is 060°. what is the bearing of Q from P?

Solution: Bearing of Q from P (Opposite bearing)  
 = 060° + 180°  
 = 240°

- The bearing of A from B is 270°. Find the bearing of B from A.

Bearing of B from A (Opposite bearing)  
 = 270° - 180°  
 = 090°



Bearing of A from B (Opposite bearing)  
 $= 150^\circ + 180^\circ$   
 $= 330^\circ$

A New MK Primary Maths Pupils Bk 7 Pg 299 exercise 15:11.

Remarks:

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**EVALUATION ACTIVITY:**

A New MK Primary Maths Pupils Bk 7.

Remarks:

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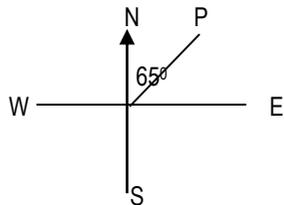
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**LESSON 19**

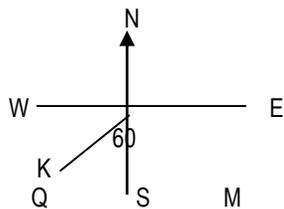
**SUB TOPIC: DIRECTION AND BEARING**

**CONTENT:**

Bearing	Opposite bearing
North	000° or 360°
East	090°
South	180°
West	270°
NE	045°
NW	315°



Direction of P from O  
 is N65° E  
 Bearing is 065°



Direction is S60W  
 Bearing is  $60^\circ + 180^\circ = 240^\circ$

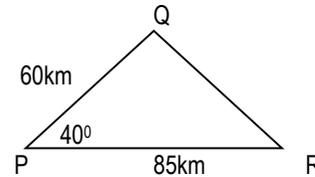
**EVALUATION ACTIVITY:**

**LESSON 20**

**SUB TOPIC: SCALE DRAWING**

**CONTENT:**

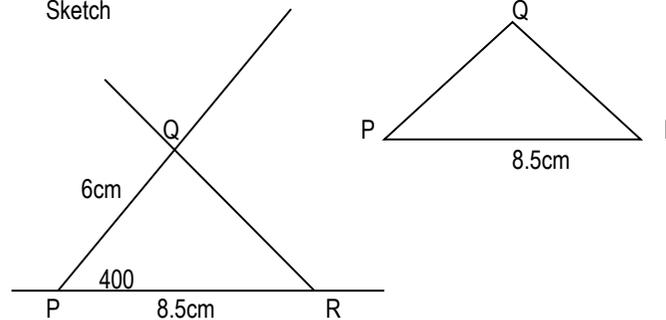
Construct the figure below using scale drawing.



Scale: 1cm represents 10km

Actual length	Drawing length
60km	$60/10 = 6\text{cm}$
85km	$85/10 = 8.5\text{cm}$

Sketch



**EVALUATION ACTIVITY:**

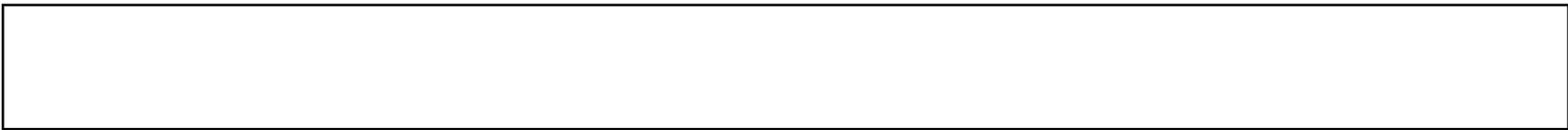
A New MK Primary Maths Pupils Bk 7 Pg 304 exercise 15:5

Remarks:

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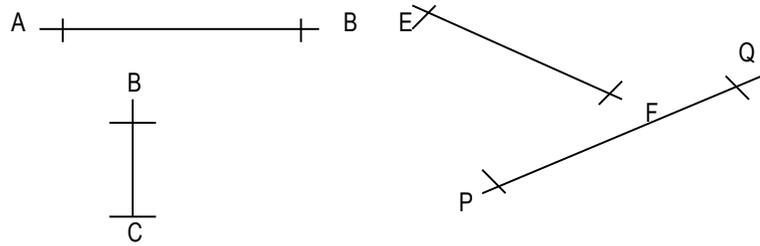


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**TOPICAL REVISION QUESTIONS:**

1. Using a ruler measure the following lines segments in cm.



2. With the help of a ruler and pair of compasses only, construct the following angles.
- (a)  $30^\circ$
  - (b)  $45^\circ$
  - (c)  $75^\circ$
  - (d)  $120^\circ$
3. Construct using a ruler and pair of compasses only the triangles with the following measurement.
- (a) Triangle ABC where  $AB = 7\text{cm}$ ,  $AC = 6\text{cm}$  and  $BC = 5\text{cm}$
  - (b) Triangle PQR where  $PQ = 8\text{cm}$ ,  $\angle Q = 120^\circ$  and  $QR = 5\text{cm}$ . Measure PR
4. What is the smaller angle between West and South West.
5. The bearing of a village P from town K is  $049^\circ$ . What is the bearing of town K from village P.
6. Construct a square WXYZ whose sides are  $4.5\text{cm}$ .
7. Each interior angle of a regular polygon is  $120^\circ$ .
- (i) Find the number of sides of the polygon.
  - (ii) Calculate its interior angle sum.
8. How many degrees will Munduni turn through in  $3\frac{1}{4}$  revolutions?
9. Town B is  $60\text{km}$  South of town A and town C is  $80\text{km}$  East of town B. Draw an accurate diagram for the 3 towns and measure the shortest distance between A and C

## TOPIC

**TOPIC:** MEASURES

**LESSON 1:**

**SUB TOPIC:** TIME

**CONTENT:** Changing seconds to minutes and hours and vice versa

Examples:

1. Change 3600 sec to minutes and hours.

$$\begin{array}{r} 60 \\ 60 \overline{) 3600} \\ \underline{60} \phantom{00} \\ 60 \phantom{00} \\ \underline{60} \phantom{00} \\ 0000 \end{array} \quad 60 \text{ seconds} = 1 \text{ minute}$$

Change 60 minutes to hours

1 hour = 60 minutes

$$\begin{array}{r} 1 \text{ hr.} \\ 60 \overline{) 60} \\ \underline{60} \\ 0 \end{array} = 1 \text{ hour}$$

### EVALUATION ACTIVITY:

A New MK Primary Mathematics 2000 Bk 7 exercise 17:1 Pg 324 (New Edition)

**Remarks:**

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## LESSON 2:

**SUB TOPIC:** TIME

**CONTENT:** Conversion of 12 hour time in 24 hour time

Use a conversion time table (A New MK Pg 411)

Example

1. Change 2:00am to 24 hour clock

$$\begin{array}{r} \text{Solution: } 2:00 \\ +00:00 \\ \hline \end{array}$$

02:00 hrs

2. Change 8:30pm to 24 hour clock

$$\begin{array}{r} \text{Solution: } 8:30 \\ +12:00 \\ \hline \end{array}$$

20:30 hrs

### EVALUATION ACTIVITY:

A New MK Primary Mathematics 2000 Bk 7 exercise 21:3 Pg 412 (New Edition)

**Remarks:**

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## LESSON 2

**SUB TOPIC:** TIME

**CONTENT:** Changing 24 hour clock to 12 hour clock

Example

1. Write 0436 hrs in the 12-hour clock

Solution: 0436

-0000

$$\begin{array}{r} 4:36 \\ \hline \end{array} = 4:36\text{am}$$

2. Write 2310 hrs in the 12-hour clock time

Solution: 2340

-1200

$$\begin{array}{r} 11:40 \\ \hline \end{array} = 11:40\text{pm}$$

### EVALUATION ACTIVITY:

A New MK Primary Mathematics 2000 Bk 7 exercise 21:3 Pg 413 (New Edition)

**Remarks:**

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## LESSON 4

**SUB TOPIC:** TIME

**CONTENT:** Finding duration

Example

1. A bus left Nairobi at 1315 hours and arrived in Kampala at 1630 hrs. How long did the journey take?

Subtract: 1630 hrs

- 1315 hrs

3 15hrs

2. A party started at 2000hrs and ended at 11:30 How long did the party last? (Express 11:30pm in 24 hr-clock)

--	--	--	--	--	--	--	--

11:3pm	Then subtract	2330hrs			
+12:00hrs		-2000hrs			
2330		3:30			

3 rem 20 minutes  
 $60 \div 200$   
 3 hours and 20 minutes.

The party lasted for 3 hours and 30 minutes.

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 21:5 Pg 414 (New Edition)

Remarks:

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**LESSON 5**

**SUB TOPIC: TIME**

**CONTENT:** School Time Table

Example:

1. Study the time table below for a P.6 class in Kyebando Primary School and answer the questions that follow.

From	8:30 am	9:10 am	9:50 am	10:30 am	11:10 am	11:50 am	12:30 pm	2:00 pm	2:40 pm
To	9:10	9:50	10:30	11:10	11:50	12:30	2:00	2:40	3:20
Mon	MTC	Eng		PAPE	PAPE	R.E		PAPE MDD	PAPE MDD
Tue.	Sci	MTC		R.E	R.E	Eng		SST	SST
Wed.	SST	Eng		IPS	Sci	Sci		Eng	Eng
Thur	Eng	Sci		MTC	MTC	L.Lag		R.E	MTC
Fri	MTC	MTC		Swah	Eng	Sci		IPS	IPS

- (i) How long does each lesson last?  
 $9:10\text{am} - 8:30\text{am} = 40\text{ minutes}$   
 $(60 + 10) = 70\text{ minutes}$   
 $70 - 30 = 40\text{ minutes}$

Each lesson lasts for 40 minutes

- (ii) At what time does break end?

- (iii) For how long do the pupils take studying Science the whole week?  
 5 lessons x 40 minutes = 200 minutes

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 21:6 Pg 415 (New Edition)

Remarks:

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**LESSON 6**

**SUB TOPIC: TIME**

**CONTENT:** Taxi and bus time tables

Example

1. The table shows the departure and arrival time of a taxi at given stations. Study it and answer the questions that follow:

Station	Arrival	Departure
Tororo		6:00am
Iganga	7:30am	7:45am
Jinja	8:35am	8:50am
Kampala	10:50am	

- (i) How long did the taxi take to move from Tororo to Iganga?

Solution: Time of arrival – Time of departure  
 Subtract  $7:30\text{am} - 6:00\text{am}$   
 $1:30$

It took 1 hour 30 minutes

- (ii) How long was the taxi stopover in Jinja?

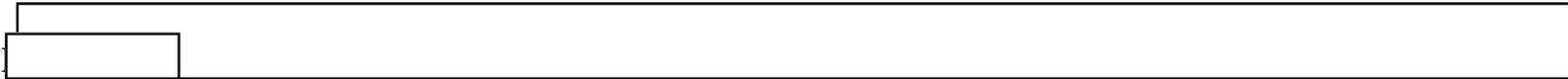
Subtract  $8:50\text{am} - 8:35\text{am}$   
 $0:15$

= It was 15 minutes.

- (ii) How long did the taxi take to move from Iganga to Kampala?

Subtract  $10:50\text{am} - 7:45\text{am}$   
 $3:15$

It took 3 hours and 15 minutes



**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 21:7 Pg 416 - 417 (New Edition)

Remarks:

**LESSON 7**

**SUB TOPIC:** TIME

**CONTENT:** Train timetables

Example

1. The tables below shows the departure, the arrival time and the fares for a train from Mityana to Tororo. Study the table carefully:

Station	Arrival	Departure
Mityana		11:00pm
Bujjuko	11:45pm	12:00 Mid night
Kampala	12:30am	12:45am
Jinja	1:30am	1:40am
Iganga	2:10am	2:30am
Tororo	3:30am	

Table II:

Mty					
500	BJK				
1000	500	Kla			
1600	1100	1000	JNJ		
2600	2100	2000	1000	ING	
3600	3100	3000	2000	1000	TRR

- (a) How long does the train take to move from Mityana to Kampala?

Solution: 12:30am  
- 11:00pm

1:30pm

1 hour and 30 minutes

- (b) Three tourists boarded the train from Kampala to Iganga. How much did they pay?

Solution: Kampala to Iganga costs shs 2,000

3 tourist pay shs 2000

X 3

Shs 6,000

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 21:8 Pg 418 - 419 (New Edition)

Remarks:

**LESSON 8**

**SUB TOPIC:** TIME

**CONTENT:** Marine timetables

Example

1. The table below describes the MV Victoria journey on the Island. Study it and answer the questions that follow:

Port		Day	Time	Fares (shs)
Port Bell (KP)	Dep	Wed	06:00	1500
Bukoba	Arrival	Wed	09:15	
Mwanza	Dep	Wed	09:55	3000
	Arrival	Wed	15:55	
Musoma	Dep	Wed	19:55	3000
	Arrival	Thurs	02:00	
Kisumu Peir	Dep	Thurs	04:00	5000
	Arrival	Thurs	14:00	

- (i) How long does the steamer take to move from Port Bell to Mwanza?

Subtract 15:55  
-06:00

9:55 It takes 9 hours and 55 minutes

- (ii) How long does the steamer take to move from Mwanza to Musoma?

Time moved on Wednesday + time moved on Thursday

24:00 - 19:55 = 4:05

It takes 4 hours and 5 minutes.

- (iii) How much does it cost one to move from Mwanza to Kisumu Pier?

Mwanza to Musoma = 3000  
Musoma to Kisumu Pier = +5000

8000

One pays shs 8000 from Mwanza to Kisumu Pier

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 21:8 Pg 418 - 419 (New Edition)

**Remarks:****LESSON 9****SUB TOPIC: TIME****CONTENT:** Air timetables

Example

1. Below is part of Uganda Airlines timetable for daily flights between Entebbe, Soroti and Kasese. Use it to answer the questions which follow:

From	To	Flight	Departure	Arrival
Entebbe	Soroti	QU 740	07:00 hours	08:00 hours
		QU 758	17:00 hours	18:00
Entebbe	Kasese	QU 702	07:00 hours	08:15 hours
		QU 730	21:00 hours	22:15 hours
Kasese	Entebbe	QU 703	07:00 hours	08:15 hours
		QU 731	21:45 hours	23:00 hours
Soroti	Entebbe	QU 741	08:30 hours	09:30 hours
		QU 759	18:30 hours	19:30 hours

- (a) How long does the flight from Entebbe to Soroti take?

Subtract 0800 it takes 1 hour  
-0700

$$\begin{array}{r} \text{---} \\ 1:00 \end{array}$$

- (b) Owori traveled from Entebbe to Kasese in the evening. He then traveled to Entebbe by the earliest flight.

- (i) For how long did Owori wait at Kasese?

24:00 Add 0700 hours 1:45  
-22:15 +07:00

$$\begin{array}{r} \text{---} \\ 1:45 \end{array}$$

$$\begin{array}{r} \text{---} \\ 8:45 \end{array}$$

Owori waited at Kasese for 8 hours and 45 minutes

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 21:10 Pg 421 (New Edition)

**Remarks:****LESSON 10****SUB TOPIC: TIME****CONTENT:** Application of timetables

Example

1. The table below shows a morning programme line up on star FM. Study the programme and answer the questions:

Time	Programme	Presenter
8:00am – 8:15 am	News	Aisha Nambedha
8:15 am – 10:15am	Healthy tips	Apio Olga
10:15am – 10:30am	News	Muwanga Kisolo
10:30am – 11:30 am	Educational Programme	Birungi Apuuli
11:30am – 11:45am	News	Muwanga Kisolo
11:45 am – 12:30pm	Farmers' platform	Iriko Tasiko

- (i) How many programmes are covered from 8:00am up to 12:30pm?  
Six programme are covered from 8:00am up to 12:30pm.
- (ii) Which presenter is concerned with farming?  
Iriko Tasiko is concerned with farming?
- (iii) Which programme in the table is the longest?  
The healthy tips programme is the longest.
- (iv) How long does the healthy tips programme last?  
10:15 am  
-8:15 am                      The healthy tips programme lasts 2 hours.

$$\begin{array}{r} \text{---} \\ 2:00 \end{array}$$
**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 21:11 &amp; 21:12Pg 422 - 423 (New Edition)

**Remarks:****LESSON 10****SUB TOPIC: TIME**



**CONTENT:** changing km/hr to m/s and vice versa

Example

1. change 10m/s to km /hr
2. change 90km/hr to m/s

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 pg 331 (old edition)  
MK NCDC bk 6 pg 116

**Remarks:**

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**TOPICAL QUESTIONS ON TIME**

1. Namayanja arrives at Kampala at 11:20pm and leaves at 2:0am to travel to Nairobi. She is due into Nairobi at 6:00am the following day. Unfortunately she is delayed and arrives at 9:30am.
  - (a) How late is Namayanja in arriving at Nairobi?
  - (b) For how long does Namayanja have to wait in Kampala?
  - (c) At what time does Namayanja leave Kampala on the 24 – hour clock?
2. A lesson started at 10:30am and ended at 11:50 am. How long did the lesson last?
3. Convert 7200 seconds into hours.
4. Convert 1717 hours to a 12- hour clock.
5. Thieves escaped from the prisons at 12:15 am. Express this time in a 24-hour clock.
6. Convert 2 ½ hours to minutes.
7. It takes 4 hours for a bus traveling at 75 km/hr to move from town X to town y. Find the time taken by a bus traveling at 50km/hr to cover the same distance.
8. Two buses were moving towards each other. Bus A moving at a speed of 40km/hr and bus B at a speed of 60km/hr If bus A starts at town P and bus B starts at Q a distance of 240km.
  - (i) After how many KM from B will they meet?
  - (ii) If both vehicles start at 9:00 am at what time will the two buses meet?
9. The table below shows the arrival and departure time for a bus moving between Masaka and Kampala.
  - (i) How long did the bus take to travel from Masaka to Nateete?
  - (ii) For how long did the bus stay at Nateete?
  - (iii) If the distance between Masaka and Kampala is 280km. calculate the average speed of the bus for the time it spent traveling.
10. Express 90km/hr as m/sec.

11. Convert 10m/second to km/hour
12. A motorist covered 140km between 11:25 am and 2:55pm. Find his average speed.
13. It takes a car industry 1 hour 10 minutes 20 seconds to assemble a car. How long will it take to assemble 50 cars?

**LESSON 1**

**SUB TOPIC: MONEY**

**CONTENT:** Bills

Example

1. A mother had a 5,000 shillings note and bought the following items.
  - 1 ½ kg of beans at 600= per kg.
  - 500g of salt at shs 700 each kg.
  - 2 bars of soap at shs 1400=
  - (a) How much did she spend and what was her balance?

Soln:

Beans	Salt	Soap	Total expenditure
1 1/2kg x 600	500g	2 bars = 1400=	1400
6 x 600	1kg = 1000g		900
2	500 kg		+ 350
3 x 300	1000		<hr/>
= 900=	500 x 700		1,650=
	1000		<hr/>
	5 x 70 = 360=		<hr/>

Balance = Money at hand – Total expenditure

$$\begin{array}{r}
 5000 \\
 - 1650 \\
 \hline
 3350
 \end{array}$$

- (b) Given that she was given a discount of 10% on the total expenditure. How much money did she pay?
  - Total expenditure = 100%
  - Discount = 10%
  - %age of money paid = 100% - 10%
  - = 90%
  - Amount = 90 x 1650
  - 100
  - = 9 x 165=
  - = 1485=

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 21:11 & 21:12Pg 214 - 216 (New Edition)

**Remarks:**

LESSON 2: REVIEW (LOWER WORK)  
SUBTOPIC: MONEY  
CONTENT: SHOPPING:

Example: Twaha bought the following items from a shop:  
3½ of beans at shs. 1400 per kg.  
1½ Kg of salt at Shs. 1000 per Kg  
4 bars of soap at Shs. 1500 per hour.

- (a) If Twaha was given a discount of 20% on his total expenditure, how much was the discount?
- (b) How much did Twaha pay?

**EVALUATION ACTIVITY:**  
Teacher's collection.

**Remarks:**

LESSON 3: REVIEW (LOWER WORK)

SUBTOPIC: MONEY  
CONTENT: NOTES IN A BUNDLE

Example:  
Moses was preparing for his birthday party and had a bundle of 5000 shilling notes numbered from DL 576634 to DL 576733. Find how much money he had to use.

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics, Pupils' Book 6 (Pg. 218), Exercise 10.

LESSON 4: REVIEW (LOWER WORK)

SUBTOPIC: MONEY

CONTENT: EXCHANGE RATES

Example:

Given that the exchange rate of US\$ to Ush. Is US\$ 1 to U sh. 1800 and that the exchange rate of K sh to U sh. Is K sh. 1 to U sh 23. How much money in Uganda shillings do I have in total if I have Us \$ 85 and K sh. 12500?

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics, Pupils' Book 6 (Page. 220-221), Exercise 10:4

**Remarks:**

**LESSON 5:**

**SUB TOPIC: CURRENCY**

**CONTENT:** The type of money used in a country is called currency. Different countries' currencies have different names:

Country	Currency
Burundi	Burundi francs (BF)
Zambia	Kwacha (Kch)
Zimbabwe	Zimbabwe Dollar (Z\$)
German	Deutsch mark (DM)
Egypt	Egyptian pound , etc

**Bank notes:**

Bank notes are numbered consecutively from A/P 003782 to <sup>A/P</sup> 003881. How many notes are there?

First note	<sup>A/P</sup> 003782
Last note	<sup>A/P</sup> 003881
Number of notes	<sup>A/P</sup> 003881
	- <sup>A/P</sup> 003782
	.....99

Total number of notes = 99 + 1 = 100 notes

**EVALUATION ACTIVITY:**

1. Amos has paper notes numbered from <sup>A/P</sup> 004300 to <sup>A/P</sup> 004399.
  - (a) Ho w many paper notes does Amos have?
  - (b) If each is 1000 shillings in value, how much money does Amos have?
2. A school bursar withdrew money from the bank. He was given new banknotes numbered consecutively <sup>Q/P</sup> 728601 to <sup>Q/P</sup> 728700. If each note was shs 500. How much money was withdrawn?
3. Find the amount of money in a bundle of 1000= notes if they are numbered UH 627400 to UH 627499



5. Which is cheaper?  
 (i) to advertise quarter full colour for 4 days or  
 (ii) to advertise half page black and white for 3 days?

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 291-293 (New Edition)

Remarks:

**LESSON 9**

**SUB TOPIC: RADIO ANNOUNCEMENTS**

- CONTENT:**
- (i) Death, accidents and sickness US 1000 for the first 25 words.  
U shs 100 for each extra word
  - (ii) Notices last funeral rites, lost and found items.  
U shs 3,000 for the first 25 words  
U shs 100 for each extra word
  - (iii) Business thanks and births  
U shs 5000 for the first 25 words.  
U sh 100 for each extra word

1. What is the cost of sending a death announcement of 27 words on Radio Kiboga?  
 The death announcement of 27 words  
 First 25 words cost 1000=  
 2 extra words cost  $100 \times 2 = 200$   
 Total cost =  $1000 + 200$   
 = 1200

**EVALUATION ACTIVITY:**

1. What is the cost of sending 2 death announcements of 30 words each?
2. Mr Kasekende sent 2 notices one of 24 words and another of 34 words through Radio Kiboga. How much money did he pay to Radio Kiboga?
3. Mr Ssenku sent 2 business annoucnemnt of 30 words each and sent 2 business announcements of 30 words each and a thanks announcement of 23 words. Calculate his total expenditure?
4. What will be the total cost of sending:
  - (i) One sickness announcement of 27 words.
  - (ii) One death announcement of 33 words.
  - (iii) The last funeral rite announcement of 33 words .
  - (iv) A thanks announcement of 15 words.

5.

Remarks:

**LESSON 10**

**SUB TOPIC: POSTAGE CHARGES**

**CONTENT:** Letters and printed papers

Example

The Uganda posts and Telecommunication transports letters and Newspaper for people and charges them accordingly.

1. Letters: For the first 20 grams shs 50  
Each additional word 50gram shs 30.
  2. Printed papers: For the first 50 grams shs 50  
Each additional 50 grams shs 20
- (a) How much does it cost to post a letter weighing 120 gram?
- |                     |   |                       |
|---------------------|---|-----------------------|
| First 20 grams      | = | shs 50                |
| Additional grams    | = | $120 - 20$            |
|                     |   | 100                   |
| Additional 20 grams | = | $\frac{100}{20}$      |
|                     | = | 5 additional 20 grams |
|                     | = | $5 \times 30 = 150$   |
|                     | = | $150 + 50$            |
|                     | = | 200                   |
- (b) How much does it cost shs 2000 to post 2 letters each weighing 120 grams and 2 printed papers each weighing 300grams?
- Letters
- |                               |   |            |
|-------------------------------|---|------------|
| 1 letters weighing 120g – 20g | = | shs 50     |
| Additional grams              | = | $120 - 20$ |
|                               | = | 100g       |
| Additional 20 grams           | = | 100        |
|                               | = | 20         |
|                               | = | 5          |
- 1 letter =  $50 + 150$   
 = 200  
 2 letters =  $200 \times 2$   
 = 400  
 Printed papers:  
 First 50g = sh 50  
 Additional grams =  $(300 - 5)$



# TERM III

## LESSON 1:

**SUB TOPIC:** METRIC SYSTEM

**CONTENT:** Comparing units/conversion of metric units

Examples:  
Comparing metric units  
Using base ten to compare metric units.

106	105	104	103	102	101	100
Km	Hm	Dm	Metre	Dm	Cm	Mm
Kg	Hg	Dg	Gram	Dg	Cg	Mg
Kl	Hl	Dll	Litre	Dll	Cl	MI

2. Conversion of metric units.  
(a) Change 7m to millimeter  
1m = 1000m  
7m = (7 x 1000m)  
= 7000mm

3. Change 800m to km  
1km = 1000m  
1m =  $\frac{1}{1000}$ km  
800m =  $\frac{1}{1000} \times 800$   
=  $\frac{8}{10} = 0.8$ km

### EVALUATION ACTIVITY:

A New MK Primary Mathematics Bk 7 exercise 18:2 and 18:1 Pg 344

**Remarks:**

## LESSON 2:

**SUB TOPIC:** ADDITION AND SUBTRACTION OF METRIC UNITS

**CONTENT:** Addition and subtraction of metric units

Examples:

1. 5cm, 8mm + 8cm + 3mm (Answer in Cm)  
Cm mm  
5 8  
+8 3

$$\begin{array}{r} 14 \\ \hline \end{array} . \begin{array}{r} 1 \\ \hline \end{array} = 14.1\text{cm}$$

2. Subtract: 8m – 7cm

M cm  
7 100  
8 00  
- 07

$$\begin{array}{r} 7 \\ \hline \end{array} \begin{array}{r} 93 \\ \hline \end{array} = 7\text{m } 93\text{cm}$$

### EVALUATION ACTIVITY:

A New MK Primary Mathematics Bk 7 exercise 18:3 and 18:1 Pg 345

**Remarks:**

## LESSON 3:

**SUB TOPIC:** METRIC SYSTEM

**CONTENT:** Multiplication and division of metric units

Examples:

1. Multiply 7cm 9mm by 4.  
Cm mm  
7 9  
X 4  

---

31 6  
316mm  
31cm 6mm  
or 31.6cm

2. Divide 2.4km wire into pieces of 60 metres each.

2.4km 1km = 1000m  
60m 2.4km = 24 x 1000  
10  
= 24 x 100  
= 2400ms  
2400  
60 = 40 pieces

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 18:4 and 18:1 Pg 346

**Remarks:**

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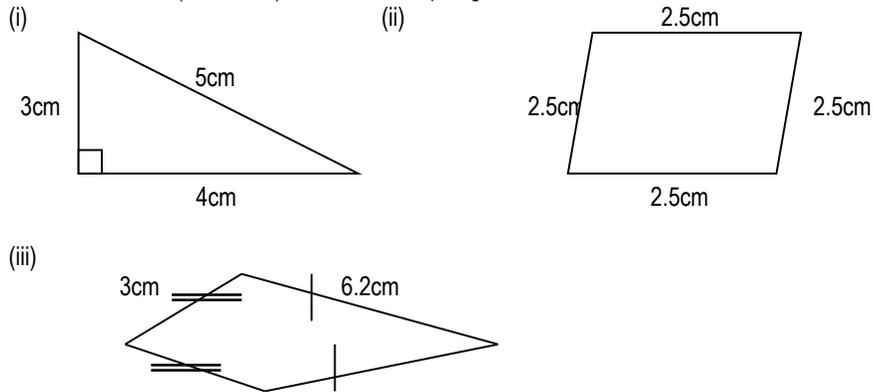
**LESSON 4:**

**SUB TOPIC: METRIC SYSTEM**

**CONTENT:** Perimeter of triangles, quadrilaterals combined figures and other polygons (Revision)

Examples:

Find the distance (Perimeter) around the shapes given below:



**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 Pg 347-350

**Remarks:**

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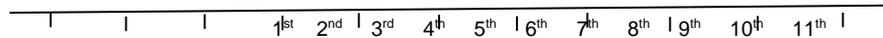
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**LESSON 5:**

**SUB TOPIC: application of perimeters**

**CONTENT:** Perimeter of triangles Application of perimeter

- (a) a) Roles in a straight line (Open fences)
- (b) 1. Electric poles are planted 20m apart. Find the distance
- (c) from the first pole to the 10<sup>th</sup> pole.
- (d) Solution:**
- (e) a) Relating numbers of poles to number of spaces.
- (f)

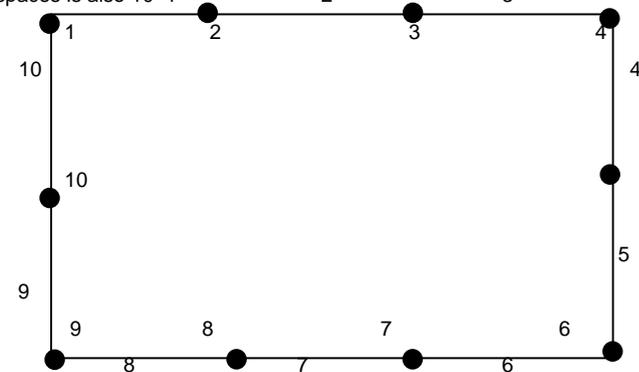


By counting we have ten poles btm 1<sup>st</sup> and tenth pole and nine spaces.

$$\begin{aligned} \text{No. of spaces} &= \text{No of poles} - 1 \\ \text{Distance} &= (10 - 1) \times 20\text{m} \\ &= 9 \times 20\text{m} \\ &= 180\text{m}. \end{aligned}$$

**2. Closed fences:**

In closed fences the number of poles corresponds with the number of spaces. In the illustration below the number of poles is 10 and the number of spaces is also 10



**Example:**

Mukasa's rectangular flower garden measures 10m by 8m. He fenced it, putting the poles 2m apart. How many poles did he need?

**Solution:**

Perimeter of flower garden



No. of poles

= Perimeter

Space btn poles

= ~~36m~~<sup>18</sup>

~~2m~~

= 18 poles

**ACTIVITY:**

1. When sprinting, Ivan athlete covers 180cm with every stride.
  - (a) How many strides does he take to finish 100m.
  - (b) How far does he run in 200 strides?
2. Telephone poles are 20m apart. What is the distance from the first pole to the 16<sup>th</sup> pole?
3. The distance around my farm is 400m. If I want posts for fencing spaced 4m, how many posts will I need?

**EVALUATION ACTIVITY:**

Macmillan Primary Mathematics Bk 7 exercise 1 Pg 81.

**Remarks:**

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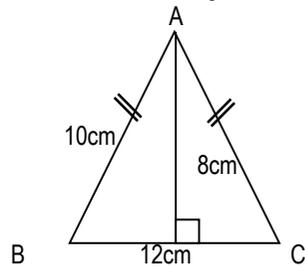
**Lesson : 6**

**SUB TOPIC: TRIANGLE**

**CONTENT:** Area of a triangle

**Examples:**

1. Find the area of triangle ABC



$A = \frac{1}{2} \times b \times h$   
 $= \frac{1}{2} \times 12 \times 8$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:1 and 18:1 Pg 351

**Remarks:**

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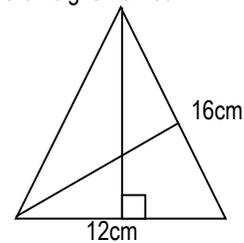
**LESSON 7:**

**SUB TOPIC: TRIANGLE**

**CONTENT:** Finding the missing side when given the area.

**Examples:**

1. Find the height marked h.



$\frac{1}{2} \times b \times h = \frac{1}{2} \times b \times h$

$\frac{1}{2} \times 12 \times h = \frac{1}{2} \times 16 \times 6$

$6h = 48$

$\frac{6h}{6} = \frac{48}{6}$

$h = 8$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:2 and 18:1 Pg 352

**Remarks:**

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**LESSON 8**

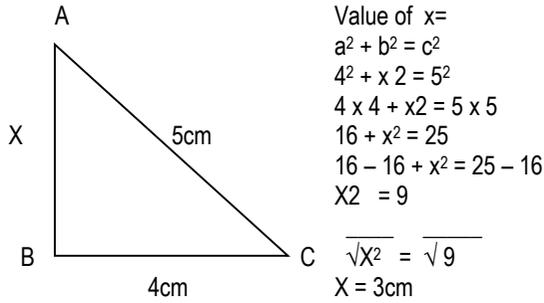
**SUB TOPIC: TRIANGLE**



**CONTENT:** Application of Pythagoras theorem in a triangle.

Examples:

1. Find the value of x and the area of the figure below.



2. Area of the triangle

$$A = \frac{1}{2} \times b \times h$$

$$= \frac{1}{2} \times 4 \times 3$$

$$= 2 \times 3$$

$$= 6\text{cm}^2$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:3 Pg 353

**Remarks:**

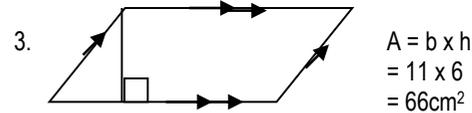
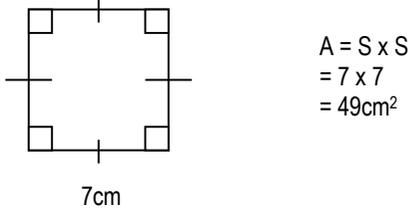
### LESSON 9

**SUB TOPIC:** QUADRILATERALS

**CONTENT:** Area of: square, rectangle and parallelogram

Examples:

1. Find the value of x and the area of the figure below.



**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:4 Pg 354

**Remarks:**

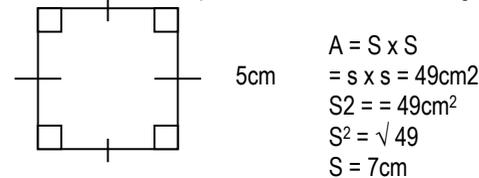
### LESSON 10

**SUB TOPIC:** QUADRILATERALS

**CONTENT:** Finding the unknown side when given area.

Examples:

1. The area of a square is  $49\text{cm}^2$ . Find the length of each side..



2. The area of a rectangular garden is  $48\text{m}^2$ . Find its length if it has a width of  $6\text{m}$ .

$$A = L \times W$$

$$L \times 6 = 48\text{m}^2$$

$$6L = 48$$

$$6 \mid 48$$

$$6 \quad 8$$

$$L = 8\text{m}$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:5 and 18:1 Pg 355

Remarks:

50cm 60cm

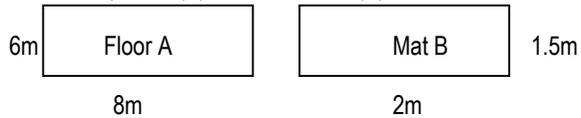
**LESSON 11**

**SUB TOPIC: AREA OF QUADRILATERALS**

**CONTENT:** Comparison of different areas

**Examples:**

1. How many mats (B) can cover floor (A)?



$1\text{m} = 100\text{cm}$   
 $8\text{m} = 800\text{cm}$   
 $6\text{m} = 600\text{cm}$   
 $2\text{m} = 200\text{cm}$   
 $1.5\text{m} = 150\text{cm}$

$\frac{800}{200} = 4$  mats  
 $\frac{600}{150} = 4$  mats  
 $= 4 \times 4 = 16$  mats

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:6 Pg 356

Remarks:

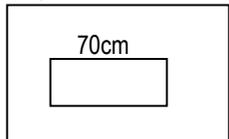
**LESSON 12**

**SUB TOPIC: AREA OF RECTANGLE**

**CONTENT:** Shaded and unshaded regions.

**Examples:**

1. A table of size 90cm by 60cm was partly covered with a piece of cloth 70cm by 50cm. What part of the table was uncovered?



90cm

Area of the table top  $A = L \times W$   
 $= 90 \times 60$   
 $= 5400 \text{ cm}^2$

Area of the cloth  $A = L \times W$   
 $= 70 \times 50$   
 $= 3500 \text{ cm}^2$

Uncovered area =  $5400 \text{ cm}^2$   
 $- 3500 \text{ cm}^2$   


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 $1900 \text{ cm}^2$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:6 Pg 356

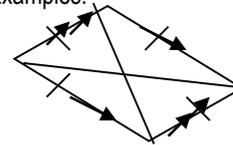
Remarks:

**LESSON 13**

**SUB TOPIC: AREA OF Rhombus**

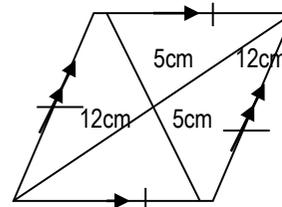
**CONTENT:** Area of a Rhombus

**Examples:**



- This parallelogram and height is called a rhombus.
  - If the base and height are given, Area = base x height.
  - If the two diagonals are given, Area =  $\frac{1}{2} \times d_1 \times d_2$
- Therefore, the area of the 4 congruent triangles in a Rhombus.

$A = \frac{1}{2} \times b \times h \times 4$  triangles



Example:  $A = \frac{1}{2} \times b \times h \times 4$   
 $\frac{1}{2} \times 12 \times 5 \times 4$   
 $= \frac{1}{2} \times 12 \times 5 \times 4$   
 $= 12 \times 5 \times 2$   
 $= 12 \times 10$   
 $= 120 \text{ cm}^2$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:8 Pg 358

Remarks:

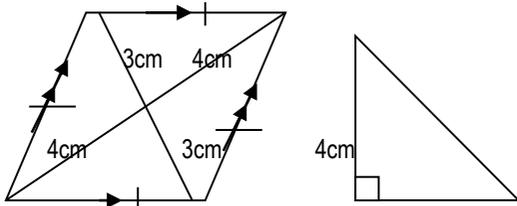
**LESSON 14**

**SUB TOPIC: AREA OF QUADRILATERAL**

**CONTENT:** Application of Pythagoras theorem in a rhombus

**Examples:**

- Calculate the length of each side of a rhombus whose diagonals are 8cm and 6cm.



$$\begin{aligned} a^2 + b^2 &= C^2 \\ 3^2 + 4^2 &= C^2 \\ 3 \times 3 + 4 \times 4 &= C^2 \\ 9 + 16 &= C^2 \\ 25 &= C^2 \\ 25 &= C^2 \\ 5 &= C \end{aligned}$$

Each side of a rhombus is 5cm

3cm

**EVALUATION ACTIVITY:**

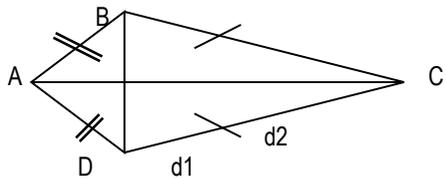
A New MK Primary Mathematics Bk 7 exercise 19:9 Pg 360

Remarks:

**LESSON 15:**

**SUB TOPIC: AREA OF QUADRILATERAL**

**CONTENT:** Area of a kite.



ABCD is a kite

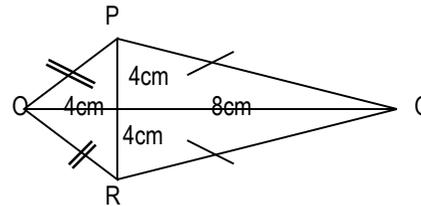
Area of the kite =  $\frac{1}{2}$  x the two diagonals =  $\frac{1}{2}$  x d1 x d2

Or Separate the kite into 2 different isosceles triangles of the same base ie ABC and BCD

$$\text{Area} = \left(\frac{1}{2} \times b \times h\right) + \left(\frac{1}{2} \times b \times h\right)$$

Example:

OPQR is a kite Calculate its area.



Method II

Area of a kite

$$\frac{1}{2} \times d1 \times d2$$

$$\frac{1}{2} \times 8 \times 12$$

$$= 48\text{cm}^2$$

Method I

(using triangles)

$$\text{Area} = \left(\frac{1}{2} \times b \times h\right) + \left(\frac{1}{2} \times b \times h\right)$$

$$\left(\frac{1}{2} \times 8 \times 4\right) + \left(\frac{1}{2} \times 8 \times 8\right)$$

$$16 + 32$$

$$= 48\text{cm}^2$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:10 Pg 361

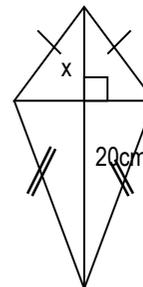
Remarks:

**LESSON 16**

**SUB TOPIC: AREA OF QUADRILATERAL**

**CONTENT:** Finding the unknown side of a kite given area.

**Examples:** The area of the kite below is 160cm<sup>2</sup>. One of the diagonals is 20cm Find the length of the second diagonal.



$$\text{Area of a kite} = \frac{1}{2} \times d1 \times d2$$

$$160 = \frac{1}{2} \times 12 \times d2$$

$$160 = 10d$$

$$160 = 10d$$

$$10 \quad 10$$

$$16 = d$$

$$\text{Second diagonal} = 16\text{cm}$$

$$X = \frac{d}{2} = \frac{16}{2} = 8\text{cm}$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:11 Pg 362

Remarks:

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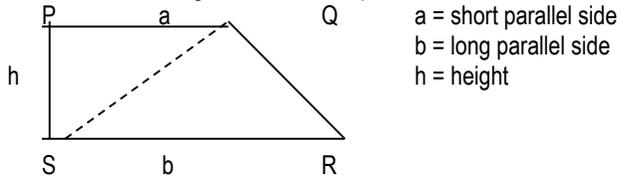


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### LESSON 17

#### SUB TOPIC: AREA OF QUADRILATERAL

CONTENT: Finding the area of a trapezium



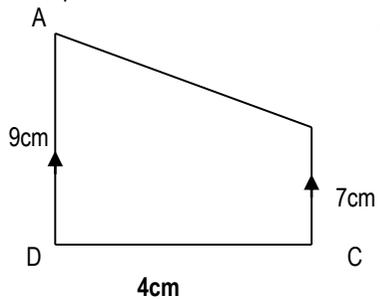
Area of a triangle PQS =  $\frac{1}{2} \times a \times h = \frac{1}{2} ah$

Area of triangle QRS =  $\frac{1}{2} \times b \times h = \frac{1}{2} bh$

Area of two triangles =  $\frac{1}{2} ah + \frac{1}{2} bh$   
=  $\frac{1}{2} h(a+b)$

Area of a trapezium =  $\frac{1}{2} h(a+b)$

Example:



Area of a trapezium =  $\frac{1}{2} h (a + b)$   
=  $\frac{1}{2} \times 4 \times (7 + 9)$   
=  $\frac{1}{2} \times 4 \times 16$   
=  $2 \times 16$   
=  $32\text{cm}^2$

#### EVALUATION ACTIVITY:

A New MK Primary Mathematics Bk 7 exercise 19:12 Pg 363

Remarks:

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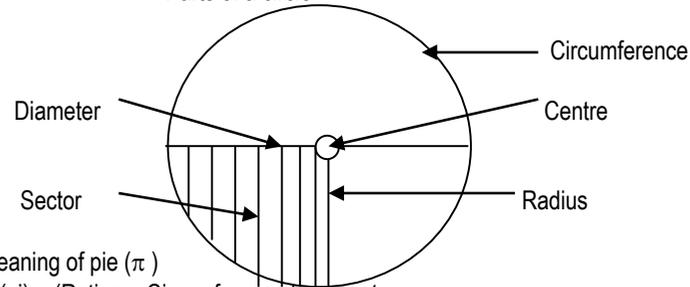


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### LESSON 18

#### SUB TOPIC: CIRCLE

CONTENT: Circumference of a circle when given diameter  
Parts of a circle



Meaning of pie ( $\pi$ )

$\pi$  (pi) = (Ratio = Circumference to diameter).

Example:  $\text{Pi} = \frac{\text{circumference}}{\text{Diameter}}$

$$\pi = \frac{C}{D}$$

$$X D = \frac{C \times D}{D}$$

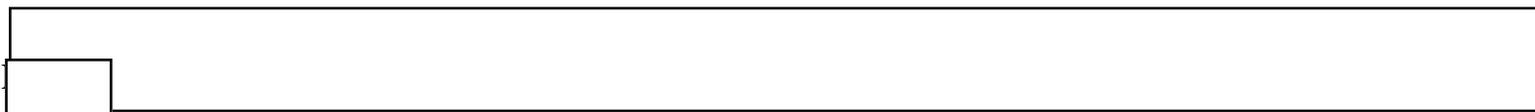
NB.  $\text{Pi} (\pi) = \frac{22}{7} = 3 \frac{1}{7}$   
Or = 3.14

- Find the circumference of a circle whose diameter is 10cm. (Use  $\pi = 3.14$ )  
 $C = D$   
 $= 3.14 \times 10$   
 $= \frac{3.14 \times 10}{10} = 31.4$   
 $C = 31.4\text{cm}$
- Calculate the circumference of a circle whose diameter is 14cm. (Use  $\pi = \frac{22}{7}$ )  
 $C = \pi D$   
 $= \frac{22}{7} \times 14$   
 $= 22 \times 2$   
 $C = 44\text{cm}$

#### EVALUATION ACTIVITY:

A New MK Primary Mathematics Bk 7 exercise 19:15 Pg 370

Remarks:



**LESSON 19**

**SUB TOPIC: CIRCLE**

**CONTENT:** Finding circumference when given radius

Examples:  $C = 2\pi R$

1. Find the circumference of a circle whose radius is:

(a) 7cm

$$C = 2\pi r$$

$$= 2 \times 22 \times 7$$

$$= 2 \times 22$$

$$= 44\text{cm}$$

(b) 10cm

$$C = 2\pi r$$

$$= 2 \times 3.14 \times 10$$

$$= 2 \times 314 \times 10$$

$$= 628$$

$$= 62.8\text{cm}$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:16 Pg 371

**Remarks:**

**LESSON 20**

**SUB TOPIC: CIRCLE**

**CONTENT:** Finding the radius of a circle when circumference is given

Examples:

1. Find the radius of a circle whose circumference is 44cm.

$$C = 2\pi r$$

$$2\pi r = 44\text{cm}$$

$$2 \times 22r = 44$$

$$44r = 44$$

$$r = 1$$

$$\frac{7}{44} \times \frac{44}{7} = 44 \times \frac{7}{44}$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:19 Pg 375

**Remarks:**

**LESSON 21**

**SUB TOPIC: CIRCLE**

**CONTENT:** Finding the perimeter of shapes using pi ( $\pi$ )

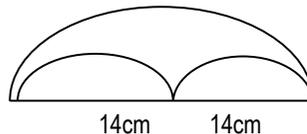
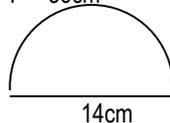
Examples:

$$P = \frac{1}{2}\pi D + D$$

$$= \frac{1}{2} \times 22 \times 14 + 14$$

$$= 22 + 14$$

$$P = 36\text{cm}$$



Diameter of each small semicircle = 14cm  
 Circumference of one semicircle =  $\frac{1}{2}D$   
 $= \frac{1}{2} \times \frac{22}{7} \times 14$   
 $= 22\text{cm}$   
 Perimeter of the figure =  $22\text{cm} + 22\text{cm} + 44\text{cm}$   
 $= 44\text{cm} + 44\text{cm}$   
 $= 88\text{cm}$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:19 Pg 375

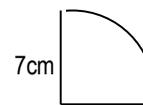
**Remarks:**

$$P = \frac{1}{4} 2\pi R + R + R$$

$$= \frac{1}{4} \times 2 \times 22 \times 7 + (7 + 7)$$

$$= 11 + 14$$

$$P = 25\text{cm}$$



Diameter of big semicircle = 28cm  
 Circumference of big semicircle  
 $= \frac{1}{2}D = \frac{1}{2} \times \frac{22}{7} \times 28$   
 $= 22 \times 2$   
 $= 44\text{cm}$

**LESSON 22**

**SUB TOPIC: CIRCLES**

**CONTENT:** Circumference (Application)

Examples:

1. How many revolutions can a wheel of a car 35cm in diameter make in a distance of 4.4km?

$$C = \pi D = \frac{22}{7} \times 35$$

$$= 22 \times 5$$

$$= 110\text{cm}$$

$$1\text{km} = 100,000\text{cm}$$

$$4.4\text{km} = 44 \times 100000$$

$$= 44 \times 10000$$

$$= 440000\text{cm}$$

$$1 \text{ revolution} = 110\text{cm}$$

$$\text{No of revolutions} = \frac{440000}{110}$$

2. A wire of length 352ms is wound round a tin 400 turns. Find the diameter of the tin.

$$1\text{m} = 100\text{cm}$$

$$352\text{m} = 352 \times 100$$

$$= 35200\text{cm}$$

$$1 \text{ revolution} = 352000$$

$$= \frac{352000}{400}$$

$$= 88\text{cm}$$

$$C = \pi D$$

$$\frac{22D}{7} = 88\text{cm}$$

$$7 \times \frac{22D}{7} = 88 \times \frac{7}{22}$$

$$\therefore D = 4 \times 7 = 28\text{cm}$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:20 Pg 376 – 377 (New Edition)

**Remarks:**

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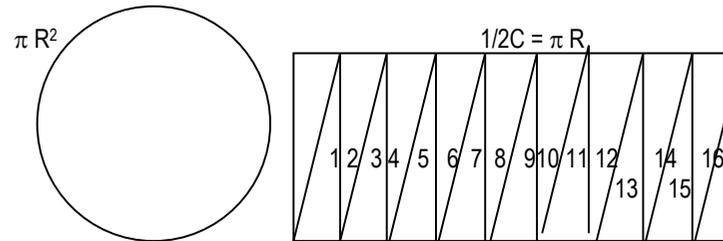


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**LESSON 23**

**SUB TOPIC: CIRCLES**

**CONTENT:** Area of a circle (given Radius)  
Formular of the area of a circle.



Area of a rectangle = L x W

Area of a circle =  $\frac{1}{2} C \times r$

$$= \frac{1}{2} 2 \pi r \times r$$

$$= \pi r \times r$$

$$= \pi r^2$$

Examples:

1. Find the area of a circle whose radius is 14cm ( $\pi = \frac{22}{7}$ )

Area of a circle =  $\pi r^2$

$$= \frac{22}{7} \times 14 \times 14$$

$$= 44 \times 14$$

$$= 616\text{cm}^2$$

2. A circular table cloth has a radius of 20cm. Calculate the area. ( $\pi = 3.14$ )

Area of a circle =  $\pi R^2$

$$= (3.14 \times 20 \times 20) \text{cm}^2$$

$$= (3.14 \times 400) \text{cm}^2$$

$$= 1256.06$$

$$= 1256\text{cm}^2$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:21 Pg 380 (New Edition)

**Remarks:**

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**LESSON 24**

**SUB TOPIC: CIRCLES****CONTENT:** Calculating area of circles given diameter.

Examples:

1. Find the area of a circle whose diameter is 8cm (
- $\pi = 3.14$
- )

Diameter = 8cm

Radius =  $\frac{8}{2} = 4$ cm

$$\begin{aligned} \text{Area} &= \pi r^2 \\ &= (3.14 \times 4 \times 4) \text{cm}^2 \\ &= 3.14 \times 16 \\ &= 50.24 \text{cm}^2 \end{aligned}$$

2. Find the area of a circle whose diameter is 28cm (
- $\pi = \frac{22}{7}$
- )

Diameter = 28cm

Radius =  $\frac{28}{2} = 14$ cm

$$\begin{aligned} \text{Area} &= R^2 \\ &= (22 \times 14 \times 14) \text{cm}^2 \\ &= 44 \times 14 \\ &= 616 \text{cm}^2 \end{aligned}$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:22 Pg 381

**Remarks:**  

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**LESSON 25****SUB TOPIC: CIRCLES****CONTENT:** Find the radius, diameter, circumference when given the area.

Examples:

1. The area of a circle is
- $154 \text{cm}^2$
- . Find its:

(a) radius

$A = r^2$

$R^2 = 154 \text{cm}^2$

$22r^2 = 154$

$r^2 = \frac{154}{22}$

$r^2 = 7 \times \frac{7}{22}$

$r^2 = 7 \times 7$

$r^2 = 49$

$r^2 = 49$

$r = 7 \text{cm}$

(b)

Diameter

$2 \times R$

$\pi r^2 = A$

$= 2 \times 7$

$= 14 \text{cm}$

(c)

Circumference

$C = D$

$22 \times 14$

$7$

$= 44 \text{cm}$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:22 Pg 381

**Remarks:**  

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**LESSON 26****SUB TOPIC: CIRCLE****CONTENT:** Finding area when given circumference

Examples:

1. Find the area of a circle whose circumference is 44cm

$C = 2\pi r$

$2\pi r = 44 \text{cm}$

$2 \times 22r = 44$

$r = \frac{44}{44}$

$r = 1$

$\frac{7}{44} \times 44r = 44 \times \frac{7}{44}$

$\frac{7}{44} \times 44r = 44 \times \frac{7}{44}$

$\therefore r = 7 \text{cm}$

$A = \pi r^2$

$= 22 \times 7 \times 7$

$7$

$= 154 \text{cm}^2$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:24 Pg 382

**Remarks:**  

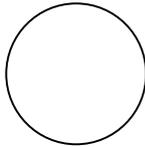
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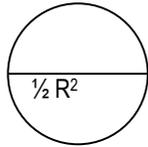
**LESSON 27**

**SUB TOPIC: CIRCLE**

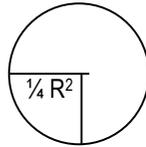
**CONTENT:** Area of parts of a circle



Circular Region



shaded part is semi circle



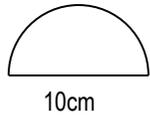
1/4 a circle it is a quadrant



sector of a circle

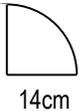
Examples:

1. Calculate area of a semicircle of radius 10cm ( $\pi = 3.14$ )



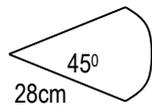
$$\begin{aligned} \text{Area} &= \frac{1}{2} R^2 \\ &= \left(\frac{1}{2} \times 3.14 \times 10 \times 10\right) \text{ cm}^2 \\ &= (3.14 \times 5 \times 10) \\ &= 157 \text{ cm}^2. \end{aligned}$$

2. Calculate the area of a sector of a circle of radius 28cm and centre angle  $45^\circ$ .



$$\begin{aligned} \text{Area} &= \frac{1}{4} \times R^2 \\ &= \left(\frac{1}{4} \times \frac{22}{7} \times 14 \times 14\right) \text{ cm}^2. \\ &= \frac{1}{4} \times \frac{22}{7} \times 14 \times 14 = 154 \text{ cm}^2 \end{aligned}$$

3. Calculate the area of a sector of a circle of radius 28cm and centre angle  $45^\circ$ .



$$\begin{aligned} \text{Area} &= \left(\frac{45}{360} \times \frac{22}{7} \times 28 \times 28\right) \text{ cm}^2 \\ &= \frac{1}{8} \times \frac{22}{7} \times 28 \times 28 \\ &= 11 \times 28 = 308 \text{ cm}^2 \end{aligned}$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:25 Pg 384

**Remarks:**

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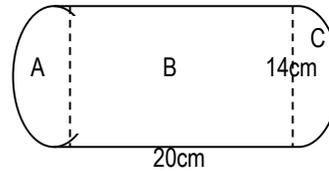
**LESSON 28**

**SUB TOPIC: AREA OF A CIRCLE**

**CONTENT:** Finding area of irregular shapes

Examples:

1. Find the area of the shape below.



$$\begin{aligned} \text{Diameter} &= 14 \text{ cm} \\ \text{Radius} &= \frac{14}{2} \\ &= 7 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{Area} &= A + B + C \\ &= \frac{1}{2} C + \text{Rec} + \frac{1}{2} C \\ &= \frac{1}{2} C + \frac{1}{2} C + \text{Rec} \\ &= 1 \text{ circle} + \text{Rec} \\ &= \pi R^2 + L \times W \\ &= \frac{22}{7} \times 7 \times 7 + 20 \times 14 \\ &= 154 + 280 \\ &= 434 \text{ cm}^2. \end{aligned}$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:26 Pg 385 (New Edition)

**Remarks:**

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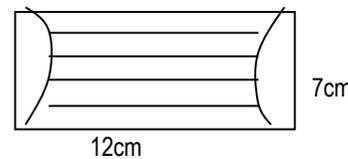
**LESSON 29:**

**SUB TOPIC: CIRCLE**

**CONTENT:** Shaded region

Examples:

1. Find the area of the shaded parts in the figure below.



$$\begin{aligned} \text{Area of a rectangle} &= L \times W \end{aligned}$$

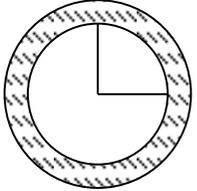
$$\begin{aligned} \text{Area of a semi circle} &= \frac{1}{2} \pi r^2. \\ &= \frac{1}{2} \times \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} \times 2 \\ &= 11 \times 7 = 77 \times 2 \\ &= 2 \times 2 \quad 4 \\ &= 38 \frac{1}{2} \text{ cm}^2. \end{aligned}$$

$$= 12 \times 7$$

$$= 84\text{cm}^2$$

Area of the shaded part =  $84\text{cm}^2$   
 $- 38 \frac{1}{2} \text{cm}^2$   
 $= 45 \frac{1}{2} \text{cm}^2$

2. Area of the outer circle



$$= \pi r^2$$

$$= 22 \times 14 \times 14$$

$$= 22 \times 2 \times 14$$

$$= 44 \times 14$$

$$= 616\text{cm}^2.$$

Area of the inner circle

$$= \pi r^2$$

$$= 22 \times 7 \times 7$$

$$= 22 \times 7$$

$$= 154\text{cm}^2.$$

Area of the shaded part =  $616\text{cm}^2$   
 $- 154\text{cm}^2$   
 $\hline$ 
 $462\text{cm}^2$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:27 and 19:28 Pg 386 (New Edition)

**Remarks:**  


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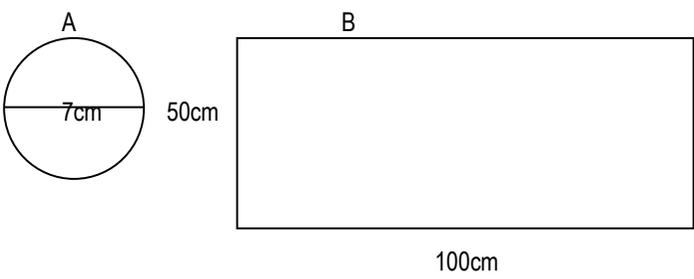


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**LESSON 30:**

**SUB TOPIC:** application of area of a circle

**CONTENT:** how many circular plates A can be cut from a card board B



b) Calculate the area of the space left  
 ref: Mk nk 7 pg 389

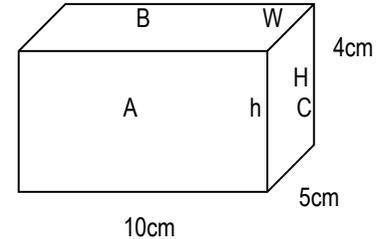
**LESSON 31**

**SUB TOPIC:** SOLID FIGURES

**CONTENT:** Surface area of cubes and cuboids

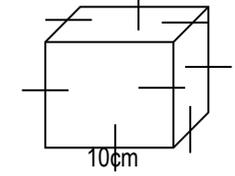
Examples:

1. Find the total surface area of the box 10cm by 5cm by 4cm.



Total surface area  
 $2(\text{face A}) + 2(\text{face B}) + 2(\text{face C})$   
 $2(L \times h) + 2(L \times w) + 2(w \times h)$   
 $2(10 \times 4) + 2(10 \times 5) + 2(5 \times 4)$   
 $2(40) + 2(50) + 2(20)$   
 $2 \times 40 + 2 \times 50 + 2 \times 20$   
 $80 + 100 + 40$   
 $180 + 40$   
 $220\text{cm}^2.$

2. Find the total surface of the cube below.



A cube has 6 faces.  
 Total surface are = Area of one face x 6  
 $A = 6 \times 10 \times 10$   
 $= 60 \times 10$   
 $= 600\text{cm}^2.$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:33 Pg 394 (New Edition)

**Remarks:**  


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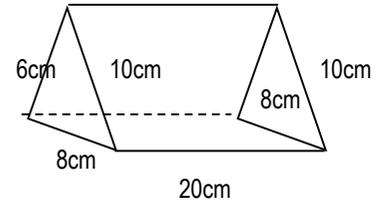
**LESSON 32:**

**SUB TOPIC:** SOLID FIGURES

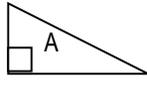
**CONTENT:** Surface area of a triangular prism

Examples:

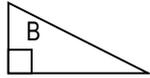
1. Find the surface area of the figure below.



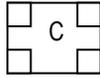
The main parts of a triangular prism



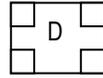
$$\frac{1}{2}bh$$



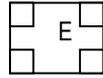
$$\frac{1}{2}bh$$



$$L \times W$$



$$L \times W$$



$$L \times W$$

Part A =  $\frac{1}{2} \times b \times h$   
 $= \frac{1}{2} \times 8 \times 6$   
 $= 8 \times 3$   
 $= 24\text{cm}^2$

Part B =  $\frac{1}{2} \times b \times h$   
 $= \frac{1}{2} \times 8 \times 6$   
 $= 4 \times 6$   
 $= 24\text{cm}^2$

Part C =  $L \times W$   
 $= 20 \times 8$   
 $= 160\text{cm}^2$

Part D =  $L \times W$   
 $= 20 \times 6$   
 $= 120\text{cm}^2$

Part E =  $L \times W$   
 $= 20 \times 10$   
 $= 200\text{cm}^2$

Total Area =  $24\text{cm}^2$   
 $24\text{cm}^2$   
 $160\text{cm}^2$   
 $120\text{cm}^2$   
 $200\text{cm}^2$   


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 $528\text{cm}^2$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:34 Pg 368 (New Edition)

Remarks:

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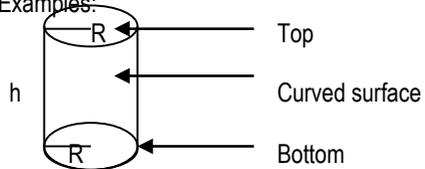
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**LESSON 33:**

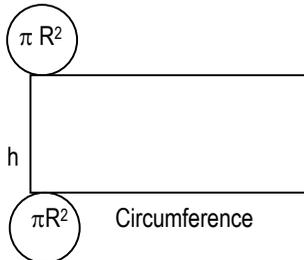
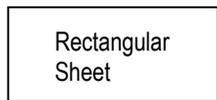
**SUB TOPIC: SOLID FIGURES**

**CONTENT:** Cylinder  
 Surface area of a cylinder

Examples:



Circular end



Circular end

Total surface area =  $R^2 + R^2 + C \times h$   
 $= \pi R^2 + \pi rh$

2. Find the total surface area of a cylinder whose radius is 7cm and height 10cm (Use = 22/7)



$$2R^2 + 2RH$$

$$2 \times \frac{22}{7} \times 7 \times 7 + 2 \times \frac{22}{7} \times 7 \times 10$$

$$44 \times 7 + 44 \times 10$$

$$308 + 440 = 748\text{cm}^2$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 19:35 Pg 398 (New Edition)

Remarks:

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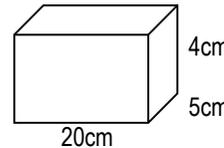
**LESSON 34:**

**SUB TOPIC: SOLID FIGURES**

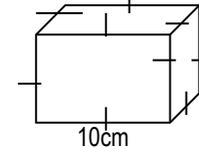
**CONTENT:** Volume of cubes and cuboids

Examples:

1. Find the volume of the cuboid below. 2. Find the volume of the cube below.



$V = \text{base area} \times \text{height}$   
 $= 20 \times 5 \times 4$   
 $= 100 \times 4$   
 $= 400\text{cm}^3$



$V = \text{base area} \times \text{height}$   
 $= 10 \times 10 \times 10$   
 $= 100 \times 10$   
 $= 1000\text{cm}^3$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 20:1 Pg 399 (New Edition)

**Remarks:**

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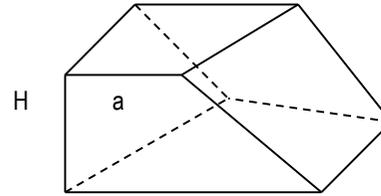
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**SUB TOPIC: SOLID FIGURES**

**CONTENT:** Volume of a trapezoidal prism

Examples:

1. Find the volume of the figure below.



Volume of the trapezoidal prism  
=  $\frac{1}{2} \times h \times (a + b) \times \text{length}$   
=  $\frac{1}{2} \times 4 \times (6 + 9) \times 10$   
=  $2(6 + 9) \times 10$   
=  $2 \times 10(15)$   
=  $20 \times 15$   
=  $300\text{cm}^3$

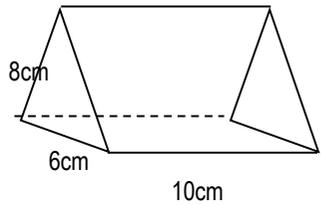
**LESSON 35:**

**SUB TOPIC: SOLID FIGURES**

**CONTENT:** Volume of a triangular prism

Examples:

1. Find the volume of the triangular prism in the figure below.



Volume = Base area x length  
=  $\frac{1}{2} \times 7 \times 6$   
=  $21 \times 10$   
=  $210\text{cm}^3$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 20:2 Pg 400 (New Edition)

**Remarks:**

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**LESSON 36:**

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 20:3 Pg 401 (New Edition)

**Remarks:**

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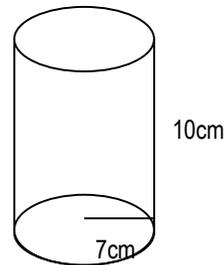
**LESSON 37:**

**SUB TOPIC: SOLID FIGURES**

**CONTENT:** Volume of a cylinder

Examples:

1. A cylindrical tin has a radius of 7cm and a height of 10cm. Calculate its volume.



$V = \text{base area} \times h$   
=  $r^2 \times h$   
=  $22 \times 7 \times 7 \times 10$   
=  $22 \times 7 \times 10$   
=  $154 \times 10$   
=  $1540\text{C.C}$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 20:4 Pg 402 (New Edition)

Remarks:

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$$\begin{array}{r}
 \text{Volume of the concrete} = 12320 \text{ cm}^3 \\
 - 3080 \text{ cm}^3 \\
 \hline
 9240 \text{ cm}^3
 \end{array}$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 20:5 Pg 403 (New Edition)

Remarks:

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**LESSON 38:**

**SUB TOPIC: SOLID FIGURES**

**CONTENT:** Volume of a cylinder

Examples:

1. The figure below shows a cylindrical hollow pipe of concrete. Calculate the volume of the concrete.

$$\begin{array}{r}
 \text{Volume of outer cylinder} \\
 = r^2h \\
 = 22 \times 14 \times 14 \times 20 \\
 \quad 7 \\
 = 22 \times 2 \times 14 \times 20 \\
 = 44 \times 280 \\
 \quad \times 44 \\
 \hline
 1120 \\
 + 11200 \\
 \hline
 12320 \text{ cm}^3
 \end{array}$$

$$\begin{array}{r}
 \text{Volume of the inner cylinder} = r^2h \\
 = 22 \times 7 \times 7 \times 20 \\
 \quad 7 \\
 = 22 \times 7 \times 20 \\
 = 154 \times 20 \\
 = 3080 \text{ cm}^3
 \end{array}$$

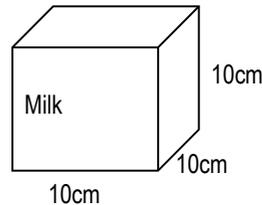
**LESSON 39:**

**SUB TOPIC: SOLID FIGURES**

**CONTENT:** Volume and capacity of cubes and cuboids

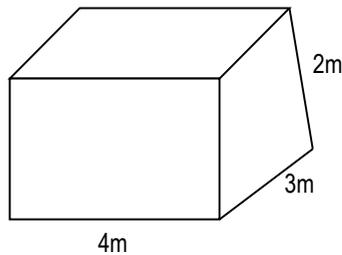
Examples:

1. A cube measures 10cm by 10cm by 10cm. How many litres of milk can it hold?



$$\begin{array}{l}
 V = \text{base area} \times h \\
 = 10 \times 10 \times 10 \\
 = 100 \times 10 \\
 = 1000 \text{ cm}^3 \\
 1 \text{ litre} = 1000 \text{ cm}^3
 \end{array}$$

2. The cube holds 1 litre  
How much water will the tank below hold?



$$\begin{array}{l}
 1 \text{ l} = 1000 \text{ cm}^3 \\
 = 1 \text{ m} = 10 \text{ cm} \\
 = 4 \text{ m} = 400 \text{ cm} \\
 = 3 \text{ m} = 300 \text{ cm} \\
 = 2 \text{ m} = 200 \text{ cm} \\
 V = (\text{base area}) \times \text{height} \\
 = \frac{400 \times 300 \times 200}{1000}
 \end{array}$$



$$= 400 \times 30 \times 2$$

$$= 12000 \times 2$$

$$= 24000 \text{ litres}$$

$$= \pi r^2 \times h$$

$$= 22 \times 350 \times 350 \times 800$$

$$= \frac{22 \times 50 \times 350 \times 800}{1000}$$

$$100 \times 35 \times 8$$

$$1100 \times 270$$

$$= 308000 \text{ litres}$$

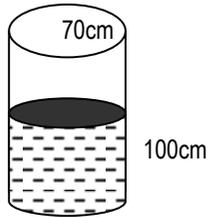
**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 20:4 Pg 404 (New Edition)

**Remarks:****LESSON 40****SUB TOPIC: SOLID FIGURES****CONTENT:** Volume and capacity of cylinders

Examples:

1. How much water is in this tank now?



$$\text{Volume} = (\text{base} \times \text{area}) \times \text{height}$$

$$= \pi r^2 \times h$$

$$= 22 \times 70 \times 100$$

$$= 22 \times 10 \times 7000$$

$$= 220 \times 7000$$

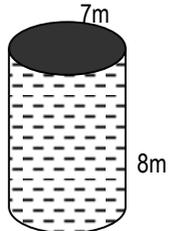
$$= 1540000 \text{cm}^3$$

$$1\text{L} = 1000 \text{cm}^3$$

$$\text{Capacity} = \frac{1540000}{1000}$$

$$= 1540 \text{ litres}$$

2. Find the capacity of this tank.



$$1\text{L} = 1000 \text{cm}^3$$

$$1\text{m} = 100 \text{cm}$$

$$7\text{m} = 700 \text{cm}$$

$$8\text{m} = 800 \text{cm}$$

$$D = 700 \text{cm}$$

$$R = 700$$

$$= 350 \text{cm}$$

$$V = (\text{base} \times \text{area}) \times h$$

$$22 \times 50 \times 36 \times 8$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 20:7 Pg 405 (New Edition)

**Remarks:****LESSON 41****SUB TOPIC: SOLID FIGURES****CONTENT:** Packing cubes or cuboids in boxes

Examples:

1. How many cubes each of 10cm side can be packed in the box?

Cubes along the sides

$$\text{Along the length} = \frac{56}{10} = 5 \text{ cubes}$$

$$\text{Along the width} = \frac{42}{10} = 4 \text{ cubes}$$

$$\text{Along the height} = \frac{60}{10} = 6 \text{ layers}$$

$$\text{Total number of cubes} = 5 \times 4 \times 6$$

$$= 20 \times 6$$

$$= 120 \text{ cubes}$$

**EVALUATION ACTIVITY:**

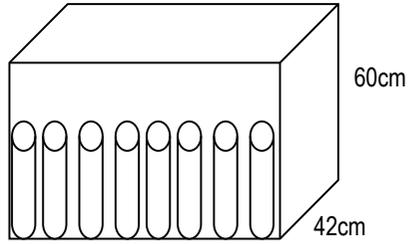
A New MK Primary Mathematics Bk 7 exercise 20:8 Pg 406 (New Edition)

**Remarks:****LESSON 42****SUB TOPIC: SOLID FIGURES****CONTENT:** Packing cylinders in boxes

Examples:

1. How many cylindrical tins of diameter 7cm and height 10cm can be packed in a box measuring 56cm by 42cm by 60cm?

E



60cm

42cm

56cm

Tins along the sides:

Along length =  $56 \div 7 = 8$  tinsAlong width =  $42 \div 7 = 6$  tinsAlong height =  $60 \div 10 = 6$  layers

Total number of tins (base x tins) x layers

 $8 \times 6 \times 6$  $= 48 \times 6$  $= 288$  tinsAltogether =  $8 \times 6 \times 6 = 288$  tins**EVALUATION ACTIVITY:**

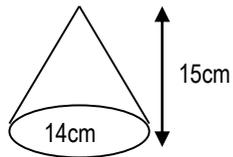
A New MK Primary Mathematics Bk 7 exercise 20:9 Pg 407 (New Edition)

Remarks:

**LESSON 43:****SUB TOPIC: SOLID FIGURES****CONTENT:** Volume of a cone

Examples:

1. Given the cone below, the diameter is 14cm height is 15cm. Calculate the volume of the cone.



D = 14cm

$$R = \frac{14}{2}$$

= 7cm

$$\begin{aligned} V &= \frac{1}{3}\pi r^2 h \\ &= \frac{1}{3} \times 22 \times 7 \times 7 \times 15 \\ &= 22 \times 7 \times 3 \\ &= 154 \times 3 \\ &= 462\text{cm}^3 \end{aligned}$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 20:9 Pg 407 (New Edition)

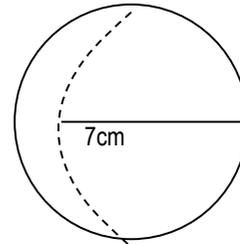
Remarks:

**LESSON 44:****SUB TOPIC: SOLID FIGURES****CONTENT:** Volume of a sphere

Examples:

1. Calculate the volume of a sphere whose radius is 7cm.

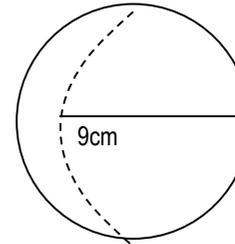
$$\text{Volume of a sphere} = \frac{4\pi r^3}{3}$$



$$\begin{aligned} &= \frac{4 \times 22 \times 7 \times 7 \times 7}{3} \\ &= \frac{4 \times 22 \times 7 \times 7}{3} = \frac{88 \times 7 \times 7}{3} = \frac{616 \times 7}{3} \\ &= \frac{4312}{3} \\ &= 1437 \frac{1}{3} \text{ cm}^3. \end{aligned}$$

2. Calculate the volume of a sphere whose radius is 9cm.

$$V = \frac{4\pi r^3}{3}$$



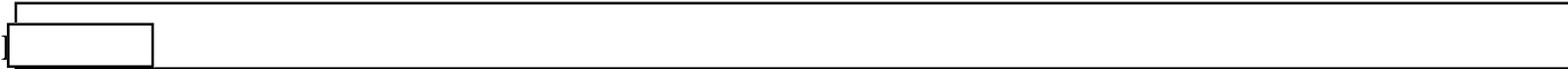
$$\begin{aligned} &= \frac{4 \times 3.14 \times 9 \times 9 \times 9}{3} \\ &= \frac{4 \times 3.14 \times 9 \times 9 \times 9}{3} \\ &= \frac{4 \times 3.14 \times 9 \times 9 \times 3}{100} = \frac{1256 \times 81 \times 3}{100} \\ &= \frac{3052.08}{100} \\ &= 3052.08 \text{ cm}^3 \end{aligned}$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics Bk 7 exercise 20:6 Pg 395 (Old Edition)

Remarks:

**LESSON 46****SUB TOPIC: mass**



**CONTENT:** converting kg to quintal and tonne

$100\text{kg} = 1 \text{ quintal}$

Examples: Express 2500kg to tonne

$1000\text{kg} = 1 \text{ tonne}$

$2500\text{kg} = \frac{2500\text{kg}}{1000\text{kg}}$

$= 2.5 \text{ tonnes}$

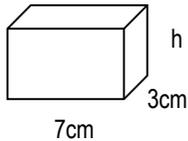
Evaluation activity

Macmillan Uganda pp 246

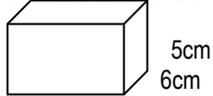
Fountain pp 210-212

**QUESTIONS ON MEASURES:**

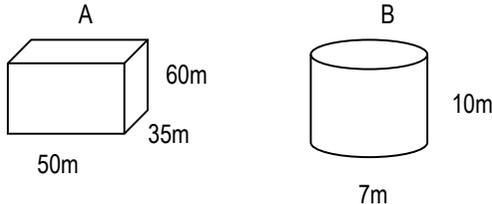
1. How many centimeters are in 0.75 metres?
2. The circumference of a circle is 17.584cm. Find the radius of the circle (Use  $= \pi 3.14$ )
3. A cylindrical tank is 7m high. What is the capacity in litres of the tank if its radius is 7m?
4. The volume of the figure below is  $105\text{cm}^3$ . Find its height.



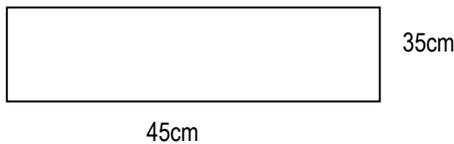
5. Find the base area of the figure below.



6. Given that the cylindrical tins B are to be packed into box A.

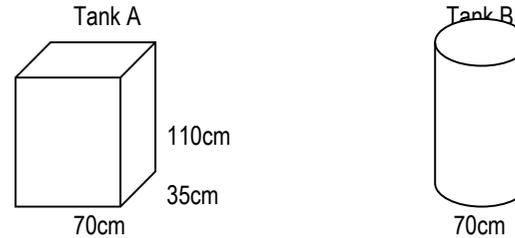


- (a) How many tins will be packed in the box?
- (b) If container A is a tank full of water, how many full cups of container B can you draw from the tank?
7. Abdul cut out circular plates of diameter 7cm from a rectangular sheet of metal of length 45cm and width 35cm as shown below.



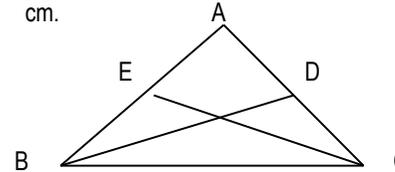
- (a) How many circular plates did he cut out from the rectangular sheet?
- (b) Find the area of the unused sheet after cutting out the circular plates. (take  $\pi = \frac{22}{7}$ )

8. A cuboid water tank (A) which is 70cm long by 35cm wide by 110cm high was filled with water. The water from tank A was all poured into the cylindrical tank B of diameter 70cm

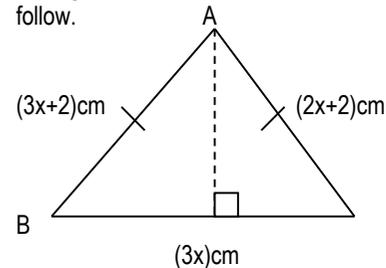


- (a) Find the volume of water in tank A when full.
- (b) Find the new height of water after it has been poured into tank B. (take  $= \frac{22}{7}$ )

9. In the triangle below,  $AB = 12\text{cm}$ ,  $CE = 10\text{cm}$  and  $AC = 16\text{cm}$ . Find the length of BD in cm.

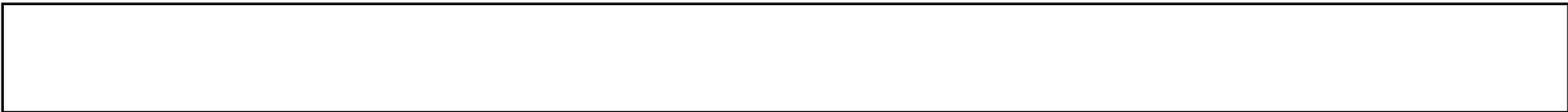


10. The figure ABC below is an isosceles triangle. Use it to answer the questions that follow.

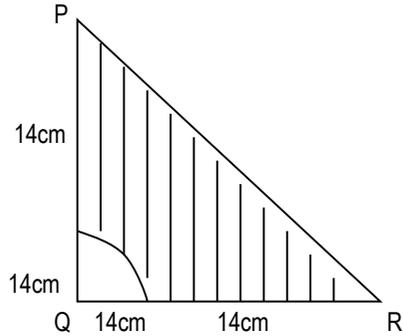


- (a) Find the value of x.
- (b) Find the area of triangle ABC
- (c) Calculate the perimeter of the triangle.

11. Find the circumference of a circular compound whose radius is 14m (take  $= \frac{22}{7}$ )



12. In the figure below,  $PQ = QR = 28\text{cm}$  use it to answer the questions that follow.



- (a) Find the area of triangle PQR.
- (b) Find the area of the sector QST
- (c) What is the area of the shaded part?

**TOPIC 10: ALGEBRA**

**LESSON 1:**

**SUB TOPIC: FORMING ALGEBRAIC EXPRESSIONS**

**CONTENT:**  
Forming Algebraic expressions.

- Example:
- 1.  $3c$  – Three times C or three c.
  - 2.  $ab$  – The product of a and b.
  - 3.  $(a + b)$  – The sum of a and b.
  - 4.  $3(x - y)$  – Thrice the difference between x and y.

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 22:1 & 22:2Pg 427 (New Edition)

**Remarks:**  
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\_\_\_\_\_

**LESSON 2:**

**SUB TOPIC: COLLECTING AND SIMPLIFYING LIKE TERMS**

- CONTENT:**  
Examples:
- 1.  $a + a + a = 3a$
  - 2.  $2p + 3p + p = 6p$
  - 3.  $2ab + ab + 5ab = 8ab$
  - 4.  $x + y + x + y + x$   
 $x + x + x + y + y$   
 $3x + 2y$
  - 5.  $3p - 6f - p + 2f$   
 $3p - p + 2f - 6f$   
 $2p - 4f$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 22:6 & 22:7 Pg 430 & 431 (New Edition)

**Remarks:**  
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\_\_\_\_\_

**LESSON 3:**

**SUB TOPIC: REMOVING BRACKETS**

**CONTENT:**  
Remove the brackets and simplify.

- Example:
- 1.  $3(x + y)$   
 $3(x + y)$   
 $3x + 3y$   
 $3x + 3y$
  - 2.  $2(a - b)$   
 $2(a - b)$   
 $2 \times a - 2 \times b$   
 $2a - 2b$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 22:9 and 22:10Pg 432 & 433 (New Edition)

Remarks:

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**LESSON 4:**

**SUB TOPIC: REMOVING BRACKETS**

**CONTENT:**

Remove the brackets and simplify.

Example:

1. Add:  $x + 4$  to  $x + 1$   
 $(x + 4) + (x + 1)$   
 $x + 4 + x + 1$   
 $x + x + 4 + 1$   
 $2x + 5$

2.  $x - 4$  to  $3x - 5$   
 $(x - 4) + (3x - 5)$   
 $x - 4 + 3x - 5$   
 $x + 3x - 4 - 5$   
 $4x - 9$

3. Subtract  $y + 1$  from  $2y + 3$   
 $(2y + 3) - (y + 1)$   
 $2y + 3 - y - 1$   
 $2y - y + 3 - 1$   
 $y + 2$

4. Subtract  $3p - 1$  from  $5p - 3$   
 $(5p - 3) - (3p - 1)$   
 $5p - 3 - 3p + 1$   
 $5p - 3p + 1 - 3$   
 $2p - 2$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 22:11 Pg 434 (New Edition)

Remarks:

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**LESSON 5:**

**SUB TOPIC: SIMPLIFYING FRACTIONAL TERMS**

**CONTENT:** Simplifying fractional terms

Example:

1.  $\frac{x}{x} + \frac{x}{x}$                       2.  $\frac{m}{m} - \frac{m}{m}$

$$\frac{\frac{2}{3}x + 2x}{6}$$

$$\frac{5x}{7}$$

$$\frac{\frac{2}{5}m - 2m}{10}$$

$$\frac{3m}{10}$$

3.  $P + \frac{P}{3}$   
 $= \frac{P}{1} + \frac{P}{3}$   
 $= \frac{3P + P}{3}$   
 $= \frac{4p}{3}$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 22:14 Pg 435 (New Edition)

Remarks:

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**LESSON 6:**

**SUB TOPIC: REMOVING BRACKETS**

**CONTENT:** removing brackets involving fractions

Example:

1.  $\frac{1}{3}(3a + 9b)$   
 $(\frac{1}{3} \times 3a) + (\frac{1}{3} \times 9b)$   
 $a + 3b$

2.  $\frac{3}{4}(8m + 12p)$   
 $(\frac{3}{4} \times 8m) - (\frac{3}{4} \times 12p)$   
 $3 \times 2m - 3 \times 3p$   
 $6m - 9p$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 22:15 & 22:16 Pg 436 (New Edition)

Remarks:

10

3 4 12

$$\frac{5mp}{12}$$

**LESSON 7:**

**SUB TOPIC: WORD PROBLEMS ON BRACKETS WITH FRACTIONS**

**CONTENT:** Word problems on brackets with fractions

Example:

- Half of  $(2x + 4y)$  plus a third of  $(6x + 9y)$   
 $\frac{1}{2}(2x + 4y) + \frac{1}{3}(6x + 9y)$   
 $\frac{1}{2} \times 2x + \frac{1}{2} \times 4y + \frac{1}{3} \times 6x + \frac{1}{3} \times 9y$   
 $x + 2y + 2x + 3y$   
 $x + 2x + 2y + 3y$   
 $3x + 5y$
- Subtract  $\frac{1}{2}(4x - 2y)$  from  $\frac{1}{3}(6x - 9y)$   
 $\frac{1}{3} \times 6x - \frac{1}{3} \times 9y - \frac{1}{2} \times 4x - \frac{1}{2} \times 2y$   
 $2x - 3y - 2x + y$   
 $2x - 2x - 3y + y$   
 $0 - 2y$   
 $= -2y$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 22:17 Pg 437 (New Edition)

Remarks:

**LESSON 8:**

**SUB TOPIC: MULTIPLICATION OF FRACTIONAL TERMS**

**CONTENT:** multiplying of fractional terms

Example:

Simplify:

- $\frac{x \times x}{2 \times 5}$   
 $= \frac{x \times x}{2 \times 5}$   
 $= \frac{x^2}{10}$
- $\frac{2m \times 5p}{3 \times 8}$   
 $\frac{2 \times m \times 5 \times p}{3 \times 8}$   
 $\frac{m \times 5p}{3 \times 8} = \frac{5mp}{24}$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 22:19 Pg 439 (New Edition)

Remarks:

**LESSON 9:**

**SUB TOPIC: SUBSTITUTION**

**CONTENT:** Substituting or replacement of letters with numbers

Example:

- If  $a = 5$ ,  $b = 4$  and  $c = 0$   
 Find the value of  $a + b + c$   
 $= 5 + 4 + 0$   
 $= 9 + 0$   
 $= 9$
- Given that  $x = 2$  and  $y = -2$   
 Evaluate  $x - y$   
 $(x) - (y)$   
 $= 2 - (-2)$   
 $= 2 + 2$   
 $= 4$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 22:4 Pg 429 (New Edition)

Remarks:

**LESSON 10:**

**SUB TOPIC: SUBSTITUTION**

**CONTENT:** Substitution involving brackets

Example:

- Given that  $a = 3$ ,  $b = 4$  and  $c = 5$   
 $= 3 \times a \times 3 \times b$   
 $= 3 \times 3 \times 3 \times 4$   
 $= 9 \times 12$   
 $= 21$
- What is  $c(b-a)$   
 $= 5(4 - 3)$   
 $= 5(1)$   
 $= 5 \times 1$   
 $= 5$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 22:12 Pg 434 (New Edition)

**Remarks:**

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**LESSON 11:**

**SUB TOPIC:      SUBSTITUTION**

**CONTENT:**      Substitution involving fractions

Example:

- |  |   |
|--|---|
| <p>1.      Given <math>a = \frac{3}{4}</math> <math>b = \frac{1}{3}</math><br/>Find the value of <math>a + b</math><br/><math>(a) + (b)</math><br/><math>\frac{3}{4} + \frac{1}{3}</math><br/><math>\frac{9 + 4}{12}</math><br/><math>\frac{13}{12}</math><br/><math>= 1 \frac{1}{12}</math></p> | <p>2.      If <math>a = \frac{1}{2}</math>, <math>c = \frac{2}{3}</math> and <math>d = \frac{1}{4}</math><br/>Evaluate <math>ac + d</math><br/><math>ac + d</math><br/><math>a \times c + d</math><br/><math>\frac{1}{2} \times \frac{2}{3} + \frac{1}{4}</math><br/><math>= \frac{1}{3} + \frac{1}{4}</math><br/><math>\frac{4 + 3}{12}</math><br/><math>= \frac{7}{12}</math></p> |
|--|---|

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 22:20 Pg 440 (New Edition)

**Remarks:**

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**LESSON 12:**

**SUB TOPIC:      ADDITION AND SUBTRACTION WITH POWERS**

**CONTENT:**      Addition and subtraction with powers

Example:

- |   |  |
|---|--|
| <p>1.      <math>2^2 + 2^4</math><br/><math>(2 \times 2) + (2 \times 2 \times 2 \times 2)</math><br/><math>2 \times 2 + 2 \times 2 \times 2 \times 2</math><br/><math>= 20</math></p> | <p>2.      <math>p^2 + p^2</math><br/><math>p^2 + p^2</math><br/><math>= 2p^2</math></p> |
|---|--|

- |  |  |
|--|--|
| <p>3.      <math>3m^3 + 4m^3</math><br/><math>3m^3 + 4m^3</math><br/><math>= 7m^3</math></p> | <p>4.      <math>3o^3 - p^3</math><br/><math>3p^3 - p^3</math><br/><math>= 2p^3</math></p> |
| <p>5.      <math>4m^3 - m^3</math><br/><math>4m^3 - m^3</math><br/><math>3m^3</math></p>     |  |

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 22:2 & 22:22 Pg 441 (New Edition)

**Remarks:**

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**LESSON 13:**

**SUB TOPIC:      MULTIPLICATION OF POWERS**

**CONTENT:**      Multiplication of powers

Example:      Simplify

- |  |  |   |
|--|--|---|
| <p>1.      <math>4^3 \times 4^2</math><br/><math>4 \times 4 \times 4 \times 4 \times 4</math><br/>45<br/>Or      <math>X^3 \times X^2</math><br/>         <math>X^{3+2}</math><br/>         <math>= 4^5</math></p> | <p>or</p> <p><math>4^3 \times 4^2</math><br/><math>4^{3+2}</math><br/><math>4^5</math></p> | <p>2.      <math>x^3 \times x \times 2</math><br/><math>x \times x \times x \times x \times x</math><br/><math>x^5</math></p> |
|--|--|---|

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 22:23 Pg 442 (New Edition)

**Remarks:**



**LESSON 14:**

**SUB TOPIC: DIVISION OF POWERS**

**CONTENT:** Division of powers

**Example:** Simplify

$$1. \quad 3^4 \div 3^2 \quad 3^4 \div 3^2$$

Either  $\frac{3 \times 3 \times 3 \times 3}{3 \times 3}$  or  $3^{4-2}$

$$3 \times 3 = 3^2$$

$$= 9 \quad = 3 \times 3$$

$$= 9$$

$$2. \quad p^8 \div p^2 = p^{8-2}$$

or  $p^8 \div p^2$

$$\frac{p \times p \times p \times p \times p \times p \times p \times p}{p \times p}$$

$$= p^6$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 22:23 Pg 442 (New Edition)

**Remarks:**

**LESSON 15:**

**SUB TOPIC: SUBSTITUTION**

**CONTENT:** Substitution involving powers

**Example:**

$$1. \quad \text{If } m = 2, \text{ what is the value of } m^6?$$

$$M^6 = m \times m \times m \times m \times m \times m$$

$$= 2 \times 2 \times 2 \times 2 \times 2 \times 2$$

$$= 4 \times 4 \times 4$$

$$= 16 \times 4$$

$$= 64$$

$$2. \quad \text{If } y = 2, \text{ what is the value of } 3y^2?$$

$$3y^2 = 3 \times y \times y$$

$$= 3 \times 2 \times 2$$

$$= 3 \times 4$$

$$= 12$$

$$3. \quad \text{If } m = 4, n = 3 \text{ and } p = 2, \text{ what is } n^3 \times m^2$$

$$= \frac{n \times n \times n \times m \times m}{M \times p} = \frac{3 \times 3 \times 3 \times 4 \times 4}{4 \times 2} = \frac{27 \times 16}{8}$$

$$= 27 \times 2$$

$$= 54$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 22:25 Pg 443 (New Edition)

**Remarks:**

**LESSON 16:**

**SUB TOPIC: REVISION OF SIMPLE EQUATIONS**

**CONTENT:** Solving simple equations.

**Example:** Solve

$$1. \quad x + 5 = 13$$

$$x + 5 - 5 = 13 - 5$$

$$x = 8$$

$$2. \quad 2x + 6 = 18$$

$$2x + 6 - 6 = 18 - 6$$

$$2x = 12$$

$$\frac{2x}{2} = \frac{12}{2}$$

$$x = 6$$

$$2. \quad y - 3 = 5$$

$$y - 3 + 3 = 5 + 3$$

$$y = 8$$

$$4. \quad 3a - 8 = 7$$

$$3a - 8 + 8 = 7 + 8$$

$$3a = 15$$

$$\frac{3a}{3} = \frac{15}{3}$$

$$a = 5$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 Pg 452 - 456 (New Edition)

Remarks:

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$$\begin{aligned}4p + 5 &= 21 \\4p + 5 - 5 &= 21 - 5 \\4p &= 16 \\ \frac{4p}{4} &= \frac{16}{4} \\p &= 4\end{aligned}$$

**LESSON 17:**

**SUB TOPIC: SOLVING EQUATIONS**

**CONTENT:** Equations involving fractions

**Example:** Solve

1.  $\frac{1}{2}p = 6$   
Use of LCM  
 $\frac{1}{2}p = 6$   
 $2 \times \frac{1}{2}p = 6 \times 2$   
 $p = 12$

2.  $4\frac{2}{3}t + 2 = 15$   
Express all items as fractions  
 $\frac{13}{3}t + \frac{2}{1} = \frac{15}{1}$  (LCM)  
 $3 \times \frac{13t}{3} + \frac{2}{1} \times 3 = \frac{15}{1} \times 3$   
 $13t + 6 = 45$   
 $13 + 6 - 6 = 45 - 6$   
 $13t = 39$   
 $\frac{13t}{3} = \frac{39}{3}$   
 $t = 13$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 22:44 Pg 457 (New Edition)

Remarks:

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**LESSON 18:**

**SUB TOPIC: SOLVING EQUATIONS**

**CONTENT:** Equations involving fractions

**Example:** Solve

1.  $0.4P + 0.5 = 2.1$   
 $\frac{4P}{10} + \frac{5}{10} = \frac{21}{10}$   
 $10 \times \frac{4P}{10} + 5 \times 10 = \frac{21}{10} \times 10$  (LCM)

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 22:44 Pg 457 (New Edition)

Remarks:

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**LESSON 19:**

**SUB TOPIC: SOLVING EQUATIONS**

**CONTENT:** Equations involving fractions

**Example:** Solve

1.  $\frac{2p}{3} - p = 5$   
 $\frac{2p}{3} - \frac{p}{1} = \frac{5}{1}$   
 $3 \times \frac{2p}{3} - \frac{p}{1} \times 3 = \frac{5}{1} \times 3$   
 $2p - 3p = 15$   
 $-p = 15$   
 $\frac{+p}{+1} = \frac{15}{-1}$   
 $p = -15$

2.  $3x + 7 - \frac{3x}{4} = 10$   
 $\frac{3x}{1} + \frac{7}{1} - \frac{3x}{4} = \frac{10}{1}$   
 $12x + 28 - 3x = 40$   
 $12x - 3x + 28 = 40$   
 $9x + 28 = 40$   
 $9x = 12$   
 $\frac{9x}{9} = \frac{12}{9}$   
 $x = 1\frac{1}{3}$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 22:46 Pg 459 (New Edition)

Remarks:

**LESSON 20:****SUB TOPIC: SOLVING EQUATIONS****CONTENT:** Equations involving fractions

Example: Solve

$$1. \quad \frac{m+1}{3} + \frac{m}{4} = 2 \text{ (observation of three items)}$$

$$\frac{M+1}{3} + \frac{m}{4} = \frac{2}{1} \text{ (LCM)}$$

$$12 \times \frac{m+1}{3} + \frac{m}{4} \times 12 = 2 \times 12$$

$$4(m+1) + m \times 3 = 2 \times 12$$

$$4m + 4 + 3m = 24$$

$$4m + 3m + 4 = 24$$

$$7m + 4 = 24 - 4$$

$$7m = 20$$

$$\frac{7m}{7} = \frac{20}{7}$$

$$M = 2 \frac{6}{7}$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 22:49 Pg 461 (New Edition)

**Remarks:****LESSON 21:****SUB TOPIC: SOLVING EQUATIONS****CONTENT:** Equations involving fractions

Example: Solve

$$1. \quad \frac{(3x+1)}{4} = \frac{(x+2)}{2}$$

$$4 \frac{(3x+1)}{4} = 4 \frac{(x+2)}{2}$$

$$2. \quad \frac{3x-1}{2} = \frac{7x+1}{6}$$

$$6 \frac{(3x-1)}{2} = 6 \frac{(7x+1)}{6}$$

$$3x + 1 = 2(x + 2)$$

$$3x + 1 = 2x + 4$$

$$3x + 1 - 1 = 2x + 4 - 1$$

$$3x = 2x + 3$$

$$3x - 2x = 2x - 2x + 3$$

$$X = 3$$

$$3(3x - 1) = 7x + 1$$

$$9x - 3 = 7x + 1$$

$$9x = 7x + 4$$

$$9x - 7x = 7x - 7x + 4$$

$$2x = 4$$

$$\frac{2x}{2} = \frac{4}{2}$$

$$X = 2$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 22:50 Pg 462 (New Edition)

**Remarks:****LESSON 22:****SUB TOPIC: SOLVING EQUATIONS****CONTENT:** Solving Equations involving squares

Example: Solve

$$1. \quad \frac{1}{2} P^2 = 8$$

$$2 \times \frac{1}{2} P^2 = 8 \times 2$$

$$P^2 = 16$$

$$\sqrt{P^2} = \sqrt{16}$$

$$P = 4$$

$$2. \quad \frac{1}{4} x^2 = 16$$

$$4 \times \frac{1}{4} x^2 = 16 \times 4$$

$$x^2 = 64$$

$$\sqrt{x^2} = \sqrt{64}$$

$$x = 8$$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 22:47 Pg 461 &amp; 460 (New Edition)

**Remarks:****LESSON 22:****SUB TOPIC: SOLVING EQUATIONS****CONTENT:** Word problems on equations

Example:



1. Baker bought 2kg of sugar at sh.  $3p$  and 1kg of salt at sh  $(p + 200)$ . Find P if Baker paid shs 3700= The cost of 2kg of sugar is shs  $(2 \times 3p) = 6p$ . The cost of 1kg of salt is sh  $(p + 200)$   
 Total cost  $6p + p + 200 = 3700$   
 $7p + 200 = 3700$   
 $7p + 200 - 200 = 3700 - 200$   
 $7p = 3500$   
 $\frac{7p}{7} = \frac{3500}{7}$   
 $P = \text{shs } 500$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 exercise 22:51 Pg 464 (New Edition)

Remarks:

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**TOPICAL EXERCISE ON ALGEBRA**

- Solve:  $x + \frac{1}{4}x = 5$
- Find the value of  $\frac{5a - (m - a)}{a}$  when  $a = 3$  and  $m = 6$ .
- Solve for  $b = \frac{3}{5}(2b - 3) = 3$
- Zahara's mother bought 8 books at shs  $(x - 150)$  each and 2 Mathematical sets at  $(x + 100)$  each. She spent shs 5300 altogether. Find the amount of money spent on books.
- If  $\frac{1}{6}x = 1\frac{1}{6}$  find the value of  $x$ .
- Solve  $\frac{2x+2}{3} = \frac{x+3}{2}$
- What is the value of  $bc - d$  when  $b = 8$ ,  $c = 3$  and  $d = 6$ ?

**LESSON 11:**

**SUB TOPIC: SOLUTION SETS**

**CONTENT:**

Examples:

- Write down the integers for the following inequalities.
  - $x > 8$   
 $X = \{9, 10, 11, 12, 13, \dots\}$  (infinite set)
  - $x < -3$   
 $X = \{-4, -5, -6, -7, -8, \dots\}$  (infinite set)
 Showing solution sets on a number line.

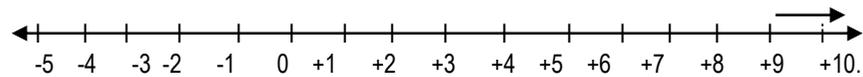
- Solve:  $x - 1 = 2x + 5$
- Simplify:  $(3x + 5) - (x + 1)$
- Solve:  $\frac{1}{2}(3y - 2) = \frac{2}{3}(2y + 3)$
- Tom has three daughters; Amanda, Brenda and Kate. Brenda is 2 years younger than Amanda, Kate's age is  $\frac{1}{2}$  that of Brenda. The total age of the three girls is 27 years. How old is Kate?
- Find the value of  $y$  in  $2y + \frac{2}{3}t = 12$ . Given that  $t = \frac{1}{2}$ .
- Solve:  $3(p - 4) - 2(3p - 1) = 2p - 15$
- Simplify:  $(4p - 3q) - (2q + p)$
- Solve:  $\frac{12}{x} + 2 = 6$
- The area of the trapezium is  $50\text{cm}^2$ . Find the value of  $t$ .
- Factorise completely:  $2xy - 4x$ .
- Given that  $a = \frac{1}{2}$ ,  $b = \frac{1}{3}$  and  $c = \frac{1}{4}$  Find the value of  $b + 2c + 3a$ .
- Subtract  $2x - 4$  from  $5x - 4$
- Given that  $x = 2y + 1$ , complete the table.



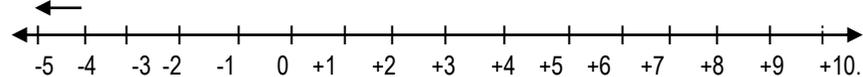
- Factorise completely:  $2xy - 4x$ .
- Given that  $a = \frac{1}{2}$ ,  $b = \frac{1}{3}$  and  $c = \frac{1}{4}$  Find the value of  $b + 2c + 3a$ .
- Subtract  $2x - 4$  from  $5x - 4$
- Given that  $x = 2y + 1$ , complete the table.

x	1	.....	5	...	9
y	...	1	...	3	...

(i)  $x > 8$



(ii)  $x < -3$



**EVALUATION ACTIVITY:**

Remarks:

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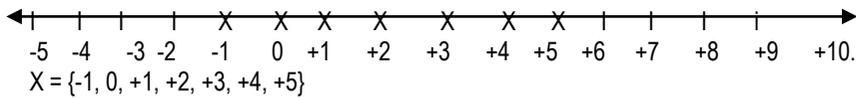
**LESSON 12:**

**SUB TOPIC: REPRESENTING OF FINITE SOLUTION SETS ON ANUMBER LINE**

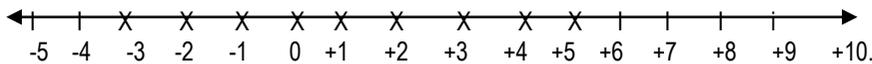
**CONTENT:**

Example

1.  $-2 < x < 6$  Find and show the solution set on a number line



2. Give the solution set and the inequality shown on the number line.



Solution:  $-4 < x < +6$   
 $X = \{-3, -2, -1, 0, +1, +2, +3, +4, +5\}$

**EVALUATION ACTIVITY:**

Remarks:

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**LESSON 13:**

**SUB TOPIC: SOLVING INEQUALITIES AND WRITING THEIR SOLUTION SETS**

**CONTENT:**

Examples:

1.  $4X > 20$   
 $4X > 20$   
 $4 \quad 4$

$X > 5$

Solution set:  $\{6, 7, 8, 9, 10, \dots\}$

2.  $-4X > 20$   
 $-4x < 20$  (the inequality sign changes when multiplied/divided by  $-ve$  integer)

$-4 \quad -4$

$X < -5$

Solution set:  $x = \{-6, -7, -8, -9, \dots\}$

3.  $3x + 6 < 9$   
 $3x + 6 - 6 < 9 - 6$

$3x < 3$

$3 \quad 3$

$X < 1$

Solution set:  $x = \{0, 1, 2, 3, \dots\}$

**EVALUATION ACTIVITY:**

Remarks:

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**LESSON 14:**

**SUB TOPIC: SOLVING INEQUALITIES INVOLVING FRACTIONS**

**CONTENT:**

Examples:

Examples

1. Solve  $\frac{x}{3} > 1$

$3 \times \frac{x}{3} > 1 \times 3$

$X > 3$

Solution set  $x = \{4, 5, 6, 7, \dots\}$

2.  $\frac{1x}{7} - 5 > -4$

$1x - 5 + 5 > -4 + 5$

$7$

$1x > 1$

$7$

$$7x - 1x > 1 \times 7$$

$$X > 7$$

Solution set:  $x \in \{8, 9, 10, 11, \dots\}$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 Exercise 6:5 Pg 76 (New Edition)

**Remarks:**

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**LESSON 15:**

**SUB TOPIC: SOLVING INEQUALITIES WITH THREE TERMS**

**CONTENT:**

Examples:

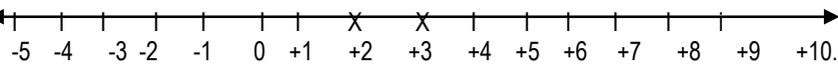
Examples

1. Solve  $8 > 2x > 2$

$$\frac{8}{2} > \frac{2x}{2} > \frac{2}{2}$$

$$4 > x > 1$$

Note with  $<$  or  $>$  the integers in the inequality are not members of the solution set.



Solution set:  $x \in \{+2, +3\}$

2.  $12 < 3x < 24$

$$\frac{12}{3} < \frac{3x}{3} < \frac{24}{3}$$

$$4 < x < 8$$

Note with  $<$  or  $>$ , the integers in the inequality are members of the solution set.

3. Solve  $13 > 3x - 2 > 4$

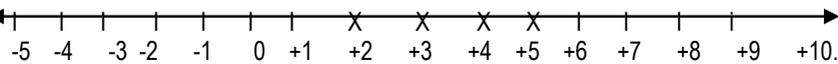
$$13 + 2 > 3x - 2 + 2 > 4 + 2$$

$$15 > 3x > 6$$

$$15 > 3x > 6$$

$$\frac{15}{3} > \frac{3x}{3} > \frac{6}{3}$$

$$5 > x > 2$$



Solution set:  $x \in \{+2, +3, +4, +5\}$

**EVALUATION ACTIVITY:**

A New MK Primary Mathematics 2000 Bk 7 Exercise 6:6 Pg 77 (New Edition)

**Remarks:**

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**LESSON 29**

**SUB TOPIC: INEQUALITIES INVOLVING BRACKETS**

**CONTENT:**

1. Solve  $2(x+1) < 4$

2. Solve  $3(2x+3) < 18$

Ref: Mk bk 7 pg 449

**LESSON 17**

**SUB TOPIC: APPLICATION OF INEQUALITIES**

**CONTENT:** the Headteacher's car can accommodate maximumly 5 passengers. Using letter X write an inequality for the above given statement

**TOPIC: INTEGERS:**

**TOPICAL QUESTIONS:**

1. Use  $>$ ,  $<$  or  $=$  to compare the following pairs of integers.
- |          |            |             |
|----------|------------|-------------|
| (i) -2 0 | (ii) -1 -3 | (iii) -6 -6 |
| (iv) 8 8 | (v) 5-5    | (vi) -7 7   |

2. Arrange the following integers in ascending order (increasing order)  
-8, 2, -1, 5, -3, +7

3. Arrange the integers below in descending order.  
0, -7, +4, -6, +1

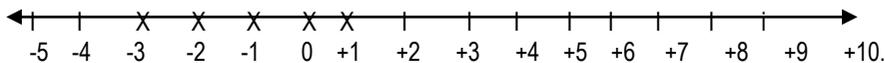
4. Add the following integers.
- |              |              |                 |
|--------------|--------------|-----------------|
| (i) +1 + +7  | (ii) +8 + -2 | (iii) +18 + -18 |
| (iv) -3 + +9 | (v) -4 + +5  |                 |

5. Subtract the following integers.
- (i)  $+4 - +2$       (ii)  $+7 - -4$       (iii)  $-3 - +7$   
 (iv)  $-3 - -11$       (v)  $8 - +8$
6. Subtract  $+6 - -4$  on a number line
7. Multiply:  
 (i)  $+4 \times -2$       (ii)  $-6 \times -3$
8. Divide:  
 (i)  $-9 \div -3$       (ii)  $27 \div -9$
9. Evaluate:  $-2 \times 8$   
 $-4$
10. Flavia was born in 2BC and she died in 38AD after her birthday. How old was she when she died.
11. John left a balance of shs 1,000 with the milk vendor. He then bought 5 litres of milk from the milk vendor. How much did he pay to meet his bill?
12. Iganga FC arrived at Nakivubo Football stadium 15 minutes before the start of the football match. The team left the stadium 15 minutes after the end of a 45 minutes first half of the match. How long was the team in the stadium?
13. In an examination you are awarded 7 marks of every correct answer and 3 marks deducted for every wrong answer. A candidate had 9 questions correct and 5 questions wrong. What mark did the candidate score?
14. A clock which loses 7 minutes shows 5:36pm. What is the real time?

TOPIC: SOLUTION SETS:

TOPICAL QUESTIONS:

1. Use  $>$ ,  $<$  or  $=$  to compare the pairs of integers below.
- (i)  $5 \ 8$       (ii)  $-3 \ -8$       (iii)  $-7 \ -7$   
 (iv)  $9 \ 1$       (v)  $0 \ -1$       (vi)  $17 \ +17$
2. Find the solution set for the following inequalities:  
 (i)  $x > 3$       (ii)  $x < -5$       (iii)  $x \leq 2$   
 (iv)  $x \geq 2$       (v)  $x < 4$
3. Write down the inequality shown on the number line below.



4. Solve and give the solution set for  $x$ .
- (i)  $-3x < -9$       (ii)  $-30 < 6x$   
 (iii)  $3x + 2 \leq 11$       (iv)  $4x - 5 \leq 19$
5. Solve and find the solution set for  $y$ .  
 $\frac{1}{3}y + 4 < 6$