GRADE 10 NOTES

WOOD TECHNOLOGY

COMPREHENSIVE HANDBOOK NOTES

Well-organized, simplified learning notes that provide clear, concise information in a logical sequence, making key concepts easily accessible and memorable, enhancing understanding and retention while fostering engagement and facilitating effective study. By providing a clear focus on key ideas, these Mwalimu Consultancy Ltd Notes foster better retention and comprehension, making learning more accessible and enjoyable.

MWALIMU VERSION

For Complete Notes, kindly contact

Mr Isaboke 0746-222-000 / 0753-222-000

MWALIMU CONSULTANCY

1.0 FOUNDATIONS OF WOOD TECHNOLOGY

1.0 Introduction to Wood Technology

Wood Technology is a practical and theoretical field of study that focuses on the use of wood as a material to create useful, decorative, and structural products. It integrates **science, technology, creativity, and practical skills** to convert wood from trees into valuable items used in homes, schools, industries, and the wider society.

Wood Technology involves:

- Understanding wood as a **natural resource**
- Processing timber into usable forms
- Designing and making wood products
- Using tools, machines, and technology safely
- Applying creativity, accuracy, and problem-solving skills

1.1 Overview of Wood Technology

1.1.1 Meaning of Wood Technology

Wood Technology refers to:

- The study of wood and its properties
- The processing of timber into useful materials
- The design and construction of wood products
- The use of tools, machines, and techniques in woodworking
- Applying **scientific and technological knowledge** in working with wood

Simple definition:

Wood Technology is the study and practice of converting wood into useful products using tools, machines, skills, and technology.

1.1.2 Development of Wood Technology as an Area of Study

(a) Historical Development of Wood Technology

i) Early / Traditional Period

- Use of stone tools to cut and shape wood
- Wood products included: shelters, canoes, spears, cooking sticks
- Skills passed orally from elders to youth

Examples:

- Wooden stools, mortars & pestles, wooden drums, carved masks, walking sticks

ii) Agricultural & Settlement Period

- Introduction of **metal tools** like axes, saws, chisels
- Wood used in farm tools, furniture, fencing, storage

Examples:

- Ox-plough handles, wooden doors, beds, granaries, animal sheds

iii) Industrial Revolution

- Introduction of **machines and sawmills**
- Mass production, standardized timber sizes

Examples:

- Machine-cut planks, factory furniture, railway sleepers, wooden crates

iv) Modern Wood Technology

- Advanced **machines, power tools, CNC, CAD**
- Sustainable forestry and engineered wood products

Examples:

- Plywood, MDF, chipboard, laminated timber, CNC-cut furniture

(b) Evolution of Wood Technology as a School Subject

- Began as **Carpentry & Joinery**
- Introduced in technical schools
- Integrated into **Competence Based Curriculum (CBC)**
- Focus on **creativity, entrepreneurship, and innovation**

1.1.3 Benefits of Studying Wood Technology

(a) Skill Development Benefits

- Develop **practical hand skills**
- Improve **hand–eye coordination**
- Learn **measurement, accuracy, and problem-solving**
- Develop **creativity, imagination, and planning**

Examples:

- Measuring and marking timber accurately
- Cutting straight or curved shapes
- Assembling joints correctly
- Designing original furniture

(b) Personal Development Benefits

- Builds **self-confidence, patience, and discipline**
- Promotes teamwork and responsibility
- Encourages safety awareness and positive work attitude

Examples:

- Completing a project from start to finish
- Working in groups in workshops
- Handling tools safely

(c) Educational Benefits

- Enhances understanding of **science** (forces, materials, structures)
- Improves **mathematics skills** (geometry, measurements)
- Encourages **technological literacy and project-based learning**

Examples:

- Calculating lengths, angles, and volume
- Understanding material strength and properties
- Interpreting working drawings

Published by Mwalimu Consultancy. Contact 0746-222-000 / 0753-222-000 for Complete Notes.

1.1.4 Careers Related to Wood Technology

(a) Artisan and Technical Careers

- Carpenter, Joiner, Cabinet maker, Furniture maker, Wood carver, Pattern maker, Flooring installer

Examples of work:

- Making tables, chairs, doors, cabinets, decorative items

(b) Industrial and Technical Careers

- Sawmill technician, Machine operator, Wood processing technician, Quality control officer

Examples:

- Operating cutting machines, supervising timber processing, inspecting wood quality

(c) Professional & Advanced Careers

- Wood technologist, Industrial designer, Furniture designer, Construction manager, Forestry technologist, Lecturer/Trainer

(d) Entrepreneurial Careers

- Furniture business owner, Timber merchant, Interior décor specialist, Wood product exporter, Workshop owner

Examples:

- School desk manufacturing, home décor production, custom furniture design

1.1.5 Role of Wood Technology in Economic Development

(a) Job Creation

- Carpenters, machine operators, designers, transporters

(b) Industrial Growth

- Supports construction and furniture manufacturing

(c) Income Generation

- Sale of wood products, export of furniture and carvings

(d) Support to Other Sectors

- Education (school furniture), health (hospital furniture), tourism (souvenirs), agriculture (farm structures)

(e) Sustainable Development

- Promotes tree planting, responsible forest use, recycling wood waste

Examples:

- Reforestation projects, engineered wood, wood recycling

1.2 Practical Activities and Projects

1.2.1 Practical Activities

1. **Workshop Visits**

- Observe wood types, tools, machines, and wood products
- Take notes on safety, organization, and workflow

2. **Hands-on Activities**

- Measuring and cutting timber
- Assembling a simple wooden stool or shelf
- Practicing joinery techniques (butt joint, lap joint, dovetail)

3. **Wood Identification**

- Identify common timber types: mahogany, cedar, cypress, pine
- Record properties: hardness, grain, color, durability

4. **Safety Practice**

- Demonstrate safe use of hand tools and machines
- Organize first aid kits in the workshop

1.2.2 Projects

1. **Individual Project**

- Construct a small wooden box, shelf, or stool
- Focus on **accuracy, finishing, and design**

2. **Group Project**

- Build a **classroom furniture set**: chairs, tables
- Apply teamwork, planning, division of labor

3. **Creative Design Project**

- Design and make **decorative or functional items** (frames, carvings, lamp stands)
- Encourage **innovation and entrepreneurship**

4. **Sustainable Project**

- Create items from **recycled timber or off-cuts**
- Promote **environmental awareness**

Published by Mwalimu Consultancy. Contact 0748-222-000 / 0733-222-000 for Complete Notes.

1.3 Summary

- Wood Technology combines **practical skills, creativity, and science**
- Focuses on **timber processing, design, construction, and safety**
- Provides **career opportunities, entrepreneurship, and economic benefits**
- Encourages **sustainable use of resources**
- Practical skills enhance **problem-solving, measurement, and teamwork**

1.2 WOOD WORKSHOP

A **wood workshop** is a designated space for woodworking activities. It provides a controlled environment for:

- Measuring, marking, and cutting timber
- Shaping, joining, and assembling wood products
- Finishing and polishing wood items
- Storage of tools, machines, and raw materials
- Ensuring safety and proper workflow

Benefits of a Wood Workshop:

- Safe working environment
- Organized storage and machine areas
- Adequate space for group practical activities
- Facilities for learning, creativity, and production
- Supports skill development and entrepreneurship

1.2.1 Meaning of a Wood Workshop

A **wood workshop** is:

- A place where wood is worked on using tools and machines
- A center for practical learning and innovation
- A space for creative design and problem-solving
- A training hub for skilled artisans and technical learners

Examples of Wood Workshops:

- School wood workshop
- Community carpentry workshop
- Furniture-making factories

- Industrial woodworking plants
- Training institutes
- Home-based hobby workshops

1.2.2 Features of a Wood Workshop

The features of a wood workshop can be grouped into **physical structure, lighting, ventilation, working areas, benches, storage, machines, and safety measures**.

(a) Physical Structural Features

Feature	Importance	Example
Strong walls	Support machines and provide durability	Reinforced concrete walls
Concrete or wooden floor	Supports weight of timber and equipment	Polished concrete floor
Wide doors	Facilitate movement of timber and furniture	Double-leaf wooden doors
Large windows	Allow natural light and ventilation	Glass windows with grills
High roof	Reduces heat and smoke accumulation	Pitched roof design
Wide working space	Supports group activities and machine operation	Open floor plan for benches
Fire exits	Ensure safety during emergencies	Clearly marked exit doors

(b) Lighting Features

Feature	Importance	Example
Natural lighting	Reduces eye strain, enhances visibility	Large sun-facing windows
Artificial lighting	Ensures work continues at night	LED bulbs, fluorescent tubes
Task lights	For precision work	Adjustable bench lamps
Overhead lights	Illuminates general workshop	Ceiling-mounted lights

(c) Ventilation Features

Feature	Importance	Example
Windows	Circulate fresh air	Cross-ventilated windows
Roof vents	Reduce heat and fumes	Ridge vents
Exhaust fans	Remove dust and smoke	Ceiling-mounted fans
Ventilation grills	Continuous airflow	Grills near machines

(d) Working Areas

Area	Purpose	Example
Measuring & marking	Precise measurement of timber	Bench with measuring tools
Cutting area	Sawing timber safely	Circular saw or handsaw section
Shaping & smoothing	Planing and sanding	Hand planes and sanders
Assembly area	Joining timber pieces	Assembly tables with vices
Finishing area	Polishing, painting, varnishing	Separate space with ventilation

(e) Work Benches

- Strong, stable, and suitable height
- Equipped with vices and smooth surfaces
- Support precision and safety

Types:

- Carpenter's bench with front vice
- Bench with tail vice
- Portable/adjustable bench for small projects

(f) Tools and Machines Storage

- Racks, cabinets, drawers, and shelves
- Organized by type: hand tools, power tools, clamps
- Reduces accidents and saves time

Published by Mwalimu Consultancy. Contact 0746-222-000 / 0753-222-000 for Complete Notes.

Examples:

- Pegboards for hammers, saws, chisels
- Metal cabinets for electric drills
- Shelves for clamps and measuring tools

(g) Machines and Equipment

- Circular saw, band saw, planer, drill press, sander, lathe
- Support mass production, precision, and speed
- Machines require careful supervision and training

(h) Safety Features

- Fire extinguishers, first aid kits, protective clothing
- Emergency switches and safety signs
- Personal protective equipment (PPE) like goggles, gloves, helmets

Examples:

- "No Running" or "Caution: Machine in Use" signs
- Fire extinguisher near entrance
- Safety goggles while sanding or cutting

1.2.3 Layout of a Wood Workshop

Characteristics of a good layout:

- Clear movement paths
- Logical placement of machines and benches
- Easy supervision
- Safe access to exits
- Separation of noisy/polluting areas from safe zones

Types of Workshop Layouts:

1. **Process Layout:** Organized by task (cutting, shaping, finishing)
2. **Product Layout:** Organized by workflow for a specific product
3. **Fixed Position Layout:** Product remains stationary; tools and machines brought to it

Typical Workshop Layout:

- Entrance and reception
- Timber storage
- Measuring and marking area
- Cutting section
- Shaping/planing section
- Assembly and joining area
- Finishing and polishing section
- Tool and machine storage
- Safety/first aid corner

1.2.4 Reasons for Observing Safety in a Workshop

Importance:

- Prevent injuries and accidents
- Protect tools, machines, and materials
- Save lives
- Maintain cleanliness
- Improve productivity and learning outcomes

Common Accidents:

- Cuts, bruises, burns
- Electric shocks
- Eye injuries from dust or flying chips
- Respiratory problems from inhaling wood dust

Safety Measures:

- Wear PPE
- Keep tools organized
- Follow instructions and operating procedures
- Maintain clean workspaces
- Switch off machines after use

Published by Mwalimu Consultancy. Contact 0746-222-000 / 0753-222-000 for Complete Notes.

1.2.5 Importance of Workshop Features

Feature	Importance
Lighting	Clear vision, accuracy, prevents eye strain
Ventilation	Reduces dust, heat, and respiratory issues
Work benches	Support for precision work, safety
Tool storage	Organizes tools, reduces accidents
Safety features	Protect learners, prevent injuries

1.2.6 Learning Activities

Individual Activities:

- Sketch workshop layout
- Label workshop features
- Identify PPE and describe usage

Group Activities:

- Visit school or community workshop
- Identify and photograph workshop sections
- Prepare a report on tools, machines, and workflow
- Create posters on workshop safety rules

Digital Activities:

- Research modern workshop designs
- Watch tutorials on machine operations and safety
- Prepare digital presentations

1.2.7 Project Ideas

1. **Mini Workshop Model:**

- Use cardboard and recycled wood to model a small workshop
- Include benches, tools, machines, and storage areas

2. **Safety Campaign:**

- Create posters or videos highlighting PPE and safe work practices
- Conduct a workshop safety drill simulation

3. **Tool Inventory Project:**

- List all tools and machines in a workshop
- Describe their uses and maintenance

SUMMARY

A **wood workshop** is a critical part of learning Wood Technology. Understanding its **features, layout, and safety practices** equips learners with:

- Practical skills for measuring, cutting, joining, and finishing wood
- Knowledge to work safely and responsibly
- Preparation for careers, entrepreneurship, and sustainable use of natural resources
- Enhanced life skills such as teamwork, creativity, and problem-solving

SUB-STRAND: 1.3 HAND TOOLS AND EQUIPMENT

Hand tools and equipment are essential items used in a wood workshop to perform woodworking operations manually. They are powered by **human effort** and are used in almost every stage of wood production.

Woodworking Tasks Supported by Hand Tools

- Measuring and checking accuracy
- Marking lines, joints, and shapes
- Cutting timber to size
- Shaping and smoothing surfaces
- Making holes
- Holding workpieces firmly
- Finishing wood surfaces

Why Hand Tools Are Important

- Easy to operate and control
- Affordable and readily available
- Highly accurate for detailed work
- Promote skill development and craftsmanship
- Safer than machines when used correctly
- Suitable for learning environments

1.3.1 Meaning of Hand Tools and Equipment

Hand Tools

Hand tools are tools:

- Operated by human power
- That do not require electricity or motors
- Used directly on wood to perform tasks

Examples:

- Saws, chisels, planes, hammers, measuring tools

Equipment

Equipment refers to:

- Supporting items that help hold, support, position, or store tools and materials
- Items that improve safety, organization, and efficiency

Examples:

- Workbenches, vices, clamps, tool racks, bench hooks

HAND TOOLS IN WOOD TECHNOLOGY

Hand tools are tools operated by **human effort only**, without electricity or motors. They are used in woodworking to **measure, mark, cut, shape, bore, hold, strike, and finish wood**.

Hand tools are important because they:

- Are simple and affordable
- Develop manual skills
- Improve accuracy and control
- Enhance safety in small-scale work
- Form the foundation of all woodworking skills

This is A Copyright Property of Mwalimu Consultancy Ltd. 0746-222-000.

CLASSIFICATION OF HAND TOOLS AND THEIR USES

1. MEASURING TOOLS

Tool	Use	Examples of Application
Steel rule	Measuring short lengths	Measuring timber thickness
Tape measure	Measuring long distances	Measuring planks and boards
Folding rule	Measuring medium lengths	Furniture making
Vernier caliper	Accurate measurement	Measuring dowel diameter
Try square	Checking right angles	Squaring timber edges
Combination square	Measuring & marking angles	Marking 45° and 90°
Sliding bevel	Transferring angles	Marking joints
Spirit level	Checking level and plumb	Installing shelves

2. MARKING OUT TOOLS

Tool	Use	Examples
Pencil	Marking lines	General marking
Marking knife	Fine marking	Joint marking
Marking gauge	Marking parallel lines	Thickness marking
Mortise gauge	Marking mortises	Mortise and tenon joints
Try square	Marking right angles	Squaring ends
Chalk line	Marking long lines	Marking boards
Scratch awl	Marking points	Starting drill holes

3. CUTTING TOOLS

Tool	Use	Examples
Rip saw	Cutting along the grain	Cutting planks
Crosscut saw	Cutting across the grain	Cutting boards
Tenon saw	Cutting joints	Tenon joints
Dovetail saw	Fine joint cutting	Dovetail joints
Coping saw	Cutting curves	Decorative work
Bow saw	Rough cutting	Cutting logs
Keyhole saw	Cutting holes	Interior cut-outs
Utility knife	Trimming	Veneer cutting

Published by Mwalimu Consultancy. Contact 0746-222-000 / 0753-222-000 for Complete Notes.

4. CHISELING TOOLS

Tool	Use	Examples
Bevel edge chisel	General cutting	Cleaning joints
Mortise chisel	Deep joints	Mortise cutting
Firmer chisel	Heavy work	Squaring joints
Paring chisel	Light finishing	Fine trimming
Gouge	Curved cuts	Carving bowls
Carving chisel	Decorative carving	Artistic work

5. PLANING TOOLS

Tool	Use	Examples
Jack plane	Rough smoothing	Leveling timber
Smoothing plane	Fine finishing	Final surface
Block plane	Trimming edges	Chamfering
Trying plane	Straightening edges	Joint preparation
Rebate plane	Cutting rebates	Frame making

6. BORING TOOLS

Tool	Use	Examples
Brace and bit	Drilling large holes	Dowels
Hand drill	Small holes	Screws
Auger bit	Deep holes	Timber joints
Bradawl	Pilot holes	Nail starting
Gimlet	Small holes	Screw holes
Countersink	Recessing screws	Flush screw heads

7. IMPACT / IMPELLING TOOLS

Tool	Use	Examples
Claw hammer	Driving & removing nails	Furniture assembly
Wooden mallet	Striking chisels	Mortise joints
Rubber mallet	Gentle striking	Assembly
Ball peen hammer	Metal striking	Fittings
Nail punch	Setting nail heads	Finishing

8. HOLDING AND CLAMPING TOOLS

Tool	Use	Examples
Bench vice	Holding work	Sawing
G-clamp	Holding joints	Gluing
F-clamp	Clamping boards	Assembly
Sash clamp	Large work	Cabinet making
Hand screw clamp	Adjustable grip	Irregular shapes
Bench stop	Prevent movement	Planing

9. SHAPING AND FINISHING TOOLS

Tool	Use	Examples
Rasp	Rough shaping	Curves
File	Smooth shaping	Edges
Spokeshave	Curved shaping	Chair legs
Scraper	Fine finishing	Smooth surfaces
Sandpaper	Final finishing	Polishing

10. SHARPENING TOOLS

Tool	Use
Oil stone	Sharpen blades
Water stone	Fine sharpening
Grinding stone	Rough sharpening
Honing guide	Correct angle
Sharpening file	Saw teeth

CARE AND MAINTENANCE OF HAND TOOLS

During Use

- Use correct tool
- Avoid misuse
- Handle carefully

After Use

- Clean tools
- Oil metal parts
- Store properly
- Sharpen cutting edges
- Repair loose handles

SAFETY RULES

- Wear goggles
- Cut away from the body
- Clamp work firmly
- Keep tools sharp
- Do not carry sharp tools carelessly

LEARNING ACTIVITIES

- Identify and name hand tools
- Classify tools by function
- Sketch and label tools
- Demonstrate correct usage
- Group discussion on safety

PROJECT WORK

Project Title: ***Hand Tools Identification and Use***

Learners should:

- Collect pictures or real tools
- Describe each tool and its use
- Demonstrate safe handling
- Present findings to class

Published by Mwalimu Consultancy. Contact 0746-222-000 / 0753-222-000 for Complete Notes.

SUMMARY

Hand tools are the foundation of Wood Technology. Proper identification, correct use, safety, and maintenance ensure **quality workmanship, safety, and skill development**, preparing learners for **careers, entrepreneurship, and advanced woodworking**.

1.3.2 Identification of Hand Tools and Equipment in a Wood Workshop

Learners must be able to:

- Recognize tools by appearance
- Name tools correctly
- State their uses
- Handle tools appropriately

(a) MEASURING TOOLS

Measuring tools are used to determine length, width, thickness, depth, diameter, and angles accurately before cutting, shaping, or assembling wood.

Purpose

Used to measure:

- Length
- Width
- Thickness
- Depth
- Angles
- Levels

Examples of Measuring Tools

- Steel rule
- Tape measure
- Folding rule
- Vernier caliper
- Try square
- Combination square
- Sliding bevel
- Spirit level
- Marking gauge (distance measurement)

Uses of Measuring Tools

- Measuring timber length before cutting
- Checking width and thickness of boards
- Ensuring right angles (90°)
- Measuring angles for joints
- Checking flatness and level surfaces

Practical Examples

- Measuring timber for a stool leg
- Checking squareness of a table frame
- Measuring thickness of a door panel

TABLE: MEASURING TOOLS IN WOODWORK

TOOL NAME	DESCRIPTION	WHAT IT MEASURES	MAIN USES / APPLICATIONS
Steel Rule	Straight metal rule marked in mm and cm	Short lengths	Measuring small pieces of wood
Wooden Rule	Wooden folding or straight rule	Short lengths	General workshop measurements
Measuring Tape	Flexible steel tape in a case	Long lengths	Measuring timber, furniture sizes
Folding Rule	Hinged wooden or metal rule	Medium lengths	Accurate measurements on site
Try Square	L-shaped tool with stock and blade	90° angles	Checking squareness, marking right angles
Combination Square	Adjustable square with ruler	90° and 45° angles	Measuring, marking, checking depth
Sliding Bevel (Bevel Gauge)	Adjustable blade and stock	Any angle	Transferring angles
Protractor	Semi-circular or circular tool	Angles in degrees	Measuring and marking angles
Mitre Square	Fixed 45° or 90° square	Angled measurements	Marking mitre joints
Marking Gauge	Adjustable pin and stock	Parallel distances	Marking lines parallel to edges

Published by Mwalimu Consultancy. Contact 0746-222-000 / 0753-222-000 for Complete Notes.

Mortise Gauge	Two adjustable pins	Mortise width	Marking mortise and tenon joints
Cutting Gauge	Sharp cutter instead of pin	Fine measurements	Cutting marking lines
Depth Gauge	Rule with sliding stop	Depth of holes or grooves	Measuring depth of mortises
Calipers (Inside)	Two curved legs	Internal diameter	Measuring holes
Calipers (Outside)	Two outward legs	External diameter	Measuring thickness
Vernier Calipers	Precision measuring tool	Diameter, depth, thickness	Accurate workshop measurements
Micrometer Screw Gauge	Precision screw tool	Very small measurements	Measuring thin wood or veneer
Straight Edge	Long flat metal or wood strip	Straightness	Checking flat surfaces
Spirit Level	Bubble tube in frame	Level and plumb	Checking horizontal/vertical alignment
Plumb Bob	Weight on a string	Vertical alignment	Checking upright structures
Thickness Gauge	Adjustable gauge	Thickness	Measuring board thickness
Story Stick	Marked wooden stick	Repeated dimensions	Transferring measurements
Profile Gauge	Pins that copy shapes	Irregular shapes	Measuring curves and profiles
Radius Gauge	Curved leaves	Radius of curves	Measuring rounded edges
Angle Finder	Digital or manual	Angles	Accurate angle measurement
Rule with Depth Scale	Graduated depth markings	Depth	Measuring slots and grooves

CLASSIFICATION OF MEASURING TOOLS

1. Linear Measuring Tools

- Steel rule
- Measuring tape
- Folding rule

This is A Copyright Property of Mwalimu Consultancy Ltd. 0746-222-000.

2. Angular Measuring Tools

- Try square
- Protractor
- Sliding bevel
- Combination square

3. Marking and Setting Tools

- Marking gauge
- Mortise gauge
- Cutting gauge

4. Precision Measuring Tools

- Vernier calipers
- Micrometer screw gauge

IMPORTANCE OF MEASURING TOOLS IN WOODWORK

- Ensure accuracy
- Reduce material wastage
- Improve quality of joints
- Enhance safety
- Achieve professional finishing

SAFETY AND CARE

- Handle carefully to avoid bending
- Clean after use
- Store in dry places
- Avoid dropping precision tools
- Use correct tool for each task

(b) MARKING OUT TOOLS

Marking tools are used to draw accurate lines, points, and shapes on wood to guide cutting, drilling, shaping, and joining.

Purpose

Used to:

- Transfer measurements onto wood
- Mark lines, shapes, joints, and holes
-

Examples of Marking Tools

- Pencil
- Marking knife
- Marking gauge
- Mortise gauge
- Try square
- Combination square
- Sliding bevel
- Chalk line
- Scratch awl

Uses

- Marking cutting lines
- Marking mortise and tenon joints
- Marking dowel and screw holes
- Marking angles and curves

Examples

- Marking dovetail joints
- Marking mortise depth
- Marking center points for drilling

TABLE: MARKING TOOLS IN WOODWORK

TOOL NAME	DESCRIPTION	WHAT IT MARKS	MAIN USES / APPLICATIONS
Pencil (Carpenter's Pencil)	Flat, thick graphite pencil	Lines on wood	General marking and layout
Marking Knife	Sharp pointed blade	Fine lines	Accurate marking for joints
Scratch Awl	Sharp steel point	Fine points and lines	Marking drilling points
Brad Awl	Short pointed steel tool	Starter holes	Starting screws and nails
Marking Gauge	Single pin and sliding stock	Parallel lines	Marking edges for cutting
Mortise Gauge	Two adjustable pins	Mortise & tenon widths	Marking joint outlines

Cutting Gauge	Knife-edge cutter	Clean lines	Cutting marking lines
Panel Gauge	Long beam with cutter	Wide boards	Marking large panels
Try Square	L-shaped tool	Right-angle lines	Marking 90° angles
Combination Square	Adjustable square	90° and 45° lines	Multi-angle marking
Mitre Square	Fixed angle square	45° and 90°	Marking mitre joints
Sliding Bevel (Bevel Gauge)	Adjustable blade	Any angle	Transferring angles
Protractor	Graduated angle tool	Angles	Measuring and marking angles
Compass (Dividers)	Two pointed legs	Circles and arcs	Marking curves
Dividers	Two sharp legs	Equal spacing	Transferring measurements
Trammel Points	Adjustable points on beam	Large circles	Marking big arcs
Chalk Line	String coated with chalk	Long straight lines	Marking boards
Center Punch	Pointed steel rod	Central points	Marking drilling centres
Nail Punch (Set)	Small concave tip	Nail positions	Setting nail heads
Template / Pattern	Pre-cut shape	Repeated shapes	Marking identical parts
Profile Gauge	Sliding pins	Irregular shapes	Copying shapes
Story Stick	Marked wooden strip	Repeated dimensions	Transferring layout marks
Edge Finder	Guide tool	Edge reference	Accurate edge marking
Scriber	Hardened steel point	Fine lines	Precision marking
Rule (Used for Marking)	Straight edge with scale	Straight lines	Guiding pencil or knife

CLASSIFICATION OF MARKING TOOLS

1. Line Marking Tools

- Pencil
- Marking knife
- Marking gauge

2. Angle Marking Tools

- Try square
- Mitre square
- Sliding bevel

3. Curve and Shape Marking Tools

- Compass
- Dividers
- Trammel points

4. Point Marking Tools

- Brad awl
- Center punch

IMPORTANCE OF MARKING TOOLS

- Improve accuracy
- Guide cutting and drilling
- Reduce errors and wastage
- Ensure proper joint fitting
- Enhance workmanship quality

SAFETY AND CARE

- Handle sharp tools carefully
- Keep marking edges sharp
- Store in tool racks
- Do not use damaged tools

PRACTICAL ACTIVITIES

- Identify marking tools
- Mark out a mortise and tenon joint
- Transfer angles using bevel gauge
- Draw shapes using compas

(c) CUTTING TOOLS

Purpose

Used to cut timber:

- Across the grain
- Along the grain
- Into joints and shapes

Examples of Cutting Tools

- Cross-cut saw
- Rip saw

- Tenon saw
- Dovetail saw
- Coping saw
- Bow saw
- Keyhole saw
- Chisels (firmer, bevel edge, mortise)
- Utility knife

Uses

- Cutting boards to size
- Cutting joints such as tenon and dovetail
- Cutting curves and internal shapes
- Trimming edges

Examples

- Using a rip saw to cut along grain
- Using a tenon saw for joints
- Using a coping saw for curved designs

(d) SHARPENING TOOLS

Sharpening tools are used to restore, maintain, and improve the cutting edges of woodwork tools such as chisels, planes, knives, and saws.

Purpose

- Maintain sharp cutting edges
- Improve accuracy
- Reduce effort and accidents

Examples

- Oil stone
- Water stone
- Grinding stone
- Sharpening file
- Honing guide

Uses

- Sharpening chisels
- Sharpening plane irons
- Removing burrs from edges

Examples

- Honing a chisel before joint cutting
- Grinding a damaged blade

TABLE: SHARPENING TOOLS IN WOOD TECHNOLOGY

TOOL NAME	DESCRIPTION	TOOLS SHARPENED	MAIN USES / FUNCTIONS
Oil Stone	Natural or synthetic stone used with oil	Chisels, plane irons	General sharpening
Water Stone	Stone used with water	Chisels, plane blades	Fine sharpening
Diamond Stone	Steel plate with diamond grit	All cutting tools	Fast sharpening
Whetstone	Multi-grit stone	Knives, chisels	Edge refinement
Combination Stone	Two grits in one stone	Chisels, plane blades	Coarse and fine sharpening
Sharpening File	Hardened steel file	Saws, axes	Removing dull edges
Mill File	Flat file	Chisels, plane irons	Edge shaping
Triangular File	Three-sided file	Handsaws	Sharpening saw teeth
Round File	Circular file	Chainsaw teeth	Filing curved edges
Bench Grinder	Motorized abrasive wheel	Chisels, plane blades	Rapid material removal
Angle Grinder	Portable grinding machine	Axes, machetes	Heavy sharpening
Wet Grinder	Water-cooled grinder	Chisels, plane blades	Prevents overheating
Honing Guide	Blade-holding jig	Chisels, plane irons	Maintains correct angle

Leather Strop	**Leather strip**	**Knives, chisels**	**Final polishing**
Stropping Compound	**Abrasive paste**	**Fine edges**	**Edge refinement**
Sharpening Steel (Honing Rod)	**Hardened steel rod**	**Knives**	**Edge alignment**
Slip Stone	**Small shaped stone**	**Curved tools**	**Gouges and carving tools**
Carborundum Stone	**Silicon carbide stone**	**Chisels, plane blades**	**Coarse sharpening**
Emery Paper	**Abrasive paper**	**Small tools**	**Surface smoothing**
Sandpaper	**Grit-coated paper**	**Blades**	**Final finishing**
Grinding Wheel	**Rotating abrasive disc**	**Metal tools**	**Edge shaping**
Buffing Wheel	**Soft rotating wheel**	**Polished edges**	**Final polish**
Sharpening Jig	**Tool holder**	**Blades**	**Angle control**
Stone Flattening Plate	**Abrasive plate**	**Stones**	**Keeping stones flat**
Sharpening Kit	**Set of stones & guides**	**Multiple tools**	**Complete sharpening**

CLASSIFICATION OF SHARPENING TOOLS

1. Manual Sharpening Tools

- **Oil stone**
- **Whetstone**
- **Files**
- **Slip stone**
- **Emery paper**

2. Power Sharpening Tools

- **Bench grinder**
- **Wet grinder**
- **Angle grinder**

3. Honing & Polishing Tools

- **Leather strop**

- **Honing guide**
- **Buffing wheel**

IMPORTANCE OF SHARPENING TOOLS

- **Improves cutting accuracy**
- **Reduces effort during work**
- **Prevents tool damage**
- **Enhances safety**
- **Increases tool lifespan**

SHARPENING SAFETY PRECAUTIONS

- **Wear eye protection**
- **Avoid overheating blades**
- **Secure tools properly**
- **Use correct grit sequence**
- **Keep fingers away from grinding wheels**

PRACTICAL ACTIVITIES

- **Sharpen a chisel using a whetstone**
- **File saw teeth using a triangular file**
- **Use a honing guide correctly**
- **Compare coarse and fine sharpening**

PROJECT WORK

- **Prepare a sharpening schedule**
- **Create a sharpening tool chart**
- **Demonstrate safe sharpening techniques**

(e) BORING TOOLS

Purpose

Used to make holes in wood.

Examples

- Brace and bit
- Hand drill
- Auger bit
- Bradawl
- Gimlet

- Countersink bit

Uses

- Making pilot holes
- Making dowel holes
- Making screw holes
- Countersinking screws

Examples

- Making holes for hinges
- Drilling holes for dowels in furniture

(f) PLANING TOOLS

Purpose

Used to:

- Smooth wood surfaces
- Reduce thickness
- Straighten edges

Examples

- Jack plane
- Smoothing plane
- Block plane
- Trying plane
- Rebate plane

Uses

- Removing rough saw marks
- Flattening timber surfaces
- Squaring edges

(g) IMPACT / IMPELLING TOOLS

Impact (impelling) tools are tools used to strike, hit, drive, force, or shape materials in woodworking. They work by applying force through impact.

Purpose

Used to apply force.

Examples

- Wooden mallet
- Rubber mallet
- Claw hammer
- Ball-peen hammer

Uses

- Driving nails
- Removing nails
- Striking chisels

Examples

- Using a mallet to strike a chisel
- Using a claw hammer to remove nails

TABLE: IMPACT / IMPELLING TOOLS IN WOODWORK

TOOL NAME	DESCRIPTION	MAIN USES	EXAMPLES OF APPLICATIONS
Claw Hammer	Steel head with flat face and curved claw	Driving nails and removing nails	Nailing joints, removing wrongly driven nails
Ball Peen Hammer	Hammer with one flat face and one rounded end	Striking metal tools and punches	Hitting chisels, setting metal fittings
Cross Peen Hammer	Hammer with wedge-shaped peen across the handle	Shaping, starting small nails	Fine woodworking, cabinet work
Straight Peen Hammer	Peen parallel to the handle	Light striking and shaping	Detail woodwork
Wooden Mallet	Made of hardwood with rectangular or cylindrical head	Striking chisels without damage	Mortise and tenon joints
Rubber Mallet	Rubber head, soft impact	Gentle striking without marking wood	Assembling joints, fitting parts
Rawhide Mallet	Made of compressed animal hide	Non-marking striking	Fine furniture assembly
Carpenter's Mallet	Heavy wooden mallet	Heavy chiseling work	Cutting deep joints
Soft-face Hammer	Replaceable plastic or rubber faces	Prevents surface damage	Assembly work
Sledge Hammer (Light)	Heavy hammer with long handle	Heavy impact work	Breaking timber, driving stakes
Dead Blow Hammer	Filled with shot to reduce rebound	Controlled impact	Accurate striking without bounce

Nail Punch (Nail Set)	Small steel rod with concave tip	Driving nail heads below surface	Preparing surface for finishing
Center Punch	Hardened steel with pointed tip	Marking drilling points	Marking holes before drilling
Pin Punch	Straight steel punch	Driving out small pins	Removing dowels or pins
Drift Punch	Tapered punch	Aligning holes	Aligning joints
Cold Chisel	Hardened steel cutting edge	Cutting metal parts in woodwork	Cutting nails, hinges
Wood Chisel (Bevel Edge)	Sharp steel blade with handle	Cutting and shaping wood	Carving joints
Mortise Chisel	Thick, strong chisel	Cutting deep mortises	Door and frame joints
Firmer Chisel	Rectangular blade	General chiseling	Cleaning joints
Carving Chisel	Curved blade	Decorative carving	Artistic woodwork
Gouge	Curved cutting edge	Hollowing and shaping	Bowl carving
Adze	Curved blade mounted sideways	Rough shaping of timber	Boat making
Hatchet / Hand Axe	Small axe with short handle	Rough cutting and shaping	Splitting small logs
Wooden Wedge	Tapered wooden block	Splitting wood	Log splitting
Metal Wedge	Hardened steel wedge	Heavy splitting	Firewood preparation
Tack Hammer	Small lightweight hammer	Driving small tacks	Upholstery
Panel Hammer	Lightweight hammer	Fine nailing work	Furniture assembly
Carpenter's Maul	Heavy wooden hammer	Driving wedges	Timber splitting
Chasing Hammer	Small hammer	Fine controlled striking	Detail carving
Leather Mallet	Leather-covered head	Non-damaging strikes	Polishing and assembly
Fret Hammer	Lightweight hammer	Precision striking	Model making
Joiner's Hammer	Balanced hammer	Joinery work	Cabinet making

Published by Mwalimu Consultancy. Contact 0746-222-000 / 0753-222-000 for Complete Notes.

CLASSIFICATION OF IMPACT TOOLS (FOR EXAMS)

1. Striking Tools

- Hammers
- Mallets
- Mauls

2. Driving Tools

- Nail punch
- Pin punch
- Drift punch

3. Cutting by Impact

- Chisels
- Gouges
- Adze

4. Splitting Tools

- Wedges
- Axe
- Hatchet

SAFETY PRECAUTIONS WHEN USING IMPACT TOOLS

- Wear safety goggles
- Ensure tool handles are firm
- Use correct tool for the task
- Strike squarely and accurately
- Store tools properly after use

LEARNING ACTIVITIES

- Identify impact tools in the workshop
- Match tools to their uses
- Demonstrate correct hammering techniques
- Sketch and label impact tools
- Group discussion on tool safety

Published by Mwalimu Consultancy. Contact 0746-222-000 / 0753-222-000 for Complete Notes.

PROJECT WORK

Project Title: *Identification and Use of Impact Tools in Wood Technology*

- Collect pictures or drawings of tools
- Describe each tool and its use
- Demonstrate safe handling
- Present findings to class

(h) HOLDING AND CLAMPING TOOLS

Purpose

- Hold work firmly
- Prevent movement
- Improve accuracy and safety

Examples

- Bench vice
- G-clamp
- F-clamp
- Sash clamp
- Hand screw clamp
- Bench stop

Uses

- Holding timber during sawing
- Holding joints during gluing
- Supporting long boards

(i) SHAPING AND FINISHING TOOLS

Purpose

Used to shape and finish wood surfaces.

Examples

- Wood rasp
- File
- Spokeshave
- Sandpaper (coarse, medium, fine)
- Scraper

Uses

- Shaping curves
- Rounding edges
- Smoothing surfaces before finishing

WOODWORK CUTTING TOOLS AND THEIR USES

Cutting tools are used to remove wood by slicing, sawing, or chopping in order to shape timber into required sizes and forms.

TABLE: WOOD CUTTING TOOLS IN WOOD TECHNOLOGY

TOOL NAME	TYPE (HAND / POWER)	DESCRIPTION	MAIN USES / FUNCTIONS
Hand Saw	Hand	General-purpose saw	Straight cutting of timber
Rip Saw	Hand	Large teeth	Cutting along the grain
Cross-Cut Saw	Hand	Fine angled teeth	Cutting across the grain
Panel Saw	Hand	Medium-sized saw	Cutting boards and panels
Tenon Saw	Hand	Reinforced spine	Cutting joints
Dovetail Saw	Hand	Small fine teeth	Precision joint cutting
Back Saw	Hand	Rigid metal back	Accurate straight cuts
Coping Saw	Hand	Thin blade	Curved and internal cuts
Fret Saw	Hand	Very fine blade	Decorative work
Bow Saw	Hand	Frame saw	Rough cutting
Keyhole Saw	Hand	Narrow pointed blade	Internal holes
Compass Saw	Hand	Long narrow blade	Circular cuts
Veneer Saw	Hand	Small double-edged blade	Cutting veneers
Pruning Saw	Hand	Curved blade	Cutting tree branches
Hacksaw	Hand	Fine metal blade	Cutting nails & rods

Chisel (Bevel-edge)	**Hand**	**Sharp steel blade**	**Paring and shaping**
Mortise Chisel	**Hand**	**Thick blade**	**Cutting mortises**
Firmer Chisel	**Hand**	**Rectangular blade**	**General cutting**
Gouge	**Hand**	**Curved blade**	**Hollowing wood**
Drawknife	**Hand**	**Two-handled blade**	**Shaping timber**
Spokeshave	**Hand**	**Small plane-like tool**	**Shaping curves**
Axe	**Hand**	**Heavy cutting blade**	**Felling trees**
Hatchet	**Hand**	**Small axe**	**Rough cutting**
Adze	**Hand**	**Curved blade**	**Hollow shaping**
Knife	**Hand**	**Sharp blade**	**Trimming & carving**
Plane	**Hand**	**Flat blade tool**	**Cutting thin shavings**
Jigsaw	**Power**	**Reciprocating blade**	**Curved cutting**
Circular Saw	**Power**	**Rotating blade**	**Straight fast cuts**
Band Saw	**Power**	**Continuous blade**	**Curves & resawing**
Table Saw	**Power**	**Fixed rotating blade**	**Accurate straight cuts**
Mitre Saw	**Power**	**Angled cutting saw**	**Accurate angles**
Chainsaw	**Power**	**Motor-driven chain**	**Cutting logs**
Scroll Saw	**Power**	**Fine vertical blade**	**Intricate designs**
Radial Arm Saw	**Power**	**Sliding blade**	**Cross-cutting boards**
Router	**Power**	**High-speed cutter**	**Grooves & profiles**

CLASSIFICATION OF WOOD CUTTING TOOLS

1. Sawing Tools

- **Hand saw**
- **Rip saw**
- **Cross-cut saw**
- **Tenon saw**
- **Coping saw**
- **Jigsaw**

- **Circular saw**

2. Chopping & Paring Tools

- **Chisels**
- **Gouges**
- **Adze**
- **Axe**

3. Shaping & Trimming Tools

- **Drawknife**
- **Spokeshave**
- **Plane**
- **Knife**

IMPORTANCE OF WOOD CUTTING TOOLS

- **Enables shaping and sizing timber**
- **Improves accuracy and quality**
- **Reduces wastage**
- **Enhances productivity**
- **Essential for joinery & carpentry**

SAFETY PRECAUTIONS

- **Use sharp tools only**
- **Wear protective gear**
- **Secure wood firmly**
- **Cut away from the body**
- **Switch off power tools when not in use**

CBC PRACTICAL ACTIVITIES

- **Cut timber along and across the grain**
- **Demonstrate safe sawing techniques**
- **Compare hand saw and power saw cuts**
- **Identify cutting tools in the workshop**

PROJECT WORK

- **Make a tool identification chart**
- **Construct a tool storage rack**
- **Prepare a safety poster for cutting tools**

Published by Mwalimu Consultancy. Contact 0746-222-000 / 0753-222-000 for Complete Notes.

WOODWORK BORING (DRILLING) TOOLS AND THEIR USES

Boring tools are tools used to make holes in wood for fixing, joining, decoration, and assembly.

TABLE: WOOD BORING TOOLS AND THEIR USES

TOOL NAME	TYPE (HAND / POWER)	DESCRIPTION	MAIN USES / FUNCTIONS
Brace and Bit	Hand	U-shaped brace with bit	Drilling large holes
Hand Drill	Hand	Gear-operated drill	Small to medium holes
Egg-beater Drill	Hand	Crank-operated drill	Accurate drilling
Push Drill	Hand	Spring-driven drill	Quick small holes
Bradawl	Hand	Sharp pointed tool	Starting pilot holes
Gimlet	Hand	Small screw-point tool	Small screw holes
Auger Bit	Hand	Spiral cutting bit	Deep holes
Shell Bit	Hand	Hollow cylindrical bit	Clean large holes
Spade Bit	Hand	Flat paddle-shaped bit	Fast large holes
Forstner Bit	Hand/Power	Flat-bottom hole bit	Smooth flat holes
Twist Drill Bit	Hand/Power	Spiral steel bit	General drilling
Countersink Bit	Hand/Power	Conical bit	Countersinking screws
Counterbore Bit	Hand/Power	Flat-bottom recess bit	Recessing screw heads
Power Drill	Power	Electric drilling tool	Fast drilling
Cordless Drill	Power	Battery-powered drill	Portable drilling
Pillar Drill	Power	Fixed vertical drill	Accurate repeated holes
Drill Press	Power	Bench-mounted drill	Precision drilling
Boring Machine	Power	Heavy-duty drill	Industrial boring
Taper Reamer	Hand	Tapered cutting tool	Enlarging holes
Reamer	Hand	Finishing hole tool	Smooth finishing
Hole Saw	Power	Circular cutting bit	Large circular holes
Mortising Machine	Power	Square chisel drill	Mortise holes
Dowel Drill Bit	Hand/Power	Center-point bit	Dowel holes

Published by Mwalimu Consultancy. Contact 0746-222-000 / 0753-222-000 for Complete Notes.

CLASSIFICATION OF BORING TOOLS

1. Hand Boring Tools

- Brace and bit
- Hand drill
- Egg-beater drill
- Bradawl
- Gimlet

2. Boring Bits

- Auger bit
- Twist bit
- Forstner bit
- Spade bit
- Countersink bit

3. Power Boring Tools

- Electric drill
- Cordless drill
- Pillar drill
- Mortising machine

USES OF BORING TOOLS IN WOODWORK

- Making holes for screws
- Preparing dowel joints
- Making mortise joints
- Creating decorative holes
- Preparing pilot holes

SAFETY PRECAUTIONS

- Clamp wood firmly
- Use correct drill bit size
- Keep hands away from rotating bits

Published by Mwalimu Consultancy. Contact 0746-222-000 / 0753-222-000 for Complete Notes.

- Switch off power before changing bits
- Wear eye protection

CBC PRACTICAL ACTIVITIES

- Drill pilot holes for screws
- Compare hand and power drilling
- Identify different drill bits
- Practice countersinking

PROJECT WORK

- Make a **wooden peg board**
- Construct a **dowel joint frame**
- Create a **tool identification chart**

POLITE NOTE!

Take note that this is a free Sample of the Well Organized Detailed Simplified Notes. THE SAMPLE IS FREE OF CHARGE!

Call/Text/WhatsApp 0746-222-000 / 0753-222-000 for the Complete Notes.

FOR MORE EDUCATIONAL RESOURCES,

CONTACT MR ISABOKE

0746-222-000 / 0753-222-000

Published by Mwalimu Consultancy. Contact 0746-222-000 / 0753-222-000 for Complete Notes.

FOR THE FOLLOWING;

- ✓ ONLINE TUITION
- ✓ REVISION NOTES
- ✓ SCHEMES OF WORK
- ✓ SETBOOKS VIDEOS
- ✓ TERMLY EXAMS
- ✓ QUICK REVISION KITS
- ✓ KCSE PREMOCKS
- ✓ TOP SCHOOLS PREMOCKS
- ✓ KPLEA JOINT PREMOCKS
- ✓ TOP SCHOOLS MOCKS
- ✓ KPLEA JOINT MOCKS
- ✓ KJSEA POSTMOCKS
- ✓ TOP SCHOOLS PREDICTIONS
- ✓ FINAL EXAM PREDICTIONS
- ✓ KPLEA REVEALED SETS
- ✓ KPSEA EXAMS

CALL/TEXT 0746-222-000

Published by Mwalimu Consultancy. Contact 0746-222-000 / 0753-222-000 for Complete Notes.

mwalimuconsultancy@gmail.com

THIS IS A PROPERTY OF MWALIMU CONSULTANCY LTD.

Powered By Mr Isaboke

SUCCESS

END OF NOTES!