**GRADE 7 TERM 1**

**PRE-TECHNICAL STUDIES LESSON NOTES**

**SAFETY**

**Personal safety**

Observing personal safety is doing activities that will protect us from accidents or getting injured.

**Potential hazards relating to personal safety**

Unsafe conditions or objects that harm us or cause injuries to us are known as potential safety hazards

Examples of potential safety hazards in day to day life are

1. Fires and hot surfaces which can cause burns
2. Sharp tools like knives which can cause cuts
3. Spills on floors which can cause falls
4. Poorly disposed waste such as fruit peels which can cause falls
5. Heavy objects like rocks, stones which can roll over us or fall on us
6. Items or objects that are properly kept on high shelves which can fall on us
7. Poisonous chemicals that are not store properly can harm us if we touch or drink them.
8. Poorly arranged equipments such as desks that can cause falls
9. Exposed naked electric wires that can lead to shocks
10. Poorly ventilated rooms that can lead to suffocation

**Demonstrating safety while performing various tasks in the locality**

Examples of task that we can do in our locality include digging, splitting firewood, pruning plants, riding bicycles

Some of the safety measures to observe while forming the above different tasks include

1. Always clean spills on the floor immediately to avoid falls
2. Keep a safe distance from your friend when performing tasks such as digging
3. Ask for help when you want to get things that are out of your reach
4. Always be alert around fire. Avoid loose clothing when near fires
5. Use kitchen gloves or a piece of cloth to hold hot kitchen tools and equipment
6. Handle different tools or equipments with care
7. Wear appropriate protective clothing when performing different tasks

Eg wear gumboots while collecting and disposing waste

**Handling tools and equipments safely while performing tasks**

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| --- | --- |
| **Tool or equipment** | **Safe use of the tool or equipment** |
| Knife | Hold the handle firmly while using it  Keep sharp edges away from your hands  You can also use a chopping board when using it |
| Sewing needle | Wear a thimble  Hold the thread end of the needle firmly between your fingers and push the sharp end into fabric |
| Wheelbarrow | Hold the handles and push it forward carefully.  Ensure the wheel is moving freely |
| Pliers | Hold the two handles and press them together  Do not touch the cutting parts while in use |
| Rake | Hold the handle and pull it towards you carefully |
| Ladder | Place it against a firm object like a wall or tree trunk and climb on its steps carefully |

**General safety rules and regulations for various tasks**

* The various task we do at home or school can expose you and other people to safety hazards.
* You should follow general safety rules when performing these task to avoid injuries to self and others.
* The general safety rules include

1. Work in a place with proper ventilation
2. Ensure you are working in a place that has enough lighting
3. Avoid crowding in the working area
4. Ensure the working area is well arranged when working and after working
5. Use tools and equipments for their correct purpose
6. Ensure all the tools you are using are in good working conditions
7. Do not touch sharp edges of cutting tools or test their sharpness with your hand
8. Ensure that your hands are dry before touching electric plugs or electrical appliances that have been plugged in
9. Do not pull heavy materials or objects towards your body
10. If working with or near fire, always stay alert and use moderate flame
11. Store tools and equipments safely after use

**Careers related to safety**

A career is a profession which one trains for, acquires the skills and applies them for a long period

1. Crossing guards

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

1. 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

1. 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.

Attends to those who face challenges while swimming

1. Risk manager

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

1. 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

**Importance of safety in day to day life**

* It is important to observe safety when performing different tasks at home, in school or in the community
* You should always keep your working areas clean and orderly to avoid accidents, injuries and illness.
* When you are free from injuries you can work well, attend school as expected, reduce hospital bills and live healthy

**INJURIES**

An injury is damage to your body.

**Types of injuries**

Examples of common injuries include

1. Scalds
2. Fractures
3. Sprains
4. Burns
5. Cuts
6. Pricks
7. Bruises

**Causes of injuries in the locality**

1. Cuts

Caused by sharp tools and equipments like knives

Can also be cause by sharp furniture corners or rough edges

1. Burns

Are caused by touching open flames, hot objects like sufurias

May also be caused by chemicals and electricity

1. Scalds

Are caused by touching hot liquids like boiling water, hot tea.

May also be caused by steam from boiling foods or water

1. Minor fractures

Occurs after falls or slips

May also occur when there is abnormal movement during activities or sudden change of speed during movement

**First aid procedures for cuts**

You will need clean water, a bandage, cotton wool and an antiseptic or salty water

1. Wash your hands
2. Apply gentle pressure around the cut with a clean piece of cloth or cotton wool until bleeding stops
3. Clean the cut with clean water. Do not use soap
4. Once the cut is clean and is not bleeding, apply some antiseptic
5. Cover the cut with a bandage or clean piece of cloth to keep away dirt

**First aid procedures for minor fractures**

You will need ice cubes, a bandage or a clean piece of cloth

1. Let the injured person rest and avoid moving the injure part completely
2. Place an ice pack on the injure part to prevent swelling
3. Wrap the affected part in a soft bandage to compress it
4. Raise the injure part higher than other body parts

**First aid procedures for burns**

You will need cold water and a clean piece of cloth

1. Move away from the source of burn
2. Remove clothing or jewellery around the burnt area
3. Cool the burn under cold running water for about 5 minutes. You can also deip the part in cold water
4. Cover the burnt area with a loosely clinging clean piece of cloth

**First aid procedures for scalds**

You will need cold water, a clean piece of cloth or bandage

1. Remove clothing or jewellery where the injury has occurred
2. Place the injured area under cold water for about 20 minutes
3. Do not pop the blister or blisters if they form
4. Cover the scalded area with a loosely clinging clean piece of cloth or gauze

**Safety measures that minimise injuries in the locality**

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| **Injury** | **Way of preventing it** |
| Cut | 1. Avoid holding sharp edges of cutting tool 2. Use a chopping board when using cutting tools such as knives 3. Pass cutting tools from one person to another using their handles 4. Keep sharp tools out of reach of children |
| Burns | 1. Do not touch hot surfaces with bare hands 2. Use moderate flame when cooking 3. Use kitchen gloves when holding hot kitchen equipments and surfaces 4. Switch off or put out equipments such as iron boxes after use |
| Scalds | 1. Avoid carrying hot liquids close to your body 2. When cooking food, take care not to get burnt with the hot steam. You should open the lids from cooking food carefully |
| Minor fractures | 1. Walk carefully especially when in places that have obstacles such as stones 2. Avoid walking on wet floors 3. Dispose waste such as banana peels properly to avoid falls 4. Wear fitting and comfortable shoes |

**Careers related to first aid and management of injuries**

* Fist aid is important because it helps to save lives and reduce pain.
* It also makes the affected people feel cared for.
* The following are common careers related to first aid and management of injuries

1. Emergency repose nurses
2. Paramedics
3. Ambulance drivers
4. Fire fighters
5. Flight attendants
6. Professional baby sitters
7. Lifeguards
8. Games instructors
9. Gym instructors

**Importance of observing safety**

1. Prevent unnecessary injuries or even death
2. Avoid lost time
3. Increase productivity

Pupil’s activity

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**MATERIALS**

Any useful substance is called a material

**COMMON MATERIALS**

1. Timber
2. Sand
3. Stones

***Identifying common materials in the locality***

Different localities have different common materials

Examples of common materials are

1. metals
2. Soil
3. Reeds
4. Sisal fibres
5. Hides and skins
6. Trees
7. Diatomite
8. Soapstone
9. Soda ash
10. Fluorspar

**Categorising common materials in the locality as either metallic or non metallic**

Pupil’s activity

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|  |  |
| --- | --- |
| **Metallic** | **Non metallic** |
| 1. Iron | 1. Soil |
| 1. Copper | 1. Trees |
|  | 1. Reeds |
|  | 1. Stones |
|  | 1. Sand |
|  | 1. Sisal fibres |
|  | 1. rubber |

**Distinguishing between metallic and non metallic materials**

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| --- | --- |
| **Items made of metallic materials** | **Items made of non metallic materials** |
| Bottle tops | A grass broom |
| A piece of iron sheet | Floor tiles |
| Coins | An exercise tiles |
| A blade of a jembe | A school sweater |
| Pins | An eraser |
| A door hinge | A plastic plate |
| A piece of wire mesh | A drinking glass |
| A key | A cooking stick |

**Physical properties of materials found in the locality**

|  |  |  |
| --- | --- | --- |
| **Physical property** | **Metal** | **Non metals** |
| Colour | Can be grey, silver, reddish brown or golden | Have a wide range of colours |
| Texture | May be rough or smooth | May be rough or smooth |
| Hardness | Most are strong and cannot break easily | Most are fragile and brittle |
| Shape | Can be formed into various shapes | Can be formed into various shapes |
| Fire resistance | Most are fire resistant and cannot burn easily | Most burn easily |

**Careers related to materials in the locality**

1. carpentry
2. carving
3. masonry
4. welding
5. pottery
6. weaving
7. blacksmith
8. farming
9. mining

**Importance of materials found in the locality**

1. create job/employment opportunities
2. improves the standard of people living in the locality

**METALS**

* Metals occur naturally within the earth’s surface
* They are mined and converted into forms that are easy to use
* Metals are used to make various items we use in our day to day life

**Different types of metals in the locality**

* Some metals exist in pure form or as alloys
* An alloy is a combination of a metal with another metal or metal with a non metal
* Examples of pure metal

1. Aluminium
2. Iron
3. Zinc
4. Silver
5. Copper
6. Lead
7. Magnesium
8. Tin
9. Gold

* Examples of alloys

1. Steel
2. Brass
3. Bronze

* Metals can be identified easily by their surface appearance

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| --- | --- |
| **Type of metal** | **Description** |
| Copper | Shiny reddish- brown surface  May turn green if exposed to moisture |
| Brass | Yellow coloured with a slightly dull surfaces  It is an alloy of **copper** and **zinc** |
| Aluminium | Has a shiny silvery surface  It is very light and flexible |
| Iron | It is dull grey in colour  It rusts when exposed to moisture |
| Stainless steel | It has a shiny silvery colour |
| Zinc | It is dull grey in colour  It develops a light grey coat which may peel off after some time |
| Gold | It is shinny orange yellow in colour |

**Physical properties of metals**

* Identification of a metal by its physical appearance is not a sure way of knowing the exact type of metal
* There are some other physical properties that we need to consider to correctly identify the metals
* Metals can further be identified as

1. Ferrous and non ferrous
2. Magnetic and non magnetic
3. Conductors and non conductors of heat
4. Conductors and non conductors of electricity

**Ferrous and non ferrous**

Ferrous metals are metals that contain iron in its original form or alloys or iron

Non ferrous metal are metals that contain iron

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| **Ferrous metals** | **Non ferrous metals** |
| Iron | Aluminium, copper, zinc, cobalt, tin, lead, silver, bronze, brass, mercury |
| steel |

**Magnetic and non magnetic**

Magnetic metals are metals that are attract by magnet if it is brought near.

Non magnetic metals are not attracted by a magnet

|  |  |
| --- | --- |
| **Magnetic metals** | Non magnetic **metals** |
| Iron, tin, nickel, cobalt, chromium, tungsten, alinco | Silver, copper, aluminium, bass, magnesium, lead, zinc, titanium |

**Conductors of heat in metals**

1. Copper
2. Aluminium
3. Graphite
4. Silver
5. Gold
6. Steel spoon

**Conduction of electricity**

1. Zinc strip
2. Silver strip

**NB**

Metals are good conductors of heat and electricity although some metals may be better conductors than others.

**Uses of metals in the locality**

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| --- | --- |
| **METAL** | **USES** |
| Gold | It is used to make jewellery  It is used to make valuable medals and trophies |
| Silver | It is used to make mirrors since it reflects a lot of light  Used to make jewellery  It is used to make utensils commonly referred to as silverware  It is used to make solar panels and screens of some electronic gadgets |
| Zinc | It is used to coat surfaces of other metals to protect them from corrosion  It is used to make roofing sheets. |
| Lead | Used to make car batteries  Used to make paints  Used to make pipes used to carry corrosive materials |
| Steel | Used to make rails and bridges  Used to make rods and beams for building houses and other structures  Used to make household utensils like sufurias, pans, and cutlery |
| Aluminium | Used to make kitchen utensils such as sufurias, pans and spoons  Used to make foils and cans for packaging food and medicine  Used to make window frames |
| Copper | Used to make electrical wires  Used to make water pipes, taps and sinks |
| Iron | It is used to make utensils like pans, sufurias and house hold appliances like iron boxes  It is used to make machineries and farm tools  Used to make building materials like iron sheets and window frames |
| Brass | It is used to make plumbing valves, doors hinges, door knobs and door locks  Used to make dental braces  It is used to make gears and bearings that are found in locomotives |

**Careers related to uses of metals**

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| **Career** | **Description** |
| Mining | Miners blast or break rocks or the ground in order to obtain metals |
| Moulding | Moulders shapes metals obtained from the ground into mould or blocks |
| Metal cutting | This career involves cutting moulds of metal into a variety of desired shapes |
| Blacksmithing | Blacksmiths make objects from iron and other metals by hitting or blending them using a hammer |
| Welding | Welders use heat to create or repair metallic products |
| Metal polishing | Metal polisher use metal smoothing equipment and machines to enhance the appearance and smoothness of surface of metals |
| fabrication | Fabricators design and make products out of metals |

**Importance of metals**

* Metals are important in the locality in many ways

1. People purse careers related to metals, they earn a living
2. It helps people improve their living standards
3. Metals are important in making most items such as kitchen and farming tools which will be used to perform different tasks within the households.
4. Can earn the government foreign exchange if imported to other countries

**Non metallic materials**

Are any materials both synthetic and natural which do not contain metal

**Distinguishing between synthetic and natural non metallic materials**

* Natural materials are those that exists on their own in or the earth without any actions of humankind.
* They may be part of the earth material or from plants and animals.
* Synthetic materials are those that are created by human beings through different process.

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| **Material** | **Description** | |
| **Natural** | **Synthetic** |
| 1. Stone |  |  |
| 1. Tiles |  |  |
| 1. Timber |  |  |
| 1. Sand |  |  |
| 1. Plastic jerry cans |  |  |
| 1. Glass panes |  |  |
| 1. Sisal ropes |  |  |
| 1. Reeds |  |  |
| 1. Rubber |  |  |
|  |  |  |

Natural non metallic materials include soil, timber, reeds, rubber, stones, hides and skins, plant fibres like banana fibres, sisal fibres, cotton and linen

**Categorising non metallic materials in the locality as either natural or synthetic**

Pupil’s activity

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**Physical properties of non metallic materials**

* Different types of non metallic materials have different properties

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| **Physical property** | **Explanation** |
| 1. Hardness | Most non metallic can easily bend, break or crumble when pressure is applied on them. |
| 1. Colour | Non metallic materials have a wide range of colours |
| 1. Conduction of heat | Non metallic materials are poor conductors of heat |
| 1. Conduction of electricity | Non metallic materials do not conduct electricity |
|  |  |

**Uses of non metallic materials in the locality**

1. Fibres like cotton and line are used to make cloths.

Cloths re then made into different types of garments that we wear.

1. Rubber is used to make Items such as tyres, erasers and footwear
2. Timber or wood is used to make furniture, doors, floors, ceilings and walls of some houses. Wood is used as fuel in most homes.
3. Different types of soil have different uses

Sand soil is mixed with ballast, cement and water to make concrete for constructon.

Loam soil is used for farming

Clay soil is used in pottery and brick making.

1. Grasses and reeds are used to make items like mats, baskets and brooms

Grasses are also used as roofing materials

1. Hides and skins are used to make shoes, belts and bags
2. Glass is used to make window panes and household items like furniture and utensils.

It is also used in making laboratory equipments such as test tubes.

1. Plastic is used to make items such as utensils, cutlery, footwear, buckets, basins
2. Minerals such as soda ash are used to manufacture soap, paper and glass.

**Careers related to processing and use of non metallic materials**

1. ROPE MAKING

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

1. Building and constructions

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

1. Brick making

Brick makers make bricks from clay soil.

1. Logging

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

1. Saw milling.

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

1. Carpentry

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

1. Pottery

Potters make pots and other earthen items.

Some potters may also use of cement or concrete to make flower pots and flower vases

1. WEAVING

Weavers make baskets, mats brooms, and other items from grasses and reeds

Plastic straws can also be made in weaving

1. FARMING

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

1. GLASS SMITHING

This is a career where people are involved in making objects out of glass

1. SHOE MAKING

Shoe makers make shoes from non metallic materials like leather, rubber and plastic

**Identifying common problems in the community**

Pupil’s activity

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**Effects of common Problems affecting the community**

Pupil’s activity

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|  |  |  |  |
| --- | --- | --- | --- |
| **Problems faced in the community** | **Causes of the problem** | **Effects of the problem to the community** | **Can the problem be solved** |
| 1 |  |  |  |
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| 3 |  |  |  |
| 4 |  |  |  |
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**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

1. Masonry skills

Are applied where structures such as houses, water pans and animal housing need to be constructed

1. Carpentry skills

Are applied when joining pieces of wood to make desired items

1. Design and drawing skills

Are applied where items or structures need to be sketched or drawn before they are made

1. Farming skills

Are applied when carrying out activities such as digging, planting, weeding and when using farming tools and equipments

1. Sewing skills

Are applied when joining and mending pieces of fabric to make desired items

1. Welding skills

Are applied when joining materials to make desired items

**TOOLS**

**HOSEHOLD HAND TOOLS**

A TOOL is any instrument held in the hand and used to do work.

A hand tool is any tool that is powered by hand in order to perform an activity

**Identifying household hand tools**

1. Scissors
2. Tape measure
3. Hammer
4. Knife
5. Chisel
6. Spade
7. Mallet
8. Pliers
9. Rake
10. Axe

**Categorising household tools according to their use**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Cutting tools** | **Layout and Measuring tools** | **Assembling tools** | **Sharpening tools** | **Holding and tightening tools** |
| Panga | Tape measure | Hammer | File | Pliers |
| Chisel | Ruler | Screw driver |  | Spanner |
| Paper cutter |  | Mallet |  | G-clamp |
| Axe |  |  |  | Pipe wrench |
| Hand saw |  |  |  | Screw diver |
| Knife |  |  |  |  |
|  |  |  |  |  |

**Using household hand tools to perform different tasks**

1. PANGA

Can be use to cut grass

1. Hold the pang firmly by the handle with one hand
2. Hold the grass with the other hand
3. Maintain a safe distance between the panga and the hand holding the grass
4. Lift the panga and cut the grass
5. TAPE MEASURE
6. Put the piece of timber on a fat surface
7. Carefully put the hook of the tape measure at the edge of the timber
8. Ask your friend to hold the end of the tape measure. Pull back the tape measure across the timber to let more tape out
9. Let out the tape until it stretches across the whole length of the timber
10. Look at the point where the tape align with the end of the timber
11. Read the measurement in centimetres and record in your notebook
12. Carefully let the tape measure to roll back into the casing
13. Store the tape measure carefully
14. HAMMER
15. Wear protective eye googles
16. Ensure there is no one behind you to avoid injuries
17. Grip the hammer by the end of the handle
18. Line the nail and the piece of wood that you want to hammer
19. Hold the nail on the surface of the wood and gently tap the nail with the hammer until it holds in place
20. Once the nail is in place, increase the hammering force to drive the rest of the nail into the wood.
21. Remove your hand and hit the nail completely inside the wood
22. Store your hammer safely after use

**Care and maintenance of household hand tools**

1. Clean the tools after use
2. Replace broken handles if any
3. Sharpen blades of cutting tools
4. Tighten loose screws and nuts of tools like saws
5. Oil moving parts of tools like pliers
6. Straighten bents and teeth of saws
7. Store tools safely in a clean dry place after use

You can hang saws on a hook

1. When storing tools with metallic parts for a long period of time, oil the metallic parts to avoid rusting.

**Careers related to household hand tools**

1. Masonry
2. Plumbing
3. Mechanics
4. Electrical installations
5. Building and constructions

**The role of household hand tools in the community**

1. Perform tasks easily as they improve efficiency
2. Save on time required to perform different tasks
3. Do simple repairs at home

This helps us to save money that would be required to pay experts to perform the repairs



**Farming hand tools**

Farming hand tools are tools that are powered by hand and used to perform different tasks

**Identifying farming hand tools**

1. Slasher
2. Panga
3. Rake
4. Jembe
5. Pruning shears
6. Garden fork
7. Sickle
8. Garden trowel
9. Axe
10. Fork jembe

**Categorising farming hand tools according to their uses**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Cutting and clearing tools** | **Digging and cultivating tools** | **Harvesting tools** | **Pruning tools** | **Scooping and lifting tools** |
| Slasher | Jembe | Panga | Secateurs | Spade |
| Panga | Fork jembe | Knife | Pruning shears | Garden trowel |
| Axe | Garden fork | Sickle | Pruning saw | Shovel |
|  | Spade | Jembe |  |  |
|  |  | Fork jembe |  |  |

**Using farming hand tools to perform different tasks**

|  |  |
| --- | --- |
| **Farming hand tool** | **How to use it** |
| Jembe | Digging   1. Hold the handle with both hands. One hand should be on the lower part of the handle 2. Raise the jembe and bring it down onto the soil 3. maintain a safe distance between the blade of the jembe and jour feet 4. dig the required area |
| Grass slasher | Clearing grass or weeds   1. ensure that nobody is close to you 2. hold the wooden handle firmly 3. maintain a safe distance between your body and the slasher 4. swing the slasher to cut the grass or other weeds |
| Panga | Cutting grass or shrubs   1. hold the panga firmly by the handle with one hand 2. hold the grass with the other hand and put it on the cutting board 3. maintain safe distance between the panga and the hand holding the grass 4. lift the panga and cut the grass |
| Spade | Scooping the soil or manure   1. hold the handle of the spade with one hand 2. the other hand should hold the middle part of the handle 3. maintain safe distance between the spade and your feet 4. scoop the soil or manure |

**Care and maintenance of farming hand tools**

We maintain and care for farming tools so that they serve as for a long time

We can care for farming hand tools by:

1. cleaning them after use
2. oiling the metallic parts of tools such as pangas to prevent rusting
3. sharpening the cutting adges
4. replacing broken handles
5. oiling the moving parts of tools such as secateurs to reduce friction
6. storing the tools safely after use

**Careers related to farming hand tools**

1. crop farming

This is a common career in our country because agriculture is the backbone of our economy.

In crop farming, we use jembes, ploughs

1. gardening

Gardeners use different hand tools when planting weeding

1. landscaping and planning

Landscapers use farming hand tools to perform tasks such as

1. Weeding and mulching landscape beds
2. Trimming small trees, hedges and shrubs
3. Planting shrubs, flowers and trees
4. Removing unwanted, dead or damaged trees
5. Welding and blacksmithing

Welders and blacksmiths take part in making and repairing metallic parts of farming hand tools

1. Carpentry

Carpenters make items using board and timber.

They also replace wooden handles of farming hand tools

1. Sugarcane cutting

Sugarcane cutters use pangas and machetes to harvest sugarcanes from farms

1. Fencing

People who erect and repair fences use tools such as pliers, jembes, shovels and hammers in their work.

1. Livestock farming

Livestock farmers use pangas for chopping napier grass for their livestock

**Importance of farming tools**

* Farming hand tools helps us in performing different tasks in the frm.
* This helps to improve efficiency with then results to productivity

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| **Farming hand tool** | **Importance** |
| Slasher | Helps in clearing long grass and small bushes around the compound  The compound remains neat and free from mosquitoes and rodents |
| Pruning shear | Helps in trimming fences, hedges and shrubs  Well trimmed fences are neat and beautiful |
| Plough | Helps in cultivating land  This makes it easy to sow seeds or plant cutting |
| Spade | It makes it easier to scoop soil  This helps to save on time and energy |
| Jembe | It helps to dig and remove weeds from crop fields  Crops that are free from weeds give healthy produce |

**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.

1. Artistic drawing – are made to visualize an idea and portray the general shape of an item, building or product.

They give a 3D view of an object.

1. Technical drawings – 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.

**Distinguishing artistic and technical drawings**

Artistic and technical drawing can be distinguished using the characteristics like

1. Purpose

Technical drawing provide accurate information about an object to allow easy manufacturing or repair

Artistic drawing are done to express one’s idea while beautifying the appearance of an object, a surface or a place

1. Presentation

Technical drawings are drawn on surface such as tracing paper, ammonia print or computer screens and are usually in standard sizes.

Artistic drawings can be drawn on paper, boards, walls canvas or fabric. These drawings do not have standard size

1. Interpretation

Technical drawing must be drawn to scale such that they are interpreted uniformly regardless of the geographical boundaries.

The interpretation of artistic drawings depends on the viewer

1. Level of precision

Technical drawing have to be drawn to scale for the accurate production and maintenance of the product

Artistic drawing show the general appearance of the product hence do not consider dimensions, shape or proportion

**Uses of artistic and technical drawing in different fields**

**Uses of artistic drawings**

1. They are used to understand how the object or building will appear when in real life
2. They help to keep records of historical events
3. They are used to express imagination and creativity
4. They represent feelings, actions and ideas
5. They help us to develop observation and interpretative skills in order to understand the world

**Uses of technical drawing**

1. They bridge communication between designers and producers
2. They guide people in careers such as engineering when constructing and repairing different structures

Eg. An engineer relies on technical drawings to make some parts of machines

1. Technical drawing are used to represent objects whose dimensions follow set of international standards

**Applications of drawings in various careers**

People in careers that use both artistic and technical drawings include

1. Architects

They use artistic drawings to show the outward appearance of the building and how the building will be intergraded with other items within its locality

They also use technical drawings to show the actual measurements and location of features such as windows and doors within the design

1. Construction workers

They use artistic drawings to create the finishing designs of the floor, roofs and walls.

They also use technical drawing to determine the location of doors, windows and other fixtures within the building

1. Electricians
2. 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

1. Interior designers

They use artistic drawings when visualising the style, colour and other suitable to use

They also use technical drawings to determine the placement of different furnishing within a room or a building

1. 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

1. Product designers

They use artistic drawings to identify how different shapes, colours, images and writing will appear on a given object.

They use technical drawings to determine the size, material and shape of the product when viewed from different positions such as top, bottom and sides

**Importance of drawing in day to day life**

* 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 conceptualise ideas

**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** |
| 1. Pencils | Used to make initial sketches |
| 1. Erasers | Used to eliminate mistakes made while drawing |
| 1. Pens | Used to outline the final work |
| 1. Templates | Help to draw repeated letters, numbers and shapes accurately |
| 1. Drawing board | Used as a support surfaces to hold the paper when drawing |
| 1. Sharpeners | Used to make tips of pencils sharp |
| 1. Rulers | Used for measuring and marking accurate measurements |
| 1. 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 equipments. 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

Eg measuring tools should be used for measuring

1. Always store the instruments and equipments safely when they are not in use

**NB**

Drawing instruments and equipments 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**

1. Architects

Use different drawing instruments to design good buildings

1. Interior designers

Use drawing instruments and skills to help people plan and decorate the spaces they live in

1. 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

1. Tailors

Use drawing instruments to draw designs of clothes before they are made

1. Illustrators

Draw pictures both in hard copies and in digital form

Most of the pictures in textbooks were drawn by illustrators

1. 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 |  |
| Varied |  |
| Dotted | ................................................ |

**How to sketch two dimensional shapes using freehand**