Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

FURNITURE & FITTINGS SKILL COUNCIL

Participant Handbook

Sector
Furniture & Fittings

Sub-Sector
Modular Furniture

Occupation
Production Wooden Furniture

Reference ID: **FFS/Q0103,** Version No. **1.0**
NSQF level: 3

Assistant Carpenter – Wooden Furniture

Published by

VIKAS®

VIKAS® PUBLISHING HOUSE PVT. LTD.

E-28, Sector-8, Noida-201301 (UP)
Phone: 0120-4078900 • Fax: 0120-4078999
Regd. Office: 7361, Ravindra Mansion, Ram Nagar, New Delhi-110055
Website: www.vikaspublishing.com • Email: vocational@vikaspublishing.com

First Edition, August 2018

ISBN 978-93-5271-242-7

Printed in India

FURNITURE & FITTINGS SKILL COUNCIL

Furniture & Fittings Skill Council
Address: 407-408, 4th Floor, DLF City Court, MG Road, Sikanderpur
Gurugram-122002, Haryana, India
Email: info@ffsc.in
Phone: +91 124 4513900

"Skilling is building a better India. If we have to move India towards development then Skill Development should be our mission."

Shri Narendra Modi
Prime Minister of India

Skill India
कौशल भारत - कुशल भारत

FURNITURE & FITTINGS SKILL COUNCIL

N·S·D·C National Skill Development Corporation
Transforming the skill landscape

Certificate

COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

FURNITURE & FITTINGS SKILLS COUNCIL

for

SKILLING CONTENT : PARTICIPANT HANDBOOK

Complying to National Occupational Standards of
Job Role/ Qualification Pack: **"Assistance Carpenter – Wooden Furniture"**
QP No. **"FFS/Q0103 NSQF Level 3"**

Date of Issuance: July 12th, 2017

Valid up to*: July 11th, 2020

**Valid up to the next review date of the Qualification Pack*

Authorized Signatory
(Furniture & Fittings Skill Council)

Acknowledgements

Furniture & Fittings Skill Council (FFSC) would like to express its gratitude to all the individuals and institutions who contributed in different ways towards the preparation of this "Participant Handbook". Without their contribution it could not have been completed. Special thanks are extended to those who collaborated in the preparation of its different modules. Sincere appreciation is also extended to all who provided peer review for these modules.

The preparation of this handbook would not have been possible without the Furniture & Fittings Industry's support. Industry feedback has been extremely encouraging from inception to conclusion and it is with their input that we have tried to bridge the skill gaps existing today in the industry.

This participant handbook is dedicated to the aspiring youth who desire to achieve special skills which will be a lifelong asset for their future endeavours.

About this book

This Participant Handbook is designed for providing skill training and /or upgrading the knowledge level of the Trainees to take up the job of an “Assistant Carpenter Wooden Furniture" in the Furniture & Fittings Sector.

This Participant Handbook is designed based on the Qualification Pack (QP) under the National Skill Qualification framework (NSQF) and it comprises of the following National Occupational Standards (NOS)/topics and additional topics.

- (FFS/N0104) Assist in furniture planning and organizing work to meet expected outcome
- (FFS/N0105) Assist in furniture making
- (FFS/N8601) Ensure health and safety at workplace
- (FFS/N8501) Maintain work area tools and machines
- (FFS/N8801) work effectively with others
- Employability and Entrepreneurship Skills

Symbols Used


Key Learning Outcomes


Activity


Summary


Tips


Notes


Unit Objectives

Table of Contents

Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

FURNITURE & FITTINGS SKILL COUNCIL

1. Assist in Furniture Planning and Basics of Wood Work

FFS/N0104

Key Learning Outcomes

At the end of this module, you will be able to:

1. Evaluate importance of Carpentry
2. Evaluate an Assistant Carpenter and his/her Role in organisation
3. Analyze the Types of Furniture
4. Analyze the Measurement Systems
5. Analyze the Tools required for Wood Working
6. Analyze the various woods and their usage in furniture
7. Evaluate the process of wood Cutting
8. Analyze the Consumables used in wood Working

Unit 1.1 Introduction

Unit Objectives

At the end of this unit, you will be able to:

1. Evaluate Carpentry and its importance
2. Analyze the role of an Assistant Carpenter
3. Analyze the various activities carried out by Assistant Carpenter

1.1.1 Carpentry and its importance

Carpentry is a skill by which wood pieces are converted in various useful articles, like – Table, chair, bed, window, door, almirah etc. No home or office is complete without wooden furniture. Carpenter is the person who does this job. This is an age-old skill, which has now evolved in technology by introduction of various special tools and equipment. Wood is also replaced by artificial wood, which is good for environment and give feeling of real wood while using. Conversion of artificial wood is also done by same wood working methodology.

Fig.1.1.1.1: Wood cutting

1.1.2 Who is Assistant Carpenter?

In Carpentry, role of an Assistant Carpenter is very important. Since lot of activities in carpentry is done by hand and no special machinery is available to hold material (except in repetitive manufacturing), hence it is required support from an Assistant Carpenter.

Woodworking requires lot of teamwork and Carpenter and Assistant Carpenter makes a small team. Success of any Carpenter is depending on their teamwork and support received from Assistant Carpenter.

An Assistant Carpenter helps Carpenter in all of his/her activities, like – Measuring, Marking, Cutting and Assembly.

Fig.1.1.2.1: Wood sizing

1.1.3 What is the role of an Assistant Carpenter?

Following are the key roles and responsibilities of Assistant Carpenter –

1. To Load / unload material related to woodworking project
2. To Pack/unpack material related to woodworking project
3. To keep all material related to woodworking project
4. To assist Carpenter for Wood Measurement
5. To organise woodworking tools
6. To fetch woodworking tools whenever required by Carpenter
7. To verify that all woodworking tools are in working condition
8. To assist Carpenter in Cutting wooden sheets
9. To assist in Safe functioning of power tools
10. To assist Carpenter in assembly of furniture
11. To assist Carpenter in furniture Finishing
12. To clean the furniture
13. To clean the work place

Unit 1.2 Types of Furniture

Unit Objectives

At the end of this unit, you will be able to:

1. Recognize various types of furniture being made from Wood

1.2.1 Types of Furniture

Our daily life is not complete without use of some type of furniture. There are many types of furniture available today. We can split them broadly in below category –

For Seating-

Chair

Sofa

Stool

Bench

Fig. 1.2.1.1: Types of Seating furniture

For sleeping:

Double bed

Cot

Fig. 1.2.1.2: Types of sleeping furniture

For Game:

Chess Table

Billiard Table

Fig. 1.2.1.3: Types of gaming furniture

For Surface:

Writing Table

Coffee table

Dining table

School Desk

Fig. 1.2.1.4: Desk type furniture

For Storage:

Cabinet

Book Shelf

Fig. 1.2.1.5: Cabinet type furniture

For Building:

Doors

Window

Fig. 1.2.1.6: Door & window

Unit 1.3 Measurement System

Unit Objectives

At the end of this unit, you will be able to:

1. Evaluate Measurement
2. Analyze measurement systems being used in the world
3. Discuss various measurement tools
4. Analyze measuring woods in length, square meter and cubic meter
5. Discuss about wood marking tools

1.3.1 Measurement

Measurement is the process of obtaining the magnitude of a quantity relative to an agreed standard. Measurement of any quantity involves comparison with some precisely defined unit value of the quantity. Standard units of measure need to be identified and defined as accurately as possible.

The Accurate measurement is the basis of good engineering and crafting practice. The accuracy of any measuring device depends on the user as much as on the design of the tool. Measuring is not only checking the length, width or thickness of objects but also checking of the shape – things like the flatness, straightness, roundness or squareness. Measuring tools are also used for inspecting a finished or partly finished product.

Measurement is required for checking the accuracy of part made, as well as creating the sketch for making a part.

All measuring tools are precision tools. You must take good care of them to keep them in good shape to maintain accuracy.

1.3.2 Measurement Systems

There are two systems of measurement. The first one is traditional system used in Carpentry is based on the English imperial system of measure; this is called FPS (also known as foot pound system). The second is called the SI system (Also known as MKS System). The metric system is an international decimalized system of measurement, first adopted by France in 1791, that is the common system of measuring units used by most countries in the world. All measuring tools have metric or imperial graduations or a combination of both. One big advantage of the metric scale is that it eliminates the necessity for a range of fractional sizes. The markings on a metric rule are every millimeter with the figures marked at 10 millimeter intervals. Fractions are not used in the SI system.

FPS (British System): In this system, the scale of measuring length is inch, foot and Gaz (Yard). In this scale, there is a unit in every inch and after every 12 inch there is a footmark. An inch is divided into 8 parts. This is called an eighth of an inch (1/8 inch)

1 Soot = 1/8 inch, 8 Soot = 1 inch, 12 inches = 1 foot, 3 feet = 1 Gaz (yard).

MKS (Metric System): In this system, the units of measurements are millimeter (millimeter), centimeter (Centimeter), meter (m) etc. The smallest unit in this system is the millimeter.

10 millimeter = 1 centimeter, 100 centimeter = 1 meter

Relation between the British System and Metric System

1 inch = 2.54 Centimeter or 25.4 millimeter

1 foot = 30.48 Centimeter or 304.8 millimeter

1 meter = 3.280 Foot = 39.370 inch

3 Foot = 1 Gaz (Yard)

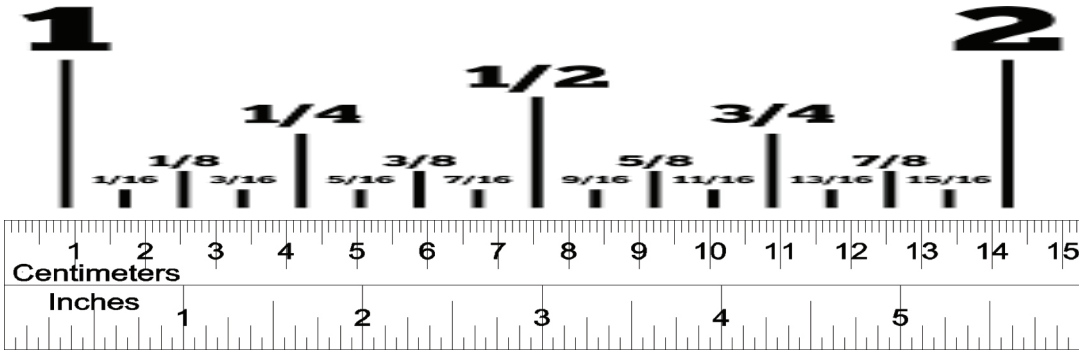
Table to convert Inch in to Millmeter

1/16” = = 1.6 Millimeter
2/16” = 1/8” = 3.2 Millimeter
3/16” = = 4.8 Millimeter
4/16” = 1/4" = 6.35 Millimeter
5/16” = = 8.0 Millimeter
6/16” = 3/8” =9.5 Millimeter
7/16” = = 11.1 Millimeter
8/16” = 1/2” = 12.7 Millimeter
9/16” = = 14.3 Millimeter
10/16” = 5/8” = 15.9 Millimeter
11/16” = = 17.5 Millimeter
12/16” = 3/4" = 19.05 Millimeter
13/16” = = 20.6 Millimeter
14/16” = 7/8” =22.2 Millimeter
15/16” = = 23.8 Millimeter
16/16” = 1” = 25.4 Millimeter

Fig. 1.3.2.1: Table to convert Inch in to Millmeter

1.3.3 Measuring Tools

Rule



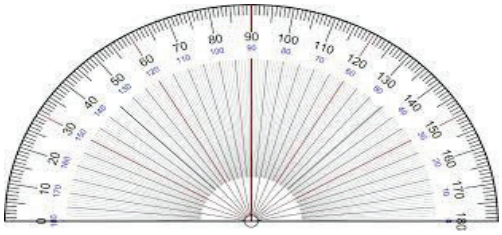
Rule

Fig. 1.3.3.1: Rule

Rule is the most common and the best-known piece of measuring equipment, for measuring linear distance. Least count for Rule is normally 1 millimeter and 1/8 inch (normally one side has Centimeters and other side has inch scale).

Protector

In geometry, a protractor is a circular or semicircular tool for measuring an angle or a circle.



Half Protector

Protector

Fig. 1.3.3.2: Half Protector and Protector

Measuring Tape

Fig. 1.3.3.3: Measuring Tape

The next important hand tool for the woodworker is an accurate **Measuring Tape**. We should have a retractable one that is at least 25 feet long. Any longer than that, and we will start having problems getting it to roll back up. Since measurements on large scale projects can be very susceptible to even the most minute measurement variations, We should make sure the "hook" or tab at the end of the is firmly attached, with no give. When they get loose, we'll have as much as 1/8" variation in your measurements. This can add up to some severe accuracy problems in the long run.

Wing Compass

This is a two-legged tool and the ends of these legs are pointed. It is used to mark arcs and circles etc. It is made up of steel.

Fig. 1.3.3.4: wing Compass

This tool is required to take indirect measurements. Measurements taken by this tool is read on the steel rule or steel tape.They are of two types –

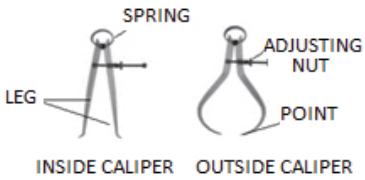


Fig. 1.3.3.5: Inside and outside of the caliper

a) Outside caliper: With this caliper, the outside measurement of wood or any object, such as the diameter of the round object, length and width etc. of the flat object
is measured. It has rounded end points.
b) Inside caliper: With the help of this caliper, the internal measurements such as the diameter of the holes, slits etc. are taken. It has two legs, which are twisted outside.

Vernier caliper is a very handy measurement instrument for length measurement till 2 point of decimal. As an example, we will learn how to read 2.13 on vernier.

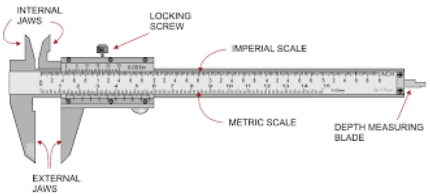


Fig. 1.3.3.6: Vernier caliper

The main scale contributes the main number and one decimal place to the reading (2.1 Centimeter)

The vernier scale contributes the second decimal place to the reading (0.03 Centimeter)

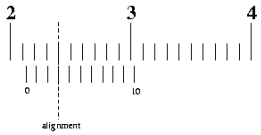


Fig. 1.3.3.7: Vernier scale

To obtain the main scale reading: Look at the image above. 2.1 Centimeter is to the immediate left of the zero on the vernier scale. Hence, the main scale reading is 2.1 Centimeter

Try Square

TryIt is used to mark or check the right angle (90 º) of the wood. It is in L-shaped. It is made of steel or wood It has only 2 main parts:- 1. Blade 2. Stock

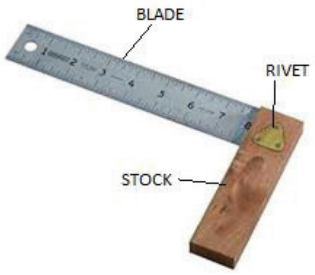


Fig. 1.3.3.8: Try Square

Miter Square

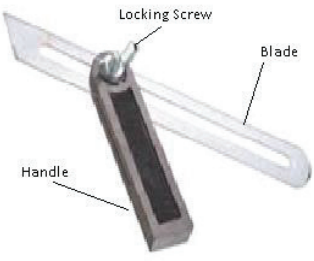
It looks like a Try Square but apart from 90 º , the angles of 45 º and 135 º angle can also be measured from this.

Fig. 1.3.3.9: Miter Square (angles *45 º)*

Fig. 1.3.3.10: Miter Square (angles *90 º)*

Bevel square

Since it looks like alphabet T it is also called as T Square. It is used to check or move not only the right angle but also different angles, it is used to make the layout or move the angles of the
dovetail, side rails of the chairs, the doors of the Louver, chamfer, etc.



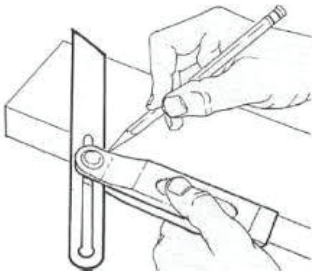


Fig. 1.3.3.11: Bevel Square

1.3.4 Methods of Measuring

There are three methods of measuring wood.

1. Running measurement - In this method, the breadth and thickness of the wooden block is not measured. Only the length is measured. The length of a wooden block measured in foot is called Running Foot and if measured in meter is called Running meter.

2. Square measurement - In this method, the length and breadth of the wooden block is multiplied. The thickness is not measured. The units of measurement in this method are square foot and square meter.

3. Cubic measurement - In this method, the length, breadth and thickness are multiplied together. The units of this method are cubic meter and cubic foot.

1.3.5 Running Meter/Running Foot

Example: - In a photo frame, there are two wooden strips; each has 50 Centimeterlength and 30 Centimeter width. Calculate the length of the wooden strip used in the photo frame.

Calculation: -

Length of a strip	= 50 centimeter
Length of two strips	= 50 x 2 = 100
Width of a strip	= 30 centimeter
Width of two strips	= 30 x 2 = 60
Total length of the strips	= 100 Centimeter
Total length of the strips	$= \frac{160}{100}$ = 1.6 meter

1.3.6 Square Meter/Square Foot

Example:- If the length and width of the wood is 210 centimeter and 120 centimeter respectively, then how much will be the sq. meter area of the door?

Calculation:-

You know that in the area of sq. meter, the length and width of the wood is considered and the thickness of the wood is ignored.

Height of the door = 210 centimeter

Width of the door = 120 centimeter

Area = Length × Width = Sq. area (Meter / foot)

Area in Centimeter = 210 × 120 = 25200 centimeter

Area in Meter = $\frac{210 \times 210}{100 \times 100}$ = 2.52 square meters

1.3.7 Measurement of the cubic

Example: - If a wooden board's length is 2.5 merter and width is 50 Centimeter and thickness 3 Centimeter, then Calulate the total quantity of wood in Cubic meter?

Calculation: -

Length of the frame = 2.5 meter

Width of the frame = 50 Centimeter

. = $\frac{50}{100}$ = 0.50 meter

Thickness of the frame = 3 Centimeter

. = $\frac{3}{100}$ = 0.03 meter

Measurement of the wood = Length x Width x Thickness

= 2.50 × 0.50 × 0.03 = 0.0375 cubic meter

1.3.8 Wood Calculation in FPS

$$\frac{\text{Inch x Foot x Foot}}{12} = \text{Square Foot}$$

$$\frac{\text{Inch x Inch x Foot}}{144} = \text{Square Foot}$$

$$\frac{\text{Inch x Inch x Inch}}{1728} = \text{Square Foot}$$

1.3.9 Marking Tools

Pencil - In India, carpenter normally use 4H Pencils, which are very hard and can write or mark almost on any surface.

Fig. 1.3.9.1: Pencil

Marking Gauge – It is used for marking parallel lines on wood. Stock and beam are its main parts. Stock is made of wood. It has a sqaure hole in which wooden beam is sliding. Stock has hole a one end. A thumb screw is fitted in it which controls beam. There is a pin on one end of beam which make marking on wood.

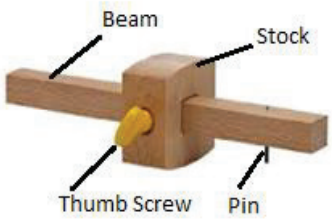


Fig. 1.3.9.2: Marking Gauge

Mortise Gauge -A Mortise gauge is made of a fence like support, which can be locked and moved on a beam for marking. It is a very common tool for marking on beam.

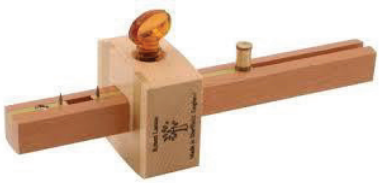


Fig. 1.3.9.3: Mortise Gauge

Scratch Awl - Scratch awl is a tool, which is used for layout and point making. It is used to scribe a line. This is basically a steel spike with its tip sharpened to a fine point. The tip of the spike is drawn across the timber, leaving a shallow groove. It is also be used to mark a point by pressing the tip into the timber.Scratch awl is normally used while doing marking. It may also be used across the grain.

Fig. 1.3.9.4: Scratch Awl

Wing Compass - This is a two-legged tool and the ends of these legs are pointed. It is used to mark arcs and circles etc. It is made up of steel.

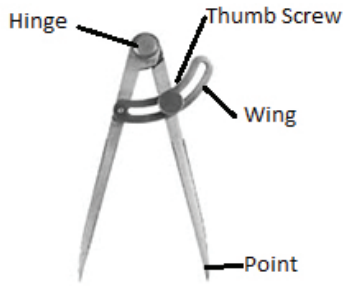


Fig. 1.3.9.4: Wing Compass

Trammel point - The Trammel point is used to draw big circles and to mark big arcs. It is a long thin wooden baton or steel rod on which there are two pointed sliding points, these pointed sliding points are tightened at the length according to the radius of the circle or arc by knurled screw. An arc or circle is drawn by one point keeping the other point at the center.

Fig. 1.3.9.5: Trammel point

Marking 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.

Fig. 1.3.9.6: Marking Knife

Marking Thread or Chalk line - 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.

Fig. 1.3.9.7:Marking Thread or Chalk line

Activity

1. Physically measuring instrument described in unit
2. Make list of instrument required for measuring all dimensions for a simple four-leg table

Notes

Exercise

Questions (Choose correct answer/s)

1. Traditional system of measurement is –
   a) FPS (Foot pound system) b) SI (MKS System)

2. Millimeter, Meter and Kilogram is part of –
   a) SI System b) FPS System

3. Ruler can be used for measuring –
   a) Minimum 1.0 millimeter b) Minimum 0.1 millimeter
   c) Minimum 0.01 millimeter d) Minimum 10 millimeter

4. Following instrument is used for transferring dimensions –
   a) Ruler b) Micrometer
   c) Caliper d) Measuring tape

5. What are the other angle, which can be measured additionally by Miter Square –
   a) 90^o and 180^o b) 45^o and 135^o
   c) 25^o and 65^o d) 35^o and 125^o

6. Following are the methods of measuring wood –
   a) Running measurement b) Square measurement
   c) Cubic measurement d) All of above

7. Angle of viewing is not important, while measuring and marking –
   a) Correct b) Incorrect

Unit 1.4 Assist in Furniture Planning

Unit Objectives

At the end of this unit, you will be able to:

1. Describe the wood Planing tools
2. Describe the wood cutting tools
3. Describe the Round cutting Saws
4. Explain the Chipping Tools
5. Explain the Striking Tools
6. Explain the Holding or tightening Tools
7. Discuss about Support Equipment
8. Discuss about Boring and Drilling Equipment
9. Discuss about Testing Equipment
10. Describe the Miscellaneous wood working Tools
11. Evaluate Power tools

1.4.1 Toolplanning

Common Planers

This is a common type of planer and with the help of this planer only the surface of the wood is planed first, Its length varies from 14 inch to 18 inch and the width of its cutter blade is 1 3/4 inch to 2 1/4 inch and over the cutter blade, there is a cap iron which is fixed with a bolt. Cutter blade is fixed at an angle of 45° to 48° in the planer blade. This planer can also be made of steel or metal.

Fig. 1.4.1.1: Wooden Planner

Fig. 1.4.1.2: Steel Planner

It is also known as cleaning planer. All its parts are similar to those of jack planer. Its length is from 6 inches to 9 inches. The width of its cutter blade is from 13/4 inches to 2 inches. Its blade is set from 45° to 50° angle. It is used on the wood after jack planer has done planning. The wood looks neater after it is used for planning.

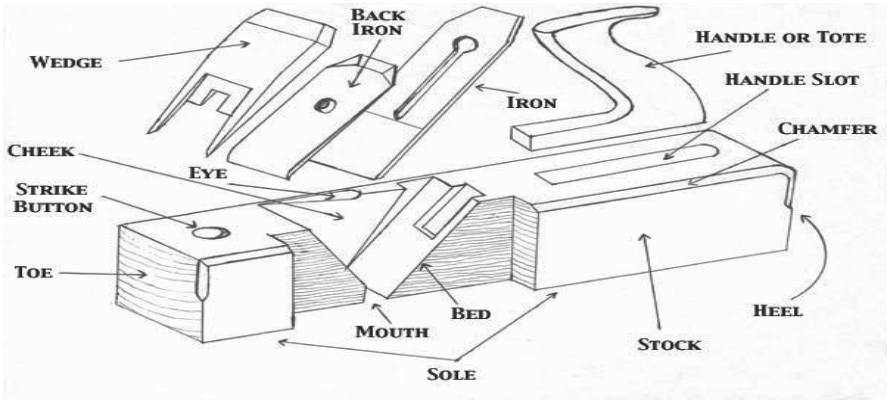


Fig.1.4.1.3: Parts of Wooden Plane

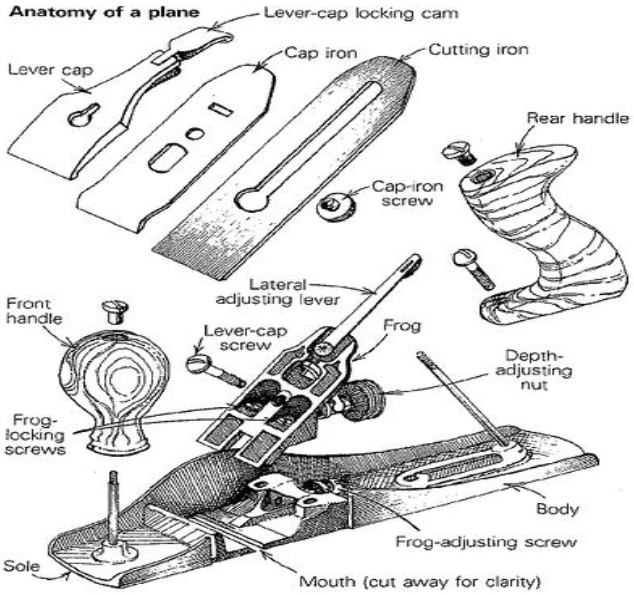


Fig.1.4.1.4: Parts of Steel Planer

Fig.1.4.1.5: Wooden Smothing Planer

Fig.1.4.1.6: Steel Smothing Planner

Trying plane

This planer is also known as the Jointer planer or the planer used to plain the edge of the long wood. Its length ranges from 20 inches to 28 inches. All of its parts are similar to those of Jack planer.

Fig.1.4.1.6: Trying plane

Plough plane

It is also known as grooving plane. Its length variesfrom 6 inches to 10 inches. The width of its cutter blade is from 1/8 inch to 5/8 inches, which can be adjusted according to the size of grooving. This planer is used to make a slot or grooving parallel to the wood. For example, to make a rebate (Patami) on doorframe that used to make a ½ inch deep slot and then with the help of Rebate (Patami) planer patami is made.

Fig.1.4.1.7: Plough plane

Special planer

Rebate Plane (Patami plane)

This planer is used to make Rebate (patami) on the wood. The length of this planer is from 7 inches to 9 inches, the width of cutter blade and Patami planer is from ½ inch to 1½ inch. These Planers are mostly made up of wood but Patami planers made up of iron and metal are also found.

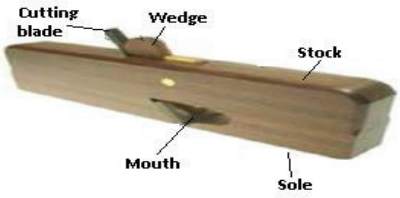


Fig.1.4.1.8: Special planer

1.4.2 MaterialGathering

Rip Saw

The length of these saw ranges from 24 inches to 28 inches. These saw are used as per the length of planks of thick wood to saw along the fibres of the wood. In these saws, there are 4 to 7 teeth in an inch. The teeth of these saws are made in such a way that they make a 90° angle with the face teeth.

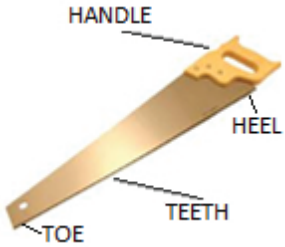


Fig.1.4.2.1: Rip saw

Cross cut saw

This saw is similar to Rip Saw but it is used to saw against the fibres i.e. to cross-saw the wood. These saws are also of the length from 24 inches to 28 inches. The teeth of these tools are 4 to 7 teeth in one inch.

Fig.1.4.2.2: Cross cut saw

Hand Saw or Panel saw

It is a combination of Rip Saw and Cross Cut Saw. It is a small saw in length. Its length normally ranges from 12 inches to 18 inches. There are 6 to 9 teeth in one inch. It works more precisely since teeth per inch are more.

Fig.1.4.2.3: Hand saw or Panel saw

Tenon Saw

It is a different kind of saw its blade has equal front width and back width. There is an iron or metal strip at the back of these saws, which does not allow it to fold. These saws are 10 inches to 16 inches long. There are 8 to 10 teeth in an inch. These saws are commonly used to cut Tenon or shoulders of Tenon.

Fig.1.4.2.4: Tenon saw

Dovetail Saw

This saw is similar to the Tenon saw. The blade of this saw is very thin. The length of this saw is less than the length of Tenon saw. Its length is from 8 inches to 12 inches and there are 14 to 16 teeth within 1 inch of the saw. Very precise work can be done by this saw. It is used to cut the Dovetail joint and socket.

Fig.1.4.2.5: Dovetail saw

1.4.3 RoundCutting (ToolUsage)

Compass Saw

The blades of this saw have lesser width. The length of these saws range from 10 inches to 14 inches and in one inch there are 8 to 12 teeth. The width of the blades of this saw is less on the front, i.e. at the toe end. This saw is used to cut wood pieces spherically.

Fig.1.4.3.1: Compass Saw

Fig.1.4.3.2: Compass Saw

Fret saw

The width of the blades of this saw is very less (about 5 millimeter). The length of this saw is from 5

inches to 6 inches. This saw can cut small curves in wood very easily. This saw is mostly used in carving. This saw is of two types, one that is manually operated and the other that runs on a machine. It is a frame saw and the blade is deeper than the frame. The depth of the frame and blade ranges from about 12 inches to 20 inches. The teeth are very fine. This saw has a straight handle.

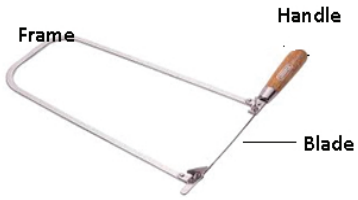


Fig.1.4.3.3: Fret Saw

Coping Saw

This saw also has a frame the depth of the frame is less than that of the blade. The blade of this saw is very thin and of a lesser width. The blade is screwed on the frame at both ends and can be replaced if broken. The length of the blade is about 6 inches. This saw is used to make curves from inside or outside the wood.

Fig.1.4.3.4: Coping Saw

Key Hole Saw

This saw is used in wooden doors to cut out keyholes. The width of the blade of this saw ranges from 3 millimeter to 10 millimeter and the length is from 6 inches to 8 inches. This is very rarely used nowadays.

Fig.1.4.3.5: Key Hole Saw

Bow Saw

This is a saw with a frame and a straight handle. The shape of this saw resembles the English alphabet "H". At the back of this saw there is a thread through the middle of which a wooden piece or lever is attached. This lever can be pulled to tighten the blade of the saw and can be loosened to loosen the blade. The width of the blade of this saw is from 3 millimeter to 10 millimeter and the length ranges from 12 inches to 16 inches. This saw is used to make the curve in the wood from outside.

Fig.1.4.3.6: Bow Saw

1.4.4 Chipping Tools

Chisel

Chisels are of two types.1. Light Duty Chisel, 2. Heavy Duty Chisel

Light Duty Chisel

Firmer Chisel This chisel is used in simple tasks by applying pressure or hitting lightly with the Mallet. This chisel is used to clean already created mortise, holes or grooves. Its Blade is about 6 inch long and 1/8 inch to 1.5 inch wide. The cutting angle of its blade is 30°. The cross section of its blade is rectangular.

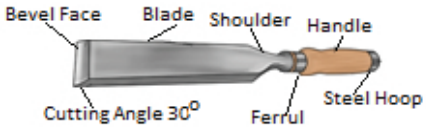


Fig.1.4.4.1: Firmer Chisel

Bevel chisel It is similar to Firmer chisel. The difference is only that the edges of this chisel are tapered. They are used to clean groove, mortise and to make dovetail. Its width is also about 1/8 inch to 1.5 inch.

Fig.1.4.4.2: Bevel Chisel

Paring chisel (long chisel)

The length of this chisel is 8 inch to 10 inch. This chisel is similar to Firmer Chisel or Bevel Chisel. The difference is only that this chisel is long. Its width is ½ inch to 1.25 inch. They are used to clean long and deep mo use.

Fig.1.4.4.3: Paring chisel

Chopping Chisel (wider chisel)

These chisels are wider. Their width is 1.5 inch to 2.25 inch. All its parts are similar to those of Firmer Chisel.

Fig.1.4.4.4: Chopping Shisel

Heavy Duty Chisel

Mortise Chisel These chisels are used to cut the mortise. The width of its blade is less at cutting edge and more towards shoulder. It is tapered in shape. The handles of these chisels are very strong. A metal ring is attached to the ends of these handles so that the handle does not break on applying a heavy blow. The thickness of its blade is more than its width. Its width is 1/8 inch to ¾ inch.

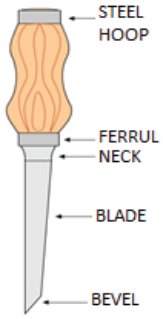


Fig.1.4.4.5: Mortise Chisel

Socket Chisel It is used to make big mortise. There is a socket instead of a tang attached to its shoulder, into which the handle is fitted. Its handle is made of a solid plastic or strong woods. This chisel is longer and stronger than Mortise Chisel. The width of its blade is 1/8 inch to 1.5 inch.

Fig.1.4.4.6: Socket Chisel

Gouges - Gouges are used in round moulding and curving. Its blades are bent inside and its cutting angle is inside or outside. Its cross section is circular.

Fig.1.4.4.7: Gouges

Firmer Gouges

These gouges, cutting edge is created by guiding the round blade from outside. The width of its blade is ¼ inch to 1.25 inch. To sharpen these gouges, slip stone is used. The cutting angle of these gouges is 25° like that of a chisel.

Scribbling Gouges

In these gouges cutting edge is created by grinding the round blade from inside.

1.4.5 Striking Tools

Ball Peen Hammer: The peen of this hammer is like a ball; hence hammer can be used for riveting work along with hitting the nail.

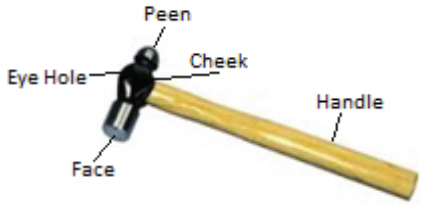


Fig.1.4.5.1: Ball peen Hammer

Claw Hammer: This hammer can be used not only to hit the nails but also to take them out. On one end of its head are claws, therefore, it is called Claw Hammer.

Fig.1.4.5.2: Claw Hammer

Cross Peen Hammer: The peen of this hammer is V-shaped towards head. This hammer is used to hit the nail in corners of wood.

Fig.1.4.5.3: Cross peen Hammer

Straight Peen Hammer: The peen of this hammer is parallel to the handle. It can be used where cross peen hammer cannot be used. It is used more in sheet metal works.

Fig.1.4.5.4: Straight Peen Hammer

Mallet: This is a type of hammer made of wood. Its main function is to hit the chisel handle and other wooden handles.

Fig.1.4.5.5: Mallet

1.4.6 Holding or Tightening tools

Bench Vice

This vice is always fitted in the working bench. It is used to hold the wood for sawing, cutting, splitting and Planing its edges. It has two jaws, one of which is fixed and the other is movable.

Fig.1.4.6.1: Bench Vice

G Clamp

The frame of this saw resembles the English alphabet "G" and is used for small tasks. The saw measures from 3 inches to 10 inches. One end of the frame has internal threads cut into it, through which a screw attached with the handle passes. The screw is fitted on the outside end of the handle. The handle has a Clamping Race. When the handle is rotated, the screw moves towards the other bent end of the frame and the object can be gripped between the gap of screw and frame.

Fig.1.4.6.2: G Glamp

T Bar Shash Cramp This clamp is long. Its length is from 2 feet to 7 feet. Big frames and models are glued and clamped in it. Frames of windows are clamped by this clamp and then dowel pin is inserted after making a hole in it, which makes the joint tight and strong. The cross section of this bar is rectangular. It is made of bar steel and there are equidistant holes in it.

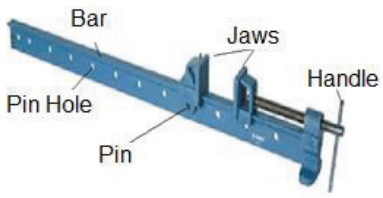


Fig.1.4.6.3: T Bar Shash Cramp

1.4.7 Support Tools

Working Bench

This bench is very important in workshops. It is a veryheavy and solid type of bench. Many jobs are done bykeeping wood on this bench, for example planing the wood, sawing the wood, etc. Vice is also fixed on this bench. The length of this bench is 8 feet. Its width is 3 feet and height is 2' 6" inch. Its size can be reduced or increased as per nature of the work.

Fig.1.4.7.1: Working Bench

The Saw Horse

Sawhorse isalso a natural fixture 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. 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.

Fig.1.4.7.2: Saw Horse

Bench Hook

It is a rectangular piece of wood. It has 1x1x7 inches wooden baton is there on the opposite edges. Its length is 10 inch, width is 8 inch and thickness is ¾ to 1 inch. It is used to cut the Tenon shoulder and cut small pieces.

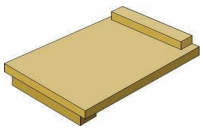


Fig.1.4.7.3: Bench Hook

Mitre Box or Mitre Block

It is used to cut the wood at an angle of 45°. It is used to cut borders of photo frames, moulding of frames and doors at 45° angle.Keeping at 45° in this box cutting can be done by a saw right up to the bottom. Moulding or borders are kept in the box and cut at 45°.

Fig.1.4.7.4: Miter Box

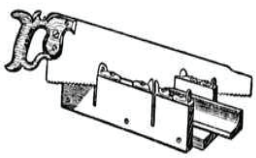


Fig.1.4.7.5: Cutting With Miter Box

1.4.8 Boring and Drilling Tool

Bradawl It has only two parts, Blade and Handle. It is used on soft wood and when shallow holes and screw holes are to be done. By applying pressure to the handle, holes are made.

Fig.1.4.8.1:Bradawal

Gimlet It is also known as Girmit. It is used to make deep holes of 10 millimeter to 50 millimeter diameter. It has a handle. It is around 2 feet long. It stip is helical and then shack has twists upto 3 inch to 5 inch.

Fig.1.4.8.2: Gimlet

Auger It is a hand tool used to make big and deep holes to insert bolt etc. into it. The shack is twisted up to considerable length. Its tip is also helical. To make a hole in the wood, wood is kept on the ground and Auger is moved towards a single direction. As hole is cut wood filings come out automatically.

Fig.1.4.8.3: Auger

Centre Bit It is used to make shallow wide holes. In the centre of the bit there is a helical point, which becomes footing for making a hole in the wood. Its spur or scriber which is on the edge of the hole to be made makes a marking. Then the cutter completes the hole. It is available in sizes varying from 3 to 50 millimeter.

Fig.1.4.8.4: Centre Bit

Expansion Bit An adjustable cutter is there in this wit. By adjusting it, holes of many shapes can be made. There is a helical centre point in it as well, which makes footing for making a hole. Holes of 12 millimeter to 75 millimeter diameter can be made on the wood with it.

Fig.1.4.8.5: Expantion Bit

Counter Sink Bit

It is used to make a hole to fit countersink bit. To get the head of the screws in the same level of the wood, its cutting edge is conical in shape and cutting flutes are made on it. They are available in 6 to 20 millimeter size.

Fig.1.4.8.6: Counter Sink Bit

Special Wood working Drill bits

Fig.1.4.8.7: Special wood working drill bit

Hand Drill It is also a type of machine which is used to make a hole in the wood. It is made of iron and there is a gear wheel attached to it having teeth. It has a handle, by moving which, drill chuck is rotated. It has two handles. One handle is held firmly and another handle is rotated. It makes small and thin holes in the wood.

Fig.1.4.8.8: Hand Drill

Country Drill (Desi Barmi) It has been used since many years ago by our native Carpenters. It is used only in India. A wooden stick with a rope attached to it is used in it. It is made of wood.

Fig.1.4.8.9: Country Drill

Plain Brace There is a crank in this hand drilling chuck. By rotating the crank the drill chuck rotates. It looks like English alphabet U. Its U crank is made of iron or steel. There is a handle in the middle and a head knob at the top. This knob is pressed with one hand and the handle is rotated with the other hand. Into the jaws of drill chuck on the other part, drill bit is fixed.

Fig.1.4.8.10: Plain Brace

Hole Cutter Saw This is used for install circular lock and is fixed in drill chuck of Drill machine.

Fig.1.4.8.11: Hole Cutter Saw

Hinge Boring Drill Bit This bit is used for fixing concealed hinges and mostly this is used with dia 35 millimeter

Fig.1.4.8.12: Hinge Boring Drill Bit

1.4.9 Testing Tools

Spirit Level This is used to measure the straightness and proper state of a vertical or horizontal surface. It is made of wood or aluminum and it has two spoil level tubes – one vertical and the other horizontal, which are filled with spirit. The tube is not filled completely with

spirit due to which a bubble forms. This bubble of the spirit level shows us if a surface is perfectly level or not. When this is placed on a vertical or horizontal surface, if the bubble is at the center position, it means that the surface is perfectly level.

Fig.1.4.9.1: Spirit Level

Plumb Bob It is also known as a Plumb. It is used to measure the straightness of a vertical surface. It is conical in shape and made of iron or metal. The pointed part is kept at the bottom and in the center of the top part a rope or thread is tied and at the end of this thread there hangs a thin wooden or iron piece. The thread is tied through the center of this piece. The length of this wooden or iron piece is equal to the diameter of the conical part.

Fig.1.4.9.2: Plumb Bob

Try Square It is used to measure the right angles of wood pieces.

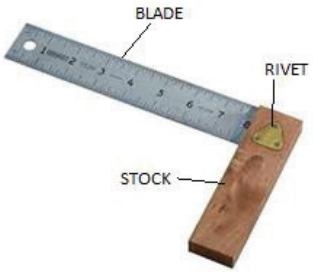


Fig.1.4.9.3: Try Square

Miter Square This is used to measure the 45º angles of wood piece.

Fig.1.4.9.4: Miter Square

Water Level Pipe This is a transparent ½ inch thick long pipe, which is filled with water. It is used to check the level of a horizontal surface.

Fig.1.4.9.5:Water Level Pipe

Straight Edge This is used to check the straightness of long wood pieces.

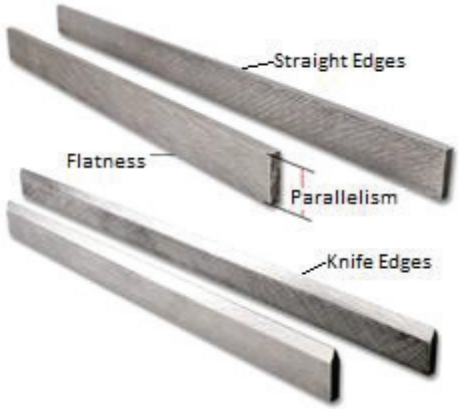


Fig.1.4.9.6: Straight Edge

Chalk line 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 for 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. If Chalk Line tool is not available, then we carpenter normally draws straight lines by the action of a taut nylon or similar string that has been previously coated with a loose dye, usually chalk. The string is then laid across the surface to be marked and pulled tight. Next, the string is then plucked or snapped sharply, causing the string to strike the surface, which then transfers its chalk to the surface along that straight line where it struck.

Fig.1.4.9.7: Chalk LIne

1.4.10 Miscellaneous Tools

Pincer This is also called a "Jamur" in Hindi. It is used to pull out nails from wood and also to cut wires and nails. It is made of iron. Before using it to pull out nails from a wooden surface, a piece of wood should be kept below the nose of the pincer so that the wooden surface does not get damaged.

Fig.1.4.10.1: Pincer

Screwdriver

It is used for tightening or loosening the screws. It is of several types such as -

Standard screwdriver The shank of the screwdriver is made of a steel rod and handle is made of wood or insulated material.

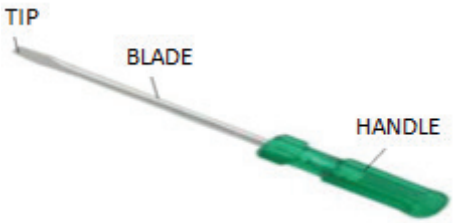


Fig.1.4.10.2: Screwdriver

Fig.1.4.10.3: Standard screwdriver

Heavy Duty Screw Driver This screwdriver is used for heavy work. A spinner is needed, to rotate the shank of this screwdriver.

Fig.1.4.10.4:Heavy Duty Screw Driver

Philips Screw Driver

The head of the Philips screws are of the shape of the plus sign (+). The Philips screwdriver is used to tighten or loosen such screws. The head of this screwdriver has the shape of the plus sign.

Fig.1.4.10.5: Types of screw driver

Nail Punch It is made of high carbon steel and is cylindrical in shape. It does not have sharp point; rather the points are pointed outwards. It is used to push in nails that have been hammered to wooden surfaces. For example, if we use a smoothing plane on a wooden surface, the cutter blade of the plane may get damaged or may get blunt. So before using a plane, a Nail Punch is kept over the nails and hammered into the wooden surface and then the plane is used.

Fig.1.4.10.6: Nail Punch

Saw Setter This is the instrument, which isused for tuning of saw blades.

Fig.1.4.10.7: Saw Setter

Oil Stone This is used to sharpen chisels and the blades of smoothing planes. This process is called Honing. Normally, it has once side coarse grade and other side fine grade

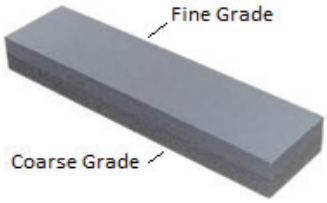


Fig.1.4.10.8: Oil Stone

Rasp File It is used for woodwork. It has embossed sharp teeth those are not aligned. It is made of hard carbon steel.

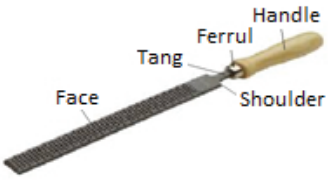


Fig.1.4.10.9: Rasp File

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.

Fig.1.4.10.10: Utility Knife

Tinner snips Tinner's snips, also known as tinner snips or tin snips, are one of the most popular type of snips. They are defined by their long handles and short blades. They usually have extra wide jaws and are made of drop forged carbon steel. Depending on the size of the blade, tin snips can cut between 24 and 16 gauge cold rolled low-carbon tin. They can be ranged in length from 7 to 14 inch (180 to 360 millimeter) long. There are two main types: straight-pattern and duckbill-pattern. Straight-pattern are best for straight cuts, but can handle gentle curves. Duckbill-pattern snips, also known as trojanpattern snips, have blades that taper down from the pivot to the tip of the blades. The blade edges are also bevelled to more easily cut curves and circles or shapes. They are a lighter duty snip that can only cut up to 25 gauge mild steel.

Fig.1.4.10.11: Tinner Snips

1.4.11 Power Tools

A power tool is, technically, anything that requires electrical power to function. First we will discuss about portable electric tools –

Portable Machines - They are smaller machines that run on electricity. They are used in carpentry or in making furniture. The use of these machines results in labor and time saving.

Portable Drilling Machine - This drill machine runs on electricity. It has a small motor that has a drill wheel at its end. It is of two types: (i) Light Duty, (ii) Heavy Duty

Light Duty Drill Machine – It is used in making small holes and in other lighter works. Generally these aresingle speed machines.

Fig.1.4.11.1: Light Duty Drill Machine

Heavy Duty Drill Machine – It is used in making larger holes. It has different speeds.

Portable Electric Circular Hand Saw

This is a smaller version of the Table Circular Saw, which can be used by carpenters to cut wood by holding them in their hands. Using this, cutting can be done along the fibers and also through them. It is used in Straight cutting of wood, rebate cutting and various other Wavell cuttings. Using this, you can cut a 2-inch thick wooden block.

Fig.1.4.11.2: Portable Electric Circular Hand Saw

Portable Electric Zig saw Machine

This machine has thin and long blades which move up and down when the machine is powered on. The teeth are bent downwards and there is a strong handle for gripping the machine. This machine is used for straight cutting as well as round and zig zag cuttings.

Fig.1.4.11.3: Portable Electric Zig saw Machine

Portable Router Machine

This machine has a drill wheel. It can be used with different types of moulding beats. It can be used in moulding, rebating, motorizing and detailing work also.

Fig.1.4.11.4: Portable Router Machine

Portable Power Planner Machine

This is a small smoothing plane machine. Inside this the blade cutting block is screwed tight. This achine can be used in smoothing of wooden blocks as well as in taking out the fillings. This can be used in smoothing woods as well as in rebating and chamfering.

Fig.1.4.11.5: Portable Power Planner Machine

Nail gun

A nail gun or nailer is a type of tool used to drive nails into wood or some other kind of material. It is usually driven by, electromagnetism, compressed air (pneumatic). Nail guns have in many ways replaced hammers as tools of choice among Carpenters.

Fig.1.4.11.6: Nail gun

1.4.12 Other Power Tools

The Palm Sander

A good palm sander is vital to any woodworker's power tool collection. The palm sander will use ¼ sheet of sanding paper, and is small enough to get into tight places. However, you should be careful not to sand patterns into your finished work with the palm sander. They usually move in a circular pattern, or back and forth. Either way, they can leave swirls and streaks in your wood that show up once it is stained, so be sure to keep it moving across the surface you are sanding so that you don't sand grooves into your wood.

Fig.1.4.12.1: Palm Sander

The Random Orbital Sander

A random orbital sander is improved version of 'palm sander'. The random orbital sander uses hook and loop (Velcro) to fasten the sanding disks to the sanding pad. The random movement of the disk helps to avoid sanding patterns into your wood. Your main precaution with this tool is to make sure that you have study source of all size grit discs. Since it is not very easy to get all size discs.

Fig.1.4.12.2: Random Orbital Sander

The Table Saw

This is a permanent fixture in woodworking shop. It isused to rip, miter, shape, square, groove, and join, so a good saw that suits your needs is vital.

Fig.1.4.12.3: Table Saw

The Compound Miter Saw

A miter saw can be set to bevel up to 45 degrees, and will cut at a 60 degree angle in both directions. The miter gauge on saw should be easy to read and clearly marked. There should be hard stops at each major point, such as 0, 15, 22.5, 30, and 45. These degrees should be stopped on both sides. Not only that, but we should be able to lock the saw at any angle we wish.

Fig.1.4.12.4: Compound Miter Saw

The Band Saw

Band saw is used for cutting precise shapes and curves. But, apart from that the band saw is a powerful tool when cutting rabbets and tenons. You can also rip small pieces of wood and even make your own laminate strips with a band saw. There are freestanding, or cabinet band saws and table mount models that you can attach to a workbench or a dedicated stand. The freestanding models are usually bigger, sturdier saws that have more features. They also have larger motors.

Fig.1.4.12.5: Band Saw

The Drill Press

While most holes can be drilled with power drill, there will be applications in your woodworking where a drill press will be required. The drill press provides you, with the ability to do precision drilling, and deliver especially accurate large-diameter holes. One of the best features of a drill press is the ability for you to set the depth of the hole. This is especially useful when you have a number of holes you need to drill, all to the same depth. The drill press also allows you to use forstner bits, hole saws, and spade bits, drilling wide diameter holes to depths that would be very difficult to drill by hand.

Fig.1.4.12.6: Drill Press

The Surface Planer

The surface planer is high-tech's solution for a Carpenter. The time saving surface planer makes your work much simpler. The planer has a table onto which you feed your stock. This table is between 10" and 14", so that's the maximum width of stock you can send through. A set of blades rotate, cutting the wood as it is fed through.

Fig.1.4.12.7: Surface Planer

The Shop Vacuum Cleaner

You may not think of a Vacuum Cleaner as a woodworking tool, but as soon as you start working with saws, sawdust will start flying in air and into your eyes. There is one optionthat you get a vacuum system installed in your shop, which is very costly. This is much like the home vacuum cleaner that has outlets in every room of the house. You just take a hose with you from one room to the other, plug it in, and the vacuum does its job, taking everything to the central vacuum receptacle.

Fig.1.4.12.8: Shop Vacuum Cleaner

Activity

1. Observe and write difference in jack planner and smoothing planner.
2. Observe no. of teeth in different type of hand saws
3. Observe sharpening of chisel.
4. Observe different type of tool storage and find out the best way of storage.
5. Observe difference between 5V and 15 V power socket.

Notes

Exercise

Choose correct answer/s

1. Planer Cutter blade is fixed at angle of –
   a. 45° to 48° b. 65° to 68° c. 25° to 28° d. 35° to 38°

2. Rip Saw is having length of 24 to 28 inches, having _____teeth per inch –
   a. 4 to 7 b. 7 to 9 c. 9 to 11 d. 11 to 15

3. To use Cross Saw, it requires –
   a. 1 persons b. 2 persons c. 3 persons d. 4 persons

4. Claw hammer can take out the nails also –
   a. Correct b. Incorrect

5. To hit nail in corners, we use –
   a. Claw Hammer b. Mallet
   c. Cross Peen Hammer d. Straight Peen Hammer

6. To check the level of surface _____ is used –
   a. Plumb bob b. Try Square
   c. Miter Square d. Spirit Level

7. Pincer or 'Jamur' is used for –
   a. Pulling nails from wood b. Cut wires
   c. Cut nails d. All of above

8. Oil Stone is used for
   a. Sharpening chisel and cutting blades b. To keep oil
   c. Boring d. Striking

9. Which Plane should be used for good finishing at wooden surface
   a. Trying plane b. Jack Plane
   c. Smoothing plane d. Compass Plane

10. Mortise Chisel is used for –
    a. For Tenoning b. For Mortising c. For Boring d. For Planing

11. Compass Saw is used for –
    a. Round cutting / Sawing b. Straight cutting / Sawing
    c. Cross cutting / Sawing d. None of above

12. Miter Square is used for marking of 45 degree angle -
    a. Correct b. Incorrect

13. Carpenter should use Nail Head for pressing _____under Wood Surface –
    a. Nails b. Nail Punch c. Chisel d. Marking Gauge

Unit 1.5 Understanding Wood

Unit Objectives

At the end of this unit, you will be able to:

1. Underline different wood and terminology used for wood
2. Underline the Process of making wood workable
3. Describe the types of natural wood
4. Describe the types of manmade wood
5. Describe the types of wood used in furniture
6. Evaluate different Wood properties

1.5.1 Brief Overview of Wood

We acquire wood from trees. Trees can be divided into two types according to their growth:

Endogenous - The trunk and hoop of these trees grow towards the inside, like bamboo, date palm, banana etc. This type of wood is used very rarely in carpentry work and in making furniture.

Exogenous - The trunk and hoop of these trees are on the outside, like teak, rosewood, Kail etc. This type of wood is widely used in carpentry work and in making furniture. Exogenous trees are of two types:

(a) In-deciduous - These trees have long and pointy leaves and are evergreen. Wood from these trees is generally soft. They are mostly found in hilly areas. It includes trees like dyar, pine etc.

(b) Deciduous - These trees shed their leaves in spring. They have wide leaves. The wood of these trees is hard and is widely used in carpentry work and in making furniture. Teak and rosewood are the main trees of this type.

1.5.2 Transforming Tree in to Wood

Cutting trees and transforming them into different shapes :

After cutting down, trees are transformed into different sizes by cutting them again in different ways using machines. After cutting, trees are named in different ways as per their sizes.

Log

Trees are cut from their stems. After being cut, these stems are called logs.

Fig.1.5.2.1: Log

Bulk

After logs are cut in squares, it is called bulk, in which it is easier to keep the wood in piles.

Fig.1.5.2.2: Bulk

Sleeper or slab

When the wood is cut in widths of 25 Centimeter or 12 inches and thickness of 5 Centimeter to 15 Centimeter, whatever is the length of the wood, that pieces of wood are called sleepers or slabs.

Fig.1.5.2.3: Sleep or slab

Planks

If the wood is cut in sizes of a width of almost 20 Centimeter and thickness less than 5Centimeter irrespective of the length of the wood, then it is called a plank.

Fig.1.5.2.4: Planks

Batten

Small pieces of wood with sizes of 5 Centimeter to 10 Centimeterwidth and thickness of less than 10 Centimeter, irrespective of the length, are called batten.

Fig.1.5.2.5:

1.5.3 Types of Wood

Furniture wood provides color, texture, strength and beauty to furniture - whether it's home furniture or office furniture. There are different types of wood for furniture making. Wood properties differ from one type of wood to another type of wood. The wood which is required for making wooden beds or outdoor furniture must be more durable as compared to the wood used for making smaller decorative items like wooden mirror frames. All types of woods are divided into two broad categories- hardwoods and softwoods.

1.5.4 Types of Furniture Wood

Each type of wood has its own individual characteristics, grain and color, which distinguishes one type of wood from another. Following the various wood types for making different furniture:

1.5.5 Different Types of Hardwood

Mahogany is finely grained wood with reddish brown color. It is highly durable and can resist swelling, shrinking and warping. This type of wood extensively used for quality furniture such as wooden cabinets, boat construction, wood facings and veneers.

Fig.1.5.5.1: Mahogany

Walnut has fine texture and is strong, easy to work with. It resists shrinking and warping and can take all types of finishes very well. It is mostly used for making gunstocks, solid and veneered furniture, novelties, cabinetry and wall paneling.

Fig.1.5.5.2: Walnut

Oak has a good bending quality, apart from being durable. It finishes well and resists moisture absorption. Oak is good for furniture, trimming, boat framing, wooden desks and flooring.

Fig.1.5.5.3: Oak

Maple is a fine textured wood with immense strength and hardness. With moderate shrinkage, maple machines well and is best used in flooring, fine furniture and woodenware such as bowling alleys.

Fig.1.5.5.4: Maple

Cherry is close-grained wood and as resists warping and shrinking. It gets red when exposed to sunlight. It ages well and is extensively used in cabinet making, boat trim, novelties and solid furniture handles.

Fig.1.5.5.5: Cherry

Rosewood is close-grained hard wood with dark reddish brown color. It has an exclusive fragrance. It is hard to work upon and takes high polish. It is good for making musical instruments, piano cases, tool handles, art projects, veneers and furniture.

Fig.1.5.5.6: Rosewood

Teak is a hard and moisture- resistant wood. It resists warping, cracking and decay and is best used in fine furniture, paneling, shipbuilding, doors, window framing, and flooring and as a general construction wood.

Fig.1.5.5.7: Teak

Shesham is also known as Indian Rosewood and is a rich medium brown wood with deep grains. It is a fast-growing hardwoods and the functional furniture made from it can deal with everyday stresses and strains without losing its attractive appearance. It is highly durable, easily carved and is exclusively used for making furniture, particularly almirahs and cabinets.

Fig.1.5.5.8: Shesham

Meranti It is light yellow colored wood. It is easy to work on this wood because it is softer. It is used in making wooden panels, doors, windows etc.

Fig.1.5.5.9: Meranti

Sal wood This is very hard and heavy kind of wood. It does not catch termites. It is very hard to work with this wood and giving a good finishing, since its surface is very hard. It is not used in making furniture. It is only used in making panels, etc.

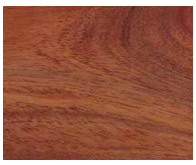


Fig.1.5.5.10: Sal wood

1.5.6 Types of Softwood

Pine has a uniform texture and is very easy to work with. It finishes well and resists shrinkage, swelling and warping. It is widely used in house construction, paneling, furniture, and molding and for making wooden boxes.

Fig.1.5.6.1: Pine

Hemlock is lightweight and machines well. It is uniformly textured and has low resistance to decay. It is mainly used for construction lumber, planks, doors, boards, paneling, sub flooring and crates. s surface is very hard. It is not used in making furniture. It is only used in making panels, etc.

Fig.1.5.6.2: Hemlock

Fir is uniformly textured and has low resistance to decay. It is non-resinous, works easy and finishes well. Fir is used for making furniture, doors, frames, windows, plywood, veneer, general millwork and interior trim.

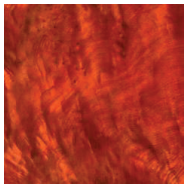


Fig.1.5.6.3: Fir

Redwood is light, durable and easy to work with. It has natural resistance to decay and is good for making outdoor furniture, fencing, house siding, interior finishing, veneering and paneling.

Spruce is a strong wood that finishes well and has low resistance to decay. It possesses moderate shrinkage and is light. It is a good option for making spares for ships, aircraft, crates, boxes, general millwork and ladders.

Fig.1.5.6.4: Spruce

Cedar is a reddish wood with sweet odor. It is very easy to work with, uniform in texture and is resistant to decay. Cedar is extensively used in chest making, closet lining, shingles, posts, dock planks, novelties and Venetian blinds.

Fig.1.5.6.5: Cedar

Kail Wood This kind of wood is found in the heights of the Himalayas. The color of this wood is white and light red. It is a weaker kind of wood. It has more bales on it and is oily. It is used in rough work like making baton of partitions, etc. It is also lighter in weight.

Fig.1.5.6.6: Kail Wood

1.5.7 Other Woods

There are many other different types of wood that are made by wooden sheeting. These various types of wood are available in thickness ranging from 4 millimeter to 24 millimeter.

MDF (Medium Density Fiber Board) is made from powdered wood bonded with glue and compressed to form the sheets. It is quite soft and very easy to work with. It cuts, sands and finishes very easily. It is used widely for interior projects especially for cupboards and shelving.

Fig. 1.5.7.1: Medium Density Fiber Board

Chipboard (Particle Board) is made like MDF but from actual wood chips. It is used widely for kitchen furniture for which it is covered with a laminate. It is also used widely for low cost flooring.

Fig. 1.5.7.2: Medium Density Fiber Board

Plywood is made from thin laminates of wood glued together. Each layer is at right angle to the grain of the other. It is very strong but also quite flexible, especially if there are thinner sheets. It is used widely in the building industry.

Fig. 1.5.7.3: Plywood

Veneer is a very thin sheet of wood. It has a thickness of 4 millimeter and 6 millimeter. It is used in furniture finishing. It comes generally in the size 8x4.

Fig. 1.5.7.4: Veneer

Decoration laminate sheet It is generally known as sun mica. It is a decorative, artificial and strong sheet. It is glued on plywood boards. It increases the beauty of furniture and the finishing is quite nice. It has a thickness of 0.5 millimeter to 1.5 millimeter and is available in the size 8x4.

Fig. 1.5.7.5: Decoration laminate sheet

Block Board: In this board, about 25 wide pieces are placed together between two thin layers of hard wood and joined using high pressure. It is widely used in making furniture, cabinets, wardrobes, etc. it has a thickness of 19 millimeter to 40 millimeter. Flush door is also a type of block board. It is available in sizes of 8x4, 7x4, 6x4, 6x3, 7x3 etc.

Fig. 1.5.7.6: Block Board

Edge Banding Tape 0.8 to 2 millimeter PVC This tape is used in the corners and edges of the doors of cabinets and wardrobes. This tape has a thickness of 0.8 millimeter to 2 millimeter and is available in every color. This tape can be fixed on Edges manually or with the help of Machines. In today's Modular furniture this is used & has replaced the earlier concept of wooden margins.

Fig. 1.5.7.7: Edge Banding Tape 0.8 to 2 millimeter PVC

1.5.8 Wood Properties

Some types of wood are very hard and durable and some are flexible enough to be bent. Furniture wood types like "Hardwood" is one of the common types of wood, which is obtained from trees that lose their leaves in winter. Another types of wood for furniture, the "Softwood" is obtained from evergreen trees like fir, pine and redwood. All the woods fall between ranges from very soft to very hard.

Activity

1. Physically observe different types of wood described in Chapter.
2. Based on wood properties, list down types of wood to be used in various household woodwork
3. Physically observe different types of wood defects described in Chapter.

Notes

Exercise

Choose correct answer/s)

1. The process of drying wood is called, Seasoning –
   a. Correct b. Incorrect

2. The wood which is best for making furniture, is –
   a. Teak b. Shisham
   c. Mango d. Marandi

3. What is the edge banding tape –
   a. Wood b. PVC Tape for Edge
   c. Glue d. None of above

4. The wood used in Door and window framing, is –
   a. Walnut b. Oak
   c. Teak d. Cherry

5. Which one is the Softwood in below listed woods –
   a. Teak b. Sal
   c. Rosewood d. Cedar

6. Which one is not a solid wood in below listed woods –
   a. Block Board b. Teak
   c. Redwood d. Mango

7. The wood used in Wooden desk and furniture, is –
   a. Walnut b. Oak
   c. Maple d. Cherry

Unit 1.6 Wood Cutting

Unit Objectives

At the end of this unit, you will be able to:

1. Demonstrate how to collect drawing / Preparing sketch
2. Demonstrate how to do Measurement and Marking on wood
3. Demonstrate how to do Wood cutting
4. Identify Cutting Angles as per Wood

1.6.1 Measurement and Marking of Wood for Cutting

Step-1 Measure the Wood for marking

Step-2 Do Marking on Baord

Step-3 Check Squarness of Board

Step-4 Cut wood after marking

1.6.2 Wood Cutting

When you build projects, you have to cut long wood pieces in to smaller ones. The straight cuts you make are either rip cuts or crosscuts.

Rip Cut

A rip cut reduces the width of a piece of stock. On a board, it's a cut along the length in the direction of the grain. On plywood and other sheet goods, it's a cut parallel to the sheet's long side, no matter the direction of the grain. Ripping stock to width is usually the first machining step in building a project.

Fig. 1.6.2.1: Rip Cut

Cross Cut

After stock has been ripped to the desired width, it's cut to length with a crosscut. This is done across (perpendicular to) the board's grain or in the narrow dimension of plywood and other sheet goods. Parts of the same length should be sawed at the same time (especially with power saws) using a stop. A stop is a piece of wood clamped in place so the stock being cut won't move beyond the required length. Using a stop eliminates re-measuring.

Fig. 1.6.2.2: Cross Cut

Tool selection for Cutting is individual's choice, based on comfort of use. We will learn to use various cutting tool for wood cutting –

Ripping with a Portable Circular Saw

A portable circular saw makes ripping boards fairly easy. Support the board with 2x4s underneath and clamp a guide in place. A kerf splitter behind the saw keeps the board from closing and binding the saw blade.

Fig. 1.6.2.3: Ripping with a Portable Circular Saw

Ripping with a Table Saw

On a table saw, reduce the chance of kickback during ripping by using a feather board ahead of the blade. To keep your hands away from the blade, feed the board with a push stick. Never reach over the blade or between the blade and the fence.

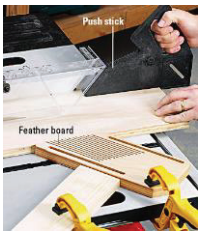


Fig. 1.6.2.4: Ripping with a Table Saw

Ripping with a Circular Saw

A circular saw can rip-cut even a large sheet of plywood accurately if you use a long traightedge securely clamped to the wood to guide the saw. Place supports under the sheet as shown.

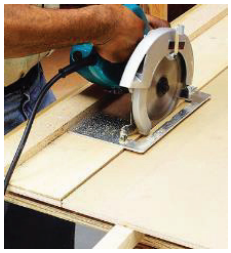


Fig. 1.6.2.5: Ripping with a Circular Saw

Cutting Large Plywood Sheets

Safely cutting large sheets of plywood on a table saw requires a second pair of hands. The helper holds the sheet level without lifting or pulling as you feed the other end through the blade.

Fig. 1.6.2.6: Cutting Large Plywood Sheets

Crosscutting with a Portable Circular Saw

First support the wood on both sides of the cut. Then tightly clamp a piece of scrap wood to the work piece along the cut line to act as a saw guide. Hold the board firmly as you make the cut.

Fig. 1.6.2.7: Crosscutting With a Portable Circular Saw

Crosscutting on a Table Saw

Use the saw's miter gauge, which rides in a slot as it carries the board through the blade, not the rip fence. For even greater accuracy, lengthen the face of the miter gauge by fastening a piece of square, true scrap wood to its face.

Fig. 1.6.2.8: Crosscutting on a Table Saw

Crosscutting with a Handsaw

Clamp a piece of scrap wood on the cut line as a blade guide. For a smooth cut, use long, even strokes and gentle pressure. Short, fast, jerky strokes can leave you with a rough cut -- or, even worse, a bent and ruined saw.

Fig. 1.6.2.9: Crosscutting with a Handsaw

1.6.3 Angled and Curved Cuts

Angled and curved cuts are used for different purposes from rip cuts and crosscuts, which separate materials. Angled cuts are used mostly in the early stages of making joints. Curved cuts shape wood decoratively.

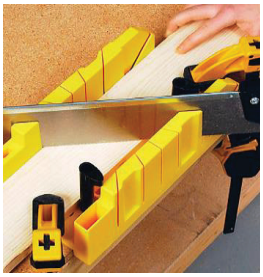
Fig. 1.6.3.1: Angle and curved cut

A miter is probably the most common type of angle cut. A miter usually is made at 45 degrees in order to join two pieces of wood at a 90-degree angle, as in the corner of a picture frame. Cutting an accurate miter is more difficult than it looks because even the slightest movement of the wood or shifting of the cutting tool will throw it off.

Bevels are angle cuts along the edges or ends of boards, often for decorative purposes. Use a sliding bevel gauge to copy and transfer unusual angles.

1.6.4 Miter Cuts Steps

Step-1 Place the Part after marking



Step-2 Make the Cut with even Smooth and storke

1.6.6 Miter Cuts Steps Details

Miter Cuts: Step 1

Use a miter box to cut a miter. Mark the cut line, place the work piece in the box, and align the cut line with the corresponding notches. Clamp the piece flush with the edge of the miter box that's farthest from you as you saw.

Miter Cuts: Step 2

Make the cut with smooth, even strokes. Get the cut started with a couple of pull strokes, then use gentle, even pressure and cut on the forward stroke. Keep the saw level, especially when finishing the cut, or you will saw through the floor of the miter box.

1.6.6 Miter Cut with Other Machines

Miter Cuts with a Portable Circular Saw

To use a portable circular saw for making a miter cut, clamp the work piece in place, draw a cut line, and then hold a saw guide next to the saw's bottom plate to steady the saw.

Fig. 1.6.6.1: Miter Cuts with a Portable Circular Saw

Miter Cuts on a Table Saw

On a table saw, cut short miters with the help of the miter gauge. Set the gauge, place the wood against its fence, and then feed the stock smoothly through the blade using the miter slot.

Fig. 1.6.6.2: Miter Cuts on a Table Saw

Miter Cuts with a Miter Saw

With a power miter saw, set the degree angle of the saw, position the board, and make the cut. A compound miter saw allows you to tilt the saw head as well as angle it.

Fig. 1.6.6.3: Miter Cuts with a Miter Saw

1.6.7 Steps for Setting Bevel Cut from Workpiece

Step-1 Recording Angle from Part

Step-2 Setting the blade angle

Step-3 Setting the blade angle on Table Saw

1.6.8 Details of Steps for Setting Bevel Cut Angle

Step1- Record the Angle

At some point you may have to cut a bevel on a work piece to match an existing angle. Record the old angle with a sliding bevel gauge that adjusts and locks by turning a wing nut. You can use it to transfer both inside and outside angles.

Step2 - Set the Angle

To transfer a beveled angle to a portable circular saw, unplug the tool and turn it over. Loosen the footplate, put the gauge in place, tilt the footplate to the desired angle, then retighten the foot plate. Set the blade depth to cut through the material.

Step3 - On a Table Saw

To transfer an angle to a table saw, loosen the arbor lock, place the gauge against the blade, and turn the tilt wheel until the angle of the blade aligns with the angle of the gauge.

1.6.9 Steps for Cutting Curved Cut

Step-1 Trace the Curve on Wood

Step-2 Cut the Curve by Jigsaw

1.6.10 Details of Steps for Cutting Curved Cut

Step 1 - A jigsaw easily follows curved and rounded pattern lines for scrolling cuts. If you have a pattern to follow, trace it onto a piece of cardboard, and then cut it out to make a template. Use the template to transfer the pattern to the wood by drawing a cut line with a pencil.

Step 2 - Clamp the work piece securely to your workbench, making sure the saw's blade won't cut into supporting surfaces. You might need to make a partial cut, then reposition the work piece and re-clamp it before continuing to make the cut.

1.6.11 Wood Cutting Angle

Where tool edge touches individual wood fibers, cutting is actually breaking of grains. The point of the edgepushes against the wood fibers with enough force that they get separated, roken into two pieces.

A cutting edge focuses all the power driving the tool at its point. And because a sharp edge contacts only a small amount of the wood surface, the resistance remainsin a small area. The sharper the point, the lower the resistance, and the lower the force neededfor cutting. The wood fibers separate near a narrow line made by the path of the tool, and the cut surface madeeven and smooth.

A dull and blunt tool makes contact with a larger surface area. Due to that, there will be more resistance and it will need more power to cut. The fibers break along a wider, poorly defined line, and the cut is ragged.

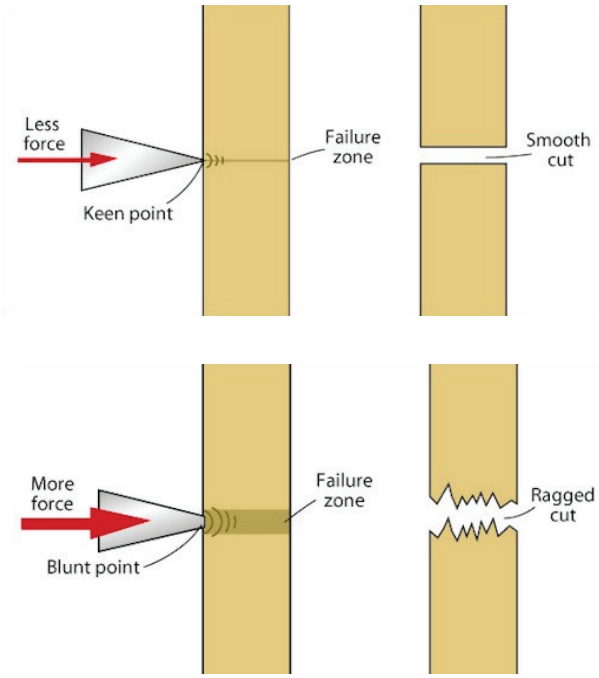


Fig. 1.6.11.1: Wood cutting

1.6.12 Cutting Edge Geometry

Sharpness isn't the only attribute that affects the cut. The angle at which the tool is sharpened, the angle at which it attacks the wood, and the shape of the cutting edge also determine how a tool cuts.

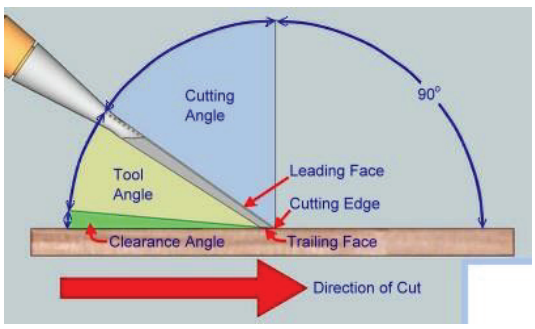


Fig. 1.6.12.1: Geometry Cutting Edge

1.6.13 Tool angle

Every cutting edge has a leading face and a trailing face. The angle between the two is the tool angle — the smaller the angle, the less force required to cut. Small tool angle reduce the "wedge effect' of the tools -- they displace less material as they are driven into the wood and therefore require less force. But if the angle is too small, there's too little metal to buttress the cutting edge and it wears quickly. It may even break or buckle.

1.6.14 Cutting Angle

The angle at which the cutting edge meets the wood — the cutting angle — is measured from an imaginary line perpendicular to the wood surface. This, more than any other angle, controls how the tool cuts. At a large cutting angle, it lifts the wood fibers as it cuts them; at a small cutting angle, the tool compresses the fibers, and then shears them off.

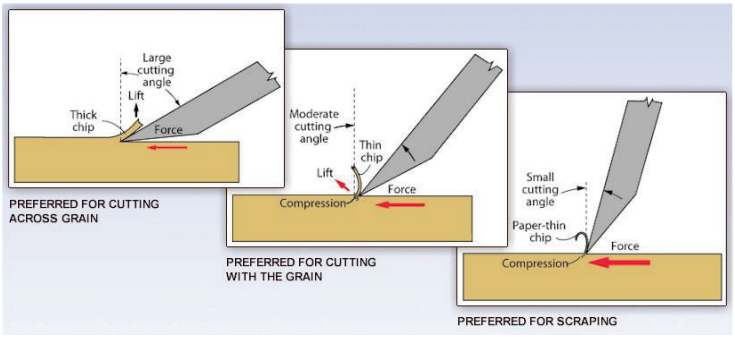


Fig. 1.6.14.1: Cutting Angle

Because it's more difficult to compress fibers than lift them, the force required removing a given amount of wood increases as the cutting angle decreases. Consequently, you must either supply more force or take thinner shaving.

1.6.15 Clearance Angle

The angle between the trailing face and the work is the clearance angle. The size of this angle is not particularly important as long as there is one. Without a clearance angle, the cutting edge will not contact the wood. The absence of a clearance angle is often the reason; you cannot cut wood when you are working with an improperly sharpened tool or an extremely dull tool.

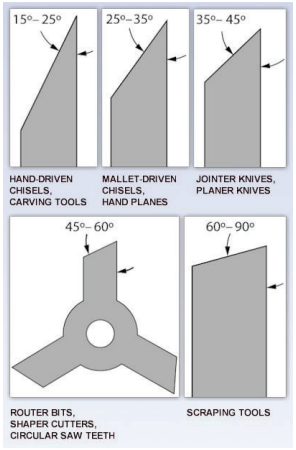


Fig. 1.6.15.1: Clearance angle

1.6.16 Cutting Angle for Softwood and Hardwood

Normally Cutting angle is set at 30º in all cutting tools. This is more suitable for hardwoods such as oak. This degree is almost always used on hand chisels and hand planes. It is also used for many removable high-speed steel knives on planers; joiners and some saw blades. However, this angle is very steep for working on softwood such as pine or fir. For Softwood, we need a lower angle, such as 40º.

When a knife is introduced into the face of wood at high speed it lifts up wood fibers. If the blade angle is set properly, the planer will produce long, curly shavings of wood. If the angle is too sharp, such as 30º, it digs deeper and breaks the shavings into pieces resulting in chips instead of long curls. This also causes pits in the surface of the wood, known as blowout. Blowout is difficult to sand off and can even ruin the finish on wood. When softwoods are run through a planer set at 40º, the shavings will be curls and the face of the freshly planed wood will be smoother without any blowout.

Activity

1. Write down steps for marking a 15 x 15 inch piece from a 20 x 20 inch board
2. Write down steps for cutting a 15 x 15 inch piece from a 20 x 20 inch board
3. Make List of Measuring and marking instrument required for above activity.

Notes

Exercise

Choose correct answer/s)

1. It is a good practice to use same measuring tape throughout a project –
   a. Correct b. Incorrect

2. To cut many pieces from a board, first we should draw all pieces, then start cutting –
   a. Correct b. Incorrect

3. A Rip cut reduces width of a piece of stock –
   a. Correct b. Incorrect

4. A stop (in carpentry), is a piece of wood –
   a. Assist in cutting similar length wood pieces
   b. Assist in stopping the cutting
   c. Assist in stopping the machines
   d. Non of above

5. Most common angle for miter is –
   a. 25º b. 35º
   c. 45º d. 55º

6. A blunt or dull tool can produce a smooth cut –
   a. Correct b. Incorrect

7. Small tool angle will require less cutting force –
   a. Correct b. Incorrect

8. Small cutting angle will require less cutting force –
   a. Correct b. Incorrect

9. Normal Cutting angle for Hardwood, is –
   a. 10º b. 20º
   c. 30º d. 45º

Unit 1.7 Consumables Required for Woodworking

Unit objectives

At the end of this unit, you will be able to:

1. Evaluate various types of consumables used in Woodworking
2. Evaluate the adhesives used in woodworking

1.7.1 Arrangement of Consumable

There are various consumables are required to be used in assembly. Some are following –

Nails, Screws, Hinges, Fittings, Door Bolt, Handle and knob, Drawer and channel set, Locks, Adhesives, etc.

We will discuss these in detail.

1.7.2 Nails and Screw

To give additional strength to wooden joints nails and screws are used.

Nails - Nails are generally made of mild steel. According to their use, nails are of different types:

Wire Nail - These nails are made by, cutting mild steel wires. After that, its sharp point and head is made. In most carpentry work, these nails are used on wood of length 1/2 inch to 6 inches. The thicknesses of these nails are measured in gauge and range from 20 no. to 10 no.

Fig. 1.7.2.1: Nail and Screw

Panel Pin - These nails are thin and its structure is similar to that of the wire nail. It comes with or without head. They are 1.2 inches to 1½ inches long. It is used in small and minute works. It has gauge no. 17 to no. 20.

Fig. 1.7.2.2: Nail and Screw

Black Nail - These are small black nails with length of ½ inch to 1 inch. It is used to fit nets on wooden doors and windows and also used sometimes on leather.

Fig. 1.7.2.3: Black Nail

Wiggle Nail - These are made by, cutting corrugated sheets. Its edges are plain or jagged. These nails are like iron strips. These are used in strengthening the joints of the ends of packing cases and joining flush doors to the frame. They are available in lengths of ¼ inch to 2 inch.

Upholstery Nail - These are small nails of round wires, with a head shaped like a big ome. It is mostly used in chairs, putting leather, resin etc. on car seats.

Fig. 1.7.2.3: Wiggle Nail

Screw - Screws are like nails that has threads cut at half of its length and it's head has a slot that can be used to open or tighten the screw by using tip of the screwdriver on it. Screws are classified as per their heads.

Fig. 1.7.2.4: Screw

Counter Sunk Head Screw - These screws are widely used in carpentry work. The head of this screw is flat or plain. This is used in doors and windows to fix hinges and other fittings, joining the seats to a chair etc.

Fig. 1.7.2.4: Counter Sunk Head Screw

Round Head Screw (Pan Head) - The head of this screw is round on the outside and the lower part is flat. It is rarely used in woodworks.

Fig. 1.7.2.5: Round Head Screw (Pan Head)

Oval Head Screw - It is a combination of counter screw and round head screw. This screw is used to fix metal fittings on wood.

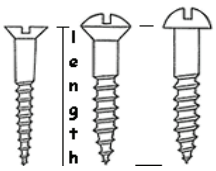


Fig. 1.7.2.6: Counter Sunk Head Screw

Philips Screw - The head of this screw has a slot shaped like the plus sign. To open or close this screw a Philips Screw Driver is required.

Fig. 1.7.2.6: Philips Screw

1.7.3 Hinge

Butt Hinges - These hinges are mostly used in carpentry and in furniture work. These hinges have two flaps that are joined together by a pin. They are mostly used in doors and windows.

Fig. 1.7.3.1: Butt Hinges

Piano or Continuous Hinges - They are thin-stripped hinges and the width of the flaps is less. They are long and can be cut as per requirement. These hinges are used in wardrobes, cabinets, beds etc.

Fig. 1.7.3.2: Piano or Continuous Hinges

Parliament Hinges - The shape of these hinges resemble the English letter "H". By using these hinges, the doors and windows can be opened at a length from the frame.

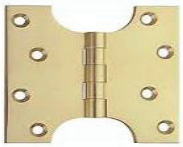


Fig. 1.7.3.3: Parliament Hinges

T Hinges - The shape of these hinges resembles the English letter "T". One flap of this hinge is like the Butt Joint and the other flap is long and oblique. These hinges are used in flapped or planked doors or in heavy doors.

Fig. 1.7.3.4: T Hinges

Spring Hinges - These hinges have a spring in them, due to which the doors fitted with this hinge can automatically close. These hinges are mostly used in offices. They can be either of one side opened/closed or both sides opened/closed.

Fig. 1.7.3.5: Spring Hinges

Concealed Hinges - These hinges are widely used in the modern age. They are mostly used in wardrobes, cabinets, modular furniture etc. After using this, wall catchers and magnets are not required.

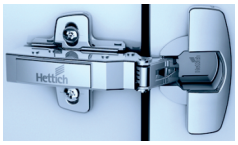


Fig. 1.7.3.6: Concealed Hinges

1.7.4 Fittings used in carpentry work

AL Drop - It is made of iron. The diameter of the bar is about 12 millimeter to 19 millimeter. They have two or three clamps. They are fitted in doors.

Fig. 1.7.4.1: AL Drop

J-Bolt - It has a bar that resembles the English alphabet "J". It has a iron strip that is bent on both sides. It is mostly used in bathroom and kitchen doors.

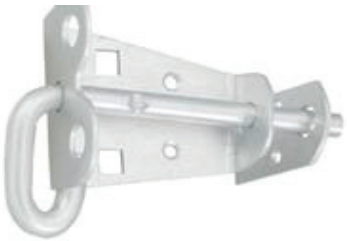


Fig. 1.7.4.2: J-Bolt

Hasp & Staple - It is mostly used in the covers of chests.

Fig. 1.7.4.3: Hasp & Staple

1.7.5 Door Bolt

Door bolts are used to close doors and windows from inside. Door bolts are of many types -

Straight door bolt - It is made of iron or metal. It has a totally straight bar called Shute, which closes the door bolt. It is bent on one end. This bar or Shute slides on a strip. One end of the door bolt is fitted on the side of the frame. This is called a staple. The other end is fitted on the door, which is the main part of the door bolt. They are 4 inches to 10 inches in length.

Fig. 1.7.5.1: Straight Door Bolt

Flush Bolt -This bolt is fit equally as per the surface of the door or window. It is 2 inches to 8 inches in length.

Fig. 1.7.5.2: Flush Bolt

Self-Acting Bolt - This bolt is small in size and used in small doors and ventilators.

Fig. 1.7.5.2: Self-Acting Bolt

1.7.6 Handle & Knob

Handle - Handles are used to open doors and windows. Handles are available in market in sizes ranging from 4 inches to 12 inches in length. They are made of iron, steel, brass or other metals. Handles are of different types like chest handles, drawer handles, flush handles etc.

Fig. 1.7.6.1: Handle

Knob - Often knobs are used in place of handles. They look very nice. They are used in wardrobe doors, drawers and cabinet doors. These screws are tightened twice. They are made of iron, brass, glass or other metals.

Fig. 1.7.5.2: Knob

Magnet Catcher - They are used to keep wardrobe or cabinet doors closed. They keep the doors closed. They have a magnet between two iron strips.

Fig. 1.7.5.2: Magnet Catcher

1.7.7 Drawer Channel or Set

Channel and Runner - These channels are used on both sides of the drawer. But sometimes, channels are fit below the drawer as well as under mount runners. By using these, the drawer can easily slide. They are available in market in sizes of 8 inches to 28 inches. These runners are available in Silent System also.

Fig. 1.7.7.1: Channel and Runner

1.7.8 Locks

To close a door temporarily, different types of locks are used. For securing the house, it is necessary to put locks on the doors. There are different types of locks:

Pad Lock - These locks are of the hanging types. This type of lock is used in doors having L Drop, J Bolt and Hasp & Staple.

Fig. 1.7.8.1: Pad Lock

Mortise Lock - These locks are fitted by, cutting a mortise on the edge of the door. This lock fits completely in the door. It has a stocking plate, which is fit in front of the doorframe, and when closed the lock bolt and latch bolt fits into this stocking plate and locks the door. It has a separate handle that controls the lock's latch bolt through a hole. The keyhole is also in the handle.

Fig. 1.7.8.2: Mortise Lock

Rim Lock - These locks are fitted inside the door. These locks are similar to Mortise Locks, but they don't have handles.

Fig. 1.7.8.3: Rim Lock

Drawer Lock - In these kinds of locks, a slot is cut in the upper side of the surface and fit inside the door. From the outside only the keyhole is visible.

Fig. 1.7.8.4: Drawer Lock

1.7.9 Adhesives

Role of adhesive is very important in carpentry. It is used to join two surfaces together without any mechanical device, i.e. nails, hammer etc. It gives very good finish. Once joined, it becomes one part.

There are many type of adhesives, which can be used as per requirement of job -

Glue – It is also called adhesive. it is used in joining wood. It is used, by mixing with water. But nowadays, it is used very less. It is obtained from animals, vegetables, etc. It has to be prepared before using.

Poly-vinyl adhesive emulsion (PVA) - It is a white colored thick fluid. It is also a kind of glue. It can be used to join wood, plywood, sun mica etc. easily. After applying, it has to be kept pressed down for 3-4 hours. After that the joint becomes very strong. This glue is available in market under the brands named Fevicol, Vemicol, etc. It is available in ready-made form. It has a long life. According to use, it comes in various forms like MR, SH.

Fig. 1.7.9.1: Poly-vinyl adhesive emulsion

Solvent Rubber Adhesive (SR) - It is available in market in ready-made form. It is applied using a brush. It has to be applied on both surfaces to be joined and kept for 15 to 20 minutes. This dries the surfaces and then they are pressed together for a strong join.

Fig. 1.7.9.2: Poly-vinyl adhesive emulsion

Activity

1. Observe different Wood joining consumables
2. Observe different type of door bolt being used in woodworking
3. Observe different type of Mortise and Drawer locks.

Notes

Exercise

Choose correct answer/s

1. _____is not a consumable for furniture –
   a. Nail b. Screw
   c. Hinge d. Plier

2. _____ is a fitting in Carpentry –
   a. Lock b. Screw Driver
   c. Nails d. Screw

3. _____is widely used wood screw –
   a. Counter-sunk Screw b. Round head Screw
   c. Philips head Screw d. All of above

4. Concealed Hinge is used in –
   a. Cabinet b. Main Doors
   c. Windows d. None of above

5. Rim Lock is not having handle in them –
   a. Correct
   b. Incorrect

6. Mortise lock is fitted in door by cutting a mortise –
   a. Correct b. Incorrect

7. While using _____ part should be kept for 15-20 minutes before joining them –
   a. PVA adhesive b. AR Adhesive
   c. Both a & b d. None of above

8. Which is an accessories –
   a. Pad Lock b. Hammer
   c. Jack Plane d. Chisel

Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

FURNITURE & FITTINGS SKILL COUNCIL

2. Assisting Carpenter in FurnitureMaking

Unit 2.1 Assisting Carpenter in Woodworking Activities

Unit 2.2 Handling Material

Unit 2.3 Sharpening of Wood working tools

Unit 2.4 Cleaning and Maintenance of Tools

FFS/N0105

Key Learning Outcomes

At the end of this module, you will be able to:

1. Demonstrate how to Assist Carpenter in various woodworking activities
2. Practice How to Handle material in Carpentry shop
3. Identify Woodworking Tool Sharpening

Unit 2.1 Assisting Carpenter in Woodworking Activities

Unit Objectives

At the end of this unit, you will be able to:

1. Demonstrate how to assist Carpenter in Measurement
2. Demonstrate how to assist Carpenter in Organising Tools
3. Demonstrate how to assist Carpenter in Safely storing Tools
4. Demonstrate how to assist Carpenter in for fetching Tools
5. Demonstrate how to assist Carpenter in checking Tools working condition
6. Demonstrate how to assist Carpenter in holding wooden sheets while working
7. Demonstrate how to assist Carpenter in wood cutting
8. Identify power source and how to use them.
9. Practice how to Carry cut wooden sheets and other furniture parts
10. Practice how to assist Carpenter in furniture assembly
11. Practice how to assist Carpenter for furniture finishing
12. Practice how to maintain oil and grease equipment
13. Identify ways of cleaning furniture and work place

2.1.1 Assisting in Measurement

Measurement is very critical activity in Carpentry. Total project can fail if measurement is not done properly. Since wood pieces are big, hence Carpenter needs support of assistant Carpenter for measurement.

Fig. 2.1.1.1: Taking Measurement

Carpenter needs assistance for –

1. Fetching the measurement tools
2. Fetching wood or wood sheet
3. Lying the wood or wood sheet at appropriate place
4. Holding the wood or wood sheets.
5. Holding the measuring Tools, while he or she does marking on wood
6. Marking on wood, while he or she hold measuring equipment

2.1.2 Organising Tools

One of the most critical thing for which Carpenter is depending on Assistant is Tool organisation. Any carpenter expects that Assistant should take good care of the tools and should make available whenever required.

Fig. 2.1.2.1: Organising Tools

Tool storage is totally up to Carpenter's personal style. But, It is always good to build locking cabinets or open shelves.

A toolbox may be a good solution to hand tool storage, and a tackle box can be used for fasteners. Some carpenters have hardware store-style bins for the many pieces that accompany woodworking.

Fig. 2.1.2.2: Toolbox for woodworking

However you can choose any method to organize your tools and accessories, only remember one thing that your time on task is aided when you can find all of your tools on time. It's also easier to take care of expensive equipment when you have easy access to it. And keeping your fasteners sorted and easily accessible may save precious time during project.

Shadow Board

This is refined version of Board. It has shape of tools to be hanged on board. In this way, it is easier to hang tool after use at its place. Also we would know about missing tool, immediately.

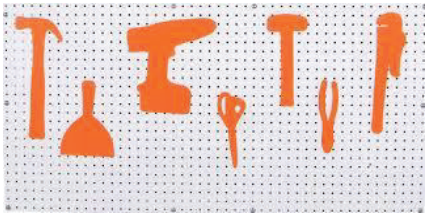


Fig. 2.1.2.3: Shadow Board

2.1.3 Safe Storage of Tools

The basic idea behind Safe Tool storage is –

- They should not touch with each other, hence no damage to edge or tool
- They should not get rusty

- They should not lost or taken away without knowledge (in case of team environment)

Edge or Tool Protection

The storing location of tool should be such that one tool should not touch with other tool. Since Edge of Tool is very brittle (due to hardness), it is prone to damages very easily. Hence proper edge cover should be used. If edge covers are not available, then edge should be wrapped in Cloth.

Rust Protection

Every time after using the tool, it should be cleaned and oiled with appropriate lubricant before storing. It will keep them safe from rust. We also need to ensure the storage location is free from water ingress, which may cause rust to metal part and damage to wood also.

2.1.4 Fetching Tools

As explained earlier, one of the main roles of Assistant Carpenter is too fetch tool for Carpenter. For doing this effectively, the Assistant Carpenter should have knowledge of woodworking tools being used by the Carpenter.

The tool organisation should be in control of Assistant Carpenter, so that he or she know that which tool is kept where.

2.1.5 Checking Tools working condition

As explained earlier, one of the main roles of Assistant Carpenter is too fetch tool for Carpenter. For doing this effectively, the Assistant Carpenter should have knowledge of woodworking tools being used by the Carpenter.

The tool organisation should be in control of Assistant Carpenter, so that he or she know that which tool is kept where.

2.1.6 Holding Wooden sheets while working

It is very much necessary that somebody should hold the sheet tight and right, while carpenter is cutting. Apart from that Carpenter needs help in hold wood pieces while cutting or doing some other operation. There should be good coordination between Assistant Carpenter and Carpenter for precision Woodworking.

Fig. 2.1.2.1:Holding Wooden Sheets

2.1.7 Assisting in Wood Cutting

Similarly Assistant carpenter is required for cutting big wood pieces and sheets in to smaller one as per requirement of Drawing and project. He should know how to operate cutting tools like hand Saws and Powered saws.

Fig. 2.1.7.1: Poly-vinyl adhesive emulsion

2.1.8 Switching On and Off Power Switch

This is very critical role of any Assistant Carpenter. It is not only switching on and off the power switch based working condition. Assistant carpenter should know about difference in various power sources, like – 5A and 15A sockets. Also he or she should know the power rating of machine to be connected with the source, so that it is not getting connected to wrong source of power.

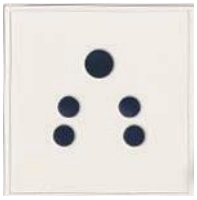


Fig. 2.1.8.1: Power point

2.1.9 Carrying wooden sheet s and furniture parts

Once wooden parts are cut, they need to be stored properly at one place before assembly is done. The parts should be carried in such way that they should not get damaged by dropping on floor or by touching each other.

Assistant carpenter should also take care of his safety while carrying these pieces by wearing appropriate gloves and safety shoes.

2.1.10 Assisting Carpenter for furniture Assembly

A carpenter requires help for assembling furniture in various forms, like –

- For dry fitting
- For holding parts together while assembling
- For applying adhesives
- For putting nails and other joining consumables for assembly

2.1.11 Assisting Carpenter for Finishing

A carpenter requires various finishing job, like –

- Sanding the corners of furniture
- Sanding sharp edges in furniture, as per design
- Preparing Putty to apply on furniture
- Applying putty in joints and holes on surface
- Doing polishing on finished Furniture

2.1.12 Properties of Hard Putty

Hard Putty is used to finish Furniture. It helps in covering holes, cracks and gaps in joints. This is made by Ground chalk or raw linseed oil. This is form of very fine powder, which is mixed with water and paste is made. It is applied to required place in paste form. After some time (depending on manufacture), it gets hard.

2.1.13 Method of Applying Hard Putty

Step-1 Mix Powder with Water

Step-2 Fill Holes and cracks with Putty Paste

Step-3 Remove Extra Putty with Sand Paper

Step-4 Polish or Colour the Surface

TIP

Desired colour matching with furniture can be mixed while preparing Putty. This will help in keeping even tone of furniture colour. After colour or polish, it will look like original furniture surface.

2.1.14 Maintaining Oil and Grease Equipment

Almost all tools used in Carpentry are made of iron, which tends to rust very quickly, if not taken care. Apart from that there are machine, which requires routine oiling and greasing. Every time after using the tool, it should be cleaned and oiled with appropriate lubricant before storing.

Fig. 2.1.14.1: Oil can

An assistant carpenter should take care of oil gun and grease gun, so that there is no lapse in routine maintenance of equipment and tools

Fig. 2.1.14.2: Greese gun

2.1.15 Cleaning of Furniture

Carpenter shop is full of dust; hence all furniture istend to get dusty. It should be regularly cleaned till the time is dispatched to its end customer.

Fig. 2.1.15.1: Cleaning of Furniture

Furniture should also be cleaned before polishing; else dust particle can remain in polish and will show up after polish is dried.

Correct way of cleaning is to clean furniture first with damp cloth and then with dry cloth

2.1.16 Cleaning of Workplace

As we know Carpentry shop is full of dust, due to various cutting and finishing activities. If you clean the place, immediately after cleaning dust will accumulate on the cleaned surface. Despite this, we should regularly clean the place, especially in morning before starting the work and before leaving the work in evening.

Regular cleaning will limit the dust accumulation and cleaning of machines and tools will ensure their long and trouble free life.

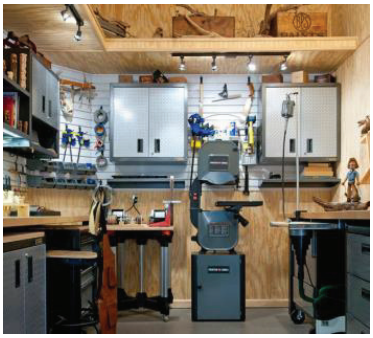


Fig. 2.1.15.1: Cleaning of Workplace

One of the methods for cleaning could be making a checklist of all the places to be cleaned along with frequency of cleaning. It will ensure regular cleaning of the places, which we want to clean.

There are other things, which we need to take care along with Cleaning of the place. We should not allow clutter to get accumulate at work place. Everything should have place to keep, and those should be at their place only. 5S technique is a very good technique for keeping the place in right order. We will learn about this in detail in 'Working in Organisation' module.

Unit 2.2 Handling Material

Unit Objectives

At the end of this unit, you will be able to:

1. Demonstrate how to lift weights Manually
2. Demonstrate how to use hoists
3. Identify safety precautions to be taken while using hoists
4. Demonstrate how to load /unload material from Vehicle
5. Identify precautions to be taken while loading / unloading material from Truck
6. Demonstrate how to unpack material for woodwork
7. Demonstrate how to keep material safe
8. Identify ways of cleaning furniture and work place

2.2.1 Lifting of Weight – Manually

While working at carpentry shop, we have to lift various kind weight, in the form of wood, wood cut pieces, Tools, woodworking Equipment, etc.

It is very important to lift the weight properly, in order to ensure safety of equipment and tools and us also.

If manual lifting is the only option then there are a number of things that can be done to reduce the risk, including:

- Making the load smaller or lighter and easier to lift,
- Breaking up large consignments into more manageable loads,
- Modifying the workstation to reduce carrying distances, twisting movements, or the lifting of things from floor level or from above shoulder height,
- Improving the environment – e g better lighting, flooring or air temperature can sometimes make manual handling easier and safer.

  There is no limit on weight of manual lifting, since it varies because of different body built of persons. Still, we should use not lift weight more than 15 kg.

Safe way of lifting weight manually is to bend knee and pick weight from floor (do not bend back). If we bend back for lifting weight then whole weight will act on back and there are chances of hurting the back.

Fig. 2.2.1.1: Correct method of Lifting Weights

For lifting weights more than this we should take help from others or use hoists. For moving around heavy weights, we should use Trolleys and Hoists.

Fig. 2.2.1.2: Trolley for Moving Heavy Material

2.2.2 Use of Hoist

A hoist is a device used to lift or move material. The lifting force is provided by a drum (or wheel) on which wraps a rope (wire or fiber) or a chain.

There are different types of hoists - Electro-hydraulic, manual or lever operated, base mounted, or pendant cranes. These hoists are different in the way they move, but the precautions that should be taken when working with them are similar.

We should always follow the manufacturer's recommendations for the hoist we are using.

Fig. 2.2.2.1: Moveable Hoist

Fig. 2.2.2.2: Overhead Hoist

Moveable hoist is used for moving lighter weight (less than 1000 kg), more than this weight are lifted and moved by overhead Hoist.

Normally in Carpentry Shop weight moved are less 1000 kg only. (unless big lot of wood is being loaded or unloaded)

Working Precautions to be taken with hoist –

- We should know the safe load limit of the hoist and Do not exceed.
- We should keep wire ropes and chains lubricated.
- We should hoist from directly over the load. If not centered, the load may swing when lifted.
- We should hang hoists solidly in the highest part of the hook area. Rigged this way, the hook support is directly in line with the hook shank
- Lever operated hoists can be used to pull in any direction, but a straight-line pull must be maintained. Side pulling or lifting increases wear and sets up dangerous stress levels on hoist parts. Only one person should pull on hand, chain and lever hoists.
- When loading the lower hook, place the load directly in line with the hook shank. Loaded this way, the load chain makes a straight line from hook shank to hook shank.

2.2.3 Using Overhead Hoists

Pushing the load is safer option. So always push the load.

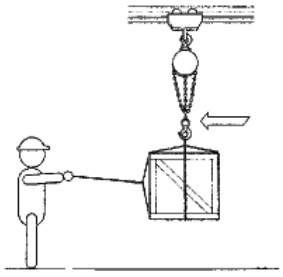


Fig. 2.2.3.1: Using Overhead Hoists

If pushing is not possible than we should pull the load with a Rope only.

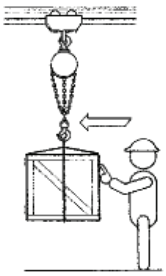


Fig. 2.2.3.2: Using Overhead Hoists

We should stand completely clear of the load.Load should properly seated in the hook.

Move hoist controls smoothly. Avoid abrupt, jerky movements of the load. Remove slack from the sling and hoisting ropes before lifting the load.Remove all loose materials, parts, blocking and packing from the load before starting the lift.

Make sure everyone is away from the load before starting to hoist.

2.2.4 Safety Precautions while working with Hoists

1. Do not use hoisting equipment for lifting people.
2. Do not pass a load over workers.
3. Do not tip a load. The load is unstable and harms the hook and hoist.
4. Do not insert the point of the hook in a link of the chain.
5. Do not hammer a sling into place.
6. Do not leave slings dangling from the load hook. Place sling hooks on the sling ring when carrying slings to the load.
7. Do not raise loads higher than necessary to clear objects.
8. Do not exceed a hoist load limit.
9. Do not leave suspended loads unattended.

2.2.5 Loading / Unloading material from vehicle

All the wood required for woodworking comes from outside. Which normally comes in big trucks. Unloading material from vehicle is very important activities for below reasons –

1. Material is expensive; any damage during unloading can cause monetary loss.
2. If material is damaged, it may delay the project, for which the material is required.
3. Any accident during unloading material could cause personal injury.

2.2.6 Precautions For Loading / Unloading of material

1. Do not use hoisting equipment for lifting people.
2. Do not pass a load over workers.
3. Do not tip a load. The load is unstable and harms the hook and hoist.
4. Do not insert the point of the hook in a link of the chain.
5. Do not hammer a sling into place.
6. Do not leave slings dangling from the load hook. Place sling hooks on the sling ring when carrying slings to the load.
7. Do not raise loads higher than necessary to clear objects.
8. Do not exceed a hoist load limit.
9. Do not leave suspended loads unattended.

Fig. 2.2.6.1: Various Ways of Unloading Material

2.2.7 Unpacking material

Now a day, wooden sheets used to come in packed condition. Packing is done by plastic sheets. It avoid moisture and dust to come in contact with wooden sheets. Wooden sheets should be kept in packed condition, unless it is required from some project.

Unpacking of wooden sheets should be done before actual use only. Due care should be taken for cutting the plastic sheet; cutting tools should not damage the wooden sheets. After unpacking sheets should be kept at one place where nobody touch them or damage them. Cover sheet should be disposed properly in dustbin.

2.2.8 Packing Finished Furniture

Finished furniture should be packed to keep it safe during transportation, while moving one place to other place. Packing material used should be chosen as per transportation condition and distance of transportation.

Packing Material –

1. Corrugated paper
2. Bubble sheet
3. Foam sheets
4. Thermocol Sheets
5. Poly bags
6. Stretch Wrap sheet
7. PVC Strap Rolls
8. Cello Tapes

Customer requirement should also be kept in mind while packing the furniture.

Fig. 2.2.8.1: Packing in Corrugated Box

2.2.9 Keeping material safe

All material required for any woodworking project should be kept very safely, so that the project can be completed on time. If any cut sheet, part or consumable get misplaced or damaged, whole project can be delayed. It will also cause monetary loss to company.

Good practices for keeping material safe –

1. All the cut parts should be numbered and same number should be written on drawing or sketch. This will help in identifying the parts while assembling and any missing part can also be identified easily.
2. All small parts should be kept in transparent polybags. Polybags can be marked with number and that detail can be written on a piece of paper.
3. Similarly, all consumables, like – nails, handles etc also should be kept in transparent bags or in their original bags, so that it is easier to locate the desired item.
4. All material should be kept at one place, so that it is easier to locate all material at one attempt.
5. The material should be away from working area and preferably in some rack. If not possible, the some corner area should be used for this purpose.

Fig. 2.2.9.1: Ways of Storing Cut Sheets

Unit 2.3 Sharpening of Woodworking tools

Unit Objectives

At the end of this unit, you will be able to:

1. Identify ways of sharpening woodworking tools
2. Demonstrate how to sharpen chisels and Plain Iron
3. Demonstrate how to sharpen a Gouge
4. Demonstrate how to sharpen a Hand Saw

2.3.1 Sharpening of Wood working Tools

Which sharpening tools and abrasives you need is depending on tools you need to sharpen. Whether you should sharpen the tool by hand or by using a sharpening machine is again depend on the tools you need to sharpen, your experience, and your preferences.

HAND SHARPENING TOOLS

BENCH STONES

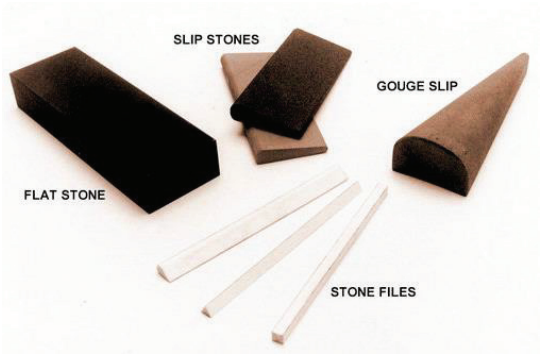


Fig. 2.3.1.1: Bench Stones

A set of whetstones or bench stones is the core of most of the sharpening systems. These are available in different sizes, shapes, and grits. The materials are either natural stone or synthetic abrasives in a hard binder. Many stones are used with light oil or water. The liquid cleans the surfaces, floating away the swarf (metal particles) so it won't clog the abrasives. On sharpening machines, liquids also serve as a coolant, keeping the tool steel from overheating and losing some of its hardness.

Sharpening stones come in a variety of shapes and sizes to conform to the cutting edges of different tools. They also come in a variety of grits, from 100# to 1200#, so you can hone keener and keener edges, as needed.

Many woodworking tools, especially handsaws and drill bits, are designed to be sharpened with files. Although made of steel, files are hardened to a higher degree than wood cutting tools. Consequently, they will cut away the worn surfaces of a cutting edge.

Files come in a variety of sizes and shapes, some of them specially made for sharpening. Sharpening files tend to be single-cut with a fine tooth pattern.

Several types of files are useful for sharpening.

Three-square files are made to fit saw teeth, while round files will fit hook teeth and chain saw teeth. You must have an auger file to sharpen drill bits. Needle files are handy for sharpening cutting edges with intricate shapes, and mill files are handy for flat,

straight cutting edges.

Fig. 2.3.1.2: Triangular File

Fig. 2.3.1.3: Mill or Flat File

2.3.2 Sharpening Chisels and Planer Iron

Tools with straight cutting edges are the simplest tools to sharpen, Ex- Flat chisels and plane irons. These tools have a bevel and a back. Initially, you must grind both surfaces, flattening the back and honing the bevel. But after the first sharpening, you need only sharpen the bevel.

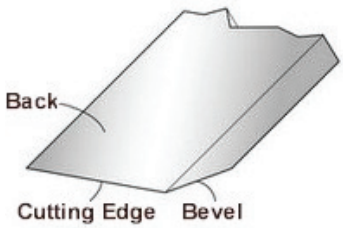
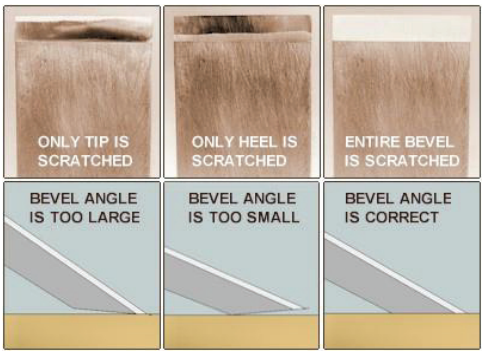


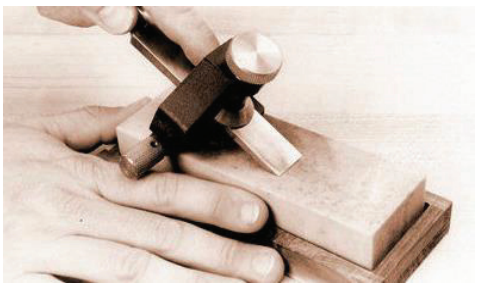
Fig. 2.3.1.2: Triangular File

2.3.3 Steps for Sharpening A Straight Edge

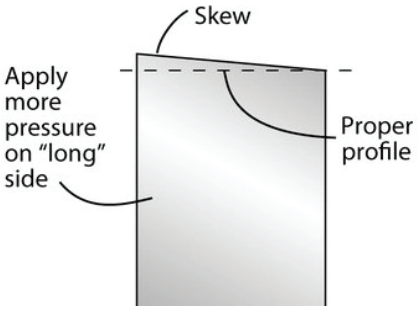
Step-1 Start the Sharpening with Coarse Stone



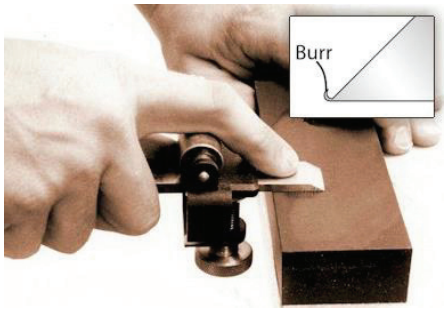
Step-2 Keep Bevel Angle Correct



Step-3 Move to Fine Grade Stone



Step-4 Preserve Profle of Blade



Step-5 Remove the Burr

2.3.4 Details of Steps for Sharpening A Straight Edge

Step-1 - The first time you sharpen a chisel or a plane iron, flatten the back. Start with a coarse abrasive. Press the back against the stone and rub it back and forth until the scratch pattern covers the entire back. Work your way through finer stones, finishing the back to the same degree that you plan to finish the bevel.

NOTE: Once the back is flat, there's no need to grind it again. In fact, you shouldn't touch it except to briefly rub it across a fine stone or strop to remove burrs. If you grind the back each time you sharpen the chisel, the blade will grow thin and fragile.

Step-2 - Mount the chisel in the tool holder or honing guide so the bevel rests against the abrasive. If you want to grind the bevel to a new angle, set that angle with the aid of a protractor. If you want to maintain the current bevel angle, set the tool so the bevel is flat on the stone. Make a few passes across the stone and inspect the bevel. If just the tip is scratched, the angle is too large. If just the heel is scratched, it's too small. When the entire bevel is scratched, the angle is just right.

Step-3 - Start with a coarse abrasive and grind the bevel until the cutting edge appears keen and straight, and all the nicks have disappeared. Move to a finer abrasive and hone the bevel at the same angle. For the sharpest possible edge, continue on through finer abrasives, polishing, then stropping the bevel. How to judge, when it's time to move to a finer stone? Inspect the bevel — when the surface is an even color and texture with no dull areas or shiny spots, change to finer grit.

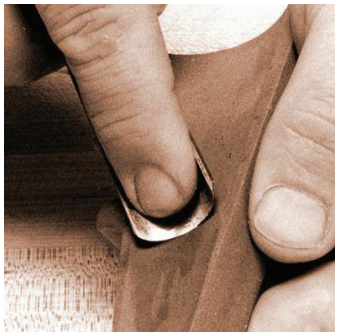
Step-4 - As you sharpen, take care to preserve the profile of the blade — the cutting edge should be straight and perpendicular to the side. If you inadvertently grind a skew, you can easily correct it with some extra work and a judicious application of pressure.

Step-5 - When you've finished the bevel, remove the burr that forms on the back. Turn the tool over and rub the back several times across the last abrasive used. Don't remove the honing guide or change the angle of the tool rest. To remove the last vestiges of the burr, it often helps to take a few more licks on the last stone or strop, alternating between the bevel and the back. Test the sharpness by cutting a thin slice across the grain of a wood scrap. Any traces of the burr will leave tiny lines of torn fibers in the cut surface.

Tip for Sharpening

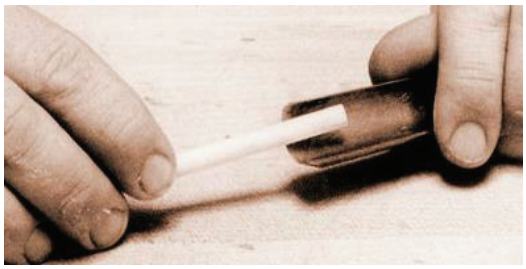
One of the most common sharpening mistakes is starting out with an abrasive that's not oarse enough. Don't use medium grits to remove nicks and chips, flatten surfaces, or change a bevel angle — it costs you extra work. And if you're using a sharpening machine, the finer grits may overheat the tool.

2.3.5 Steps for Sharpening A Gouge



Step-1 Choose a Right Profile Gouge Slip for Hand Sharpening

Step-2 For Sharpneing in Machine Use 'V' Groove Guide Block



Step-5 Remove the Burr After Sharpening

2.3.6 Details of Steps for Sharpening A Gouge

STEP -1 -When hand sharpening a gouge, use a gouge slip. The rounded surfaces on the stone fit the curved cutting edge and pod of the tool. Put your fingertips in the pod opposite the bevel to help feel the angle.

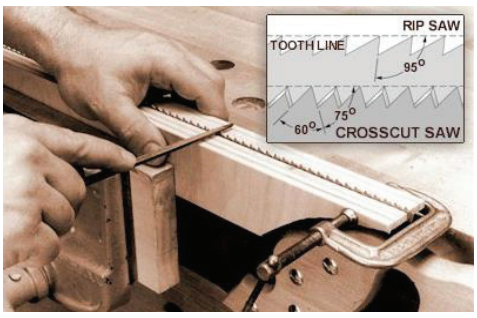
Step - 2 - To sharpen a gouge on a sharpening machine, make a guide block with a V-groove and clamp it to the tool rest. Rest the blade of the gouge in the V and hold it there as you roll the tool from side to side. Press the tool forward gently to keep the cutting edge against the abrasive as the gouge rolls.

Step – 3 - After finishing the bevel, use a round stone file to remove the burrs from the cutting edge of a gouge. Lightly stroke the concave surface of the pod with the file.

2.3.7 Steps for Sharpening A Handsaw

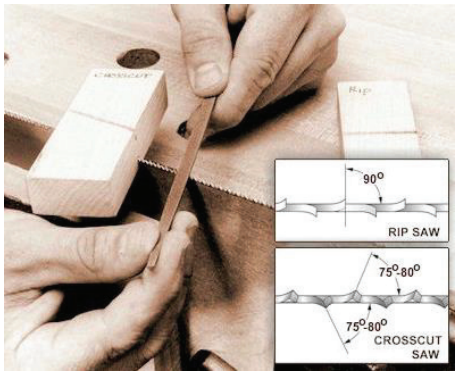
Saw Sharpening Tools

Step-1 Clamp the Saw in Saw Jointer



Step-2 Re-Cut the teeth Shap with Triangle file

Step-3 Remove the Burr After Sharpening



Step-4 Remove the Burr After Sharpening

2.3.8 Details of Steps for Sharpening Handsaw

The teeth of handsaws are sharpened with files. You need a mill file to joint the teeth at the same height, and a triangular file to sharpen the edges. Additionally, you'll need a saw jointer or vice to hold the mill file and a saw set to set (bend) the teeth.

If the teeth are extremely worn or damaged, joint them flat and even with a mill file. Then recut or shape the teeth with a triangular file. Set the reshaped teeth alternately left and right, and then sharpen them with a triangular file.

Step –1 - Clean the handsaw and inspect the teeth. Compare the lightly used teeth near the heel of the saw with the heavily used teeth near the middle. If the middle teeth are worn down, or any teeth are damaged, joint the teeth with a mill file. Clamp the file in a saw jointer and run it along the saw until there's a small, shiny spot at the tops of all the teeth. When this happens, all the teeth are the same height.

Step –2 - When jointing removes more than a third of the height of the teeth, re-cut the shapes with a Triangular file. Clamp the saw between two long scraps and align the scraps about 1⁄16 inch below the old gullets. If you're sharpening a ripsaw, cut hooked teeth with faces 95 degrees from the tooth line. For a crosscut saw, cut sloped teeth with the faces 75 degrees from the tooth line. Stop cutting when the file reaches the scraps. Inspect the teeth — they should all be pointed with no shiny flat spots.

Step –3 - Saw teeth are bent slightly right and left so the kerf will be wider than the blade. This prevents the saw from binding in the cut. Bend the teeth with a saw set, adjusting it to bend each tooth about one-third of the blade thickness. Bend every other tooth to the right, and then bend the teeth in between to the left.

Step –4 - After setting the teeth; sharpen them with a triangular file. File rip saw teeth straight across, perpendicular to the saw blade. For a crosscut saw, work at a 75º to 80º angle to the saw body. First file the teeth that are set to the right, working from the left side of the saw. Then switch sides and file the teeth that are set to the left.

Unit 2.4 Cleaning and Maintenance of Tools

Unit Objectives

At the end of this unit, you will be able to:

1. Demonstrate how to do Metal Tools Maintenance
2. Demonstrate how to do Power Tools Maintenance
3. Demonstrate how to do Cutting Tools Maintenance
4. Practice how to to do Air-Powered Tools Maintenance

2.4.1 Cleaning and Maintenance of Tools

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. It is very important to set up a routine maintenance program to assure everything is running correctly, tools are correctly sharpened, instrument calibration are true, and tools are clean.

2.4.2 Metal Tool Maintenance

You need to ensure to follow operating and care instruction of tools. 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. Metal tool parts need proper oiling, or lubrication, while some components of an electrically driven tool need to be kept free of dust and debris.

2.4.3 Power Tool Maintenance

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.

2.4.4 Cutting Tool Maintenance

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.

2.4.5 Air-powered Tool Maintenance

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.

Activity

1. Physically see Woodworking tools briefed in unit, and remember their name.
2. Physically see working of woodworking tools.
3. See various power socket and identify whether it is 5Amp or 15Amp

Notes

Exercise

Choose Correct answer/s

1. It is ok to keep tools in unorganized way –
   a. Correct b. Incorrect

2. _____is a way of storing tools –
   a. Tool Almirah b. Tool Box
   c. Tool Trolley d. All of above

3. The idea behind safe tool storing, is –
   a. Tool edge should be protected b. Tool should be protected from Rust
   c. Tools should be protected against theft d. All of above

4. It is a good practice to check tool working before storing tool after working with them
   a. Correct b. Incorrect

5. Following are type of Woodworking finishing
   a. Sanding b. Polishing
   c. Apply putty d. All of above

6. Ideal maximum weight of manual lifting is –
   a. 15 Kg b. 25 Kg
   c. 35 Kg d. 45 Kg

7. Weight more than manual lifting limit and less than 1000 kg –
   a. Overhead Hoist b. Moveable Hoist
   c. Crane d. None of above

8. _____is not type of Packing material –
   a. Bubble sheet b. Foam Sheet
   c. Cloth d. Cello tape

9. _____ is a tool sharpening device –
   a. File b. Oil Stones
   c. a& b both d. none of above

10. Hand saw is sharpen with –
    a. Oil Stone b. Triangle File
    c. a & b both d. none of above

11. For quality woodworking Tool maintenance is a must –
    a. Correct
    b. Incorrect

12. Oil in machine attracts –
    a. Dust
    b. Water
    c. Air
    d. None of above

13. Power tool should be running in –
    a. Dry environment
    b. In moist environment
    c. a& b both
    d. none of above

14. Cutting tools require regular sharpening –
    a. Correct
    b. Incorrect

15. _____is a Packing Material
    a. Poly Bag
    b. Bubble sheet
    c. Cello Tape
    d. All of above

Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

FURNITURE & FITTINGS SKILL COUNCIL

3. Safety in Carpentry

Unit 3.1 Carpentry safety equipment and common Hazard and safety practice instructions

Unit 3.2 Handling Emergencies and Waste

FFS/N0105, FFS/N8501
& FFS/N8601

Key Learning Outcomes

At the end of this module, you will be able to:

1. Demonstrate how to use safety equipment
2. Identify various common safety hazards
3. Identify safe practices for using Electric Powered tools
4. Identify safe practices for using wood working tools
5. Identify safe practices for using Hazardous material
6. Identify safe practices for Housekeeping
7. Identify safe practices for using ladders and step ladders
8. Identify safe practices for lifting material
9. Identify safe practices for using Pneumatic tools
10. Identify safe practices for using Powder actuated tools
11. Identify safe practices for using scaffolding
12. Identify safe practices for using stairways, Floors and openings
13. Demonstrate how to follow emergency procedure
14. Demonstrate how to handle fire emergencies
15. Identify fire extinguishers
16. Practice first aids
17. Identify how to minimize waste
18. Demonstrate how to dispose waste

Unit 3.1 Carpentry Safety Equipment and Common Hazard and Safety Practice Instructions

Unit Objectives

At the end of this unit, you will be able to:

1. Demonstrate how to use safety equipment
2. Identify various common safety hazards
3. Identify safe practices for using Electric Powered tools
4. Identify safe practices for using hand tools
5. Identify safe practices for using chisels
6. Identify safe practices for using clamps
7. Identify safe practices for using files / Rasps
8. Identify safe practices for using Hammers
9. Identify safe practices for Knives / Sharp instruments
10. Analyze safe practices for using Pliers
11. Analyze safe practices for using Saws
12. Analyze safe practices for using Screwdriver
13. Analyze safe practices for using Snips
14. Analyze practices for using Vises
15. Identify safe practices for using Hazardous material
16. Identify safe practices for Housekeeping
17. Identify safe practices for using ladders and step ladders
18. Identify safe practices for lifting material
19. Identify safe practices for using Pneumatic tools
20. Discuss safe practices for using Powder actuated tools
21. Discuss safe practices for using scaffolding
22. Discuss safe practices for using stairways,

3.1.1 Woodworking Safety Equipment

Any activity should be started with Safety-first Attitude. Woodworking or Carpentry has got its own health and safety hazards. These hazards can be minimized or eliminated with effective use of safety equipment.

Eye Protection

Eye Protection is a very necessary while working in Carpentry. Eyes are very delicate. Safety glasses and goggles help prevent foreign materials from entering our eyes. This becomes very critical while working saws or wood finishing equipment. Since, there is big amount of dust and wood particles coming out with great force. Goggles should be used in place of prescription glasses.

Foot Protection

There is always chance of dropping something heavy on foot. To protect it, we should wear Safety Shoes.

Ear Protection

We should use earplugs or earmuffs while working in noisy environment. Loud noise may damage our hearing. It should be worn while working with electric powered tools.

Gloves

We should always use appropriate gloves while working in carpentry. There are many sharp edges we have to deal with, due to which our hand can get cut. We should use good quality cotton gloves or if required leather gloves.

3.1.2 Safety Hazards in Carpentry

Almost all fields, where we use tools, have some kind of hazard. Since we use Saws, sharp and electric powered tools etc., hence level of safety hazard is very high in carpentry. Some of examples are below –

1. It is very common to get dust of wood particle in eyes, while sawing or finishing the wood.
2. If nail gun not used carefully, nail may get pierced in body.
3. There are many people who have lost their fingers and limbs during sawing.
4. If wire is cut in any of electric powered tool, you may get electrocuted.
5. Fumes of varnish, solvent and paints may create nausea. Prolonged exposure may create acute respiratory diseases.
6. Dust generated during sawing or other wood cutting operation may cause many respiratory diseases.
7. Wood is easily flammable. A small short circuit may cause big fire.
8. Wood saw dust is very fine and accumulation of dust on floor may make floor slippery. It may cause very serious head or body injury.

In view of above, it is absolute necessary to carefully read all safety related instruction, before starting any carpentry work.

3.1.3 Safety Practices for Electric Powered Tools

1. Do not use power equipment or tools on which you have not been trained.
2. Keep power cords away from the path of drills, saws, vacuum cleaners, floor polishers, mowers, slicers, knives, grinders, irons and presses.
3. Do not carry plugged-in equipment or tools with your finger on the switch.
4. Do not carry equipment or tools by the cord.
5. Disconnect the tool from the outlet by pulling on the plug, not the cord.
6. Turn the tool off before plugging or unplugging it.
7. Do not leave tools that are "On" unattended.
8. Do not handle or operate electrical tools when your hands are wet or when you are standing on wet floors.
9. Do not operate spark-inducing tools such as grinders, drills or saws near containers labeled "Flammable" or in an explosive atmosphere such as a paint spray-booth.
10. Turn off electrical tools and disconnect the power source from the outlet before attempting repairs or service work. Tag the tool "Out of Service."
11. Do not connect multiple electrical tools into a single outlet.
12. Do not run extension cords through doorways, through holes in ceilings, walls or floors.
13. Do not drive over, drag, step on or place objects on a cord.
14. Do not operate a power hand tool or portable appliance with a two-pronged adapter or a two-conductor extension cord.
15. Do not use a power hand tool while wearing wet cotton gloves or wet leather gloves.
16. Never operate electrical equipment barefooted. Wear rubber-soled or insulated work boots.

17. Do not operate a power hand tool or portable appliance while holding a part of the metal casing or holding the extension cord in your hand. Hold all portable power tools by the plastic hand grips or other nonconductive areas designed for gripping purposes.

18. Do not operate a power hand tool or portable appliance that has a frayed, worn, cut, improperly spliced or damaged power cord.

19. Do not operate a power hand tool or portable appliance if the ground pin from the three pronged power plug is missing or has been removed.

20. Test run the Electric equipment, before actually running it on wood

21. Power source should be used as per equipment rating only.

3.1.4 Safety Practices for Hand Tools

1. Use tied-off containers to keep tools from falling off of scaffolds and other elevated work platforms.

2. Keep the blades of all cutting tools sharp.

3. Carry all sharp tools in Cover.

4. Tag worn, damaged or defective tools "Out of Service" and do not use them.

5. Do not use a tool if its handle has splinters, burrs, cracks, and splits or if the head of the tool is loose.

6. Do not use impact tools such as hammers, chisels, punches or steel stakes that have mushroomed heads.

7. When handing a tool to another person, direct sharp points and cutting edges away from yourself and the other person.

8. Do not carry sharp or pointed hand tools such as screwdrivers, scribes, aviation snips, scrapers, chisels or files in your pocket unless the tool or pocket is sheathed.

9. Do not perform "make-shift" repairs to tools.

10. Do not carry tools in your hand when climbing. Carry tools in tool belts or hoist the tools to the work area with a hand line.

11. Do not throw tools from one location to another, from one employee to another, from scaffolds or other elevated platforms.

3.1.5 Safety Practices for Chisels

1. Keep the cutting edge of the chisel sharp.

2. Do not use chisels with damaged ferrules.

3. Hold a chisel with a tool holder if possible.

4. Clamp a small work piece in a vise and chip towards the stationary jaw when working with a chisel.

3.1.6 Safety Practices for Chisels

1. Do not use the C-clamp for hoisting materials.

2. Do not use the C-clamp as a permanent fastening device.

3.1.7 Safety Practices for Files/Rasps

1. Do not use a file as a pry bar, hammer, screwdriver or chisel.
2. When using a file or a rasp, grasp the handle in one hand and the toe of the file in the other.
3. Do not hammer on a file.

3.1.8 Safety Practices for Hammers

1. Use a claw hammer for pulling nails and driving nails.
2. Do not strike nails or other objects with the cheek of the hammer.
3. Do not strike a hardened steel surface, such as a cold chisel, with a claw hammer.
4. Do not strike one hammer against another hammer.
5. Do not use a hammer if your hands are oily, greasy or wet.
6. Do not use a hammer as a wedge, a pry bar or for pulling large spikes.
7. Use only a sledge-type hammer on a striking face wrench.

3.1.9 Safety Practices for Knives/Sharp instruments

1. When handling knife blades and other cutting tools, direct sharp points and edges away from you.
2. Store knives in knife blocks or in cover after use.
3. Do not use knives with dull blades.
4. Do not use honing steels that do not have disc guards.
5. Do not use sharp tools as toys.
6. Use knives for the operation for which they are named.
7. Do not use knives with broken or loose handles.
8. Do not use knives as screwdrivers, pry bars, can openers or ice picks.
9. Do not pick up knives by their blades.
10. Carry knives with their tips pointed towards the floor.

3.1.10 Safety Practices for Saws

1. Do not use an adjustable blade saw such as a hacksaw, coping saw, and keyhole saw or bow saw, if the blade is not taut.
2. Do not use a saw that has dull saw blades.
3. Keep hands and fingers away from the saw blade while using the saw.
4. Do not carry a saw by the blade.
5. When using a handsaw, hold the work piece firmly against the worktable.
6. Do not use woodworking equipment such as circular saws, radial saws or jointers if they do not have guards on the saw blade.
7. Keep control of saws by decreasing downward pressure at the end of the stroke.
8. When operating scroll saws, stop the machine before removing scrap pieces from the table.
9. Clamp work when using a hole saw.
10. Do not use saw without teeth setting
11. Always use sharpen teeth saw.

3.1.11 Safety Practices for Screwdriver

1. Always match the size and type of screwdriver blade to fit the head of the screw.
2. Do not hold the work piece against your body while using a screwdriver.
3. Do not put your fingers near the blade of the screwdriver when tightening a screw.
4. Use an awl, drill or a nail to make a starting hole for screws.
5. Do not force a screwdriver by using a hammer or pliers on it.
6. Do not use a screwdriver as a punch, chisel, pry bar or nail puller.
7. Use a screwdriver that has an insulated handle for electrical work.
8. Do not use a screwdriver if your hands are wet, oily or greasy.
9. Do not use a screwdriver to test the charge of a battery.
10. When using a spiral ratchet screwdriver, push down firmly and slowly.

3.1.12 Safety Practices for Snips

1. Wear safety glasses or safety goggles when using snips to cut materials.
2. Wear work gloves when cutting materials with snips.
3. Do not use straight cut snips to cut curves.
4. Keep the blade aligned by tightening the nut and bolt on the snips.
5. Do not use snips as a hammer, screwdriver or pry bar.
6. Use the locking clip on the snips after use.

3.1.13 Safety Practices for Vises

1. When clamping a long work piece in a vise, support the far end of the work piece by using an adjustable pipe stand, saw horse or box.
2. Position the work piece in the vise so that the entire face of the jaw supports the work piece.
3. Do not use a vise that has worn or broken jaw inserts, or has cracks or fractures in the body of the vise.
4. Do not slip a pipe over the handle of a vise to gain extra leverage.

3.1.14 Safety Practices for Hazardous Material

1. Follow the instructions on the label and in the corresponding Material Safety Data Sheet (MSDS) for each chemical product used in your workplace.
2. Do not use chemicals from unlabeled containers and unmarked cylinders.

3.1.15 Safety Practices for Housekeeping

1. Do not place material such as boxes or trash in walkways and passageways.
2. Sweep up shavings from around equipment such as drill presses, lathes or planers by using a broom and a dustpan.
3. Do not block or obstruct stairwells, exits or accesses to safety and emergency equipment such as fire extinguishers or fire alarms.
4. Keep walking surfaces of elevated working platforms, such as scaffolds, clear of tools and materials that are not being used.
5. Remove protruding nails or bend them down into the lumber by using a claw hammer.
6. Return tools to their storage places after use.
7. Do not use gasoline for cleaning purposes.

3.1.16 Safety Practices for Ladders and step Ladders

1. Read and follow the manufacturer's instructions label affixed to the ladder if you are unsure how to use the ladder.
2. Do not use ladders that have loose rungs, cracked or split side rails, missing rubber foot pads, or are otherwise visibly damaged.
3. Keep ladder rungs clean and free of grease. Remove buildup of material such as dirt or mud.
4. Do not use a metal ladder on rooftops or within 50 feet of electrical power lines.
5. Allow only one person on the ladder at a time.
6. Face the ladder when climbing up or down.
7. Maintain a three-point contact by keeping both hands and one foot or both feet and one hand on the ladder at all times when climbing up or down.
8. When performing work from a ladder, face the ladder and do not lean backward or sideways from the ladder.
9. Do not stand on the top two rungs of any ladder.
10. Do not stand on a ladder that wobbles, or that leans to the left or right.
11. When using a straight ladder, extend the top of the ladder at least 3 feet above the edge of the landing.
12. Do not move a rolling ladder while someone is on it.
13. Do not place ladders on barrels, boxes, loose bricks, pails, concrete blocks or other unstable bases.
14. Do not carry items in your hands while climbing up or down a ladder.
15. Do not try to "walk" a ladder by rocking it. Climb down the ladder, and then move it.
16. Do not use a ladder as a horizontal platform.

3.1.17 Safety Practices for Lifting Materials

1. Plan the move before lifting; remove obstructions from your chosen pathway.
2. Test the weight of the load before lifting by pushing the load along its resting surface.
3. If the load is too heavy or bulky, use lifting and carrying aids such as hand trucks, dollies, pallets jacks and carts, or get assistance from a co-worker.
4. If assistance is required to perform a lift, coordinate and communicate your movements with those of your co-worker.
5. Position your feet 6 to 12 inches apart with one foot slightly in front of the other.
6. Face the load.
7. Bend at the knees, not at the back.
8. Keep your back straight.
9. Get a firm grip on the object with your hands and fingers. Use handles when present.
10. Never lift anything if your hands are greasy or wet.
11. Wear protective gloves when lifting objects with sharp corners or jagged edges.
12. Hold objects as close to your body as possible.
13. Perform lifting movements smoothly and gradually; do not jerk the load.
14. If you must change direction while lifting or carrying the load, pivot your feet and turn your entire body. Do not twist at the waist.
15. Set down objects in the same manner as you picked them up, except in reverse.
16. Do not lift an object from the floor to a level above your waist in one motion. Set the load down on a table or bench and then adjust your grip before lifting it higher.
17. Slide materials to the end of the tailgate before attempting to lift them off of a pick-up truck. Do not lift over the walls or tailgate of the truck bed.

3.1.18 Safety Practices for Pneumatic Tools

1. Do not point a compressed air hose at bystanders or use it to clean your clothing.
2. Do not use tools that have handles with burrs or cracks.
3. Do not use compressors if their belt guards are missing. Replace belt guards before use.
4. Turn the tool "off" and let it come to a complete stop before leaving it unattended.
5. Disconnect the tool from the airline before making any adjustments or repairs to the tool.
6. Engage positive locks on hoses and attachments before use.
7. Shut off pressure valve and disconnect airline when not in use.
8. Tag damaged or defective pneumatic tools "Out of Service" to prevent usage of the tool by other employees.

3.1.19 Safety Practices for Scaffolding

1. Follow the manufacturer's instructions when erecting the scaffold.
2. Do not work on scaffolds outside during stormy or windy weather.
3. Do not climb on scaffolds that wobble or lean to one side.
4. Initially inspect scaffold prior to mounting. Do not use a scaffold if any pulley, block, hook or fitting is visibly worn, cracked, rusted or otherwise damaged. Do not use a scaffold if any rope is frayed, torn or visibly damaged.
5. Do not use any scaffold tagged "Out of Service."
6. Do not use unstable objects such as barrels, boxes, loose brick or concrete blocks to support scaffolds or planks.
7. Do not use a scaffold unless guardrails and all flooring are in place.
8. Level the scaffold after each move. Do not extend adjusting leg screws more than 12 inches.
9. Do not walk or work beneath a scaffold unless a wire mesh has been installed between the midrail and the toe board or planking.
10. Use safety belts and lanyards when working from scaffolds that are higher than 10 feet and that do not have top and mid-guard rails.
11. Do not climb the cross braces for access to the scaffold. Use a ladder.
12. Do not jump from, to, or between scaffolding.
13. Do not slide down cables, ropes or guys used for bracing.
14. Keep both feet on the decking. Do not sit or climb on the guardrails.
15. Do not lean out from the scaffold. Do not rock the scaffold.
16. Keep the scaffold free of scraps, loose tools, tangled lines and other obstructions.
17. Do not throw anything "overboard" unless a spotter is available. Use debris chutes or lower things by hoist or by hand.
18. Do not move a mobile scaffold with anyone on the scaffold.
19. Lock and chock wheels on rolling scaffolds before using.

3.1.20 Safety Practices for Stairways, Floors and Openings

1. Do not work on open sided floors, elevated walkways or elevated platforms if there are no guardrails in place.
2. Stand clear of floor openings if guardrails or covers are removed or displaced.
3. Place floor guards or Safety mats on floor to avoid any slippage, wherever possible.

3.1.21 Reporting Safety Hazard

It is a very important Role of any employee to report any Safety hazard to superior, whenever it is observed.

In case of any observation while working, which you think might create safety hazard, should be discussed with supervisor, before starting actual work.

An employee should comply all the safety protocols of organisation. He / she should fill all forms or documents related to health and safety.

An Employee should take care of safety issue, which may arise during work, while planning for any project.

Activity

1- Observe all wood working safety equipment and try wearing all of them.
2- Go to Carpentry shop and list down all safety hazard present.

Notes

Exercise

Choose Correct Answer/s

1. Prescription glass are also ok to be used in place of safety glass –
   a. Correct b. Incorrect

2. There is no equipment in Carpentry which can damage Ear by creating noise –
   a. Correct b. Incorrect

3. Which is the example of Safety Hazard in Carpentry –
   a. Dust particle in Eye b. Piercing by nail gun
   c. Electrocution by electric powered tool d. All of above

4. Saw dust is a potential Fire Hazard –
   a. Correct b. Incorrect

5. Leaving 'plug-in' Electric tools connected with power source after use is a good practice –
   a. Correct b. Incorrect

6. It is a good idea to connect multiple power tool to a single socket –
   a. Correct b. Incorrect

7. _____ is a part of safe practice for Hand tool –
   a. Keep the blades of all cutting tools sharp Incorrect
   b. Keep all sharp tools in sheaths or holsters.
   c. Not to use a tool if its handle has splinters, burrs, cracks, splits or if the head of the tool is loose.
   d. All of above.

8. Chisel could be a safety hazard, if used with damaged ferrules –
   a. Correct b. Incorrect

9. It is a good idea to strike one hammer with another hammer –
   a. Correct b. Incorrect

10. _____ is a part of safe practice for Saws –
    a. Do not use a saw that has dull saw blades
    b. Do not carry a saw by the blade.
    c. When using a handsaw, hold the work piece firmly against the work-table.
    d. All of above.

11. 'Returning tools to their storage places after use' is a part of safe practice related to –
    a. Using Hand Tools b. Using Saws
    c. Housekeeping d. None of above

12. It is a good idea to clean your clothes by 'compressed Air Hose' –
    a. Correct
    b. Incorrect

13. Which is Safety equipment in below listed equipment –
    a. Safety Shoes
    b. Safety Gloves
    c. Ear Plugs
    d. All of above

Unit 3.2 Handling Emergencies and Waste

Unit Objectives

At the end of this unit, you will be able to:

1. Demonstrate how to follow emergency procedure
2. Demonstrate how to handle fire emergencies
3. Identify Fire Extinguishers
4. Demonstrate how to respond in case of fire
5. Demonstrate how to operate multipurpose Fire Extinguishers
6. Practice first aids
7. Identify common injuries during carpentry and how to react in case of those injuires

3.2.1 Identifying Emergency Situation

Like any other working place, Carpentry shop is full of accident-prone things. You should have an eye to identify the emergency situation. Some of situation could be –

1. Any machine being operated without guard
2. Any machine making abnormal noise
3. Noticing fume from any place or machine
4. Unattended fire
5. Unattended working machine
6. Fumes from any power source

In any of situation we should immediate inform to our supervisor and fellow workers. We should always follow Organisation's Emergency procedure.

3.2.2 Following Organisation Emergency procedure

Normally all organisations have their Emergency procedure. We should read the procedure carefully. Any emergency situation should be dealt as per the procedure. However, we should also apply common sense, while dealing with emergency, as per situation.

All machine and equipment should be run as per organisation procedure and manufacturer manual. We should not bypass any safety procedure. It may cause very costly in terms of cost and human life also.

Almost all tools used in Carpentry are potential hazard for safety. We need to follow the rules stated in Unit 3.1.

3.2.3 Safety Signs

In Industry there are some un iversal signs designed to give information and instruction. These are very important to understand, since it is very widely used and it is expected from all employees working in a orgainsation, that they would know these signs. Some important signs and their meaning are given below -

There is a Fire Extinguisher near the sign, which can be used in case of Fire

There is a Fire Extinguisher near the sign, which can be used in case of Fire

This Place is prohibited for Smoking

Equipment or Place having this sign is having high voltage, so it is not safe to go near that

There is a threat of catching any limb by machine. Do not use the machine without Guard.

The Indicated Zone is having machines or Equipment, which are not safe to work for un-trained person

3.2.3 Handling Fire Emergencies

Fires and explosions can severely damage or destroy premises or plant. Concentrations of small dust particles in the air can form a mixture that will explode if ignited. Often the explosions occur in dust extraction equipment and it is here that special precautions have to be taken. Secondary explosions can also follow the main explosion especially if dust deposits have accumulated in the workroom.

Wood dust will also burn readily if ignited. There have been numerous fires started due to either badly maintained motors, electric sparks, or due to open wood burning stoves and cigarettes.

Make sure that all equipment is cleaned and that dust is not allowed to accumulate. Report any defects you see on equipment.

Goggles should be worn at all times to prevent dust particles entering the eye, and the correct type of dust mask to prevent dust entering the body. Proper dust extraction equipment should be used.

Fire Rescue Arrangements: Workplaces, especially furniture or timber workshops, have high risk of fire because the workplace has inflammable substances like wood, sawdust, etc. Thus, it is necessary to have fire-extinguishing equipment inside the workplace and all employees should be trained properly to use these equipment.

3.2.4 Types of Fire Extinguishers

Water Fire Extinguisher: It is used to extinguish the fire on wood, paper, cloth etc. It should not be used to extinguish the fire over electrical equipment.

Foam Extinguishers (Foam Extinguishers): It is used to extinguish the fire caused by kerosene, spirit, thinner etc. It also should not be used to extinguish the fire caused on electrical equipment.

Dry Powder Extinguishers (Dry Powder Extinguishers): This is used to extinguish – the fire evolving due to flammable liquids such as petrol, diesel etc.

Carbon di oxide Fire Extinguisher: Carbon dioxide evolves from this fire extinguisher and it can be used to extinguish fire over electric equipment, liquid gases or fluids.

These fire-extinguishing equipment should be installed at the proper place and it should be inspected, repaired and refilled regularly.

Water Fire Hydrant
hose Roll

Water FireExtinguisher

Water Fire Hydrant
hose Roll

Powder Fire Extinguisher

Carbon-di-oxide Fire Extinguisher

Fire Extinguisher Chart

Extinguisher		Type of Fire				
Colour	Type	Solids (wood, paper, cloth, etc)	Flammable Liquids	Flammable Gasses	Electrical Equipment	Cooking Oils & Fats
	Water	✓ Yes	✗ No	✗ No	✗ No	✗ No
	Foam	✓ Yes	✓ Yes	✗ No	✗ No	✓ Yes
	Dry Powder	✓ Yes	✓ Yes	✓ Yes	✓ Yes	✗ No
	Carbon Dioxide (CO2)	✗ No	✓ Yes	✗ No	✓ Yes	✓ Yes

3.2.5 Class and Type of Fires

Class	Type
A	Wood, Paper, Ordinary Combustibles Extinguish by Cooling and Quenching Using Water or Dry Chemicals
B	Gasoline, Oil, Grease, Other Greasy Liquids Extinguish by Smothering, Cooling or Heat Shielding using carbon Dioxide or Dry Chemicals
C	Electrical Equipment Fires Extinguish with Non-conducting Agents such as Carbon Dioxide or Dry Chemicals. DO NOT USE WATER.
D	Fires in Combustible Metals Extinguish by Using Specialized Extinguishing Powders

3.2.6 Class of Fire and Type of Extinguisher to be used

Class of Fire	Fire Extinguisher Type
B or C	Regular Dry Chemical
A, B, C, or D	Multi-Purpose Dry Chemical
D	Purple K Dry Chemical
B or C	KCL Dry Chemical
D	Dry Powder Special Compound
B or C	Carbon Dioxide (Dry)
B or C	Halogenated Agent (Gas)
A	Water
A	Water With Anti-Freeze
A or B	Water, Loaded Steam Style
B,	Foam

3.2.7 How to Respond in case of Fire

When fires do occur, the role of a person is to minimize the damage

- Extinguishing small fires
- Assisting in evacuations
- Notifying the local fire Brigade promptly
- Extinguishing fires

All fires consist of Heat plus Material plus Oxygen. Eliminating any one of these will eliminate a fire. Different types of fires require different responses to eliminate them. There are three general classifications of fires. Each requires a different type of fire extinguisher.

Class “A” fires involve wood, cloth, vegetable matter, paper, etc. Extinguishers for Class A fires use either water or soda and acid foam. Class “B” fires involve combustible liquids such as oil, solvents, and grease. Extinguishers for Class B fires use CO2 or foam. Class “C” fires are electrical. Extinguishers for Class C fires use CO2, which is not a conductor of electricity. Your life can depend on using the correct extinguishing agent and using it correctly.

Important Safety Instructions

1. Do not use water on Types B, C or D fires.
2. If it is used on Type B fires it can spread the flames.
3. Water conducts electricity so if it is used on Type C fires it can cause major shock.
4. If it is used on Type D fires it will react violently causing an explosion.

3.2.8 How to operate a multipurpose fire

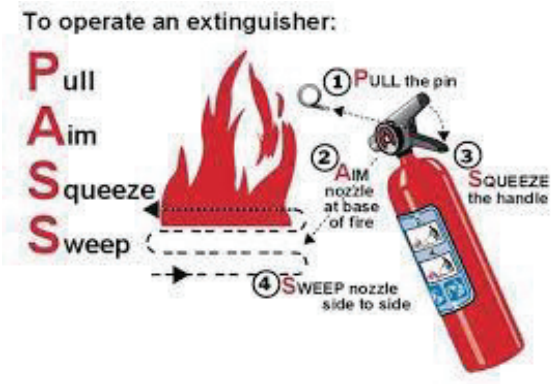
Remember **PASS**

P- Pull the pin. In some models you may have to remove a locking pin.

A- Aim. Aim low. Direct the hose or cone to the base of the fire.

S-Squeeze. Squeeze the handle. This will release the contents of the extinguisher.

S-Sweep. Sweep from side to side. Don't lessen the pressure on the handle. Try to keep it constant.



It is important that you get fire extinguisher training before you have to use one. You don't want to waste valuable time trying to read directions or figure out how to remove a pin in an emergency situation. Other important information, like how far to stand away from a fire, when to move toward it, and how long the extinguisher contents last can only be understood by actually operating one. Make sure your employer and your Safety and Health Rep know that you need this training.

3.2.9 First Aid in Carpentry

A carpenter must understand basic first aid technique. First aid training should be taken for better understanding. A small first aid kit should be carried to the place, if workplace is away from workshop.

Some of the more common situations a carpenter should be able to handle are skin abrasions; sharp, deep cuts; puncture wounds; shock due to an accident or electrical shock; heat exhaustion; heat stroke; broken bones; burns.

3.2.10 Common injuries in carpentry and how to deal with them

Abrasions and small cuts

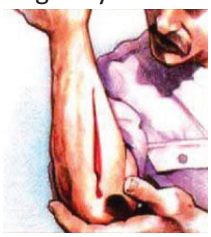
Clean wound with soap and water. Apply antibiotic cream or Providone-iodine solution. Bandage and check dressing daily. See your doctor if there are signs of infection: increased redness, pus or red lines running from wound.

Splinters

Remove with sharp, pointed tweezers. (They should be sharp enough to pick up a single hair.) If splinter is completely under the skin, expose splinter end with sewing needle doused in alcohol, and then remove with tweezers.

Lacerations

Clean wound with soap and water. Assess damage: If laceration is gaping or more than 1⁄4 in deep seek emergency help. Otherwise, apply pressure to stop bleeding. Close wound with butterfly closures or adhesive strips. Check dressing daily.



Fractures

Signs include extreme pain, swelling, bruising and an inability to move an adjacent joint. If you have any of these signs, you should be seen by a doctor to see whether you need an X-ray to evaluate for a fracture.

Amputations

Apply pressure to wounded area with clean bandage. Don't panic. Call for help. Raise wounded area above heart. Wrap amputated appendage in plastic bag. Keep appendage cool, not directly on ice. Sit in a chair near door, and await help.

Eye injuries

Look in mirror to assess eye. If foreign matter is embedded in the eye, go to the emergency room. If foreign matter is on the surface, flush it with water, or use eye wash and cup. For chemical splashes, flush with running water for five to 10 minutes. If it hurts too much to open your eye, go to the emergency room.

Fumes and dust

If you feel dizzy or are having trouble breathing, leave the area, and go to fresh air. If normal breathing doesn't return in 15 minutes, go to the emergency room.

3.2.11 Basic things in first aid box

Top shelf: An asthma inhaler to counteract allergic reactions to fumes and to exotic-wood dust; sharp scissors for cutting bandages; adhesive tape.for bandaging; an elastic bandage for securing dressings.

Middle shelf: Needles for splinter removal are stored in sterile alcohol; splinter tweezers, precise enough to pick up a single hair; 4-in. by 4-in. gauze pads for bandaging; assorted adhesive strips for small boo-boos; clean plastic bag for amputated parts; sterile rolled gauze for bandaging; butterfly bandages for drawing together larger lacerations.

Bottom shelf: Providone-iodine solution for killing germs; eyewash and cup; small mirror for eye inspections; instant ice packs to reduce swelling or for transporting amputated parts to the hospital; latex gloves for eye examinations.

3.2.12 Waste minimization

1. Do not place material such as boxes or trash in walkways and passageways.
2. Sweep up shavings from around equipment such as drill presses, lathes or planers by using a broom and a dustpan.
3. Do not block or obstruct stairwells, exits or accesses to safety and emergency equipment such as fire extinguishers or fire alarms.
4. Keep walking surfaces of elevated working platforms, such as scaffolds, clear of tools and materials that are not being used.
5. Remove protruding nails or bend them down into the lumber by using a claw hammer.
6. Return tools to their storage places after use.
7. Do not use gasoline for cleaning purposes.

3.2.13 Waste Disposal

There are many types of waste getting generated due wood working –

- Wood Chips (while planning)
- Wood Dust (While Sawing)
- Chemicals (from wood finishing)
- Polybags (from consumables)
- Wood pieces (left over wood)

Main waste is wood chips and wood shavings. Although wood chips are biodegradable, but it is restricted to dump in land filling. There are approved govt. source for handling wood chips. It should be handed over to them.

Fig. 3.2.13: Different Typesof Wood Chips

Activity

1. Go in workshop and list various ways of fire protection
2. Observe storage area of Sawdust storage and fire protection equipment.
3. List down control and mitigation methods being used in workshop.
4. Observe different kind of waste generated in Carpentry shop.

Notes

Exercise

1. The Safe storage of and use of all flammable substances are not covered by govt. regulation –
   a. Correct b. Incorrect

2. Employer is responsible for putting control in place reduce the effects of any incidents involving dangerous substances –
   a. Correct b. Incorrect

3. Saw dust and wood chips do not have any fire hazard –
   a. Correct b. Incorrect

4. It is ok to use 5V electric socket for 15V equipment –
   a. Correct b. Incorrect

5. Fuel retriever is a device to safely emptying petrol tanks and pipelines –
   a. Correct b. Incorrect

6. There is no need of keeping lid on flammable item's cans (Paints and other solvents) –
   a. Correct b. Incorrect

7. Verification of measurement and marking may help in waste reduction –
   a. Correct b. Incorrect

8. _____ is a kind of waste generated during wood working –
   a. Wood Chips b. Wood Dust
   c. Poly bags d. All of above

9. Why should you keep first Aid Box in Work shop
   a. For Filling wood dust and chips b. For First and immediate treatment of any injury
   c. For storing tools d. None of the above

10. Which Fire Extinguisher should be used in Electric Fire
    a. Water Extinguisher b. Foam Extinguisher
    c. Dry Powder extinguisher d. None of above

11. Which Fire Extinguisher should be used in Wood, Paper or cotton Fire
    a. Water Extinguisher b. Foam Extinguisher
    c. Dry Powder Extinguisher d. None of above

12. Which Fire Extinguisher should be used in Petrol or Gasoline Fire
    a. Water Extinguisher b. Foam Extinguisher
    c. Dry Powder Extinguisher d. None of above

Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

FURNITURE & FITTINGS SKILL COUNCIL

4. Working in Organisation

Unit 4.1 Working in Organisation

FFS/N0105
& FFS/N8801

Key Learning Outcomes

At the end of this module, you will be able to:

1. Evaluate the scope of carpenter's job in organisation
2. Evaluate the expectation of organisation from carpenter
3. Demonstrate how to follow organisation's rules and policies
4. Practice team work
5. Demonstrate the importance of communication
6. Demonstrate how to manage working in organisation

Unit 4.1 Working in Organisation

Unit Objectives

At the end of this unit, you will be able to:

1. Evaluate the scope of Assistant carpenter's job in organisation
2. Evaluate the job responsibility of Assistant carpenter's
3. Identify the expectation of organisation from assistant carpenter
4. Demonstrate how to follow organisation's rules and policies
5. Identify the hierarchy and escalation procedure in an organisation
6. Identify the '5S' methodology of housekeeping
7. Identify the importance and rules of Team working
8. Identify the various ways of communication and importance
9. Identify how to handle conflict
10. Identify how to plan and manage work
11. Demonstrate how to manage resources in organisation

4.1.1 Scope of Assistant Carpenter's Job in Organisation

In any Furniture Company, Carpenter's job is very important. He / she responsible for, rough and finished skilled carpentry work. An Carpenter is responsible to work from sketches, specifications, drawings and instructions to design, build, remodel, retrofit, maintain and repair various types of facilities and structures; inspect completed work for conformance with specifications, requirements and compliance with applicable building and safety codes and regulations; estimate cost, time and materials for carpentry projects; participate in the maintenance and operation of the carpentry shop.

4.1.2 Job Responsibility of Assistant Carpenter

Following are the job responsibility of Carpenter working in an organisation –

1. He should able to communicate in local language (Listen / speak)
2. He should able to write in one language (English or local language)
3. He should able to read drawings / Sketches of Furniture.
4. He should able to understand carpentry related product catalogue.
5. He should able to understand the work instruction and should able to interpret them correctly.

6- He should able to understand the manuals, health and safety instructions and should able to interpret them correctly.

7- Ensure and follow organizational procedures pertaining to General working and health & safety are followed

8- Display courteous behavior at all times

9- Respond politely to customer queries

10- Follow dress code as applicable at the work location

11- Carry out work functions in accordance with the norms of the organization and work place

12- Identify and ask any possible deviations from appropriate authority

4.1.3 Expectation from Assitant Carpenter

It is expected that he would -

1. Effectively communicate with Fellow team members and seniors.
2. Take appropriate decision based on situation.
3. Assess any damage/faulty component in the equipment/machines and take action accordingly.
4. Work with supervisors/ team mates to carry out work related tasks
5. Solve operational role related issues
6. Analyze, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently
7. Seek assistance as and when required from appropriate authority at the workplace in an appropriate manner
8. Seek and obtain clarifications on policies and procedures, from the supervisor or other authorized personnel.
9. Fill in all required forms accurately based on the requirement and as applicable.
10. Use gestures or simple words to communicate as applicable.
11. Pay attention while instructions are being given.
12. Ask questions to minimize misunderstandings.
13. Positively influence the team members into following procedures.
14. Be proactive in solving issues with the fellow members in the team.

4.1.4 Comply with organisation's current General, health, safety and security policies and procedures

Every organisation has its own policy related to health, safety and security. Every employee has to follow these policies and procedures.

A policy is a written statement, usually comprises three elements:

- A statement section (often a single page) detailing how safety will be managed and that demonstrates the organisation's commitment to health and safety
- An organisation section that details where responsibilities are allocated and how employees fit into the overall safety management system
- An arrangements section that contains details of how specific activities and functions are managed.

This arrangements section could include such matters as risk assessments, fire safety, first aid, accident reporting, electrical safety, work equipment, hazardous substances, manual handling and other workplace issues.

In larger organisations the arrangements section may refer to other documents, such as safety manuals or safe systems of work.

4.1.5 Organisation Hierarchy and Escalation

1. Do not place material such as boxes or trash in walkways and passageways.
2. Sweep up shavings from around equipment such as drill presses, lathes or planers by using a broom and a dustpan.
3. Do not block or obstruct stairwells, exits or accesses to safety and emergency equipment such as fire extinguishers or fire alarms.
4. Keep walking surfaces of elevated working platforms, such as scaffolds, clear of tools and materials that are not being used.
5. Remove protruding nails or bend them down into the lumber by using a claw hammer.
6. Return tools to their storage places after use.
7. Do not use gasoline for cleaning purposes.

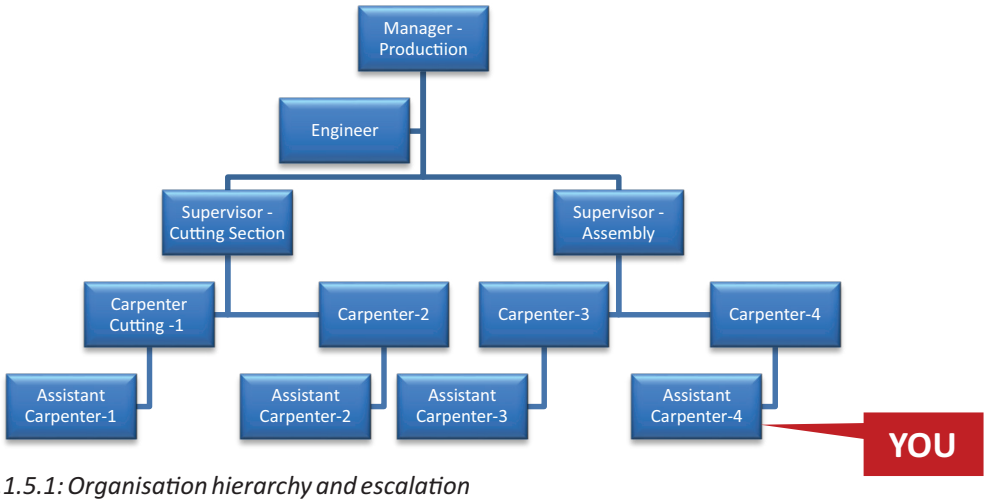


Fig. 4.1.5.1: Organisation hierarchy and escalation

Any person in organisation should escalate his / her issues to the person he / she reporting, i.e. Supervisor. However, companies encourage direct escalation to higher levels in some in cases, like –

- Breach of code of conduct
- Women Harassment
- Racial discrimination
- Misbehaiour by Supervisor, etc.
- Misbehaviour & tkrh; HksnHkko vkfn

4.1.6 Workplace housekeeping and cleanliness activities and equipment maintenance

All organisations have their policies and schedule for housekeeping and cleaning activities and equipment maintenance.

This has ways of doing housekeeping, like –

- Brooming, washing, cleaning of floors.
- Allocating space to all tools and equipment.
- Keeping all tools and equipment at their place.
- Disposing unwanted or unused parts, tools and equipment
- Cleaning of equipment and other office areas

It also has frequency of doing these activities, which is based on previous experience.

One of the very famous ways of housekeeping is '5S'. Which is based on Japanese philosophy –

1S – 'Seiri' means Sorting. First of all we need to sort all things in wanted and unwanted category. Remove unnecessary items and dispose of them properly We can make working easy by eliminating unwanted things. Chance of being disturbed with unnecessary items will be reduced. It prevents accumulation of unnecessary items. We require fully skilled supervisor for checking on regular basis. We can define a red-tag area to keep those unnecessary items. From where, we can decide their disposal.

2S – 'Seiton' means Set. Which is "set in order", "straighten", or "streamline" We need to keep all necessary items, so that they can be easily accessible for use, whenever required. It prevents loss and waste of time. It makes workflow smooth and easy. This is required to be done on regular basis In case of Carpentry, all tools and equipment required in workshop should have defined space for them.

3S – 'Seiso' means Shine. This can also be interpreted as "sweep", "sanitize", or "scrub". Which mean, clean your workplace completely. Inspect while cleaning, which will prevent machinery and equipment deterioration. This makes workplace safe and easy to work. This also makes work place clean and pleasing to work in. One of the golden rule of 3S is you should be able to detect any abnormality at your workplace within 5 seconds and from 5 feet.

4S – 'Seiketsu' means Standardize. Which is to standardize the best practices in the work area. It will ensure high standards of housekeeping and workplace organization at all times. It will also maintain orderliness and will keep everything in order and according to its standard. It means best practices related to housekeeping will be incorporated in to standard operating procedure. In this way, everybody will be following the same rule and we can expect the same outcome, which is 'Everything in its right place'.

5S – Shitsuke' means Sustain. Which is to keep things in improved condition. It also means, "do without being told". Which is only possible by performing regular audits, Training and Discipline

In the same way all Equipment have their maintenance procedures. We need to follow them, to keep them in working condition.

4.1.7 Effective Ways of Working in Team

Since there are many Carpenters in the team, it is very important to interact effectively

- Ask other's opinions about a subject before you present yours
- Be prepared; think things out before speaking
- Address one issue at a time
- Use a positive or neutral tone of voice
- Focus on the issue, not the person
- Avoid blanket, know-it-all statements, loaded words and hyperbole
- Keep your cool and don't lose your temper.
- Show an interest in the other person's views and feelings
- Don't hide your feelings, but keep your emotions under control
- Present concrete specifics instead of overriding generalizations
- Back up your opinions with a few important key points
- Portray what seems like an individual problem as a mutual concern
- Avoid a hidden agenda and the potential to politicize an issue
- Find the areas of agreement as the basis for collaboration.
- Follow organisation’s Rules and procedures to become example for team

4.1.8 Importance of Team Working

becomes easier and can be carried out with more efficiency and skill. There are many advantages of working in a team:-

- The work gets done on time. Big projects get completed easily.
- Customer satisfaction is increased, by delivering better quality products on time.
- The possibility of getting more work in future increases.
- There is always something new to be learned.
- Mutual skill and work efficiency increases.
- There is an opportunity of understanding one’s own strengths and weaknesses.

4.1.9 Communication Skills

Importance of Communication Skills for effective communication

Inside workplace employees should have good communication skills and proper sense of behaving. All the employees work together at workplace and they have to coordinate with each other on various topics.

Communication skills are required for everyone whether it is the carpenter or the employees of the workshop because the employee needs to communicate with others (client, copartners, official, etc.) every day for his work that is why the carpenter or employee should have Communication skills which is needed for carpenter to contacts other person in various ways such as –

4.1.10 Oral Communication

It is necessary for the Assistant carpenter to communicate with the other people in order to complete his work such as -

1. The Assistantcarpenter has to communicate with the customer, architect etc. to understand the drawing or sketch.
2. The Assistantcarpenter has to communicate with the shopkeeper to buy the materials.
3. To communicate with peers.
4. To communicate with the customer or other officials (supervisor, foreman, engineer, etc.) for the work related progress and issues.

Thus, the Assistantcarpenter's language should be easily understandable to others his voice should not be very loud nor be very low. Since others can get annoyed by the loud voice, which may lead to fights. If the voice is low then it won't be understandable by others. Instead of that the Assistantcarpenter should speak in normally i.e., not very fast nor very slow. Assistant Carpenter should use proper technical terms related to woodworking, so that Carpenter and other people can understand the communication easily.

4.1.11 Written Communication

1. Do not place material such as boxes or trash in walkways and passageways.
2. Sweep up shavings from around equipment such as drill presses, lathes or planers by using a broom and a dustpan.
3. Do not block or obstruct stairwells, exits or accesses to safety and emergency equipment such as fire extinguishers or fire alarms.
4. Keep walking surfaces of elevated working platforms, such as scaffolds, clear of tools and materials that are not being used.
5. Remove protruding nails or bend them down into the lumber by using a claw hammer.
6. Return tools to their storage places after use.
7. Do not use gasoline for cleaning purposes.

4.1.12 Electronic communication

Nowadays in the modern era, the electronic means of communication is being used. Electronic tools such as e-mail, mobile, fax, etc. are being used on a very large scale. Electronic tools such as e-mail, mobile, fax, etc. are being used. With this you can send messages to the customer very fast and easily. A record can be maintained of your work report and the other information can also be shared by this medium to the customer.

But generally the carpenter should interact orally with the customer and also in writing to maintain the balance.

4.1.13 Safety Practices for Snips

In any working day we have to do lot of activity. It is important to complete all activity, but there are some which are absolute necessary to complete on time. This is only possible when we do work based on priority. Here we will learn how to prioritize our work.

First we have to divide our work in 4 categories –

1. Important and necessary
2. Not important but necessary
3. Important but not necessary
4. Not important and not necessary

Once we have divided the all work available, we need to following –

1. Discard all activities, which are in category 4 'Not important and not necessary'.
2. Review first category work, which is 'Important and necessary'. Do big duration work, out of this category initially and small duration later on. Like – Finishing touch to furniture.
3. Then do work from category 2, which is 'Not important but necessary'. Such as – arranging parts for assembly, arranging equipment for next operation etc.
4. At last, do work from category 3, 'Important but not necessary'. Such as – Informing Supervisor for work progress, meeting with customer.

Above way of prioritizing will help in completing all work in time.

4.1.14 Managing Resources (Time, Material and Cost) effectively

For any employee one of the main responsibilities is to sensibly manage all available resources. These are in form of Time, Material and cost.

First, it is Time. Time is money. Since working hours are limited. There are 24hrs in a day, and normally working duration is 8 hours in any organisation. The more we utilize this available time the more we can gain out of it.

Time: For utilizing time properly, we need to follow below steps –

1- Planning: We need to plan in advance. Every morning before start of work, we need to review pending work, like- Total part to cut, assemblies to make, furniture to finish, etc.

2- Resource arrangement:

Once planning is done, then we need to review the resources required for completing the tasks. Like – required material, required tools and equipment, additional manpower, support from Supervisor etc.

3- Execution: After arranging the resources, we need to execute the plan, i.e. work as per planning.

4- Intermittent Review: One of the important activities is review of progress against plan. Without review we would not whether we are on time or not. While reviewing we realize that we are running behind schedule, we can ask for support to expedite the work.

5- Handover: Once work is complete, we need to handover the activity to next person in chain. Like in case of carpentry, we need to inform to person responsible for next operation, so that he can perform his activity on furniture.

6- Final review: This is the review, which we need to do at end of the day. We need to find out, what went right and what went wrong, against planning. We need to plan differently for things, which went wrong against plan. If we follow above technique we can manage time better.

Material: It is necessary to manage material better, since wasting material a national loss. If any part or equipment is damaged or rejected, it is a loss. If by any means it is possible to repair the existing part, we should try to do that. By doing this, we will help nation by not wasting resources. Also it will save money for organisation.

Cost: We should try to minimize the cost to be incurred for each repair. Which can be saved, by expediting the furniture making. Also we should look for the ways to reduce cost by eliminating various wastes in day to day working.

There are following type of Wastes exist in workshop, as per lean concept. We will discuss them in brief –

Transport: By transporting any part from one place to another place, we do not add any value to the part. Hence transport is the first waste. One may think that without transport how we will get one part at desired place. That is true, but there are many unnecessary transports, which we should look for and should eliminate.

For example, if we do not have in-house facility big Saw, then we have to send wood logs to other facility. Now cutting wooden logs will add value, but transporting wooden logs to other facility is not adding any value.

Inventory: Inventory (stock of parts or wood) is another type of waste. Here again we need to understand the difference between good inventory and bad inventory. Good inventory is the stock of parts, which is required to keep for making furniture, till the time we get next lot of supply of parts. But if we keep inventory, which is more than that; then it is a waste.

Motion: Motion is next waste. We should look for the ways to minimize the motion or movement of people as minimum as possible.

For example, if tool board is farther form furniture making area, then we have to walk more for fetching any tool. Similarly, if we move tool board near to repair area, or we use tool trolley, we can minimize the motion waste.

Waiting: Waiting is another kind of waste. If somebody has to wait to start his / her job, then it is a waste.

For example, if polishing of furniture has to be started after full assembly of furniture and assembly is delayed, then 'polishing' person has to wait for the furniture. This waiting period is waste.

Defects: One more waste is Defect. If we make any furniture, then it should be ok in first attempt. Any repairing of furniture is adding additional cost, which cannot be recovered from the customer; hence it will be a loss to company. So we should work towards, **'first time right'**. By eliminating these wastes, we can manage costs.

Activity

1- Go in workshop and make hierarchy by enquiring from supervisor.

2- Distribute plan of making a table and chair in team of 5 persons. Ensuring equal workload to all members.

3- Create example conflict with fellow team member for work related activity and demonstrate how to solve it, by using techniques advised in chapter.

4- Do exercise on 'Work planning technique' explained in chapter.

Notes

Exercise

Choose correct answer/s

1. _____ are part of Carpenter's job responsibility –
   a. Reading drawing related to furniture. b. Understanding work instructions
   c. Reading and following – health and safety instructions.
   d. All of above

2. Every organisation has its own policy related to health, safety and security -
   a. Correct b. Incorrect

3. A policy is a written statement
   a. Correct b. Incorrect

4. A Health and Safety Policy demonstrates how seriously an organisation takes its health and safety responsibilities –
   a. Correct b. Incorrect

5. Employee has no right to identify any breach in health, safety and security policy –
   a. Correct b. Incorrect

6. There should be an identified place for assembly in case of any emergency –
   a. Correct b. Incorrect

7. 'Listening carefully' is a part of conflict management –
   a. Correct b. Incorrect

8. We need to carry out on priority, 'Category 4' activities – 'Not important and not necessary' –
   a. Correct b. Incorrect

9. _____ is a important resource, which should be used in responsible manner –
   a. Manpower b. Time
   c. Electricity d. Material e. All of above

10. If carpenter has completed his work on time, then he has –
    a. Saved Time b. Saved Money
    c. Earned Customer Satisfaction d. Above all

11. Before starting any work, Carpenter must take all approved drawing from –
    a. Security Guard b. Police man
    c. Manager d. Supervisor

12. Why Should Carpenter plan his / her work –
    a. To able to communicate right delivery time to customer
    b. To reduce interruption in work due to non-availability of tools
    c. To get support in advance, if needed in his project
    d. All of above.

Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

FURNITURE & FITTINGS SKILL COUNCIL

5. Employability and Entrepreneurship Skills

Key Learning Outcomes 

At the end of this unit, you will be able to:

1. Explain the meaning of health
2. List common health issues
3. Discuss tips to prevent common health issues
4. Explain the meaning of hygiene
5. Discuss the purpose of Swacch Bharat Abhiyan
6. Explain the meaning of habit
7. Discuss ways to set up a safe work environment
8. Discuss critical safety habits to be followed by employees
9. Explain the importance of self-analysis
10. Discuss motivation with the help of Maslow's Hierarchy of Needs
11. Discuss the meaning of achievement motivation
12. List the characteristics of entrepreneurs with achievement motivation
13. List the different factors that motivate you
14. Discuss the role of attitude in self-analysis
15. Discuss how to maintain a positive attitude
16. List your strengths and weaknesses
17. Discuss the qualities of honest people
18. Describe the importance of honesty in entrepreneurs
19. Discuss the elements of a strong work ethic
20. Discuss how to foster a good work ethic
21. List the characteristics of highly creative people
22. List the characteristics of highly innovative people
23. Discuss the benefits of time management
24. List the traits of effective time managers
25. Describe effective time management technique
26. Discuss the importance of anger management
27. Describe anger management strategies
28. Discuss tips for anger management
29. Discuss the causes of stress
30. Discuss the symptoms of stress
31. Discuss tips for stress management
32. Identify the basic parts of a computer
33. Identify the basic parts of a keyboard
34. Recall basic computer terminology
35. Recall basic computer terminology

36. Recall the functions of basic computer keys
37. Discuss the main applications of MS Office
38. Discuss the benefits of Microsoft Outlook
39. Discuss the different types of e-commerce
40. List the benefits of e-commerce for retailers and customers
41. Discuss how the Digital India campaign will help boost e-commerce in India
42. Describe how you will sell a product or service on an e-commerce platform
43. Discuss the importance of saving money
44. Discuss the benefits of saving money
45. Discuss the main types of bank accounts
46. Describe the process of opening a bank account
47. Differentiate between fixed and variable costs
48. Describe the main types of investment options
49. Describe the different types of insurance products
50. Describe the different types of taxes
51. Discuss the uses of online banking
52. Discuss the main types of electronic funds transfers
53. Discuss the steps to prepare for an interview
54. Discuss the steps to create an effective Resume
55. Discuss the most frequently asked interview questions
56. Discuss how to answer the most frequently asked interview questions
57. Discuss basic workplace terminology
58. Discuss the concept of entrepreneurship
59. Discuss the importance of entrepreneurship
60. Describe the characteristics of an entrepreneur
61. Describe the different types of enterprises
62. List the qualities of an effective leader
63. Discuss the benefits of effective leadership
64. List the traits of an effective team
65. Discuss the importance of listening effectively
66. Discuss how to listen effectively
67. Discuss the importance of speaking effectively
68. Discuss how to speak effectively
69. Discuss how to solve problems
70. List important problem solving traits
71. Discuss ways to assess problem solving skills
72. Discuss the importance of negotiation

73. Discuss how to negotiate
74. Discuss how to identify new business opportunities
75. Discuss how to identify business opportunities within your business
76. Explain the meaning of entrepreneur
77. Describe the different types of entrepreneurs
78. List the characteristics of entrepreneurs
79. Recall entrepreneur success stories
80. Discuss the entrepreneurial process
81. Describe the entrepreneurship ecosystem
82. Discuss the purpose of the Make in India campaign
83. Discuss key schemes to promote entrepreneurs
84. Discuss the relationship between entrepreneurship and risk appetite
85. Discuss the relationship between entrepreneurship and resilience
86. Describe the characteristics of a resilient entrepreneur
87. Discuss how to deal with failure
88. Discuss how market research is carried out
89. Describe the 4 Ps of marketing
90. Discuss the importance of idea generation
91. Recall basic business terminology
92. Discuss the need for CRM
93. Discuss the benefits of CRM
94. Discuss the need for networking
95. Discuss the benefits of networking
96. Discuss the importance of setting goals
97. Differentiate between short-term, medium-term and long-term goals
98. Discuss how to write a business plan
99. Explain the financial planning process
100. Discuss ways to manage your risk
101. Describe the procedure and formalities for applying for bank finance
102. Discuss how to manage your own enterprise
103. List important questions that every entrepreneur should ask before starting an enterprise

Unit 5.1 Personal Strength & Value System

Unit Objectives

At the end of this unit, you will be able to:

1. Explain the meaning of health
2. List common health issues
3. Discuss tips to prevent common health issues
4. Explain the meaning of hygiene
5. Discuss the purpose of Swacch Bharat Abhiyan
6. Explain the meaning of habit
7. Discuss ways to set up a safe work environment
8. Discuss critical safety habits to be followed by employees
9. Explain the importance of self-analysis
10. Discuss motivation with the help of Maslow's Hierarchy of Needs
11. Discuss the meaning of achievement motivation
12. List the characteristics of entrepreneurs with achievement motivation
13. List the different factors that motivate you
14. Discuss the role of attitude in self-analysis
15. Discuss how to maintain a positive attitude
16. List your strengths and weaknesses
17. Discuss the qualities of honest people
18. Describe the importance of honesty in entrepreneurs
19. Discuss the elements of a strong work ethic
20. Discuss how to foster a good work ethic
21. List the characteristics of highly creative people
22. List the characteristics of highly innovative people
23. Discuss the benefits of time management
24. List the traits of effective time managers
25. Describe effective time management technique
26. Discuss the importance of anger management
27. Describe anger management strategies
28. Discuss tips for anger management
29. Discuss the causes of stress
30. Discuss the symptoms of stress
31. Discuss tips for stress management

5.1.1 Health, habits, hygiene: What is Health

As per the World Health Organization (WHO), health is a "State of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity." This means being healthy does not simply mean not being unhealthy – it also means you need to be at peace emotionally, and feel fit physically. For example, you cannot say you are healthy simply because you do not have any physical ailments like a cold or cough. You also need to think about whether you are feeling calm, relaxed and happy.

Common Health Issues

Some common health issues are:

- Allergies
- Asthma
- Skin Disorders
- Depression and Anxiety
- Diabetes
- Cough, Cold, Sore Throat
- Difficulty Sleeping
- Obesity

Tips to Prevent Health Issues

Taking measures to prevent ill health is always better than curing a disease or sickness. You can stay healthy by:

- Eating healthy foods like fruits, vegetables and nuts
- Cutting back on unhealthy and sugary foods
- Drinking enough water everyday
- Not smoking or drinking alcohol
- Exercising for at least 30 minutes a day, 4-5 times a week
- Taking vaccinations when required
- Practicing yoga exercises and meditatio

How many of these health standards do you follow? Tick the ones that apply to you.

1. Get minimum 7-8 hours of sleep every night. ☐
2. Avoid checking email first thing in the morning and right before you go to bed at night. ☐
3. Don't skip meals – eat regular meals at correct meal times. ☐
4. Read a little bit every single day. ☐
5. Eat more home cooked food than junk food. ☐

6. Stand more than you sit. ☐
7. Drink a glass of water first thing in the morning and have at least 8 glasses of water through the day. ☐
8. Go to the doctor and dentist for regular checkups. ☐
9. Exercise for 30 minutes at least 5 days a week. ☐
10. Avoid consuming lots of aerated beverages. ☐

What is Hygiene

As per the World Health Organization (WHO), "Hygiene refers to conditions and practices that help to maintain health and prevent the spread of diseases." In other words, hygiene means ensuring that you do whatever is required to keep your surroundings clean, so that you reduce the chances of spreading germs and diseases.

For instance, think about the kitchen in your home. Good hygiene means ensuring that the kitchen is always spick and span, the food is put away, dishes are washed and dustbins are not overflowing with garbage. Doing all this will reduce the chances of attracting pests like rats or cockroaches, and prevent the growth of fungus and other bacteria, which could spread disease.

How many of these health standards do you follow? Tick the ones that apply to you.

1. Have a bath or shower every day with soap – and wash your hair with shampoo 2-3 times a week. ☐
2. Wear a fresh pair of clean undergarments every day. ☐
3. Brush your teeth in the morning and before going to bed. ☐
4. Cut your fingernails and toenails regularly. ☐
5. Wash your hands with soap after going to the toilet. ☐
6. Use an anti-perspirant deodorant on your underarms if you sweat a lot. ☐
7. Wash your hands with soap before cooking or eating. ☐
8. Stay home when you are sick, so other people don't catch what you have. ☐
9. Wash dirty clothes with laundry soap before wearing them again. ☐
10. Cover your nose with a tissue/your hand when coughing or sneezing. ☐

See how healthy and hygienic you are, by giving yourself 1 point for every ticked statement! Then take a look at what your score means.

Your Score

0-7/20: You need to work a lot harder to stay fit and fine! Make it a point to practice good habits daily and see how much better you feel!

7-14/20: Not bad, but there is scope for improvement! Try and add a few more good habits to your daily routine.

14-20/20: Great job! Keep up the good work! Your body and mind thank you!

Swachh Bharat Abhiyan

We have already discussed the importance of following good hygiene and health practices for ourselves. But, it is not enough for us to be healthy and hygienic. We must also extend this standard to our homes, our immediate surroundings and to our country as a whole.

The 'Swachh Bharat Abhiyan' (Clean India Mission) launched by Prime Minister Shri Narendra Modi on 2nd October 2014, believes in doing exactly this. The aim of this mission is to clean the streets and roads of India and raise the overall level of cleanliness. Currently this mission covers 4,041 cities and towns across the country. Millions of our people have taken the pledge for a clean India. You should take the pledge too, and do everything possible to keep our country clean!

What are Habits

A habit is a behaviour that is repeated frequently. All of us have good habits and bad habits. Keep in mind the phrase by John Dryden: "We first make our habits, and then our habits make us." This is why it is so important that you make good habits a way of life, and consciously avoid practicing bad habits.

Some good habits that you should make part of your daily routine are:

- Always having a positive attitude
- Making exercise a part of your daily routine
- Reading motivational and inspirational stories
- Smiling! Make it a habit to smile as often as possible
- Making time for family and friends
- Going to bed early and waking up early

Some bad habits that you should quit immediately are:

- Skipping breakfast
- Snacking frequently even when you are not hungry
- Eating too much fattening and sugary food
- Smoking, drinking alcohol and doing drugs
- Spending more money than you can afford
- Worrying about unimportant issues
- Staying up late and waking up late

Tips

- Following healthy and hygienic practices every day will make you feel good mentally and physically.
- Hygiene is two-thirds of health – so good hygiene will help you stay strong and healthy!

5.1.2 Safety: Tips to Design a Safe Workplace

Every employer is obligated to ensure that his workplace follows the highest possible safety protocol. When setting up a business, owners must make it a point to:

- Use ergonomically designed furniture and equipment to avoid stooping and twisting
- Provide mechanical aids to avoid lifting or carrying heavy objects
- Have protective equipment on hand for hazardous jobs
- Designate emergency exits and ensure they are easily accessible
- Set down health codes and ensure they are implemented
- Follow the practice of regular safety inspections in and around the workplace
- Ensure regular building inspections are conducted
- Get expert advice on workplace safety and follow it

Non-Negotiable Employee Safety Habits

Every employee is obligated to follow all safety protocols put in place by the employer. All employees must make it a habit to:

- Immediately report unsafe conditions to a supervisor
- Recognize and report safety hazards that could lead to slips, trips and falls
- Report all injuries and accidents to a supervisor
- Wear the correct protective equipment when required
- Learn how to correctly use equipment provided for safety purposes
- Be aware of and avoid actions that could endanger other people
- Take rest breaks during the day and some time off from work during the week

Tips

- Be aware of what emergency number to call at the time of a workplace emergency
- Practice evacuation drills regularly to avoid chaotic evacuations

5.1.3 Self Analysis - Attitude, Achievement Motivation:

What is Self-Analysis

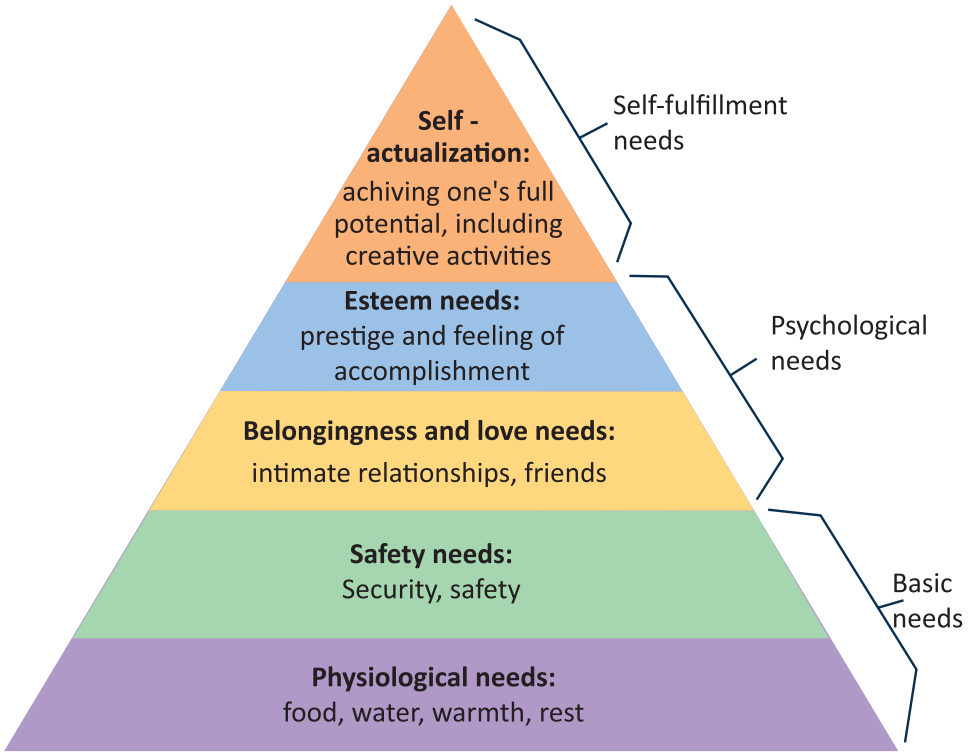
To truly achieve your full potential, you need to take a deep look inside yourself and find out what kind of person you really are. This attempt to understand your personality is known as self-analysis. Assessing yourself in this manner will help you grow, and will also help you to identify areas within yourself that need to be further developed, changed or eliminated. You can better understand yourself by taking a deep look at what motivates you, what your attitude is like, and what your strengths and weaknesses are.

What is Motivation

Very simply put, motivation is your reason for acting or behaving in a certain manner. It is important to understand that not everyone is motivated by the same desires – people are motivated by many, many different things. We can understand this better by looking at Maslow's Hierarchy of Needs.

Maslow's Hierarchy of Needs

Famous American psychologist Abraham Maslow wanted to understand what motivates people. He believed that people have five types of needs, ranging from very basic needs (called physiological needs) to more important needs that are required for self-growth (called self-actualization needs). Between the physiological and self-actualization needs are three other needs – safety needs, belongingness and love needs, and esteem needs. These needs are usually shown as a pyramid with five levels and are known as Maslow's Hierarchy of Needs.



As you can see from the pyramid, the lowest level depicts the most basic needs. Maslow believed that our behaviour is motivated by our basic needs, until those needs are met. Once they are fulfilled, we move to the next level and are motived by the next level of needs. Let's understand this better with an example.

Rupa comes from a very poor family. She never has enough food, water, warmth or rest. According to Maslow, until Rupa is sure that she will get these basic needs, she will not even think about the next level of needs – her safety needs. But, once Rupa is confident that her basic needs will be met, she will move to the next level, and her behaviour will then be motivated by her need for security and safety. Once these new needs are met, Rupa will once again move to the next level, and be motivated by her need for relationships and friends. Once this need is satisfied, Rupa will then focus on the fourth level of needs – her esteem needs, after which she will move up to the fifth and last level of needs – the desire to achieve her full potential.

Understanding Achievement Motivation

We now know that people are motivated by basic, psychological and self-fulfillment needs. However, certain people are also motivated by the achievement of highly challenging accomplishments. This is known as Achievement Motivation, or 'need for achievement'.

The level of motivation achievement in a person differs from individual to individual. It is important that entrepreneurs have a high level of achievement motivation – a deep desire to accomplish something important and unique. It is equally important that they hire people who are also highly motivated by challenges and success.

What Motivates You

What are the things that really motivate you? List down five things that really motivate you. Remember to answer honestly!

I am motivated by:

Characteristics of Entrepreneurs with Achievement Motivation

Entrepreneurs with achievement motivation can be described as follows:

- Unafraid to take risks for personal accomplishment
- Love being challenged
- Future-oriented
- Flexible and adaptive
- Value negative feedback more than positive feedback
- Very persistent when it comes to achieving goals
- Extremely courageous
- Highly creative and innovative
- Restless – constantly looking to achieve more
- Feel personally responsible for solving problems

Think about it:

- How many of these traits do you have?
- Can you think of entrepreneurs who display these traits?

What is Attitude

Now that we understand why motivation is so important for self-analysis, let's look at the role our attitude plays in better understanding ourselves. Attitude can be described as your tendency (positive or negative), to think and feel about someone or something. Attitude is the foundation for success in every aspect of life. Our attitude can be our best friend or our worst enemy. In other words:

"The only disability in life is a bad attitude."

When you start a business, you are sure to encounter a wide variety of emotions, from difficult times and failures to good times and successes. Your attitude is what will see you through the tough times and guide you towards success. Attitude is also infectious. It affects everyone around you, from your customers to your employees to your investors. A positive attitude helps build confidence in the workplace while a negative attitude is likely to result in the demotivation of your people.

How to Cultivate a Positive Attitude

The good news is attitude is a choice. So it is possible to improve, control and change our attitude, if we decide we want to! The following tips help foster a positive mindset:

- Remember that you control your attitude, not the other way around
- Devote at least 15 minutes a day towards reading, watching or listening to something positive
- Avoid negative people who only complain and stop complaining yourself
- Expand your vocabulary with positive words and delete negative phrases from your mind
- Be appreciative and focus on what's good in yourself, in your life, and in others
- Stop thinking of yourself as a victim and start being proactive
- Imagine yourself succeeding and achieving your goals

What Are Your Strengths and Weaknesses

Another way to analyze yourself is by honestly identifying your strengths and weaknesses. This will help you use your strengths to your best advantage and reduce your weaknesses.

Note down all your strengths and weaknesses in the two columns below. Remember to be honest with yourself!

Strengths	Weaknesses

Tips

- Achievement motivation can be learned.
- Don't be afraid to make mistakes.
- Train yourself to finish what you start.
- Dream big.

5.1.4 Honesty & Work Ethics: What is Honesty

Honesty is the quality of being fair and truthful. It means speaking and acting in a manner that inspires trust. A person who is described as honest is seen as truthful and sincere, and as someone who isn't deceitful or devious and doesn't steal or cheat. There are two dimensions of honesty – one is honesty in communication and the other is honesty in conduct.

Honesty is an extremely important trait because it results in peace of mind and builds relationships that are based on trust. Being dishonest, on the other hand, results in anxiety and leads to relationships full of distrust and conflict.

Qualities of Honest People

Honest individuals have certain distinct characteristics. Some common qualities among honest people are:

1. They don't worry about what others think of them. They believe in being themselves – they don't bother about whether they are liked or disliked for their personalities.
2. They stand up for their beliefs. They won't think twice about giving their honest opinion, even if they are aware that their point of view lies with the minority.
3. They are think skinned. This means they are not affected by others judging them harshly for their honest opinions.
4. They forge trusting, meaningful and healthy friendships. Honest people usually surround themselves with honest friends. They have faith that their friends will be truthful and upfront with them at all times.
5. They are trusted by their peers. They are seen as people who can be counted on for truthful and objective feedback and advice.

Importance of Honesty in Entrepreneurs

One of the most important characteristics of entrepreneurs is honesty. When entrepreneurs are honest with their customers, employees and investors, it shows that they respect those that they work with. It is also important that entrepreneurs remain honest with themselves. Let's look at how being honest would lead to great benefits for entrepreneurs.

- Honesty and customers: When entrepreneurs are honest with their customers it leads to stronger relationships, which in turn results in business growth and a stronger customer network.
- Honesty and employees: When entrepreneurs build honest relationships with their employees, it leads to more transparency in the workplace, which results in higher work performance and better results.
- Honesty and investors: For entrepreneurs, being honest with investors means not only sharing strengths but also candidly disclosing current and potential weaknesses, problem areas and solution strategies. Keep in mind that investors have a lot of experience with startups and are aware that all new companies have problems. Claiming that everything is perfectly fine and running smoothly is a red flag for most investors.
- Honesty with oneself: The consequences of being dishonest with oneself can lead to dire results, especially in the case of entrepreneurs. For entrepreneurs to succeed, it is critical that they remain realistic about their situation at all times, and accurately judge every aspect of their enterprise for what it truly is.

What are Work Ethics

Being ethical in the workplace means displaying values like honesty, integrity and respect in all your decisions and communications. It means not displaying negative qualities like lying, cheating and stealing.

Workplace ethics play a big role in the profitability of a company. It is as crucial to an enterprise as high morale and teamwork. This is why most companies lay down specific workplace ethic guidelines that must compulsorily be followed by their employees. These guidelines are typically outlined in a company's employee handbook.

Elements of a Strong Work Ethic

An entrepreneur must display strong work ethics, as well as hire only those individuals who believe in and display the same level of ethical behavior in the workplace. Some elements of a strong work ethic are:

- **Professionalism**: This involves everything from how you present yourself in a corporate setting to the manner in which you treat others in the workplace.
- **Respectfulness**: This means remaining poised and diplomatic regardless of how stressful or volatile a situation is.
- **Dependability**: This means always keeping your word, whether it's arriving on time for a meeting or delivering work on time.
- **Dedication**: This means refusing to quit until the designated work is done, and completing the work at the highest possible level of excellence.
- **Determination**: This means embracing obstacles as challenges rather than letting them stop you, and pushing ahead with purpose and resilience to get the desired results.
- **Accountability**: This means taking responsibility for your actions and the consequences of your actions, and not making excuses for your mistakes.
- **Humility**: This means acknowledging everyone's efforts and had work, and sharing the credit for accomplishments.

How to Foster a Good Work Ethic

As an entrepreneur, it is important that you clearly define the kind of behaviour that you expect from each and every team member in the workplace. You should make it clear that you expect employees to display positive work ethics like:

- **Honesty**: All work assigned to a person should be done with complete honesty, without any deceit or lies.
- **Good attitude**: All team members should be optimistic, energetic, and positive.
- **Reliability**: Employees should show up where they are supposed to be, when they are supposed to be there.
- **Good work habits**: Employees should always be well groomed, never use inappropriate language, conduct themselves professionally at all times, etc.
- **Initiative**: Doing the bare minimum is not enough. Every team member needs to be proactive and show initiative.
- **Trustworthiness**: Trust is non-negotiable. If an employee cannot be trusted, it's time to let that employee go.

- **Respect**: Employees need to respect the company, the law, their work, their colleagues and themselves.
- **Integrity**: Each and every team member should be completely ethical and must display above board behaviour at all times.
- **Efficiency**: Efficient employees help a company grow while inefficient employees result in a waste of time and resources.

Tips

- Don't get angry when someone tells you the truth and you don't like what you hear.
- Always be willing to accept responsibility for your mistakes.

5.1.5 Creativity & Innovation: What is Creativity

Creativity means thinking outside the box. It means viewing things in new ways or from different perspectives, and then converting these ideas into reality. Creativity involves two parts: thinking and producing. Simply having an idea makes you imaginative, not creative. However, having an idea and acting on it makes you creative.

Characteristics of Highly Creative People

Some characteristics of creative people are:

- They are imaginative and playful
- They see issues from different angles
- They notice small details
- They have very little tolerance for boredom
- They detest rules and routine
- They love to daydream
- They are very curious

What is Innovation

There are many different definitions of innovation. In simple terms, innovation means turning an idea into a solution that adds value. It can also mean adding value by implementing a new product, service or process, or significantly improving on an existing product, service or process.

Characteristics of Highly Innovative People

Some characteristics of highly innovative people are:

- They embrace doing things differently
- They don't believe in taking shortcuts
- They are not afraid to be unconventional
- They are highly proactive and persistent
- They are organized, cautious and risk-averse

Tips 

- Take regular breaks from your creative work to recharge yourself and gain fresh perspective.
- Build prototypes frequently, test them out, get feedback, and make the required changes.

5.1.6 Time Management: What is Time Management

Time management is the process organizing your time, and deciding how to allocate your time between different activities. Good time management is the difference between working smart (getting more done in less time) and working hard (working for more time to get more done).

Effective time management leads to an efficient work output, even when you are faced with tight deadlines and high pressure situations. On the other hand, not managing your time effectively results in inefficient output and increases stress and anxiety.

Benefits of Time Management

Time management can lead to huge benefits like:

- Greater productivity
- Better professional reputation
- Higher chances for career advancement
- Higher efficiency
- Reduced stress
- Greater opportunities to achieve goals

Not managing time effectively can result in undesirable consequences like:

- Missing deadlines
- Substandard work quality
- Stalled career
- Inefficient work output
- Poor professional reputation
- Increase in stress and anxiety

Traits of Effective Time Managers

Some traits of effective time managers are:

- They begin projects early
- They set daily objectives
- They modify plans if required, to achieve better results
- They are flexible and open-minded
- They inform people in advance if their help will be required
- They know how to say no
- They break tasks into steps with specific deadlines
- They continually review long term goals
- They think of alternate solutions if and when required
- They ask for help when required
- They create backup plans

Effective Time Management Techniques

You can manage your time better by putting into practice certain time management techniques. Some helpful tips are:

- Plan out your day as well as plan for interruptions. Give yourself at least 30 minutes to figure out your time plan. In your plan, schedule some time for interruptions.
- Put up a “Do Not Disturb” sign when you absolutely have to complete a certain amount of work.
- Close your mind to all distractions. Train yourself to ignore ringing phones, don’t reply to chat messages and disconnect from social media sites.

- Delegate your work. This will not only help your work get done faster, but will also show you the unique skills and abilities of those around you.
- Stop procrastinating. Remind yourself that procrastination typically arises due to the fear of failure or the belief that you cannot do things as perfectly as you wish to do them.
- Prioritize. List each task to be completed in order of its urgency or importance level. Then focus on completing each task, one by one.
- Maintain a log of your work activities. Analyze the log to help you understand how efficient you are, and how much time is wasted every day.
- Create time management goals to reduce time wastage.

Tips 

- Always complete the most important tasks first.
- Get at least 7 – 8 hours of sleep every day.
- Start your day early.
- Don’t waste too much time on small, unimportant details.
- Set a time limit for every task that you will undertake.
- Give yourself some time to unwind between tasks.

5.1.7 Anger Management: What is Anger Management

Anger management is the process of:

1. Learning to recognize the signs that you, or someone else, is becoming angry
2. Taking the best course of action to calm down the situation in a positive way

Anger management does not mean suppressing anger.

Importance of Anger Management

Anger is a perfectly normal human emotion. In fact, when managed the right way, anger can be considered a healthy emotion. However, if it is not kept in check, anger can make us act inappropriately and can lead to us saying or doing things that we will likely later regret.

Extreme anger can:

- **Hurt you physically**: It leads to heart disease, diabetes, a weakened immune system, insomnia, and high blood pressure.
- **Hurt you mentally**: It can cloud your thinking and lead to stress, depression and mental health issues.
- **Hurt your career**: It can result in alienating your colleagues, bosses, clients and lead to the loss of respect.
- **Hurt your relationships**: It makes it hard for your family and friends to trust you, be honest with you and feel comfortable around you.

This is why anger management, or managing anger appropriately, is so important.

Anger Management Strategies

Here are some strategies that can help you control your anger:

Strategy 1: Relaxation

Something as simple as breathing deeply and looking at relaxing images works wonders in calming down angry feelings. Try this simple breathing exercise:

1. Take a deep breath from your diaphragm (don't breathe from your chest)
2. Visualize your breath coming up from your stomach
3. Keep repeating a calming word like 'relax' or 'take it easy' (remember to keep breathing deeply while repeating the word)
4. Picture a relaxing moment (this can be from your memory or your imagination)

Follow this relaxation technique daily, especially when you realize that you're starting to feel angry.

Strategy 2: Cognitive Restructuring

Cognitive restructuring means changing the manner in which you think. Anger can make you curse, swear, exaggerate and act very dramatically. When this happens, force yourself to replace your angry thoughts with more logical ones. For instance, instead of thinking 'Everything is ruined' change your mindset and tell yourself 'It's not the end of the world and getting angry won't solve this'.

Strategy 3: Problem Solving

Getting angry about a problem that you cannot control is a perfectly natural response. Sometimes, try as you may, there may not be a solution to the difficulty you are faced with. In such cases, stop focusing on solving the problem, and instead focus on handling and facing the problem. Remind yourself that you will do your best to deal with the situation, but that you will not blame yourself if you don't get the solution you desire.

Strategy 4: Better Communication

When you're angry, it is very easy to jump to inaccurate conclusions. In this case, you need to force yourself to stop reacting, and think carefully about what you want to say, before saying it. Avoid saying the first thing that enters your head. Force yourself to listen carefully to what the other person is saying. Then think about the conversation before responding.

Strategy 5: Changing Your Environment

If you find that your environment is the cause of your anger, try and give yourself a break from your surroundings. Make an active decision to schedule some personal time for yourself, especially on days that are very hectic and stressful. Having even a brief amount of quiet or alone time is sure to help calm you down.

Tips for Anger Management

The following tips will help you keep your anger in check:

- Take some time to collect your thoughts before you speak out in anger.
- Express the reason for your anger in an assertive, but non-confrontational manner once you have calmed down.
- Do some form of physical exercise like running or walking briskly when you feel yourself getting angry.
- Make short breaks part of your daily routine, especially during days that are stressful.
- Focus on how to solve a problem that's making you angry, rather than focusing on the fact that the problem is making you angry.

Tips

- Try to forgive those who anger you, rather than hold a grudge against them.
- Avoid using sarcasm and hurling insults. Instead, try and explain the reason for your frustration in a polite and mature manner.

5.1.8 Stress Management: What is Stress

We say we are 'stressed' when we feel overloaded and unsure of our ability to deal with the pressures placed on us. Anything that challenges or threatens our well-being can be defined as a stress. It is important to note that stress can be good and bad. While good stress keeps us going, negative stress undermines our mental and physical health. This is why it is so important to manage negative stress effectively.

Causes of Stress

Stress can be caused by internal and external factors.

Internal causes of stress

- Constant worry
- Rigid thinking
- Unrealistic expectations
- Pessimism
- Negative self-talk
- All in or all out attitude

External causes of stress

- Major life changes
- Difficulties with relationships
- Having too much to do
- Difficulties at work or in school
- Financial difficulties
- Worrying about one's children and/or family

Symptoms of Stress

Stress can manifest itself in numerous ways. Take a look at the cognitive, emotional, physical and behavioral symptoms of stress.

Cognitive Symptoms	Emotional Symptoms
• Memory problems	• Depression
• Concentration issues	• Agitation
• Lack of judgement	• Irritability
• Pessimism	• Loneliness
• Anxiety	• Anxiety
• Constant worrying	• Anger

Physical Symptoms	Behavioral Symptoms
• Aches and pain	• Increase or decrease in appetite
• Diarrhea or constipation	• Over sleeping or not sleeping enough
• Nausea	• Withdrawing socially
• Dizziness	• Ignoring responsibilities
• Chest pain and/or rapid heartbeat	• Consumption of alcohol or cigarettes
• Frequent cold or flu like feelings	• Nervous habits like nail biting, pacing etc.

Tips to Manage Stress

The following tips can help you manage your stress better:

- Note down the different ways in which you can handle the various sources of your stress.
- Remember that you cannot control everything, but you can control how you respond.
- Discuss your feelings, opinions and beliefs rather than reacting angrily, defensively or passively.
- Practice relaxation techniques like meditation, yoga or tai chi when you start feeling stressed.
- Devote a part of your day towards exercise.
- Eat healthy foods like fruits and vegetables. Avoid unhealthy foods especially those containing large amounts of sugar.
- Plan your day so that you can manage your time better, with less stress.
- Say no to people and things when required.
- Schedule time to pursue your hobbies and interests.
- Ensure you get at least 7-8 hours of sleep.
- Reduce your caffeine intake.
- Increase the time spent with family and friends.

Tips

- Force yourself to smile even if you feel stressed. Smiling makes us feel relaxed and happy.
- Stop yourself from feeling and thinking like a victim. Change your attitude and focus on being proactive.

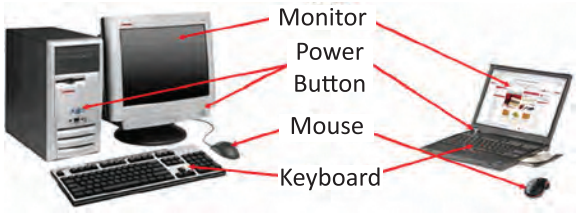
Unit 5.2 Digital Literacy: A Recap

Unit Objectives

At the end of this unit, you will be able to:

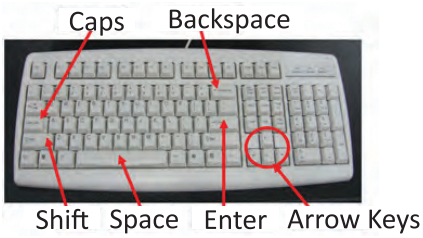
1. Identify the basic parts of a computer
2. Identify the basic parts of a keyboard
3. Recall basic computer terminology
4. Recall basic computer terminology
5. Recall the functions of basic computer keys
6. Discuss the main applications of MS Office
7. Discuss the benefits of Microsoft Outlook
8. Discuss the different types of e-commerce
9. List the benefits of e-commerce for retailers and customers
10. Discuss how the Digital India campaign will help boost e-commerce in India
11. Describe how you will sell a product or service on an e-commerce platform

5.2.1 Computer and Internet basics: Basic Parts of a Computer



- **Central Processing Unit (CPU)**: The brain of the computer. It interprets and carries out program instructions.
- **Hard Drive**: A device that stores large amounts of data.
- **Monitor**: The device that contains the computer screen where the information is visually displayed.
- **Mouse**: A hand-held device used to point to items on the monitor.
- **Speakers**: Devices that enable you to hear sound from the computer.
- **Printer**: A device that converts output from a computer into printed paper documents.

Basic Parts of a Keyboard



- **Arrow Keys**: Press these keys to move your cursor.
- **Space bar**: Adds a space.
- **Enter/Return**: Moves your cursor to a new line.
- **Shift**: Press this key if you want to type a capital letter or the upper symbol of a key.
- **Caps Lock**: Press this key if you want all the letters you type to be capital letters. Press it again to revert back to typing lowercase letters.
- **Backspace**: Deletes everything to the left of your cursor.

Basic Internet Terms

- **The Internet**: A vast, international collection of computer networks that transfers information.
- **The World Wide Web**: A system that lets you access information on the Internet.
- **Website**: A location on the World Wide Web (and Internet) that contains information about a specific topic.
- **Homepage**: Provides information about a website and directs you to other pages on that website.
- **Link/Hyperlink**: A highlighted or underlined icon, graphic, or text that takes you to another file or object.
- **Web Address/URL**: The address for a website.
- **Address Box**: A box in the browser window where you can type in a web address.

Tips

- When visiting a .com address, there no need to type http:// or even www. Just type the name of the website and then press Ctrl + Enter. (Example: Type 'apple' and press Ctrl + Enter to go to www.apple.com)
- Press the Ctrl key and press the + or - to increase and decrease the size of text.
- Press F5 or Ctrl + R to refresh or reload a web page.

5.2.2 MS Office and Email: About MS Office

MS Office or Microsoft Office is a suite of computer programs developed by Microsoft. Although meant for all users, it offers different versions that cater specifically to students, home users and business users. All the programs are compatible with both, Windows and Macintosh.

Most Popular Office Products

Some of the most popular and universally used MS Office applications are:

- **Microsoft Word**: Allows users to type text and add images to a document.
- **Microsoft Excel**: Allows users to enter data into a spreadsheet and create calculations and graphs.
- **Microsoft PowerPoint**: Allows users to add text, pictures and media and create slideshows and presentations.
- **Microsoft Outlook**: Allows users to send and receive email.
- **Microsoft OneNote**: Allows users to make drawings and notes with the feel of a pen on paper.
- **Microsoft Access**: Allows users to store data over many tables.

Why Choose Microsoft Outlook

A popular email management choice especially in the workplace, Microsoft Outlook also includes an address book, notebook, web browser and calendar. Some major benefits of this program are:

- **Integrated search function**: You can use keywords to search for data across all Outlook programs.
- **Enhanced security**: Your email is safe from hackers, junk mail and phishing website email.
- **Email syncing**: Sync your mail with your calendar, contact list, notes in OneNote and…your phone!
- **Offline access to email**: No Internet? No problem! Write emails offline and send them when you're connected again.

Tips

- Press Ctrl+R as a shortcut method to reply to email.
- Set your desktop notifications only for very important emails.
- Flag messages quickly by selecting messages and hitting the Insert key.
- Save frequently sent emails as a template to reuse again and again.
- Conveniently save important emails as files.

5.2.3 E-Commerce: What is E-Commerce

E-commerce is the buying or selling of goods and services, or the transmitting of money or data, electronically on the internet. E-Commerce is the short form for "electronic commerce."

Examples of E-Commerce

Some examples of e-commerce are:

- Online shopping
- Online auctions
- Online ticketing
- Electronic payments
- Internet banking

Types of E-Commerce

E-commerce can be classified based on the types of participants in the transaction. The main types of e-commerce are:

- **Business to Business (B2B)**: Both the transacting parties are businesses.
- **Business to Consumer (B2C)**: Businesses sell electronically to end-consumers.
- **Consumer to Consumer (C2C)**: Consumers come together to buy, sell or trade items to other consumers.
- **Consumer-to-Business (C2B)**: Consumers make products or services available for purchase to companies looking for exactly those services or products.
- **Business-to-Administration (B2A)**: Online transactions conducted between companies and public administration.
- **Consumer-to-Administration (C2A)**: Online transactions conducted between individuals and public administration.

Benefits of E-Commerce

The e-commerce business provides some benefits for retailers and customers.

Benefits for retailers:

- Establishes an online presence
- Reduces operational costs by removing overhead costs
- Increases brand awareness through the use of good keywords
- Increases sales by removing geographical and time constraints

Benefits for customers:

- Offers a wider range of choice than any physical store
- Enables goods and services to be purchased from remote locations
- Enables consumers to perform price comparisons

Digital India Campaign

Prime Minister Narendra Modi launched the Digital India campaign in 2015, with the objective of offering every citizen of India access to digital services, knowledge and information. The campaign aims to improve the country's online infrastructure and increase internet connectivity, thus boosting the e-commerce industry.

Currently, the majority of online transactions come from tier 2 and tier 3 cities. Once the Digital India campaign is in place, the government will deliver services through mobile connectivity, which will help deliver internet to remote corners of the country. This will help the e-commerce market to enter India's tier 4 towns and rural areas.

E-Commerce Activity

Choose a product or service that you want to sell online. Write a brief note explaining how you will use existing e-commerce platforms, or create a new e-commerce platform, to sell your product or service.

Tips

- Before launching your e-commerce platform, test everything.
- Pay close and personal attention to your social media.

Unit 5.3 Money Matters

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss the importance of saving money
2. Discuss the benefits of saving money
3. Discuss the main types of bank accounts
4. Describe the process of opening a bank account
5. Differentiate between fixed and variable costs
6. Describe the main types of investment options
7. Describe the different types of insurance products
8. Describe the different types of taxes
9. Discuss the uses of online banking
10. Discuss the main types of electronic funds transfers

5.3.1 Personal Finance - Why to Save

Importance of Saving

We all know that the future is unpredictable. You never know what will happen tomorrow, next week or next year. That's why saving money steadily through the years is so important. Saving money will help improve your financial situation over time. But more importantly, knowing that you have money stashed away for an emergency will give you peace of mind. Saving money also opens the door to many more options and possibilities.

Benefits of Saving

Inculcating the habit of saving leads to a vast number of benefits. Saving helps you:

- **Become financially independent**: When you have enough money saved up to feel secure you can start making your choices, from taking a vacation whenever you want, to switching careers or starting your own business.
- **Invest in yourself through education**: Through saving, you can earn enough to pay up for courses that will add to your professional experience and ultimately result in higher paying jobs.
- **Get out of debt**: Once you have saved enough as a reserve fund, you can use your savings to pay off debts like loans or bills that have accumulated over time.
- **Be prepared for surprise expenses**: Having money saved enables you to pay for unforeseen expenses like sudden car or house repairs, without feeling financially stressed.
- **Pay for emergencies**: Saving helps you deal with emergencies like sudden health issues or emergency trips without feeling financially burdened.

- **Afford large purchases and achieve major goals**: Saving diligently makes it possible to place down payments towards major purchases and goals, like buying a home or a car.
- **Retire**: The money you have saved over the years will keep you comfortable when you no longer have the income you would get from your job.

Tips

- Break your spending habit. Try not spending on one expensive item per week, and put the money that you would have spent into your savings.
- Decide that you will not buy anything on certain days or weeks and stick to your word.

5.3.2 Types of Bank Accounts, Opening a Bank Account: Types of Bank Accounts

In India, banks offer four main types of bank accounts. These are:

- Current Accounts
- Savings Accounts
- Recurring Deposit Accounts
- Fixed Deposit Accounts

Current Accounts

Current accounts offer the most liquid deposits and thus, are best suited for businessmen and companies. As these accounts are not meant for investments and savings, there is no imposed limit on the number or amount of transactions that can be made on any given day. Current account holders are not paid any interest on the amounts held in their accounts. They are charged for certain services offered on such accounts.

Savings Accounts

Savings accounts are meant to promote savings, and are therefore the number one choice for salaried individuals, pensioners and students. While there is no restriction on the number and amount of deposits made, there are usually restrictions on the number and amount of withdrawals. Savings account holders are paid interest on their savings.

Recurring Deposit Accounts

Recurring Deposit accounts, also called RD accounts, are the accounts of choice for those who want to save an amount every month, but are unable to invest a large sum at one time. Such account holders deposit a small, fixed amount every month for a pre-determined period (minimum 6 months). Defaulting on a monthly payment results in the account holder being charged a penalty amount. The total amount is repaid with interest at the end of the specified period.

Fixed Deposit Accounts

Fixed Deposit accounts, also called FD accounts, are ideal for those who wish to deposit their savings for a long term in return for a high rate of interest. The rate of interest offered depends on the amount deposited and the time period, and also differs from bank to bank. In the case of an FD, a certain amount of money is deposited by the account holder for a fixed period of time. The money can be withdrawn when the period expires. If necessary, the depositor can break the fixed deposit prematurely. However, this usually attracts a penalty amount which also differs from bank to bank.

Opening a Bank Account

Opening a bank account is quite a simple process. Take a look at the steps to open an account of your own:

Step 1: Fill in the Account Opening Form

This form requires you to provide the following information:

- Personal details (name, address, phone number, date of birth, gender, occupation, address)
- Method of receiving your account statement (hard copy/email)
- Details of your initial deposit (cash/cheque)
- Manner of operating your account (online/mobile banking/traditional via cheque, slip books)

Ensure that you sign wherever required on the form.

Step 2: Affix your Photograph

Stick a recent photograph of yourself in the allotted space on the form.

Step 3: Provide your Know Your Customer (KYC) Details

KYC is a process that helps banks verify the identity and address of their customers. To open an account, every individual needs to submit certain approved documents with respect to photo identity (ID) and address proof. Some Officially Valid Documents (OVDs) are:

- Passport
- Driving License
- Voters' Identity Card
- PAN Card
- UIDAI (Aadhaar) Card

Step 4: Submit All your Documents

Submit the completed Account Opening Form and KYC documents. Then wait until the forms are processed and your account has been opened!

Tips

- Select the right type of account.
- Fill in complete nomination details.
- Ask about fees.
- Understand the rules.
- Check for online banking – it's convenient!
- Keep an eye on your bank balance.

5.3.3 Costs: Fixed vs Variable: What are Fixed and Variable Costs

Fixed costs and variable costs together make up a company's total cost. These are the two types of costs that companies have to bear when producing goods and services.

A fixed cost does not change with the volume of goods or services a company produces. It always remains the same.

A variable cost, on the other hand, increases and decreases depending on the volume of goods and services produced. In other words, it varies with the amount produced.

Differences Between Fixed and Variable Costs

Let's take a look at some of the main differences between fixed and variable costs:

Criteria	Fixed Costs	Variable Costs
Meaning	A cost that stays the same, regardless of the output produced.	A cost that changes when the output changes.
Nature	Time related.	Volume related.
Incurred	Incurred irrespective of units being produced.	Incurred only when units are produced.
Unit cost	Inversely proportional to the number of units produced.	Remains the same, per unit.
Examples	Depreciation, rent, salary, insurance, tax etc.	Material consumed, wages, commission on sales, packing expenses, etc.

Tips

- When trying to determine whether a cost is fixed or variable, simply ask the following question: Will the particular cost change if the company stopped its production activities? If the answer is no, then it is a fixed cost. If the answer is yes, then it is probably a variable cost.

5.3.4 Investment, Insurance and Taxes: Investment

Investment means that money is spent today with the aim of reaping financial gains at a future time. The main types of investment options are as follows:

- **Bonds:** Bonds are instruments used by public and private companies to raise large sums of money – too large to be borrowed from a bank. These bonds are then issued in the public market and are bought by lenders.
- **Stocks:** Stocks or equity are shares that are issued by companies and are bought by the general public.
- **Small Savings Schemes:** Small Savings Schemes are tools meant to save money in small amounts. Some popular schemes are the Employees Provident Fund, Sukanya Samriddhi Scheme and National Pension Scheme.
- **Mutual Funds:** Mutual Funds are professionally managed financial instruments that invest money in different securities on behalf of investors.
- **Fixed Deposits:** A fixed amount of money is kept aside with a financial institution for a fixed amount of time in return for interest on the money.
- **Real Estate:** Loans are taken from banks to purchase real estate, which is then leased or sold with the aim of making a profit on the appreciated property price.
- **Hedge Funds:** Hedge funds invest in both financial derivatives and/or publicly traded securities.
- **Private Equity:** Private Equity is trading in the shares of an operating company that is not publicly listed and whose shares are not available on the stock market.
- **Venture Capital:** Venture Capital involves investing substantial capital in a budding company in return for stocks in that company.

Insurance

There are two types of insurance – Life Insurance and Non-Life or General Insurance.

Life Insurance

Life Insurance deals with all insurance covering human life.

Life Insurance Products

The main life insurance products are:

- **Term Insurance:** This is the simplest and cheapest form of insurance. It offers financial protection for a specified tenure, say 15 to 20 years. In the case of your death, your family is paid the sum assured. In the case of your surviving the term, the insurer pays nothing.
- **Endowment Policy:** This offers the dual benefit of insurance and investment. Part of the premium is allocated towards the sum assured, while the remaining premium gets invested in equity and debt. It pays a lump sum amount after the specified duration or on the death of the policyholder, whichever is earlier.
- **Unit-Linked Insurance Plan (ULIP):** Here part of the premium is spent on the life cover, while the remaining amount is invested in equity and debt. It helps develop a regular saving habit.

Indirect Tax

Indirect taxes are levied on goods or services.

Some examples of Indirect Taxes are:

- **Sales Tax:** Sales Tax is levied on the sale of a product.
- **Service Tax:** Service Tax is added to services provided in India.
- **Value Added Tax:** Value Added Tax is levied at the discretion of the state government. The tax is levied on goods sold in the state. The tax amount is decided by the state.
- **Customs Duty & Octroi:** Customs Duty is a charge that is applied on purchases that are imported from another country. Octroi is levied on goods that cross state borders within India.
- **Excise Duty:** Excise Duty is levied on all goods manufactured or produced in India.

Tips

- Think about how quickly you need your money back and pick an investment option accordingly.
- Ensure that you are buying the right type of insurance policy for yourself.
- Remember, not paying taxes can result in penalties ranging from fines to imprisonment.

5.3.5 Online Banking, NEFT, RTGS etc:

What is Online Banking

Internet or online banking allows account holders to access their account from a laptop at any location. In this way, instructions can be issued. To access an account, account holders simply need to use their unique customer ID number and password.

Internet banking can be used to:

- Find out an account balance
- Transfer amounts from one account to another
- Arrange for the issuance of cheques
- Instruct payments to be made
- Request for a cheque book
- Request for a statement of accounts
- Make a fixed deposit

Electronic Funds Transfers

Electronic funds transfer is a convenient way of transferring money from the comfort of one's own home, using integrated banking tools like internet and mobile banking.

Transferring funds via an electronic gateway is extremely convenient. With the help of online banking, you can choose to:

- Transfer funds into your own accounts of the same bank.
- Transfer funds into different accounts of the same bank.
- Transfer funds into accounts in different banks, using NEFT.
- Transfer funds into other bank accounts using RTGS.
- Transfer funds into various accounts using IMPS.

NEFT

NEFT stands for National Electronic Funds Transfer. This money transfer system allows you to electronically transfer funds from your respective bank accounts to any other account, either in the same bank or belonging to any other bank. NEFT can be used by individuals, firms and corporate organizations to transfer funds between accounts.

In order to transfer funds via NEFT, two things are required:

- A transferring bank
- A destination bank

Before you can transfer funds through NEFT, you will need to register the beneficiary who will be receiving the funds. In order to complete this registration, you will require the following information:

- Recipient's name
- Recipient's account number
- Recipient's bank's name
- Recipient's bank's IFSC code

RTGS

RTGS stands for Real Time Gross Settlement. This is a real time funds transfer system which enables you to transfer funds from one bank to another, in real time or on a gross basis. The transferred amount is immediately deducted from the account of one bank, and instantly credited to the other bank's account. The RTGS payment gateway is maintained by the Reserve Bank of India. The transactions between banks are made electronically.

RTGS can be used by individuals, companies and firms to transfer large sums of money. Before remitting funds through RTGS, you will need to add the beneficiary and his bank account details via your online banking account. In order to complete this registration, you will require the following information:

- Name of the beneficiary
- Beneficiary's bank address
- Beneficiary's account number
- Beneficiary's bank's IFSC code

IMPS

IMPS stands for Immediate Payment Service. This is a real-time, inter-bank, electronic funds transfer system used to transfer money instantly within banks across India. IMPS enables users to make instant electronic transfer payments using mobile phones through both, Mobile Banking and SMS. It can also be used through ATMs and online banking. IMPS is available 24 hours a day and 7 days a week. The system features a secure transfer gateway and immediately confirms orders that have been fulfilled.

To transfer money through IMPS, the you need to:

- Register for IMPS with your bank
- Receive a Mobile Money Identifier (MMID) from the bank
- Receive a MPIN from the bank

Once you have both these, you can login or make a request through SMS to transfer a particular amount to a beneficiary.

For the beneficiary to receive the transferred money, he must:

1. Link his mobile number with his respective account
2. Receive the MMID from the bank

In order to initiate a money transfer through IMPS, you will need to enter the following information:

1. The beneficiary's mobile number
2. The beneficiary's MMID
3. The transfer amount
4. Your MPIN

As soon as money has been deducted from your account and credited into the beneficiary's account, you will be sent a confirmation SMS with a transaction reference number, for future reference.

Differences Between NEFT, RTGS & IMPS

Criteria	NEFT	RTGS	IMPS
Settlement	Done in batches	Real-time	Real-time
Full form	National Electronic Fund Transfer	Real Time Gross Settlement	Immediate Payment Service
Timings on Monday – Friday	8:00 am – 6:30 pm	9:00 am – 4:30 pm	24x7
Timings on Saturday	8:00 am – 1:00 pm	9:00 am – 1:30 pm	24x7
Minimum amount of money transfer limit	₹1	₹2 lacs	₹1
Maximum amount of money transfer limit	₹10 lacs	₹10 lacs per day	₹2 lacs
Maximum charges as per RBI	Upto 10,000 – ₹2.5 above 10,000 – 1 lac – ₹5 above 1 – 2 lacs – ₹15 above 2 – 5 lacs – ₹25 above 5 – 10 lacs – ₹25	above 2 – 5 lacs – ₹25 above 5 – 10 lacs – ₹50	Upto 10,000 – ₹5 above 10,000 – 1 lac – ₹5 above 1 – 2 lacs – ₹15

Tips

- Never click on any links in any e-mail message to access your online banking website.
- You will never be asked for your credit or debit card details while using online banking.
- Change your online banking password regularly.

Unit 5.4 Preparing for Employment & Self Employment

Unit Objectives

At the end of this unit, you will be able to:

- Discuss the steps to prepare for an interview
- Discuss the steps to create an effective Resume
- Discuss the most frequently asked interview questions
- Discuss how to answer the most frequently asked interview questions
- Discuss basic workplace terminology

5.4.1 Interview Preparation: How to Prepare for an Interview

The success of your getting the job that you want depends largely on how well your interview for that job goes. Therefore, before you go in for your interview, it is important that you prepare for it with a fair amount of research and planning. Take a look at the steps to follow in order to be well prepared for an interview:

1. **Research the organization that you are having the interview with.**
   - Studying the company beforehand will help you be more prepared at the time of the interview. Your knowledge of the organization will help you answer questions at the time of the interview, and will leave you looking and feeling more confident. This is sure to make you stand out from other, not as well informed, candidates.
   - Look for background information on the company. Ty and find an overview of the company and its industry profile.
   - Visit the company website to get a good idea of what the company does. A company website offers a wealth of important information. Read and understand the company's mission statement. Pay attention to the company's products/services and client list. Read through any press releases to get an idea of the company's projected growth and stability.
   - Note down any questions that you have after your research has been completed.
2. **Think about whether your skills and qualifications match the job requirements.**
   - Carefully read through and analyze the job description.
   - Make a note of the knowledge, skills and abilities required to fulfill the job requirements.
   - Take a look at the organization hierarchy. Figure out where the position you are applying for fits into this hierarchy.
3. **Go through the most typical interview questions asked, and prepare your responses.**
   - Remember, in most interviews a mix of resume-based, behavioral and case study questions are asked.
   - Think about the kind of answers you would like to provide to typical questions asked in these three areas.
   - Practice these answers until you can express them confidently and clearly.

4. **Plan your attire for the interview.**
   - It is always safest to opt for formal business attire, unless expressly informed to dress in business casual (in which case you should use your best judgement).
   - Ensure that your clothes are clean and well-ironed. Pick neutral colours – nothing too bright or flashy.
   - The shoes you wear should match your clothes, and should be clean and suitable for an interview.
   - Remember, your aim is to leave everyone you meet with the impression that you are a professional and highly efficient person.
5. **Ensure that you have packed everything that you may require during the interview.**
   - Carry a few copies of your resume. Use a good quality paper for your resume print outs.
   - Always take along a notepad and a pen.
   - Take along any information you may need to refer to, in order to fill out an application form.
   - Carry a few samples of your work, if relevant.
6. **Remember the importance of non-verbal communication.**
   - Practice projecting confidence. Remind yourself to smile and make eye contact. Practice giving a firm handshake.
   - Keep in mind the importance of posture. Practice sitting up straight. Train yourself to stop nervous gestures like fidgeting and foot-tapping.
   - Practice keeping your reactions in check. Remember, your facial expressions provide a good insight into your true feelings. Practice projecting a positive image.
7. **Make a list of questions to end the interview with.**
   - Most interviews will end with the interviewer(s) asking if you have any questions. This is your chance to show that you have done your research and are interested in learning more about the company.
   - If the interviewer does not ask you this question, you can inform him/her that you have some queries that you would like to discuss. This is the time for you to refer to the notes you made while studying the company.
   - Some good questions to ask at this point are:
     - What do you consider the most important criteria for success in this job?
     - How will my performance be evaluated?
     - What are the opportunities for advancement?
     - What are the next steps in the hiring process?
   - Remember, never ask for information that is easily available on the company website.

Tips

- Ask insightful and probing questions.
- When communicating, use effective forms of body language like smiling, making eye contact, and actively listening and nodding. Don't slouch, play with nearby items, fidget, chew gum, or mumble.

5.4.2 Preparing an Effective Resume: How to Create an Effective Resume

A resume is a formal document that lists a candidate's work experience, education and skills. A good resume gives a potential employer enough information to believe the applicant is worth interviewing. That's why it is so important to create a resume that is effective. Take a look at the steps to create an effective resume:

Step 1: Write the Address Section

The Address section occupies the top of your resume. It includes information like your name, address, phone number and e-mail address. Insert a bold line under the section to separate it from rest of your resume.

Example:

Khyati Mehta
Breach Candy, Mumbai – India
Contact No: +91 2223678270
Email: khyati.mehta@gmail.com

Step 2: Add the Profile Summary Section

This part of your resume should list your overall experiences, achievements, awards, certifications and strengths. You can make your summary as short as 2-3 bullet points or as long as 8-10 bullet points.

Example:

Profile Summary

- A Floor Supervisor graduated from University of Delhi having 6 years of experience in managing a retail outlet.
- Core expertise lies in managing retail staff, including cashiers and people working on the floor.

Step 3: Include Your Educational Qualifications

When listing your academic records, first list your highest degree. Then add the second highest qualification under the highest one and so on. To provide a clear and accurate picture of your educational background, it is critical that include information on your position, rank, percentage or CPI for every degree or certification that you have listed.

If you have done any certifications and trainings, you can add a Trainings & Certifications section under your Educational Qualifications section.

Example:

Educational Qualifications

- *<Enter qualification> <enter date of qualification> from <enter name of institute> with <enter percentage or any other relevant scoring system>.*

Step 4: List Your Technical Skills

When listing your technical skills, start with the skills that you are most confident about. Then add the skills that you do not have as good a command over. It is perfectly acceptable to include just one skill, if you feel that particular skill adds tremendous value to your résumé. If you do not have any technical skills, you can omit this step.

Example:

Technical Skills

- *<Enter your technical skill here, if applicable>*

Step 5: Insert Your Academic Project Experience

List down all the important projects that you have worked on. Include the following information in this section:

- Project title
- Organization
- Platform used
- Contribution
- Description

Example:

Academic Projects

Project Title: *<Insert project title>*

Organization: *<Insert the name of the organization for whom you did the project>*

Platform used: *<Insert the platform used, if any>*

Contribution: *<Insert your contribution towards this project>*

Description: *<Insert a description of the project in one line>*

Step 6: List Your Strengths

This is where you list all your major strengths. This section should be in the form of a bulleted list.

Example:

Strengths

- Excellent oral, written and presentation skills
- Action-oriented and result-focused
- Great time management skills

Step 7: List Your Extracurricular Activities

It is very important to show that you have diverse interests and that your life consists of more than academics. Including your extracurricular activities can give you an added edge over other candidates who have similar academic scores and project experiences. This section should be in the form of a bulleted list.

Example:

Extracurricular Activities

- *< Insert your extracurricular activity here. E.g.: Member of _____, played (name of sport) at _____ level, won (name of prize/award) for _____ >*

Step 8: Write Your Personal Details

The last section of your résumé must include the following personal information:

- Date of birth
- Nationality
- Gender & marital status
- Languages known

Example:

Personal Details

- Date of birth: 25th May, 1981
- Gender & marital status: Female, Single
- Nationality: Indian
- Languages known: English, Hindi, Tamil, French

Tips

- Keep your resume file name short, simple and informational.
- Make sure the resume is neat and free from typing errors.
- Always create your resume on plain white paper.

5.4.3 Interview FAQs

Take a look at some of the most frequently asked interview questions, and some helpful tips on how to answer them.

Q1. Can you tell me a little about yourself?

Tips to answer:

- Don't provide your full employment or personal history.
- Offer 2-3 specific experiences that you feel are most valuable and relevant.
- Conclude with how those experiences have made you perfect for this specific role.

Q2. How did you hear about the position?

Tips to answer:

- Tell the interviewer how you heard about the job – whether it was through a friend (name the friend), event or article (name them) or a job portal (say which one).
- Explain what excites you about the position and what in particular caught your eye about this role.

Q3. What do you know about the company?

Tips to answer:

- Don't recite the company's About Us page.
- Show that you understand and care about the company's goals.
- Explain why you believe in the company's mission and values.

Q4. Why do you want this job?

Tips to answer:

- Show that you are passionate about the job.
- Identify why the role is a great fit for you.
- Explain why you love the company.

Q5. Why should we hire you?

Tips to answer:

- Prove through your words that you can not only do the work, but can definitely deliver excellent results.
- Explain why you would be a great fit with the team and work culture.
- Explain why you should be chosen over any other candidate.

Q6. What are your greatest professional strengths?

Tips to answer:

- Be honest – share some of your real strengths, rather than give answers that you think sound good.
- Offer examples of specific strengths that are relevant to the position you are applying for.
- Provide examples of how you've demonstrated these strengths.

Q7. What do you consider to be your weaknesses?

Tips to answer:

- The purpose of this question is to gauge your self-awareness and honesty.
- Give an example of a trait that you struggle with, but that you're working on to improve.

Q8. What are your salary requirements?

Tips to answer:

- Do your research beforehand and find out the typical salary range for the job you are applying for.
- Figure out where you lie on the pay scale based on your experience, education, and skills.
- Be flexible. Tell the interviewer that you know your skills are valuable, but that you want the job and are willing to negotiate.

Q9. What do you like to do outside of work?

Tips to answer:

- The purpose of this question is to see if you will fit in with the company culture.
- Be honest – open up and share activities and hobbies that interest and excite you.

Q10. If you were an animal, which one would you want to be?

Tips to answer:

- The purpose of this question is to see if you are able to think on your feet.
- There's no wrong answer – but to make a great impression try to bring out your strengths or personality traits through your answer.

Q11: What do you think we could do better or differently?

Tips to answer:

- The purpose of this question is to see if you have done your research on the company, and to test whether you can think critically and come up with new ideas.
- Suggest new ideas. Show how your interests and expertise would help you execute these ideas.

Q12: Do you have any questions for us?

Tips to answer:

- Do not ask questions to which the answers can be easily found on the company website or through a quick online search.
- Ask intelligent questions that show your ability to think critically.

Tips

- Be honest and confident while answering.
- Use examples of your past experiences wherever possible to make your answers more impactful.

5.4.4 Work Readiness - Terms & Terminologies: Basic Workplace Terminology

Every employee should be well versed in the following terms:

- **Annual leave:** Paid vacation leave given by employers to employees.
- **Background Check:** A method used by employers to verify the accuracy of the information provided by potential candidates.
- **Benefits:** A part of an employee's compensation package.
- **Breaks:** Short periods of rest taken by employees during working hours.
- **Compensation Package:** The combination of salary and benefits that an employer provides to his/her employees.
- **Compensatory Time (Comp Time):** Time off in lieu of pay.
- **Contract Employee:** An employee who works for one organization that sells said employee's services to another company, either on a project or time basis.
- **Contract of Employment:** When an employee is offered work in exchange for wages or salary, and accepts the offer made by the employer, a contract of employment exists.
- **Corporate Culture:** The beliefs and values shared by all the members of a company, and imparted from one generation of employees to another.
- **Counter Offer/Counter Proposal:** A negotiation technique used by potential candidates to increase the amount of salary offered by a company.
- **Cover Letter:** A letter that accompanies a candidate's resume. It emphasizes the important points in the candidate's resume and provides real examples that prove the candidate's ability to perform the expected job role.
- **Curriculum Vitae (CV)/Resume:** A summary of a candidate's achievements, educational background, work experience, skills and strengths.
- **Declining Letter:** A letter sent by an employee to an employer, turning down the job offer made by the employer to the employee.
- **Deductions:** Amounts subtracted from an employee's pay and listed on the employee's pay slip.
- **Discrimination:** The act of treating one person not as favourably as another person.
- **Employee:** A person who works for another person in exchange for payment.
- **Employee Training:** A workshop or in-house training that an employee is asked to attend by his or her superior, for the benefit of the employer.
- **Employment Gaps:** Periods of unemployed time between jobs.
- **Fixed-Term Contract:** A contract of employment which gets terminated on an agreed-upon date.
- **Follow-Up:** The act of contacting a potential employer after a candidate has submitted his or her resume.
- **Freelancer/Consultant/Independent Contractor:** A person who works for him or herself and pitches for temporary jobs and projects with different employers.
- **Holiday**: Paid time-off from work.
- **Hourly Rate**: The amount of salary or wages paid for 60 minutes of work.

- **Internship**: A job opportunity offered by an employer to a potential employee, called an intern, to work at the employer's company for a fixed, limited time period.
- **Interview**: A conversation between a potential employee and a representative of an employer, in order to determine if the potential employee should be hired.
- **Job Application**: A form which asks for a candidate's information like the candidate's name, address, contact details and work experience. The purpose of a candidate submitting a job application, is to show that candidate's interest in working for a particular company.
- **Job Offer**: An offer of employment made by an employer to a potential employee.
- **Job Search Agent**: A program that enables candidates to search for employment opportunities by selecting criteria listed in the program, for job vacancies.
- **Lay Off**: A lay off occurs when an employee is temporarily let go from his or her job, due to the employer not having any work for that employee.
- **Leave**: Formal permission given to an employee, by his or her employer, to take a leave of absence from work.
- **Letter of Acceptance**: A letter given by an employer to an employee, confirming the offer of employment made by the employer, as well as the conditions of the offer.
- **Letter of Agreement**: A letter that outlines the terms of employment.
- **Letter of Recommendation**: A letter written for the purpose of validating the work skills of a person.
- **Maternity Leave**: Leave taken from work by women who are pregnant, or who have just given birth.
- **Mentor**: A person who is employed at a higher level than you, who offers you advice and guides you in your career.
- **Minimum wage**: The minimum wage amount paid on an hourly basis.
- **Notice**: An announcement made by an employee or an employer, stating that the employment contract will end on a particular date.
- **Offer of Employment**: An offer made by an employer to a prospective employee that contains important information pertaining to the job being offered, like the starting date, salary, working conditions etc.
- **Open-Ended Contract**: A contract of employment that continues till the employer or employee terminates it.
- **Overqualified**: A person who is not suited for a particular job because he or she has too many years of work experience, or a level of education that is much higher than required for the job, or is currently or was previously too highly paid.
- **Part-Time Worker**: An employee who works for fewer hours than the standard number of hours normally worked.
- **Paternity Leave**: Leave granted to a man who has recently become a father.
- **Recruiters/Headhunters/Executive Search Firms**: Professionals who are paid by employers to search for people to fill particular positions.
- **Resigning/Resignations**: When an employee formally informs his or her employer that he or she is quitting his or her job.
- **Self-Employed**: A person who has his or her own business and does not work in the capacity of an employee.
- **Time Sheet**: A form that is submitted to an employer, by an employee, that contains the number of hours worked every day by the employee.

Unit 5.5 Understanding Entrepreneurship

Unit Objectives

1. Discuss the concept of entrepreneurship
2. Discuss the importance of entrepreneurship
3. Describe the characteristics of an entrepreneur
4. Describe the different types of enterprises
5. List the qualities of an effective leader
6. Discuss the benefits of effective leadership
7. List the traits of an effective team
8. Discuss the importance of listening effectively
9. Discuss how to listen effectively
10. Discuss the importance of speaking effectively
11. Discuss how to speak effectively
12. Discuss how to solve problems
13. List important problem solving traits
14. Discuss ways to assess problem solving skills
15. Discuss the importance of negotiation
16. Discuss how to negotiate
17. Discuss how to identify new business opportunities
18. Discuss how to identify business opportunities within your business
19. Explain the meaning of entrepreneur
20. Describe the different types of entrepreneurs
21. List the characteristics of entrepreneurs
22. Recall entrepreneur success stories
23. Discuss the entrepreneurial process
24. Describe the entrepreneurship ecosystem
25. Discuss the purpose of the Make in India campaign
26. Discuss key schemes to promote entrepreneurs
27. Discuss the relationship between entrepreneurship and risk appetite
28. Discuss the relationship between entrepreneurship and resilience
29. Describe the characteristics of a resilient entrepreneur
30. Discuss how to deal with failure

5.5.1 Concept Introduction, (Characteristic of an Entrepreneur, types of firms/Types of enterprises): Entrepreneurs and Entrepreneurship

Anyone who is determined to start a business, no matter what the risk, is an entrepreneur. Entrepreneurs run their own start-up, take responsibility for the financial risks and use creativity, innovation and vast reserves of self-motivation to achieve success. They dream big and are determined to do whatever it takes to turn their idea into a viable offering. The aim of an entrepreneur is to create an enterprise. The process of creating this enterprise is known as entrepreneurship.

Importance of Entrepreneurship

Entrepreneurship is very important for the following reasons:

1. It results in the creation of new organizations
2. It brings creativity into the marketplace
3. It leads to improved standards of living
4. It helps develop the economy of a country

Characteristics of Entrepreneurs

All successful entrepreneurs have certain characteristics in common.

They are all:

- Extremely passionate about their work
- Confident in themselves
- Disciplined and dedicated
- Motivated and driven
- Highly creative
- Visionaries
- Open-minded
- Decisive

Entrepreneurs also have a tendency to:

- Have a high risk tolerance
- Thoroughly plan everything
- Manage their money wisely
- Make their customers their priority
- Understand their offering and their market in detail
- Ask for advice from experts when required
- Know when to cut their losses

It often means discarding the material and starting again. To select right bit size, hold the screw under a bit. If only the screw threads are visible, it means bit size is perfect.

How to use a drill machine

STEP 1: Insert the chuck key into the small hole on the side of the chuck and turn it counterclockwise until the chuck can accommodate the drill bit. Slide a bit into the chuck.

STEP 2: Turn the key in a clockwise direction to tighten the chuck. Make sure the bit is secured tightly.

STEP 3: Mark the position where you intend to drill. Use a hammer and nail punch to produce a small indentation at that point. This will prevent the drill from slipping.

STEP 4: Turn on the power to the drill. Position the tip of the drill bit in the indentation, and start drilling at a low speed. Increase the speed of the drill gradually. Keep both hands on the drill as you apply pressure to the trigger. Keep the drill perpendicular to the object you are drilling to.

STEP 5: Stop the drill when you have drilled to your desired depth. Remove the drill bit from the hole with the bit rotating at a slow speed.

5.5.2 Leadership & Teamwork: Leadership and Leaders

Leadership means setting an example for others to follow. Setting a good example means not asking someone to do something that you wouldn't willingly want to do yourself. Leadership is about figuring out what to do in order to win as a team, and as a company.

Leaders believe in doing the right things. They also believe in helping others to do the right things. An effective leader is someone who:

- Creates an inspiring vision of the future.
- Motivates and inspires his team to pursue that vision.

Leadership Qualities That All Entrepreneurs Need

Building a successful enterprise is only possible if the entrepreneur in charge possesses excellent leadership qualities. Some critical leadership skills that every entrepreneur must have are:

1. **Pragmatism**: This means having the ability to highlight all obstacles and challenges, in order to resolve issues and reduce risks.
2. **Humility**: This means admitting to mistakes often and early, and being quick to take responsibility for your actions. Mistakes should be viewed as challenges to overcome, not opportunities to point blame.
3. **Flexibility**: It is critical for a good leader to be very flexible and quickly adapt to change. It is equally critical to know when to adapt and when not to.
4. **Authenticity**: This means showing both, your strengths and your weaknesses. It means being human and showing others that you are human.
5. **Reinvention**: This means refreshing or changing your leadership style when necessary. To do this, it's important to learn where your leadership gaps lie and find out what resources are required to close them.
6. **Awareness**: This means taking the time to recognize how others view you. It means understanding how your presence affects those around you.

Benefits of Effective Leadership

Effective leadership results in numerous benefits. Great leadership leads to the leader successfully:

- Gaining the loyalty and commitment of the team members
- Motivating the team to work towards achieving the company's goals and objectives
- Building morale and instilling confidence in the team members
- Fostering mutual understanding and team-spirit among team members
- Convincing team members about the need to change when a situation requires adaptability

Teamwork and Teams

Teamwork occurs when the people in a workplace combine their individual skills to pursue a common goal. Effective teams are made up of individuals who work together to achieve this common goal. A great team is one who holds themselves accountable for the end result.

Importance of Teamwork in Entrepreneurial Success

For an entrepreneurial leader, building an effective team is critical to the success of a venture. An entrepreneur must ensure that the team he builds possesses certain crucial qualities, traits and characteristics. An effective team is one which has:

1. **Unity of purpose:** All the team members should clearly understand and be equally committed to the purpose, vision and goals of the team.
2. **Great communication skills:** Team members should have the ability to express their concerns, ask questions and use diagrams, and charts to convey complex information.
3. **The ability to collaborate:** Every member should feel entitled to provide regular feedback on new ideas.
4. **Initiative:** The team should consist of proactive individuals. The members should have the enthusiasm to come up with new ideas, improve existing ideas, and conduct their own research.
5. **Visionary members:** The team should have the ability to anticipate problems and act on these potential problem before they turn into real problems.
6. **Great adaptability skills:** The team must believe that change is a positive force. Change should be seen as the chance to improve and try new things.
7. **Excellent organizational skills:** The team should have the ability to develop standard work processes, balance responsibilities, properly plan projects, and set in place methods to measure progress and ROI.

Tips

- Don't get too attached to your original idea. Allow it to evolve and change.
- Be aware of your weaknesses and build a team that will complement your shortfalls.
- Hiring the right people is not enough. You need to promote or incentivize your most talented people to keep them motivated.
- Earn your team's respect.

5.5.3 Communication Skills: Listening & Speaking: The Importance of Listening Effectively

Listening is the ability to correctly receive and understand messages during the process of communication. Listening is critical for effective communication. Without effective listening skills, messages can easily be misunderstood. This results in a communication breakdown and can lead to the sender and the receiver of the message becoming frustrated or irritated.

It's very important to note that listening is not the same as hearing. Hearing just refers to sounds that you hear. Listening is a whole lot more than that. To listen, one requires focus. It means not only paying attention to the story, but also focusing on how the story is relayed, the way language and voice is used, and even how the speaker uses their body language. The ability to listen depends on how effectively one can perceive and understand both, verbal and non-verbal cues.

How to Listen Effectively

To listen effectively you should:

- Stop talking
- Stop interrupting
- Focus completely on what is being said
- Nod and use encouraging words and gestures
- Be open-minded
- Think about the speaker's perspective
- Be very, very patient
- Pay attention to the tone that is being used
- Pay attention to the speaker's gestures, facial expressions and eye movements
- Not try and rush the person
- Not let the speaker's mannerisms or habits irritate or distract you

How to Listen Effectively

How successfully a message gets conveyed depends entirely on how effectively you are able to get it through. An effective speaker is one who enunciates properly, pronounces words correctly, chooses the right words and speaks at a pace that is easily understandable. Besides this, the words spoken out loud need to match the gestures, tone and body language used.

What you say, and the tone in which you say it, results in numerous perceptions being formed. A person who speaks hesitantly may be perceived as having low self-esteem or lacking in knowledge of the discussed topic. Those with a quiet voice may very well be labelled as shy. And those who speak in commanding tones with high levels of clarity, are usually considered to be extremely confident. This makes speaking a very critical communication skill.

How to Speak Effectively

To speak effectively you should:

- Incorporate body language in your speech like eye contact, smiling, nodding, gesturing etc.
- Build a draft of your speech before actually making your speech.
- Ensure that all your emotions and feelings are under control.
- Pronounce your words distinctly with the correct pitch and intensity. Your speech should be crystal clear at all times.
- Use a pleasant and natural tone when speaking. Your audience should not feel like you are putting on an accent or being unnatural in any way.
- Use precise and specific words to drive your message home. Ambiguity should be avoided at all costs.
- Ensure that your speech has a logical flow.
- Be brief. Don't add any unnecessary information.
- Make a conscious effort to avoid irritating mannerisms like fidgeting, twitching etc.
- Choose your words carefully and use simple words that the majority of the audience will have no difficulty understanding.
- Use visual aids like slides or a whiteboard.
- Speak slowly so that your audience can easily understand what you're saying. However, be careful not to speak too slowly because this can come across as stiff, unprepared or even condescending.
- Remember to pause at the right moments.

Tips

- If you're finding it difficult to focus on what someone is saying, try repeating their words in your head.
- Always maintain eye contact with the person that you are communicating with, when speaking as well as listening. This conveys and also encourages interest in the conversation.

5.5.4 Problem Solving & Negotiation skills: What is a Problem

As per The Concise Oxford Dictionary (1995), a problem is, "A doubtful or difficult matter requiring a solution"

All problems contain two elements:

1. Goals 2. Obstacles

The aim of problem solving is to recognize the obstacles and remove them in order to achieve the goals.

How to Solve Problems

Solving a problem requires a level of rational thinking. Here are some logical steps to follow when faced with an issue:

Step 1: Identify the problem

Step 2: Study the problem in detail

Step 3: List all possible solutions

Step 4: Select the best solution

Step 5: Implement the chosen solution

Step 6: Check that the problem has really been solved

Important Traits for Problem Solving

Highly developed problem solving skills are critical for both, business owners and their employees. The following personality traits play a big role in how effectively problems are solved:

- Being open minded
- Being proactive
- Having a positive attitude
- Asking the right questions
- Not panicking
- Focusing on the right problem

How to Assess for Problem Solving Skills

As an entrepreneur, it would be a good idea to assess the level of problem solving skills of potential candidates before hiring them. Some ways to assess this skill are through:

1. **Application forms**: Ask for proof of the candidate's problem solving skills in the application form.
2. **Psychometric tests**: Give potential candidates logical reasoning and critical thinking tests and see how they fare.
3. **Interviews**: Create hypothetical problematic situations or raise ethical questions and see how the candidates respond.
4. **Technical questions**: Give candidates examples of real life problems and evaluate their thought process.

What is Negotiation

Negotiation is a method used to settle differences. The aim of negotiation is to resolve differences through a compromise or agreement while avoiding disputes. Without negotiation, conflicts are likely to lead to resentment between people. Good negotiation skills help satisfy both parties and go a long way towards developing strong relationships.

Why Negotiate

Starting a business requires many, many negotiations. Some negotiations are small while others are critical enough to make or break a startup. Negotiation also plays a big role inside the workplace. As an entrepreneur, you need to know not only know how to negotiate yourself, but also how to train employees in the art of negotiation.

How to Negotiate

Take a look at some steps to help you negotiate:

Step 1: Pre-Negotiation Preparation	Agree on where to meet to discuss the problem, decide who all will be present and set a time limit for the discussion.
Step 2: Discuss the Problem	This involves asking questions, listening to the other side, putting your views forward and clarifying doubts.
Step 3: Clarify the Objective	Ensure that both parties want to solve the same problem and reach the same goal.
Step 4: Aim for a Win-Win Outcome	Try your best to be open minded when negotiating. Compromise and offer alternate solutions to reach an outcome where both parties win.
Step 5: Clearly Define the Agreement	When an agreement has been reached, the details of the agreement should be crystal clear to both sides, with no scope for misunderstandings.
Step 6: Implement the Agreed Upon Solution	Agree on a course of action to set the solution in motion

Tips

- Know exactly what you want before you work towards getting it
- Give more importance to listening and thinking, than speaking
- Focus on building a relationship rather than winning
- Remember that your people skills will affect the outcome
- Know when to walk away – sometimes reaching an agreement may not be possible

5.5.5 Business Opportunities Identification: Entrepreneurs and Opportunities

"The entrepreneur always searches for change, responds to it and exploits it as an opportunity."

Peter Drucker

The ability to identify business opportunities is an essential characteristic of an entrepreneur.

What is an Opportunity

The word opportunity suggests a good chance or a favourable situation to do something offered by circumstances.

A business opportunity means a good or favourable change available to run a specific business in a given environment, at a given point of time.

Common Questions Faced by Entrepreneurs

A critical question that all entrepreneurs face is how to go about finding the business opportunity that is right for them.

Some common questions that entrepreneurs constantly think about are:

- Should the new enterprise introduce a new product or service based on an unmet need?
- Should the new enterprise select an existing product or service from one market and offer it in another where it may not be available?
- Should the enterprise be based on a tried and tested formula that has worked elsewhere?

It is therefore extremely important that entrepreneurs must learn how to identify new and existing business opportunities and evaluate their chances of success.

When is an Idea an Opportunity

An idea is an opportunity when:

- It creates or adds value to a customer
- It solves a significant problem, removes a pain point or meets a demand
- Has a robust market and profit margin
- Is a good fit with the founder and management team at the right time and place

Factors to Consider When Looking for Opportunities

Consider the following when looking for business opportunities:

- Economic trends
- Changes in funding
- Changing relationships between vendors, partners and suppliers
- Market trends
- Changes in political support
- Shift in target audience

Ways to Identify New Business Opportunities

1. Identify Market Inefficiencies

   When looking at a market, consider what inefficiencies are present in the market. Think about ways to correct these inefficiencies.

2. Remove Key Hassles

   Rather than create a new product or service, you can innovatively improve a product, service or process.

3. Create Something New

   Think about how you can create a new experience for customers, based on existing business models.

4. Pick a Growing Sector/Industry

   Research and find out which sectors or industries are growing and think about what opportunities you can tap in the same.

5. Think About Product Differentiation

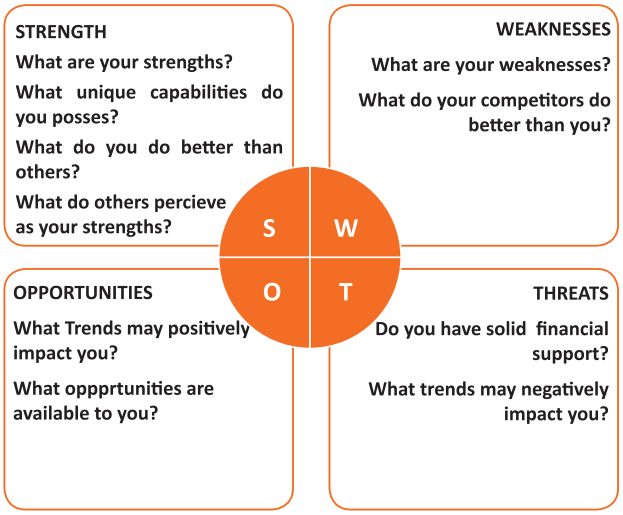
   If you already have a product in mind, think about ways to set it apart from the existing ones.

Ways to Identify Business Opportunities Within Your Business

1. **SWOT Analysis**

An excellent way to identify opportunities inside your business is by creating a SWOT analysis. The acronym SWOT stands for strengths, weaknesses, opportunities, and threats.

SWOT analysis framework:



Consider the following when looking for business opportunities:

By looking at yourself and your competitors using the SWOT framework, you can uncover opportunities that you can exploit, as well as manage and eliminate threats that could derail your success.

2. **Establishing Your USP**

Establish your USP and position yourself as different from your competitors. Identify why customers should buy from you and promote that reason.

Opportunity Analysis

Once you have identified an opportunity, you need to analyze it.

To analyze an opportunity, you must:

- Focus on the idea
- Focus on the market of the idea
- Talk to industry leaders in the same space as the idea
- Talk to players in the same space as the idea

Tips 

- Remember, opportunities are situational.
- Look for a proven track record.
- Avoid the latest craze.
- Love your idea.

5.5.6 Entrepreneurship Support Eco-Syetem: What is an Entrepreneur

An entrepreneur is a person who:

- Does not work for an employee
- Runs a small enterprise
- Assumes all the risks and rewards of the enterprise, idea, good or service

Types of Entrepreneurs

There are four main types of entrepreneurs:

1. **The Traditional Entrepreneur**: This type of entrepreneur usually has some kind of skill – they can be a carpenter, mechanic, cook etc. They have businesses that have been around for numerous years like restaurants, shops and carpenters. Typically, they gain plenty of experience in a particular industry before they begin their own business in a similar field.
2. **The Growth Potential Entrepreneur**: The desire of this type of entrepreneur is to start an enterprise that will grow, win many customers and make lots of money. Their ultimate aim is to eventually sell their enterprise for a nice profit. Such entrepreneurs usually have a science or technical background.
3. **The Project-Oriented Entrepreneur**: This type of entrepreneur generally has a background in the Arts or psychology. Their enterprises tend to be focus on something that they are very passionate about.
4. **The Lifestyle Entrepreneur**: This type of entrepreneur has usually worked as a teacher or a secretary. They are more interested in selling something that people will enjoy, rather than making lots of money.

Characteristics of an Entrepreneur

Successful entrepreneurs have the following characteristics:

- They are highly motivated
- They are creative and persuasive
- They are mentally prepared to handle each and every task
- They have excellent business skills – they know how to evaluate their cash flow, sales and revenue
- They are willing to take great risks
- They are very proactive – this means they are willing to do the work themselves, rather than wait for someone else to do it
- They have a vision – they are able to see the big picture
- They are flexible and open-minded
- They are good at making decisions

Entrepreneur Success Stories

Dhiru Bhai Ambani

Dhirubhai Ambani began his entrepreneurial career by selling "bhajias" to pilgrims in Mount Girnar on weekends. At 16, he moved to Yemen where he worked as a gas-station attendant, and as a clerk in an oil company. He returned to India with Rs. 50,000 and started a textile trading company. Reliance went on to become the first Indian company to raise money in global markets and the first Indian company to feature in Forbes 500 list.

Dr. Karsanbhai Patel

Karsanbhai Patel made detergent powder in the backyard of his house. He sold his product door-to-door and offered a money back guarantee with every pack that was sold. He charged Rs. 3 per kg when the cheapest detergent at that time was Rs.13 per kg. Dr. Patel eventually started Nirma which became a whole new segment in the Indian domestic detergent market.

The Entrepreneurial Process

Let's take a look at the stages of the entrepreneurial process.

Stage 1: Idea Generation. The entrepreneurial process begins with an idea that has been thought of by the entrepreneur. The idea is a problem that has the potential to be solved.

Stage 2: Germination or Recognition. In this stage a possible solution to the identified problem is thought of.

Stage 3: Preparation or Rationalization. The problem is studied further and research is done to find out how others have tried to solve the same problem.

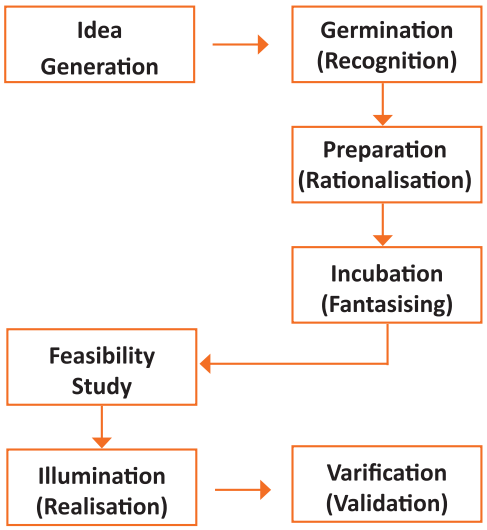
Stage 4: Incubation or Fantasizing. This stage involves creative thinking for the purpose of coming up with more ideas. Less thought is given to the problem areas.

Stage 5: Feasibility Study: The next step is the creation of a feasibility study to determine if the idea will make a profit and if it should be seen through.

Stage 6: Illumination or Realization. This is when all uncertain areas suddenly become clear. The entrepreneur feels confident that his idea has merit.

Stage 7: Verification or Validation. In this final stage, the idea is verified to see if it works and if it is useful.

Take a look at the diagram below to get a better idea of this process.



Introduction to the Entrepreneurship Ecosystem

The entrepreneurship support ecosystem signifies the collective and complete nature of entrepreneurship. New companies emerge and flourish not only because of the courageous, visionary entrepreneurs who launch them, but they thrive as they are set in an environment or 'ecosystem' made of private and public participants. These players nurture and sustain the new ventures, facilitating the entrepreneurs' efforts.

An entrepreneurship ecosystem comprises of the following six domains:

1. **Favourable Culture:** This includes elements such as tolerance of risk and errors, valuable networking and positive social standing of the entrepreneur.
2. **Facilitating Policies & Leadership:** This includes regulatory framework incentives and existence of public research institutes.
3. **Financing Options:** Angel financing, venture capitalists and micro loans would be good examples of this.
4. **Human Capital:** This refers to trained and untrained labour, entrepreneurs and entrepreneurship training programmes, etc.
5. **Conducive Markets for Products & Services:** This refers to an existence or scope of existence of a market for the product/service.
6. **Institutional & Infrastructural Support:** This includes legal and financing advisers, telecommunications, digital and transportation infrastructure, and entrepreneurship networking programmes.

These domains indicate whether there is a strong entrepreneurship support ecosystem and what actions should the government put in place to further encourage this ecosystem. The six domains and their various elements have been graphically depicted.

Early Customers

- Early adopters for proof-of-concept
- Expertise in productizing
- Reference customer
- First reviews
- Distribution channels

Leadership

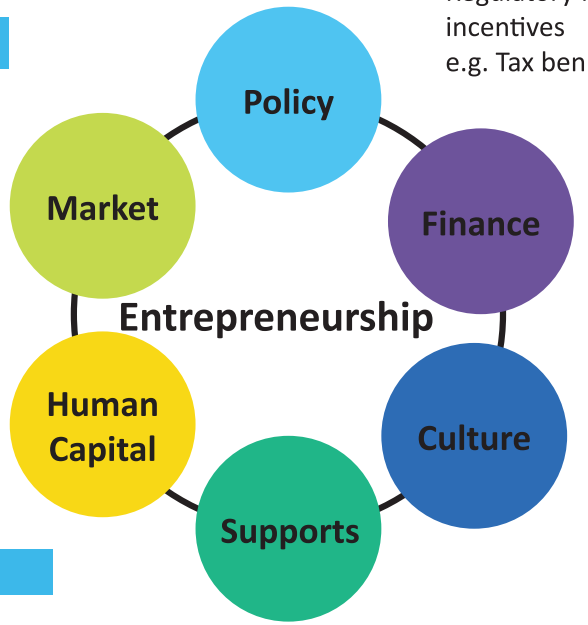
- Unequivocal support
- Social legitimacy
- Open door for advocate
- Entrepreneurship strategy
- urgency, crisis and challenge

Government

- Institutions
  e.g. Investment, support
- Financial support
  e.g. for R&D, jump start funds
  Regulatory framework
  incentives
  e.g. Tax benifits
- Research institutes
- Venture-friendly legislation
- e.g. Bankruptcy, contract enforcement, property rights, and labour

Networks

- Entrepreneure's networks
- Diaspora networks
- Multinational corporations



Financial Capital

- Micro-loans
- Angel investors, friends and family
- Zero-stage venture capital
- Venture capital funds
- Private equity
- Public capital markets
- Debt

Labour

- Skilled and unskilled
- Serial entrepreneures
- Later generation family

Success Stories

- Visible successes
- Wealth generation for founders
- International reputation

Educational Institutions

- General degrees (professional and academic)
- Specific entrepreneurship training

Societal norms

- Tolerance of risk, mistakes, failure
- Innovation, creativity, experimentation
- Social status of entrepreneur
- Wealth creation
- Ambition, drive, hunger

Infrastructure

- Telecommunications
- Transportation & logistics
- Energy
- Zones, incubation centers, clusters

Non-Government Institution

- Entrepreneurship promotion in non-profits
- Business plan contests
- Conferences
- Entrepreneur-friendly association

Support Professions

- Legal
- Accounting
- Investment bankers

Every entrepreneurship support ecosystem is unique and all the elements of the ecosystem are interdependent. Although every region's entrepreneurship ecosystem can be broadly described by the above features, each ecosystem is the result of the hundred elements interacting in highly complex and particular ways.

Entrepreneurship ecosystems eventually become (largely) self-sustaining. When the six domains are resilient enough, they are mutually beneficial. At this point, government involvement can and should be significantly minimized. Public leaders do not need to invest a lot to sustain the ecosystem. It is imperative that the entrepreneurship ecosystem incentives are formulated to be self-liquidating, hence focusing on sustainability of the environment.

Make in India Campaign

Every entrepreneur has certain needs. Some of their important needs are:

- To easily get loans
- To easily find investors
- To get tax exemptions
- To easily access resources and good infrastructure
- To enjoy a procedure that is free of hassles and is quick
- To be able to easily partner with other firms

The Make in India campaign, launched by Prime Minister Modi aims to satisfy all these needs of young, aspiring entrepreneurs. Its objective is to:

- Make investment easy
- Support new ideas
- Enhance skill development
- Safeguard the ideas of entrepreneurs
- Create state-of-the-art facilities for manufacturing goods

Key Schemes to Promote Entrepreneurs

The government offers many schemes to support entrepreneurs. These schemes are run by various Ministries/Departments of Government of India to support First Generation Entrepreneurs.Take a look at a few key schemes to promote entrepreneurship:

Sl.	Name of the Scheme
1.	Pradhan Mantri MUDRA Yojana - Micro Units Development and Refinance Agency (MUDRA),
2.	STAND UP INDIA
3.	Prime Minister Employment Generation Programme (PMEGP)
4.	International Cooperation
5.	Performance and Credit Rating
6.	Marketing Assistance Scheme
7.	Reimbursement of Registration Fee for Bar Coding
8.	Enable Participation of MSMEs in State/District level Trade Fairs and Provide Funding Support

9. Capital Subsidy Support on Credit for Technology up gradation
10. Credit Guarantee Fund for Micro and Small Enterprise (CGFMSE)
11. Reimbursement of Certification Fees for Acquiring ISO Standards
12. Agricultural Marketing
13. Small Agricultural Marketing
14. Mega Food Park
15. Adivasi Mahila Sashaktikaran Yojana

1. Pradhan Mantri MUDRA Yojana, - Micro Units Development and Refinance Agency (MUDRA),

   Description

   Under the aegis support of Pradhan Mantri MUDRA Yojana, MUDRA has already created its initial products/schemes. The interventions have been named 'Shishu', 'Kishor' and 'Tarun' to signify the stage of growth/development and funding needs of the beneficiary micro unit/entrepreneur and also provide a reference point for the next phase of graduation/ growth to look forward to:

   a. Shishu: Covering loans upto Rs.50,000/-
   b. Kishor: Covering loans above Rs. 50,000/- and upto Rs.5 lakh
   c. Tarun: Covering loans above Rs. 5 lakh to Rs.10 lakh

   Who can apply?

   Any Indian citizen who has a business plan for a non-farm sector income generating activity such as manufacturing, processing, trading or service sector and whose credit need is less than Rs.10 lakh can approach either a Bank, MFI, or NBFC for availing of MUDRA loans under Pradhan Mantri Mudra Yojana (PMMY).

2. Stand Up India

   Description

   The objective of the Standup India scheme is to facilitate bank loans between Rs.10 lakh and Rs.1 crore to at least one Schedule Caste (SC) or Scheduled Tribe (ST) borrower and at least one woman borrower per bank branch for setting up a Greenfield enterprise. This enterprise may be in manufacturing, services or the trading sector. In case of non-Individual enterprises at least 51% of the shareholding and controlling stake should be held be either an SC/ST or Woman Entrepreneur.

   Who can apply?

   ST, SC &Women

3. Prime Minister Employment Generation Programme (PMEGP)

   Description

   The Scheme is implemented by Khadi and Village Industries Commission (KVIC), as the nodal agency at the National level. At the State level, the Scheme is implemented through State KVIC Directorates, State Khadi and Village Industries Boards (KVIBs) and District Industries Centres (DICs) and banks. The Government subsidy under the Scheme is routed by KVIC through identified banks for eventual distribution to the beneficiaries/entrepreneurs in their bank accounts.

Nature of assistance

The maximum cost of the project/unit admissible under manufacturing sector is Rs.25 lakh and under business/service sector is Rs.10 lakh. Levels of funding under PMEGP

Categories of beneficiaries under PMEGP	Beneficiary's contribution (of project cost)	Rate of Subsidy (of project cost)
Area (location of project/unit)		Urban Rural
General Category	10%	15% 25%
Special (including SC / ST / OBC / Minorities / Women, Ex-servicemen, Physically handicapped, NER, Hill and Border areas, etc.	05%	25% 35%

The balance amount of the total project cost will be provided by Banks as term loan as well as working capital.

Who can apply?

Any individual, above 18 years of age. At least VIII standard pass for projects costing above Rs.10 lakh in the manufacturing sector and above Rs.5 lakh in the business/ service sector. Only new projects are considered for sanction under PMEGP. Self Help Groups (including those belonging to BPL provided that they have not availed benefits under any other Scheme), Institutions registered under Societies Registration Act,1860; Production Co-operative Societies, and Charitable Trusts are also eligible. Existing Units (under PMRY, REGP or any other scheme of Government of India or State Government) and the units that have already availed Government Subsidy under any other scheme of Government of India or State Government are NOT eligible.

4. **International Cooperation**

Description

The Scheme would cover the following activities:

a. Deputation of MSME business delegations to other countries for exploring new areas of technology infusion/upgradation, facilitating joint ventures, improving market of MSMEs products, foreign collaborations, etc.

b. Participation by Indian MSMEs in international exhibitions, trade fairs and buyer-seller meets in foreign countries as well as in India, in which there is international participation.

c. Holding international conferences and seminars on topics and themes of interest to the MSME.

Nature of assistance

IC Scheme provides financial assistance towards the airfare and space rent of entrepreneurs. Assistance is provided on the basis of size and the type of the enterprise.

Who can apply?

a. State/Central Government Organisations;

b. Industry/Enterprise Associations; and

c. Registered Societies/Trusts and Organisations associated with the promotion and development of MSMEs

5. Performance and Credit Rating for Micro and Small Enterprises

Description

The objective of the Scheme is to create awareness amongst micro & small enterprises about the strengths and weaknesses of their operations and also their credit worthiness.

Nature of assistance

Turn Over	Fee to be reimbursed by Ministry of MSME
Up to Rs.50 lacs	75% of the fee charged by the rating agency subject to a ceiling Rs.15,000/-
Above Rs.50 lacs to Rs.200 lacs	75% of the fee charged by the rating agency subject to a ceiling of Rs.30,0001-
Above Rs.200 lacs	75% of the fee charged by the rating agency subject to a ceiling of Rs.40,000/-

Who can apply?

Any enterprise registered in India as a micro or small enterprise is eligible to apply.

6. Marketing Assistance Scheme

Description

The assistance is provided for the following activities:

a. Organizing exhibitions abroad and participation in international exhibitions/trade fairs
b. Co-sponsoring of exhibitions organized by other organisations/industry associations/ agencies
c. Organizing buyer-seller meets, intensive campaigns and marketing promotion events

Nature of assistance

Financial assistance of up to 95% of the airfare and space rent of entrepreneurs. Assistance is provided on the basis of size and the type of the enterprise. Financial assistance for co-sponsoring would be limited to 40% of the net expenditure, subject to maximum amount of Rs.5 lakh.

Who can apply?

MSMEs, Industry Associations and other organizations related to MSME sector.

7. Reimbursement of Registration Fee for Bar Coding

Description

The financial assistance is provided towards 75% reimbursement of only one-time registration fee and 75% of annual recurring fee for first three years paid by MSEs to GS1 India for using bar coding.

Nature of assistance

Funding support for reimbursement of 75% of one time and recurring bar code registration fees.

Who can apply?

All MSMEs with EM registration.

8. Enabling Participation of MSMEs in State/District Level Trade Fairs and Provide Funding Support

Description

Provide marketing platform to manufacturing MSMEs by enabling their participation in state/district level exhibitions being organized by state/district authorities/associations.

Nature of assistance

1. Free registration for participating in trade fairs

Note: *The selection of participants would be done by the MSME-DIs post the submission of application.*

2. Reimbursement of 50% of to and fro actual fare by shortest distance/direct train (limited to AC II tier class) from the nearest railway station/bus fare to the place of exhibition and 50% space rental charges for MSMEs (General category entrepreneurs).
3. For Women/SC/ST entrepreneurs & entrepreneurs from North Eastern Region Govt. of India will reimburse 80% of items listed above in Point (2).

Note: The total reimbursement will be max. Rs.30,000/- per unit for the SC/ST/Women/ Physically Handicapped entrepreneurs, while for the other units the max. limit will be Rs.20,000/- per person per MSME unit.

Note: *The participant is required to submit follow-up proofs post attending the event to claim reimbursement. The proofs can be submitted after logging in online under the section "My Applications" or directly contacting a DI office.*

Who can apply?

All MSMEs with EM registration.

9. Capital Subsidy Support on Credit for Technology Upgradation

Description

MSMEs can get a capital subsidy (~15%) on credit availed for technology upgradation.

Nature of assistance

Financial assistance for availing credit and loan.

Who can apply?

1. Banks and financial institutions can apply to DC-MSME for availing support.
2. MSMEs need to directly contact the respective banks for getting credit and capital subsidy.

How to apply?

If you are a financial institution, click on the "Apply Now" button or else you can also directly contact the Office of DC-MSME. You can view the contact details of Office of DC-MSME. If you are an MSME, directly contact the respective banks/financial institutions as listed in the scheme guidelines.

10. Provision of Collateral Free Credit for MSMEs

Description

Banks and financial institutions are provided funding assistance under this scheme so that they can in turn lend collateral free credit to MSMEs.

Nature of assistance

Funding support to banks and financial institutions for lending collateral-free credit to MSMEs.

Who can apply?

Banks and financial institutions can apply to office of DC-MSME/MSME-DIs for availing support. MSMEs need to directly contact the respective banks for getting credit.

11. **Reimbursement of certification fees for acquiring ISO standards**

ISO 9000/ISO 14001 Certification Reimbursement.

Description

The GoI assistance will be provided for one-time reimbursement of expenditure to such MSME manufacturing units which acquire ISO 18000/ISO 22000/ISO 27000 certification.

Nature of assistance

Reimbursement of expenditure incurred on acquiring ISO standards.

Who can apply?

MSMEs with EM registration.

12. Agricultural Marketing

Description

A capital investment subsidy for construction/renovation of rural godowns.

Creation of scientific storage capacity and prevention of distress sale.

Nature of assistance

Subsidy @ 25% to farmers, 15% of project cost to companies.

Who can apply

NGOs, SHGs, companies, co-operatives.

13. Small Agricultural Marketing

Description

Business development description provides venture capital assistance in the form of equity, and arranges training and visits of agri-preneurs

Farmers' Agriculture Business Consortium

Business development description provides venture capital assistance in the form of equity, and arranges training and visits of agri-preneurs.

Nature of assistance

Financial assistance with a ceiling of Rs.5 lakh.

Who can apply

Individuals, farmers, producer groups, partnership/propriety firms, SGHs, agri-preneurs, etc.

14. Mega Food Park

Description

Mechanism to link agricultural production and market to maximize value addition, enhance farmers income, create rural employment.

Nature of assistance

One-time capital grant of 50% of project cost with a limit of Rs.50 crore.

Who can apply

Farmers, farmer groups, SHGs.

15. Adivasi Mahila Sashaktikaran Yojana

Description

Concessional scheme for the economic development of ST women.

Nature of assistance

Term loan at concessional rates upto 90% of cost of scheme.

Who can apply

Scheduled Tribes Women.

Tips 

- Research the existing market, network with other entrepreneurs, venture capitalists, angel investors, and thoroughly review the policies in place to enable your entrepreneurship.
- Failure is a stepping stone and not the end of the road. Review yours and your peers' errors and correct them in your future venture.
- Be proactive in your ecosystem. Identify the key features of your ecosystem and enrich them to ensure self-sustainability of your entrepreneurship support ecosystem.

5.5.7 Risk Appetite & Resilience: Entrepreneurship and Risk

Entrepreneurs are inherently risk takers. They are path-makers not path-takers. Unlike a normal, cautious person, an entrepreneur would not think twice about quitting his job (his sole income) and taking a risk on himself and his idea.

An entrepreneur is aware that while pursuing his dreams, assumptions can be proven wrong and unforeseen events may arise. He knows that after dealing with numerous problems, success is still not guaranteed. Entrepreneurship is synonymous with the ability to take risks. This ability, called risk-appetite, is an entrepreneurial trait that is partly genetic and partly acquired.

What is Risk Appetite

Risk appetite is defined as the extent to which a company is equipped to take risk, in order to achieve its objectives. Essentially, it refers to the balance, struck by the company, between possible profits and the hazards caused by changes in the environment (economic ecosystem, policies, etc.). Taking on more risk may lead to higher rewards but have a high probability of losses as well. However, being too conservative may go against the company as it can miss out on good opportunities to grow and reach their objectives.

The levels of risk appetite can be broadly categorized as “low”, “medium” and “high.” The company’s entrepreneur(s) have to evaluate all potential alternatives and select the option most likely to succeed. Companies have varying levels of risk appetites for different objectives. The levels depend on:

- The type of industry
- Market pressures
- Company objectives

For example, a startup with a revolutionary concept will have a very high risk appetite. The startup can afford short term failures before it achieves longer term success. This type of appetite will not remain constant and will be adjusted to account for the present circumstances of the company.

Risk Appetite Statement

Companies have to define and articulate their risk appetite in sync with decisions made about their objectives and opportunities. The point of having a risk appetite statement is to have a framework that clearly states the acceptance and management of risk in business. It sets risk taking limits within the company. The risk appetite statement should convey the following:

- The nature of risks the business faces.
- Which risks the company is comfortable taking on and which risks are unacceptable.
- How much risk to accept in all the risk categories.
- The desired tradeoff between risk and reward.
- Measures of risk and methods of examining and regulating risk exposures.

Entrepreneurship and Resilience

Entrepreneurs are characterized by a set of qualities known as resilience. These qualities play an especially large role in the early stages of developing an enterprise. Risk resilience is an extremely valuable characteristic as it is believed to protect entrepreneurs against the threat of challenges and changes in the business environment.

What is Entrepreneurial Resilience

Resilience is used to describe individuals who have the ability to overcome setbacks related to their life and career aspirations. A resilient person is someone who is capable of easily and quickly recovering from setbacks. For the entrepreneur, resilience is a critical trait. Entrepreneurial resilience can be enhanced in the following ways:

- By developing a professional network of coaches and mentors
- By accepting that change is a part of life
- By viewing obstacles as something that can be overcome

Characteristics of a Resilient Entrepreneur

The characteristics required to make an entrepreneur resilient enough to go the whole way in their business enterprise are:

- A strong internal sense of control
- Strong social connections
- Skill to learn from setbacks
- Ability to look at the bigger picture
- Ability to diversify and expand
- Survivor attitude
- Cash-flow conscious habits
- Attention to detail

Tips

- Cultivate a great network of clients, suppliers, peers, friends and family. This will not only help you promote your business, but will also help you learn, identify new opportunities and stay tuned to changes in the market.
- Don’t dwell on setbacks. Focus on what the you need to do next to get moving again.
- While you should try and curtail expenses, ensure that it is not at the cost of your growth.

5.5.8 Success & Failure: Understanding Successes and Failures in Entrepreneurship

Shyam is a famous entrepreneur, known for his success story. But what most people don't know, is that Shyam failed numerous times before his enterprise became a success. Read his interview to get an idea of what entrepreneurship is really about, straight from an entrepreneur who has both, failed and succeeded.

Interviewer: Shyam, I have heard that entrepreneurs are great risk-takers who are never afraid of failing. Is this true?

Shyam: Ha ha, no of course it's not true! Most people believe that entrepreneurs need to be fearlessly enthusiastic. But the truth is, fear is a very normal and valid human reaction, especially when you are planning to start your own business! In fact, my biggest fear was the fear of failing. The reality is, entrepreneurs fail as much as they succeed. The trick is to not allow the fear of failing to stop you from going ahead with your plans. Remember, failures are lessons for future success!

Interviewer: What, according to you, is the reason that entrepreneurs fail?

Shyam: Well, there is no one single reason why entrepreneurs fail. An entrepreneur can fail due to numerous reasons. You could fail because you have allowed your fear of failure to defeat you. You could fail because you are unwilling to delegate (distribute) work. As the saying goes, "You can do anything, but not everything!" You could fail because you gave up too easily – maybe you were not persistent enough. You could fail because you were focusing your energy on small, insignificant tasks and ignoring the tasks that were most important. Other reasons for failing are partnering with the wrong people, not being able to sell your product to the right customers at the right time at the right price… and many more reasons!

Interviewer: As an entrepreneur, how do you feel failure should be looked at?

Shyam: I believe we should all look at failure as an asset, rather than as something negative. The way I see it, if you have an idea, you should try to make it work, even if there is a chance that you will fail. That's because not trying is failure right there, anyway! And failure is not the worst thing that can happen. I think having regrets because of not trying, and wondering 'what if' is far worse than trying and actually failing.

Interviewer: How did you feel when you failed for the first time?

Shyam: I was completely heartbroken! It was a very painful experience. But the good news is, you do recover from the failure. And with every subsequent failure, the recovery process gets a lot easier. That's because you start to see each failure more as a lesson that will eventually help you succeed, rather than as an obstacle that you cannot overcome. You will start to realize that failure has many benefits.

Interviewer: Can you tell us about some of the benefits of failing?

Shyam: One of the benefits that I have experienced personally from failing is that the failure made me see things in a new light. It gave me answers that I didn't have before. Failure can make you a lot stronger. It also helps keep your ego in control.

Interviewer: What advice would you give entrepreneurs who are about to start their own enterprises?

Shyam: I would tell them to do their research and ensure that their product is something that is actually wanted by customers. I'd tell them to pick their partners and employees very wisely and cautiously. I'd tell them that it's very important to be aggressive – push and market your product as aggressively as possible. I would warn them that starting an enterprise is very expensive and that they should be prepared for a situation where they run out of money.

I would tell them to create long term goals and put a plan in action to achieve that goal. I would tell them to build a product that is truly unique. Be very careful and ensure that you are not copying another startup. Lastly, I'd tell them that it's very important that they find the right investors.

Interviewer: That's some really helpful advice, Shyam! I'm sure this will help all entrepreneurs to be more prepared before they begin their journey! Thank you for all your insight!

Tips 

- Remember that nothing is impossible.
- Identify your mission and your purpose before you start.
- Plan your next steps – don't make decisions hastily.

Unit 5.6 Preparing to be an Entrepreneur

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss how market research is carried out
2. Describe the 4 Ps of marketing
3. Discuss the importance of idea generation
4. Recall basic business terminology
5. Discuss the need for CRM
6. Discuss the benefits of CRM
7. Discuss the need for networking
8. Discuss the benefits of networking
9. Discuss the importance of setting goals
10. Differentiate between short-term, medium-term and long-term goals
11. Discuss how to write a business plan
12. Explain the financial planning process
13. Discuss ways to manage your risk
14. Describe the procedure and formalities for applying for bank finance
15. Discuss how to manage your own enterprise
16. List important questions that every entrepreneur should ask before starting an enterprise

5.6.1 Market Study/The 4 Ps of Marketing/ Importance of an IDEA: Understanding Market Research

Market research is the process of gathering, analyzing and interpreting market information on a product or service that is being sold in that market. It also includes information on:

- Past, present and prospective customers
- Customer characteristics and spending habits
- The location and needs of the target market
- The overall industry
- Relevant competitors

Market research involves two types of data:

- Primary information. This is research collected by yourself or by someone hired by you.
- Secondary information. This is research that already exists and is out there for you to find and use.

Primary research

Primary research can be of two types:

- Exploratory: This is open-ended and usually involves detailed, unstructured interviews.
- Specific: This is precise and involves structured, formal interviews. Conducting specific research is the more expensive than conducting exploratory research.

Secondary research

Secondary research uses outside information. Some common secondary sources are:

- Public sources: These are usually free and have a lot of good information. Examples are government departments, business departments of public libraries etc.
- Commercial sources: These offer valuable information but usually require a fee to be paid. Examples are research and trade associations, banks and other financial institutions etc.
- Educational institutions: These offer a wealth of information. Examples are colleges, universities, technical institutes etc.

The 4 Ps of Marketing

The 4 Ps of marketing are Product, Price, Promotion and Place. Let's look at each of these 4 Ps in detail.

Product

A product can be:

- A tangible good
- An intangible service

Whatever your product is, it is critical that you have a clear understanding of what you are offering, and what its unique characteristics are, before you begin with the marketing process.

Some questions to ask yourself are:

- What does the customer want from the product/service?
- What needs does it satisfy?
- Are there any more features that can be added?
- Does it have any expensive and unnecessary features?
- How will customers use it?
- What should it be called?
- How is it different from similar products?
- How much will it cost to produce?
- Can it be sold at a profit?

Price

Once all the elements of Product have been established, the Price factor needs to be considered.

The Price of a Product will depend on several factors such as profit margins, supply, demand and the marketing strategy.

Some questions to ask yourself are:

- What is the value of the product/service to customers?
- Do local products/services have established price points?
- Is the customer price sensitive?
- Should discounts be offered?
- How is your price compared to that of your competitors?

Promotion

Once you are certain about your Product and your Price, the next step is to look at ways to promote it. Some key elements of promotion are advertising, public relations, social media marketing, email marketing, search engine marketing, video marketing and more.

Some questions to ask yourself are:

- Where should you promote your product or service?
- What is the best medium to use to reach your target audience?
- When would be the best time to promote your product?
- How are your competitors promoting their products?

Place

According to most marketers, the basis of marketing is about offering the right product, at the right price, at the right place, at the right time. For this reason, selecting the best possible location is critical for converting prospective clients into actual clients.

Some questions to ask yourself are:

- Will your product or service be looked for in a physical store, online or both?
- What should you do to access the most appropriate distribution channels?
- Will you require a sales force?
- Where are your competitors offering their products or services?
- Should you follow in your competitors' footsteps?
- Should you do something different from your competitors?

Importance of an IDEA

Ideas are the foundation of progress. An idea can be small or ground-breaking, easy to accomplish or extremely complicated to implement. Whatever the case, the fact that it is an idea gives it merit. Without ideas, nothing is possible. Most people are afraid to speak out their ideas, out for fear of being ridiculed. However, if are an entrepreneur and want to remain competitive and innovative, you need to bring your ideas out into the light.

Some ways to do this are by:

- Establishing a culture of brainstorming where you invite all interested parties to contribute
- Discussing ideas out loud so that people can add their ideas, views, opinions to them
- Being open minded and not limiting your ideas, even if the idea who have seems ridiculous
- Not discarding ideas that you don't work on immediately, but instead making a note of them and shelving them so they can be revisited at a later date

Tips 

- Keep in mind that good ideas do not always have to be unique.
- Remember that timing plays a huge role in determining the success of your idea.
- Situations and circumstances will always change, so be flexible and adapt your idea accordingly.

5.6.2 Business Entity Concepts: Basic Business Terminology

If your aim is to start and run a business, it is crucial that you have a good understanding of basic business terms. Every entrepreneur should be well versed in the following terms:

- Accounting: A systematic method of recording and reporting financial transactions.
- Accounts payable: Money owed by a company to its creditors.
- Accounts Receivable: The amount a company is owed by its clients.
- Assets: The value of everything a company owns and uses to conduct its business.
- Balance Sheet: A snapshot of a company's assets, liabilities and owner's equity at a given moment.
- Bottom Line: The total amount a business has earned or lost at the end of a month.
- Business: An organization that operates with the aim of making a profit.
- Business to Business (B2B): A business that sells goods or services to another business.
- Business to Consumer (B2C): A business that sells goods or services directly to the end user.
- Capital: The money a business has in its accounts, assets and investments. The two main types of capital are debt and equity.
- Cash Flow: The overall movement of funds through a business each month, including income and expenses.
- Cash Flow Statement: A statement showing the money that entered and exited a business during a specific period of time.
- Contract: A formal agreement to do work for pay.
- Depreciation: The degrading value of an asset over time.
- Expense: The costs that a business incurs through its operations.
- Finance: The management and allocation of money and other assets.
- Financial Report: A comprehensive account of a business' transactions and expenses.
- Fixed Cost: A one-time expense.
- Income Statement (Profit and Loss Statement): Shows the profitability of a business during a period of time.
- Liabilities: The value of what a business owes to someone else.
- Marketing: The process of promoting, selling and distributing a product or service.
- Net Income/Profit: Revenues minus expenses.
- Net Worth: The total value of a business.
- Payback Period: The amount of time it takes to recover the initial investment of a business.
- Profit Margin: The ratio of profit, divided by revenue, displayed as a percentage.
- Return on Investment (ROI): The amount of money a business gets as return from an investment.

- Revenue: The total amount of income before expenses are subtracted.
- Sales Prospect: A potential customer.
- Supplier: A provider of supplies to a business.
- Target Market: A specific group of customers at which a company's products and services are aimed.
- Valuation: An estimate of the overall worth of the business.
- Variable Cost: Expenses that change in proportion to the activity of a business.
- Working Capital: Calculated as current assets minus current liabilities.
- Business Transactions: There are three types of business transactions. These are:
  - Simple Transactions – Usually a single transaction between a vendor and a customer. For example: Buying a cup of coffee.
  - Complex Transactions – These transactions go through a number of events before they can be completed. For example: Buying a house.
  - Ongoing transactions – These transactions usually require a contract. For example: Contract with a vendor.

Basic Accounting Formulas

Take a look some important accounting formulas that every entrepreneur needs to know.

1. The Accounting Equation: This is value of everything a company owns and uses to conduct its business.

   Formula:

   Assets = Liability + Owner's Equity

2. Net Income: This is the profit of the company.

   Formula:
   Net Income = Revenues – Expenses

3. Break-Even Point: This is the point at which the company will not make a profit or a loss. The total cost and total revenues are equal.

   Formula:
   Break-Even = Fixed Costs/Sales Price – Variable Cost per Unit

4. Cash Ratio: This tells us about the liquidity of a company.

   Formula:
   Cash Ratio = Cash/Current Liabilities

5. Profit Margin: This is shown as a percentage. It shows what percentage of sales are left over after all the expenses are paid by the business.

   Formula:
   Profit Margin = Net Income/Sales

6. Debt-to-Equity Ratio: This ratio shows how much equity and debt a company is using to finance its assets, and whether the shareholder equity can fulfill obligations to creditors if the business starts making a loss.

   Formula:
   Debt-to-Equity Ratio = Total Liabilities/Total Equity

1. Cost of Goods Sold: This is the total of all costs used to create a product or service, which has been sold.

   Formula:
   Cost of Goods Sold = Cost of Materials/Inventory – Cost of Outputs

8. Return on Investment (ROI): This is usually shown as a percentage. It calculates the profits of an investment as a percentage of the original cost.

   Formula:

   ROI = Net Profit/Total Investment * 100

9. Simple Interest: This is money you can earn by initially investing some money (the principal).

   Formula:

   A = P(1 + rt); R = r * 100

   Where:

   A = Total Accrued Amount (principal + interest)

   P = Principal Amount

   I = Interest Amount

   r = Rate of Interest per year in decimal; r = R/100

   t = Time Period involved in months or years

10. Annual Compound Interest: The calculates the addition of interest to the principal sum of a loan or deposit.

    Formula:

    A = P (1 + r/n) ^ nt:

    Where:

    A = the future value of the investment/loan, including interest

    P = the principal investment amount (the initial deposit or loan amount)

    r = the annual interest rate (decimal)

    n = the number of times that interest is compounded per year

    t = the number of years the money is invested or borrowed for

5.6.3 CRM & Networking: What is CRM

CRM stands for Customer Relationship Management. Originally the expression Customer Relationship Management meant managing one's relationship with customers. However, today it refers to IT systems and software designed to help companies manage their relationships.

The Need for CRM

The better a company can manage its relationships with its customers, the higher the chances of the company's success. For any entrepreneur, the ability to successfully retain existing customers and expand the enterprise is paramount. This is why IT systems that focus on addressing the problems of dealing with customers on a daily basis are becoming more and more in demand.

Customer needs change over time, and technology can make it easier to understand what customers really want. This insight helps companies to be more responsive to the needs of their customers. It enables them to modify their business operations when required, so that their customers are always served in the best manner possible. Simply put, CRM helps companies recognize the value of their clients and enables them to capitalize on improved customer relations.

Benefits of CRM

CRM has a number of important benefits:

- It helps improve relations with existing customers which can lead to:
  - Increased sales
  - Identification of customer needs
  - Cross-selling of products
- It results in better marketing of one's products or services
- It enhances customer satisfaction and retention
- It improves profitability by identifying and focusing on the most profitable customers

5.6.4 What is Networking

In business, networking means leveraging your business and personal connections in order to bring in a regular supply of new business. This marketing method is effective as well as low cost. It is a great way to develop sales opportunities and contacts. Networking can be based on referrals and introductions, or can take place via phone, email, and social and business networking websites.

5.6.5 The Need for Networking

Networking is an essential personal skill for business people, but it is even more important for entrepreneurs. The process of networking has its roots in relationship building. Networking results in greater communication and a stronger presence in the entrepreneurial ecosystem. This helps build strong relationships with other entrepreneurs.

Business networking events held across the globe play a huge role in connecting like-minded entrepreneurs who share the same fundamental beliefs in communication, exchanging ideas and converting ideas into realities. Such networking events also play a crucial role in connecting entrepreneurs with potential investors. Entrepreneurs may have vastly different experiences and backgrounds but they all have a common goal in mind – they all seek connection, inspiration, advice, opportunities and mentors. Networking offers them a platform to do just that.

Benefits of Networking

Networking offers numerous benefits for entrepreneurs. Some of the major benefits are:

- Getting high quality leads
- Increased business opportunities
- Good source of relevant connections
- Advice from like-minded entrepreneurs
- Gaining visibility and raising your profile
- Meeting positive and enthusiastic people
- Increased self-confidence
- Satisfaction from helping others
- Building strong and lasting friendships

Tips

- Use social media interactions to identify needs and gather feedback.
- When networking, ask open-ended questions rather than yes/no type questions.

5.6.6 Business Plan: Why Set Goals

Setting goals is important because it gives you long-term vision and short-term motivation. Goals can be short term, medium term and long term.

Short-Term Goals

- These are specific goals for the immediate future.

Example: Repairing a machine that has failed.

Medium-Term Goals

- These goals are built on your short term goals.
- They do not need to be as specific as your short term goals.

Example: Arranging for a service contract to ensure that your machines don't fail again.

Long-Term Goals

These goals require time and planning.

They usually take a year or more to achieve.

Example: Planning your expenses so you can buy new machinery

Why Create a Business Plan

A business plan is a tool for understanding how your business is put together. It can be used to monitor progress, foster accountable and control the fate of the business. It usually offers a 3-5 year projection and outlines the plan that the company intends to follow to grow its revenues. A business plan is also a very important tool for getting the interest of key employees or future investors.

A business plan typically comprises of eight elements.

Elements of a Business Plan

Executive Summary

The executive summary follows the title page. The summary should clearly state your desires as the business owner in a short and businesslike way. It is an overview of your business and your plans. Ideally this should not be more than 1-2 pages.

Your Executive Summary should include:

- The Mission Statement: Explain what your business is all about.

  Example: Nike's Mission Statement

  Nike's mission statement is "To bring inspiration and innovation to every athlete in the world."
- Company Information: Provide information like when your business was formed, the names and roles of the founders, the number of employees, your business location(s) etc.
- Growth Highlights: Mention examples of company growth. Use graphs and charts where possible.
- Your Products/Services: Describe the products or services provided.
- Financial Information: Provide details on current bank and investors.
- Summarize future plans: Describe where you see your business in the future.

Business Description

The second section of your business plan needs to provide a detailed review of the different elements of your business. This will help potential investors to correctly understand your business goal and the uniqueness of your offering.

Your Business Description should include:

- A description of the nature of your business
- The market needs that you are aiming to satisfy
- The ways in which your products and services meet these needs
- The specific consumers and organizations that you intend to serve
- Your specific competitive advantages

Market Analysis

The market analysis section usually follows the business description. The aim of this section is to showcase your industry and market knowledge. This is also the section where you should lay down your research findings and conclusions.

Your Market Analysis should include:

- Your industry description and outlook
- Information on your target market
- The needs and demographics of your target audience
- The size of your target market
- The amount of market share you want to capture
- Your pricing structure
- Your competitive analysis
- Any regulatory requirements

Organization & Management

This section should come immediately after the Market Analysis.

Your Organization & Management section should include:

- Your company's organizational structure
- Details of your company's ownership
- Details of your management team
- Qualifications of your board of directors
- Detailed descriptions of each division/department and its function
- The salary and benefits package that you offer your people
- The incentives that you offer

Service or Product Line

The next section is the service or product line section. This is where you describe your service or product, and stress on their benefits to potential and current customers. Explain in detail why your product of choice will fulfill the needs of your target audience.

Your Service or Product Line section should include:

- A description of your product/service
- A description of your product or service's life cycle
- A list of any copyright or patent filings
- A description of any R&D activities that you are involved in or planning

Marketing & Sales

Once the Service or Product Line section of your plan has been completed, you should start on the description of the marketing and sales management strategy for your business.

Your Marketing section should include the following strategies:

- **Market penetration strategy**: This strategy focuses on selling your existing products or services in existing markets, in order to increase your market share.
- **Growth strategy**: This strategy focuses on increasing the amount of market share, even if it reduces earnings in the short-term.
- **Channels of distribution strategy**: These can be wholesalers, retailers, distributers and even the internet.
- **Communication strategy**: These can be written strategies (e-mail, text, chat), oral strategies (phone calls, video chats, face-to-face conversations), non-verbal strategies (body language, facial expressions, tone of voice) and visual strategies (signs, webpages, illustrations).

Your Sales section should include the following information:

- **A salesforce strategy**: This strategy focuses on increasing the revenue of the enterprise.
- **A breakdown of your sales activities**: This means detailing out how you intend to sell your products or services – will you sell it offline or online, how many units do you intend to sell, what price do you plan to sell each unit at, etc.

Funding Request

This section is specifically for those who require funding for their venture.

The Funding Request section should include the following information:

- How much funding you currently require.
- How much funding you will require over the next five years. This will depend on your long-term goals.
- The type of funding you want and how you plan to use it. Do you want funding that can be used only for a specific purpose, or funding that can be used for any kind of requirement?
- Strategic plans for the future. This will involve detailing out your long-term plans – what these plans are and how much money you will require to put these plans in motions.
- Historical and prospective financial information. This can be done by creating and maintaining all your financial records, right from the moment your enterprise started, to the present day. Documents required for this are your balance sheet which contains details of your company's assets and liabilities, your income statement which lists your company's revenues, expenses and net income for the year, your tax returns (usually for the last three years) and your cash flow budget which lists the cash that came in, the cash that went out and states whether you had a cash deficit (negative balance) or surplus (positive balance) at the end of each month.

Financial Planning

Before you begin building your enterprise, you need to plan your finances. Take a look at the steps for financial planning:

Step 1: Create a financial plan. This should include your goals, strategies and timelines for accomplishing these goals.

Step 2: Organize all your important financial documents. Maintain a file to hold your investment details, bank statements, tax papers, credit card bills, insurance papers and any other financial records.

Step 3: Calculate your net worth. This means figure out what you own (assets like your house, bank accounts, investments etc.), and then subtract what you owe (liabilities like loans, pending credit card amounts etc.) the amount you are left with is your net worth.

Step 4: Make a spending plan. This means write down in detail where your money will come from, and where it will go.

Step 5: Build an emergency fund. A good emergency fund contains enough money to cover at least 6 months' worth of expenses.

Step 6: Set up your insurance. Insurance provides long term financial security and protects you against risk.

Risk Management

As an entrepreneur, it is critical that you evaluate the risks involved with the type of enterprise that you want to start, before you begin setting up your company. Once you have identified potential risks, you can take steps to reduce them. Some ways to manage risks are:

- Research similar business and find out about their risks and how they were minimized.
- Evaluate current market trends and find out if similar products or services that launched a while ago are still being well received by the public.
- Think about whether you really have the required expertise to launch your product or service.
- Examine your finances and see if you have enough income to start your enterprise.
- Be aware of the current state of the economy, consider how the economy may change over time, and think about how your enterprise will be affected by any of those changes.
- Create a detailed business plan.

Tips

- Ensure all the important elements are covered in your plan.
- Scrutinize the numbers thoroughly.
- Be concise and realistic.
- Be conservative in your approach and your projections.
- Use visuals like charts, graphs and images wherever possible.

5.6.7 Procedure and Formalities for Bank Finance: The Need for Bank Finance

For entrepreneurs, one of the most difficult challenges faced involves securing funds for startups. With numerous funding options available, entrepreneurs need to take a close look at which funding methodology works best for them. In India, banks are one of the largest funders of startups, offering funding to thousands of startups every year.

What Information Should Entrepreneurs Offer Banks for Funding

When approaching a bank, entrepreneurs must have a clear idea of the different criteria that banks use to screen, rate and process loan applications. Entrepreneurs must also be aware of the importance of providing banks with accurate and correct information. It is now easier than ever for financial institutions to track any default behaviour of loan applicants. Entrepreneurs looking for funding from banks must provide banks with information relating to their general credentials, financial situation and guarantees or collaterals that can be offered.

General Credentials

This is where you, as an entrepreneur, provide the bank with background information on yourself. Such information includes:

- Letter(s) of Introduction: This letter should be written by a respected business person who knows you well enough to introduce you. The aim of this letter is set across your achievements and vouch for your character and integrity.
- Your Profile: This is basically your resume. You need to give the bank a good idea of your educational achievements, professional training, qualifications, employment record and achievements.
- Business Brochure: A business brochure typically provides information on company products, clients, how long the business has been running for etc.
- Bank and Other References: If you have an account with another bank, providing those bank references is a good idea.
- Proof of Company Ownership or Registration: In some cases, you may need to provide the bank with proof of company ownership and registration. A list of assets and liabilities may also be required.

Financial Situation

Banks will expect current financial information on your enterprise. The standard financial reports you should be prepared with are:

- Balance Sheet
- Cash-Flow Statement
- Business Plan
- Profit-and-Loss Account
- Projected Sales and Revenues
- Feasibility Study

Guarantees or Collaterals

Usually banks will refuse to grant you a loan without security. You can offer assets which the bank can seize and sell off if you do not repay the loan. Fixed assets like machinery, equipment, vehicles etc. are also considered to be security for loans.

The Lending Criteria of Banks

Your request for funding will have a higher chance of success if you can satisfy the following lending criteria:

- Good cash flow
- Adequate shareholders' funds
- Adequate security
- Experience in business
- Good reputation

The Procedure

To apply for funding the following procedure will need to be followed.

1. Submit your application form and all other required documents to the bank.
2. The bank will carefully assess your credit worthiness and assign ratings by analyzing your business information with respect to parameters like management, financial, operational and industry information as well as past loan performance.
3. The bank will make a decision as to whether or not you should be given funding.

Tips 

- Get advice on funding options from experienced bankers.
- Be cautious and avoid borrowing more than you need, for longer than you need, at an interest rate that is higher than you are comfortable with.

5.6.8 Enterprise Management - An Overview: How to Manage Your Enterprise

To manage your enterprise effectively you need to look at many different aspects, right from managing the day-to-day activities to figuring out how to handle a large scale event. Let's take a look at some simple steps to manage your company effectively.

Step 1: Use your leadership skills and ask for advice when required.

Let's take the example of Ramu, an entrepreneur who has recently started his own enterprise. Ramu has good leadership skills – he is honest, communicates well, knows how to delegate work etc. These leadership skills definitely help Ramu in the management of his enterprise. However, sometimes Ramu comes across situations that he is unsure how to handle. What should Ramu do in this case? One solution is for him to find a more experienced manager who is willing to mentor him. Another solution is for Ramu to use his networking skills so that he can connect with managers from other organizations, who can give him advice on how to handle such situations.

Step 2: Divide your work amongst others – realize that you cannot handle everything yourself.

Even the most skilled manager in the world will not be able to manage every single task that an enterprise will demand of him. A smart manager needs to realize that the key to managing his enterprise lies in his dividing all his work between those around him. This is known as delegation. However, delegating is not enough. A manager must delegate effectively if he wants to see results. This is important because delegating, when done incorrectly, can result in you creating even more work for yourself. To delegate effectively, you can start by making two lists. One list should contain the things that you know you need to handle yourself. The second list should contain the things that you are confident can be given to others to manage and handle. Besides incorrect delegation, another issue that may arise is over-delegation. This means giving away too many of your tasks to others. The problem with this is, the more tasks you delegate, the more time you will spend tracking and monitoring the work progress of those you have handed the tasks to. This will leave you with very little time to finish your own work.

Step 3: Hire the right people for the job.

Hiring the right people goes a long way towards effectively managing your enterprise. To hire the best people suited for the job, you need to be very careful with your interview process. You should ask potential candidates the right questions and evaluate their answers carefully. Carrying out background checks is always a good practice. Running a credit check is also a good idea, especially if the people you are planning to hire will be handling your money. Create a detailed job description for each role that you want filled and ensure that all candidates have a clear and correct understanding of the job description. You should also have an employee manual in place, where you

put down every expectation that you have from your employees. All these actions will help ensure that the right people are approached for running your enterprise.

Step 4: Motivate your employees and train them well.

Your enterprise can only be managed effectively if your employees are motivated to work hard for your enterprise. Part of being motivated involves your employees believing in the vision and mission of your enterprise and genuinely wanting to make efforts towards pursuing the same. You can motivate your employees with recognition, bonuses and rewards for achievements. You can also motivate them by telling them about how their efforts have led to the company's success. This will help them feel pride and give them a sense of responsibility that will increase their motivation.

Besides motivating your people, your employees should be constantly trained in new practices and technologies. Remember, training is not a one-time effort. It is a consistent effort that needs to be carried out regularly.

Step 5: Train your people to handle your customers well.

Your employees need to be well-versed in the art of customer management. This means they should be able to understand what their customers want, and also know how to satisfy their needs. For them to truly understand this, they need to see how you deal effectively with customers. This is called leading by example. Show them how you sincerely listen to your clients and the efforts that you put into understand their requirements. Let them listen to the type of questions that you ask your clients so they understand which questions are appropriate.

Step 6: Market your enterprise effectively.

Use all your skills and the skills of your employees to market your enterprise in an effective manner. You can also hire a marketing agency if you feel you need help in this area.

Now that you know what is required to run your enterprise effectively, put these steps into play, and see how much easier managing your enterprise becomes!

Tips

- Get advice on funding options from experienced bankers.
- Be cautious and avoid borrowing more than you need, for longer than you need, at an interest rate that is higher than you are comfortable with.

5.6.9 20 Questions to Ask Yourself Before Considering Entrepreneurship

1. Why am I starting a business?
2. What problem am I solving?
3. Have others attempted to solve this problem before? Did they succeed or fail?
4. Do I have a mentor or industry expert that I can call on?
5. Who is my ideal customer?
6. Who are my competitors?
7. What makes my business idea different from other business ideas?
8. What are the key features of my product or service?
9. Have I done a SWOT analysis?
10. What is the size of the market that will buy my product or service?
11. What would it take to build a minimum viable product to test the market?
12. How much money do I need to get started?
13. Will I need to get a loan?
14. How soon will my products or services be available?
15. When will I break even or make a profit?
16. How will those who invest in my idea make a profit?
17. How should I set up the legal structure of my business?
18. What taxes will I need to pay?
19. What kind of insurance will I need?
20. Have I reached out to potential customers for feedback?

Tips

- It is very important to validate your business ideas before you invest significant time, money and resources into it.
- The more questions you ask yourself, the more prepared you will be to handle to highs and lows of starting an enterprise.

Footnotes:

1. A mentor is a trusted and experienced person who is willing to coach and guide you.
2. A customer is someone who buys goods and/or services.
3. A competitor is a person or company that sells products and/or services similar to your products and/or services.
4. SWOT stands for Strengths, Weaknesses, Opportunities and Threats. To conduct a SWOT analysis of your company, you need to list down all the strengths and weaknesses of your company, the opportunities that are present for your company and the threats faced by your company.

5. A minimum viable product is a product that has the fewest possible features, that can be sold to customers, for the purpose of getting feedback from customers on the product.
6. A company is said to break even when the profits of the company are equal to the costs.
7. The legal structure could be a sole proprietorship, partnership or limited liability partnership.
8. There are two types of taxes – direct taxes payable by a person or a company, or indirect taxes charged on goods and/or services.
9. There are two types of insurance – life insurance and general insurance. Life insurance covers human life while general insurance covers assets like animals, goods, cars etc.

Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

FURNITURE &
FITTINGS
SKILL COUNCIL

Address: 407-408, 4th Floor, DLF City Court, MG Road
Sikanderpur Gurugram - 122002, Haryana, India
Email: info@ffsc.in
Web: www.ffsc.in
Phone: +91 124 4513900

ISBN 978-93-5271-242-7

Price:

"This book is provided free to students under the PMKVY (Pradhan Mantri Kaushal Vikas Yojana)."