COMPETENCE BASED CURRICULUM

Junior secondary school

Grade 7

NOTES

Pre-Technical Studies

By:

Quality Notes

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Free Schemes of Work

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Strand 1

SAFETY

1.1 PESONAL SAFETY

❖ **What is safety?**

✓ Safety is a situation where one avoids causing harm, discomfort or sickness to self and to others when carrying out the daily activities.

Examples of safety measures include:

1. Wearing face mask to prevent spreading of airborne diseases or breathing in dirty air.
2. Buckling a safety belt while in a vehicle to avoid falling off the seat in case of emergency brakes.
3. Wearing hand gloves when working to avoid injury and dirt to the hands when working.
4. Wearing gum boots to protect the feet from injury when working in areas with mud or sharp objects.
5. Wearing an overall to guard against soiling clothes.

❖ **What is personal safety?**

✓ This is when you take precautions to protect yourself and others while carrying out a task.

❖ What is a hazard?

✓ A hazard is anything or any action that is likely to cause someone harm, discomfort or sickness in the daily life.

❖ **Examples of Hazards to personal safety.**

☞ Sharp edged tools and objects that can easily cut or poke someone.
☞ Disarranged rooms where one can easily tumble and fall.
☞ Naked electric wires that can easily cause electric shock.
☞ Poorly lit rooms where one can easily know oneself against objects.
☞ Poorly stored items on the shelves where they can easily fall off and hit someone.
☞ Working without protective gear where one can easily be hurt or injured.
☞ Rooms with wet slippery floors where one can easily slip and fall.

❖ **What is safety gear?**

☞ ***Safety gear are things people wear when carrying out tasks to avoid injuring themselves and others***.
☞ We are advices to always wear the right safety gear when performing a task.
☞ When at work place you are required to be awake and alert all the time.
☞ Incase of a potential hazard such as spills, leaks etc., you are required to immediately clear and report.
☞ Dress appropriately for your specific workplace or tasks.
☞ Clearly follow instructions when using any tool or machines.
☞ Always make safety your first thought not your afterthought.

Safe Handling of Tools and Equipment.

- We use tools and equipment in our daily tasks.
- Tools and equipment should be handled safely to reduce chances of harming ourselves and others.
- Some of the ways used to handle tools and equipment safely while performing tasks in the locality include:

a.) Wearing personal protective equipment like safety googles, helmet and others.
b.) Picking the right tool for the task at hand.
c.) Avoid throwing or tossing a tool in the direction of or directly to a co-worker.
d.) Never put sharp tools in the pocket.
e.) Keeping safe distance from each other when working with tool. This gives enough space to safely operate without coming into contact with co-workers.
f.) Picking up all hand tools after the job. Idle tools lying around the workplace can lead to tripping.
g.) Unplugging and disconnecting electric power tools when not in use, when making adjustments such as replacing blades and bits or loading fasteners.
h.) Sharpening cutting tools before and after use.

- **Safety Rules and Regulations at Work.**

Safety rules and regulations exist in all workplaces. They are principles that govern the actions and procedures to keep the works property and the environment safe.

Some of the general safety rules and regulations include:

1. To ensure that you know how to safely perform the task.
2. To ensure you know the hazards pf the task and how to protect yourself.
3. To wear the required personal protective equipment necessary for the task.
4. To always work clear of suspended loads.
5. To always keep your mind and eyes on the task at hand.
6. To obey all warning signs and barricades.
7. To inspect all tools and equipment to ensure they are not defective before using them.
8. Do not perform a task under unsafe conditions and report any unsafe tools, equipment or hazardous conditions.
9. All chemicals containers should be well labelled and covered.
10. Maintain good house keeping at workplace all the time.

- **Careers related to Personal Safety.**

☞ The activity which a person is engaged in daily to earn a living is called an **occupation.**

☞ An occupation for which one is trained and undertakes as a permanent calling throughout their life is called a **career.**

☞ In the field of personal safety, you can decide to take a career in

✓ Production of personal safety items such as face masks, hand gloves, ladders, upholstery, fire extinguishers etc.

✓ Marketing of safety equipment and products as technical sales personnel.

✓ Personal safety services such as fire officer, coast guards, divers, ambulance drivers, and safety education and training among others.

✓ Crossing guards
These are people who help children or adults to cross busy roads

✓ Safety engineers
These are people who monitor a working environment and inspects buildings and machines. They later recommend the safety precautions to be observed in the working environment

✓ Life guards
These are people who help children and adults to swim safely. There also ensure that all people are following rules set by the swimming place. They attend to those who face challenges while swimming

✓ Risk manager.
This person researches and makes a report on the safety of a particular work and the hazards that are expected.

✓ Environment health and safety consultants.
They perform some roles similar to those of safety engineers. They offer advice on how to minimise health and safety risks in the workplace.

- **Role of safety in day-to-day life.**

☞ Personal safety plays an important role in the day-to-day life because:

- It reduces our exposure to risks of hurting ourselves and others.
- It makes one carry out an activity without fear.
- It makes one focus on the activity he or she is doing.
- It makes one work faster on an activity.
- It makes one feel confident in life.

1.2 INJURIES

- ✓ ***An injury is a damage to someone's body.***
- ✓ ***It refers to harm caused by falls, hits among others.***

- ✓ **Some of the common types of injuries that occurs in the locality are:**

- A burn is an injury caused by a flame.
- A scald is an injury caused by hot liquid or team.
- A cut is a tear or opening in the skin by a sharp object.
- Fracture is a partial or complete break of a bone.
- Sprains
- Pricks
- Bruises

Causes of Injuries.

- ✓ ***Causes of injuries in the locality include the following:***

- ☞ Cuts which are caused by sharp objects or tools and equipment like knives. Also can be caused by sharp furniture corners or rough edges.
- ☞ Burns which are caused by fire or hot objects or touching open flames.
- ☞ Scalds which are caused by hot liquids or steam.
- ☞ A fracture which is caused by twisting of an arm or leg resulting from during falls or slips.

First Aid Measures for different types of Injuries.

- ➢ First Aid refers to the first and immediate assistance given to a person suffering from an illness or an injury.

Reason for first Aid:

- ➢ To preserve life.
- ➢ To prevent the condition from worsening or to promote recovery.

- ➢ **A first Aid Kit** is a set of items used to give immediate medical treatment to an injured person.

Items Contained in A First Aid Kit.

- o Bandages.
- o Adhesive tape.
- o Gauze roll and pads.
- o First Aid manual.
- o Safety pins.
- o Tweezers.
- o Scissors.
- o Antiseptic wipes.

- Emergency blanket.
- Gloves.
- Thermometer.
- Instant cold pack.
- Elastic bandages.
- Triangular bandages.

Uses of the Items in First Aid Kit.

NO	ITEM	PHOTO	FUNCTIONS
1	**Antiseptic solution**		• It is applied when dealing with cuts and wounds to ensure they are not infected
2	**Combine bandages**		• They are thick bandages which are good for covering wounds or controlling bleeding.
3	**Cold pack**		• It is used by people experiencing swelling or skin reactions. • They help to soothe the pain or discomfort.
4	**Disposable gloves**		• They ensure you can attend to the problem without risk of contaminating the wound.
5	**Eyewash.**		• It helps to clear out foreign objects that are dislodged in the eye without or at least discomfort.

6	**First aid manual**		• It is a set of instructions on what to do when a administering first aid.
7	**Notepad and pen**		• It is important for noting or writing down symptoms and details of what caused it.
8	**Saline**		• Used to rinse cuts, grazes or other injuries where the wound may need cleaning.
9	**Scissors**		• Used for cutting bandages, tape and other materials.
10	**Thermometer**		• Used for measuring and keeping track of fever.
11	**Triangular bandage**		• It is a large cotton bandage that can be used as a sling for anyone who have a fractured arm.

12	**Tweezers**		• They help you to easily remove things like splinters from the skin.

Procedure for Administering First Aid.

Describe the Procedure of Administering First Aid for Cuts.

- **Wash the Injured part**. *This helps to kill germs around the wound.*
- **Stop the bleeding**. *Apply gentle pressure with a clean bandage or cloth and elevate the wound until bleeding stops.*
- **Clean the wound**. *Rinse the wound with water or spirit to reduce the risk of infection.*
- **Apply an antibiotic or petroleum jelly**. *Apply a thin layer of an antibiotic ointment or petroleum jelly to keep the surface moist and help prevent scarring.*
- **Cover the wound**. *Apply a bandage or gauze to keep the wound clean. If the injury is just a minor scrape or scratch, leave it uncovered.*
- **Get a tetanus injection.** *Get a tetanus injection shot if you have not had one in the past five years and the wound is deep or dirty.*
- **Watch for signs of infection**. *Visit a doctor if you experience signs of infection on the skin or near the wound such as increasing pain or swelling.*

Describe the Procedure of Administering First Aid for Burns and Scalds.

- **Stop the burning process as soon as possible-***This means covering the person with a blanket and remove him or her from the area. Put out the fire by dousing flames with water or smothering flames with a blanket or sand.*
- **Remove any clothing or jewellery-***near the burnt area of the skin but do not try to remove anything that is stuck to the burnt skin.*
- **Cool the burn with cool or lukewarm running water for 20 minutes as soon as possible after injury-***never use ice, iced water or any cream or greasy substances like butter.*
- **Keep yourself or the person warm-***use a blanket or layer of clothing but avoid putting them on the injured area.*
- **Reduce the pain from a burn using pain killer-***always check the manufactures' instructions when using over the counter medication.*

Describe the Procedure of Administering First Aid for Fracture.

- A fracture is a broken bone. Call for any assistance in case of the following:

✓ The broken bone is the result of major trauma or injury.
✓ The person is not breathing or is not moving.
✓ There is heavy bleeding.
✓ Gentle pressure or movement cause pain.
✓ The limb or joint appears deformed.
✓ The bone has pierced the skin.
✓ The extreme end of the injured arm or leg such as a toe or finger is numb.
✓ You suspect a bone is broken in the neck, head or back.

NOTE:

☞ However, to not move the person except if necessary to avoid further injury. Use the following actions immediately while waiting for medical help.

- ***Stop any bleeding-apply pressure to the wound with a sterile bandage or a clean piece of clothing.***
- ***Immobilize the injured area-do not try to realign the bone or push a bone that is sticking out back in. apply a splint to the area above and below the fracture sites to help reduce discomfort.***
- ***Apply ice pack to limit swelling and help relieve pain-don't apply ice directly to the skin. Wrap the ice in a towel, piece of cloth or some other material.***
- ***Treat for shock-If the person feels faint or is breathing in short, rapid breaths, lay the person down with the head slightly lower than the trunk and if possible, elevate the legs.***

- **Safety Measures to Minimize/Reduce Injuries.**

The following are safety measures used to minimize injuries in the locality.

☞ **To minimise cuts.**

✓ Do not leave loose cutting tools unattended.
✓ Keep blades in separate drawers.
✓ Keep your free hand away from path of the cutting blade.
✓ Do not use a cutting blade as a screw driver or a chisel.

☞ **To minimise burns.**

✓ Place warning signs or stickers near hot equipment or surfaces.
✓ Wear heat resistant gloves and aprons.
✓ Use a waiter's cloth to protect arms while carrying hot plates or trays.
✓ Use dry cloths to pick up hot items to avoid scalding.

☞ **To minimise scalds.**

- ✓ Cover equipment containing hot fat or fluids when not in use.
- ✓ Use a tray or trolley to serve hot liquids.
- ✓ Operate steam equipment with steam valves directed away from body

☞ **To minimise fractures.**

- ✓ Keep work spaces free from clutter, especially the floors.
- ✓ Keep floor surfaces smooth but not slippery.
- ✓ Be aware of differences in floor levels and thresholds when entering rooms.
- ✓ Keep electrical and telephone cords and wires out of walkaways.

Careers Related to first Aid and Management of Injuries.

Careers in areas related to first aid and management of injuries are as follows:

- Production of first aid items such as first aid kits, stretchers, wheel chairs and oxygen cylinders among others.
- Merchandising in first aid equipment and products as technical sales personnel.
- First aid services such as para-medicine, nursing, and first aid education and training among others.
- Emergency repose nurses
- Paramedics
- Ambulance drivers
- Fire fighters
- Flight attendants
- Professional baby sitters
- Lifeguards
- Games instructors
- Gym instructors

Importance of Safety in everyday Life.

☞ When injuries occur they affect every day aspects of life for the person and their families.
☞ It is therefore important to observe safety to reduce injuries in the day to day activities.

This is because of:

- ✎ It saves life.
- ✎ It guards against pain and suffering.
- ✎ It assures one of continued income and financial well-being.
- ✎ It gives one piece of mind.
- ✎ It enables one to continue his or her job or career.
- ✎ It saves one medical cost.
- ✎ It gives one self-confidence.
- ✎ It reduces one's reliance om others for support.
- ✎ One does not become a burden to other people.

END OF TOPIC ONE NOTES.

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Strand 2 MATERIALS.

- ❖ This topic introduces you to how different items are usually made from different materials.
- ❖ In the topic you are going to learn about the materials found within our locality.

- **Common Materials.**

✓ **Materials** are physical substances for making different items.

✓ The common materials found within the locality are:

- Wood.
- Stones.
- Textile.
- Soil.
- Glass.
- Leather.
- Plastics.
- Rubber.
- Water.
- Water.
- Coper.
- Aluminium.
- Steel.
- Silver.
- air

- **Categorisation of materials into Metals and Non-metals.**

✓ Metallic materials are materials that have properties of metal.

✓ Non-metallic materials are any material which do not contain metal.

✓ ***Metals include***:

- Copper.
- Iron.
- Aluminium.
- Steel.
- Silver among others.

✓ ***Non-metals include***:

- Wood.
- Stones.
- Textile.
- Soil.
- Glass.
- Leather.
- Plastic.
- Rubber.
- Water.
- Air among others

- **Distinction between metallic and Non-metallic materials.**

Metallic materials	Non-metallic materials
Some rust	They do not rust.
They have definite shape.	Liquids and air do not have a definite shape but solids have a definite shape.
They produce a sharp loud sound on knocking.	They produce a dull sound on knocking.
They are more reflective.	They are less reflective, except glasses.
They are generally smooth.	They are generally more rough when not polished.
They heat up faster when put under the sun.	They heat up slowly.
They are hotter than non-metals when under the sun.	They are cooler than metals when put under a shade.
They cool faster when put under a shade.	They cool slowly when put under a shade.
They are colder than non-metals under cold weather.	They are warmer than metals under cold weather.
They are not easy to break.	They are easier to break than metals.

- **Physical properties of materials.**

➢ **Physical property** describes a state of physical matter that can be measured.
➢ Materials exist in three states which are: **solid**, **liquid** and **gas**.
➢ Materials have different physical properties as follow:

❖ **Shape**
- Solid material such as stones and metals have definite shape.
- Liquids and gaseous materials do not have a definite shape of their own. They take any shape of the container in which they are stored in.

❖ **Appearance**
- Material have different colours, texture and reflection. For example, materials such as wood, stone and soil are rough.

❖ **Feel**
- Some materials have surface that feel smooth such as metals and glasses while other like wool is tenderer than sand and glasses are smooth and shiny.

❖ **Hardness**
- The ability of a material to resist scratching. Some materials are harder than others. For example, a stone is harder than timber.

❖ **Fire resistance**
- Some materials like metals, stones and clay do not burn. Other materials like those from plants and animals burn.

Careers related to materials in the locality.

In areas related to materials, you can take a career in:

- Making of items from different such as a potter, weaver and blacksmith.
- Extraction and production of materials such as mining, quarrying, concrete production etc.
- Preparation of materials as cotton ginnery, tanning of hides and skin etc.
- Marketing and selling of materials such as hardware shop, textile shops and products outlets etc.

Importance of different materials found in the locality.

A material is a substance that people value for economic reasons.

- Materials are used to produce parts, components and products.
- They are also used to build infrastructure, buildings and landscapes.
- Materials can also be used as raw materials in farming and other manufacturing process.
- Materials are consumed as food.
- Materials create job opportunities and careers.

Metals.

- A metal is a solid material which is typically hard, shiny, malleable, fusible and ductile. With good electrical and thermal conductivity.
- Metals are mostly identified by the items made from them. The types of materials include:

a.) ***Shiny metals*** such as copper, silver and gold for decorative arts, jewellery and coins.

b.) ***Iron and steel*** for structures like buildings, furniture and vehicle parts.



c.) ***Copper*** for electric wires.

d.) ***Aluminium*** for cams, bottle tops and caps, household appliances and utensils, airplanes.

e.) ***Bronze*** for church and school bells.


Physical properties of Ferrous and non-ferrous metals.

- **Ferrous metals** are metals that consists mostly of iron and small amount of other elements.
- Some of the physical properties of ferrous metals include:
  - ***Magnetism***-ferrous metals are highly attracted to a magnet.
  - ***Heat conductivity***- ferrous metals are better conductors of heat than non-ferrous materials.
  - ***Appearance***-ferrous metals have a silvery colour.
  - ***Electricity conductivity*** – ferrous metals are poor conductors of electricity than non-ferrous metals.

- **Non-ferrous metals** are metals that do not have any iron in them at all.
- Some of the physical properties of non-ferrous materials include:
  - ***Magnetism***-non-ferrous metals are not magnetic.
  - ***Heat conductivity***- non-ferrous metals are poor conductors of heat than ferrous metals.
  - ***Appearance***- non-ferrous metals like gold have a more colourful appearance than ferrous metals.
  - ***Electricity conductivity***- non-ferrous metals like copper are better conductors of electricity than ferrous metals.

Careers related to use of metals.

In areas related to use of metals, you can take a career in:

- Making of items from different metals such as a welding, fabrications and blacksmith, among others.
- Extraction of metals such as mining.
- Processing of metals such as metal smelting.
- Marketing and selling metals and metal products such as hardware among others.

Importance of different metals.

Metals are substances that people value for economic reasons.

- Metals are used to make different items that people use in their day-to-day activities.
- They are also used to build infrastructure, buildings and landscapes.
- Use of metals in factories and workshops create job opportunities for the people working there.

Synthetic and natural non-metallic materials.

- Natural non-metallic materials are materials that occur naturally.
- They come from plants, animals, rocks, mineral and other naturally occurring elements.
- Synthetic materials are obtained from a natural material which has undergone a chemical reaction in a laboratory or factory.

Distinction (difference) between synthetic and natural non-metallic materials

	Natural non-metallic materials	Synthetic non-metallic materials
1	Natural materials like skin or bark depends on the length and size of the animal or plant form which it is taken.	The length or size of synthetic material can be adjusted according to the needs.
2	The shape of a natural material is similar to the shape of the source from which it is got.	The shape of synthetic material can be adjusted to the needs.
3	Items made from natural fiber such as wool and cotton are soft and very comfortable to wear.	Items made from synthetic fibre are less comfortable.
4	Natural materials are in their original colour and they do not fade easily.	Synthetic materials are dyed to change their colours as desired and they easily fade.
5	Most of materials are not easily damaged by water.	Most synthetic materials are easily damaged by water.

Categorization of Non-metallic materials as either synthetic or natural.

- Non-metallic materials can be categorized as **synthetic** or **natural**.
- Synthetic materials include plastics, manufactured glass, manufactured fibres, polythene, ink, paints and drugs among others.
- Natural non-metallic materials include plant and animal products such as wood, wool, bones and skin among others. They also include inorganic material such as stones, minerals, sand, clay and ballast among others.

Physical properties of non-metallic materials.

Physical state	Non-metals can exist in all the three physical stats; solid, liquid and gaseous.
Hardness	Non-metals are generally soft. Some of the solid non-metals are quite soft. They can easily be cut with a knife.
Brittleness	Non-metallic materials are brittle because they break down into pieces on hammering.
Decomposition	Natural non-metallic decompose (rot) after sometime. Synthetic non-metallic materials do not decompose easily.

Combustibility	Non-metallic materials generally burn in fire, except earth and mineral products.
Heat conduction	Non-metallic materials do not conduct heat. This means that non-metals do not allow heat to pass through them.
shininess	Natural non-metallic materials are dull. Synthetic non-metals appear a little shiny.

Uses of Non-metallic material.

Material	Uses	
Soil materials	Used in pottery. Used in wall construction such as bricks. Used in construction of roads.	  
Synthetic materials	Used in making plastic utensils. Making of plastic chairs. Insulation such as of electrical conductors.	
Materials from plants	Making mats. Roof covering materials such as thatch. Source of energy such as wood fuel.	  
Materials from animals	Making leather items. Making ornaments from bones. Making wollen garments.	 
Mineral material	Making building materials. Making paints. Making chalk.	 

Careers related to the Processing and use of non-metallic materials.

1. Making of items from different non-metallic materials such as curving, pottery, moulding and shoe making among others.

2. Extraction of non-metallic materials such as quarrying.

3. Processing of non-metallic materials such as tanning of skins and baking of bricks.

4. Merchandising in non-metallic materials such as boutique and timber yard.

5. Rope making. Rope makers harvest sisal fibres, dry and use them to make ropes

6. Building and constructions. Builders use timber, grass, clay and other materials to construct houses.

7.Brick making. Brick makers make bricks from clay soil.

8. Logging. Loggers are authorised to cut trees selectively from a given area to get logs.

9. Saw milling. Saw millers cut the logs into timber or shapes them into boards.

10. Carpentry. Carpenters use timber and boards to make furniture and other useful items.

11. Pottery. Potters make pots and other earthen items. Some potters may also use of cement or concrete to make flower pots and flower vases

12. Weaving. Weavers make baskets, mats brooms, and other items from grasses and reeds. Plastic straws can also be made in weaving

13.Farming. Crop farmers cultivate the soil using hand tools or farm machinery and plants crops into it.

14. Glass smithing. This is a career where people are involved in making objects out of glass

15. Shoe making. Shoe makers make shoes from non-metallic materials like leather, rubber and plastic.

Skills need to solve problems in the community

- Some of the problems can be solved by learners, intervention of adults, experts or the government.
- When solving these problems, we apply some of the technical skills that we have learnt.
- We can also involve other members of the community who have the skills and experience

Example of technical skills are

- Masonry skills.
  They are applied where structures such as houses, water pans and animal housing need to be constructed.

- Carpentry skills.
  They are applied when joining pieces of wood to make desired items.

- Design and drawing skills.
  They are applied where items or structures need to be sketched or drawn before they are made.

- Farming skills.
- They are applied when carrying out activities such as digging, planting, weeding and when using farming tools and equipment.

- Sewing skills.

They are applied when joining and mending pieces of fabric to make desired items.

- Welding skills.
  They are applied when joining materials to make desired items

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Strand 3

TOOLS

- *Tools are used to perform different tasks.*

Household hand tools.

- A tool is an instrument used for performing a task.
- A hand tool is a simple tool which you hold by the hand and operate without electricity or other power.
- A household hand tool is a tool which helps you to carry out tasks around the house.
- Some of the household hand tools in the locality include the following:

	House hold tool	photograph
1	***Screwdriver.***	
2	***Tape measure.***	
3	***Flash light.***	
4	***Pliers***	
5	***Hand saw.***	
6	***Hammer.***	

7	***Spanner***	
8	***Clamp***	
9	***Comb***	
10	***Broom***	
11	***Needle***	
12	***Razor blade***	
13	***A pair of scissors***	
14	***Nail cutter***	

15	***Cooking stick***	
16	***Brush***	
17	***Shoe brush***	

Categorization of Household hand tool according to their uses.

- House hold hand tools are used to perform different tasks around the house.
- Household tools are categorized based on the following;

a.) Measuring tools.

- They are hand held tools used to measure a physical quantity.

b.) Marking tools.

- They are handheld implements used to mark on a job or work piece to obtain accurate size and shape before cutting.

c.) Cutting tools.

- They are handheld implements used in manual operations such as chopping, shaping, trimming among other operations.

d.) Boring tool.

- They are handheld implements used to make holes such as sewing in a material.

e.) **Driving tools**.

- They are handheld tools used to drill, insert and drive screws, nuts and bolts into surfaces.

f.) Holding tools.

- They are handheld implements used to firmly hold a piece of work when carrying out a task.

g.) Cleaning tools.

- They are hand held implements used for removing dirt from surfaces.

h.) Scooping tools.

- They are handheld implements consisting of a curved container and a handle for lifting loose materials

Example of tools in each category

	Category	Example of tools
1	Measuring tools	Ruler. Protractor Measuring tape. Weighing scale. Measuring cylinder
2	Marking tool	Pair of compasses. Pair of dividers. Chalk. Pencil. Pen. Scribers.
3	Cutting tools.	Hand saw. Knife. Scissors. Chisel. Clipper.
4	Boring tools	Hand brace. Rotary leather punch. Awl Needle.
5	Driving tools.	Mallet. Screw driver. Claw hammer. Nail punch.
6	Holding tools	Sufuria holder. Pliers. Clamps. Tapes. Vise. Clips. Forceps.
7	Cleaning tools	Floor mop. Shoe brush Towels. handkerchiefs
8	Scooping tools	Kitchen spatula. Wooden ladle. Spoons. Cooking stick. Mugs. calabash

Specific uses of some household tools.

- ☆ Screwdriver-used for tightening and loosening screws. There are two types of screwdrivers.
  - *i.* ***Slotted or flat****-fits into a slot on the screw and helps the user turn it.*
  - ***ii.*** ***Star*** *– used on screws with a matching star design.*
- ☆ Tape measure-used to measure sizes of household items and spaces.
- ☆ Flashlight-used when a portable light source is needed.
- ☆ Pliers- used to get good grip on items as well as tightening and loosening tight nuts. It is also used for splicing wires.
- ☆ Knife-used for cutting and slicing items.
- ☆ Handsaw -used for trimming timber.
- ☆ Claw hammer -used for driving and removing nails to and from a surface.
- ☆ Spanner -used to tighten or loosen nuts.
- ☆ Comb -used for straightening hair and wool.
- ☆ Broom -used for sweeping dirt off surfaces.
- ☆ Needles -used for sewing fabric with thread.
- ☆ Cooking stick -used for mashing and stirring food and soup.
- ☆ Tooth brush -used for removing dirt from teeth.
- ☆ Shoo brush-used for polishing and shining leather shoes and garment.

Using household hand tools safely.

- When using hand tools to perform a task, it is very important to observe safety.
- The following are safety measures to observe when using household hand tools.

a.) Inspect the tool regularly to make sure that they are in good condition.

b.) Wear protective attire such as overall, gloves and googles when using some of the household hand tools.

c.) Do not pocket sharp tools like knives. Instead, carry them in a toolbox.

d.) Use the right tools. Using a tool for a different purpose than it was intended for may damage the tool or cause injury.

e.) After using tools ensure they are stored in their respective places such as tool box or hanged for those required to be hanged on walls.

Care for and maintenance of household hand tools.

- The following maintenance practices should be done after using household hand tools to perform a task;
- ✖ *Wash or clean tools after use. This ensures good appearance of the tools throughout. It also minimises rusting of metallic parts.*
- ✖ *Oil, grease or lubricate movable parts to reduce friction. This prevents the moving parts of the tools from wearing out.*
- ✖ *Sharpen cutting tools regularly. This ensures continued efficiency of the tools.*

- *Store tools properly after use. This ensures safety of the tool and other people in the house.*
- *Replace worn out or damaged parts of farm tools. This ensures efficiency and durability when using the tools. It also reduces chances of injury.*

Careers related to household tools.

- In areas related to household hand tools, you can take a career in the following;
- Making of tools from different materials for example, blacksmith.
- Marketing and selling tools for example, marketing and salesman of tools.
- Career that involve use of household hand tools such as plumbing, electrical technician, painters, among other.
- Caring for and maintaining tools for example, tool sharpeners.

Role of household hand tools in the community.

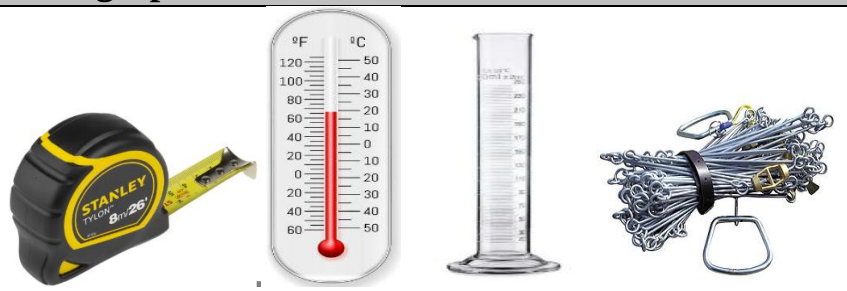
The role of household hand tools in the community is;

- *To enable people carry out activities such as making items, repairing broken items and cleaning.*

Identification of Farming tools.

- A farming tool is a tool which helps you to perform outdoor tasks especially on the farm such as trimming flowers, cutting hedges and digging trenches among others.
- Farming tools are categorized into
    - Measuring tools-instruments used to measure a physical quantity.
    - Marking tools-instruments used to mark on a job or work piece to obtain accurate size and shape before cutting.
    - Cutting tools- handheld instruments used in manual operations such as chopping, shaping, trimming, clipping among others.
    - Driving tools- handheld tools used to drill, insert and drive screws, nuts and bolts into a surface.
    - Holding tools-handheld implements used to firmly hold a piece of work when carry out tasks.
    - Cleaning tools- handheld tools used for removing dirt from surfaces.
    - Scooping tool- handheld equipment consisting of a curved surface container and a handle for lifting loose materials.

☞ ***Examples of farming tools and their categories include;***

	Category	Example	Photograph
1	Measuring tools	Tape measure. Thermometer. Measuring chains. Measuring cylinder.	 Tape measure Thermometer Measuring cylinder Measuring chain
2	Marking tools	Wooden peg. Builder's line. Picks. Scriber.	 Wooden pegs Builders line Picks Scribers
3	Cutting tools	Sickle. Jembe. An axe. Secateurs.	 Sickle Jembe Axe Scribers Panga
4	Driving tools	Sledge hammer. Claw hammer. Screw driver. Wooden mallets.	 Sledge hammer Claw hammer Screw driver Wooden mallet
5	Holding tools	Vice. Long nose pliers. Clamps. Tongs.	 Vice Long nose pliers Clamp Tongs
6	Cleaning tools	Rake. Stick broom. Brooms. Towels. Handkerchiefs.	 Rake Stick broom Towel Handkerchief

7	Scooping tools	Spade. Garden trowel. Shovels. Wheel barrows.	 Spade Garden Trowel Shovel Wheelbarrow

Other tools


Crow Bar


Pickaxe


Watering can

Specific uses of some farming tools

Panga.

- Cutting trees and branches, weeds and other materials on the farm.
- Digging holes for planting seeds.
- Harvesting crops like sugarcane.

Spade.

- To help in scooping or lifting materials such as soil, sand or gravel and manure.

Wheel barrow.

- For carrying and transporting material within the farm.

Rake.

- For gathering dirt in the compound.
- Loosening and levelling the top soil.

Sickle.

- Cutting grass and other soft crops.
- Harvesting of crops such as rice and wheat.

The pickaxe

- Used to break up a hard surface especially when digging.

Crowbar

- Used to dig holes that are used by fencing posts.
- Used to dig out rocks, stumps and other objects stuck in the soil.

Using farming hand tools safely.

* Farming hand tools are used to perform practical tasks around the compound in the farm.
* When using farming hand tools to perform a task, it is important to observe safety.
* The following are safety measures to reduce the chances of an accident:

a.) Regularly oil moving parts of the tool to make sure that they are moving smoothly.
b.) Wear protective attires such as overall and boots.
c.) Keep safe distance from each other when using farming hand tools.
d.) Use the right tools for the correct work or job. Using a tool for a different purpose than the one intended for may damage the tool or cause injury to the user.

Care for and maintenance of farming hand tools.

The following maintenance practices are to be carried out when using farming hand tools to perform a task:

~ Wash or clean tools after use to ensure they appear good throughout and to reduce rusting of metallic parts.
~ Lubricate moving parts to reduce friction which causes wear and tear.
~ Sharpen cutting tools regularly to ensure continued efficiency of the tools.
~ Ensure proper storage of the tools after use.
~ Replace worn out or damaged parts of the tools to ensure efficiency when using them and to reduces chances of injury to users.

Careers related to farming hand tools.

~ Making of farming hand tools such as a fabricator.
~ Marketing and selling tools such as hardware traders.
~ Caring for and maintaining of farming hand tools such as a welder.
~ Using farming hand tools such as a gardener, farmer among others.
~ Gardening. Gardeners use different hand tools when planting weeding.
~ Landscaping and planning. Landscapers use farming hand tools to perform tasks such as Weeding and mulching landscape beds, trimming small trees, hedges and shrubs, planting shrubs, flowers and trees, Removing unwanted, dead or damaged trees.
~ Welding and blacksmithing. Welders and blacksmiths take part in making and repairing metallic parts of farming hand tools.
~ Carpentry. Carpenters make items using board and timber. They also replace wooden handles of farming hand tools.

- ~ Sugarcane cutting. Sugarcane cutters use pangas and machetes to harvest sugarcanes from farms.
- ~ Fencing. People who erect and repair fences use tools such as pliers, jembes, shovels and hammers in their work.
- ~ Livestock farming. Livestock farmers use pangas for chopping napier grass for their livestock.

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Strand 4 DRAWING

TYPES OF DRAWINGS

- Drawing are types of diagrams used for communication to show the shape and structure of a given idea or product.
- Technical fields use drawings to draw designs of different items before they are made

❍ Types of drawing used in technical fields.

- Drawing involves making marks on a surface to create images of forms and shapes.

↳ **<u>Artistic drawing</u>** – these are drawings that allows the communication of emotions, ideas or feelings.

- Examples of artistic drawing include: illustrations, portraits, caricature and graffiti.

↳ **Technical drawings** – these are drawings made to scale to communicate specific idea on how a physical object functions or is constructed.

- They are made to give a precise and detailed view of an object. They give information about how an object functions or how it is constructed.

❍ Differences between Artistic and Technical Drawings.

	Feature	Technical drawings	Artistic drawing
1	Purpose	A technical drawing is used to provide accurate measurement of an object to scale.	An artistic drawing is used to express one's ideas, to decorate or to give pleasing appearance to a surface.
2	Presentation	The technical drawings are presented on a convenient.	The artistic drawings are done on any material and in all sizes.
3	Dimensioning and precision.	Technical drawing MUST be precise and accurate in dimension.	The artistic drawing need not and do not obey the rules of dimensions, shape or proportion.
4	Emotions, feelings and sentiments	The technical drawings do not take care of feelings or sentiments of a person. They are factual, functional, productive and result-oriented.	The artistic drawings involve expression of feelings and sentiments.
5	Interpretation	The technical drawings must be interpreted in the same way all over the globe regardless of the geographical boundaries, religions or nations	The interpretation of the drawing is strictly left to the individual or the onlooker.

❍ Use of artistic and technical drawings.

	Uses of artistic drawings	Uses of technical drawings
a	To remember something important in the culture or personal life.	To communicate ideas in the technical and manufacturing workplaces.
b	To illustrate events and communicate ideas or information.	To convey information about how an object functions or it is constructed.
c	For self-expression of the artist's personal, internal emotions and feelings.	Used as guide for engineers and technicians when constructing or repairing objects and buildings.
d	To beautify objects that we use in everyday life.	
e	To promote ideas and products	

❍ Application of drawings in various careers.

Careers that require drawing skills.

- **Fashion designers**-apply artistic drawings to illustrate new styles for their target customers
- **Animators**-apply artistic drawing to create the moving images for cartoons, video games and animated films.
- **Graphical designers**-apply artistic drawing to create individual, original images for digital devices, websites, print media, signs and logos.
- **Textile designers**-apply artistic drawing to develop repeat designs or patterns of clothing.
- **An illustrator**-apply artistic drawing to create drawings for advertisements, books, magazines and any other business.
- **Tattoo artists**-applies artistic drawing to design and draw desired tattoo ideas and then they use needles to permanently draw the design on the client's skin.
- **Interior designer**-applies artistic drawing to create beautiful and functional indoor spaces in homes, business and public buildings.
- **Architectural drafter**-apply technical to prepare detailed drawings of the building and floor plans.
- **Industrial designer**-apply artistic and technical drawing to develop the appearance of cars, toys, appliances and many other consumer products.
- **Advertising designers**-apply artistic drawing in illustration, calligraphy, photography and graphic design to create a visually-compelling image to use for an advertisement in digital and print publication.
- **Art teachers**-apply their skills to share their love of art with children by allowing self-expression through drawing, painting and sculpting.

- **Technical sales persons**-apply drawing skills and knowledge to market drawing equipment and products.
- **Electricians**-They use technical drawing to identify the position of electrical ducts within a building wiring, installation or repair. They also use artistic drawings to determine the neatness and finish requires after installation or repair of electrical systems.
- **Plumbers**-They use artistic drawings to identify how to finish an area after installation of drainage pipes and other fixtures in the buildings. They use technical drawings to identify access points to areas having blockages or repairing repairs within the drainage points of a building.

❍ Importance of Drawing.

- ✓ Some of the objects created from drawing are vehicles, roads, houses, furniture and electronics.
- ✓ Drawing helps us to learn to write and think creatively, develop hand to eye coordination and conceptualize ideas.
- ✓ Sketch to plan is useful in many fields from science and medicine to product development.
- ✓ Drawing to remember helps you to remember items better.
- ✓ Illustration to understanding; through reading, seeing and drawing are different ways to interact with an object or piece of information and helps to understand and remember it all.
- ✓ Drawing to enhance communication-a drawing is easier to understand than written communication.

Drawing instruments and equipments

- Drawing can be done using a variety of instruments and equipments.
- These instruments and equipments helps us to make neat and accurate drawings

Drawing instruments and equipments used in technical drawing

1. Pencils
2. Tee squares
3. Drawing boards
4. Drawing pens
5. Rulers
6. Sharpeners
7. Drawing templates
8. Erasers
9. Pair of compass

Uses of drawing instruments and equipments

Drawing instrument or equipment	USE
Pencils	Used to make initial sketches
Erasers	Used to eliminate mistakes made while drawing
Pens	Used to outline the final work
Templates	Help to draw repeated letters, numbers and shapes accurately
Drawing board	Used as a support surfaces to hold the paper when drawing
Sharpeners	Used to make tips of pencils sharp
Rulers	Used for measuring and marking accurate measurements
Compasses	

Drawing lines and shapes using drawing instruments

Name of the line	Image of the line	How the line is used in technical drawing
Construction line		A faint line used for sketching and drawing the initial details of a drawing
Centre line		
Hidden line	- - - - - - - -- -- - ----- ----------	
Phantom line		
Break line		
Drawing line		
Break line		
Dimension line		
Leader line		
Cutting line		

Care and maintenance of drawing instruments and equipments

1. Clean them well after use
2. Avoid dropping the instruments or equipment. This prevents them from cracking and breaking.
3. Sharpen pencils when necessary. Do not press the pencil lead on a hard surface when sharpening.
4. Use each instrument or equipment for its intended purpose. E.g. measuring tools should be used for measuring.
5. Always store the instruments and equipment safely when they are not in use

NB

Drawing instruments and equipment are cared for and maintained well in order for them to work well and make neat and accurate drawings.

Uses of drawing instruments and equipments in various careers

- **Architects**.
  Use different drawing instruments to design good buildings.

- **Interior designers.**
  Use drawing instruments and skills to help people plan and decorate the spaces they live in.

- **Fashion designers.**
- Use drawing instruments to come up with creative ideas on how different outfits should be made. Most of the clothes we wear were design by somebody. Fashion designers work closely with tailors.

- **Tailors**.
- Use drawing instruments to draw designs of clothes before they are made.

- **Illustrators**.
- Draw pictures both in hard copies and in digital form. Most of the pictures in textbooks were drawn by illustrators.

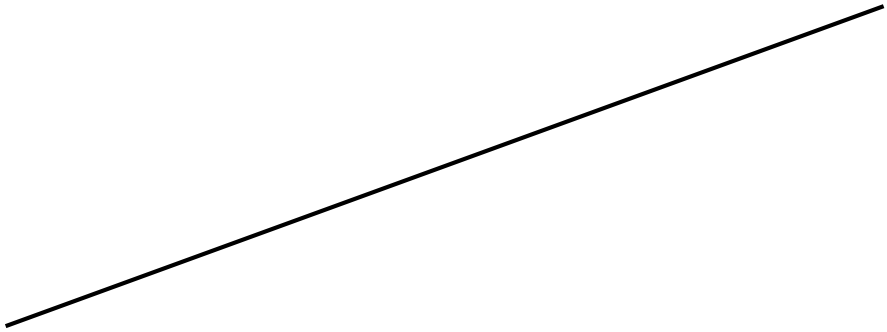
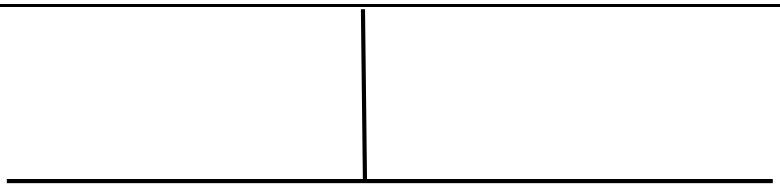
- **Carpenters**.
- Draw furniture before making them

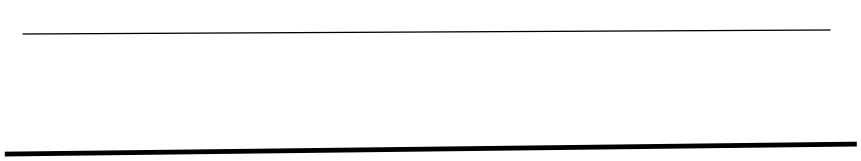
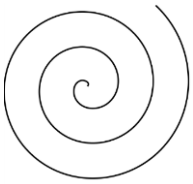
Freehand sketching

Free hand sketching is drawing without the use of measuring instruments

How to sketch lines freehand

- Different types of lines are used in freehand sketching
- The measurement, direction and thickness of the lines can be varied to enhance the mood and character portrayed in the drawings

Type of line	
Horizontal	
Vertical	
Diagonal	
Parallel	
Perdendicular	

Thick and thin	
Curved	
Zigzag	
Wavy	
Spiral	
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Strand 5 ENERGY RESOURCES

- Energy is the ability to do work.
- Energy enables activities to take place and work to be done.

Sources of Energy.

- Human beings use energy from different sources for example;

1. Energy used by human beings to do work comes from food eaten.
2. Energy used by animals to carry out their activities comes from the food they eat.
3. Energy for drying things under the sun comes from the sun.
4. Energy used by electrical appliances comes from electricity.
5. Energy people use to warm themselves comes from burning fuels.
6. Energy that blows away the chaff from the grains comes from wind.

Therefore. sources of energy in our locality include;

- ❍ Food.
- ❍ Sun.
- ❍ Electricity.
- ❍ Coal.
- ❍ Wood.
- ❍ Wind.
- ❍ Fuels such as petroleum and diesel.
- ❍ Water.

Renewable and Non-renewable sources of Energy.

❍ Renewable sources of energy.

- They are those sources that cannot be exhausted or finished even when used over a long period of time.
- ***Common types of renewable source include:***
  - ☆ ***Wind power***-power of fast-moving wind turns windmills to generate electricity.
  - ☆ ***Solar power***-energy from the sun heats the solar cells to generate electricity and heat.
  - ☆ ***Hydro power***- power of fast-moving water turns turbines to generate electricity.
  - ☆ **Biomass**-generates electricity from organic plant matter.
  - ☆ ***Geothermal power***-heat from inside the earth produces pressure which turns turbines to generate electricity.

❍ **Non-renewable sources of energy.**

- They are sources of energy that can be exhausted or finished when used over a long period of time.
- The four major types of non-renewable sources of energy include;
  - ☆ ***Petroleum products.***
  - ☆ ***Coal.***
  - ☆ ***Natural gas.***
  - ☆ ***Nuclear energy.***

NB The following Link has been uploaded to watch Video on Renewable sources of energy

https://youtu.be/44Wp3WE1AHs

Advantages and disadvantages of different sources of Energy.

Both **renewable** and **non-renewable** sources of energy have advantages and disadvantages as show below.

Advantage and disadvantages of Renewable energy.

	Advantages	Disadvantages
1	Renewable energy such as sunshine, wind, geothermal and hydropower does not run out. They are inexhaustible.	Technologies are typically more expensive to install than traditional energy generators.
2	Maintenance requirements are lower for renewable sources of energy. Equipment such as solar and turbines requires overall less maintenance than generators.	Many of the renewable energy resources are reliant on weather elements which may not be available throughout.
3	Renewable sources save money, when using technology that generates power from the sun, wind, steam and water, one does not have to pay to refuel.	High cost of storing using batteries and capacitors.
4	Renewable sources of energy do not pollute the air.	

Advantage and disadvantages of Non-renewable energy

	Advantages	Disadvantages
1	Non-renewable are higher in energy intensity than renewable sources. Coal and petrol burn more fiercely	Non-renewable sources are exhaustible for example, firewood can be depleted
2	Non-renewable energy sources are readily available, wood energy is easy to find.	Non-renewable energy pollutes the environment for example, diesel produces smoke.
3	Most of the non-renewable sources of energy are also very easy to store for example, kerosene can be stored in a container.	It is expensive to install and distribute, ir is expensive to install oil pipeline and distribute to different places.

Careers related to sources of energy.

Careers in the field of energy include:

- Engineering.
- Electrical technician.
- Merchandisers of energy equipment and appliances.
- Trainers.

Importance of Energy.

- ✓ Energy sector creates employment opportunities.
- ✓ It enables people to get information through radios, watch television and other forms of entertainments using electronic devices.
- ✓ It enhances convenience in performing tasks.
- ✓ Energy enables people to do different forms of work.

Forms of energy.

- ✓ There are different forms of energy depending on the source they come from.
- *Wind energy from wind.*
- *Solar energy from the sun.*
- *Chemical energy from biomass and petroleum products.*
- *Electrical energy comes from electric cells or batteries, hydropower, wind power. Solar power and geothermal.*
- *Thermal or heat energy from hot objects.*
- *Mechanical energy from moving objects.*

Kinetic and Potential Energy.

- Forms of energy used in daily activities are either kinetic or potential.
- Some are potential or kinetic depending on the activity being done.

1. *Mechanical energy can be either potential or kinetic.*
2. *Electrical energy is kinetic.*
3. *Heat energy can be either potential or kinetic.*
4. *Chemical energy is potential.*
5. *Wind energy is kinetic.*
6. *Sound energy is kinetic.*
7. *Light energy is kinetic.*

Uses of different forms of energy.

- The forms of energy are used in different sectors:

a.) **Domestic**.

✓ For cooking needs.
✓ Electricity is used for all electrical appliances.

b.) **Transportation**.

✓ Diesel, petrol and jet fuel are used to run transport machines such as cars, motor cycles, lorries, aeroplanes among others.

c.) **Commercial**.

✓ Electrical energy is need for office and communication equipment, appliances among other commercial activities.

d.) **Industrial**.

✓ Electrical energy, biomass and diesel is also used to run industrial machines.

Careers that require the use of energy.

career	Use of energy
Welding	Welders use electric energy to operate machines when repairing and manufacturing metallic items such as furniture and tools.
Electrical engineering	An electrician installs and repairs electrical installations in factories, homes and businesses.
Electronic engineering	An electronic technician installs and repairs electronic equipment such as radios, television sets and fridges among others.

Mechanical engineering	A mechanical engineer designs, develops and manufactures different mechanical devices like engines, heating and cooling systems among others.
Power plant operation.	A power plant operator conducts a wide variety of tasks such as operating folk lift, cranes and construction machines. Among others
Farming.	A farmer uses energy from agricultural machinery and equipment to carry out farm activities like ploughing, spraying and harvesting among others.
Industrial mechanics	An industrial mechanic installs and repairs mechanical equipment in factories and other production units.
Office work	An office worker uses electricity energy to operate machines like computers, mobile phones, photocopiers among others.

Role of Energy.

- ✓ Carrying out tasks at home.
- ✓ Performing transportation activities.
- ✓ Performing commercial activities.
- ✓ Running industrial activities.

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