

BA SANGAM COLLEGE
YEAR 9
BASIC TECHNOLOGY
WORKSHEET 3

Subject: Basic Technology	Year/Level: 9	
Week: 3	Lesson 1	Date:
Topic: Hand Tools and Appliances (Abrading and Cutting Tools)		

LESSON PREPARATION:

- Prepared lesson notes
- Prepared follow up work

PREVIOUS LEARNING/PRIOR KNOWLEDGE:

Students have thorough knowledge on the content as the topic is still based on hand tools where the sub-topics are divided into groups of tools.

LESSON OBJECTIVES:

At the end of the lesson, students should be able to:

- Identify the basic abrading and cutting tools, their parts and their uses.
- Develop the skills in the use of these abrading and cutting tools.
- Acquire practical skills and knowledge with abrading and cutting tools.

LESSON NOTES:

Abrading Cutting Tools:

Saws are the most heavily used of all woodworking tools which take away small pieces or particles of the timber at a time. It is important to hold the saw properly and the best method is described as 3-1-1 which represents the placing of the fingers on the handle. The cut made by the saw is called a **kerf**. Saws can be divided into 3 main saw groups based on their type, sizes and uses:

Back saws - these are the saws used for general bench and fine cutting work. A stiffening rib is fitted over the blade to prevent the blade from bucking while cutting.

Hand saws - are saws used for larger cuts.

Curve cutting saws - are narrow bladed saws used for cutting curved shapes.

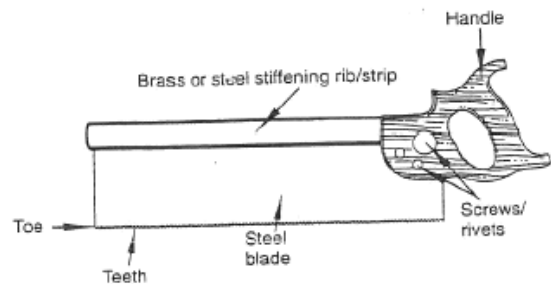
Back Saws:

These are small saws with stiff thin blades used for making accurate cuts in small pieces of timber.

Tenon Saw:

It is considered the best general purpose saw for a beginner. The handle of a tenon saw is made from either plastic or wood and is fixed onto a steel blade with screws/rivets. The brass or steel rib/strip strengthens the blade and enables fine straight cutting.

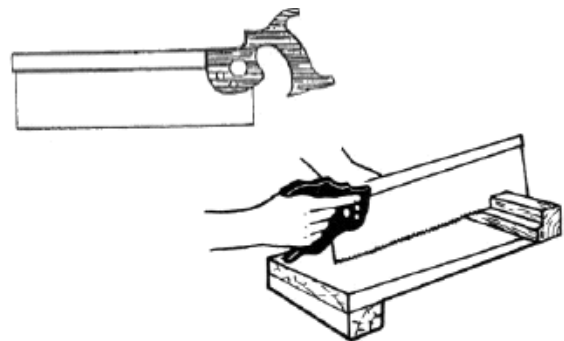
It is used for general bench work such as cutting of joints, angles, with and across the grain.



Dovetail Saw:

It is smaller than the tenon saw and has an open handle.

It is used for fine accurate work and for cutting dovetails.



Hand Saws:

These saws have long, flexible blades ranging from 500 to 660 mm in length. Unlike a backsaw, there is no stiffening back thus, allows the blade to cut right through a wide board.

Cross Cut Saw:



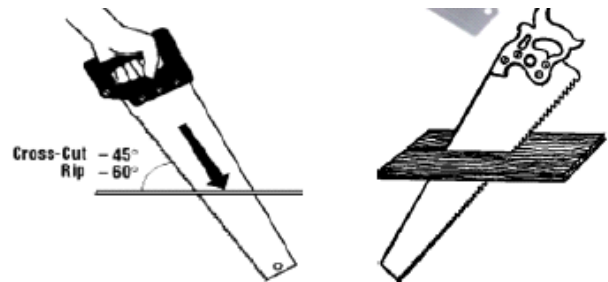
It is not suitable for cutting small pieces of wood. To get the best from a cross cut saw, hold it at about 45° to the wood.

It is specially designed to cut timber across the grain of timber, especially cutting large pieces of timber.

Rip Saw:

It is the largest hand saw and is not suitable for sawing small pieces. Use the saw at a low angle to start the cut and continue at about 60° to the wood using the full blade length.

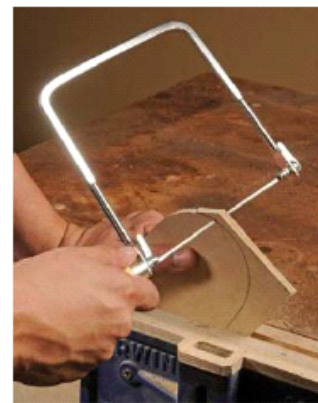
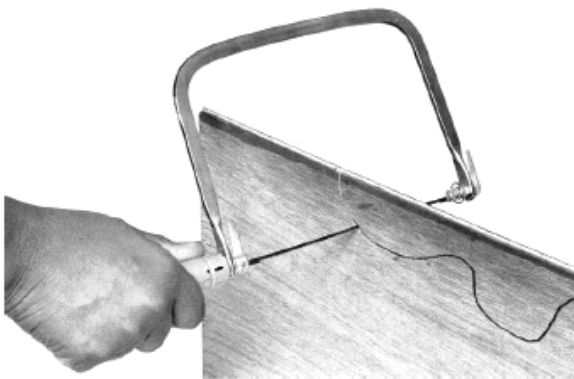
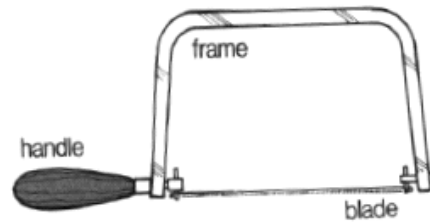
It is used for cutting timber along the grain or ripping lengthwise, especially cutting large pieces of timber.



Curve Cutting Saw:

Are narrow bladed saws and available in various shapes and sizes. This book will only cover the most commonly used curve cutting saw which is called the coping saw.

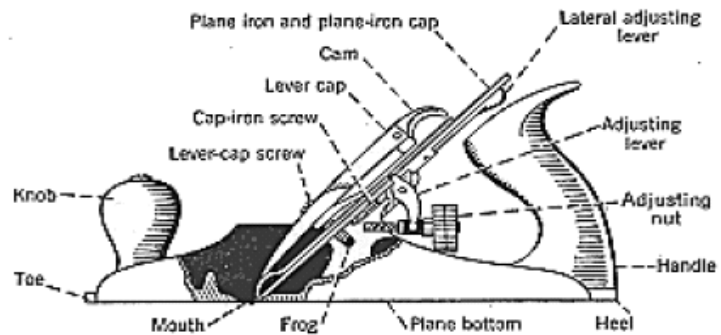
Consists of a narrow, flexible steel blade held in tension to a 'C' shaped frame to which a handle is fixed. The coping saw cuts best on the pull stroke so the blade is fixed with the teeth facing the handle. It is used to cut small curves, slots and difficult shapes in fairly thin timber, plastic, glass fibre and mild steel.



Coping Saw:

Bench Plane:

It is a traditional tool that is used to level off wood and for finishing prior to sanding, painting and sealing. A range of planes have been developed and they each have a different but specific use. When working with planes remember it is best to work with the grain as this allows for easier use.



Jackplane:

It is designed to take off heavy shavings.

It is used to square up rough timber to correct size and quickly removes waste wood.



Smoothing Plane:

It is used with a finely adjustable blade to skim the surface of wood that is already flat. It tends to ride up and down uneven surfaces so it cannot be used for squaring timber.

It is used to produce a final smooth planed surface on the wood.



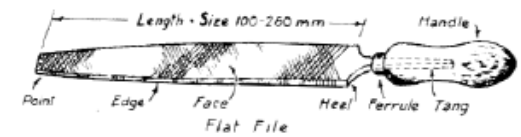
Files:

Files are used in woodwork for two purposes:

1. Tool sharpening e.g. a saw.
2. Smoothing edges and small curves in wood which are difficult to reach with other tools.

Files have three distinguishing features:

1. *Length* is measured from heel to shoulder.
2. *Kind, shape or style* may be flat, mill half-round, circular, or triangular.
3. *Cut* having set of furrows; single or double cut.



Rasp:

It is similar in appearance to a file except it has teeth instead of furrows.

It removes the wood more rapidly than a file but leaves a coarse finish which must be smoothed with a file or glass paper.



STUDENTS ACTIVITY:

- What is the name given when there is a cut made by a saw?

- Name three main saw groups.

a. _____

b. _____

c. _____

- What is the difference between rip saw and cross cut saw?

- Identify two uses of files?

a. _____

b. _____

- What is the main use of Rasp?

- The cutting tool that is used for fine accurate work and for cutting dovetails is called

_____.

- The saw that is used to cut small curves, slots and difficult shapes in thin timbers, plastic, glass fibre and mild steel is called _____.

- The traditional tool that is used to level off wood and finishing prior to sanding, painting and sealing is called _____.

- The tool that is designed to take off heavy shavings is _____.

- The tool that has teeth instead of furrows that removes the wood more rapidly than a file is _____.

Reference:

Year 9 Basic Technology Textbook, Year 9 Basic Technology Workbook, MEHA.

INDUSTRIAL ARTS DEPARTMENT LESSON PLAN

<u>Subject:</u> Basic Technology	<u>Year/Level:</u> 9	
<u>Week:</u> 3	<u>Lesson</u> 2	<u>Date:</u>
Topic: Hand Tools and Appliances (Percussion and Impelling Tools)		

LESSON PREPARATION:

- Prepared lesson notes
- Prepared follow up work

PREVIOUS LEARNING:

Based on the lesson at hand students are able to have prior knowledge on what to be taught in this lesson as they have already covered some topics on hand tools and this enable them to understand what to be taught in this lesson.

LESSON OBJECTIVES:

At the end of the lesson, students should be able to:

- Identify the basic percussion and impelling tools, their parts and their uses.
- Develop the skills in the use of this percussion and impelling tools.
- Acquire practical skills and knowledge with percussion and impelling tools.

TEACHING RESOURCES:

- Lesson notes

FOLLOW UP WORK:

- Students activity

LESSON NOTES:

Percussion and Impelling Tools:

Chisels are among the handiest of all woodworking tools and for many jobs. Chisels are available in wide range of shapes and sizes. These useful tools need to be handled with care and skills for the best results. *Before using a chisel it is important to ensure it is sharp.*

Chisels are tools with a long flat beveled blade with a square cut edge attached to a handle. They are used to remove unwanted parts from the wood or to carve and shape. The chisel is held by one hand, while the other hand is used in striking a mallet at the chisel's handle.

A variety of sizes of chisels are used in woodworking. The large chisels are usually used for larger work while the small chisels are saved for detailed tasks.

Beveled-edge firmer chisel:

Has a beveled-edge and slim blade making it suitable for light work.

It is used for joint making; reaching into awkward corners in paring trenches, dovetails and chamfering.



Paring chisel:

Is the same as a beveled-edged chisel except that it has a longer blade and is used for paring work.



Mortise chisel:

Is specifically designed for heavy work. The blade is thicker than most other chisels and the handle is stronger.

It is used for heavy work, cutting out mortises and slots.



Firmer chisel:

It is the most common general purpose chisel that has a strong, thick rectangular section blade.

It is used for a wide range of tasks such as paring, trenching and light chopping of waste wood.



Parts of a chisel and uses:



- | | |
|------------|----------------------------|
| 1 Blade | 4 Tang |
| 2 Shank | 5 Grinding bevel |
| 3 Shoulder | 6 Sharpening bevel |
| 7 Ferrule | 8 Handle - wood or plastic |

Vertical Paring:



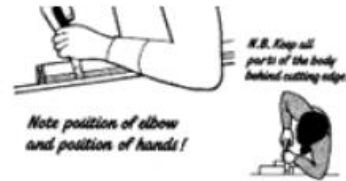
Timber supported, note position of hands!

Chopping Operations



Wood secured on solid part of bench

Horizontal Paring:



Note position of elbow and position of hands!

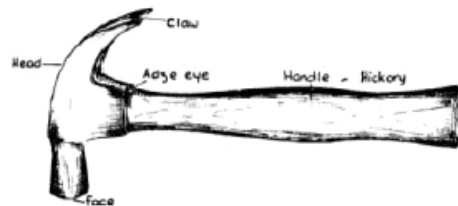
Hammers:

Hammers come in variety of head weights and handle lengths. The head of a hammer is made of forged steel and the handle is made of either wood or steel. Always choose the hammer that fits your hand and is designed for the work to be carried out. You should acquire the habit of grasping the handle of the hammer at the end, as this will give greater force to the blow. Upon light work, the hand will naturally slip a little toward the head.

Claw hammer:

Is the commonly used hammer in woodworking and is mostly used for heavy work.

It is mainly used for heavy work in driving large nails. As the name suggests, it has a claw used for extracting nails



Warrington hammer:

Is a light hammer with a cross pein.

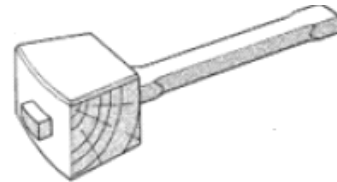
It is used for light hammering and general use in cabinet work. The cross pein is used for starting small nails and also for pressing small inlays and veneers into position when gluing.



Mallet:

It is similar to a hammer made of wood with a large rectangular head fitted with a tapered handle.

It is used for driving chisels and for knocking pieces in assembling jobs.



Pincer:

Is a tool made from drop forged steel. A block or scrap piece of timber is used with the pincer and the claw hammer while extracting nails to prevent damage to the surface and provide greater leverage.

It is used for extracting nails.



Nail punch:

A small tool made of steel.

It is used with the hammer for driving nails below the surface of timber.



Screwdriver:

Has a blade made of alloy steel which may be flat, round or square. One end of the blade is ground to form a tip(s) to fit the slots of screws, and the other end shaped to a tang which is fitted into a handle made of tough hardwood or plastic. These are available in a variety of sizes and patterns.

The screwdriver is a driving or impelling tool used for inserting or removing screws for general work.



STUDENTS ACTIVITY

- State the tools classified under impelling tools.

- Give two examples of impelling tools and state their main purpose.

- The chisel that is used for heavy work, cutting out mortise and slots is _____.
- The chisel that is mainly used for joint making, dovetail and chamfering is _____.
- The hammer that is used for heavy work in driving large nails is _____.
- The type of hammer that is used for pressing small inlays and veneers in position when gluing is _____.
- The impelling tool that is used for driving chisel and for knocking pieces in assembling jobs is _____.
- What part of the claw hammer is used for extracting nails?
- A tool used for extracting nails is _____.
- State the main purposes of the nail punch.

Reference:

Year 9 Basic Technology Textbook, Year 9 Basic Technology Workbook, MEHA.

INDUSTRIAL ARTS DEPARTMENT LESSON PLAN

Subject: Basic Technology	Year/Level: 9	
Week: 3	Lesson 3	Date:
Topic: Hand Tools and Appliances (Boring Tools)		

LESSON PREPARATION:

- Prepared lesson notes
- Prepared students activity

PREVIOUS LEARNING:

Students have background knowledge on the topic that will be discussed in this lesson as most the students have the tools in their homes. The main idea in this lesson is to have a picture on the drill and its bits.

LESSON OBJECTIVES:

At the end of the lesson, students should be able to:

- Identify the basic boring tools, their parts and their uses.
- Develop the skills in the use of this boring tool.
- Acquire practical skills and knowledge with boring tools.

TEACHING RESOURCES:

- Lesson notes

FOLLOW UP WORK:

- Students activity

LESSON NOTES:

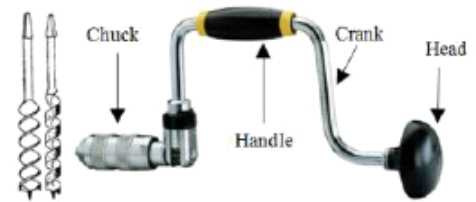
Boring Tools:

These are tools that are used for boring or cutting holes in timber.

Ratchet Brace:

It is fitted with a *ratchet* so that holes can be bored in confined spaces, where it is impossible to turn or sweep the crank for complete turn.

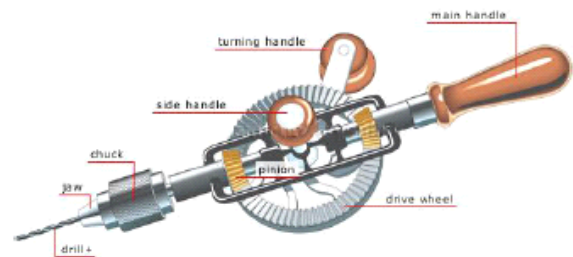
The brace is used with screwdriver bit for driving screws.



Hand Drill:

It is useful for woodwork because the drills cut quickly and do not split the wood.

It is used mainly for boring holes for screws or nails.



Hand Drill Bits:

Many varieties of bit are designed for boring holes. Bits have a round shank to fit into the chuck of the hand drill. The term boring means cutting holes in materials.



STUDENTS ACTIVITY:

- What are boring tools?

- Define the term boring.

- State the purpose of the ratchet brace.

- State the purpose of the hand drill.

Reference:

Year 9 Basic Technology Textbook, Year 9 Basic Technology Workbook, MEHA.