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CABINET MAKER

Learner Guide

National Vocational
Certificate Level 1

Version 1 - January 2020



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Introduction

Welcome to your Learner's Guide for the *Cabinet Maker Level 1* Program. It will help you to complete the program and to go on to complete further study or go straight into employment.

The *Cabinet Maker Level 1* program is to engage young people with a program of development that will provide them with the knowledge, skills and understanding to start this career in Pakistan. The program has been developed to address specific issues, such as the national, regional and local cultures, the manpower availability within the country, and meeting and exceeding the needs and expectations of their customers.

The main elements of your learner's guide are:

- **Introduction:**
 - This includes a brief description of your guide and guidelines for you to use it effectively
- **Modules:**
 - The modules form the sections in your learner's guide
- **Learning Units:**
 - Learning Units are the main sections within each module
- **Learning outcomes:**
 - Learning outcomes of each learning units are taken from the curriculum document
- **Learning Elements:**
 - This is the main content of your learner's guide with detail of the knowledge and skills (practical activities, projects, assignments, practices etc.) you will require to achieve learning outcomes stated in the curriculum
 - This section will include examples, photographs and illustrations relating to each learning outcome
- **Summary of modules:**
 - This contains the summary of the modules that make up your learner's guide
- **Frequently asked questions:**
 - These have been added to provide further explanation and clarity on some of the difficult concepts and areas. This further helps you in preparing for your assessment.
- **Multiple choice questions for self-test:**
 - These are provided as an exercise at the end of your learner's guide to help you in preparing for your assessment.



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Module-1

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Detail of Competency Standards.

Module 1: Maintain Workplace Safety

Objective: This module covers the knowledge and skills required to Ensure Personal safety, Ensure workplace safety, Ensure safety of tools and equipment, Maintain First aid Box, Ensure Machines Safety and Interpret Environmental Regulation.

Duration: 100 Hours

Theory: 20 Hours

Practice: 80 Hours

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
LU1. Ensure Personal safety	Trainee will be able to: • Arrange personal protective equipment as per requirements • Wear correct personal protective equipment • Store PPE at appropriate place after use	• Types and use of PPEs • Use of safety equipment • Types of physical hazards	eyewear, gloves, overalls, Fire extinguishers, Fire blankets, Respirators, masks, Fire hoses,
LU2. Ensure workplace safety.	Trainee will be able to: • Clean the workplace as per SOP • Apply electrical hazardous safety precautions as per standard. • Apply chemical hazardous safety precautions as per standard. • Operate Fire extinguishers	• Types of chemical hazards • Types of electrical hazards • Differentiate between physical, chemical and electrical hazards • Identification of different Fire Extinguisher? • Operating techniques of Fire extinguisher. • Types materials used in fire extinguishing materials.	First-aid box and items
LU3. Ensure safety of tools and equipment	Trainee must be able to: • Ensure insulation of tools and equipment • Ensure safe storing of tools and equipment	• Knowledge of insulation materials. • Insulation techniques.	Fire Extinguisher

	• Perform Cleaning of tools and equipment on regular basis. • Ensure use of specific tool as per requirement of job	• Cleaning techniques of tools and equipment. • Storing techniques of tools and equipment.	
LU4. Maintain First aid Box	Trainee must be able to • Ensure availability of first aid box • Check first aid box for Emergency Medicines. • Check Expiry date of the Medicines • Perform first aid treatment/bandages against minor injury. • Ensure availability of emergency/Rescue numbers	• Knowledge of first aid box. • Understanding of medicines in first aid box. • Understanding of First Aid Treatment	Rubber gloves insulation materials
LU5. Ensure Machines Safety	Trainee must be able to • Check belts of Machine • Check cutters of machines • Check Machine for short circuit • Perform test operation on Machine • Ensure smooth functioning	• Knowledge and understanding of company policy and procedures. • Importance of/machines/ tools safety • Adjustment techniques of belt and chain.	Hard copy of company policy
LU6. Interpret Environmental Regulation	• Ensure work friendly environment. • Adopt environmental regulation	• Knowledge of emergency plan • Types of Risks • Risk Management • Risk assessment • Monitor and risk control measures	

Examples and illustrations

Personal Protective Equipment:

PPE are equipment that will protect the user against health or safety risks at work. It can include items such as safety helmets, gloves, eye protection, high-visibility clothing, safety footwear and safety harnesses. It also includes respiratory protective equipment (RPE).

Basic Types of PPE:

Following are the basic types of PPE.

1.Head Protection:

PPE includes hard hats and headgears and should be required for tasks than can cause any force or object falling to the head. When performing head protection safety checks, ensure that there are no dents or deformities on the shell and connections are tightened inside. Do not store in direct sunlight and always replace a hard hat if it was used for any kind of impact, even if damage is unnoticeable.

2.Face and Eye Protection:

PPE includes safety goggles and face shields and should be used for tasks that can cause loss of vision and an eye, burns, splashes, sprays of toxic liquids etc. When conducting equipment safety checks, ensure that there are no cracks or deformities on the lenses, ensure the strap is in good working order and is firmly sealed to the cheek and forehead.

3.Foot Protection:

PPE includes knee pads and safety boots and should be used for tasks that can cause serious foot and leg injuries from falling or rolling objects, hot substances, electrical hazards and slippery surfaces. Use boots with slip-resistant soles that protect against compression and impact.

4.Hands Protection:

PPE includes safety gloves and should be used for tasks that can cause hand and skin burns, absorption of harmful substances, cuts, fractures or amputations. When inspecting hand protection equipment, ensure that they fit perfectly with no spaces and are free from cuts, burns and chemical residue. Always replace them if any sign of contamination was observed.

5.Body Protection:

PPE includes safety vests and suits and should be used for tasks that can cause body injuries from extreme temperatures, flames and sparks, toxic chemicals, insect bites and radiation. Ensure that they are clean and free from cuts and burns. Always get a good fit to ensure full body protection.

6.Hearing protection:

PPE includes ear muffs and plugs and should be used for tasks that can cause hearing problems and loss of hearing. When ensuring hearing safety, the equipment must fit the ear canal perfectly. Recommended types include formable earplugs to fit on different sizes of ear canals.

7.Fall Protection:

PPE includes safety harnesses and lanyards and should be strictly used for tasks that can cause falling from heights and serious injury or death. When inspecting equipment, ensure that the straps are free from tears, deformities and burn marks and buckles are connected securely and tightly. It is very important to dispose them if used after a falling incident.

8.Respiratory Protection:

PPE includes respirators and should be used for tasks that can cause inhalation of harmful materials to enter the body. When conducting respiratory protection safety, ensure that the equipment is fit-tested and the employee has undergone proper training before wearing one.

Where to store PPE

The general maintenance and storage of PPE usually includes keeping it in a clean and dry place, where it can be easily accessed and is not exposed to potentially damaging conditions. A cupboard is fine, as long as it meets the above criteria, but avoid storing your PPE with other items such as consumables or machinery.

The most important things to remember are to keep your PPE storage area clean, tidy, and organized. Avoid stacking things on top of each other excessively and utilize organizational tools like wall hooks and shelves where possible.



<https://millops.community.uaf.edu/tag/ppe/>

First Aid Box:

It is a set of materials and tools used for giving emergency treatment to a sick or injured person. First aid kits are designed to manage all types of injuries including basic cuts, scrapes and burns etc.

A basic workplace first aid kit includes:

- **Plasters:** Used for small cuts and grazes
- **Dressings:** Used to apply pressure to larger wounds and help to stop bleeding
- **Bandages:** Used to support joints, hold dressings in place, put pressure on wounds and to stop swelling
- **Disposable gloves:** Used to reduce the risk of infection
- **Face shields or pocket masks:** Used to prevent infection when you give rescue breaths
- **Cleansing wipes, alcohol free wipes:** Used to clean the skin around the wound
- **Adhesive tape:** Used to hold dressings or the loose end of bandages in place
- **Pins and clips:** Used to fasten the loose end of bandages
- **Scissors or tweezers:** Used to cut bandages or sticky tape or someone's clothing if you need to get to a wound



First Aid Box

Fire Extinguisher:

A fire extinguisher is an active fire protection device used to extinguish or control small fires, often in emergency situations. Typically, a fire extinguisher consists of a hand-held cylindrical pressure vessel containing an agent which can be discharged to extinguish a fire.

Types of Fire Extinguishers:

There are three main types of extinguisher and they work in slightly different ways:

- **Water extinguishers:**

Water extinguishers are the most common, are essentially tanks full of water with compressed (tightly squeezed) air as the propellant to make them come out. Water extinguishers work by removing heat from the fire.

- **Dry chemical extinguishers:**

Dry chemical extinguishers are tanks of foam or dry powder with compressed nitrogen as the propellant. They work by smothering the fire: when you put a layer of powder or foam on the fire, you cut the fuel off from the oxygen around it, and the fire goes out.

- **Carbon dioxide (CO₂) extinguishers:**

Carbon dioxide extinguishers contain a mixture of liquid and gaseous carbon dioxide (a nonflammable gas). CO₂ is normally a gas at room temperature and pressure. It has to be stored under high pressure to make it a liquid. When you release the pressure, the gas expands enormously and makes a huge white jet. CO₂ attacks the fire triangle in two ways: it smothers the oxygen and, when it turns from a liquid back to a gas, it "sucks" in a massive amount of heat from its surroundings (the latent heat of vaporization), which cools whatever you spray it on by removing heat.



Operating a Fire Extinguisher:

There are four (4) basic steps for using modern portable fire extinguishers.

The acronym **PASS** is used to describe these four basic steps.

1.Pull (pin):

Pull pin at the top of the extinguisher, breaking the seal. When in place, the pin keeps the handle from being pressed and accidentally operating the extinguisher. Immediately test the extinguisher. (Aiming away from the operator) This is to ensure the extinguisher works and also shows the operator how far the stream travels

2.Aim:

Approach the fire standing at a safe distance. Aim the nozzle or outlet towards the base of the fire.

3.Squeeze:

Squeeze the handles together to discharge the extinguishing agent inside. To stop discharge, release the handles.

4.Sweep:

Sweep the nozzle from side to side as you approach the fire, directing the extinguishing agent at the base of the flames. After an A Class fire is extinguished, probe for smoldering hot spots that could reignite the fuel.



CPR- Cardio Pulmonary Resuscitation:

CPR – or Cardiopulmonary Resuscitation – is an emergency lifesaving procedure performed when the heart stops beating. Immediate CPR can double or triple chances of survival after cardiac arrest.

How CPR is Performed:

There are two main stages to CPR: the preparation stage and the CPR stage.

Preparation Step:

Before performing CPR on an adult, use the following preparation steps:

Step 1. Call Emergency services:

First, check the scene for factors that could put you in danger, such as traffic, fire, or falling masonry. Next, check the person. Do they need help? Tap their shoulder and shout, "Are you OK?"

If they are not responding, call emergency service or ask a bystander to call emergency service before performing CPR.

Step 2. Place the person on their back and open their airways:

Place the person carefully on their back and kneel beside their chest. Tilt their head back slightly by lifting their chin. Open their mouth and check for any obstruction, such as food or vomit. Remove any obstruction if it is loose. If it is not loose, trying to grasp it may push it farther into the airway.

Step 3. Check for breathing:

Place your ear next the person's mouth and listen for no more than 10 seconds. If you do not hear breathing, or you only hear occasional gasps, begin CPR.

If someone is unconscious but still breathing, do not perform CPR. Instead, if they do not seem to have a spinal injury, place them in the recovery position. Keep monitoring their breathing and perform CPR if they stop breathing.

Step 4. Perform 30 chest compressions:

Place one of your hands on top of the other and clasp them together. With the heel of the hands and straight elbows, push hard and fast in the center of the chest, slightly below the nipples.

Push at least 2 inches deep. Compress their chest at a rate of least 100 times per minute. Let the chest rise fully between compressions.

Step 5. Perform two rescue breaths:

Making sure their mouth is clear, tilt their head back slightly and lift their chin. Pinch their nose shut, place your mouth fully over theirs, and blow to make their chest rise. If their chest does not rise with the first breath, retilt their head. If their chest still does not rise with a second breath, the person might be choking.

Step 6. Repeat:

Repeat the cycle of 30 chest compressions and two rescue breaths until the person starts breathing or help arrives. If an AED arrives, carry on performing CPR until the machine is set up and ready to use.

Chest compressions



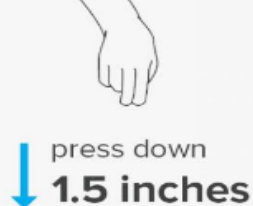
Adult



Child



Infant

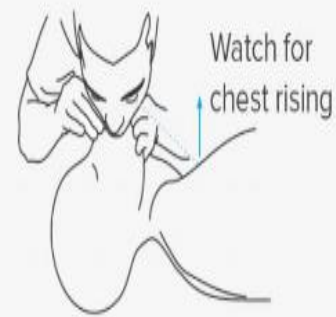


Perform 30 chest compressions at a rate of 100 per minute, letting the chest rise between each

Rescue breaths



Open airways by
lifting the chin
slightly



Pinch nose and give
two rescue breaths

CPR

Method

<https://www.medicalnewstoday.com/articles/324712.php>

Workplace Emergency:

A workplace emergency is an unforeseen situation that threatens your employees, customers, or the public; disrupts or shuts down your operations; or causes physical or environmental damage. Emergencies may be natural or manmade and include the following:

- Floods,
- Hurricanes,
- Tornadoes,
- Fires,

- Toxic gas releases,
- Chemical spills,
- Radiological accidents,
- Explosions,
- Civil disturbances, and
- Workplace violence resulting in bodily harm and trauma.

How do you protect yourself, your employees, and your business?

The best way is to prepare to respond to an emergency before it happens. Few people can think clearly and logically in a crisis, so it is important to do so in advance, when you have time to be thorough.

What is an emergency action plan?

An emergency action plan covers designated actions employers and employees must take to ensure employee safety from fire and other emergencies. Not all employers are required to establish an emergency action plan. Even if you are not specifically required to do so, compiling an emergency action plan is a good way to protect yourself, your employees, and your business during an emergency.

Putting together a comprehensive emergency action plan that deals with all types of issues specific to your worksite is not difficult.

When developing your emergency action plan, it's a good idea to look at a wide variety of potential emergencies that could occur in your workplace. It should be tailored to your worksite and include information about all potential sources of emergencies. Developing an emergency action plan means you should do a hazard assessment to determine what, if any, physical or chemical hazards in your workplaces could cause an emergency. If you have more than one worksite, each site should have an emergency action plan.

At a minimum, your emergency action plan must include the following:

- A preferred method for reporting fires and other emergencies;
- An evacuation policy and procedure;
- Emergency escape procedures and route assignments, such as floor plans, workplace maps, and safe or refuge areas;
- Names, titles, departments, and telephone numbers of individuals both within and outside your company to contact for additional information or explanation of duties and responsibilities under the emergency plan;
- Procedures for employees who remain to perform or shut down critical plant operations, operate fire extinguishers, or perform other essential services that cannot be shut down for every emergency alarm before evacuating; and
- Rescue and medical duties for any workers designated to perform them.

You also may want to consider designating an assembly location and procedures to account for all employees after an evacuation.

Identifying workplace hazards

Every workplace has hazards. As an employer, you have a legal responsibility to look after your employees' safety and protect them against health and safety hazards at work. In order to manage workplace health and safety and help prevent accidents and sickness absence, it's important to identify, monitor and reduce the risk associated with workplace hazards.

What are workplace hazards?

Workplace hazards are any aspect of work that cause health and safety risks and have the potential to harm. Some hazards are more likely to be present in some workplaces than others, and depending on the work that you do, there will be hazards that are more or less relevant to your business.

What are the most common workplace hazards?

There are many types of workplace hazards, which tend to come under four main categories:

- **physical hazards** – the most common workplace hazards, including vibration, noise and slips, trips and falls;
- **ergonomic hazards** – physical factors that harm the musculoskeletal system, such as repetitive movement, manual handling and poor body positioning;
- **chemical hazards** – any hazardous substance that can cause harm to your employees;
- **biological hazards** – bacteria and viruses that can cause health effects, such as hepatitis, HIV/AIDS and Legionnaire's disease.

Machine Guarding Safety.

Each piece of machinery has its own unique mechanical and non-mechanical hazards. Machines can cause a variety of injuries ranging from minor abrasions, burns or cuts to severe injuries such as fractures, lacerations, crushing injuries or even amputation. Machine guards are your first line of defense against injuries caused by machine operation. Each machine must have adequate safeguards to protect operators and other employees in the immediate work area from hazards created by ingoing nip points, rotating parts, sparks and flying debris.

Having an understanding of how a machine works, and how the guards can protect you, will result in a reduced risk of injury. In order to be in compliance with OSHA requirements, all guards must:

- **Prevent contact** – machine guards must provide a physical barrier that prevents the operator from having any part of his/her body in the "danger zone" during the machine's operating cycle;
- **Be secured in place or otherwise be tamper proof** – machine guards must be secure and strong so that workers are not able to bypass, remove, or tamper with them. They must be attached to the machine where possible. If the guard cannot be physically attached to the machine it must be attached elsewhere;
- **Create no new hazard** – A safeguard defeats its own purpose if it creates a hazard of its own such as a shear point, a jagged edge, or an unfinished surface which can cause a laceration. The edges of guards, for instance, should be rolled or bolted in such a way that they eliminate sharp edges. Machine guards should not obstruct the operator's view; **Allow for lubrication with the guard still in place** - If possible, one

should be able to lubricate the machine without removing safeguards. Locating oil reservoirs outside the guard, with a line leading to the lubrication point, will reduce the need for the operator or maintenance worker to enter the hazardous area.

- **Not interfere with the machine operation** - Any safeguard which impedes a worker from performing the job quickly and comfortably might soon be overridden or disregarded. Proper safeguarding can actually enhance efficiency since it can relieve the worker's apprehensions about injury.

TYPES OF HAZARDS

A wide variety of mechanical motions and actions may present hazards to workers operating or working around machinery. The three basic types of hazardous mechanical motions and actions are:

- **Hazardous Motions** – *including rotating machine parts, reciprocating motions (sliding parts or up/down motions), and transverse motions (materials moving in a continuous line);*
- **Points of Operation** – *the areas where the machine cuts, shapes, bores, or bends the stock being fed through it;*
- **Pinch Points and Shear Points** – *the area where a part of the body or clothing could be caught between a moving part and a stationary object. This would include power transmission apparatuses such as flywheels, pulleys, belts, chains, couplings, spindles, cams, gears, connecting rods and other machine components that transmit energy.*

There are also non-mechanical hazards that can injure machine operators or personnel working in the vicinity of machinery. These hazards include flying splinters, chips or debris; splashes, sparks or sprays that are created when the machine is operating. These hazards can be prevented through the use of machine guarding and wearing/use of required personal protective equipment (PPE).

METHODS OF SAFEGUARDING

There are five (5) general types of machine safeguards that can be used to protect workers and personnel in the immediate vicinity of machinery. They are:

- **Guards** – *these are physical barriers that prevent contact. They can be fixed, interlocked, adjustable, or self-adjusting.*
- **Devices** – *these limit or prevent access to the hazardous area. These can be presence-sensing devices, pullback or restraint straps, safety trip controls, two-hand controls, or gates.*
- **Automated Feeding and Ejection Mechanisms** – *These eliminate the operator's exposure to the point of operation while handling stock (materials).*
- **Machine Location or Distance** – *this method removes the hazard from the operator's work area.*
- **Miscellaneous Aids** – *these methods can be used to protect both operators and people in the immediate vicinity of operating machinery. Examples include shields to contain chips, sparks, sprays or other forms of flying debris; holding tools that an operator can use to handle materials going into the point of operation; and awareness barriers to warn people about hazards in the area.*

VIDEOS:

	How to use a fire extinguisher https://www.youtube.com/watch?v=IUojO1HvC8c
	Introduction to PPE's https://www.youtube.com/watch?v=r9vp1q1L2ro
	Health and Safety Training https://www.youtube.com/watch?v=dCOojwkWO8c
	How to Perform CPR https://www.youtube.com/watch?v=hizBdM1Ob68



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Module-2

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Module 2: Maintain Tools and Equipment

Objective: This module covers the skills and knowledge required to Maintain tools Cabinet, Arrange tool & Equipment, Calibrate measuring tools, Prepare tools for job, Clean Tools & equipment and Manage Inventory of tools and equipment.

Duration: 50 Hours

Theory: 10 Hours

Practice: 40 Hours

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
LU1. Maintain tools Cabinet	<i>Trainee will be able to:</i> • Identify the tools to be stored in the cabinet. • Identify partitions for specific tools • Place tools and equipment at appropriate place	• Identification of different Tools	
LU2. Arrange tool & Equipment	<i>Trainee will be able to:</i> • Identify Tools and Equipment • Interpret job card • Collect tools and equipment from store as per job requirement.	• Uses of tools and equipment • Understanding of Job Card	
LU3. Calibrate measuring tools	<i>Trainee will be able to:</i> • Calibrate the moisture meter • Calibrate the Vernier calipers • Record Calibration test results	• Calibration techniques • Importance of calibration	
LU4. Prepare tools for job	<i>Trainee will be able to:</i> • Collect the required tool as per job demand • Check physical condition of tools before use. • Prepare/design tools for job	• Cleaning techniques of various tools and equipment. • Sharpening techniques of cutting tools.	Nil

	• Sharp hand saw blade with triangular file • Sharp planner blade with oil stone • Sharp chisel blade with oil stone • Sharp drill bits with disc grinder machine		
LU5. Clean Tools & equipment	<i>Trainee will be able to:</i> • Check condition of tools after use. • Clean tools and equipment after use. • Lubricate main screw of bench vice/Clamps.	• Cleaning techniques of various tools and equipment.	Nil
LU6. Manage Inventory of tools and equipment	<i>Trainee will be able to:</i> • Check number of tools and equipment as per record • Report for faulty tools and equipment • Generate demand for defective tools and equipment • Maintain record of all tools and equipment.	• Knowledge of Inventory Management	

Tools and Equipment for Pine Nuts Processing:

Tool List

Cutting, assembling and finishing are the three basic cabinet-making operations. You'll need a well-tuned table saw with a sharp blade for precision straight cuts, a band saw for curved cuts and a router for shaping and making grooves. A drill makes holes and can double as a screwdriver, and you'll need clamps if you plan to do any gluing. Don't forget the measuring tools. They should include an accurate ruler, a bevel for measuring angles and a tape measure. A stationary belt sander is useful for shaping and dimensioning, but you can make do with a handheld belt sander and an orbital sander.



7 Power Tools Every Woodworker Should Have



Circular Saw



Power Drill



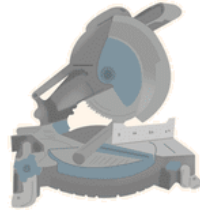
Jigsaw



Random Orbital Sander



Table Saw



Compound Meter Saw



Router

The Claw Hammer

A hammer with one side of the head split and curved, used for extracting nails.



The Tape Measure A tape measure or measuring tape is a flexible ruler. It consists of a ribbon of cloth, plastic, fiber glass, or metal strip with linear-measurement markings. It is a common measuring tool. Its design allows for a measure of great length to be easily carried in pocket or toolkit and permits one to measure around curves or corners.	
The Chalk lines A chalk line or chalk box is a tool for marking long, straight lines on relatively flat surfaces, much farther than is practical by hand or with a straightedge. It is an important tool in construction and carpentry, the working of timber in a rough and unplanned state, as it does not require the timber to have a straight or squared edge formed onto it beforehand.	
The Utility Knife A good utility knife is another asset for the woodworker. There are many different kinds, but the kind that uses disposable blades is the most common. The blade retracts into the grip for safety. The woodworker will use the utility knife when cleaning out mortise joints or scribing wood, as well as many other uses.	

The Chisel

A long-bladed hand tool with a beveled cutting edge and a plain handle that is struck with a hammer or mallet, used to cut or shape wood, stone, metal, or other hard materials.



The Level

Every woodworker needs a couple of levels. You probably won't need one of the 6-foot levels used in construction, but 48" is a good length for many of the woodworking projects you'll do. Usually, you'll also need an 8" level too, usually known as a torpedo level. You'll check the level and plumb of your construction. Level is horizontal, and plumb is vertical. Most quality levels are made of either brass-edged wood or of metal. There will be a bubble reading for level, and another one for plumb. When the bubble is exactly between the lines, you have a level or plumb surface. You can also get string levels and laser levels, but the woodworker will use these types of levels the most often.



The Screwdriver

Screwdrivers are another must-have in the woodworker's set of hand tools. Not only will you need Phillips and slot, or flathead screwdrivers, you'll need star drivers and Torx drivers, too. A quality construction is vital to a good set of screwdrivers. So many of them are made out of soft metal, and the first time you put any "umph" behind them, they strip out, becoming absolutely useless.



The Nail Set

The next hand tool every woodworker should have is a nail set. In fact, you should have several sizes. They look like awls, and you use them to drive nail heads into the wood so they are flush or right below the surface. This allows you to fill the holes and prepare for staining or painting. The nail setter will usually have either a convex or concave surface to grip the nail better and keep it from sliding off and marring the wood.



The Sliding Bevel

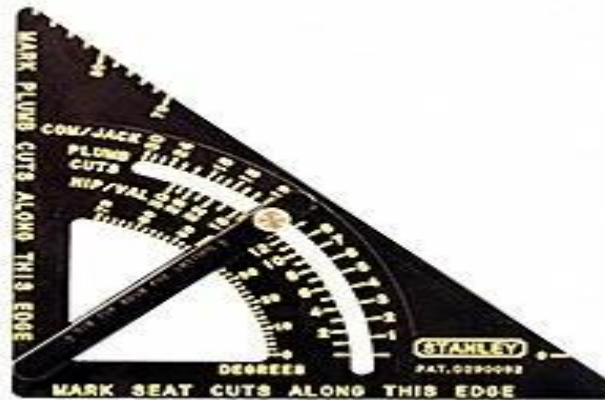
If you're going to be measuring a bunch of angles, a sliding bevel, or T Bevel, will be a handy tool. This is adjustable, and you can lock it at the angle you want to mark, making it much more time-savvy to mark multiple angles.



The Layout Square

A layout square (sometimes also referred to as a combination square) is a triangular-shaped measuring tool designed for making square marks or angles on stock.

The layout square has three major functions. First and most often, it is used for making square marks on a piece of stock. Second, a layout square has markings making it easy to determine an approximate angle of a mark or cut. Finally, a layout square allows the user to mark angles in a similar manner to the method for determining an existing angle.



The Block Plane

A block plane is the key to versatility in your woodwork. You can flatten a piece of wood, add a curve to it, or square your work. Shape or chamfer your stock using a block plane. Once you have a piece dovetailed, you can smooth the joint with your block plane, rather than spending endless time sanding. Your plane can ease the edges of a piece, taking the sharpness out of it.



The Caliper

A caliper (British spelling also caliper, or in plural tantum sense a pair of calipers) is a device used to measure the distance between two opposite sides of an object. A caliper can be as simple as a compass with inward or outward-facing points. The tips of the caliper are adjusted to fit across the points to be measured, the caliper is then removed and the distance read by measuring between the tips with a measuring tool, such as a ruler.



The Clamp

A clamp is a fastening device used to hold or secure objects tightly together to prevent movement or separation through the application of inward pressure. In the United Kingdom and Australia, the term cramp is often used instead when the tool is for temporary use for positioning components during construction and woodworking; thus a G cramp or a sash cramp but a wheel clamp or a surgical clamp.



The Hand Saw In woodworking and carpentry, hand saws, also known as "panel saws", "fish saws", are used to cut pieces of wood into different shapes. This is usually done in order to join the pieces together and carve a wooden object. They usually operate by having a series of sharp points of some substance that is harder than the wood being cut. The hand saw is a bit like a tenon saw, but with one flat, sharp edge.	
The Feather Board Feather boards are important for achieving smooth, quality cuts. You'll use a feather board with all kinds of saws and other cutting surfaces to push the material past the cutting edge. You can make your own feather boards, or purchase them instead. Most woodworkers find it easier to just make them to suit their own needs.	
The Saw Horse Saw horses, of course, are a natural in any woodworking shop or construction site. There are actually patterns available that you can use to build your own stacking sawhorses. If you build your sawhorses properly, they'll hold up to 500 lbs. apiece. They're even fairly cheap to build. Your saw horses will serve countless uses around your shop, from providing backup as you saw and drill, to extending your work surface while using power saws.	

The Work Bench

A workbench is sturdy table at which manual work is done. They range from simple flat surfaces to very complex designs that may be considered tools in themselves. Workbenches vary in size from tiny jewelers' benches to the huge benches used by staircase makers.



The Tool Storage System

Tool storage is totally up to your own personal style. Some people are just messy, and leave things piled around. They simply remember that they left the moisture meter on the router table. However, think about your organizational system. You may want to build locking cabinets or open shelves. Many woodworkers display fasteners in Mason jars that they twist into lids that have been nailed to an overhead board. Others have spent too many hours picking fasteners out of the shattered remains of Mason jars, and don't like that method.



The Power Drill

Do have their place in your shop. The steady power that comes with a corded drill makes it a better tool for extended use, especially when using large bits such as paddle bits.



The Sabre Saw

Every woodworker should have a sabre saw. Often called a jigsaw, it will allow you to cut curves and patterns in your stock materials.



The Table Saw

Now, we start getting into the first permanent fixture in your woodworking shop – the table saw. Of course, table saws can be loaded in the bed of your truck, so, technically, they're portable. But, the table saw is not one you can pick up with one hand and head to the worksite. The table saw will be the workhorse of your shop, so get a good one. You'll use it to rip, miter, shape, square, groove, and join, so a good saw that suits your needs is vital.



The Rip Fence

Your table saw should have a rip fence. You'll want one with fine-tuning adjustment that runs parallel to the blade. Some rip fences have an adjustment knob on each end of the fence, others on just one end. The main thing to look for is torque. When you move the fence, do both ends move evenly, or does the far end hand up? This can be a real problem, and you'll save yourself a lot of frustration and stock lumber if you have a rip fence that stays parallel to the cutting blade.



Tool cleaning, storage, and maintenance

In order to work safely, it is extremely important that all workshop equipment is maintained and inspected before it is used each time. Taking care of tools and equipment, and keeping them well maintained, will make them last longer before needing replacement.

Cleaning:

Tools are expensive items, so it is essential they are kept clean and in good working order. Some tools may need cleaning with high pressure air. They should be kept clean by wiping off any dirt, grease, or metal chips before being stored.

Storage:

Never leave tools lying round the workshop. Lost tools would be expensive to replace, but they may also cause damage or injury if not properly stored. After finishing the work look around in workshop or workplace if any tools are left behind and store them properly.

Small hand tools, such as screwdrivers, pliers, or spanners, can be hung on a panel or pegboard mounted on the wall. Measuring instruments, gauges, and meters should be stored where they cannot be damaged by weather or impact with other tools. Small tools may also be stored in a chest, cabinet, or tray system.

Maintenance:

If a tool or piece of equipment is damaged, it should not be used because it may be dangerous. It may damage other worker or property if used. Ensure equipment is clean and tidy. Damaged tools or equipment should not be used; they might damage other property and they are potentially dangerous. It is not acceptable to use a tool or piece of equipment that is damaged in any way.

Corrective maintenance

Corrective maintenance can be defined as a maintenance task performed to identify, isolate, and rectify a fault so that the failed equipment, machine, or asset can be restored to an operational condition within the tolerances or limits established for in-service operations.

Corrective maintenance is maintenance which is carried out after failure detection and is aimed at restoring an asset to a condition in which it can perform its intended function.

Preventive maintenance (PM) has the following meanings:

1. The care and servicing by qualified personnel for the purpose of maintaining equipment and facilities in satisfactory operating condition by providing for systematic inspection, detection, and correction of incipient failures either before they occur or before they develop into major defects.
2. Maintenance, including tests, measurements, adjustments, and parts replacement, performed specifically to prevent faults from occurring.

What is Instrument Calibration?

The process of evaluating the measurements made by the instrument to be calibrated against an instrument known to be making measurements that surpass the suitable limits of precision and correctness is known as instrument calibration. If any variation is found, then the instrument is calibrated so that it can give exact readings and values. It is common for any instrument to lose its calibration after a long period of usage. After the process of calibration, the instrument is good to use again.

Calibration is necessary for:

1. A crucial measurement
2. If the instrument has undergone adverse conditions and cannot give the right reading.
3. When the output does not match the stand-in instrument.
4. Drastic change in weather
5. Cyclic testing of instruments

When are Instruments Calibrated?

Instruments which measure length, weight, temperature, pressure etc. should be calibrated against some standard measurement at regular intervals. Methods of calibration depend on whether the instrument is calibrated regularly or only occasionally for a special task where a highly calibrated instrument is required. It is essential to get the instruments calibrated every now and then even if they are in good condition to prevent wrong measurements.

1. **Maintaining a Record** – When an instrument is being calibrated it is mandatory to maintain a record of every minute detail of the results before and after the calibration.
2. **Inspect the Documentation** – Regular inspection of the calibration process is mandatory other than just documenting the process. The changes can easily be detected if the calibration process is closely audited every single time. It is necessary to document the changes

Calibration Procedures

- The measurements acquired from the scale are compared with the measurements of the sub-standard instrument and the calibration curve is formed from the obtained values.
- If the measurements from the instruments are parallel to the substandard then it is a good enough calibration. Otherwise the readings will have to be taken multiple times.

Tools Maintenance:

The condition of your tools is important to the quality of your pieces. Your tools working correctly and efficiently add to the satisfaction of your efforts, but also ensure your safety. But it is just as importance to set up a routine maintenance program to assure everything is running correctly, are correctly sharpen, that calibration is true, and tool are clean. After purchasing a new tool make sure you keep the operating and care instruction. Some people keep them in binders, some put them in plastic sleeves, Best is to keep them in a handy drawer. Please don't ignore the following points.

- Don't ignore the maintenance instruction, tools are always running in a harsh environment. Oil that keeps a motor running smoothly attracts dust, and usually in the most inconvenient places. Proper care will keep them running efficiently, help in maintaining their new tool look, and increase their lifespan. Some tool parts need proper oiling, or lubrication, while some components of an electrically driven tool need to be kept free of dust and debris.
- Power tools require little maintenance if store in a clean, dry protected area, keeping dust and debris away from them, and protecting them from the elements. Make sure that the cord is free of cuts or abrasions. You can also check the switch to see that it is properly connected to allow current to flow to the motor. Some power tools, including routers, have a pair of brushes that might need to be repaired or replaced as they wear down over time. Double check that chucks and bits are proper tightened. Keep tools in their case when not in use and make sure there is a proper storage place for tools that do not have a protective case.
- Saws and sanders require more attention for their maintenance. The nature of the tool entails cutting or abrasive action. The cutting and abrasion surfaces wear-out and must be change or restore frequently. Flattening tool surfaces, keeping sawdust and resin buildup away from integral components, checking electronic components for sustained damage, wheel and bearings function and proper lubrication are important to proper operation and lifespan of the tools. Worn out drive belts can cause amplified vibration and slippage and will tend to break.
- Air powered tools are usually piston-driven and this necessitates lubrication. Add a few drops of pneumatic oil into the air intake coupling. Tools used daily can also be oil daily. Use of tape on threaded surfaces will keep a tight seal which avoids loss of pressure on components. Clean or replace filters depending on use of the tool, and the overall environment in which it is used.
- Always protect your tools from moisture and extremes in temperature, exposure to moisture causes corrosion on unprotected metal surfaces. Use tools as they are intended, tools are usually made for specific purposes, when they are subjected to misuse and stresses they weren't designed, they will often brake down and fail to work correctly



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Module-3

CABINET MAKER

Learner Guide

National Vocational
Certificate Level 1

Version 1 - January 2020

Module 3: Prepare Workplace / Housekeeping

Objective: This module covers the skills and knowledge required to Maintain Log yard, Dump Logs, Ensure clear passage, Manage safe Storage of allied materials and Maintain Inventory

Duration: 50 Hours

Theory: 10 Hours

Practice: 40 Hours

Learning Unit	Learning Outcomes	Learning Elements	Materials Required
LU1. Maintain Log yard	<i>Trainee will be able to:</i> • Arrange partition for logs (like soft/ hard woods) • Clear travel path • Unload logs safely.	• Cleaning Techniques of workplace • Procedure for area calculation • Safe loading/Unloading techniques of Logs/allied material/hardware	Nil
LU2. Dump Logs	<i>Trainee will be able to:</i> • Segregate logs according to: ➤ Type (soft/hard) ➤ Grade ➤ Size (Girth) ➤ Shape • Dump the Logs in proper partitions • Update Inventory of logs	• Dumping techniques of logs • Types and categories of logs • Procedure for volume calculation	Nil
LU3. Ensure clear passage	<i>Trainee will be able to:</i> • Remove waste material from the passage • Mark the passage with yellow colour strip. • Ensure safe movement of loader/trolley for transfer of logs to log band saw.	• Importance of maintaining clear passage	Nil

LU4. Manage safe Storage of allied materials	<i>Trainee will be able to:</i> • Identify location for storage of allied material. • Ensure safe unloading of allied materials. • Segregate allied material according to: ➤ Type ➤ Color ➤ Size • Perform safe storage of allied material. • Ensure easy access to allied material.	• Types of allied materials • Techniques for safe storage of allied materials & hardware	Nil
LU5. Maintain Inventory	<i>Trainee will be able to:</i> • Check Inventory. • Update Inventory.	• Procedure of inventory management	Nil

Examples and Illustrations:

Introduction:

Because timber and board materials are heavy, when accidents occur they tend to be serious. Falling timber-based materials are one of the main causes of fatalities and serious accidents within the woodworking industry. Stacked timber is often given less attention than other more obvious risks such as those from machinery. A high proportion of falling timber-based material accidents involve propped up boards or doors. Injuries occur when the mass of boards or doors topple over as an attempt is made to withdraw a single board or door.

Please find below the guidance for employers, in particular managers and other duty holders, on safe working practices for the safe stacking and storage of logs, sawn timber and board materials. Employees may also find this information of use.

Accidents Preventions:

Most accidents could be prevented by devising and following safe working practices. You should always make sure that:

- Your stacking/storage area is well organized with appropriate racking systems where necessary;
- Everybody who is involved in stacking is adequately trained and appropriately supervised;
- Safe stacking and unstacking procedures are always used – supervisors should check regularly to make sure they are being followed.

Safe stacking of logs:

The following factors will increase the risk of a stack collapsing:

- Sloping ground causing logs to slide from the stack or roll down the slope;
- De-barked logs which are slippery, particularly if recently cut;
- Logs stacked with their butt ends to one side of the stack so that the angle across the top of the stack causes logs to slide off, particularly if de-barked, see Figure 2;
- Logs stacked on soft ground sinking on one side and becoming unstable.

The most effective control measure to reduce the risk of injury from a log stack collapse is to locate log storage areas well away from pedestrian and vehicle routes. The use of a loader with grab attachments is the safest method of stacking, de-stacking and transporting logs as this avoids any need for workers to be on or near the stacks for slinging,

- The height of the log stacks should be justified by the site risk assessment. The height should however be limited to within the safe range of the grabber and take into account the cab position and the protection it has.
- The maximum stacking angles should be 45° but if it is not possible to keep stacks separate from workers then the angle should not exceed 35°.
- Wedges should be used to fix the logs and prevent them from rolling.

Stability of sawn timber stacks:

Pack quality.

We need good quality packs to build a stable stack. Packing the same size of timber together to remove internal air space and using suitable sticks to bind layers of timber together will improve pack stability. Signs of broken or loose banding, lozenging, balling and internal collapse are all signs of poor practice when producing packs. Any out-of-shape or collapsing packs should be identified before being placed in a stack otherwise they will need to be safely removed from the stack and rebuilt.

Pack quality, particularly internal stability, can deteriorate each time they are transported so try to keep this to a minimum.

If a stack is damaged and becomes unstable then it will need to be rebuilt. To do this safely you should follow these guidelines:

- Before unstacking, examine the stack to see how it was constructed and to check for signs of instability or faults such as broken bands, bearers or sticks, and pack balling. It is important to identify any packs which are bridging other stacks or packs.
- Take down packs tier by tier. Move only one at a time. Do not leave isolated single stacks. Do not remove individual pieces of timber from packs until they are on the ground and the working area is safe.
- If you need access to the top of the stack do so safely, as detailed above. It should not be necessary to work at height directly on top of the stack.

Yard management:

The yard layout should allow safe access and exit for FLT's to/from each stack. You can improve visibility by the use of fixed mirrors around the site as well as fitting them to vehicles. There must also be adequate lighting in place. The site layout should take into account the prevailing wind directions and any micro-climate conditions caused by buildings or geographical features.

Safe stacking of wood-based sheet materials

Wooden sheets generally have a standard size of 2440 x 1220 mm (or divisions of) and can range in thickness from 3 mm to 35 mm. A single 18 mm thick plywood sheet of this size weighs approximately 30 kg. It is easy to lose control of such a large heavy sheet when they are being moved. This problem is made much worse when they are stored together in a stack leaning against a wall and several sheets fall at once. You should store boards and similar flat articles (ie doors or windows) horizontally on a level surface, using suitable pallets or wood/chipboard battens. Never stack boards on edge without adequate support as they can tip out of control from a vertical position. It is common for boards that have just been delivered, and propped up temporarily, to topple before they are moved to the storage area. Tell staff, especially those receiving deliveries, about the dangers of propping boards without support and put up warning signs in the delivery area. An acceptable alternative to storing the materials flat is the 'pigeon hole' or 'toast rack' system, see

Boards are stored in compartments preventing sideways movement and allowing the removal of individual boards. This is relatively easy to construct and can often be made 'in-house', Figure 5 shows an example of a smaller racking system but it is important both types are fixed securely to the floor, marked with maximum load information and regularly checked for damage. Protect exposed corners at the ends of aisles with, for example, bollards or stanchions.

Appropriate handling aids should also be provided as part of a safe system of work for the retrieval and movement of sheets.

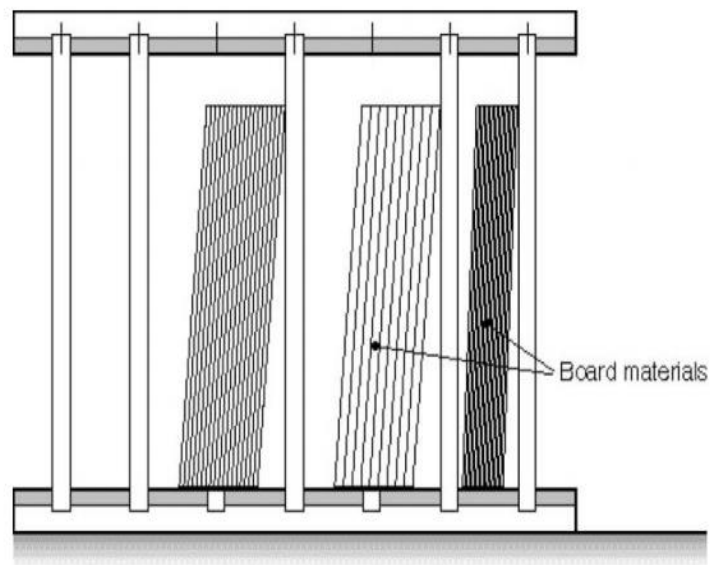


Figure 1 Pigeon Hole Stacking

General Public protection:

Timber yards can be attractive but dangerous playgrounds and children have been hurt, particularly when climbing on log stacks. Where there is a risk of public access to the stacking area, appropriate fencing should be used. Any site visitors should be directed to the reception area by clear signs. The reception area should ideally be close to the main entrance.

Personal protection: Helmets, gloves and safety footwear will normally be required to protect employees, as well as appropriate clothing for outside working. High-visibility clothing is required where there are frequent vehicle movements.

Frequently Asked Questions

1. What is Competency Based Training (CBT) and how is it different from currently offered trainings in institutes?	Competency-based training (CBT) is an approach to vocational education and training that places emphasis on what a person can do in the workplace as a result of completing a program of training. Compared to conventional programs, the competency-based training is not primarily content based; it rather focuses on the competence requirement of the envisaged job role. The whole qualification refers to certain industry standard criterion and is modularized in nature rather than being course oriented.
2. What is the passing criterion for CBT certificate?	You shall be required to be declared “Competent” in the summative assessment to attain the certificate.
3. What are the entry requirements for this course?	The entry requirement for this course is 8th Grade or equivalent.
4. How can I progress in my educational career after attaining this certificate?	You shall be eligible to take admission in the National Vocational Certificate Level-2 in Cabinet Maker. You shall be able to progress further to National Vocational Certificate Level-3-4 in Cabinet Maker Course; and take admission in a level-5, DAE or equivalent course (if applicable). In certain case, you may be required to attain an equivalence certificate from The Inter Board Committee of Chairmen (IBCC).
5. If I have the experience and skills mentioned in the competency standards, do I still need to attend the course to attain this certificate?	You can opt to take part in the Recognition of Prior Learning (RPL) program by contacting the relevant training institute and getting assessed by providing the required evidences.
6. What is the entry requirement for Recognition of Prior Learning program (RPL)?	There is no general entry requirement. The institute shall assess you, identify your competence gaps and offer you courses to cover the gaps; after which you can take up the final assessment.
7. Is there any age restriction for entry in this course or Recognition of Prior Learning program (RPL)?	There are no age restrictions to enter this course or take up the Recognition of Prior Learning program
8. What is the duration of this course?	The duration of the course work is 1,510 hrs. (11 months)
9. What are the class timings?	The classes are normally offered 25 days a month from 08:00am to 01:30pm. These may vary according to the practices of certain institutes.

10.What is equivalence of this certificate with other qualifications?	As per the national vocational qualification's framework, the level-4 certificate is equivalent to Matriculation. The equivalence certificate can be obtained from The Inter Board Committee of Chairmen (IBCC).
11.What is the importance of this certificate in National and International job market?	This certificate is based on the nationally standardized and notified competency standards by National Vocational and Technical Training Commission (NAVTTTC). These standards are also recognized worldwide as all the standards are coded using international methodology and are accessible to the employers worldwide through NAVTTTC website.
12.Which jobs can I get after attaining this certificate? Are there job for this certificate in public sector as well?	You shall be able to take up jobs in the local or overseas construction companies in heavy machinery operator job profile.
13.What are possible career progressions in industry after attaining this certificate?	You shall be able to progress up to the level of supervisor after attaining sufficient experience, knowledge and skills during the job. Attaining additional relevant qualifications may aid your career advancement to even higher levels.
14.Is this certificate recognized by any competent authority in Pakistan?	This certificate is based on the nationally standardized and notified competency standards by National Vocational and Technical Training Commission (NAVTTTC). The official certificates shall be awarded by the relevant certificate awarding body.
15.Is on-the-job training mandatory for this certificate? If yes, what is the duration of on-the-job training?	On-the-job training is not a requirement for final / summative assessment of this certificate. However, taking up on-the-job training after or during the course work may add your chances to get a job afterwards.
16.How much salary can I get on job after attaining this certificate?	The minimum wages announced by the Government of Pakistan in 2019 are PKR 17,500. This may vary in subsequent years and different regions of the country. Progressive employers may pay more than the mentioned amount. The heavy Machinery Operator normally earns 20,000 to 25,000 in the start.
17.Are there any alternative certificates which I can take up?	There are some short courses offered by some training institutes on this subject. Some institutes may still be offering conventional certificate courses in the field.
18.What is the teaching language of this course?	The teaching language of this course is Urdu and English.
19.Is it possible to switch to other certificate programs during the course?	There are some short courses offered by some training institutes on this subject. Some institutes may still be offering conventional certificate courses in the field.
20.What is the examination / assessment system in this program?	Competency based assessments are organized by training institutes during the course which serve the purpose of assessing the progress and preparedness of each student. Final /

	summative assessments are organized by the relevant qualification awarding bodies at the end of the certificate program. You shall be required to be declared “Competent” in the summative assessment to attain the certificate.
21.Does this certificate enable me to work as freelancer?	You can start your small business by purchasing your own heavy construction machine and can start earning 50,000 per month. You may need additional skills on entrepreneurship to support your initiative.

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