







Participant Handbook

Sector

Furniture and Fittings

Sub-Sector

Wooden/Modular Furniture

Occupation

Design: Wooden/Modular Furniture

Reference ID: FFS/Q0106, Version 1.0

NSQF level: 4



Assistant Furniture Designer

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If we have to move India towards development then Skill Development should be our mission.

Shri Narendra Modi Prime Minister of India







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FURNITURE & FITTINGS SKILLS COUNCIL

for

SKILLING CONTENT: PARTICIPANT HANDBOOK

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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 endeavors.

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 Furniture Designer" in the Furniture and 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.

- 1. Introduction
- 2. FFS/N0109 Research and creation of furniture design concept
- 3. FFS/N0110 Create a scale model and build a furniture prototype
- 4. FFS/N8601 Ensure health and safety at workplace
- 5. FFS/N8801 Work effectively with others
- 6. Employability & Entrepreneurship Skills

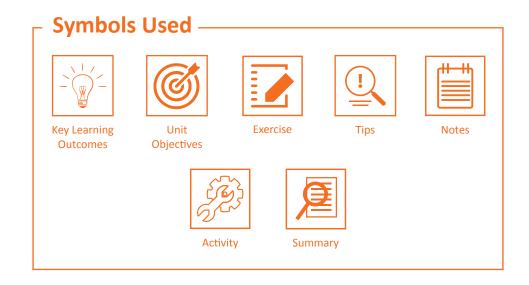


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1. Introduction

- Unit 1.1 Introducing the Furniture and Fittings Sector in India
- Unit 1.2 Common Furniture Styles
- Unit 1.3 Defining Modular Design of Furniture



Key Learning Outcomes



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

- 1. Discuss the Furniture and Fittings sector in India
- 2. Analyze the common furniture styles
- 3. Define modularity

Unit 1.1: Introducing the Furniture and Fittings Sector in India

Unit Objectives



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

- 1. Evaluate the Furniture and Fittings sector in India
- 2. Analyse the statistics for furniture purchase in India

1.1.1 Get an Overview of the Furniture and Fittings Sector in India

- Currently, India is the 14th largest market in the world for the Furniture and Fittings sector, as stated by HKTDC Research.
- The Indian middle-class population and business organisations are gradually recovering from the temporary market decline, which was driven by recent economic reforms and measures. These are like Demonetization, introduction of the GST (Goods and Services Tax) and advent of the Long-Term Capital Gains Tax.
- The GDP (Gross Domestic Product) of India, for the fiscal year 2018-19, has been forecasted to grow by 7-7.5% by the Economic Survey of India (2017-18).
- This can be attributed to the rise in per capita income level and the subsequent growth in consumption by the urban and semi-urban middle-class population.
- The choice and consumption of middle-class population in India are now driven by need, quality and convenience, rather than affordable prices.
- Middle-class households are now interested in enhancing their lifestyle standards by decorating their homes with modern and chic furniture, fixtures and fittings.
- The Furniture & Fittings sector in India has been forecasted, by TechSci Research, to beat INR 3200 Crores by 2019.
- Apart from the rising consumption of middle-class households, expansion of the Tourism and
- Hospitality sector would also substantially contribute towards the mammoth growth of the Furniture & Fittings sector.
- According to recent reports by KPMG India, the current Furniture & Fittings sector in India comprises the following segments:



Fig. 1.1.1.1: popular brands in Indian furniture industry

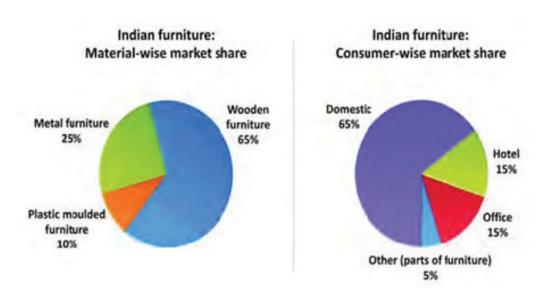


Fig. 1.1.1.2: Furniture Industry in India

On the basis of the area of applicability, the major subsectors in the Indian Furniture & Fittings sector are:

- Home Furniture segment (comprises furniture used to furnish and decorate Indian homes)
- Office Furniture segment (comprises furniture used in commercial spaces)
- Contract segment (caters to the need of Tourism & Hospitality industry)

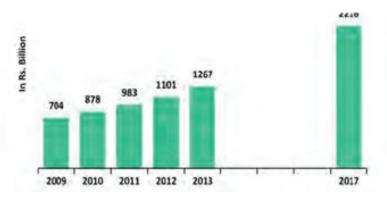


Fig. 1.1.1.3: Statistics for Furniture purchase in India

Unit 1.2: Common Furniture Styles

Unit Objectives



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

- 1. State the History and Style of Furniture
- 2. Identify the common furniture styles (before and after 20th Century)

1.2.1 About History and Style of Furniture

History of Furniture

The concept of furniture came from ancient Egypt. The chief forms of furniture were boxes, chairs, beds and thrones. One of the earliest forms of furniture were beds that were made up of wood and had a simple framework.

The location of one of the great beds was found in Tutankhamen's tomb which was put together with staples and bronze hooks. The ideology behind such furniture design was simple – quick folding and dismantling process and easy facilitation for transportation and storage.



Fig. 1.2.1.1: Furniture from Tutankhamen's tomb

As per the early Indian culture, the furniture-making tradition started with the Vijayanagar Empire (South India) during the 14th Century.

The common types of wood that were used for creating and designing furniture in ancient and present India are:

- Rosewood or Shisham
- Ebony (Aabnus or Aablus)
- Acacia (Olonkar or Badam)
- Teak (Segun or Sagaun)

In India, the furniture designs were heavily inspired by traditional English Styles, Indo-Dutch Style, Goanese Style, Mughal Style, and Indo-European furniture.



Fig. 1.2.1.2: Furniture design with East and West blend - Goanese Style



Fig. 1.2.1.3: Traditional English Styles



Fig. 1.2.1.4: Indo Portuguese Furniture



Fig. 1.2.1.5: Mughal Style Wooden Furniture

The common styles of furniture are:

Before 20th Century

Style	Characteristics	Images
Jacobean	 Geometric, symmetrical design and a strong emphasis on rectilinear lines and shapes Ornate carvings, influenced by the Classical era and detailed geometric motifs Physically and visually heavy Very close to the ground level 	The second secon
William and Mary	 Replaced the orthogonal, rectilinear Jacobean style with soft curves and graceful spirals Physically lighter and sleeker, as compared to the Jacobean style Visually disconnected from and higher off the ground Implemented Dovetails joints to incorporate softer features in furniture 	

Style	Characteristics	Images
Queen Anne	 Geometric, symmetrical design and a strong emphasis on rectilinear lines and shapes Ornate carvings, influenced by the Classical era and detailed geometric motifs Physically and visually heavy Very close to the ground level 	
Pennsylvania Dutch	 Influenced by American and German culture Straightforward and utilitarian style Incorporated straight lines and tapered legs Less use of ornate curves Decorated with colorful folk painting on the cases, generally depicting natural sceneries or geometric patterns Often polished, finished and varnished with veneer (thin, decorative piece of fine wood) 	
Chippendale	 Pioneered by English cabinet-maker Thomas Chippendale Highly elegant and classy, this style incorporates the important features of Gothic, Chinese and Rococo influence Pointed arches, wooden lattice, and S-shaped curves were adopted from the Gothic culture Fretwork design and Jappaning were adopted from the Chinese culture Rococo influence brought about designs like broad chair seats, decorated with interlacing ribbon backs Stained Maple was used, instead of Mahogany, Walnut and Cherry Wood to reduce cost Such furniture were often finished with a clear wax coating Easily recognized from designs like the Ball-and-Claw foot and Chair backs decorated with ribbon and shell motifs 	

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Hepplewhite	 Pioneered by English designer George Hepplewhite Very graceful and influenced by the Neoclassical style Delicate appearance due to extensive use of veneers with contrasting colors (Marquetry) Presence of decorative motifs like elegant swags, tapered legs, curling ribbons, feathers, urns, trees, etc. Use of narrow vertical strips of wood glued to a heavy background clot called 'Tambours.' Incorporates simple geometric shapes like circle and primary curves 	

Style	Characteristics	Images
Sheraton	 Marked with the use of thinner legs Visually lighter as compared to other styles Characterized by Rectangular Chair and Sofa backs Characterized by Cabinets and dressers with rectilinear features Flaunts the presence of ornate and delicate lines and contrasting veneers, influenced by the Neoclassical style The legs are usually tapered, often resembling columns of a Greek temple in appearance 	
Federal	 Incorporates the borderline features of the Sheraton and the Hepplewhite styles Depicts strong use of ornate inlay, tapered legs, straight lines and delicate feature columns of a Greek temple in appearance 	
American Empire	 Characterized by traditional ornamentation, rustic decoration and dark finish Depicts a strong presence of Roman and Greek motifs Visually heavy, thus communicating strength and durability Highly decorated, to depict prosperity 	
Victorian	 This style was greatly influenced by Queen Victoria's love for heavy, ornate decoration This style primarily includes a mixture of the Gothic, Neoclassical and Rococo features Usually characterized by dark pieces of furniture, heavy fabrics, and chinaware and glassware as accessories 	

Style	Characteristics	Images
Scandinavian Contemporary	 Involves basic, utilitarian style Primarily built out of natural wood Influenced by less ornate details Defined strongly by modern, clean, solid pieces Designed to occupy less space, in a clutter-free manner 	
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Post 20th Century

- Antique
- Traditional
- Vintage
- Rustic
- Art Deco
- Retro
- Modern
- Contemporary
- Modular

Style	Characteristics	Images
Antique	 A piece of furniture is considered "Antique" if it is at least 100 years old Generally built out of wood Antique furniture comprises ornate details and specific motifs that help in determining their date of origin and thus, their prices 	
Traditional	 This style incorporates the best features of styles like Queen Anne, Chippendale and Sheraton Significant features are the elegant ornamentation, straight lines and gently tapered legs 	
Vintage	 Younger in age as compared to Antique, this style of furniture flaunts the most prominent features of a particular detail associated with a certain period Incorporates a very charming, delicate, lightweight style Wood is painted in light pastel colors like Wool White, Beryl Green, Santa's Gray, Mauve, Oriental Pink, etc 	
Art Deco	 Characterized by geometric and angular patterns Typical examples of such patterns are ziggurats, pyramidal, triangular, trapezoidal, zigzagged, chevron, sunburst, sweeping curves, stepped forms, etc. It harmonizes jazzy patterns with materials like glass, chrome, mirrors, etc. 	

Style	Characteristics	Images
Retro	 This style bears the look of having been built between the 1950s and the 1980s This style imitates previous fashion trends Evokes nostalgic feelings and memories related to a particular era or place 	
Modern	 Characterized by smooth surfaces, minimal decoration, standardized dimensions, neutral design and combination of different materials in an ad hoc manner Common materials are Steel, Vinyl, Plastic and Leather However, the use of natural materials is predominant Prominent use of monochromatic color palettes Marked by a balance between aesthetics, utility, and affordability 	
Contemporary	 This style is ever-changing and adapts itself with time Contemporary style pertains to the style most popular nowadays Although referred to synonymously, the Contemporary style is completely different from the modern style of furniture The Modern style refers to a particular era (the 1900s), while the Contemporary style walks hand-in-hand with the changing time 	
Art Deco	 Specific form of portable furniture aimed at saving space Highly utilitarian and costeffective Divided into numerous small and solid units, which can be connected horizontally, vertically and matrix-wise, using a simple series of steps All small parts or "modules" in a system are reusable and scalable 	

Unit 1.3: Defining Modular Design of Furniture

Unit Objectives



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

- 1. Define and explain Modularity
- 2. Evaluate the characteristics of Modular Furniture
- 3. Categorise Modular Furniture according to design

1.3.1 Defining and Explaining Modularity

- Modularity is an approach of designing furniture, which involves subdividing a system into numerous small building blocks, or elementary components, commonly known as "modules" or "skids".
- These elementary modules, building blocks or skids can be autonomously created for developing various systems.
- In simple words, Modularity enables us to develop and administer a system by the "divide and rule" policy.
- The procedure, in which a system can be broken down or subdivided into modules, is called "Functional Allocation".
- Modular furniture can not only be assembled from small modules but also be dismantled into them, thus making repeated assembly and disassembly possible.
- For re-assembling specific pieces of furniture (say, modular bed), entire sets of modules are available and sold in the market in the form of prefilled packages.
- Modularity is a popular concept that is applicable not only in building furniture but also in the following areas:
 - Architecture
 - o Designing and building Heavy Vehicles
 - o Aerodynamics
 - o Building Heavy Machinery
 - Manufacturing Computer Hardware
 - Developing and testing Software using OOPS (Object-oriented Programming System) concept

1.3.2 Characteristics of Modular Furniture

Modular Furniture and their components exhibit the following characteristics:

Reusability	The same modules can be arranged and built up according to various designs or matrices to develop diverse types of furniture.
Discreteness	Individual modules or skids have autonomous properties and are functionally distinct from the other modules in the matrix.
Adaptability	An existing modular design can be broken down into its modules, which can be reconstructed into another modular design, serving a different purpose.

A 1: .:		
Application	Hardware application plays an important role in modular furniture.	
Scalability	A modular design is scalable, i.e., its size, shape, and dimensions can be varied by rearranging, increasing or decreasing (as per requirement) the number of modules used in building it	
Simplicity	 As the term suggests, modular designs are very simple to understand and easy to build This is because the first step in building design is to understand the individual, small building blocks 	
Reliability	 Modular designs are very precise, accurate and highly reliable This is because each design is created and built using discrete modules, which are precise regarding individual dimensions, make and specifications 	
Cost Minimization and Space Utilization	 Modularity helps in reducing training, operational (assembling, installing and dismantling) and maintenance costs The very purpose behind modularity is Space utilization 	

1.3.3 Classifying Modular Furniture According to Design

According to design, Modular Furniture can be classified into the following:

- Single-bodied
- Multi-bodied
- Universal for completion
- On a frame
- For hanging

Summary



- India is the 14th largest market in the world for the Furniture and Fittings sector, as stated by HKTDC Research.
- The Indian middle-class population and business organizations are gradually recovering from the temporary market decline.
- The GDP (Gross Domestic Product) of India, for the fiscal year 2018-19, has been forecasted to grow by 7-7.5% by the Economic Survey of India (2017-18).
- Middle-class households are now interested in enhancing their lifestyle standards by decorating their homes with modern and chic furniture, fixtures and fittings.
- The Furniture & Fittings sector in India has been forecasted, by TechSci Research, to beat INR 3200 Crores by 2019.
- Furniture styles can be broadly categorized into Before and After the 20th Century
- Modularity is an approach of designing furniture, which involves subdividing a system into numerous small building blocks
- Modular Furniture can be classified according to the design.
- The location of one of the great beds was found in Tutankhamen's tomb which was put together with staples and bronze hooks.

—Notes 🗒 ———————————————————————————————————	
	
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Exercise



Choose the Correct Option

- 1. Which sector also substantially contributes towards the mammoth growth of the Furniture & Fittings sector?
 - a) Bartending
- b) Electrical

- c) Hospitality
- 2. The characteristic of which furniture type has geometric and angular patterns?
 - a) Retro

b) Art Deco

c) Vintage

- 3. The full form of OOPS is:
 - a) On-Line Operating Plan System **Programming System**
- b) Operation on Placental Support
- c) Object-oriented
- 4. Modularity helps in reducing training, operational (assembling, installing and dismantling) and:
 - a) Maintenance costs
- b) Travel allowance
- c) Electricity bills
- 5. As per the early Indian culture, the furniture-making tradition started with the Vijayanagar Empire (South India) during which Century?
 - a) 50th

b)14th

c) 3rd

Activity



Chart Paper

- In this session, the Trainer will divide the class into 3 groups
- After the group is formed, the Trainer will give the groups their respective topic.
- The topic for the 1st group will be on "History of Furniture."
- The topic for the 2nd group will be on "Types of Furniture before the 20th Century."
- The topic for the 3rd group will be on "Types of Furniture Post 20th Century."
- The Trainees can use both texts as well as hand-drawn diagrams to represent their answers.
- After the groups complete their work, it is the responsibility of the Trainer to collect all the charts and evaluate them properly
- The group that impressively creates the chart with valid points and diagrams will receive appreciation and accolades









2. Research and Creation of Furniture Design Concept

- Unit 2.1 Furniture Design Objective and Research
- Unit 2.2 Prioritize Work Activities to Achieve Desired Results
- Unit 2.3 Create Design Concept
- Unit 2.4 Furniture Design Drawing and Approval



Key Learning Outcomes



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

- 1. List the furniture design objective and research
- 2. State the correct process of marking out and measuring accurately
- 3. Illustrate furniture ergonomics
- 4. Relate about design software like Auto-CAD, CorelDraw, Photoshop

Unit 2.1: Furniture Design Objective and Research

Unit Objectives



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

- 1. Express furniture design objective and research
- 2. List and prioritize work activities to achieve desired results
- 3. State about the design concept
- 4. Describe furniture design drawing and approval

2.1.1 Organisation Procedures and Formalities to be completed during Work

An assistant furniture designer must understand that successful designing, assembly, and installation is not a mechanical work that can be done alone.

There are a few other important aspects of the designing processes that an assistant furniture designer must consider.

There are relevant procedures and formalities that designers require to check. They are like:

- Appropriate documentation
- Accepting client's payment
- Reporting
- Calling up and asking for the clients' suggestions (if any)
- Greeting the client on visit
- Using appropriate PPE

Statutory Responsibilities under Organization Rules and Regulations

- An assistant furniture designer must abide by all clauses in his / her job responsibilities and code of conduct. These are considered statutory as per the organizational legislation and regulations.
- The role and responsibilities of an assistant furniture designer depend on the situation and the phase of the project. It is extremely important that the designer, on requirement, must switch between the role of a Team Player and a Team Leader.
- During the process and during each phase of the project, the assistant furniture designer must identify the mandatory clauses in his / her job responsibilities and play the role accordingly.
- It is important that on the initiation of an assignment or project, the assistant furniture designer is subjected to an induction or a training session on his / her work area and related responsibilities.

Escalation Hierarchy and Code of Conduct

Organizational hierarchy refers to the pyramid of ranks or posts in an organization. In an organization, every employee has to report to the immediate boss. In case of escalations, the employee should put it forward to the immediate boss. Here, we will see the escalation hierarchy in the furniture industry.

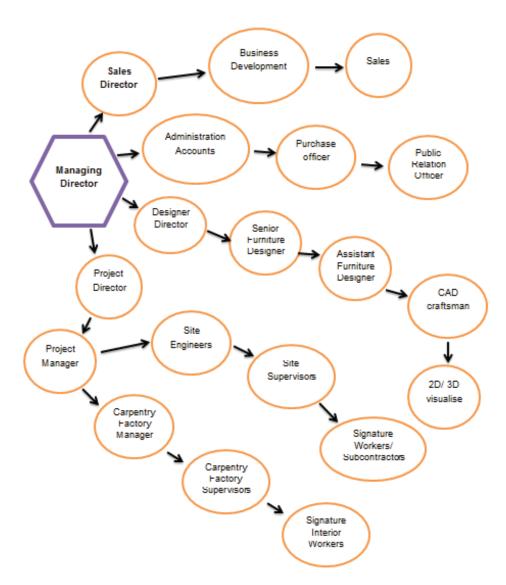


Fig. 2.1.1.1: Sectoral hierarchy

Any person in an organization should escalate his/ her issues to the person he/she is reporting. For example, as an assistant furniture designer, you will be working under and with your supervisor or senior furniture designer.

You should contact your supervisor in case of queries on procedures, products, or problem. If it is not satisfactorily resolved, you can report your query to a higher level.

Although, organizations encourage direct escalation to higher levels in some cases, like:

- Breach of code of conduct
- Women Harassment
- Racial discrimination
- Misbehavior by co-workers/seniors

Code of Conduct

- It is mandatory to follow the design standards that are approved by the Project Director and Project Manager.
- You should not indulge in any fraudulent activity

You should project pleasant behavior to the Admin team, other designers, and customers

- You should not put your personal watermark in the created furniture designs sanctioned by your company
- The submission of furniture designs should be before the allotted deadline
- It is considered inappropriate to ask the clients for their personal contact numbers
- Misbehavior with clients regarding money is a strict no-no

Standard Operating Procedures

- There is a set of Standard Operating Procedures (SOPs) for the designing of each modular furniture or unit.
- As a part of the organizational context, an assistant furniture designer must thoroughly learn, abide by and refer to the SOP before starting an operation.
- Apart from the SOPs, a designer must also thoroughly read and follow the Instruction Manuals and Directions of Use of software required for designing of modular furniture.
- In case of accidents and deviations from protocols, a designer must report the same according to the standard Escalation Hierarchy

Roles and Responsibilities in Executing the Work and Support Requirement from Subordinates

- 1. Recognising the key opportunities required for the work delegation: When you are given a task, it is imperative that you complete the task on time. Being the project delegator, it is your responsibility to break down your task into a series of steps like brainstorming, designing as per requirement and with measurements, etc.
- 2. Setting objectives as per your project: Being a designer, you would be opened to the designing of various types of modular furniture. This may be of individual nature like beds, lounges, chairs, etc. or of sets like kitchens, bedrooms, office rooms, etc.

It is necessary that for every project you have proper planning regarding the flow of work and its execution.

3. Using the strength of your Subordinates: Even though your co-workers and you are in the same department, there are chances of them possessing certain skills. That may be related to flawless 2D drawing, AutoCAD drawing, or creating furniture models that would stand fit to be put together.

For an effortless and excellent task, it is better to delegate to work to your colleagues who are adept at those fields.

Organisation Processes and Products and Services

As per the standard organization processes, an assistant furniture designer require to follow certain things:

- Gathering information about the organization's clients
 - o Generally, assistant furniture designers are grouped in the organizational hierarchy as per the clients and assignments they are working in.
 - o It is extremely crucial for an assistant furniture designer to understand the requirements and specifications of a given assignment or task before laying hands on it.
 - o Apart from reading the work order carefully, a person can also gather relevant and fruitful information about the assignment or job by knowing and understanding the client he/she would be working for.
 - o This can be accomplished by interacting with senior colleagues and supervisors who have worked for the same client(s) previously.
 - o Knowing the organization's clients help not only in understanding the project better, but also in handling objections if any.

• Getting acquainted with the various types of designs of the products

- o Apart from the general style of furniture available in the market as "popular trends", any business organization that manufactures, assembles and installs modular furniture, design their own products.
- o An organization's own products are unique. This is in terms of design type, make of the product, style, and utility.
- o The more unique and special a product is, the more difficult it is for its competitors to replicate its design and features.
- o This uniqueness of the products helps an organization build or strengthen its brand value and reputation in the market.
- o In order to design a given product accurately and as per the given specifications, an assistant furniture designer must familiarize with the latest trends, models, prototypes, and types of designs of the products available in the market.

• Familiarizing about the relevant safety and security procedures to be followed

- o While carrying out the product or prototype creation process, assistant furniture designers must take adequate safety and security measures. This is to protect themselves and others in the workplace against potential risks and hazards.
- o Such procedures include SOPs, Instruction Manuals, Dos and Don'ts of carrying out the operations as well as using, storing and maintaining PPE.
- o One must never miss or avoid mock drills and safety training sessions as these are the sessions where the actual safety measures during different disasters, hazards and emergencies are enacted, simulated and demonstrated practically.

About Terminology, Abbreviations, Symbols, Dimension Matrix Etc.

Terminology

Alder	A light brown hardwood from the Birch family.
Back Splat	Vertical slat of wood in the center of the back of a chair.
Cabriole	Furniture leg which curves outward from where it's attached descending in a reverse curve into an ornamental foot.
Dowel	Round wooden pin; usually spiral fluted or reeded, used to join pieces of wood together and strengthen the joint.
Engineered Wood	Manmade sheet goods made from wood chips and glue under pressure; commonly referred to as particle board.
Faux Finish	Decorative finish used to imitate the look of a natural material
Grain	The natural patterns in wood created by the direction of fibers.
Headboard	The upright structure attached to the head of the bed frame.
Inlay	Decorative technique of inserting contrasting wood veneers or materials to create a feature or design.
Japan Drier	A drying agent or solvent used to speed up the drying time of oil based finishes.
Kiln Dried	Lumber dried in a kiln to specified uniform moisture content.
Laminate	Composite material used on counter or table tops; provides a heat resistant, wipe clean surface.
Molding	Decorative strip covering transitions or used for ornamentation.
Nesting Tables	Multiple tables graduating in height allowing one to be stored under another; usually in sets of three.
Ovolo	Convex molding referred to a quarter-round molding.

Ovolo	Convex molding referred to a quarter-round molding.
Plinth	The squared base or pedestal that supports a cabinet or piece of furniture instead of legs
Quarter Sawn	Wood, cut from a log, which has been quartered lengthwise sometimes exposing distinctive grain patterns such as tiger striped oak.
Runners	Strips of wood on which drawers slide
Stretchers	The horizontal braces which connect and reinforce the vertical elements together such as chair or table legs.
Tenon	A projection at the end of a piece of wood which fits into a mortise to join the pieces together.
Unfinished	Furniture that has not been stained, painted or had a finish applied to it.
Varnish	A solvent based transparent film finish used to coat furniture.
Webbing	Strips of elastic or woven fabric used to provide support for upholstered arms, backs, and seats.
Zig-Zag Spring	A sinuous or S-shaped upholstery spring used in a chair, ottoman and sofa seats and backrests.

Abbreviations

- CL Centreline
- CLP Classification, Labelling, and Packaging
- CAD Computer Aided Design
- FAS Firsts-and-Seconds (hardwood-lumber grading)
- GST Goods and Services Tax
- GDP Gross Domestic Product
- HTP Human Toxicity Potential
- HKTDC Hong Kong Trade Development Council
- MDF Medium Density Fibreboard
- OOPS Object-oriented Programming System
- REACH Registration, Evaluation, Authorisation, and Restriction of Chemicals
- S4S surfaced on four sides
- S3S surfaced on three sides
- S2S surfaced on two sides
- TPI threads per inch
- VOC Volatile Organic Compound

Symbols

1. Bookcase and Cabinet Symbols

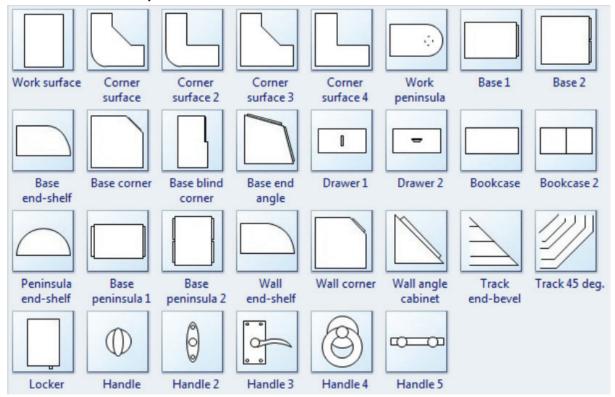


Fig. 2.1.1.2: Bookcase and cabinet symbols

2. Washroom related Symbol

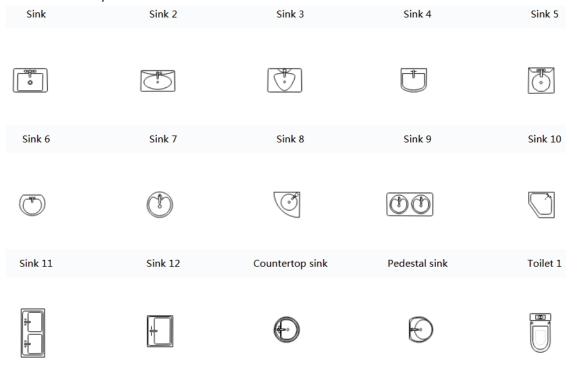
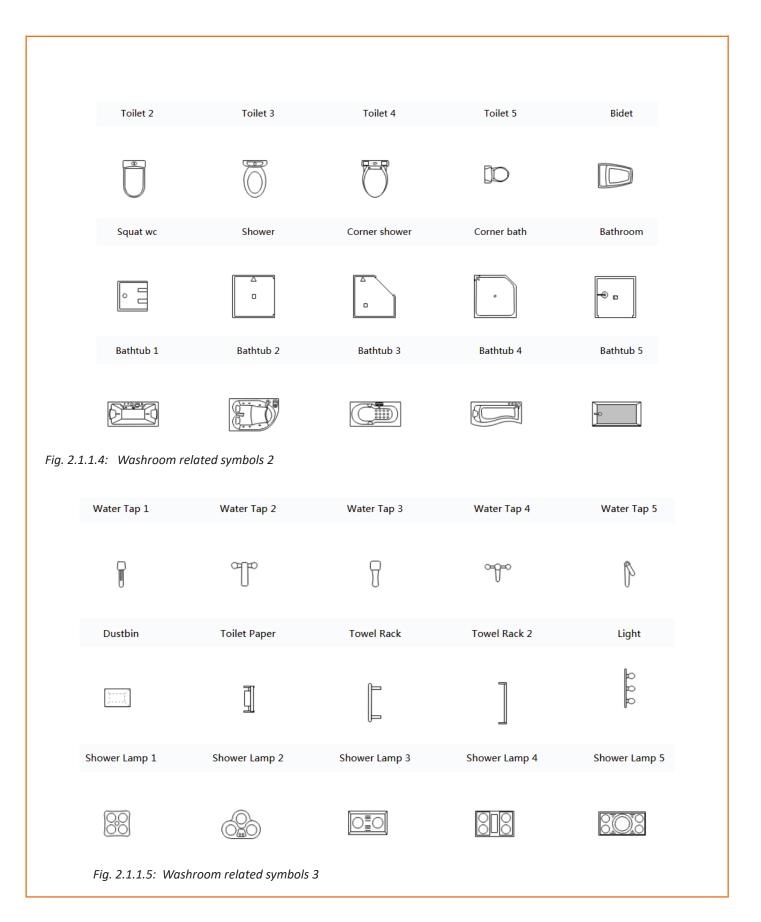


Fig. 2.1.1.3: Washroom related symbols 1



3. Chair and Table Symbols

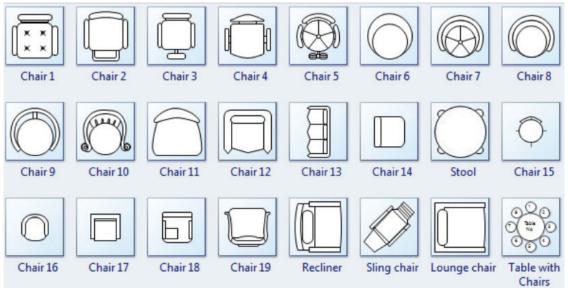


Fig. 2.1.1.6: Chair and table symbols 1

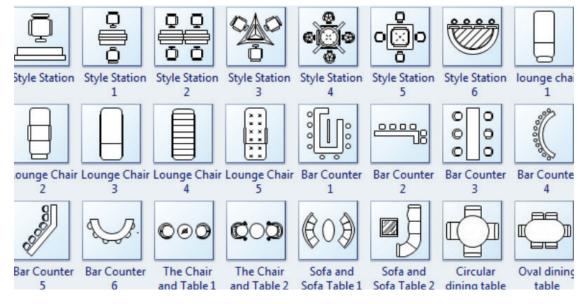


Fig. 2.1.1.7: Chair and table symbols 2

Sample of Floor Plan layout



Fig. 2.1.1.8: Sample floor plan

Dimension Matrix

- As a part of the profession, an assistant furniture designer must be well aware of the common glossary of terms, symbols abbreviations and dimension matrices available with the employer organization.
- A Dimension Matrix helps in mapping given furniture with the standard dimensions and guidelines for manufacture and repair.
- Designing Tables General Dimension Matrix:

Type of Table	Height (Inches)	Length (Inches)	Width / Depth (Inches)
Coffee, Rectangular	15-17	36-60	18-24
Coffee, Round	15-17	36-42 (diameter)	36-42 (diameter)
Dining, Rectangular	28-30	60-80	36-42
Dining, Round	28-30	40 (minimum diameter)	40 (minimum diameter)
Writing	28-30	36-40	20-24

• Designing Chairs- General Dimension Matrix:

Parameter	Standard Dimensions
Seat Width	16"-20"
Seat Depth	15"-18"
Seat Height from the floor	16"-18"
Slope of Seat Front to Rear	5-8 degrees
Armrest Height above Seat	7"-9'
Armrest Length (full armrest)	8" (minimum)
Armrest Width	2" (average)
Seat Back height	12"-16' (above seat)
Seat Back Recline Angle	0-5 degrees (formal), 10-15 degrees (casual)

Designing Average Adult Beds - General Dimension Matrix:

Parameter	Standard Dimensions (Inches)
Height to top of mattress	16-24
Best mattress height for sitting	17-18
Best mattress height for changing sheets	24
Acceptable toe room	6-8

• Designing Desks

Type of Desk	Height (Inches)	Width (Inches)	Depth (Inches)
Children's Desk	20-22	24-30	18-20
Computer Desk	24-28	24-60	20-30
Secretary Desk	28-30	60-80	36-42
Table Desk	28-30	30-48	20-30
Writing Desk	28-30	36-40	20-24

About The Organization's Regular Buyers and Their Tastes and Preferences

- An organization selling modular furniture can attain regular buyers when they can fulfill their requirement.
- Buyers come back to the same organization from where they can buy quality furniture at an affordable range.
- As per the taste and preference of Indian buyers, the aspects that they usually look for are:
 - o Good quality wood (preferably Sheesham for sofas, beds, dressing tables, etc.)
 - o Intricate work on the furniture
 - o Glossy polishing for residential and commercial based furniture (houses, art galleries, bars, restaurants, etc.) and matte for corporate use
 - o Compact furniture for smaller rooms without cutting off the modern looks

2.1.2 Instructions from Design in Charge/Supervisor or Client about Design Objective

The foremost information that you require to take from your in charge or the client is the type of furniture he or she needs and the purpose of it. The objective of the furniture design is based on the purpose.

For example,



This is a piece of decorative furniture that can be used in residential areas, art galleries or bistros. However, one will not see these types of furniture in industrial areas like offices or factories.



This is a piece of functional furniture that has a sleek and modern look but can accommodate numerous items, thereby saving a lot of space.



Furniture of this type are mass produced for commercial areas.

As an assistant furniture designer, the other instructions that you need to ask for are:

- Request for a specific design from the client's side or as per your description
- Extra specifications from the client's end
- Purpose for the specific furniture
- Number of furniture pieces
- Individual furniture or in set
- Size of the furniture
- Dimension of the room where the furniture will be placed
- Colour and polishing of the furniture
- Deadline for the product delivery

Contact Person In Case Of Queries on Procedure or Products

During the research and project comprehension period, there are chances that you may come across scenarios where you may face difficulties. This may be in the form of confusions regarding products or work procedure.

In such cases, you can approach your designer in charge or supervisor.

In case you senior cannot answer your queries or is not present at that time, you can approach the design director.

2.1.3 Identify the Type of Furniture to be designed

Chair









Chair 3 Chair 4



Sofa



Sofa 1





Sofa 2 Sofa 3



Sofa cum Bed

Table





Table 1 Table 2



Table 3



Contemporary Coffee Table



Contemporary Table

Cupboard



Cupboard 1



Cupboard 2



Cupboard 3



Cupboard 4





Wooden Cabinet 1

Wooden Cabinet 2



Wooden Cabinet 3



TV Cabinet

Kitchen Modular Furniture







Other Types of Furniture



Modular Furniture in an Office



Modular Furniture in a Restroom



Modular Furniture in a Living Room





Modular Bookcase

Modular Bedroom Furniture 1





Modular Bedroom Furniture 2

Modular Bedroom Furniture 3

Evaluate the Size of Furniture to be designed, the Style of the Furniture

Before delivering a piece of furniture in the client's place, it is important to know the appropriate space of that place. After you receive your project order, the foremost thing after measuring the area of the place where the furniture will be placed is to start working on the measurement of the furniture to be made.

As per the General standard, the measurement of an average human adult is:

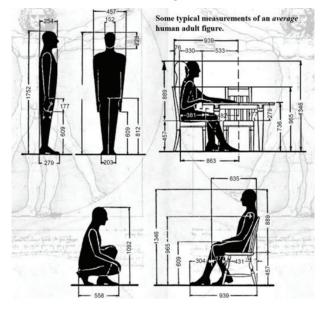


Fig. 2.3.1.1: Measurement of an Average Human Adult

Standard Kitchen Appliances

Appliance	Height	Width	Depth
Wall Oven with Broiler	38" – 40"	21" – 24"	21" – 23"
Wall Oven, Double	39" – 50"	21" – 24"	21" – 23"
Trash Compactor	33" – 35"	12" – 15"	18" – 24"
Range Hood	5" - 8"	24" – 72"	12" – 72"
Cooktop	2" - 3"	12" – 48"	18" – 22"

Wall Cabinets

- Width As per Base cabinet
- Highest shelf Height 60" 68"
- Height without Soffit 42"
- Height with Soffit 30"

Stepback Cabinet

- Width 36" 48"
- Shelf Depth 10" 13"
- Base Cabinet Depth 15" 25"
- Shelf above base 36" 54"
- Base Cabinet's Height 30" 36"
- Unit Height 72" 84"

Standing Bookcase

- Shelf Spacing (Maximum) 13" 15"
- Shelf spacing (Minimum) 7" 8"
- Width 24" 48"
- Depth 8" 24"
- Highest Shelf 72" 78"
- Height 30" 84

Appliance	Height	Width	Depth
Writing table	28" – 30"	36" – 40"	20" – 24"
Table Desk	28" – 30"	30" – 48"	20" – 30"
Secretary	28" - 30"	36" – 42"	18" – 24"
Rolltop Desk	28" – 30"	48" – 72"	24" – 30"
Lap Desk	4" - 6"	20" – 24"	12" – 18"
Computer Desk	24" – 28"	24" - 60"	20" – 30"

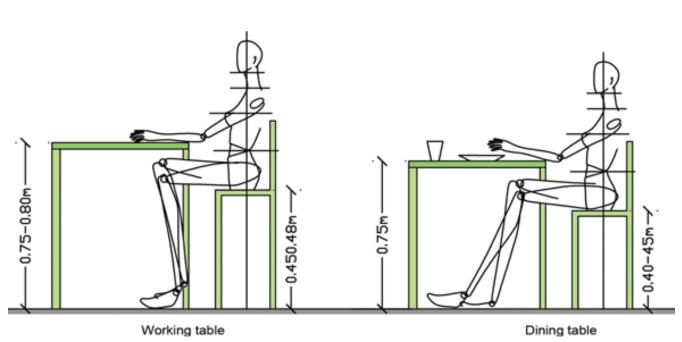


Fig. 2.3.1.2: Standard Working and Dining Table Dimensions

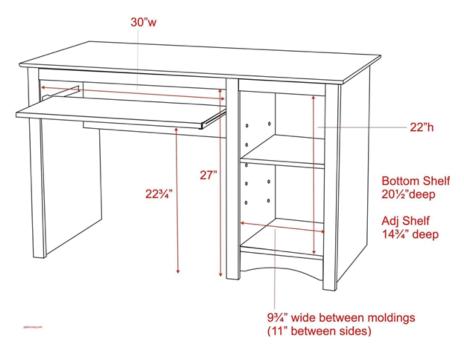


Fig. 2.3.1.3: Standard Computer Desk Measurements

Appliance	Height	Width	Depth
Lingerie Chest	50" – 54"	22" – 24"	16" – 18"
Night Table	16" – 25"	18" – 28"	18" – 22"
Double Dresser	26" – 34"	60" - 72"	18" – 22"
Chest of Drawers	42" – 56"	32" – 40"	18" – 22"

Standard Bed Dimensions

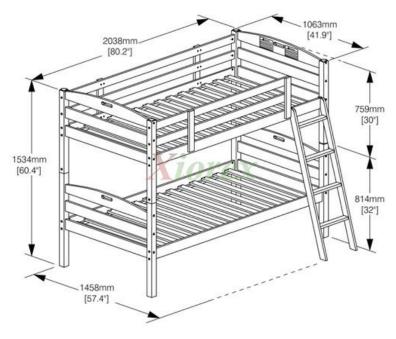


Fig. 2.3.1.4: Bunk Bed

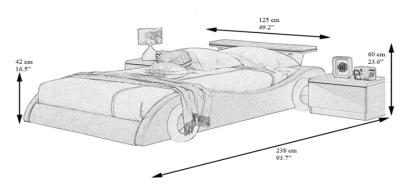


Fig. 2.3.1.5: Adult Bed Dimensions

Standard Chair Dimension

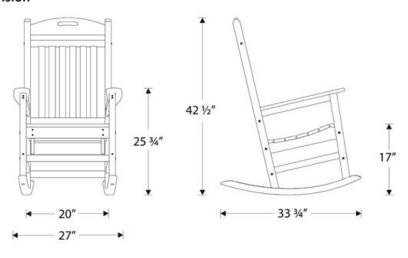


Fig. 2.3.1.6: Wooden Rocking Chair Dimension

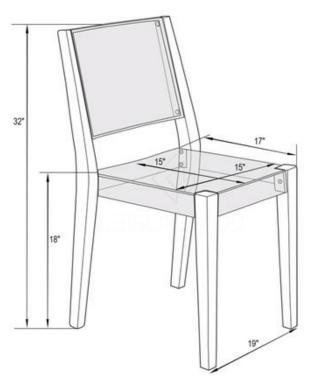


Fig. 2.3.1.7: Dining Chair

Style of the Furniture

Modern Wooden Furniture









Contemporary Wooden Furniture









Classical Wooden Furniture









Kind of Usage of Furniture

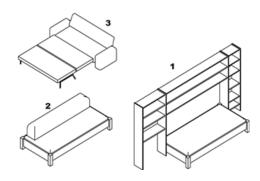
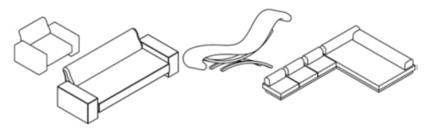


Fig. 2.3.1.8: Multifunctional furniture



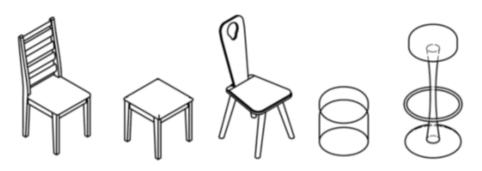


Fig. 2.3.1.9: Furniture for lounging and sitting

(Top – Left to Right – Armchair, Sofa, Chaise lounge, Corner sofa) (Bottom – Left to Right – Chair, Tabouret, Stool, Pouffe, Bar Stool)

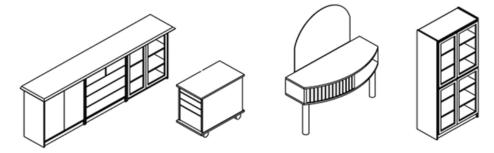


Fig. 2.3.1.10: Storage Furniture

(Top – Left to Right – Buffet, Container, Dressing Table, Library Bookcase)
(Bottom – Left to Right – Wardrobe, Bookcase, Shelf, Dresser, Chest Of Drawers)

Identify the Visual Impact it should Have (Whether to Complement or Contrast the Surrounding) And Whether the Designed Furniture Piece Will Be a Focal Piece or Blend with Surroundings

The visual impact of furniture can only come to light when it is placed on a complimenting or contrasting surrounding



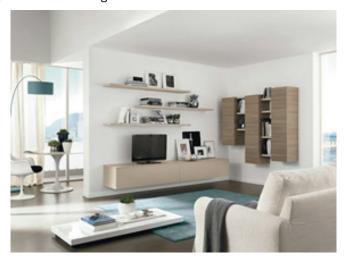
In this case, the light colored wooden bookshelf is placed against a bright colored wall which instantly captures the attention of the viewer.



In this case, the choice of furniture color is on a dual tone, which has been placed in a spacious room with a white floor



The size of this room is uneven with a slanted roof, giving it a den-like structure. The beige colored wall apart from the off-white wall color on all the side is creating a focused backdrop. The visual aspect, in this case, is the colored wooden cabinets placed on the beige wall.



The stark white backdrop ensures that the dark colored furniture pops out to the viewers.



In this case, the color of the furniture is darker than the standard furniture. The chocolate brown color comes out to the forefront, keeping the dual wall color (off-white and beige) and the floor color (latte brown) to a contrasting but harmonious distance.



The latte brown and off-white bookcase with a quirky design on a grainy, off-white and grey background is making the furniture piece a star attraction.

Conduct Market Research for Latest Designs, Fixtures/Fittings, Style, Trends, Wooden Material /Other Material

the requirement of modular furniture in residential and corporate areas have increased two folds as compared to the past 5 years.as per the market research the contribution of furniture production from India is nearly 85%.

The focus of the Indian furniture market is not only to search for latest trends of the current times but to also bring back the traditional furniture designs with a new twist.

The prediction as per the market research states the furniture market growth 20%+ CAGR (Compound Annual Growth Rate).

Amongst the current trends, Indian furniture and fittings industry is gleefully accepting the application of laminates, ply board, MDF, veneers, fiber board, etc. This shift from using "only traditional furniture designs" to inculcating modular furniture in all spans of lives is mainly due to more disposable income and urbanization.



With the evolving market of modular kitchen and furniture, the demand for latest furniture styles with highly improved fittings is on the rise.

The mode of market research includes:

Research from Valid source: The primary research process passes through surveys from distributors, retailers, manufacturers, catalogs from these sources, websites, etc. Later, this is followed by another set of exhaustive secondary research

Assessment and validation: After the required data are collected, with the help of various data warehouses and sources are they validated.

Identify and Extract the Information from Research Materials about Recycling /Best Use of Waste Material Which Can Be Used/Incorporated With the Target Piece of Furniture

As different types of furniture are made in joineries, a huge amount of waste materials are also produced. This may be in the form of chiseled wood, wood chips, shavings, etc.

Some of the main reasons for wood wastage were:

- Chipboard
- Fencing
- Shuttering
- Floorboards
- Doors
- Beams
- Crates
- Pallets

Recycling of such wood waste can be achieved via the following methods:

- Any extra piece of wood from the side rails or slats can be used inside the furniture
- Wood chips can be used at the joints within the furniture
- Wooden bars can be used as the frame slats
- Some of the thinner bars can be used on the headboard bar (can also be used for designing the headboard)
- Extra pieces of wood can also be used inside the modular kitchen cabinets

Unit 2.2: Prioritize Work Activities to Achieve Desired Results

Unit Objectives



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

- 1. List the process of marking out and measuring accurately
- 2. State about effective communication and presentation skills
- 3. Analyse and prepare a plan marking out the activities to be done
- 4. Relate the process to sync timelines with processes involved to complete work in given time

2.2.1 Marking Out and Measuring Accurately -

The method of marking out and measurement depends on:

- **Running measurement** In this method, the breadth and thickness of the wooden block are 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, it is called Running meter.
- 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.
- Cubic measurement In this method, the length, breadth, and thickness are multiplied together. The units of this method are cubic meter and cubic foot.

The steps include:



Measure the Wood for marking



Do Marking on Board



Check Squarness of Board



Cut wood after marking

Measurement length, width & depth in MKS & FPS system and its application

Measurement of Length

- The method of measuring physical parameters is called Metrology.
- Each physical parameter is estimated and expressed in numerical values, along with Units. For example, the units for temperature are Kelvin, Celsius, Fahrenheit, etc.
- Units of measurement are of two types:
 - System International (SI)
 - Centimeter Gram Second (CGS)

System International

- This comprises the Base Units, measuring the Base Quantities and the Derived Units, measuring the Derived Quantities.
- Base Quantities are those physical quantities which are distinct and are independent of other physical quantities.
- Derived Quantities are those physical quantities which result from the base quantities.

Base Quantities: Length, Time, Mass, Electric Current, Temperature, Amount of Substance and Luminous Intensity.

Derived Quantities: Velocity, Acceleration, Area, Volume, Force, Capacitance, Density, Electric Charge, Voltage, Energy, Work, and Resistance.

Examples of SI units are: (Both Base and Derived Quantities)

Physical Quantity	SI Unit
Length, Width, Height, Depth	Meter
Time	Second
Mass	Kilogram
Temperature	Kelvin
Electric Charge	Coulomb
Force	Newton
Electric Current	Ampere
Electric Power	kiloWatt
Energy	Joule
Luminous Intensity	Candela
Plane Angle	Radian
Solid Angle	Steradian

CGS Unit

Examples of CGS units are:

Physical Quantity	CGS Unit
Length, Width, Height, Depth	Centimeter
Time	Second
Mass	Gram
Temperature	Kelvin
Electric	Franklin
Force	Charge
Electric Current	Dyne
Energy	Biot

MKS & FPS System and its Application

MKS System

This system basically discusses length in Meter (M), time in Second (S) and mass in Kilogram (K).

- **Meter** refers to the length of path through which light travels in vacuum. The interval of travel is 1/299,792,458 of a second.
- **Kilogram** refers to mass that is equal to the kilogram's prototype mass (platinum-iridium standard) kept at BIPM (International Bureau of Weights and Measures).
- Second refers to the duration which defines 1/86400 of a day.

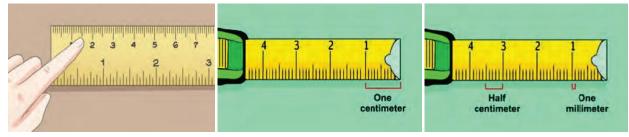


Fig. 2.2.1.1: Marking scale

Now let us read the ruler in the metric system. Here is given a picture of a ruler. Look at it carefully. A centimeter is marked on one side of the ruler, like one cm, two cm, three cm, and so on. Alter 100 centimeters, one meter (m) is marked. Normally, meter is marked in black color or it has a black circle or square around it. One centimeter (cm) has 10 equal segments. These segments are called millimeters (mm) which is the smallest measuring unit.

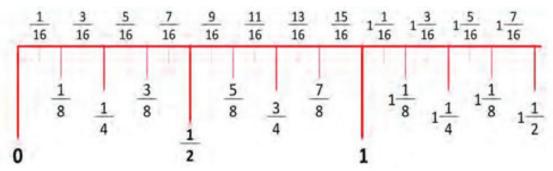


Fig. 2.2.1.2: Marking segmentation

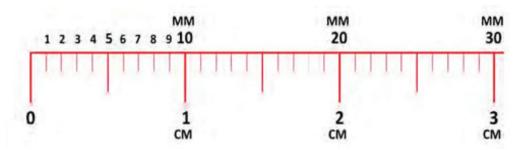


Fig. 2.2.1.3: Marking segmentation (2)

Length	Weight	Volume
1 Km = 1000 m	1 Kg = 1000g	1 kL = 1000 L
1 m = 0.001 Km	1 Kg = 1000g	1 L = 0.001 kL
1 m = 100 cm	1 g = 0.001 Kg	1 L = 100 cL
1 cm = 0.01 m	1 g = 100 cg	1 cL = 0.01 L
1 m = 1000 mm	1 cg = 0.01 g	1 L = 1000 mL
1 mm = 0.001 m	1 g = 1000 mg	1 mL = 0.001 L

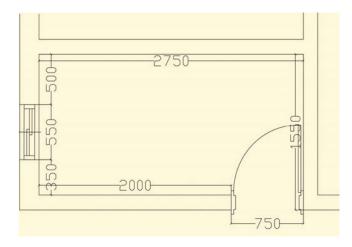


Fig. 2.2.1.4: MKS Measuring System

FPS System

This system basically discusses about length in Foot (F), time in Second (S) and mass in Pound (P). Reading of a Rule/ Tape

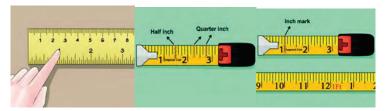


Fig. 2.2.1.5: FPS Marking

Let us learn how to read a ruler in FPS system. Here is given a picture of a ruler. Look at it carefully. Inch is marked on one side of the ruler, like one inch, two inch, three inch, and so on.

After every twelve Inches, a foot is marked. Normally, foot is marked in black colour or it has a black circle or square around it.

The inch is divided into 16, 8. 4 and 2 equal segments. These segments are called graduations. 1/4 of an inch is called quarter inch. 1/2 of an inch is called half inch. Symbol used for foot is (') and far inch is ("). For example, 2 feet and 4 inches are written as 2'4".

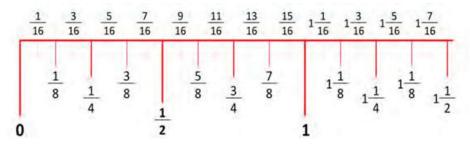


Fig. 2.2.1.6: Marking segmentation (3)

Parameter Name of the Unit Measure

Parameter	Name of the Unit	Measure	
	Inch	1/12th	Ft (Foot)
	Foot	1	ft (Foot)
Length	Yard	3	ft (Foot)
	Mile	5280	ft (Foot)
	Nautical Mile	6080	ft (Foot)
Area	Area Acre	43,560	Sq.ft (Square Foot)
	Volume	1/20th	Pint
Valuma	Fluid Ounce	1	Pint
Volume	Pint	2	Pint
	Quart	8	Pint
	Gallon	1/16th	Lb (Pound)
\\\\ai_bt	Weight	1	Lb (Pound)
Weight	Ounce	14	Lb (Pound)
	Pound	2240	Lb (Pound)

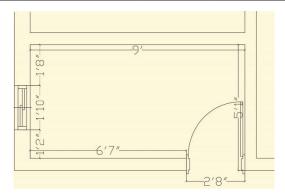


Fig. 2.2.1.7: FPS Measuring System

2.2.2 Effective Communication and Presentation Skills

Effective communication teaches people the appropriate way to share or exchange information.

It states that a person is responsible to respect other's person boundaries and limits

Effective communication involves:

- 9% Writing
- 16% Reading
- 302% Speaking
- 45% Listening

Presentation Skills

There are certain factors on the basis of which listeners determine if they want to listen or trust you or not. Those factors are:

- Visible factors 55%
- Vocal factors 38%
- Verbal factors 7%

While dealing with customers regarding the designed furniture model, it is necessary that you project the best of your presentation skills

2.2.3 Plan out Activities to be done

An appropriate planning depends on certain aspects like:

The Process Steps:

The process of Site Measurement varies according to the below criteria:

- Requirements and Specifications of the Project
- Site location
- · Availability of resources, like time, manpower, funds and equipment
- Constraints and limitations involved in the project

However, the general steps involved in measuring a site are:

- **Step 1:** Make a drawing of the room that needs to be measured. Mark the windows, doors and other openings of the room on the drawing as well. Leave enough space to write down the measurements.
- **Step 2:** Always measure the room starting clockwise. Measure the room from the left side of the room on the first wall and work from left to right.
- **Step 3:** Sketching the features of each room, including doors, windows, skylights, ventilators and positions of fixtures and fittings like lighting, power outlets, fireplaces, brackets, shelves, etc.
- **Step 4:** Naming each wall, room and fixture differently, with a different colours. It is recommended that the names are given sequentially
- **Step 5:** Showing the interrelationship of the units and labelling each of them
- **Step 6:** Deciding what dimensions are required to show on the sketch
- **Step 7:** Using appropriate dimension lines to indicate the overall dimensions of the site as well of individual units and fixtures

Step 8: Measuring with the help of appropriate Measuring Tools (like Measuring Tape, Callipers, etc.) and sticking to a particular unit (either MKS or FPS system)

Step 9: Writing down the dimensions, thus measured, along the particular Dimension Lines and followed by the respective units

Step 10: Preparing elevations on the basis of the dimensions measured

Step 11: Taking additional notes in a separate block on the rough outline using a separate pen. In case of insufficient space, a separate sheet of paper may be used for taking notes

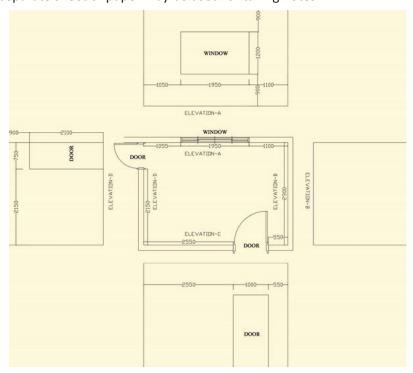


Fig. 2.2.3.1: A Sample of Site Measurement Sketch

Extracting and Using Information from Engineering Drawings

A technical sketch or engineering drawing comprises of the following elements: Title Block, Main Contents and Notes.

The steps involved in reading and interpreting a technical drawing/sketch are:

- **1. Start with reading the Title Block:** This indicates the context in which the drawing must be perceived. The Title block provides information about the following:
 - General tolerances
 - Projection details for the items and components to be manufactured
 - Scale used in the drawing
 - Status of the drawing (Preliminary, Approved, etc.)
 - Name of the component or assembly
 - Contact details of the drawing owner
 - Mass
 - Units used in the drawing
 - Sheet number and number of sheets

2. Read the Notes.

- The notes should lie outside the Title Block.
- The information provided by the notes is preferred to that provided by the Title Block and hence, the Notes supersede the Title Block information.
- In case of conflicts, the Notes are considered correct over the Title Block.

3. Read the Bill of Material (BOM).

- The Bill of Materials is a list of the components and the corresponding quantities that make up the general assembly of the item being installed.
- The BOM is usually tabulated on the first page.
- **4. Ensure that you have all the relevant pages for the drawings:** Drawings could be part of a series and hence the entire series should be present in order to be able to read, understand and interpret the drawing.

5. Understand and interpret the difference between Visible Lines, Hidden Lines, and Phantom Lines.

- Visible lines indicate an edge is visible in the relevant view
- Hidden lines indicate the edge is behind a face
- Center lines indicate the geometric center of the assembly
- Dimension lines allow for the placement of the dimension value, with arrowheads at each end

Name of the Line	Type of Line	Image of the Line
Visible Lines	Continuous thick line	
Hidden Lines	Dashed thick line	
Center Lines	Chain thin line	
Dimension Lines	Continuous thin line with arrow-head at the ends	R

6. Understand and Interpret the Projection, Sections, and Details

- View the drawing itself, regardless of the dimensions, trying to visualize how and what the assembly looks like in 3D.
- Use the sections and details as a start point and you will soon realize that the details and sections have been created to highlight important components or features.
- Few sketches are accompanied with Isometric projection drawings for easy comprehension.

- 7. With the aid of the BOM, find out the components in the drawing in order to understand the role each component plays.
- 8. Find out the notes that have arrows pointing towards the assembly. These information are extremely vital to the assembly and its functionality.
- 9. Use the dimensions in the drawing to comprehend the size of the component/Assembly and even use a tape measure or ruler to estimate the size. The sketch may or may not be drawn to the scale.

2.2.4 Sync Timelines with Processes Involved

- Deciding and fixing the given work as per the timeline is an important work. This habit ensures that every work stage gets completed within the estimated time and is delivered to the client.
- It is important to sync timelines during sketching, analyzing and generating a measurement of the furniture (first draft) with creating AutoCAD image.
- After the image gets ready and approved by the supervisor or designer in charge, the work of miniature prototype creation should be in sync with the purchase of required materials.
- Subsequently, with the completion of this work, a number of craftsmen will start joining the smaller furniture pieces (joints) with nails and adhesives.
- The same synchronization has to be followed in case of cutting and chiseling the wood pieces as per the approved image and sanding of furniture with sandpaper.
- Next, the craftsmen will add the finishes and start polishing the furniture and leave the pieces to dry out completely.

Unit 2.3: Create Design Concept

Unit Objectives



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

- 1. Analyze furniture ergonomics
- 2. Identify furniture making techniques, process and step involved
- 3. Relate about joineries and all kind of furniture finishes
- 4. Organize all the researched data for analysis to create a design concept
- 5. State the current market trends and customer preferences

2.3.1 Furniture Ergonomics

The word ERGONOMICS is derived from the Greek words -

Ergo (Work) + Nomos (Laws)

When we talk about furniture ergonomics, we are basically talking about items that can provide comfort to the user. The logical aspect, in this case, revolves around height, adjustability, width, comfort, etc.

Again, if we consider the anthropometric dimensions regarding the design of furniture, it is 95% for males and 5% for female.

When assistant furniture designers design furniture, the general measurement ranges are:

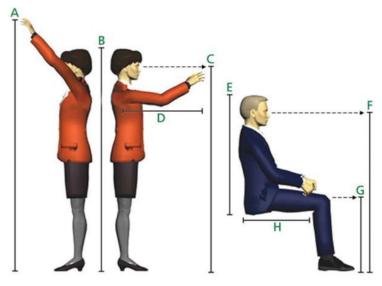


Fig. 2.3.1.1: Posture Measurements

- Section A showcases the height of females at their highest stretching point
- Section B showcases the height of females with a direct view (Section C)
- Section D showcases the rest position of the hand
- Section E showcases the appropriate sitting position of a male candidate
- Section F showcases the height of males with a direct view
- Section G showcases the normal position of the leg (resting position)
- Section H showcases the appropriate sitting area

The Anthropometric measurements for both Female and Male as per the above image are:

Measurement	Letter	Male	Female
Seat Depth	Н	17.7" – 21.1"	16.9" - 20.4"
Sitting Knee Height	G	21.4" - 25.0"	19.8" - 23.2"
Sitting Eye Height	F	46.3" - 52.6"	42.6" - 48.8"
Sitting Height	Е	33.6" – 38.3"	31.3" - 35.8"
Standing Forward Reach	D	33.8" – 39.5"	30.8" - 36.1"
Standing Eye Height	С	61.4" - 69.8"	56.9" - 65.0"
Standing Height	В	64.8" - 73.5"	60.2" - 68.4"
Standing Overhead Reach	А	81.2" - 93.7"	74.9" – 86.8"

About Standard Size and Dimension of Furniture

CHAIRS					
Types	Width	Depth	Height (Min)	Height (Max.)	
Upholstered	30	26	16	40	
Rocker	20	26	16	42	
Kitchen Stool	12	12	27		
Kitchen	19	19	19	34	
Easy	25	26	17	31	
Dining, Arm	24	18	18	36	
Dining, Side	19	19	18	36	
Barstool	17	17	30	42	

CHESTS					
Types	Height	Width	Depth		
Buffet	34	50	20		
Cedar	20	40	19		
Blanket	24	36	19		
Bookcase (Hardbound)	50	36	10		
Bookcase (Paperbacks)	38	36	7		
Tall Chest (6" leg)	54	36	18		
Lowboy (7" leg)	36	36	18		

TABLES					
Туре	Height	Width	Length		
Workstation	26	30	48		
Typewriter	25	18	30		
Sofa	26	14	72		
Printer	26	22	26		
Poker	29	48	48		
Picnic	28	36	72		
Kitchen	29	36	60		
Bedside	26	15	19		
Hall	27	15	55		
End	20	17	28		
Dining	29	40	64		
Conference	30	36	96		
Coffee	19	18	36-48		
Card	30	36	36		
Buffet	34-38	24	60		

Knowledge about Materials and its Properties

The main furniture material is wood.

Soft Wood



Pine

- It 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.



Hemlock

- It 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, subflooring and crates.



Fir

- It 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.



Redwood

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



Spruce

- It 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.



Cedar

- It is a reddish wood with a 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.



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.

Hard Wood





Rosewood

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



Teak

- It 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.



Sheesham

- It is also known as Indian Rosewood and is a rich medium brown wood with deep grains.
- It is a fast-growing hardwood 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



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.



Sal wood

- This is a 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.

2.3.2 Furniture Making Techniques, Process and Steps

There are several wood types available in the market which is used for making furniture. The construction techniques that are utilized for this are:

- **Ply construction:** A cross-grained wood is taken of either particleboard core or solid wood core and on it ply pieces are added. The sandwiching technique is completed with the help of adhesives. This makes the construction resistant to warping and strong.
- Combination wood panels: These are made by mixing wood flakes, chips or particles with binding agents and resins. Under tremendous pressure and extreme heat, these sheets are created that are resistant to warping and are stable and strong. These are used as panels, tops or cabinet backs.
- **Shaping of wood:** This can be done by gluing blocks of wood. With the help of machines, these woods are intricately carved to achieve various furniture parts like posts, pedestals, legs, etc.
- **Bonding:** This technique states about the cutting of wide boards into narrow, long planks and then bonding it back. This technique is used for creating door panels, sides, and tops.

Process

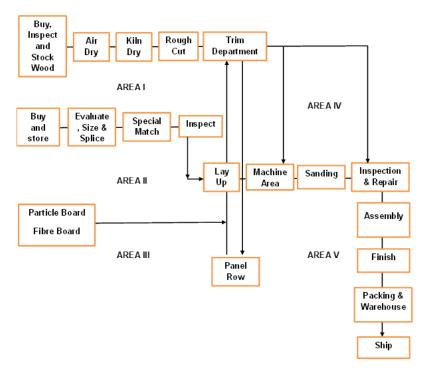


Fig. 2.3.2.1: Process flow chart

Steps

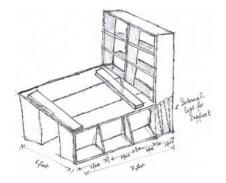
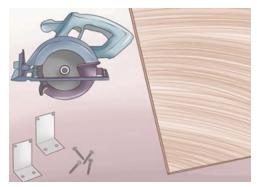


Fig. 2.3.2.2: Rough sketch of a bed

Make a rough sketch of the furniture that you have to create. The sketch does not need to be appropriate at this phase.



Now create an AutoCAD image of the furniture.



Assemble all the required elements for creating the furniture. In case of this bed (mounting screws, basic L brackets 24, decking screws, saw, velcro, Ikea Expedit bookshelves - 2)

Measurement of woods (example) -

- 1x10 Four 16 & 3/4" wood
- 2x10 Six 28" wood
- 2x10 Four 38" wood



Mark and measure the wooden pieces.



The foremost thing, in this case, is the creation of shelves on which the frame of the bed will be created and the weight will be shared.

The approximate dimension of the boxes will be 38"x31". L Bracket will be used at each corner at the center. The brackets will be secured with decking screws.



Both the ends of the two boxes will be joined with the help of two thick wood pieces of 28" 2x10. The center brace will be secured at each side with the help of L Bracket (bottom and top).



With the help of 1x10 lumber, which is cut into 16 and 3/4" you can create shelves on top of the bed frame. Secure the shelves with L Brackets (2 at one side).



At the end shelves, add the backing. This can be done by tracing shelves onto plywood and with a jigsaw and cutting out the backing. Secure it firmly with nails.



To provide support to the shelves above the bed frame, add feets below the end shelves.



Cut 38"x75" plywood and attach at the pointed area with strong adhesive and nails.



Beneath the bed frame, you can add rails and create drawers or sliding doors.



Finally, color the Bed frame.

About Furniture Material

In carpentry, wood is the material. Carpenters use seasoned wood to prepare furniture.

Here, we will discuss the types of material which are widely used by the carpenters.

Solid Wood:

- Solid wood refers to the timbre that is used to build structures.
- Timbres are the raw materials that are seasoned to produce workable wood.
- Timbre or the log of the tree is the first material that is processed to produce beams.
- Generally, the logs are cut horizontally to make beams.
- Beams are then sent to designated places for seasoning.



Fig. 2.3.2.2: Log and Beam

Engineered Wood:

- Engineered wood is commonly known as composite wood.
- This is a type of wood which incorporates various chemicals, fibers, sawdust and adhesive to prepare the desired type from the solid wood.
- In other words, solid wood is further processed to engineered wood.
- There are many types of engineered wood available in the market

Some of the most important types of engineered wood are –

- 1. Plywood
- 2. High-Density Fibre (HDF)
- 3. Medium Density Fibre (MDF)
- 4. Veneer
- 5. Laminates
- 6. Block-board



Fig2.3.2.3: Sample of Engineered Wood

Plywood

Plywood is a form of engineered wood where thin slices or layers of wood are glued together to form a sheet.

Thickness:

MR grade (Moisture Resistant) = 3, 4, 6, 8, 12, 15, 18, 21, 25 mm

Size: 6' x 3', 6' x 4', 7' x 3', 7' x 4', 8' x 3' & 8' x 4' (for both MR & BWR Grade)



Fig. 2.3.2.4: Plywood

Plywood is used to build interior walls, ceilings, doors, and cupboards in structural construction. Furniture pieces like wardrobes, sideboards of cabinets, drawer bottoms can be made. Apart from this, plywood is used in decorating railway coaches and trams etc.

High-Density Fibre (HDF)

HDF, also known as Hardboard, is made up of highly-compressed wood fibers. The higher magnitude of compression makes hardboard denser and harder.

Thickness: 9, 11, 12, 17, 18 & 25mm

Size: Standard and common size 8 x 4 feet

Medium Density Fibre (MDF)

MDF is another form of engineered wood, which is denser than plywood.

MDF is produced by gluing residuals of softwood or hardwood with binders like resin or wax.

High temperature and pressure are required to procure MDF.

Thickness: 2.3, 4, 8, 12 & 15mm

Size: Standard and common size 8 x 4 feet



Fig. 2.3.2.5: MDF Sample

Advantages of using MDF:

- It's stronger than particle board
- It's cheaper than plywood and remains undamaged due to change in weather
- MDF doesn't swell usually if it comes in contact with water or humid weather
- It has a smoother surface without any grain or knot which allows users to cut it into various shapes and forms
- Smooth surface is ideal for painting
- MDF is good substance for veneering

Veneer

- Veneer is the thin slice of wood (typically lesser than 3mm) which is glued to form plywood sheet.
- Veneer is widely used to produce the outermost layer of the door, cupboard, and other furniture.
- Veneer is a smooth and well-polished slice of engineered wood.
- Thickness: 4 mm
- Size: Standard and common size 8 x 4 feet

Veneers are of following types depending upon their purpose:

- Raw Veneer: It has no backing on it. You can make any side as its face and vice versa. Keep in mind that both the sides of veneer have a different appearance when finished. This difference in appearance is due to the cell structure of the wood which is different on both sides.
- Paper Backed Veneer: This type of veneer is backed with paper. The best part of paper backed veneer is its
 availability in large sizes or sheets. Before putting a backing, all smaller pieces are joined together making it
 easy to get sheets of the required size. Paper-backed veneers have less possibility of cracking which makes
 it helpful to use in veneer curves and columns.
- Phenolic Backed Veneer: It is an uncommon type of veneer. Mostly, it is used for composite or manmade
 wood veneers. It is gaining popularity as it helps in saving the natural resource. The phenolic backed veneer
 is available in sheets and can be used for curves as it does not crack if handled with care.
- Laid Up Veneer: It is also called raw veneer which is joined together to get larger pieces. It is extremely timeconsuming process and requires very careful handling. There is no need to use any expensive machinery or
 tool to join these pieces. You can easily get veneers laid up to any size, shape, and design manually.
- **Reconstituted Veneer:** It is made from fast-growing tropical species. Raw veneer is cut from a log and dyed if necessary. After drying the sheets are laminated to form a block. Then this block is sliced so that the edges of the laminated veneer become the "grain" of the reconstituted veneer.
- **Wood on Wood:** It is commonly called 2-ply. It is a decorative wood veneer face with a utility grade wood backer applied in the opposite direction to the face veneer.



Fig. 2.3.2.6: Sample Veneer

Laminates

Laminated wood is typically used to prepare flooring tiles. Generally, photographs or designs are glued on the thin slice of wood to produce laminates.

• Thickness: 0.6 mm to 1.5 mm

Size: Standard and common size is 8'x 4'



Fig. 2.3.2.7: Decorative Laminates

Decorative laminates are usually used for furniture surfaces and wall paneling. This includes cabinets, tables, showcases and etc. The laminates are easy to maintain nut exposure to water may cause warping or ballooning. Decorative laminates are used in the cubical toilets, kitchen or laboratory tables to resist moisture.

Laminates are made by compressing thin layers of flat papers and plastic resins. The upper layer is printed with decorative textures, patterns, and colors. The typical size of laminate sheets is 8" by 4". These sheets are pasted on plywood, block board or MDF with adhesive.

Block-board

Block-boards are a fusion of softwood strips, which are sandwiched between veneer boards under high pressure.

- Thickness: 16, 19 & 25 mm
- Size: 6' x 3', 6' x 4', 7' x 3', 7' x 4', 8' x 3' & 8' x 4'
- These types of engineered wood have a general width of 25mm.
- Other than engineered wood, there are several other materials which are also used in furniture fittings. They are:



Fig. 2.3.2.8: Block Board

Particle Board or Chipboard

Chipboard, commonly known as particle board is a man-made or engineered wood which is manufactured by gluing chips, shaving or even sawdust. These are pasted with the help of suitable binders like resin. It is extensively used across the world to manufacture furniture that is not exposed to moisture and humidity.

Particle boards that come with a layer of lamination done on its surface to make it more enduring are known as a pre-laminated board. Particle board is a useful product to prepare cabinet, interior decorations, and roof and partition constructions.

- Thickness: 9 mm to 25 mm
- Size: 8x4', 8x6', 8x3', 9x6', 9x3', 6x4', 6x3', 6x2.5'





Fig. 2.3.2.9: Samples Of Particle Board (Chipboard)

BWD is a type of engineered wood resistant to high temperature and moisture. BWP is manufactured by gluing thick layers of wood at right angles using Phenol formaldehyde (PF) resin.

Thickness: 4, 6, 9, 12, 16, 19, 25 mm

Size: 6' x 3', 6' x 4', 7' x 3', 7' x 4', 8' x 3' & 8' x 4' (for both MR & BWR Grade)



Fig. 2.3.2.10: Stack of Boiling Waterproof Plywood

Some of the advantages of BWP are:

- It is better than solid wood in handling water exposure. Therefore, BWP is the first preference to manufacture kitchen cabinets, laboratory tables, and other useful items
- It is free from termites or borer attacks
- It is stronger and more endurable than MDF or particle board and is lesser prone to warping
- It can be covered with laminates or veneer as per clients' requirement

Edge Bands (PVC Tapes)

The edges of a panel, made of plywood, MDF or particle board need to be covered, secured, decorated so that the furniture looks good and hide the rough edges. To give furniture a clean and polished finish, edge banding is used. Edge banding, used for modular furniture, is made up of PVC materials.

Edge bands are available in circular bangle form. The length of the roll or the bangle is typically 15 meters (50 feet) and the width varies from 7/8 inches to 2 inches. In certain cases, aluminum edge bands are also used to protect the modular furniture.



Fig. 2.3.2.11: Edge bands or PVC Tapes

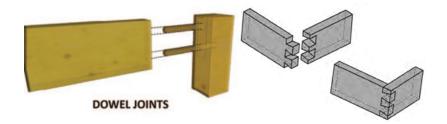
Butt Joint

- The butt joint is the most basic of joints.
- In this joint two members are simply butted together.
- In most cases, carpenters glue the boards together and further strengthen it with screws or nails.
- One can even use this humble joint to glue two boards together side by side to make a wider panel.
- These joints can be used in making simple boxes or frames.



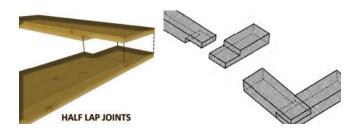
Dowel Joints

- Another way of strengthening the butt joint is by adding wooden pegs called dowel pins.
- Accurate matching holes should be drilled on both edges.
- Dowel pins are short bamboo sticks that fit in the drilled holes.
- This joint is further secured with an adhesive.



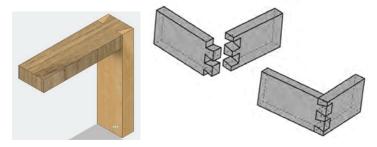
Half Lap Joints

- Aside from the basic butt joint, the half lap joint is your simplest choice for joining pieces together.
- A notch is cut out of one board, and a similar notch is cut out of another.
- The two pieces are overlapped and glued together.
- Some variations of a half lap joint include:
- Cross-Lap Joints
- "T"-Lap Joints
- Corner-Lap Joints



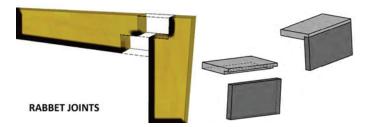
Dovetail Joints

- The dovetail joint is used for fine woodworking.
- The dovetail joint is most commonly used in drawers.
- Triangular sections called "tails," are cut on one member.
- The receiving member is cut into "pins."
- The pins fit inside the tails and are glued into place.



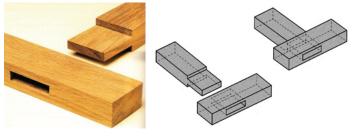
Rabbet Joint

A rabbet is simply an open-sided recess cut along the edge or across the end of one member. Usually, only one member of the mating parts is rabbeted.



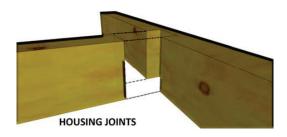
Mortise and Tenon Joint

- The mortise and tenon often used in the assembly of tables, chairs, and furniture.
- It consists of the tenon (stub), cut on one piece of wood, and a mortise (a hole) cut into a receiving piece of wood.
- The tenon is inserted into the mortise, then glued or nailed in place.



Housing Joint

- A housing joint can also be called a dado joint.
- A dado joint is made by cutting a recess across the face of a member.
- The end of another member is then inserted and secured into the recess.



Furniture Finishes

One of the most essential components of any modular kitchen and wardrobe is its finish. It is what enhances the aesthetic appeal of the furniture. There are various finishes available in the market as presents. Some of the preferred ones are like:

- Acrylic
- Membrane foils
- Polymer
- Laminates

Acrylic and laminates are among the most popular options. However, they differ in terms of aesthetics, durability, and pricing.

Acrylic Finish

- This is a type of finish that is similar to lacquer.
- Acrylic is a non-toxic, reflective high gloss finish which can give furniture a perfectly smooth appearance.
- It is available in a wide range of colors which retain their hue and brightness for years.
- Acrylic finish gives a mirror-like appearance to the furniture.
- A premium high-gloss option is preferred for high-end kitchens and wardrobes.
- Scratch resistant, acrylic finishes do not tarnish, de-laminate or fade away with time
- They maintain their smooth and ultra-glossy appearance.
- However, this means that finger print marks, dirt, and stains are more visible and require regular cleaning.
- Acrylic finished cabinets are more expensive when compared to laminates.

Laminate Finish

- Laminate is a commonly used finishing material for various type of furniture.
- Laminates are also available in glossy options but these are not as reflective as an acrylic finish.
- The variety available in laminate finishes is higher and includes matt, glossy, ultra high gloss.
- Apart from colors, these are also available in various textures including wood.
- Relatively more hard-wearing and durable when compared to acrylic finishes, laminate finishes are moisture and heat resistant and can be treated for antibacterial properties.
- Laminate finishes offer variety and durability at a significantly lower cost.
- One possible option which is trending today is a combination of both acrylic and laminate finishes.

- Since most lighting tends to highlight the upper cabinets, acrylic finishes is used on them for a glossy, attractive look.
- Laminate is a good choice for lower cabinets since they are likely to see more use as well as wear and tear.
- One can choose textures and colors that complement each other for a coordinated look.

2.3.4 Organize all the Researched Data for analysis to Create a Design Concept

Creation of design concept is based on two aspects – creativity of the designer and samples from previous furniture designs. For design concept creation, the analysis depends on:

- Furniture design as per Human body support or proxemics Fabrication processes like digital techniques, methods-hand technique
- Spatial partitions
- Environmental design matters like off-gassing, renewable materials, sustainability
- Design processes like Full-scale working prototypes collage assemblies, digital modeling, model studies, iterative overlays, sketching
- Ergonomics furniture functionality
- Principles of design like spatial order, hierarchy, harmony, unity
- Furniture examples or samples from the past
- Aesthetics related to the furniture

Organize all Ideas for Design Concept and discuss the same with Seniors/Peers to Finalize/Shortlist one or two Ideas for Creating New Designs

Before presenting your design concept ideas to your peers or seniors it is important to arrange those prospects as a list. This will ensure that the people reading your ideas will understand the logical steps and can add or subtract the ideas without hampering the others.

- Furniture design as per the site or purpose
- Furniture design preference of client (towards modern look and feel, completely traditional or mix of two)
- Handy-work or carving on the wood or sleek look
- Drawing and templates of the furniture
- Type of fabric on the furniture
- Preference for abstract designs or as per market standards.

Convert these Conceptualized Ideas onto a Paper by making of few Basic Rough Design Sketches

The sketch of furniture as per market standards:

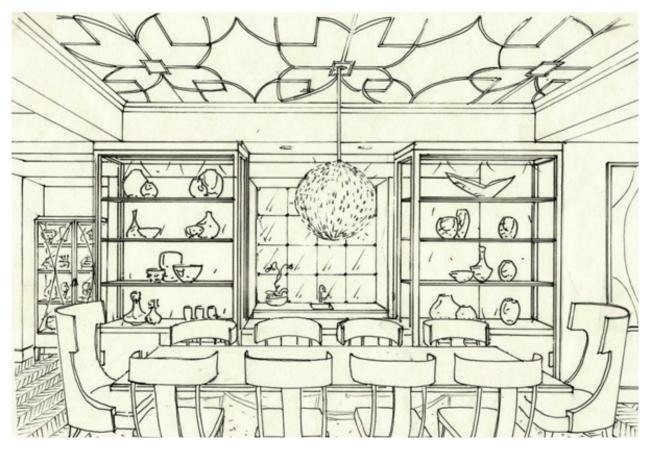


Fig. 3.2.4.1: Design Sketch of a Dinning Set

This image focuses on:

- Dining table and chairs
- Bookshelf (at the left-hand corner)
- Showcases
- Small tables

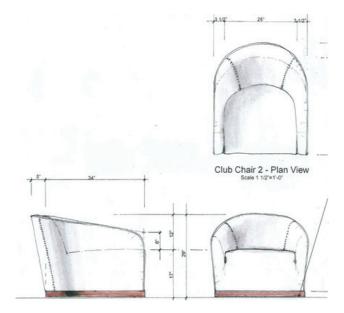


Fig. 2.3.4.2: Sketch of a Sofa

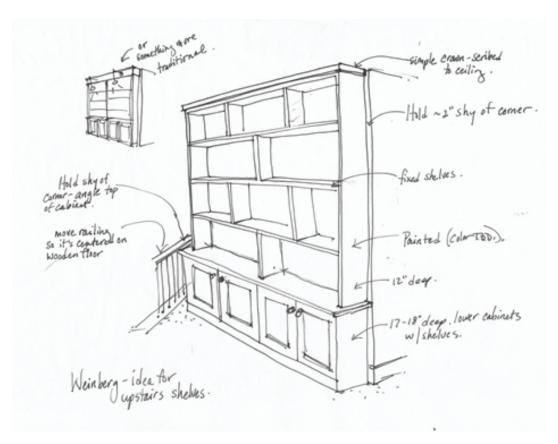


Fig. 2.3.4.3: Sketch of a Bookshelf

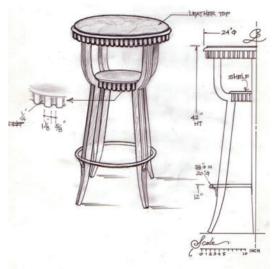
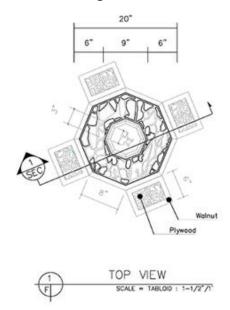


Fig. 2.3.4.4: Sketch of a Bar Tool

Abstract furniture design



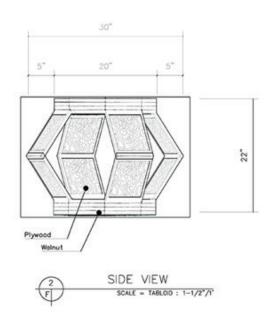


Fig. 2.3.4.5: Drawing of an Abstract Furniture Design



Fig. 2.3.4.6: Model of an Abstract Furniture Design



Fig. 2.3.4.7: Sketches of Various types of Cabinets

Observe and visualize all the Sketches Drawn to come up with Final Design Paper Sketch

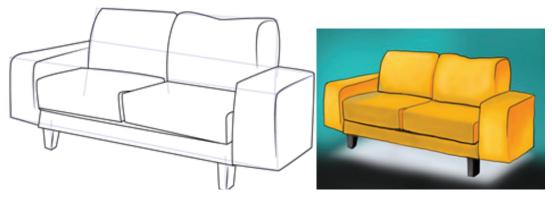
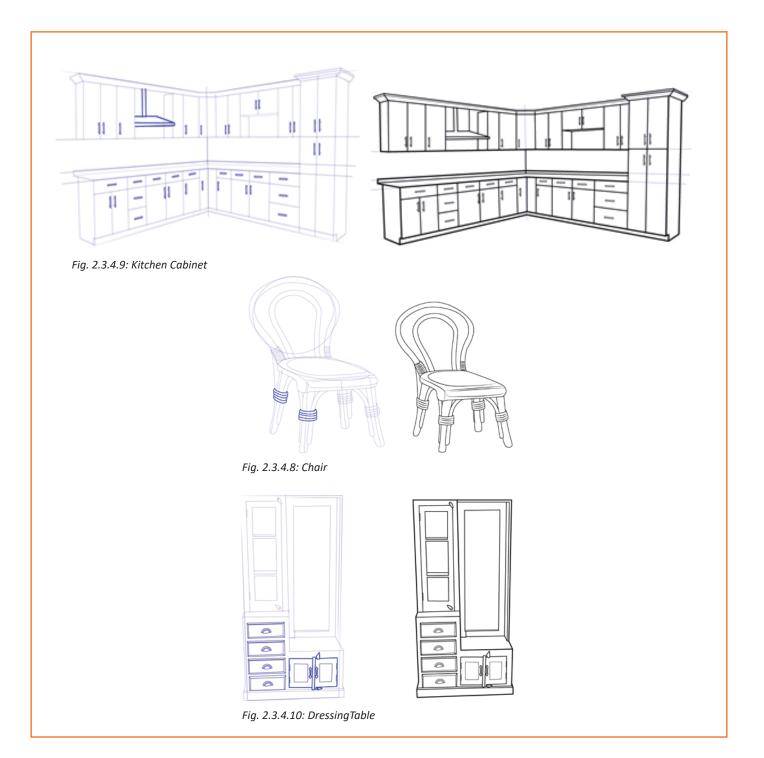


Fig. 2.3.4.8: Sofa



2.3.5 Current Market Trends and Customer Preferences

With the consistent upgrade in every industry, the Indian furniture industry is not lagging behind. In the next few years, it is expected that the growth in furniture industry will be roughly 20% per year. This study is presented by the World Bank, which also states that the monetary projection is expected to cross at least US\$ 32 billion by the end of 2019.

If we consider the Luxury Furniture Market, the expected turnover by 2020 is around \$27.01 billion with a CAGR of 4.1% from 2015-2020.

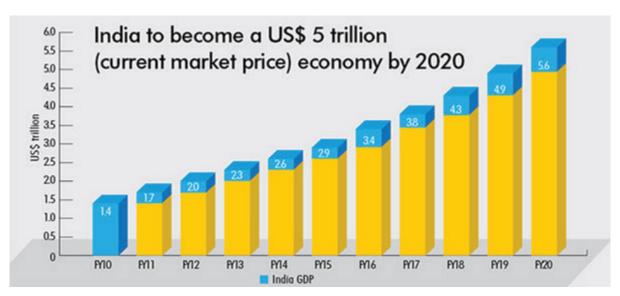


Fig. 2.3.5.1: Indian Market Scenario – Growth of Furniture Industry

Some of the current furniture trends that are as per Customer preference



Fig: Coffee Table and Sofa Set

Fig: Walk-In Closet



Fig. 2.3.5.2: Bed with Wardrobe and Dressing Table





Fig. 2.3.5.3: Wall Unit



Fig. 2.3.5.4: Showcase



Fig. 2.3.5.5: Dining Table

Fig. 2.3.5.6: Shoe Rack



Fig. 2.3.5.7: Traditional looking Modern Bed

Unit 2.4: Furniture Design Drawing and Approval

Unit Objectives



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

- 1. Define design software like Auto-CAD, CorelDraw, and Photoshop
- 2. List the various types of furniture
- 3. State about furniture drawing preparation
- 4. Analyse and interpret 2D / 3D drawings
- 5. List the common issues troubleshooting knowledge

2.4.1 Design Software like Auto-CAD, CorelDraw, Photoshop

Auto-CAD

- Computer-aided Design, commonly known as CAD, controls the manufacture of parts and accessories, according to specifications given by the client.
- This software defines the mechanical dimensions, commonly known as "specifications" of furniture accessories, parts or modules.
- CAD can also be used to enhance the productivity and accuracy of the machines.
- CAD helps in preparing the blueprint of any modular furniture or module/accessory / part.
- AutoCAD is one of the most popular software that implements computer-aided design.
- The latest version of AutoCAD, AutoCAD 23.0, has been released on March 22, 2018.
- Few popular commands and shortcuts in AutoCAD
- Few popular commands and shortcuts in AutoCAD



Important AutoCAD Commands

QSAVE	Saving the current drawing in default format	
ARC	Creating an arc	
ZOOM	Increasing or decreasing the magnification of view in the current viewpoint	
WBLOCK	Writing an object or a block to a new drawing file	
STRETCH	Stretching objects crossed by a selection window or polygon	
EXPLODE	Breaking a compound object into its component objects	
ERASE	Deleting objects from a drawing	
DIMSTYLE	Creating and modifying dimension styles	
CIRCLE	Creating a circle	
REDRAW	Refreshing the display in the current viewpoint	
FILLET	Rounding and filleting (cutting into strips) the edges of objects	

VIEW	Saving and restoring named views, camera views, layout views and preset views	
MTEXT	Creating a multiline text object	
GROUP	Creating and managing saved sets of objects called "groups"	
BLOCK	Creating a block from selected objects	
HATCH	Filling an enclosed area or selected objects with a hatch pattern, solid fill or gradient fill	
JOIN	Joining similar objects to form a new, single, unbroken object	
MOVE	Moving objects along a specific direction, for a specific distance	
INSERT	Inserting a new block object or drawing into the current drawing/draft	
OFFSET	Creating concentric circles, parallel lines and parallel curves	
LINE	Creating straight line segments	
PAN	Adding a given parameter with grips to a dynamic block definition	

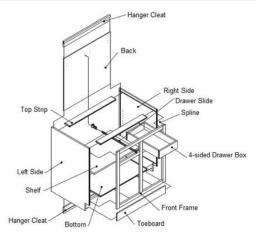


Fig. 2.4.1.1: AutoCAD Illustration of a Kitchen Cabinet

Make a furniture design drawing of final sketch with the help of computer software package (CAD)

As you can see the AutoCAD illustration of a kitchen cabinet, the final product will look like this:



CorelDraw

- $\bullet \quad \text{CorelDraw software is a vector graphics editor that is used for designing and other graphics-related programs.}\\$
- The latest version of CorelDraw is 20 with the name CorelDraw Graphics Suite 2018.
- The supported platforms for this software are Windows 10, Windows 8, Windows 7, Mac OS X, and Mac OS.
- This software offers a range of symmetrical designs with the help of which the designers can not only draw the basic furniture structure but also apply complex kaleidoscopic effects making the furniture piece look like real.
- In most cases where the architects or the furniture designers prefers using CAD for creating a technically

perfect drawing, the intricacies, distribution modes, corner control in case of dashed lines can only be achieved in CorelDraw.

Align and Distribute to the Right	R
Align and Distribute to the Bottom	В
Align and Distribute to the Left	L
Align and Distribute to the Top	В
Text alignment to the Baseline	Alt+F12
Break Apart a selected object	Ctrl + K
Converting selected object to a curve	Ctrl + Q
Character Formatting	Ctrl + T
Dynamic Guides (Hides or shows)	Alt + Shift + D
Duplicate a selected object(s)	Ctrl + D
Full-Screen Preview	F9
Hue/Lightness/Saturation	Ctrl + Shift + U
Opening dialog box for CorelDraw options setting	Ctrl + J
Repeat the last operation	Ctrl + R

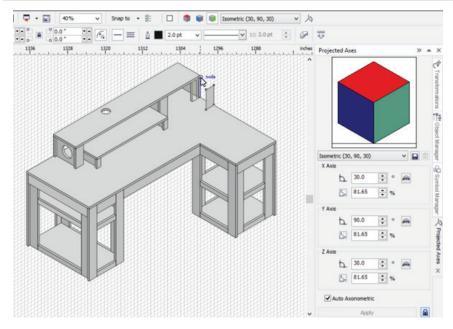


Fig. 2.4.1.2: CorelDraw Illustration of a Shelf

Photoshop

- Photoshop is created by Adobe system, which is a raster graphics editor. In simple words, it is an excellent drawing and editing tool.
- Various creative professionals like the furniture designers, interior designers, etc. to bring out the desired effect from their generated drawings.
- One of the best aspects of this software is its comparability with software producing 2D drawings (AutoCAD) and 3d drawing (SketchUp).

Suppose you have drawn a rough sketch via AutoCAD.

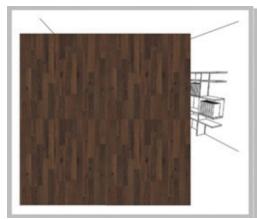


When you take the help of photoshop, you can add effects, finishes, and colors to your visuals for a realistic outcome.



Make a furniture design drawing of final sketch with the help of computer software package (Photoshop)

You can easily distort, transform and manipulate images. One of the good examples is the wood flooring sample in Photoshop.





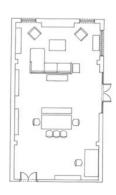








The floor plan concept in Photoshop will look like this:





Include all dimensions such as construction details, material used, products finishes, and manufacturing technics, joineries, used in making of the furniture

In this case, we will take a specific furniture – sofa.



Fig. 2.4.1.3: Sofa Frame

Construction Details

The foundation of a sofa will have:

- Woven strips of webbing that are interlocked tightly
- Burlap stitched over the springs
- Tight attachment of strings to the webbing

The frame of a sofa will have:

- Leg
- Back upright slat
- Webbing bridge
- Crest rail
- Back rail
- Front rail
- Arm top
- Armrest



Material Used

- Pocket Screws
- Screws (2.5" and 3")
- Biscuit join panels

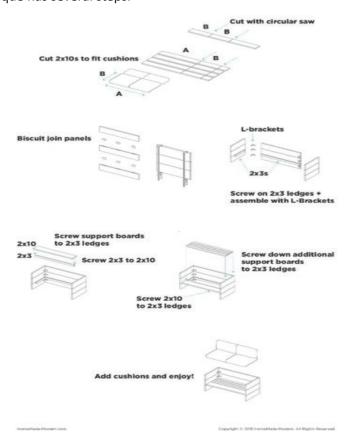
- Sliding Compound Miter Saw with Laser
- Sander machine
- Screw Bit
- Cordless Drill
- Sofa Cushions
- Clamps
- Rag
- Grit sandpaper
- Pencil
- Ruler
- Construction Lumber:
 - o 2×4 8' Long wood pieces (4)
 - o 2x3 8' Long wood pieces (2)
 - o 2×10 8' Long wood pieces (5)

Products finishes

- Danish Oil
- Seal and wood stain

Manufacturing Techniques

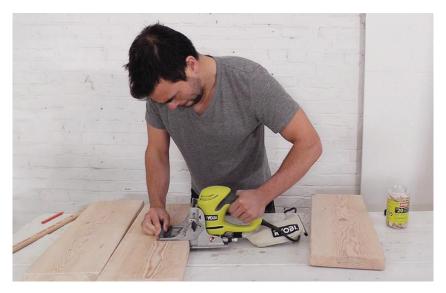
The manufacturing technique has several steps.



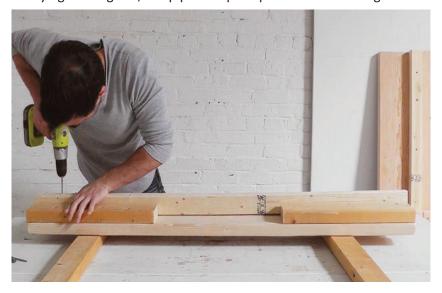
The first step begins with the creation of instructional diagrams on the basis of which the entire process will proceed.



Cut the wood pieces as per the approved dimensions and sanding those pieces



Lay all the 3 2x10 panels and cut the notches with a biscuit joiner. Take the notches, add glue and put it above the notches. For quick drying of the glues, use pipe clamps to press the boards together.



Using 3" screws assemble the bottom frame.



With the help of L-Brackets, wood plugs and screws, attach the base to the panel



Screw the back panel to the bottom frame and the panel to the frame top



Polish the furniture with wood stain



Add cushions and your sofa is ready. (This is just a prototype)

Joineries

- L Bracket
- Wood plugs
- Dowels

Ensure to Add Design Elements and Features to this Furniture Drawing

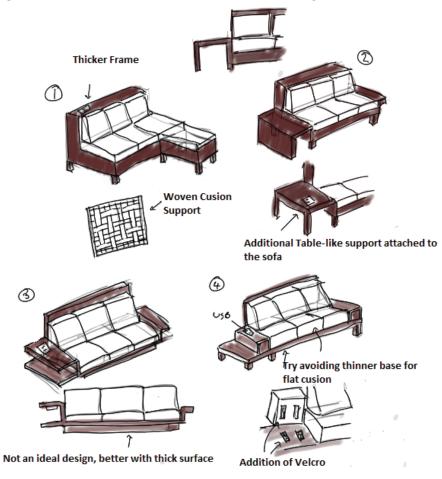


Fig. 2.4.1.4: Drawing of Sofa Set

2.4.2 Various Types of Furniture _____

Modular Kitchen

Drawer System

Currently, the drawer systems are available with metal side walls and the runners are mounted under the drawer. The robust, resilient tracks provide the steel balls with optimum control. This is for perfect vertical and lateral stability. The runners are ball bearing and Silent in operation.

Also, the runners are available with different weights that can carry capacity. Henceforth, one can design a kitchen with these hardware and drawer size can be 150 mm for bottle pull out, 450 mm for grain trolley, 600 and 900 mm for cutlery, utensil or for containers.













Fig. 2.4.2.1: Types of Cabinets



Fig. 2.4.2.2: Types of Cabinets (2)

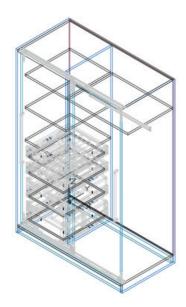


Fig. 2.4.2.3: Cabinet Sketch

Tall Units

Storage space in perfection: The tall units not only accommodate plentiful supplies but also bulky items like brooms and vacuum cleaners. There are immense varieties of fitting solutions ensuring efficient use of the storage space available in tall units, be it for intelligent supply management or as a classical broom cupboard. Optimum use of the available storage space is assured. All supplies are stored in well-organised fashion and within easy reach.



Fig. 2.4.2.4: Tall Units







Fig. 2.4.2.5: Ladder or Panty Unit

Pull-outs

Pull outs make the best of spaces in the kitchen. They are installed under the counter. Pull outs are available in multiple widths and height. They can be used for keeping items like utensils, bottle, jars, cleaning agents and more.







Wire Basket Pull Out



Under Sink Pull Out



Sink in an important application in the Modular Kitchen



Garbage pullout

- Garbage pullout is a sub-assembly that comes with modular kitchen set-up
- Garbage pullout, like drawers, is installed on a pair of cleat
- This is used to store the garbage such as empty packets, vegetable skin, food residual



Garbage Pullout Cleat

Cutlery Tray



Fig. 2.4.2.6 Cutlery Tray

- Cutlery trays have different slots to store spoon, fork, knife and other kitchen items
- Cutlery trays come in different shapes and sizes as per the requirement of the user
- The basic idea behind cutlery tray installation is to avoid shabby appearance of the items like a spoon, fork etc.



Fig. 2.4.2.7: Cutlery Tray Slots

Kitchen Cabinet



Fig. 2.4.2.8: Kitchen Cabinet Layout

- Kitchen cabinet is one of the most useful kitchen furniture
- Kitchen cabinet is used to store various items such as bottles, packets, dry food, cereals etc.



Fig. 2.4.2.9: Kitchen Cabinet Sample

Kitchen Drawer



Fig. 2.4.2.10: Kitchen Drawer Sample

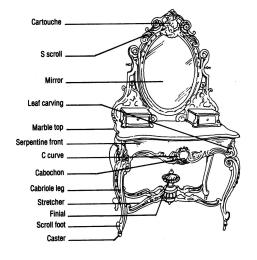
• Kitchen drawer is an integrated part of kitchen cabinet



Fig. 2.4.2.11: Smart Kitchen Drawer

Furniture Parts like Types of Legs, Back, Seats, Skirting etc. and their Drawings Dressing Table with Cabriole Legs









Trumpet Leg

Remington leg



Fig. 2.4.2.12: Furniture Legs

20

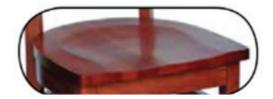
21

- 1 11 (From Left to Right): Baluster, Twist, Cup & Cover, Flemish Scroll, Square, Louis XV, Plain cabriole, Carved cabriole, Taper, Chippendale straight
- **12 22 (From Left to Right):** Hepplewhite, Adam Sabre (13-14), Pre-Victorian, American fancy, Windsor, Victorian (18-21), Modern Cabriole

Different Types of Chair Backs Fiddle Pierced Splat Bentwood Sheaf Anthemion Shield Balloon Round Lath Bannister Stick Bow Pillow Top Ladder Square Lyre

Fig. 2.4.2.13: Chair Backs

Different Types of Seats



Saddle Seat, Solid Wood



Pad Seat with removable waterfall



Welted, padded seat



Padded waterfall seat with solid wood edge and continuous waterfall seat



Ridged Edge Veneer Seat



Cane Seat



Arched seat with edge welt



Spaced nail trim with padded inlaid seat



Fully Padded Seat



Rush Seat

Fig. 2.4.2.14: Types of Chair Seats

Skirting



Oak Skirting Boards



Beech Skirting



Oak Veneered Skirting



Maple Skirting Boards



Ash Skirting



Pine Skirting

Fig. 2.4.2.15: Types of Skirting

2.4.3 Furniture Drawing Preparation

Before you start with furniture designing, it is important that you have all the necessary tools and equipment to perform the task. Some of the necessary and preparatory tools are:

Drafting Table



Fig. 2.4.3.1: Drafting Table

These have a flat and smooth surface that is ideal for drawing. The angles can be adjusted as per the designer's comfort. The size of such table can range from 30 inches x 48 inches to 30 inches x 60 inches.

Drawing Paper

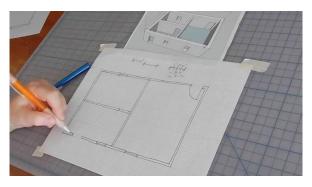


Fig. 2.4.3.2: Drawing Paper

The drawing sheets are of 2 types - Translucent and Opaque.

Translucent papers are like vellum and tracing papers, with the help of which designers can reproduce designs via the diazo process.

Standard Paper Sizes

Metric		Architectural Drawing		
Туре	Size (mm)	Туре	Size (inches)	
A0	841 x 1189	E	36 x 48	
A1	594 x 841	D	24 x 36	
A2	420 x 594	С	17 x 22	
А3	297 x 420	В	11 x 17	
A4	210 x 297	A	8 ½ x 11	

Pencils

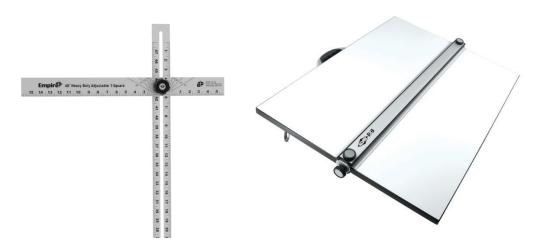


- Wood-Cased Pencil (4H, 5H, 6H, 7H, 8H, 9H)
- Lead holder (B HB, F, H, 2H, 3H)
- Fine-Line Mechanical Pencil (6B, 5B, 4B, 3B, 2B)

Sketch Drawing Pen or Technical Pen



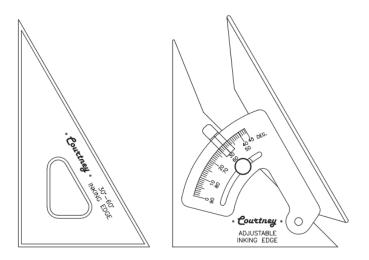
T-Square and Parallel Bar



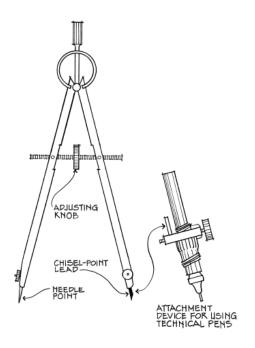
Arm-Track Drafting Machine



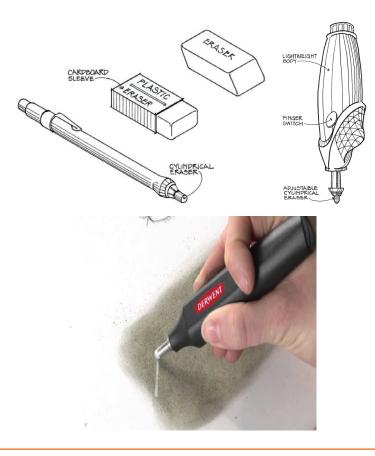
Adjustable Triangle



Compass and Attachment



Eraser



2.4.4 Interpret 2D / 3D drawings

The job of an assistant furniture designer is practically impossible without good skills in reading, studying and interpreting work orders, technical drawings, and blueprints.

1. Ability to Interpret Work Specifications and Interpret them Accurately

- Work Order is a task, job or assignment, which can be assigned to a person for completion.
- A work order may be issued from the client's end or circulated internally within the organization.
- Work Orders comprise details and specifications of a certain job per work-piece.
- It explains the client's expectations about the assignment.
- The essential components of Work Orders are:

Instructions and Guidelines	Cost Estimates	Forms and Annexures
Date and Time to Execute the Work Order	Information about the Location and Entities to Execute the Work Order	The Person to Whom the Work Order is Assigned

- Job Orders are the work orders circulated internally within the organization.
- A job order is prepared during the initial stages of an assignment/project and is connected with the final Bill of Materials.
- The essential components of a Job Order are:
 - o Quantity of the product to be manufactured, assembled, installed or repaired
 - o Quantity of the raw material to be used, along with its Price per unit and the number of units required
 - o The types of labor needed (casual or skilled), rate per hour or per unit and amount required
 - o Machine utilization of each machine involved in carrying out the assignment, the rate and the amount

2. Study the drawing (2D/3D) and designs and understand the requirement

a. The Blueprint and its Parts

- The requisite for reading a Blueprint is interpreting 1st and 3rd angle drawings.
- A Blueprint is a 2D (two dimensional) miniature/replica of the actual workpiece prepared by scaling down the actual measurements.
- A Blueprint is a plan which is proportionate with the product to be developed.
- It comprises the required technical specifications as well as the techniques of preparation.
- The essential parts of a Blueprint are:

Elevation View

- o Vertical display of one side of the project, from north, south, east or west
- o Gives an idea about how the complete structure will look after installation
- Helps in determining the height dimensions

Plan View

- Horizontal display of the proposed job looking down from above
- o This view is usually on a horizontal plane 30 inches (75 centimeters) above the floor
- o Helps in determining the length and width dimensions

Section View

A cut-through display, showing how an object will be built

b. Steps in Reading a Blueprint

Determining the view

- o The **Elevation view** must be studied and understood first. This is a representation of the expected outcome of the project. This view indicates the height dimensions of the workpiece.
- o The **Plan view** comes next, which indicates the length and width dimensions of the workpiece.
- o The **Section view** must be read at the last, to get a clear idea about the sequence of the parts to be built, in order to obtain the final product.

• Understand the scale and determine the actual dimensions

- The measurement scale is always exactly proportionate to the final product.
- o This proportion is usually 1:2 ratio
- o The Engineering Scale is used, which incorporates a ratio, where one has to follow multiples of

- **Reading the Title Block:** This indicates the context in which the drawing must be perceived. The Title block provides information about the following:
 - o General tolerances
 - Projection details for the item, component to be manufactured
 - Scale used in the drawing
 - Status of the drawing (Preliminary, Approved, etc.)
 - o Name of the component or assembly
 - o Contact details of the drawing owner
 - o Mass
 - o Units used in the drawing
 - o Sheet number and number of sheets

Reading the Notes

- o The notes should lie outside the Title Block.
- o The information provided by the notes are preferred to that provided by the Title Block and hence, the Notes supersede the Title Block information.
- o In case of conflicts, the Notes are considered correct over the Title Block.

• Reading the Work Order or the Bill of Materials

- o The Work Order provides the requisite details of the assignment and the requirements of the final product.
- o The Bill of Materials is a list of the components and the corresponding quantities that make up the general assembly of the item being manufactured.
- o The BOM is usually tabulated on the first page of the Blueprint / Drawing.

Understanding the differences between the various Lines and interpreting them

- Visible lines indicate an edge is visible in the relevant view
- Hidden lines indicate the edge is behind a face
- o Phantom lines indicate edges of structure that are relevant but not included in the drawing
- Phantom lines could also mean a tangent line (where a curve starts or ends)
- o Center lines indicate the geometric center of the assembly

Understand and interpret the projections, sections, and details

- o View the drawing itself, regardless of the dimensions, trying to visualize how and what the assembly looks like in 3D.
- o Use the sections and details as a start point and you will soon realize that the details and sections have been created to highlight important components or features.
- o With the aid of the BOM / Work Order, find out the components in the drawing in order to understand the role each component plays.
- o Find out the notes that have arrows pointing towards the assembly. These information are extremely vital to the assembly and its functionality.
- Use the dimensions in the drawing to comprehend the size of the component / Assembly / Final product.

c. Understanding Allowances from the Blueprint

- Allowance is the minimum clearance (positive allowance), or maximum interference (negative allowance) between parts of an Assembly.
- While preparing Blueprints and technical drawings, a high degree of diligence is implemented to incorporate Allowances, thus ensuring "Zero Wastage".
- This helps in reducing the Cost of Production per unit and increasing the productivity of the assignment.

3. Work instructions and specifications and interpret them accurately

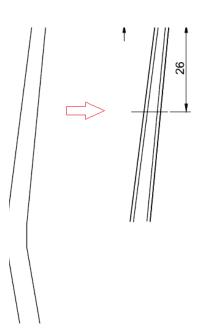
- Instructions and specifications provided to the Lead Assembler must not be read casually.
- Instead, all sections and preferably every word must be read and understood diligently.
- This helps the Lead Assembler and the other team members to fully understand and interpret the client's requirements and the specifications of the workpiece or job.
- This is an important step in the project/assignment since it eliminates chances of miscommunication.

Draw Plan, Views, Sections and Other Design Structure with the Help of Software for Designing Furniture Piece

In this case, we will take the example of a chair.



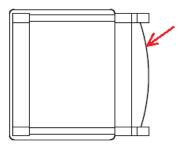
This is the original image of the chair for which the software design will be created.



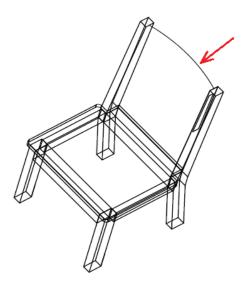
With the help of Offset Command and keeping the offset distance of 1, create 2 internal lines.



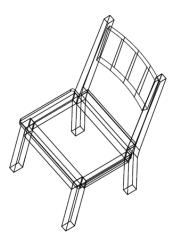
With the help of "REGION command" sweep it along the path to create the chair's backrest.



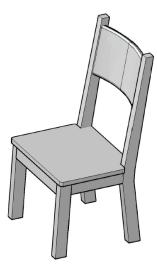
Clicking on the top view, you can see the chair from the topmost part.



This is a 3D view.



The "SWEEP command" will give this result.



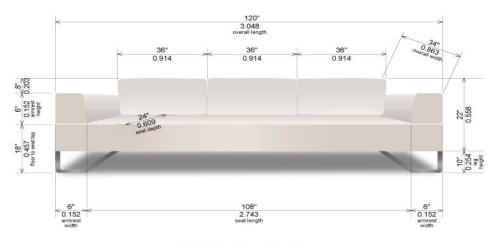
After adding color to the designed framework.

Get Approval from Design in Charge/Supervisor for the Target Furniture Design Drawing and its related aspects like Dimensions of Target Furniture etc.

Supervisors or designer in charge can only approve a furniture design if it fulfills all the requisites and their dimensions are justifiable.

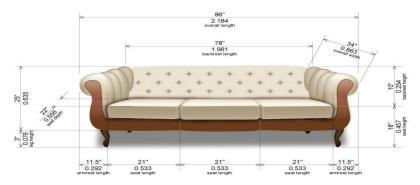
Some of the standard dimensions of target furniture are:

Sofa



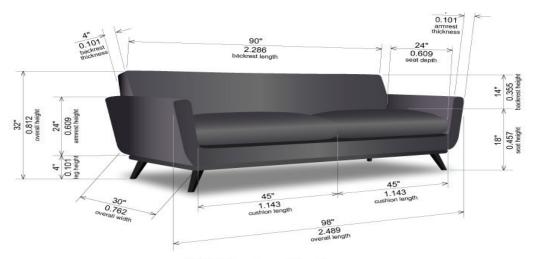
Mid-Century Modern

5-person sofa - 108" width without couch arms



Chesterfield

3-person sofa - 78" width without arms



Mid-Century Modern

4-person sofa - 90" width without sofa arms



Left Arm Loveseat

2-person sofa - 50" width without arms

Tall Cabinet



Depth - 12" to 24" deep

Height - 84" to 96" tall

Width - 12" to 36" wide

Wall Cabinet



Depth - 12" to 24" deep Height - 12" to 42" tall Width - 9" to 48" wide

Base Cabinet



Depth - 24" deep

Height - 35" to 36" with countertop & 341/2" without countertop

Width - 12" to 48" wide

Crockery Unit



Depth – 1 foot 6 inches deep

Height – 6 feet high

Width – 6 feet wide

2.4.5 Common Issues Troubleshooting Knowledge

Troubleshooting

- Troubleshooting is a systematic and sequential approach to solve problems, used to detect and resolve issues in a unit or a system.
- In short, Troubleshooting is the process of detecting a problem, finding its root cause and then rectifying it.
- With the sole purpose of bringing back a system into operation, troubleshooting techniques also focus on preventive maintenance, so that a particular issue does not appear again and what needs to be done in case it recurs.

Common Issues

Common Issues	Cause	How to Solve	
Scratched modules and pieces	Rough handling and excessive usage	 Using a rug to avoid scratches during handling Avoiding sliding items during assembly and installation operations Keeping sharp tools and equipment away from the modules 	
Missing modules and pieces	 Not unpacking and arranging the modules and pieces according to the Blueprint Clumsy and unorganized work area Not storing the modules as you proceed with the operations 	 Getting substitute modules from the vendor/manufacturer Arranging the modules and pieces as per instructions and requirement Keeping the work area free of clutter Ensuring that modules, meant for different purposes, do not get mixed up Putting aside assembled parts, as you proceed with assembly and installation 	
Broken modules and pieces	 Defective modules received in consignment Exerting undue force while using tools Exerting undue force while trying to fit 	Noting down the reference numbers of the broken parts and placing an order for the same with the manufacturer	
Modules not fitting well	 Using the wrong size and specification of hardware, say, a wrong size or shape of screw or nut. Trying to fit mismatched modules and pieces Failing to understand the Instruction Manual and following the sketches wrongly 	Reading and thoroughly understanding the Instruction Manual, Directions of Use and Blueprints / Sketches	

Common Issues	Cause	How to Solve	
Skin Peeling	 The upper part of the plywood surface gets peeled from the body of the furniture due to water, humidity or exposition to direct sunlight At times, the lather or clothing covers (especially in the upholstery) gets peeled owing to rough use/prolonged use 	 In case of wooden skin peel off (of furniture), use adhesives to join the defective part. If the adhesive application doesn't solve the issue, replace it with a new part For skin peeling of clothes or lather, it is advisable to replace the defective part 	
Angular Default	 Due to rough use or over exposition to heat and water, the angular portions of the modules get damaged Untidy installation or assembling may lead to angular defaults where the alignment of the angular portion goes wrong 	 Use hinges to make up for the defective angle If the installation of hinge doesn't fix the issue, replace the defective part with a new module 	
Floor Level Mismatch	At times, the modules for assembly, especially the legs which remain in contact with the floor, do not sit steadily on the floor. This might happen due to rough or uneven floor level.	 Cut the legs carefully after taking proper measurement Shimmer the end of the leg according to the floor level 	
Screwing alignment default	 Wrong measurement and marking lead to screw alignment default Wrong drilling or excessive drilling may cause screw alignment default Selection of wrong screw also causes screw alignment disorder 	 HDE Drilling is a good solution to the screw alignment issues If HDE drilling doesn't fix the issue, replace the screw with new one 	

Summary



- The role and responsibilities of an assistant furniture designer depend on the situation and the phase of the project.
- You should contact your supervisor in case of queries on procedures, products, or problem. If it is not satisfactorily resolved, you can report your query to a higher level.
- The foremost information that you require to take from your in charge or the client is the type of furniture he or she needs and the purpose of it.
- After you receive your project order, the foremost thing after measuring the area of the place where the furniture will be placed is to start working on the measurement of the furniture to be made.
- With the evolving market of modular kitchen and furniture, the demand for the latest furniture styles with highly improved fittings is on the rise.
- The method of measuring physical parameters is called Metrology.
- BOM is usually tabulated on the first page.
- If we consider the anthropometric dimensions regarding the design of furniture, it is 95% for males and 5% for female.
- Plywood is a form of engineered wood where thin slices or layers of wood are glued together to form a sheet.
- Dowel pins are short bamboo sticks that fit in the drilled holes.
- CAD helps in preparing the blueprint of any modular furniture or module/accessory / part.
- Runners are available with a different weight that can carry capacity
- Work Orders comprise details and specifications of a certain job per work-piece.

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Fyercise
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1.	refers to the	ne pyramid of ranks or posts in an organization.	
	a) SOP	b) Organizational hierarchy	c) Tabulation of designs
2.	is usually t	abulated on the first page.	
	a) BOM	b) TOM	c) KOL
3.	Allowances from the Bluepr of the assignment.	rint helps in reducing the per uni	it and increasing the productivity
	a) Cost of ProductionA: Cost of Production	b) Work Order	c) Interpret the projections
4.	CorelDraw software is a a) Copy tool	that is used for designing and other b) Coloring tool	er graphics-related programs. c) Vector graphics editor
5.	•	b) Marketing Development Funds	
	c)Multimedia Description F	ramework	

Activity



Video Session

- In this session, the Trainer will play 4 videos.
- The Trainer has the discretion of playing all the 3 videos or the number of videos he or she may deem fit.
- The first video will be about the process of creating a queen size bed
- The YouTube link for the video is: https://www.youtube.com/watch?v=JY1mxnXCeF8
- The second video will be about the basics of wood cutting, furniture polishing and adding vanishes
- The YouTube link for the video is: https://www.youtube.com/watch?v=84qXNa697bU
- The third video will be about the process of wood cutting and shaping
- The YouTube link for the video is: https://www.youtube.com/watch?v=sQUL3hLWLcQ
- The students will watch the video attentively with pin drop silence.
- They can note down pointers from the video that they may find relevant.
- Trainees will maintain decorum in the class and will not talk, whisper or discuss in the class.
- In case of any queries or confusions, students will write those down in their notebooks.
- After the videos end, the students can ask questions of you.
- The students will raise their hands, and you will pick up the students who will place their questions.
- The answering session will be in the form of a discussion where the answers can be given by either you or any of the students knowing the answer.

Activity



Lab Session

- In this activity, the Trainer will divide the class into 3 groups.
- In this activity, the students will be provided with the necessary equipment to create a bed.
- The bed will be miniature in size.
- The Trainer will provide the necessary tools like:
 - Wood pieces of different dimensions
 - L bracket
 - o Screws
 - o Drilling machine
 - o Sandpaper
 - o Saw
 - o Adhesive
 - o Others
- The Trainer will allot 45 minutes to create their miniature beds.
- After the work is complete, the Trainer will take 15 minutes to analyze the work of all the 3 groups.
- The group that can portray the process in the best way will be declared as the winner and will be appreciated in the class with accolades.









3. Create a Scale Model and Build a Furniture Prototype

Unit 3.1 - Create a Scale Model

Unit 3.2 - Build a Prototype and Test



Key Learning Outcomes



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

- 1. State the process to create a scale model
- 2. State the process to build a prototype and test

Unit 3.1: Create a Scale Model

Unit Objectives

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

- 1. List the types of materials used in the selected product category, their trade names and availability
- 2. Collect materials such as cardboard, small sticks or other products to create scale model
- 3. Analyse and draw layouts on cardboard sheet as per dimension
- 4. Analyse furniture making drawings and measurements

3.1.1 Materials Used in the Selected Product Category, their Trade Names and Availability

In this case, we are going to take a certain type of furniture like a bed as a scale model.



Fig. 3.1.1.1: Sample of a Ready-made Bed

For this selected product (bed), the used materials are:

Bed (with 6 Drawers) Headboard Slat Top Rail Mattress (Cushion) Side Rail Drawers Side Rail Footboard Top Rail Footboard Slat Slat



Trade Names of Beds as per their Availability Divan



The make of these beds are based on 2 main parts that are joined with the help of bracket. The height of the bed base from the floor is nearly 3 feet. These are best for storing clothes and other materials.

Sofa Bed



These types of beds are generally called "Sofa cum Beds." This is considered as one of the smart furniture that adds a stylish touch to the room.

Four-poster Bed



These are antique looking traditional-styled beds whose construction comprises of engraved art and high-quality wood. These types of beds give a royal touch to the rooms.

Canopy bed



The design of this type of bed is more like a four-poster bed. However, these types of beds impart an antique, dreamy, and luxurious feel to the user.

Mid Sleeper or Bunk Bed



The make of these beds are mainly though for small houses where room space is less as compared to other spacious houses. In India, these types of beds are created for kids rooms.

Sleigh bed



This is one of the contemporary forms of beds that have a slender look, smart and sleek curves, and a classic look.

Storage Beds



These types of Beds are high in demand at present times. These types of furniture have "Hydraulic" facility or ottoman gas lift system. This ensures that the user can easily pull the cleat without any extra effort.

Trundle Beds



These are standard on caster beds. In simple words, these bed types have another smaller bed beneath the upper beds. These beds are useful to save space in a small room

These bed types are available in various sizes like:

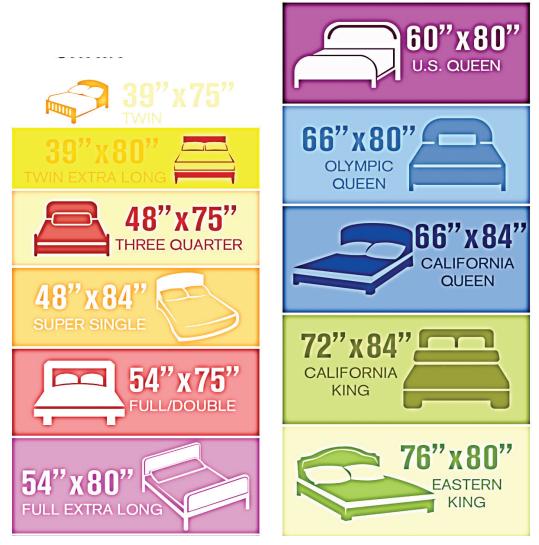


Fig. 3.1.1.1: Different Bed Sizes with name

3.1.2 Select Proper Materials to create Scale Model -

Before you jump in with the carpenters to cut the wood pieces for furniture construction, it is imperative that as an assistant furniture designer to produce a prototype. This prototype or model can be made with simple items like small sticks, cardboards, pins, adhesive, etc.

Here are some of the prototypes of scale models of different types of beds.



Fig. 3.1.2.1: Rough Construction of a Bed (Prototype)



Fig. 3.1.2.2: Scale Model of a Bed made up of Piece boards

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Add Sticks or Other Chosen Material to Display the Feature and Details of the Furniture Piece

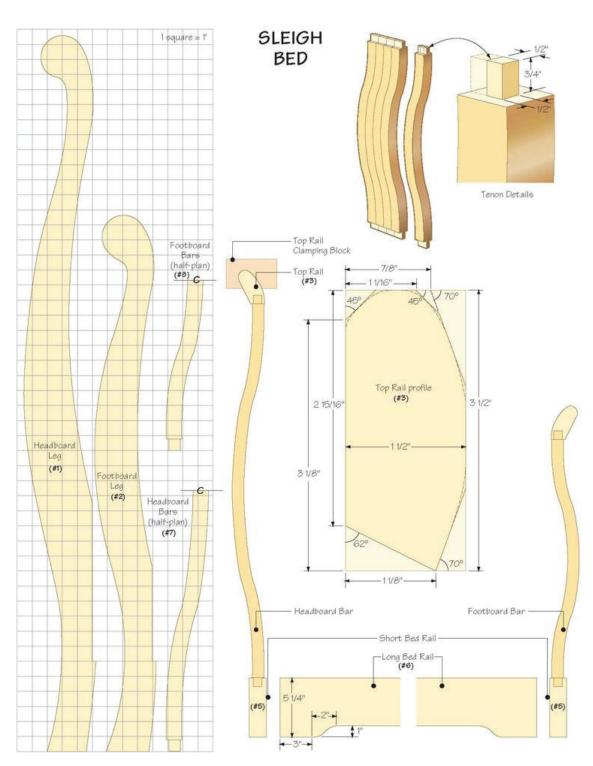
Fig. 3.1.2.3: Bed Models Created with Cardboard, Popsicle sticks, Small sticks, etc.

3.1.3 Draw a Layout on Card Board Sheet as per Dimension

When a prototype of furniture is made, it usually is based on the layout that is made prior to the model creation. The process is simple for this.

The first step is to take a cardboard sheet of a considerable thickness.





The next step is to draw out the layout of the furniture (Bed in this case)

Material Characteristics with Reference to Product Category like Construction, Dimensional Properties, Durability etc.

As per this layout, the measurement for each section will be (on actual model):

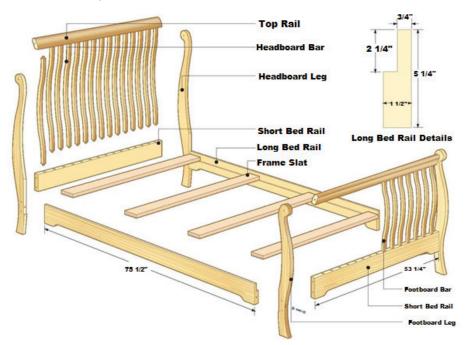
- Floorboard Bars (Spruce or Pine) 22 ¾" x 2 ½" x 1 ½"
- Headboard Bars 34 %" x 2 ¾" x 1 ½"
- Long Bed Rails 75 ½" x 5 ¼" x 1 ½"

- Short Bed Rails 53 ¼" x 5 ½" x 1 ½"
- Frame Slats 54 ¼" x 3 ½" x ¾"
- Top rails 53 ¼" x 3 ½" x 1 ½"
- Footboard Legs 35 %" x 4 %" x 1 ½"
- Headboard Legs 47 4/5" x 4 %" x 1 ½"

Now, cut the layout drawn on the cardboard with precision.

As per the numbers on the cardboard, join the pieces of furniture.

After cutting the cardboard, the pieces will resemble like this:



The final model will look like this:



3.1.4 Furniture Making Drawings and Measurements

Drawing is one of the fundamental aspects in case of furniture designing. As an assistant designer has to work on different types of projects, it becomes important to create prototypes as per the work requirement.

This formation of the prototype can be achieved with the help of diagrammatic representation. Now in case of assistant furniture designer, the drawings have to be via AutoCAD or CorelDraw. The use of such type of software ensures that the furniture designs are appropriate with proper use of measurements.

For example, if your project asks you to design furniture for modular furniture, the diagrammatic approach for this will be:

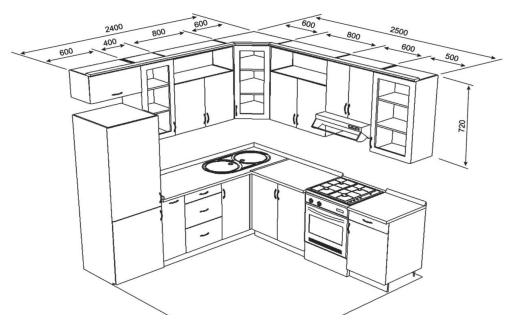


Fig. 3.1.4.1: Diagram for Kitchen based Furniture with their proper Arrangement (in mm.)

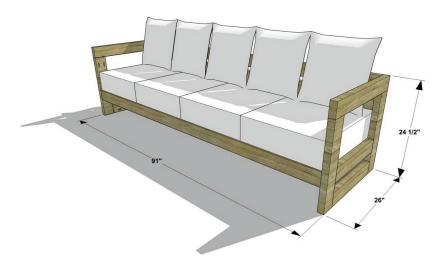


Fig. 3.1.4.2: Diagram with Measurement for a Sofa



When the diagram is shifted from AutoCAD to CorelDraw, the diagram for furniture will look like this:

Review All Sizes and Proportions of Scale, Also Review All Joineries and Making Techniques of Furniture

In case of furniture designing, knowing the concept is important. The concept that we are going to talk about is Scale and Proportion.

Scale refers to an object's size in relation to another. Mostly, it is used to scale the size of a space or an object with respect to the size of an average human body.

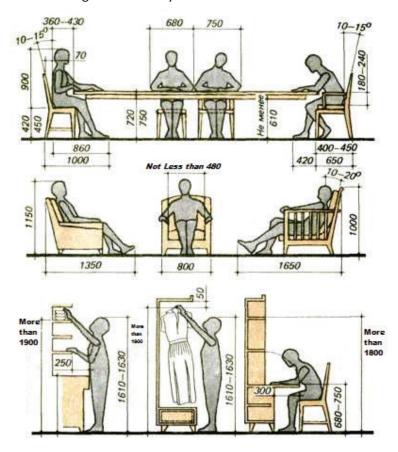


Fig. 3.1.4.3: Proportionate Measurement

When we talk about furniture's proportion, we are basically talking about the generic proportion of 2 objects. In this case, the general proportion is basically related to the different types of furniture with its arrangement of requirement of a room.



Fig. 3.1.4.4: Room Diagram with Furnitures

As per this image, different types of furniture are designed, created and placed in a room.

Another aspect to review regarding proportion is the calculation regarding the creation of furniture with accurate proportion and size.

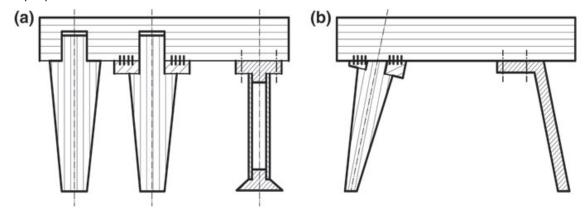


Fig. 3.1.4.5: Sketch Diagram of a Furniture

The first image showcases the appropriately measured and proportionately attached wooden legs that will provide stability to the furniture. The second image showcases the incorrect proportioned wooden leg that can break due to pressure.

Review all Joineries

One of the fastest growing industries in India is that of Woodwork. With more than 200,000 artisans and 100,000 registered woodworking units, the joineries in India are contributing a marginal contribution (nearly 0.5%) in the GDP of India.

You will find the information on joineries in (Section 2.3.3).

Analyse and Conduct A Visual Inspection to Identify Any Problems That Are Present or May Arise In Scale Model, Before Proceeding to Prototype Sample

- Visually inspecting each step help in detecting issues in the early stages of the task
- Early detection of faults and issues in the hardware tools and the modules helps in avoiding wastage of money, time and manpower.
- Visual Inspection eliminates chances of future breakdowns and major faults.
- This helps in avoiding serious defects in the final products, and, in turn, a product recall.

Method of Conducting Visual Inspection

The common methods of conducting visual inspection are:

- Tallying all aspects of the assembled and installed product against the AutoCAD sketches, blueprints, and approved samples
- Visually checking for defects related to:
 - o Wrong dimensions (not according to specifications in Work Order)
 - o Discoloration, Staining and Tainting
 - o Improper and inadequate Finishing
 - o Scratches
 - o Mismatched and misfit parts
 - Other defects

Present To Seniors and Seek Approval, Incorporate Feedback for Getting a Furniture Prototype Sample Ready

- Each organization has a set of parameters on which customers share their feedback.
- Before sending the prototypes to the customers, it is the responsibility of the assistant furniture designer (you) to present the AutoCAD model to their seniors for approval.
- The senior designer then checks the AutoCAD design for any flaws or gaps. This includes the measurement for each part of the furniture.
- In case your seniors find a fault or wish to add certain specifications, they will mention those in the feedback sheet.
- Your work here will be to incorporate those feedbacks in your generated designs and then provide assistance for furniture prototype creation.

Unit 3.2: Build a Prototype and Test

Unit Objectives

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

- 1. State about the detail drawings & specification to the craftsman /carpenter
- 2. Analyse the look and appearance of the prototype sample and check for errors

3.2.1 Detail Drawings & Specification to the Craftsman / Carpenter for Prototype

As an assistant furniture designer, your job role is not just limited to drawing the furniture designs in software like AutoCAD. To get the prototype ready for the clients, it is important that detailed drawings with their specifications are provided to the carpenters or craftsmen to get the work done.

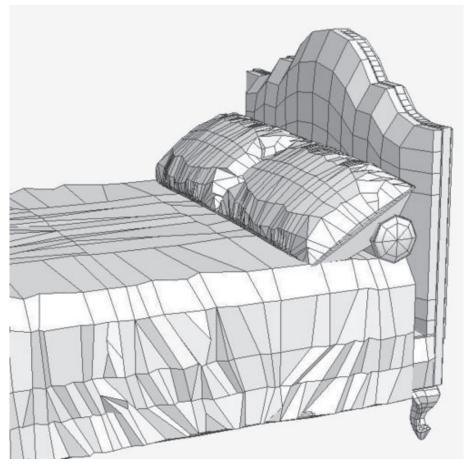
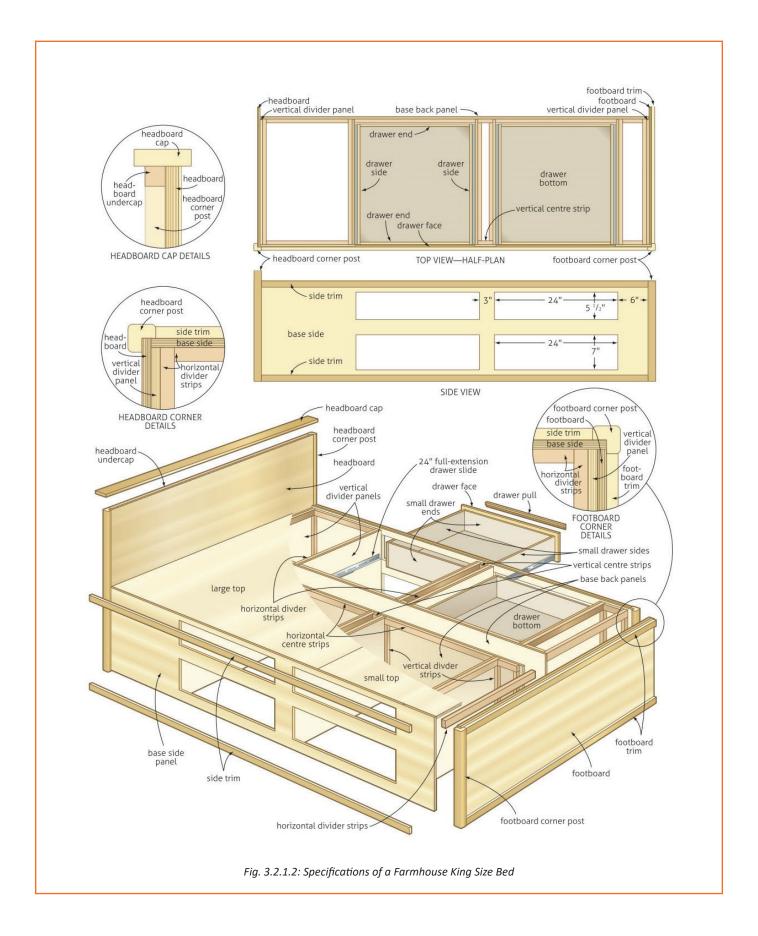


Fig. 3.2.1.1: Drawing of a Bed in AutoCAD (Partial)



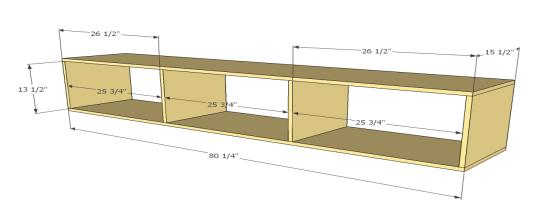
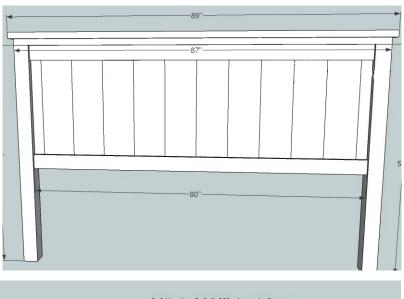


Fig. 3.2.1.3: Specifications of its Drawer System

The above drawing can be a little confusing if give as a single image. For better understanding, it is better to give the craftsmen or carpenters elaborate sets of furniture drawing with required measurements.



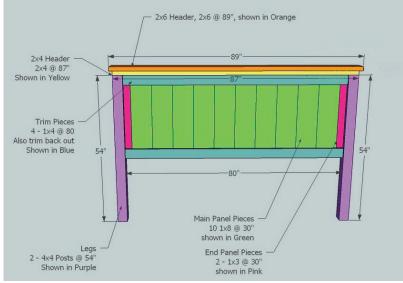


Fig. 3.2.1.4: Dimensions of Headboard

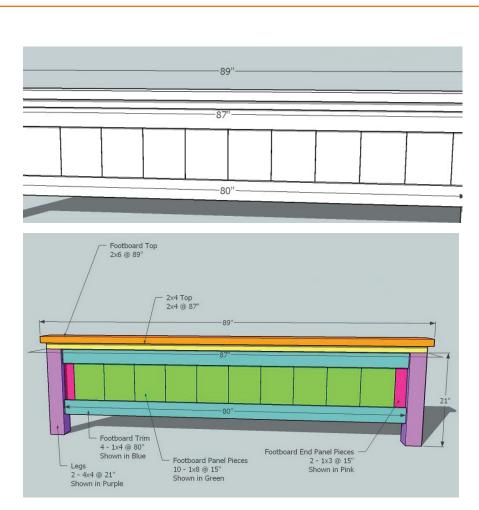


Fig. 3.2.1.5: Dimensions of Floorbard

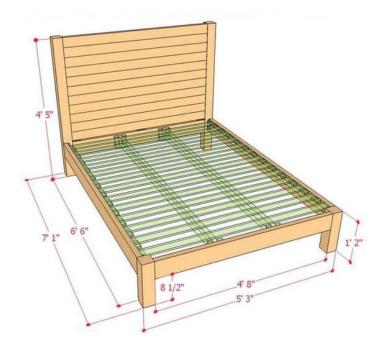


Fig. 3.2.1.6: Measurements of the Bed

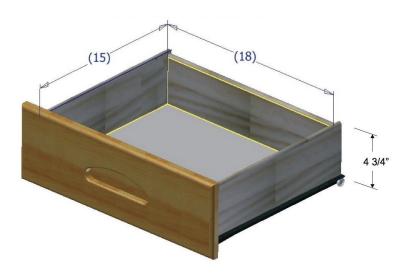


Fig. 3.2.1.7: Under Bed Dresser Drawer with Measurements

Ensure all the Collected Raw Materials or Sample Materials are of Standard Quality

- The main material in furniture making is wood. It is important to see if the wood quality is good and it arrives in intact without the infestation of pests.
- The average weight of king size beds is usually on the heavier side. So, it is imperative that the used materials are of galvanized steel.
- The quick-grip clamps to hold the pieces of the bolts connecting the different parts if wood pieces should be rust-free.
- The adhesive used for fastening the wood pieces should be of good quality.
- Check that the wood used for making beds are of hardwood.
- A standard quality wood for making furniture should be kiln-dried and air-dried.
- Make sure that the furniture pieces are put together either with Dovetails or Mortise and tenon.

Make Sure all Cut Size of Wood Pieces are as per Given Layout

When the project for a piece of furniture comes to an assistant furniture designer, he or she has to design the prototype based on the site measurement. In simple words, the size of the furniture should be appropriate to the size of the room without giving a cluttered feeling.

To do so, it is important that the craftsman follow the exact measurement as given by the designer on the furniture drawing.

After the prototype is created, it is the responsibility of the designer to ensure that the wood pieces are cut as per the specification provided by him or her and formerly approved by the supervisor.

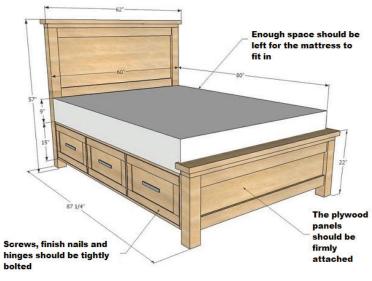
The measurement includes the size of various elements like:

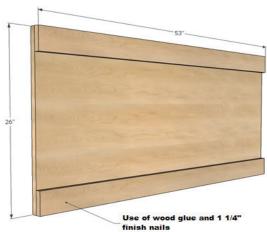
- Top head
- Bottom head
- Legs of the bed
- Panel trim pieces
- Floorboard trim pieces

If the wood pieces are cut as per the given layout, the final product will be sturdy and durable.

Check Structure of Prototype and Analyze all Joineries and Techniques Used are Correct

The analysis of joineries and techniques with accurate prototype structure, the following things are required to be checked:





Attachment of 1x4 trim to headboard's panel and





3.2.2 Analyze Look and Appearance of the Prototype Sample and Check for Errors

If you see the above section (3.2.1), you will find the drawings of the furniture on the basis of which the prototypes are made.

The AutoCAD images of the furniture only show the appearance and look of the prototype sample. However, it will not highlight the errors. For this, creation of prototype samples is a must. Based on the previous section's drawings, the prototype will look like this:



Fig. 3.2.2.1: Headboard of the Prototype



Fig. 3.2.2.2: Frame of the Prototype



Fig. 3.2.2.3: Complete Prototype



Fig. 3.2.2.4: Look and Feel of Prototype with Mattress and other Essentials

After the prototype is created, it is imperative from your side to check the complete product. The best aspect would be to tally the product with the drawings that you have generated. In this way, you can be assured of the measurements and the specifications that you have given to the craftsmen.

Any issues with the prototype creation will also come to light as the model is based on the software generated drawings.

Review and get the furniture prototype tested by supervisors

Supervisors review the furniture prototypes with the help of various steps. The common practice involves:

Checking For Balance and Levelling

The first step is from the point of view of visual aspect.

The other method is the use of bubble level that can be placed at the furniture's top (flat) part. The bubble inside the bubble level will stay at the center of the instrument if the furniture is leveled. In case the furniture is not leveled, the bubble will float towards the opposite direction.



Fig. 3.2.2.5: Balance and Level checking scale

Checking For Strength, Durability, and Longevity

These checks can be made with the help of putting considerable weight on the furniture. This can be in the form of adding weights with a minimum of 10 kg and increasing with another 10 kgs.

For durability, the supervisors can impose various types of tests in the form of chemical or stain use (ketchup, orange or lemon juice, red wine, coffee, alcohol, etc.

Another of the checks in this category can be in the form of checking heat resistance where hot objects like teacups or bowl of hot soup are kept above the furniture surface.

The longevity of furniture with its finish can be tested with water test where water is sprinkled all over the furniture and left to be dried. Cracks on the furniture surface (polishes) can state that the designed furniture is not up to the mark.

Ensure that the Prototype Finish is as per Instruction and Quality Standard

As per the general standards fixed for checking furniture finishes (in this case, the prototype), the focus is mainly on the sheen on the surface.

There are certain procedures to check it. One of the potent methods that are highly sought is the use of gloss meters. With the help of this device, supervisors can easily check the sheen of furniture to that of another.

This instrument measures the angles when a light beam is struck on the furniture surface and it bounces back.

The angles at which the light will bounce back for different types of finishes are:

- Full gloss finish- 80° 90°
- Semi-gloss finish 50° 60°
- Satin finish 25° 30°
- Dead flat to Flat finish 5° 10°



Fig. 3.2.2.6: Gloss Meter

Develop a New Prototype or Make Changes in This Existing Prototype Sample as per Feedback or Inputs Received

You are already aware of the fact that the created prototype is of a farmhouse king size bed. As you have to create a new prototype based on the previously created prototype, we will proceed with Chestwick Platform Bed of queen size.

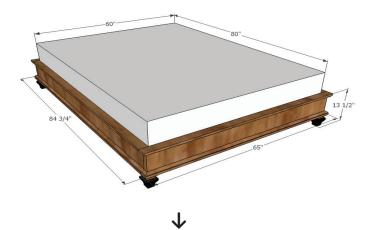
For this, you will require the following things:

- Furniture Feet 4 4" tall
- Molding
- Box spring or wood slats

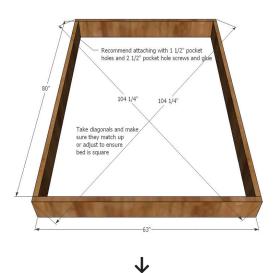
Tools

- Drill bit set
- Sander
- Brad Nailer
- Miter saw
- Circular saw
- Drill
- Pencil
- Speed square
- Tape measurement

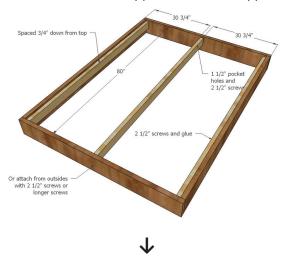
To begin with the new prototype creation, the first step is to draw the furniture with their appropriate dimensions.



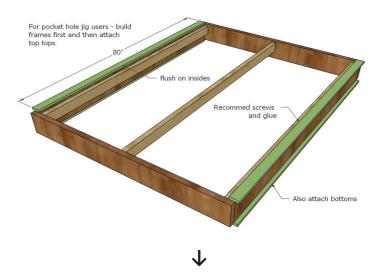
Join the 4 moldings together to create the outer frame.



With the help of Kreg Jig create pocket holes where the other molding heads will be inserted so that the outer frame remains in balance. This is known as center support which will support the mattress.



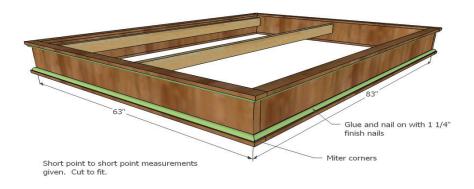
Add bottom and top tops on two sides (represented by green molding).



Trim the edges of the bottom and top tops to keep damage less distance from the wall.



With the help of nails and glue, attach all the gaps. This will reduce the gap between the bed and the mattress space.



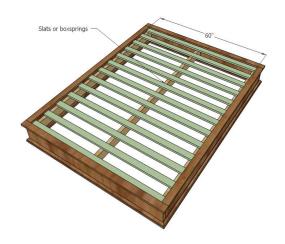


Turn the structure upside down so that you can attach the legs.





Add the box spring or slats.



Final Product



Get Signoff/Approval of This Final Prototype from the Supervisor

- After the prototype is created from the approved diagram of the AutoCAD model, the supervisor will check it once as an overview.
- The supervisor will check if the slats and moldings are places appropriately.
- After the supervisor states the prototype to be appropriate, you require getting the approval for the final prototype.

ABC Furniture Pvt. Ltd. Voucher No. 12 Date: 20/09/2018 Category: Farmhouse King Size Bed Colour: Glossy Wooden Colour Contents: Basic Sketch of the Prototype AutoCAD Model Specifications as per the drawn model Type of wood used Use of divider panel, divider strips, centre strip, etc. as per instruction Screws and joints as per instruction Cutting of wood and joining as per provided dimensions Presence of external furniture parts Leveling of furniture Finish on furniture category of Finish Polish on Furniture Presence of visible flaws Signature of Supervisor

Fig. 3.2.2.7: Sample Voucher

Assist In Compliance With Procedural Documentation and If Required Take the Photograph of the Finished Furniture Prototype to Make a Portfolio/Record Purpose

The documentation will be similar to the previous document with an additional point.

ABC Furniture Pvt. Ltd.

Voucher No. 12 Date: 20/09/2018

Category: Farmhouse King Size Bed

Colour: Glossy Wooden Colour

Contents:

Basic Sketch of the Prototype

AutoCAD Model

Specifications as per the drawn model

Type of wood used

Use of divider panel, divider strips, centre strip, etc. as per instruction

Screws and joints as per instruction

Cutting of wood and joining as per provided dimensions

Presence of external furniture parts

Leveling of furniture

Finish on furniture

category of Finish

Polish on Furniture

Presence of visible flaws

Image of Prototype



Prototype without Polish



Prototype with Polish

Signature of Supervisor

Signature of Furniture Designer

Fig. 3.2.2.8: Sample Voucher 2

Summary



- 1. When a prototype of furniture is made, it usually is based on the layout that is made prior to the model creation.
- 2. Drawing is one of the fundamental aspects in the case of furniture designing.
- 3. Before sending the prototypes to the customers, it is the responsibility of the assistant furniture designer (you) to present the AutoCAD model to their seniors for approval.
- 4. The adhesive used for fastening the wood pieces should be of good quality.
- 5. The AutoCAD images of the furniture only show the appearance and look of the prototype sample.

–Notes 🗐 –	

Exercise



Choose the Correct Option

- 1. What eliminates chances of future breakdowns and major faults?
 - a) Competition

b) Visual Inspection

- c) Defect
- 2. What is the software via which you can generate prototype drawing of furniture?
 - a) AutoCAD

b) Video editor

c) Sketch down

- A: AutoCAD
- 3. Standard quality wood for making furniture should be:
 - a) Kiln-dried

b) Soggy

- c) White
- 4. Which instrument measures the angles when a light beam is struck on the furniture surface and it bounces
 - a) Thermometer

b) Gloss Meter

c) Finish meter

Activity



Chart Paper

- This session will be in the form of "Chart Paper" activity.
- In this activity, the Trainer will divide the class into groups where the students will be even in number.
- The topic on which the students will work on will be "Creating a prototype sample of your preferred furniture with their respective drawings and specifications"
- The student groups presenting their answers should use both text and images (hand drawn)
- After the time is up, the Trainer will dedicate 5 minutes each for evaluating the chart paper of each group
- The group presenting their answers in the best way will be declared the winning group and awarded with accolades and appreciation

Activity



Lab Session

- This session will be in the form of "Laboratory" activity.
- In this activity, the Trainer will take the students to the computer lab.
- The Trainer will divide the class into 4 groups where the students will be even in number or as per the total number of students.
- The topic on which the students will work on "Develop a New Prototype from the existing prototype with cardboard, sticks, and other required material."
- The Trainer will give the students 45 minutes to complete their task.
- After the work of students is over, the Trainer will inspect the work of each group.
- The group presenting their prototype in the best way will be declared the winning group and awarded with accolades and appreciation









4. Ensure Health and Safety at Workplace

Unit 4.1 - Health and Safety

Unit 4.2 - Dealing with Emergencies



Key Learning Outcomes



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

- 1. Describe the aspects related to health and safety
- 2. State the process of dealing with emergencies

Unit 4.1: Health and Safety

Unit Objectives

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

- 1. List the common health and safety hazards in a work environment and related precautions
- 2. State the safe working practices in a furniture and fittings related workplace
- 3. Analyse and ensure safe handling and disposal of waste and debris
- 4. Relate the importance of using protective clothing/equipment while working
- 5. Explain the correct process to maintain correct body posture while standing and working
- 6. List the different risks associated with the use of electrical equipment

4.1.1 Common Health and Safety Hazards in a Work Environment

An assistant furniture designer is an integral part of woodwork designing. The designer not only works with the designing part but is also associated with the use of woodworking tools. It is essential for her/him to have a full understanding of the hazards and risks associated with woodworking.

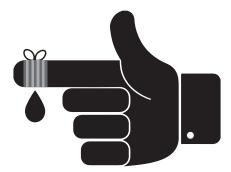
Woodworking involves various activities such as sawing, chiseling, drilling, etc. Many sharp tools, saws, electrically powered tools are used to carry out these activities. Hence, the level of safety hazards is high in woodworking.

It is very easy to recognize those hazards that cause immediate and traumatic injury — blades that cut fingers and limbs, wood chips and fragments that fly into eyes, loose clothing or long hair that catches in whirling machinery, muscle strains from heavy lilting.

But there are also hidden dangers in woodworking. These include wood dust, sap and oils, mold and fungus, vibration, and noise.

Common hazards in the work area and workplace procedures for dealing with them

Cuts, lacerations, and piercing



- Use of blunt blades of saw or chisel
- Unbalanced and insecurely fastened blades
- Unguarded blades of power cutting tools
- Incorrect use of sharp tools: for example placing hand or body in front of the blade, not using push block

or push stick while cutting a piece of wood on a table saw or planer

- Unsecured workpiece: for example not using clamps while working with saw or chisel
- Lack of proper training in operating cutting tools
- Poor maintenance of tools
- Poor housekeeping: for example sharp objects lying on the floor, not keeping sharp tools back in their designated place
- Not wearing personal protective equipment

Eye injury



Causes:

- Not wearing personal protective equipment
- Incorrect and irregular disposal of wood dust/wood debris
- The unsecured or unsupported workpiece
- Making cuts in the wrong direction.

Exposure to loud noise



- Woodworking machines generate a lot of noise.
- If you have trouble hearing someone speak from three feet away, the noise level from the machine is too high.
- Short exposure to loud noise may result in temporary hearing loss and continued exposure may result in permanent hearing damage.

Wood dust



Causes:

- The sawing and planning action or using drill machine generates high level of dust, which is called wood dust.
- Wood dust is a potential explosion, fire and health hazard.
- Breathing in wood dust can damage lungs.
- It can also cause eye injuries.
- Wood dust can also cause skin allergies and irritation from direct contact.
- Wood dust can be recycled and it can also be used as fuel.
- Contact with the dust of many kinds of wood can cause conjunctivitis (eye inflammation), hay fever, asthma, coughing, and other respiratory diseases.
- Wood dust can catch fire easily, that is why workshop should be cleaned at regular intervals.

Personal injury and fatigue



- Working in awkward positions
- Performing repetitive tasks for a prolonged period
- Lifting excessive weight
- Poor lifting techniques:
- For example
 - o Lifting too fast, too often or too long
 - o Lifting with back bent or while twisting or reaching too far
 - o Lifting while sitting or kneeling, etc.
- Not taking appropriate rest breaks

- Wearing inappropriate clothing
- Uneven and unsteady walking surface
- Poor housekeeping: for example wet and slippery floor, inadequate lighting
- Working in confined place

Slips, trips, and falls



Causes:

- Wet or oily surfaces and spills
- Uneven walking surface
- Tools or material in walkways and passageways
- Cables across the way
- Inappropriate use of equipment: for example placing a ladder on uneven floor
- Poor maintenance: for example broken ladder
- Inadequate lighting
- Obstructed view
- Not using personal protective equipment
- Working without safety belt at heights
- Not reporting your supervisor about faulty equipment

Electrocution



- Using power tools near water
- Using power tools with wet hands
- Damaged or frayed cables or wires
- The socket is in on position when plugging anything into it
- Pulling the cord to remove plug from socket

Potential hazards and risks which may be present at furniture and fittings related workplace

An assistant furniture designer is exposed to multiple occupational health hazards. Potential hazards and risks are the ones which are likely to occur but have not occurred yet. The knowledge on the same is essential so that the trainees stay awake and alert while working hands-on live assignments. These are:

- Injury (of varying severity) hazards and risks from the use of different equipment, machinery, and tools
- Ergonomic injuries, fatigue and muscle stress arising from working in long shifts, in awkward and inconvenient positions, exposure to repetitive tasks and lifting as per inappropriate methods
- Biologically and chemically toxic hazards like prolonged exposure to toxic pathogens (harmful microorganisms like bacteria, fungi and molds, viruses and their vectors and carriers), corrosive, harmful and radioactive chemicals
- Exposure to extreme temperatures and the resulting risks like heat stroke and hypothermia (the condition of having fatally low body temperature)
- Prolonged or repetitive exposure to carcinogenic (causing cancer) materials like radioactive materials, radiations and waste like wood dust and formaldehyde in pressed wood
- Exposure to toxic fumes from chemical solvents and hydrocarbons
- Exposure to highly combustible materials like wood debris, straw, and hay, gas cylinders, etc.
- Exposure of the eye to sharps, debris and flying splinters
- Exposure to climbing heights (trolleys, ladders, scaffolding, and cranes) and the resultant risk of falling from them

Check the worksite for any possible health and safety hazards

- Ensure that the worksite does not have any open or broken electrical wires.
- Maintain the work area, clean it properly and take necessary steps to keep the area hygienic and wellventilated
- The walking or working area should not have scattered nails or small that may hurt the people working at the workshop
- Appoint a safety supervisor in the workshop
- This safety supervisor will stay responsible for checking the worksite for potential health and safety hazards
- Have your employer develop a daily checklist for all areas, delegated to appropriate employees

Identify and report any hazards and potential risks/ threats to supervisors or other authorized personnel

Hazards and potential risks/threats can be identified and then reported to supervisors or other authorized persons in the following ways:



Fig. 4.1.1.1: Hazard Reporting Process

While identifying and reporting a hazard / potential threat / potential risk, one must describe the following:



Fig. 4.1.1.2: Threat Identification Process

4.1.2 Safe Working Practices in a Furniture and Fittings Related Workplace

How to follow safe working practices while at work?

Assistant furniture designers may follow safe working practices at all times by:

- · Working safely with all tools, tackles, and equipment
- · Using ppe appropriately and safely and storing and maintaining them as instructed by the manufacturer
- Maintaining and storing tools and equipment in excellent working condition according to organizational requirements and standards
- Checking all tools and the entire work area for possible hazards and risks before starting with the task
- Conducting regular electrical inspections at the workplace by an experienced and licensed electrician
- Conducting frequent inspection of powered tools and equipment by licensed electricians (preferably every month)
- Replacing defective machinery and accessories with new ones, if deemed absolutely necessary
- Ensuring that the work area is absolutely free of clutter
- Reporting any spills to the housekeeping staff immediately
- Operating machines and equipment only with the safety guards and safety switch techniques in place
- Enforcing adequate and timely lock-out and tag-out mechanisms in powered tools and machinery
- Maintaining good ventilation and lighting conditions in the work area and reporting to concerned authorities if otherwise
- Keeping a fully equipped first aid kit

- Abiding by safe ergonomic practices
- Ensuring that the power supply to all powered machinery, equipment, and tools is disconnected while conducting troubleshooting, routine maintenance and repair/replacement operations
- Taking short breaks without hampering the schedule and productivity of the system
- Always abiding by safe housekeeping practices

Work safely at all times, complying with health and safety legislation, regulations, and other relevant guidelines

- Ensure that all emergency route maps are on display, in publicly accessible places, on all floors of the workplace
- Ensure that appropriate fire extinguishers are available on all the floors of the workplace
- Ask your supervisor how you may retrieve ppe and how to maintain and store the same
- Stay aware that confined spaces must bear appropriate signs, to restrict claustrophobic people from accessing them
- Learn and abide by company policy and procedures for dealing with security risks in your workplace
- Learn and abide by company policies and procedures for making sure that security will be maintained when you go on your breaks and when you finish work

Ensure that health and safety instructions applicable to the work place are being followed

- Lighting should be adequate in all areas and replacement bulbs should be kept handy
- Ensure that all manual cutting tools must be honed in advance because blunt tools can slip and lead to deep cuts
- Ensure that while using cutting tools the direction of cutting is always away from your body
- Arrange for frequent safety drills and training for employees to promote safety awareness
- Have a clear idea of how much authority and responsibility you have to deal with security risks including your legal rights and duties
- Learn and abide by company policies and procedures for maintaining security while you work

Follow manufacturers' instructions and job specifications relating to safe use of materials specifically chemicals and power equipment

- Ensure that all chemical solutions used on display shelves or for housekeeping purposes must be used only after referring to the relevant msds (material safety data sheets) or instruction manuals
- Loosely fitted clothes must be completely avoided because the loose ends may get caught in powered machinery and tools and may be fatal
- Ensure that you read the instruction manual thoroughly before handling powered tools and equipment.

4.1.3 Safe Handling and Disposal of Waste and Debris

- All walkways should be cleared of clutter and debris to avoid trips and falls.
- Any spill should be cleared off immediately and 'wet floor' or 'work in progress' signs should be used in appropriate places.
- Store equipment, tools and chemicals should be stored appropriately, abiding by all instructions provided in the instruction manual and 'directions for use'.

Procedure to be followed for safe disposal of waste

Disposal of solid waste

- Solid waste, once accumulated, must be labeled appropriately.
- o Solid waste on the site mainly comprises debris and sharps.
- o Debris in a furniture workshop comprises wood and timber splinters, sawdust, metal and glass sharps.
- Wood, timber and sawdust can be either treated at landfill or at the incinerator.
- Metal and glass sharps are collected in appropriate containers.
- o Metal sharps are melted for recycling.
- o Glass sharps are pulverized for recycling.
- o Sharps, if contaminated, must be autoclaved and deactivated before disposing of into containers.
- o Ferro-magnetic debris is separated using magnetic filters and treated according to their nature.

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- Disposal of chemical waste
- o Common chemical wastes include:
- o Paint
- o Batteries
- o Motor oil, oil filters and antifreeze
- o Cfcs and hcfcs in aerosol sprays and coolants
- o Paints of all categories must be recycled to the full extent.
- o Empty paint containers may comprise sediments and debris which can be separated. This can be done by allowing the material to settle for some time so that the remaining paint can be poured out from the top and the sediment at the bottom removed and treated as per norms.
- o Batteries should never be treated at landfills because they contain toxic chemicals, which may pollute the environment.
- o Batteries are generally incinerated which is a safer option as compared to landfill.
- o Hammer mills are used to break the batteries and the electrolytes are treated chemically for neutralization.
- o Motor oil and other oil-based products can be recycled into lubricating oil.
- o Mercury must be isolated chemically and recycled into:
- o Thermometers
- o Paints
- o Metal halide lamps
- o Mercury vapour lamps
- Lead from batteries can be recovered through controlled temperature processes and later on, refined for resale.
- o Batteries containing unknown levels of mercury are treated at mercury retorts.
- o Cfcs (chlorofluorocarbons) and hcfcs (hydro-chlorofluorocarbons) are either recycled or destroyed.

Destruction involves one or more of the following techniques:

- o Superheated steam
- Submerged combustion
- o Arc plasma
- Solid alkali reaction
- Incineration
- o Electric furnace

Proper disposal system for waste and by-product

- Assistant furniture designers must be well aware of the waste and the by-products procured during the assembly and installation processes from the designed blueprint.
- Waste must be sorted into appropriate categories, disposed of in designated places and treated according to their physical and chemical nature.
- Assistant furniture designers must learn to identify symbols for hazardous waste and take appropriate
 measures by wearing ppe and careful handling and treating the waste.









Fig. 4.1.3.1: Types of wood chips

4.1.4 Preventative and Remedial Actions

Toxic Solvents

An assistant furniture designer is often exposed to toxic solvents like acetone, chloroform, gasoline, carbon tetrachloride, diethyl ether, ethyl alcohol and methyl (ethanol), toluene, benzene, ethers, trichloroethylene, dichloroethane, tricresyl phosphate, nitroparaffins, tetralin, decalin, etc. Exposure of the body to toxic solvents can be via Ingestion, Skin Contact, and Inhalation.

The more volatile a toxic solvent is, higher are its chances of poisoning the respiratory system. Apart from administering appropriate first aid techniques, one must seek medical help and report the concerned supervisor.

Remedial actions for exposure to toxic solvents:

- In case of inhalation of toxic solvents or resulting fumes, moving the victim to fresh air immediately, thus exposing the person to an adequate oxygen supply.
- In case of skin contact with toxic solvents, the affected area must be washed thoroughly with lukewarm water and soap.
- In case of ingestion, vomiting must be instigated and the stomach must be washed.
- Activated charcoal may be administered in case of ingestion and inhalation.
- In case the eye is affected, it must be splashed and rinsed off with cold water until the effect subsides.

Preventative actions for exposure to toxic solvents:

- Appropriate PPE like protective chemical-resistant gloves, respiratory masks (for protection against toxic fumes), aprons, etc. must be worn.
- Initiatives must be taken to provide adequate ventilation to the work area.
- Any spillage of toxic chemicals must be wiped off immediately with a wet cloth.
- The containers must be closed tightly after every use, to prevent spillage or leakage of fumes.
- Solvents must be kept away from naked flames, in a cool and dark place.
- All solvents must be stored in neatly labeled containers and provided with MSDS (Material Safety Data Sheets).

Toxic Flux

Flux is an agent for chemical cleaning, purifying or flowing. Fluxes are extensively used in extractive metallurgy, furniture manufacture and metal joining techniques. Few common fluxes are Beeswax, Lead, Paraffin Wax, Borax, resin, Palm Oil, Cryolite, Unslaked Lime, Common Salt, Solder, etc.

The most toxic fluxes are Acid fluxes (which may comprise harmful agents like Hydrochloric acid, Ammonium chloride, Zinc chloride, etc.), Resin fluxes (which may lead to Asthma), Molten Solder fluxes (which can cause severe burns on the skin), Lead and Mercury fluxes (which are very easily absorbed by the body and cause countless health issues and even death).

Remedial actions for exposure to toxic fluxes:

- The victim must be carefully removed from the exposure area to a well-ventilated place.
- In case of skin contact or eye injury with toxic fluxes, the affected area must be washed thoroughly with a generous amount of water for at least 15-20 minutes.
- In case of ingestion, vomiting must not be induced unless prescribed by a physician.
- Ingestion must be treated with a drink of cold water or milk.
- In case of inhalation, adequate breathing support must be provided to the victim.
- Washing of the skin and the eye must be followed by a suitable skin or eye ointment.
- In case of difficulty in swallowing and unconsciousness in the victim, no oral remedy must be administered to prevent choking.
- Medical help must be summoned in case of severity.

Preventative actions for exposure to toxic fluxes:

- Appropriate PPE must be used while working with toxic fluxes.
- The Directions of Use provided by the supplier/manufacturer must be strictly abided by.

4.1.5 Protective Clothing/Equipment While Working

Hazards exist in every workplace in many different forms:

- Sharp edges
- Falling objects
- flying sparks
- Chemicals
- Noise and other potentially dangerous situations

Like every workplace, the wood workshop also has exposure to a variety of risks and hazards that can cause injury. An assistant furniture designer, a lock technician, a carpenter, and other team members may face many risks while working with wood, such as flying wood fragments, noise, wood dust, nails, sharp tools, etc. Everyone at the workplace should be protected from these risks and hazards that can cause danger to their safety.

Controlling a hazard at its source is the best way to prevent accidents from occurring. But sometimes it is not feasible or does not provide sufficient protection. Workers must use personal protective equipment to protect themselves from workplace hazards.

Personal protective equipment is commonly referred to as 'PPE'. Personal protective equipment is equipment worn to safeguard from hazards and help to minimize exposure to hazards at the workplace. PPE includes items such as:

- Gloves
- Foot and eye protection
- Protective hearing devices
- Safety helmets
- High-visibility clothing
- Safety harnesses

It also includes respiratory protective equipment (RPE).

As an efficient worker, it is your responsibility that you should take care of your personal safety and also the safety of your co-workers at the workplace. You must take every possible safety precautions to avoid accidents and hazards and ensure the safety of all workers. Never forget to use personal protective equipment at work.

You must have knowledge of the following:

- When PPE is necessary
- What PPE is necessary
- How to properly put on, take off, adjust and wear the PPE
- · The limitations of the PPE
- Proper care, maintenance, and disposal of PPE

Safety Standards and Precautions to Be Taken and Different Types of Personal Protective Gear and Their Usage

Do's

- Always use the right tool for the job.
- Always use personal protective equipment.

- While giving a sharp tool to anybody, hold the edge in your hand and the handle towards another person.
- Keep the sharp tools in designated place only.
- Check power tools before using them for a broken plug or poor condition of the cord.
- Always sharpen the blades of plane or chisel before using them.

Don'ts

- Do not keep hand tools on machine.
- Do not keep sharp tools in your pocket.
- Do not use caliper as tongs.
- Do not wipe off edges of the steel pull-push rule with bare hands to avoid injury.
- Do not use power tools near water, inflammable gas, or oil.
- Do not touch power tools while they are working.
- Do not use power tools with wet hands.
- Do not talk while working with tools.

Different Types of Personal Protective Equipment and Their Use

Personal Protective Equipment, commonly termed as PPE, is specialized clothing or equipment worn and used by employees for safeguarding themselves against Occupational Health and Safety hazards.

Such clothing is aimed at protecting different parts of the body, like hands, eyes, ears, face, feet, head etc.

Here is a table of personal protective equipment that is widely used.

- **Hand Gloves** Used for protecting the hands from harmful and corrosive chemicals, extreme temperatures, sharp and contaminated objects.
 - For example, Nitrile gloves are used for protecting the hands against solvents, oils, greases, tar, acids, and alkalis.
 - Gloves made of natural rubber or Latex are used for protection against contaminations and biohazard risks. Asbestos gloves are worn while dealing with extremely hot materials.
- Safety Shoes These are made of highly durable and robust material and protect the feet from injuries due to cuts and bruises.
- Safety Goggles These protect the eyes from harmful radiation, dust particles, and splinters.
- Masks and Face Shields- These are worn especially during welding, gas cutting, and brazing operations, in order to protect the face from direct flame, extreme temperatures, dust particles and splinters.
- **Apron** This protects the clothes from dust and other impurities. These are often heat-resistant and antiabrasive in nature.
- **Ear Muffs** These are used in extremely noisy places like factories and workshops, in order to protect the ears from deafening.
- **Respirators** These masks, if of the FFP3 (Filtering Face Piece Grade-3) specification, allow a maximum air pollutant leakage of 5% only and filter 99% of all particles measuring up to 0.6 μm.

Head Protection (Safety Helmet)



Safety Helmet

Function

Head injury can impair a worker for the lifetime. Wearing a safety helmet is the easiest way to avoid such situations. Safety helmet is used to:

- Protect head from falling objects and knocks
- Reduce risk of head bumping against fixed objects like exposed pipes and beams
- Protect head from accidental electrical hazards

Safety helmet comes in different forms. Some helmets include other protective elements such as goggles, earmuffs attached to it.

Safety helmet should be worn on the head, not on any hat or cap.

Eye Protection



Function

Eye is one of the most sensitive organs of the body. Woodwork is a job which comes with various hazards related to eye damage.

For example, sawdust, small pieces of sharp objects may cause damage to the eye. Therefore, eye protection must be used. Some widely used eye protection are –

- Safety Goggle
- Safety Spectacle
- Facemask

These protections should be worn to avoid any damage owing to wood dust, metal chips in the process of sawing, drilling, grinding and chiseling.

Hearing Protection







Pre-formed or Modelled Earplug



Ear Defender or Earmuff

Function

Woodworking machines such as drilling machine, circular saw, and jigsaw create a lot of noise.

Short exposure to the noise may cause temporary hearing loss and long exposure may lead to permanent hearing loss.

Therefore, hearing protection is an essential PPE for a woodworker. Some important hearing protection are –

- **Single Use Earplug:** They are made of waxed cotton, foam, silicon rubber or fibreglass wool. They are self-forming and, when properly inserted they work as well as most modeled earplugs.
- **Pre-formed or Modelled Earplugs:** These are small fiber plugs that are inserted into the ear and used in case of severe noise. They can be either disposable or reusable. Reusable plugs should be cleaned after use. Never use plugs which are used by somebody else.
- **Ear Defender or Earmuff:** These are used to cover the entire ear and connected to a band that fits over the top of the head. These are used when the noise is excessively high.

Hand Gloves



Hand Gloves

Function

These are used for protecting the hands from harmful and corrosive chemicals, extreme temperatures, sharp and contaminated objects.

For example:

- Nitrile gloves are used for protecting the hands against solvents, oils, greases, tar, acids, and alkalis.
- Gloves made of natural rubber or Latex are used for protection against contaminations and biohazard risks.
- Asbestos gloves are worn while dealing with extremely hot materials.

Safety Shoes



Safety Shoes

Function

- Woodworkers, who face a possible foot or leg injuries from the falling or rolling objects or from crushing or penetrating materials, should wear protective footwear.
- Safety shoes are used to protect the feet from heavy objects such as tools that might roll onto or fall on the workers' feet
- It is also used while working with sharp objects such as nails or spikes that could pierce the soles or uppers of ordinary shoes
- It also protects feet from hot, wet or slippery objects

Select and Use Appropriate Personal Protective Equipment Compatible to the Work and Compliant To Relevant Occupational Health and Safety Guidelines

Head Protection



Protection from potential head injuries is a key element of any safety program. A head injury can impair a worker for life or it can be fatal. Wearing a safety helmet is one of the easiest ways to protect the head from injury.

- Safety helmet is used to protect the head from falling objects and knocks, and risk of head bumping against fixed objects, such as exposed pipes or beams.
- It is also used to protect the head from accidental head contact with electrical hazards.
- It has an adjustable strap to ensure a snug fit.
- Some safety helmets come with attachments for ear defenders or eye protection.
- Safety helmets are meant to be worn directly on the head and must not be worn over any other type of hat.

Eye Protection



Woodworkers can be exposed to a large number of hazards that pose danger to their eyes and face. It is important to ensure that workers use appropriate eye or face protection if they are exposed to eye or face hazards.

- Eye protection is used to protect the eyes from dirt, wood dust, metal or wood chips entering the eye from activities such as chipping, grinding, sawing, hammering, the use of power tools at the wood workshop.
- It is also used to protect the eyes from molten metal, chemical splashes, chemical gases, harmful light radiation.

Some of the most common types of eye and face protection are:

- Safety goggles They are made of a durable plastic and used when there is a danger of dust getting into the eyes or a chance of impact injury
- Safety spectacles These are also made from a durable plastic but give less protection than goggles. This is because they do not fully enclose the eyes and only protect from flying debris.

Facemasks



- It is also made of durable plastic.
- Facemasks protect the entire face from flying debris.

Hearing Protection



Woodworking machines, such as a drilling machine, circular saw, etc. generate a lot of noise.

Short exposure can result in temporary hearing loss and continued exposure can result in permanent hearing damage. Wearing a hearing protector can prevent damage to the ears caused by very loud noise.

It is important to understand that hearing protectors reduce only the amount of noise that gets through to the ears.

Some types of hearing protection are:

- **Single-use earplugs** They are made of waxed cotton, foam, silicone rubber or fiber glass wool. They are self-forming and, when properly inserted, they work as well as most molded earplugs.
- **Pre-formed or molded earplugs -** These are small fiber plugs that are inserted into the ear and used when the noise is not too severe.

They can be disposable or reusable. Reusable plugs should be cleaned after each use.

Before inserting earplugs, make sure that your hands are clean.

Never use plugs that have been used by somebody else.

• **Ear defenders or Earmuffs** - These are worn to cover the entire ear and are connected to a band that fits over the top of the head.

They are used when there is excessive noise. They must be cleaned regularly.

Hand Protection



- Safety gloves are used to protect hands from cuts.
- There are several types of safety gloves and the correct type must be used for the task at hand.
- To make sure you are wearing the most suitable type of glove for the task, you need to look first at what is going to be done and then match the type of glove to that task.
- For example, wearing lightweight rubber gloves to move glass will not offer much protection, so leather gauntlets must be used. Plastic-coated gloves will protect from certain chemicals.

Safety Shoes



- Woodworkers, who face possible foot or leg injuries from falling or rolling objects or from crushing or penetrating materials, should wear protective footwear.
- Safety shoes are used to protect the feet from heavy objects, such as tools that might roll onto or fall on the worker's feet.
- It is also used while working with sharp objects such as nails or spikes that could pierce the soles or uppers of ordinary shoes.
- It also protects feet from hot, wet or slippery surfaces.

Respiratory Protection



Respiratory protection is used to prevent the worker from breathing in any dust or fumes that may be hazardous. The main type of respiratory protection in the wood workshop is the dust mask.

- Dust masks are used while working with hand saw, table saw, etc.
- They are lightweight, comfortable and easy to fit.
- They should be worn by only one person and must be disposed of at the end of the working day.

Undertake First Aid Activities In Case Of An Accident, if required and asked to do so

- First Aid is an emergency care or treatment given to an ill or injured person before regular medical aid can be obtained.
- Before administering first aid to a victim, one must check the category and degree of emergency and then apply the techniques duly.
- Stop and look at the scene and the person before responding.

- Ask yourself the following questions:
 - o Is the scene safe for you to enter?
 - o What happened exactly?
 - o What is the casualty?
 - o What is the category and nature of the emergency?
 - o Is the accident fatal for the victim?
 - o Is anyone else available at the place to help?
- Do the following if the victim is conscious and injury is not fatal:
 - o Ask for the victim's consent to administer first aid.
 - o Put on appropriate PPE, if possible.
 - o Interview the victim to ask basic medical questions, so that accurate information may be provided to the Emergency Medical Team, once it arrives.
 - o Conduct a thorough check for undetected injuries.
 - o Administer appropriate care and technique.
- If the victim is unconscious, try reviving the person by addressing him/her, rubbing shoulders, hands or the sole of feet.
- Fetch the AED and use it, along with Artificial Respiration.

4.1.6 Maintain Correct Body Posture While Standing and Working

While prescribing the correct body postures for designers, we must discuss the differences between Neutral and Awkward body postures.

- In neutral body posture, a person's body is aligned and balanced, at sitting, working or standing positions, thus imposing minimal stress on the body and keeping the joints aligned.
- Neutral postures lessen the stress exerted on the musculoskeletal system, thus promoting maximum control over the task and efficiency.
- On the contrary, awkward body postures move away from the neutral body postures, away from the comfort zone, towards the extremes in the range of motion.
- This exerts greater stress on the body's musculoskeletal system.
- Few examples of Neutral and Awkward body postures are:

1. Working with Hand Tools





Fig. 4.1.6.1: Proper Technique of Working with Hand Tools (Use Clamps)

2. Proper Technique of Lifting



Fig. 4.1.6.2: Improper Way of Lifting (May Cause Back Injury)



Fig. 4.1.6.3: Proper Technique of Lifting

3. Personal Safety Practices



Fig. 4.1.6.4: Wear Safe Boots, Don't Wear Sandals or Slippers

Lift, Carry or Move Heavy Wooden Furniture and Accessories from One Place to another Using Approved Safe Working Practices

The steps involved in correct lifting, loading, unloading and handling procedures are:

- 1. **Preparation:** One must prepare for lifting and handling the load, keeping in mind the following points:
 - The heaviness of the load

- If mechanical means like Hand Trucks are required to lift the load
- If the load can be broken into small parts
- The destination of the load and if the path is free of obstacles
- If there are closed doors on the way
- If PPE must be worn while handling the load
- If another person is needed to help with the load
- 2. Lifting: Lifting should be done by considering the following factors:
 - Staying as close to the load as possible for ensuring better grip
 - · Keeping elbows and arms close to the body
 - · Keeping the back straight by tightening the stomach muscles
 - Avoiding twisting and jerking motions while lifting
 - Asking for assistance if the load is too heavy for one person to lift
- **3.** Carrying: Carrying should be accomplished by considering the following factors:
 - One should turn by moving the feet around but not by twisting or turning the body
 - The carrier's hips, shoulders, toes, and knees should face the same direction
 - Rest and short breaks should be taken for some time if the carrier is too fatigued and stressed out
- **4. Settling Down:** Settling down needs considering these factors:
 - The load must be put down in the same way it was picked up, but in the reverse order
 - The carrier must bend at the knees but not at the hips
 - The load must be kept close to the body to ensure a firm grip until it is completely set down
 - Hold should be released only when the load is securely set down



Fig. 4.1.6.5: Steps of Lifting Weight (From the Left)

Handle All Required Tools, Machines, Materials & Equipment Safely

A. Safe Handling of Powered Tools

Before Using

- Appropriate measures should be taken to inspect the tool and the power supply. If the tool or any part/accessory is found defective, it must be either replaced immediately or removed from service and tagged appropriately as "Out of Service for Repair".
- Care should be taken that no defective tool must be used at any point in time.
- All repair and maintenance work must be accomplished by licensed and experienced persons.
- Before operating Powered Tools, the Instruction Manual must be read thoroughly.
- The guidelines and recommendations (by manufacturer) must be stringently followed, as per the Instruction Manual or Directions of Use.
- The tools must be grounded adequately with the help of a three-pronged plug (equipped with relevant 3-wired color coded cord) and double insulation. This helps in preventing electric shocks.
- All powered tools must be checked with a continuity tester or a Ground Fault Circuit Interrupter (GFCI), for effective grounding.
- Powered tools must be switched off before connecting them to a power supply.
- Powered tools must be switched off before connecting them to a power supply.

While Using

- Issues like a tool getting heated too soon or appearance of sparks must be inspected and rectified by a licensed electrician only.
- All power cords must be kept clear of tools and the path along which the tool will operate.
- Approved extension cords, with proper specifications, power requirement (for the tool) and dimensions must be used, to prevent overheating and fraying of the cord.
- Outdoor work must be done with the help of outdoor extension cords labeled with "W-A" or "W".
- Cords must be suspended over the work area to mitigate trips and falls.
- Octopus connections must be avoided by deploying a power bar or power distribution, comprising multiple receptacles plugs.
- While unplugging the tool from the socket, the plug must be pulled gently and not the cord. Forcibly pulling the cord leads to fraying and subsequent risk of electric shocks.
- The entire work area must be kept dry and away from heat, sharp edges, and oil, to avoid damage of insulation.
- Cords, instead of knots, may be looped, using a twist lock plug.

B. Safe Handling of Hand Tools

- The user must ensure that he/she is adequately trained in the secure usage of hand tools.
- Appropriate and accurate choice must be made on the right tool for the task.
- The user must deploy the correct techniques of handling and using the hand tools thus selected for the task.
- The user must operate hand tools by keeping the wrist straight.
- Hand tools must be thoroughly inspected before use and must be repaired immediately or replaced, whenever necessary.
- The user must ensure that handles of axes, hammers, saws, and chisels must fit tightly into the head of the tool, to avoid accidental injuries.
- One must always pull on pliers or wrench.

- Worn jaws of pliers, pipe tools and wrenches must be replaced immediately.
- All hand tools must be kept in a robust toolbox, in a clean and dry place, away from the work area.
- While using hand tools, one must wear appropriate PPE, according to the types of hazards involved in the task. This includes protective gloves of appropriate material, heavy aprons, safety goggles, and face shields.
- When not in use, sharp and cutting tools must be covered with appropriate sheaths to avoid injuries.

Adhere To Relevant Occupational Safety Policies While Handling Sharp Tools to Make and Install Furniture and Fittings

Occupational Safety Policies, while handling sharp tools, can be implemented via the Hierarchy of Control:

Elimination: Removing the sharp tool hazard completely from the work area

Substitution: Replacing the sharp tool hazard with a comparatively less hazardous one

Isolation: Isolate the sharp tool hazard by controlling general access or guarding it

Engineering Control: Redesign the sharp tool hazard to mitigate or remove the risk

Administrative Control: Encouraging safe working practices via policies, SOPs, and training

Sharps Management

- Classifying the broken bits from sharp tools as "Sharps"
- Disposing of sharps into the appropriate Sharp container
- Using appropriate PPE to safeguard oneself while handling sharp tools and broken bits

4.1.7 Different Risks Associated with Electrical Equipment

The risks associated with the use of electrical equipment are extended to both the user and his / her surroundings in the workplace, to people and properties alike. Few of such risks are:

- Fatal Electrocution accidents
- Non-fatal electric shocks leading to serious burn injuries
- Non-fatal yet severe shocks leading to damages caused to the internal tissues and vital organs like the heart and the brain
- Falls from ladders, cranes, and scaffolding and resulting mechanical injuries due to electric shocks
- Health issues like muscle spasms, nausea, unconsciousness, and palpitations
- Non-fatal yet painful static electric shocks
- Fire outbreaks and explosions caused by the sudden ignition of flammable materials

Perform Basic Safety Checks before Operation of All Machines, Tools and Electrical Equipment

- An assistant furniture designer must perform basic safety checks before operating all equipment as a part of the Standard Operating Procedures.
- Before starting with the basic safety checks, one must go through the Instruction Manual, Manufacturer's Recommendations and Directions of Use thoroughly.
- These documents are essential because one can find detailed and stepwise instructions about the maintenance and operating procedures as well as emergency shutdown and tag-out mechanisms in them.
- In case a machine or tool is marked with a lock or tag, it must not be removed and not used.

- Machines and tools, that are floor or bench-mounted, must be anchored or firmly clamped to a robust foundation, before maintenance operations.
- In case a machine does not have safety valves or guards on, one must not operate that for maintenance purpose.
- Check out for frayed out electric cables or loose live prongs in plugs.
- Ensure that power supply is off before one starts maintenance operations.

Health and Safety Practices at Work Place

- It is important not to bring drinks and food in the workplace
- As woodwork workshops are equipped with various types of power and hand tools. it is imperative that the workers wear less or no jewelry around the machines
- Ensure that the worker's proper fitting clothes
- Woodwork workshops should observe "No smoking" Regulations
- Everyone working or visiting the workshop should wear proper protective gears

Storage and Handling of Hazardous Substances

Follow Recommended Material Handling Procedure to Control Damage and Personal Injury

In order to ensure appropriate safety practices at the workplace, one must understand the importance of following the recommended material handling procedure to control damage and personal injury. The essentials of the same have been discussed below:

1. Biological

- Infectious and potentially infectious materials must be inactivated by bleaching or Autoclave Sterilization during storage and before disposal.
- Infectious waste must be inactivated within 24 hours and marked with "Biohazard" symbol.
- Appropriate PPE must be worn or used while procuring, handling and disposing of infectious materials.
- Non-infectious biological waste do not need inactivation but must be put away separately in a biological waste box lined with a red garbage bag
- Non-infectious biological waste include used but uncontaminated laboratory utensils, disposable clothing, and gloves
- Sharps waste (including metal lancets, hypodermic needles, scalpel blades, medical instruments for cutting and piercing), used and unused must be placed in red sharp boxes.
- Sharps boxes must be closed, when they get ¾ full.
- Closed Sharp boxes must not be stored for more than 30 days.
- Contaminated sharps must be autoclaved and inactivated before storing for disposal.
- Penetration-resistant gloves must be worn for handling and storing contaminated sharps.

2. Chemicals

- One must read all the information stated in the Material Safety Data Sheet (MSDS) before handling chemically toxic materials so that the user is aware of the hazards involved and the necessary precautions
- All storage containers must be appropriately and accurately labeled.
- Any incident of damaged container or illegible label must be reported to the concerned authority.
- One must ensure that incompatible material like Acetone and concentrated Nitric Acid, Molten Wax and Water are stored and used separately.

- To avoid destruction of containers, corrosive chemicals must never be stored in containers made of inappropriate materials.
- Containers of corrosive materials must be closed tightly.
- Appropriate PPE must be worn while handling toxic and corrosive chemicals.
- One must never consume anything while handling toxic chemicals and can do so only after thoroughly cleansing oneself with appropriate soap and solutions.
- Chemicals that produce a lot of fumes must be used carefully, enclosed in a Fume Hood.
- Flammable chemicals like alcohol, benzene, gasoline, Carbon disulfide, etc. must be handled only after turning off all sources of flame (burners, ovens, heaters, etc.)
- Flammable liquids must be only heated in a flask fitted with a Reflux Condenser; they must never be heated in open containers over open flames.
- While working with acids, one must wear acid resistant chemical gloves and clothing.
- One must keep emergency eyewash solutions handy.
- Dilution of acids must be done very carefully, by gradually stirring the concentrated acid into the water.
- Ethers must not be kept open and exposed to open air, because, this would create peroxides, which are highly unstable and may lead to violent explosions.
- All chemicals must be treated as a potential toxin and hence, one must keep appropriate antidotes nearby.

3. Radioactive

- Containers for storing radioactive materials or items contaminated with radioactivity must be labeled with "Nuclear" or "Radioactive Hazard" sign and the radioactive tape.
- Severely contaminated items must be stored and handled under specially designated Fume Hoods and Radioactive Materials (RAM) Hood.
- Lead is considered the most appropriate material to store and contain radioactive materials.
- One must never pipette radioactive materials by mouth.
- Radioactive waste cans must remain covered at all times and must be placed in enclosed, secluded areas, away from the working premises.
- Radioactive waste cans, if contaminated with substantial external radiation levels, must be provided with an additional shielding.
- While handling or storing radioactive materials, the work surface must be covered with an Absorbent Paper sheet to capture contamination.
- A separate set of equipment must be dedicated to handling and storing radioactive materials and must be labeled carefully with radioactive tape.
- Radioactive materials must never be left unsecured and unattended, even for a short span of time.
- One must never leave edible items open near radioactive materials.
- One must keep on surveying the skin of the wrists while handling radioactive materials.
- Long gloves and lead-lined protective clothing must be worn.

4. Flammable and Explosive

- Appropriate PPE, like disposable gloves (generally lead-lined latex or nitrile gloves) and close-toed shoes, must be worn while handling radioactive materials.
- Flammable materials must be contained, stored or transported in vapor-proof, metal or plastic
 containers and must be equipped with welded seams, spark/flame arrestors, pressure release valves,
 spring closing lids with spout covers, etc.
- Care must be taken that the flammable material does not react with the container material.

- Containers must be labeled with "Flammable" sign.
- The labeling comprises the following information:
 - o Name of the flammable material
 - Disclaimer that the contents are flammable
 - o Precautions to be taken, like the fact that the container should be kept away from open flames, spark and other sources of ignition
- Storage and transportation containers for flammable substances must remain closed, when not in use.
- Flammable gas cylinders must be stored in a separate room
- Cylinders must be fitted with appropriate valves so that they do not run the chances of leakage
- Parts of the cylinder, like valves, hoses, and container, must be checked regularly for damages.
- Compressed gases must never be stored along with or near bulk storage containers for flammable materials.
- Pieces of wood, straw, and hay, sawdust, paper, cardboard etc. must be cleared off as soon as they are procured during the Furniture & Fittings operations.
- Adequate care must be adopted to ensure that the entire work area is a non-smoking zone.

Importance of good housekeeping

Apply Good Housekeeping Practices at all Times

Housekeeping in a furniture workshop involves operations related to the maintenance and cleaning of the work area, tools, and equipment.

- Good housekeeping practices include, but are not limited to:
 - Clean/tidy work areas
 - o Removal/disposal of waste products
 - o Protect surfaces from erosion, corrosion, discoloring, disfiguring, tarnishing, molding, etc.
- Good housekeeping is required to avoid accidents like:
 - o Tripping over and stumbling across loose objects on cluttered floors, stairs, and platforms
 - o Bumping against unattended objects on raised platforms
 - o Slipping on wet, dirty and greasy surfaces
 - Getting burnt with corrosive chemicals
 - o Getting punctured and cut with sharps, jagged edges (like cut tin), unsheathed cutting tools, protruding nails, etc.
- Good housekeeping is associated with the following benefits:
 - o Easy flow of materials
 - o Reduced chances of workplace accidents
 - o Reduced employee exposure to dust, fumes, and debris
 - Enhanced control over tools, equipment and other elements of inventory
 - o Optimized productivity due to efficient maintenance and timely repair
 - o Improved workplace hygiene, leading to improved employee health and, in turn, productivity
 - o Efficient space management by eliminating clutters
 - o Improved preventive maintenance and subsequent decrease in chances of property damage

Report Accident/Incident Report to Authorized Personal

Reporting an accident/incident to an authorized person can be best done with the help of the Hazard Reporting form. The common format of the Hazard Reporting form is given below:

Part A: To be completed by the Worker

Details Required:

- · Name of Worker
- Designation
- Date of filling up the form
- Time of incident/accident
- Supervisor / Manager Name
- Work Location / Address
- Description of the hazard / what happened (Includes area, task, equipment, tools, and people involved)
- Possible solutions to prevent recurrence (Suggestions)

Part B: To be completed by the Supervisor / Manager

Details Required:

Results of Investigation (Comment on if the hazard is severe enough to cause an injury and mention the causes of the incident/accident)

Part C: To be completed by the Supervisor / Manager

Details Required:

Actions taken / Measures adopted (Identify and devise actions to prevent further injury, illness, and casualty)

Action	Responsibility	Completion Date

Unit 4.2: Dealing with Emergencies

Unit Objectives

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

- 1. Explain the organizational reporting protocol
- 2. State the various causes of fire
- 3. Describe the process to follow in emergency and evacuation procedures
- 4. Relate the various types of safety signs and what they mean
- 5. List the appropriate basic first aid treatment relevant to the condition
- 6. State the importance of safe lifting practices and correct body postures
- 7. List of names and the contact details of all the people responsible for health and safety in a workplace

4.2.1 Organizational Reporting Protocol

When you notice a hazard, you should report it immediately to your supervisor. Hazards can be reportedly verbal or by filling a simple form.

Hazard Report Form	
Name:	Date:
Location:	
Tool/Equipment:	
Description of the Hazard	
Suggestive corrective action:	
Signature:	
Supervisor's remark:	
Corrective action taken:	
Signature of Supervisor:	Date:

Fig. 4.2.1.1: Hazard Report Form

Follow Agreed Work Location Procedures In The Event Of an Emergency or an Accident

- Emergency procedures and related protocols vary according to the work locations and the nature of work.
- A worker must abide by the agreed work location procedures, in case of emergencies and accidents.
- A worker, on joining, must be adequately briefed on the occupational health hazards and the procedures to deal with the same.
- All agreed work location procedures must be standardized and laid down under Standard Operating procedures, commonly known as SOPs, for general access.

- Each case of emergency and accident must be reported appropriately, to concerned authority, by filling up relevant forms.
- Usage of first aid kit and fire extinguishers must be reported to concerned authority after each use.
- Any incident of an unlabelled chemical bottle, or waste container, or illegible label, must be reported to the Supervisor or concerned authority immediately.

State Methods of Accident Prevention in the Work Environment

One must stay aware and updated about the various methods of accident prevention in the work environment. Few of these are:

- Training In Health and Safety Procedures: One must be trained in the industrial health and safety
 procedures through drills and training sessions. Apart from the procedures popular in the industry, every
 organization has its own set of procedures and protocols. Those are laid down and standardized in the
 form of Standard Operating Procedures (SOPs).
- **Using Health and Safety Procedures;** Ergonomic practices, use of PPE, hygiene, and importance of good housekeeping practices must be promoted among workers.
- **Use of Equipment and Working Practices:** Proper use, storage, and maintenance of PPE, as well as medically recommended lifting, carrying and transporting practices must be taught and promoted among workers.
- Safety Notices, Advice; Instruction from Colleagues and Supervisors: Workers must always keep their eyes open so that they do not miss out on safety notices, advice and instructions being circulated around them. Such safety notices, plans and instructions are often displayed for general public access at prominent and common places at the workplace.

Potential Risks and Threats

On the basis of effects on individuals, Occupational Hazards can be broadly categorized into Health and Safety Hazards.

Examples of Health Hazards are:

- Carcinogenic factors
- Corrosive
- Toxic
- Irritant
- Factors that may lead to chronic and adverse effects on one's health

Examples of Safety Hazards are:

- Spills on floors
- Tripping hazards like loose cords and cluttered workplace Working from high or raised areas like ladders, cranes, scaffolds, rooftops etc.
- Unsafe and unguarded machinery and their moving parts
- Electrical hazards like live wires, lack of earthing, loose cables, frayed cords, wet and poorly insulated devices, etc.
- Inadequate space

How to Deal With an Accident Which Involve Human Life?

An accident that may lead to the loss of human life falls under the "Critical" and "Possible" categories of the Risk Assessment Matrix. Thus, considering the degree of severity, one may follow the below steps while dealing with an accident that involves the loss of human life:

- Turn off and stall the source of the accident. For example, in case a severe accident has occurred due to a running machine, the machine must be turned off and stopped first, to prevent other people from getting injured in the same manner.
- One must not panic and not allow anybody else to panic at the scene. Maintaining a calm and composed attitude is extremely crucial for bystanders.
- One must assess the severity of the accident and promptly decide if emergency services must be summoned.
- One must look over the accident scene carefully, to gather information for the emergency services personnel.
- One must take initiatives to keep the accident spot clear so that the victim(s) are not asphyxiated with lack of breathing air. Alarms may be raised, if possible, to notify and warn everyone else at the work area about the accident.
- Before approaching the victim for extending help and support, one must ensure that the spot and the victim's body is safe for one to touch and access. For example, in case of electrocution, the main power supply must be switched off before touching the victim's body.
- A seemingly unconscious victim may be revived to consciousness by rubbing the chest, artificial respiration or pinching the earlobes.
- Such a victim must be asked if he/she require any assistance.
- One must provide the best possible assistance to the victim, before summoning emergency services.
- The victim must not be removed from the spot (unless there are imminent dangers like fire or electrocution) before the arrival of the emergency team.
- The legs of a victim in shock must be raised to mitigate the impact.
- One must use encouraging and comforting words to help the victim in reviving.

How to Respond To an Emergency Situation?

An Emergency can be defined as "a serious, unexpected, and often dangerous situation requiring immediate action." Responding to an Emergency situation, while working at the site, involves the following steps:

Evaluating the Emergency

- One must remain calm and composed during an emergency situation because stress during an emergency complicates things and confuses a person.
- One must critically and rationally think and evaluate the severity of the emergency and determine, what requires to be done on an immediate basis.
- One must look for additional help by calling up the emergency toll-free number, which would help the caller reach an official or 'dispatcher'.
- The emergency dispatcher aims at providing immediate and appropriate help, depending on the nature and degree of emergency.
- One must help the dispatcher by answering his / her questions and providing the dispatcher with the accurate location and nature of the emergency.
- It is recommended that one should call from a GPS equipped phone so that the dispatcher is able to track the location, even if the caller is unable to speak.
- One must determine the nature of the emergency, i.e. if it is a medical, mental health or behavioral emergency.
- One must assess the immediate threats, for example, in case a person is severely injured from a running machine, the machine must be turned off immediately to prevent others from getting hurt as well.

Handling the Emergency

- Extremely high casualties must be reported to the Occupational Health and Safety Committee (OHSC).
- One must move farther from the emergency spot and help others do the same.
- Evacuation Plans must be adopted and Escape Routes must be taken.
- Secondary Hazards must be eliminated or mitigated, at least. For example, a car accident involves the risk of a violent explosion and fire outbreak resulting from spilled fuel.
- One must help the other victims and take appropriate measures to help the specially-abled ones.
- One must never feel guilty if nothing can be done to help the others.
- Once the emergency team arrives, it must be provided with all required and relevant information.
- In case nothing can be done to mitigate the severity of the situation, one must provide support to the others by comforting them, inquiring about their medical history, noting events as they occur, etc. These information may prove crucial for the emergency response team.
- A First Aid kit must be used, wherever applicable.
- One must try reviving a seemingly unconscious victim by rubbing the chest, pinching the earlobes, providing Cardiopulmonary Resuscitation (combination of chest compression and artificial respiration)
- One must avoid moving a severely injured victim and provide only the basic first aids.
- Only the emergency services can properly handle and move such victims.

Participate in Emergency Procedures

Raising Alarm:

- Fire Alarms can either have a "Break Glass" or a "Pull / Push" mechanism.
- In the "Break Glass" system, the glass sheet must be forcefully hit with a clenched fist.
- One must repeat the process until the glass breaks.
- In the "Pull / Push" systems, one must smash the glass first and then either pull down or push up the lever to raise the alarm.

Safe and Efficient Evacuation:

- Appropriate evacuation procedures must be adopted for general public and for specially-abled persons.
- Specially-abled persons must be helped to evacuate the place by providing them access to Wheelchairs and other aids.

Correct Assembly Point:

- Proper instructions must be given to the workers about the location of and the directions to the correct assembly point in the workplace.
- Information about this must be provided during mock evacuation drills and training sessions as well.

Roll Call:

- Once everybody has evacuated the building/workshop and arrived at the Assembly Point, Roll call or Head Count must be done.
- This is to ensure that nobody is left behind in the affected area.
- This must be done mandatorily to ensure that everybody within the premises is safe.

Correct Return to Work:

- Evacuation must be conducted in a very organized, streamlined and noiseless manner.
- Likewise, everybody, who had evacuated the workplace, must return to his / her respective locations/ positions / seats, following normal or emergency routes, depending on whether the situation has been restored to normal or not.
- Once everybody is back in place, another roll call is conducted.

Respond Promptly and Appropriately to an Accident Situation or Medical Emergency

- One must respond to an accident or emergency situation with a calm and composed mind.
- Presence of mind is very crucial under such circumstances.
- Medical help must be sought by calling the in-house medical team (if any), the Safety Committee, or the Emergency toll-free number.
- Appropriate first aid treatment must be administered to anyone in need, by a trained person/colleague.
- In case a victim cannot be adequately treated by first aid, and the emergency team is yet to arrive on the spot, the victim must be taken to the emergency ward of the nearest hospital.
- Ambulance services may be summoned by calling up the toll-free number for the same.
- The Environmental Health and Safety (EHS) department must be notified about the accident within 48 hours of the Supervisor being informed.
- Care should be taken that a seriously injured victim must not be moved and one must wait for the emergency team to arrive.

Comply With Restrictions Imposed on Harmful Chemicals inside Work Area during Working Hours

Few hazardous chemicals in the workplace are recommended for restricted and expert use only.

These chemicals must be stored in cool, dry and clean storage locations, in containers made of compatible materials and labeled with relevant Directions of Use, Precautionary Measures, Ingredients and Hazard Warnings.

Follow Electrical Safety Measures While Working with Electrically Powered Tools & Equipment

- Powered tools and equipment must be inspected for any damage, before and after every use.
- The power cord must be checked carefully for any fraying, faults, cracks or loss of insulation.
- Damaged switches must be reported to the supervisor and repaired immediately.
- Plugs must be checked for missing or faulty prongs/pins.

Demonstrate How to Free a Person from Electrocution

Electrocution, to put simply, is injury or death caused by electric shock. The following procedure must be adopted while freeing a victim from electrocution:

Approach

- The first step is to approach the spot to find out if you run the risk of electrocution as well.
- Summon help from a colleague, who is trained in treating electrocution victims.

Inspect

- Examine the accident scene to ensure if the source of electrocution is still active.
- Examine if the victim is still in contact with the source of shock.



Fig. 4.2.1.2: Approach The Victim And Inspect The Accident From A Safe Distance

Disconnect

- Disconnect the main power supply of the area.
- Avoid any electrical conductors in the surroundings.
- Touch the victim only if all power sources have been deactivated.

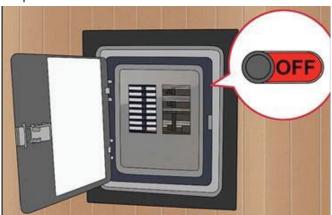


Fig. 4.2.1.3: Disconnect The Source Of Power

Insulate

- In case it is impossible to deactivate the power supply, the victim must be removed from the vicinity of the live power source.
- This should be done by wearing appropriate insulating PPE.



Fig. 4.2.1.4: Use Insulators To Approach The Victim Of Electrocution

Rescue

- The victim must not be removed in case of neck or spine injury.
- The area must not be crowded to allow sufficient breathing air.
- The victim's breathing rate and pulses must be checked.
- CPR may be incorporated if required.



Fig. 4.2.1.5: Perform CPR if Required

Recollect

- Never touch the victim or the surroundings without disconnecting the main power supply.
- Wear appropriate insulating gloves and shoes to protect yourself from electric shocks.

4.2.2 Various Causes of Fire

Various Classes of Fire

• Class K – fires related to cooking oil and greases like vegetable fat and animal fat.





• Class D – fires related to flammable metals (combustible material like aluminum, sodium, potassium, magnesium). These fires burn at extremely high temperatures and require special suppression agents.





Class C – fires related to flammable gases (energized electrical equipment like motors, appliances, transformers, propane, and methane). Electrical equipment such as appliances, wiring, and breaker panels, etc. These categories of fires become Class A, B, and D fires when the electrical equipment that initiated the fire is no longer receiving electricity)





• Class B – fires related to flammable liquids (paint, diesel, gasoline, petroleum oil, and pain)





• Class A – fires related to solid materials (wood, paper, cloth, trash, rubber and plastics, charcoal, etc.)





Causes

- Poor housekeeping: For example not disposing of wood dust or wood fragments regularly
- Smoking inside the workshop
- Broken socket and plug or flayed wires of power tools
- Using one socket for many plugs
- Not reporting your supervisor for faulty tools and equipment

Other causes are:

- **Common Fire Hazards** These include combustible and inflammable materials like waste paper, cardboard, wood, sawdust, hay, straw, liquid fuels, gas cylinders, etc.
- **Faulty Electrical Wiring -** This is one of the most common causes of fire outbreaks in the workplace. Faulty Electrical Wiring includes:
 - Out-dated and frayed wires and cables
 - o Misuse of portable heaters, which includes putting them extremely close to inflammable surfaces like upholstery, couches, chairs, desks, rugs, and carpets
 - o Misuse of Extension Cords by plugging in appliances into Extension Cords and not directly into outlets
 - Misuse of cords by letting them run under rugs (made of combustible fiber)
 - o Removal of the Grounding Plug from a cord, in order to use it in a two-pronged electrical outlet
 - o Installation of lamps and light bulbs with a wattage specification, too high for the existing outlets
- **Faulty Electrical Equipment** Short Circuit faults occur when the circuit in an electrical apparatus allows a current to travel along an accidental path with NIL or extremely low resistance.

- Short Circuit is caused by the internal breakdown of equipment, resulting in the deterioration of insulation.
- o Short Circuit is also caused by insulation failure due to lightning surges, overloading of equipment due to overheating, physical damage, etc.

Use the Various Appropriate Fire Extinguishers on Different Types of Fires Correctly

1. Water Fire Extinguisher

- Utilisation of these is on Class A fires
- These have RED labels
- Lift the extinguisher, aim it at the fire's base and use it in a sweeping motion

2. Water Mist Fire Extinguisher (Dry Water Mist)

- Utilisation of these is on Class C, B, A fires
- These have RED writing on WHITE labels
- Lift the extinguisher, aim it at the fire's base and use it in a sweeping motion



Fig. 4.2.2.1: Water Mist Fire Extinguisher

3. Powder Fire Extinguisher

- Utilisation of these is on electrical fires as well as classes A, B, C fires.
- These have BLUE labels
- Lift the extinguisher, aim it at the fire's base and turn it on.



Fig. 4.2.2.2: Fire Extinguisher

4. Dry Powder Fire Extinguisher

- Utilisation of these is on Class D fires
- These have BLUE labels
- Lift the extinguisher and aim it at the fire's base

5. Wet Chemical Fire Extinguisher

- Utilisation of these is on Class F fires in addition to class A and B fires
- These have YELLOW labels
- Lift the extinguisher, aim it at the fire's base and use it in slow circular motions

6. Foam Fire Extinguisher

- Utilisation of these is on Class A and B fires
- These have CREAM labels
- Lift the extinguisher, aim it at the fire's base and use it in a sweeping motion for class A and at the top of the burning liquid for class B.



Fig. 4.2.2.3: Foam Fire Extinguisher

7. CO2 Fire Extinguisher

- Utilisation of these is on Class B fires
- These have BLACK labels
- Lift the extinguisher, aim it at the fire's base and use it across the area otherwise, your skin can freeze

Different Type of Fire Extinguishers and their Use

An asdidtsnt furniture designer needs to be aware of the different types of fires that can occur and the emergency procedures applicable to their work environment. Especially while working with tools like a circular saw, bar clamp, etc., it becomes important that utmost care is taken for fire safety.

Few important firefighting tools are:

- Sand
- Non-flammable blanket
- Water
- Condensed aerosol fire suppression
- Foam
- Flame inhibitor liquids like Halon

- Fire extinguisher
- Dry powder
- CO₂



Fig. 4.2.2.4: Fire Extinguisher

- Halon 1211 (BCF); This is helpful in extinguishing fires of Class B, and A. this is highly effective as this extinguishant combines with oxygen molecule and makes inert gas. This smothers fire.
- Fire Blanket; These are best for extinguishing fire caught on clothes.
- Wet Chemical; The Wet Chemicals are helpful in extinguishing fires of Class B and A.
- Carbon Dioxide (CO₂): These are specialized extinguishant that is best for extinguishing fires caused due to electrical equipment.

Demonstrate the Correct Use of a Fire Extinguisher

The method of using a fire extinguisher is to follow P.A.S.S.

PASS is the acronym for:

- Pin (P)
- Aim (A)
- Squeeze (S)
- Sweep (S)
- 1. To use an extinguisher in a proper way, the first step is to pull the handle's pin
- 2. The next step is to aim the extinguisher's nozzle. The direction should be towards the fire's base. This is because the sprayed foam at the top will diminish or extinguish only the fire at the top. This will not serve the purpose for which the extinguisher is used. The burned down flame may spring up to life if it gets enough oxygen or any combustible material.

- 3. Then in an extremely controlled manner, you need to release the agent. This can be done by squeezing the trigger.
- 4. If you see in the second step, you already read that you should direct the nozzle at the fire's base. You will sweep the extinguisher's nozzle from left to right. Continue with this process until you put out the fire. You need to act fast as most extinguishers' discharge time is nearly 10-20 seconds.

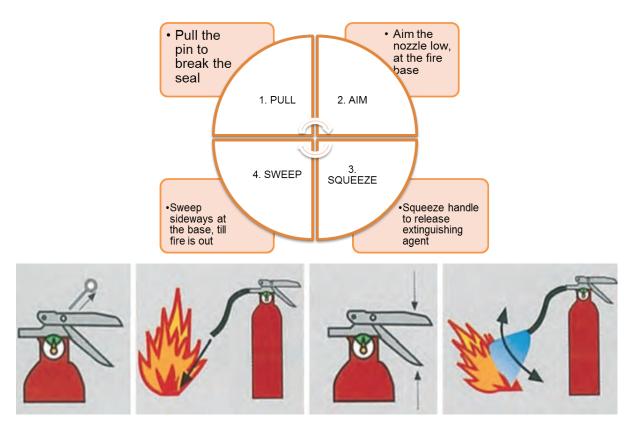


Fig. 4.2.2.5: PASS Technique

Techniques of Using the Different Fire Extinguishers

Water

- o After ensuring that the extinguisher is full (by checking if the Pressure Gauge is pointing at the green area), the Safety Pin must be removed, which in turn would break the seal.
- o For a fire spreading horizontally, the hose of the Water Extinguisher must be aimed at the base of the fire and the jet of water must be moved across the area of the fire.
- o For a fire spreading vertically, the hose of the Water Extinguisher must be aimed at the base of the fire, thus moving the jet gradually upwards, following the direction of the fire.
- o The lever must be gradually squeezed to discharge the extinguisher.
- o The user must move closer to the diminishing fire, gradually, applying the extinguishing agent at the same time.
- o The user must look out for any hot regions that may reignite.
- o The user must note that Water Extinguishers are suitable for Class A fires only.

Powder

- o After ensuring that the extinguisher is full (by checking if the Pressure Gauge is pointing at the green area), the Safety Pin must be removed, which in turn would break the seal.
- o For extinguishing fires from flammable solid materials, the hose of the Powder Extinguisher must be aimed at the base of the fire and moved gradually across the area of the fire.
- o For extinguishing fire from spilled liquids, the hose of the extinguisher must be must be aimed at the near edge of the fire and moved with a brisk sweeping movement, thus driving the fire towards the far edge till all the flames have been put out.
- o For extinguishing fire from flowing liquids, the hose of the Powder Extinguisher must be aimed at the base of the fire and be swept upwards until all the flames have been put out.
- o The lever must be gradually squeezed to discharge the extinguisher.
- o The user must move closer to the diminishing fire, gradually, applying the extinguishing agent at the same time.
- o The user must look out for any hot regions that may reignite.
- o The user must note that Powder Extinguishers are suitable for Class A, B and C fires only.
- o A Powder Extinguisher must be used differently, depending on the class of the fire it is being used on.

Foam

- o After ensuring that the extinguisher is full (by checking if the Pressure Gauge is pointing at the green area), the Safety Pin must be removed, which in turn would break the seal.
- o For extinguishing fire from flammable liquids, the hose of the Foam Extinguisher must be aimed at a vertical surface near the fire and must never be sprayed directly at the fire, to prevent the fire from being pushed and spread to the surrounding areas.
- o For using Foam Extinguisher on live Electrical Fires, it must be tested to 35 kV, keeping a safe distance of 1 km.
- o For putting out fire from combustible solid materials, the hose must be aimed at the base of the fire, moving across the entire area of the fire.
- o Foam Extinguishers are suitable for both Class A and B fires. However, the technique of application differs for both the classes.
- o Foam Extinguishers help in putting out fires by accumulating a thick foam blanket across the entire surface of the fire.
- o This built-up foam blanket prevents re-ignition of fire.

CO₂

- o After ensuring that the extinguisher is full (by checking if the Pressure Gauge is pointing at the green area), the Safety Pin must be removed, which in turn would break the seal.
- o While putting out fire from flammable liquids, the hose of the CO2 extinguisher must be aimed at the base of the fire and briskly move across the area.
- o The user needs to ensure that the CO2 jet does not splash the burning liquid.
- o For extinguishing live electrical fire, the power supply must be switched off, if it is safe to do the same, and then, the hose must be aimed directly at the fire.
- Adequate care must be taken to extinguish the fire completely since re-ignition is possible while using CO2 extinguishers.
- o These extinguishers are suitable for using on Class B and E fires. However, the technique of application differs for both the classes.

Wet Chemical

- o After ensuring that the extinguisher is full (by checking if the Pressure Gauge is pointing at the green area), the Safety Pin must be removed, which in turn would break the seal.
- o The heat source must be turned off.
- o The lance must be held at an arm's length from the body, thus maintaining a safe distance with the fire.
- o The nozzle, at this juncture, must be at least 1 m away from the source of fire.
- o The lever must be squeezed slowly to discharge the extinguishing agent.
- o The spray must be applied in gentle round movements, allowing the wet chemical to enter the fire gradually, thus preventing hot molten fats and oils from splashing on to the user.
- o The user must ensure that the entire fire has been extinguished, since wet chemical may instigate reignition.
- o These extinguishers are suitable to put out Class A, B and F fires.

Follow Appropriate Procedure in Case of Fire Emergency

Dos

- o Switch off the isolation switch to stop the electric supply. This will prevent the spreading of fire.
- o Use a wooden stick to switch off the isolation switch to protect yourself from electric shock
- o Check electrical sockets and switches to ensure there are no loose wires.
- o Use appropriate Fire Extinguishers to put out Fire.

Don'ts

- o Do not place combustible items like cotton waste oil soaked cotton or oil, near the brazing or electrical points. These are highly inflammable and even a small spark may start a fire.
- o Do not keep the LPG cylinder's regulator switched on.
- o Do not use water on electrical fires.

4.2.3 Emergency and Evacuation Procedures in Case of Accidents, Fires, Natural Calamities

For Fire Outbreak:

The emergency and evacuation procedures are:

- A clear passageway must be present to all escape routes.
- Signage like escape routes should be clearly marked.
- Enough exits and routes must be there for all people to escape
- Emergency doors, that open easily, must be present.
- Emergency lighting (Infrared lights for night and blurred vision) must be present.
- All people at the workplace must be given brief instructions about the positions of the escape routes.
- Brief instructions must also be given regarding the availability and use of fire extinguishers.
- The workplace must have a safe meeting point or assembly area for the staff.
- Nobody should use the Elevator during fire.

Correctly Demonstrate Rescue Techniques Applied During Fire Hazard

1. Responding to Fire

- The Fire Alarm System must be initiated and an alert must be raised.
- A safe evacuation path must be identified before dealing with the fire.
- The appropriate class of Fire Extinguisher must be chosen.
- The P.A.S.S technique must be adopted for extinguishing the fire.
- Immediate evacuation must be initiated if the extinguisher is exhausted and the fire still exists.
- Call the workplace security or the local emergency services.
- Summon the firefighting services at the earliest.
- Stay as far as possible from smoke, because smoke may comprise toxic gases.
- Cover your mouth and nose with a damp cloth to protect yourself. If possible, help your colleagues (those who are with you) to repeat the same.
- Look out for the nearest emergency exit routes and call out for people, who you can take along with you.
- While opening a door, first touch the door with the back side of your palm.
- Keep doors open, after you open them.
- Start moving out of the building and ask your colleagues to do so.
- Always use a staircase and not the elevator.
- Do not rush.
- As you move out of the building, gather people, whoever you come across.
- Always move downstairs and avoid returning to the burning premises, until the firefighters arrive.

2. Initiate Evacuation

- Stop your work but safely and without spreading panic.
- Gather and carry only the most important items like a cell phone.
- Leave the workplace through the nearest door bearing an "Exit" sign.
- Report to the designated Assembly Area.
- Await instructions from the Safety Committee.
- Incorporate first aid treatment to anyone in need.

For Natural Calamities / Disasters:

1. Earthquake

The emergency and evacuation procedures are:

- Quickly shutdown any hazardous operations or processes and render them safe.
- Notify others in the area by raising an alarm if they have not heard it while you are evacuating yourself.
- Exit the room.
- Take jackets or other clothing needed for protection from the weather.
- If possible, close windows and doors as you leave, but do not lock the doors and emergency exit routes.
- Exit the building, walk to the nearest safe exit route. Do not run. Do not use elevators.

2. Flood and Storms

The emergency and evacuation procedures are:

• Stay alert, avoid panicking and monitor the surroundings with eyes and ears open.

- Move to the high grounds and help others move before the flood strikes.
- Accumulate disaster supplies like:
 - o Canned, dry, ready-to-eat and packaged food, which do not require refrigeration or cooking
 - o Liquid cash
 - o Drinking water in clean containers
 - o First Aid Kit
 - o Essential clothing
 - o Flashlights
 - Adequate batteries
- Instruct people around you not to drive
- Do not walk or swim through flooded water
- Shut off the Mains Supply (electricity) at the circuit breakers
- Stay alert for evacuation calls and help people identify alternate routes of getting there

For Accidents:

The emergency and evacuation procedures are:

- Summon emergency medical help by calling up the Safety Committee officials or the toll-free number.
- Check and examine the site, to gather as much information (location, nature, and severity of injuries, casualty if any, hazards present, etc.) as possible, so that the same can be provided to the emergency team, once it arrives.
- One must inform the immediate supervisor about an injury or illness.
- If possible, workers may treat themselves to first aid or ask colleagues to do so.
- One must extend help and assistance to others.

Check and Ensure General Health and Safety Equipment Are Available at Work Site

Workers must ensure the availability of general and safety equipment like Fire extinguishers, First aid equipment, safety instruments and clothing (Personal Protective Equipment) as well as safety installations like neon-enabled and glowing fire exits, exhaust fans, etc. All such equipment must be in good operating condition and must be periodically maintained.

Inspection of Fire Extinguisher

- · Look for the locking pin if it is intact
- Inspect for an unbroken tamper seal
- Inspect it carefully for clogged nozzle, leakage, corrosion, and physical damage.
- Check the tag for last professional service date (it should be within the past 1 year)
- Lift the extinguisher to see if it is full or empty
- Look for the indicator or the pressure gauge carefully for operable range or position

Inspection of First Aid Equipment and Kits

- Look at the medical supply cabinet where all the required first aid kits are placed. See if all those are within their manufacturing date. If not, then it is best to replace those immediately.
- While checking the supplies, it is your responsibility to see the quantity of used first aid supplies. This will help you to be prepared for the future.

• Amongst the first aid equipment check for the ones that are dirty, soiled, or even damaged. You should also look for the ones that are partially soiled.

Inspection for Safety Instruments and Clothing

- You should carry out assessments to check the effectiveness and suitability of safety instruments and clothing
- Separate the working safety instruments from the damaged ones
- Keep the damaged products in a separate area with warning signs or safety cages

Demonstrate Good Housekeeping In Order to Prevent Fire Hazards

- The workplace must be freed from clutter and debris since these can act as fuels and are fire hazards.
- The entire workplace must be a "No Smoking" zone, thus designated with the help of "No Smoking Signs".
- Only designated areas, outside and far from the main work area, must be allowed for smoking.
- Fire Extinguishers must be maintained properly and refilled after use.
- Electrical faults may lead to fire and hence, any electrical hazards must be reported and attended to, immediately.
- There must be easy access to the Main Power Supply Control Panel so that electrical power can be switched off in case of electrical fires.
- All powered tools, machinery, and equipment must be maintained and inspected regularly by trained professionals, to prevent fire outbreak from overheating and friction sparks.
- Fuel containers, like Gas Cylinders and flammable oils, must be enclosed and stored separately, away from the main work area.
- Emergency exits, sprinklers, firefighting apparatus, emergency exits etc. must never be blocked.
- Materials must never be stacked as it can block the clearances and exit.
- All fire alarm systems and fire fighting equipment must be inspected regularly.



Do Not Stack the Waste Material at A Place; Dispose of It Regularly



Do Not Store the Waste Material Digging A Hole



Good Housekeeping Is an Essential Thing



Always Keep the Tools at A Safe Place



Use Waste Bins to Collect and Dispose the Waste Material



Always Keep the Sharp Objects like Nails, Screws at the Allotted Box; Don't Leave Them Scattered

4.2.4 Various Types of Safety Signs

The various safety signs are given below:

- Emergency escape route signs: To display emergency exits
- **Fire equipment safety signs:** To indicate the location of fire equipment and convey compliance with fire precaution regulations
- Prohibited Safety Signs: To indicate prohibited actions
- Supplementary safety signs: To indicate additional information to be followed by employees
- Safety equipment signs: To emphasize on the protective equipment to be worn

Prohibition Signs	
Image	Significance
	This is a sign to signify "No access for unauthorized person(s)" beyond a particular point
	This is a sign which indicates "Smoking and Naked Flaming" is disallowed in that particular area
	This is a "No Smoking" sign. No one should smoke in an area where this signboard is put up by the authority.
	This sign symbolizes "No pedestrian is allowed beyond this point".
	This symbol refers to the water which is not drinkable. The symbol, in short, implies "Not Drinkable Water".

Prohibition Signs	
Image	Significance
No. of the second secon	There are different classes of fire and each class of fire requires different extinguisher. The class of fire which are not extinguishable by water is denoted by this sign which signifies "Do not extinguish with water".

Warning Signs	
Image	Significance
	This symbol signifies "High Temperature or Flammable Materials".
	This particular symbol refers to the materials which are potential explosive. This symbol is called "Explosive Material" symbol.
	This is a symbol which is labeled on "Toxic Materials" as a precaution.
	This symbol refers to the substances which are corrosive and harmful to us. It damages the skin severely. This sign is embalmed on "Corrosive Materials".

Warning Signs	
Image	Significance
	This is a sign to signify the "Radioactive Materials". Radioactive materials are very harmful and can even cause death.
	This is "Overhead Load" symbol. In case of overloaded box/ crane/ crate, this sign is used.
	This sign refers to "Industrial Vehicle". The vehicles which are used only for the industrial purposes (for example transportation of goods) are labeled with the "Industrial Vehicle" symbol.
	This sign implies to "Electricity Danger". In case of high voltage, this sign is commonly used to beware the passers-by/ users/ workers.
	This is a "General Danger" sign. In case of "work in progress"/ "men at work", this symbol is used.

Warning Signs	
Image	Significance
	This is a sign to denote "Laser Beam Danger". Laser beams are harmful to us and exposure to laser beams may cause blindness.
	This sign refers to "Danger Drop". If a landing/floor abruptly ends or in case of low height of balcony wall/grill, this sign is used.
<u></u>	If there is any obstacle laid on the floor, the "Obstacle Ahead" sign is used.

Mandatory Signs

Here is a table of signs which are commonly used as a precaution for the workers. The utility of the signs is described in the "Significance" column beside the images.

Image	Significance
	Eye protection must be worn
	Safety helmet must be worn

Image	Significance
	Ear protection must be worn
	Respiratory equipment must be worn
	Safety boots must be worn
	Safety gloves must be worn
	Safety harness must be worn
	Face protection must be worn

Image	Significance	
	Safety overalls must be worn	

Emergency Escape Signs

- There are certain situations which are considered to be emergency situations.
- Fire, earthquake, flood, tsunami, civilian disturbance, riot, bomb threat are the examples of emergency situations.
- In these cases, people are prone to panic.
- However, panic deteriorates the situation.
- Therefore, every organization plans for emergency evacuation.
- At the time of emergency, workers should adjourn at the safe evacuation place.
- There are different signs (directions) used to guide the employees to a safe place.

The signs used for this purpose are as follows:



Go To The Left For Safe Evacuation



Go To The Right For Safe Evacuation



Go Down For Safe Evacuation



Go Up For Safe Evacuation

First Aid Signs

In every organization, first aid is mandatory. Especially, in the organizations that deal with different types of hand and power tools, first aid is compulsory. In the following table, the symbols and their significance are discussed.



This is a general symbol for first aid. Generally, this sign is used to denote first aid room, first aid box.



This is the "First Aid Stretcher" symbol. In case of accidents, where the victim is unable to stand up on feet and walk, first aid stretcher is used.



This symbol signifies "Eyewash".



This is a "Safety Shower" sign.



This is the "Emergency Telephone" sign. In case of accidents, when the first aid is required on an immediate basis, this telephone is used.

4.2.5 Basic First Aid Treatment Relevant to the Condition

Principles of First Aid

- Act calmly and logically.
- Be in control both of yourself and the problem.
- Be gentle but firm.
- Speak to the casualty kindly but purposefully.
- Build up trust through talking to the casualty throughout the examination and treatment.
- Avoid giving any misleading information.
- Never leave the casualty alone and continue to talk to him/her until the ambulance or doctor arrives.
- Continuously reassure the casualty.
- Send the casualty to a hospital or doctor by the quickest means of transport.
- Always inform the police about serious accidents.
- Inform relatives of the casualty.

Objectives of First Aid

- Preservation of life by the promptness of action
- Relief from pain
- Prevention of the worsening of illness or injury
- · Enhancement of chances of recovery
- Protection of the unconscious or semi-conscious

Appropriate Basic First Aid Treatment Relevant to the Condition

Importance of First Aid in emergency management can be elaborated through the following points:

For Heavy Bleeding

- Put pressure on the wound with whatever is available to stop or slow down the flow of blood.
- As soon as possible, call the Emergency Toll Free number or get someone else to do it.
- Keep pressure on the wound until help arrives.



Fig. 4.2.5.1: Treating Heavy Bleeding (Put Pressure On The Wound)

For Burns

- Cool the burn under cold running water for at least ten minutes.
- Loosely cover the burn with cling film or a clean plastic bag.
- Call and summon the Emergency Services if needed.



Fig. 4.2.5.2: Treating Burns (Cool The Burn Under Cold Running Water)

For Broken Bones

- Encourage the person to support the injury with their hand, or use a cushion or items of clothing to prevent unnecessary movement.
- Continue supporting the injury until help arrives.
- Call and summon the Emergency Services if needed.

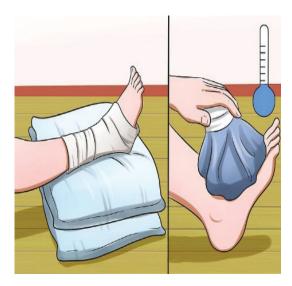


Fig. 4.2.5.3:Treating Broken Bones (Use A Cushion To Heal The Fracture)

For Heart Attack / Stroke

Think FAST.

Face: Is there weakness on one side of the face?

Arms: Can they raise both arms?

Speech: Is their speech easily understood?

Time to call Emergency helpline

Provide CPR (Cardiopulmonary resuscitation) as applicable.

• Immediately call medical/ambulance helpline or get someone else to do it.



Fig. 4.2.5.4: Cardiopulmonary Resuscitation

For Head Injury

- Ask the victim to rest and apply a cold compress to the injury (e.g. ice bag).
- If the victim becomes drowsy or vomits, call Medical helpline or get someone else to do it.
- Call and summon the Emergency Services if needed.



Fig. 4.2.5.5: Apply a Cold Compress to the Injury

For Electric Shocks

- Switch Off the Main Power Supply immediately
- Free the victim of his clothes

- Give artificial respiration and oxygen if needed
- In case of Burns, apply ice and burn cream and rush to the hospital depending on the severity of the burn
- Call and summon the Emergency Services if needed.



Fig. 4.2.5.6: Do Not Touch The Victim Of A Electric Shock Directly, Use Non-Conducting Materials

For Eye Injuries

- In case of chemical exposure, the eyes must not be rubbed. Instead, the eyes must be washed with lots of water. If the irritation/pain does not subside even after flushing the eyes continuously for 15-20 minutes, medical help must be sought.
- In case of a blow to the eye, the injured eye must be treated with a cold compress, without imparting any pressure to it.
- If the pain persists, accompanied by bleeding, bruising or impaired vision, one must seek medical help immediately.
- In case of a foreign particle in the eye, it must not be rubbed. Instead, the upper lid must be pulled down and blinking must be repeated, very briskly.
- One must rinse the affected eye with eyewash if itching or irritation from the foreign particle persists.
- If pain persists even after rinsing, the eye must be closed gently, bandaged lightly and medical help must be sought.



Fig. 4.2.5.7: Wash The Injured Eye Cleanly And Use Proper Eye Rinsing Elements

Essential Contents of a First Aid Kit



- Basic first aid notes
- Disposable gloves
- Resuscitation mask
- Individually wrapped sterile adhesive dressings
- Sterile eye pads (packet)
- Sterile coverings for serious wounds
- Triangular bandages

Essential First Aid Item

- Safety pins
- Small, medium and large sterile non-medicated wound dressings
- Non-allergenic tape
- Rubber thread or crepe bandage
- Scissors
- Tweezers
- A suitable book for recording details of first aid provided
- Sterile saline solution
- Plastic bags for disposal
- The name and telephone number of workplace first aid officers, and the phone number and address of the emergency services should be either in or near each first aid kit
- Reusable items, like scissors and tweezers, need to be thoroughly cleaned using warm soapy water or an alcohol swab after each use.

Besides these, adequate and medically prescribed oxygen supply must be help in hand at the workplace.

4.2.6 Safe Lifting Practices and Correct Body Postures

Safe Lifting Practices

As recommended by OSHA:

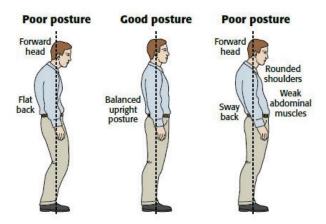
DOs

- Check the exact weight of an object before moving it.
- Always size up the load. Get help from others for heavy objects.
- Chose the flattest, straightest, and clearest route before your lift the object.
- If the load is wet or slippery, wipe it off before lifting.
- Make sure the weight of the object is stable and distributed evenly if possible.
- Stand close to the object with legs at a shoulder-width stance.
- Check your footing before you pull the load close to your body. Lift with your legs, not your back.
- Use material handling equipment whenever possible.
- When unloading, do face the spot you have chosen and lower the load slowly by bending your knees.

DONTs

- Never lift more than you can easily handle or without knowing the weight.
- Avoid twisting your body when lifting or when carrying.
- Never lift with a rounded back and straight legs.
- Never lift from an unbalanced position.
- Never carry a load that blocks your view or is big enough for the path you are following.
- Never look down when lifting.
- Never reach over your shoulders to lift. Instead, use a step stool or platform. If possible.
- Avoid heavy lifting if you have had previous joint injuries.
- Don't bend over to load or unload a heavy object, it may hurt your back.

Correct Body Postures



When we talk about the term "posture", we simply understand it as the correct positioning or alignment of the body with respect to the force of gravity.

Good posture is necessary not only for a healthy spine but also for overall health. Maintaining a good posture is essential as it supports your ligaments and muscles.

As an assistant furniture designer, there are times when you need to work for hours while sitting. Even in such situations, it is imperative that you maintain a correct posture. The ideal posture that should be on line comprises:

- Ankle bone
- Middle of knee
- Hip joint
- Tip of shoulder
- Back of your ear

You can clearly see this in the diagram (center)

To maintain appropriate posture, you should follow these aspects:

- Consider your head to be attached to an invisible string that is stretching you upwards.
- Refrain your body from slouching
- When you stand straight, see the aspect that your weight is distributed evenly to your feet's balls and feet.
- Try not to lock your knees.
- Attain a firm standing position by tucking your tummy (stomach) in.
- Keep your shoulders straight and back.
- Try to keep the chin tucked in, and your head held up.
- If you are standing for a long time, you can shift your weight from one leg to another.

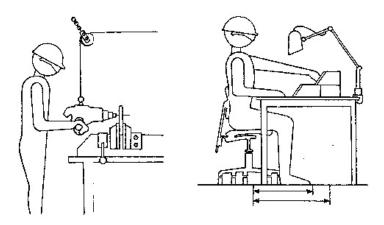
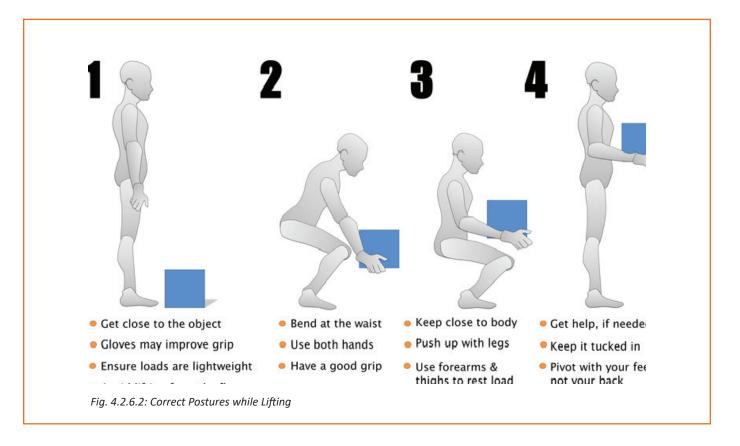


Fig. 4.2.6.1: Correct Postures

Again, there are also instances when designers have to fit various mechanical parts in a sitting position this work may take a few minutes or hours.

- To sit on a chair properly, you should:
- Rest your feet on a footrest or the floor
- Ensure that you are sitting in a comfortable position and your knees are behind your ankle
- Try to stop yourself from sitting with crossed leg
- Try resting your forearms on a parallel surface
- While sitting on the floor, you should sit straight without slouching your shoulder

In case of handling heavy materials, you should maintain this posture.



4.2.7 List of Names and the Contact Details Responsible for Health and Safety

- As an important part of the emergency management procedure, any workplace must elect a Safety Committee, which comprises responsible and senior people from all departments and teams
- This committee would act as the legislative body, the authority and the first point of contact for reporting any hazard, potential risks/threats and emergency situations in the entire workplace.
- This committee would also be responsible for conducting training sessions, safety audits, and drills, to help all employees prepare themselves for emergency and unprecedented situations.
- The list of the committee members, their designations and job titles, as well as contact numbers, must be listed and circulated among all staff members.
- The Safety Committee must comprise important members from the following departments:
 - Supervisor / Manager / Team Lead from each project
 - o Security Services
 - Reception / Front Desk
 - o Building Operations and Maintenance team
 - o Emergency Medical Services
 - o Counselling and Psychological Services team
- This list must be put up for easy display at prominent parts of the workplace in the form of an Emergency Escalation Matrix and must be updated regularly.
- Furthermore, this list must be mandatorily included in every First Aid kit available in the workplace premises, so that a person treating a victim with first aid techniques may summon additional help and report the accident.

Few Emergency Toll-free numbers are:

100	Police	
101	Fire	
102	Ambulance	
108	Disaster Management	
181	Women's Helpline	
1097	AIDS Helpline	
1098	Child Abuse Helpline	

Summary



- 1. Infectious and potentially infectious materials must be inactivated by bleaching or Autoclave Sterilization during storage and before disposal.
- 2. Containers for storing radioactive materials or items contaminated with radioactivity must be labeled with "Nuclear" or "Radioactive Hazard" sign and the radioactive tape.
- 3. Pieces of wood, straw, and hay, sawdust, paper, cardboard etc. must be cleared off as soon as they are procured during the Furniture & Fittings operations.
- 4. Fire outbreaks and explosions caused by the sudden ignition of flammable materials.
- 5. Have a clear idea of how much authority and responsibility you have to deal with security risks including your legal rights and duties
- 6. Reporting an accident/incident to an authorized person can be best done with the help of the Hazard Reporting form.
- 7. Loosely fitted clothes must be completely avoided because the loose ends may get caught in powered machinery and tools and may be fatal.
- 8. Conducting regular electrical inspections at the workplace by an experienced and licensed electrician
- 9. Materials must never be stacked as it can block the clearances and exit.
- 10. Never forget to use personal protective equipment at work.
- 11. Woodworkers can be exposed to a large number of hazards that pose danger to their eyes and face.
- 12. Single-use earplugs are made of waxed cotton, foam, silicone rubber or fiber glass wool.
- 13. A seemingly unconscious victim may be revived to consciousness by rubbing the chest, artificial respiration or pinching the earlobes.
- 14. All solvents must be stored in neatly labeled containers and provided with MSDS (Material Safety Data Sheets).
- 15. Short Circuit is also caused by insulation failure due to lightning surges, overloading of equipment due to overheating, physical damage, etc.
- 16. The Wet Chemicals are helpful in extinguishing fires of Class B and A.
- 17. Do not use water on electrical fires.
- 18. The P.A.S.S technique must be adopted for extinguishing the fire.
- 19. Good posture is necessary not only for a healthy spine but also for overall health.
- 20. On the contrary, awkward body postures move away from the neutral body postures, away from the comfort zone, towards the extremes in the range of motion.
- 21. Emergency procedures and related protocols vary according to the work locations and the nature of work.
- 22. Ambulance services may be summoned by calling up the toll-free number for the same.

–Notes 🗒 –	

_Exercise



Choose the Correct Option

1.	What should be administered in cas a) Saline Water	e of ingestion and inhalation? b) Activated charcoal	c) Milk
2.	The full form of PPE is: a) Personal Protection Equipment c) Professional Practice Examination		nt
3.	Reporting an accident/incident to a a) Accident form	n authorized person can be best done wi b) Supervisor	th the help of what? c) Hazard reporting form
4.	waste do not need inactivation but must be put away separately in biological waste box lined with red garbage bag.		
	a) Non-infectious biological A: Non-infectious biological	b) Atomic	c) Water-based
5.	Incorrect and irregular disposal of wa) Head injury	vood dust/wood debris can lead to b) Eye Injury	c) Bleeding Gums





Show and Explain Session

- This session will be in the form of "Show and Explain" activity.
- In this activity, the Trainer will bring few PPE (relevant to the job role and recommended by SME or Master Trainer) to the class and demonstrates the utility of each.
- The focus of this activity is to select and use appropriate Personal Protective Equipment compatible with the work and compliant with relevant occupational health and safety guidelines.
- To make the session interesting, the Trainer will show an image of the PPE and ask the students to identify it and their knowledge on that equipment.
- After the session, the Trainer will select a few volunteers from the class and makes them wear few PPE.
- This would further help the students to understand the use of these PPE.

Activity



Laboratory Visit Session

- In this activity, the Trainer will take the students to the laboratory.
- The main idea of the Trainer is to help the students by getting them introduced to the basic chemicals required in basic Carpentry, Furniture & Fittings operations.
- The Trainer or the Subject Matter Expert will recommend the chemicals to be included in the demonstration.
- Arrangement of those chemicals will be done by the Program Coordinator in advance.
- The Trainer, during the session, will explain the following:
 - o Purpose of the chemical in Furniture & Fittings operations
 - o Nature of the chemical and the hazards associated with it
 - o The PPE to be worn for handling the chemical
 - o Precautions to be taken while storing the chemical
 - Importance of following manufacturers' instructions and the job specifications related to the safe use of materials
- The students must jot down the crucial observations in the notebook.









5. Work Effectively with Others

Unit 5.1 - Interaction with Seniors

Unit 5.2 - Work Effectively



Key Learning Outcomes



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

- 1. State the process of interaction with seniors
- 2. Explain the importance of working effectively

Unit 5.1: Interaction with Seniors

Unit Objectives

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

- 1. Identify and report any possible deviations to appropriate authority
- 2. State the importance of effective communication and establishing good working relationships with other
- 3. List the different type of people that one is required to communicate and coordinate within the organization
- 4. Relate the importance and need of supporting co-workers facing problems for smooth functioning of work
- 5. List the various components of communication cycle
- 6. State the importance of discipline and ethics for professional success

5.1.1 Identify and Report Deviations to Appropriate Authority

Reporting Procedure in Case of Deviations

- Like any other job role, in any other industry, an assistant furniture designer is required and expected to abide by a specific reporting procedure, in case non-compliance or non-conformity occurs in any of the standard operating procedures.
- Non-compliance or Non-conformity occurs through Protocol Violations and Protocol Deviations.
- A Protocol Deviation is said to have occurred when there is a minor or moderate divergence from the sanctioned design, blueprint, and processes in the organization.
- Under such circumstances, one must alert certain personnel, holding designated positions, arranged and organized in the form of a hierarchy, known as the "Escalation Matrix".
- This Escalation Matrix is segregated into multiple levels and a case of deviation

Follow Escalation Matrix in Case of any Grievance

- Before complaining and expressing a grievance, be very clear of the objectives, i.e. why do you require to complain and what do you want to achieve in the long run
- Follow the Escalation Matrix for Internal Grievance Resolution
- At each level of the matrix, write an email to the designated official, according to the guidelines and formats provided.
- Follow up with the concerned official, if the complaint or grievance is not addressed within the standard TAT at that escalation level.
- Document all records of emails and phone calls, until the issue is duly addressed and closed.
- If the concerned official, at a certain level, does not address the grievance within the TAT, "escalate" and carry forward the issue to the next level.
- Repeat the process from 2-6.
- On resolution of the grievance, thank the concerned authority over phone or email, whichever is applicable.

Seek and Obtain Clarifications on Policies and Procedures, From the Supervisor or other Authorized Personnel

• If the designer has doubts about the organizational policies and SOPs, they can be clarified by the supervisors or other authorized personnel.

- Address the problems effectively and report if required to immediate supervisor appropriately.
- Identify and report any possible deviations to appropriate authority.
- Receive instructions clearly from superiors and respond effectively on the same.
- Accurately receive information and instructions from the supervisor related to one's work.

Seek Assistance from Supervisor or any Such Appropriate Authority as and When Required

- One's supervisor is supposed to be one's mentor and guide at work.
- Assistance and guidance must be sought from the supervisor whenever needed.
- Ask questions to clarify doubts.

Ask Questions and Seek Clarifications on Work Tasks Whenever Required

- Question must be asked to clarify doubt and to narrow down communication gaps with one's supervisor.
- This must be done to get a clear idea about the responsibilities expected by one's supervisor.
- Having a clear idea about one's tasks helps in fulfilling targets successfully.

5.1.2 Effective Communication and Establishing Good Working Relationships

A workplace is an area where people from different backgrounds and perspective come to work together. An individual working in an office doesn't work alone. He or she works with a team – colleagues, supervisor, trainer and others (as per requirement). In this case, good communication and mutual bonding make the workflow smooth and uninhibited. In fact, effective communication allows us to understand the problems that our colleagues are facing, and them to portray it clearly.

Effective communication

Ensures positive attitude

- o Communication amongst employees with a positive attitude ensures that change or the development is towards a prospective change (positive).
- o It also motivates the employees, thereby ensuring that they provide cost-effective, productive, and valuable services.

Ensures proper comprehension regarding strategy and goal accomplishment

- o It gives the employees the correct perception regarding their work.
- o It also makes sure that the employees know how their work is directly influencing the profitability of the company
- o It gives employees the true impression of working as a team

Ascertain that everybody complies with company's regulatory bodies

- o Talking with colleagues and sharing information on any new updates on company policy or project ensures that everyone stays on the same page.
- o Added to this, this makes the team more responsive and positively engaged in the work.

Components of Effective Communication

Effective Communication is a two-way information sharing process which involves one party sending a message that is easily understood by the receiving party. An assistant furniture designer with effective communication skills can work more efficiently and earn appreciation more commonly.

- Oral/Verbal Communication
- Clarity & Concision
- Confidence
- Respect
- Non-Verbal Communication
- Politeness & Precision
- Empathy
- Right Medium
- Active Listening
- · Open to Feedback

Types of Communication

- Verbal or Oral Communication: Involves the use of language spoken verbally or orally to convey messages
- Written Communication: It involves the art of writing to convey messages. This includes letters, emails, reports, etc.
- Non-verbal Communication: Involves the use of Body Language and gestures to convey messages

Barriers in Communication

- The following factors hinder Effective Communication and are hence called "Barriers".
- Use of Jargon and Technical terms
- Lack of attention, interest, distractions, or irrelevance to the receiver
- Differences in Perception
- Physical disabilities like Hearing Ailments or Impaired Speech
- Cultural & Language Differences and Unfamiliar accents
- Expectations and prejudices leading to false assumptions or stereotyping

5.1.3 Type of People that one is required to communicate and Coordinate

A designer must communicate and coordinate not only with clients but with peers and supervisors in the organization as well. The elements of communicating effectively with clients, peers/colleagues and supervisors are:

- Effectively communicate with team members and customers
- Manage Expectations
- Write and Speak Persuasively
- Listen to your audience reframe communication if needed
- Deliver the message clearly
- Watch your tone
- Communicate effectively with team members, supervisors, managers etc.

5.1.4 Importance and Need of Supporting Co-Workers Facing Problems

Team Work is extremely crucial for successfully carrying out an assignment. An important aspect of effective teamwork is supporting co-workers facing problems, for ensuring smooth functioning of the assignment. Supporting a co-worker is vital because:

- **Confidence:** Going out of one's way to help and support co-workers will have a marked effect on their confidence and give them a sense of pride in their work, but it is likely to improve engagement, productivity and eagerness to maintain high standards at the workplace.
- **Improved Communication:** If you are supportive and friendly towards a colleague, he/she will see you as an approachable person, hence marinating smooth communication and increasing productivity.
- Team Spirit: A supportive environment undoubtedly leads to a better working atmosphere. It helps in
 creating a sense of community and team spirit, which works as a reminder that everyone is striving towards
 one unified goal.
- **Support from a grateful co-worker, in return:** To repay your support and help, the colleagues, who you helped and supported, will help you in your work, as a token of gratitude.

5.1.5 Various Components of Communication Cycle

- Aim
- Formulate/Encode message
- Transmit/Deliver message to Receiver
- Receive Feedback from receiver
- Decode, Analyse and Act
- Ask question to sender to clarify doubts if message is still not clear

Importance of Active Listening

Active listening is the process by which an individual secures information from another individual or group. Active listening:

- Reduces negative assumptions
- Innovative solutions
- Enhances Confidence
- Ensures better Learning
- Does not allow any conflicting issue to develop amongst colleagues
- Enhances Relationships
- Accuracy
- Better Productivity
- Trust formation
- Building respect amongst colleagues

5.1.6 Importance of Discipline and Ethics for Professional Success

The importance of Discipline and Ethics is to achieve professional success can be elaborated with the help of the following elements. These are known as the pillars of workplace discipline and ethics:

Professionalism

- Defined as the competence or skill expected of a professional
- Emphasizes the importance of Grooming, which adds to one's confidence level and enhances personality
- Emphasizes the importance of Effective Communication Skills and strong Interpersonal Skills, which help the person in carrying out activities in a team

Respecting others

- Emphasizes appreciating and admiring other colleagues for their contribution towards a task
- Emphasizes the need of complimenting
- This helps in boosting team spirit and improves work culture

Reliability and Accountability

- Measurement of how responsible a worker is towards his / her job role and assigned tasks
- Dedication and Determination
- Measurement of how focused, committed and sincere a worker is towards the job role and responsibilities

Integrity

Having honesty and strong moral principles are very crucial for a worker

Humility

One must be formal, firm, yet cordial, polite and humble while dealing with peers and colleagues

What Constitutes Disciplined Behavior for a Working Professional?

It is important that a working professional leads a disciplined personal and professional life. Here are some of the important aspects that will demonstrate responsible and disciplined behaviors at the workplace that every professional should abide by.

- The workers should abide by the company rules, policies and regulations
- They should be compliant to the contract terms related to employment
- The professionals should be punctual to work
- In case the workers take leaves, it should be after taking permission
- Adherence to safety instructions that are set by the organization
- Fulfilling the given task effectively
- Ensuring that the company property is well maintained

Expressing and Addressing Grievances Appropriately and Effectively

Grievance, according to the Dictionary, is "a complaint or a strong feeling that one has been treated unfairly".

1. Follow Escalation Matrix In Case Of Any Grievance

- Before complaining and expressing a grievance, be very clear of the objectives, i.e. why do you require to complain and what do you want to achieve in the long run
- Follow the Escalation Matrix for Internal Grievance Resolution
- At each level of the matrix, write an email to the designated official, according to the guidelines and formats provided.
- Follow up with the concerned official, if the complaint or grievance is not addressed within the standard TAT at that escalation level.
- Document all records of emails and phone calls, until the issue is duly addressed and closed.
- If the concerned official, at a certain level, does not address the grievance within the TAT, "escalate" and carry forward the issue to the next level.
- Repeat the process from 2-6.
- On the resolution of the grievance, thank the concerned authority over phone or email, whichever is applicable.

2. Addressing Worker's Grievance (for the team lead or supervisor; but in here the assistant furniture designer)

- Hold a formal yet private meeting with the worker.
- Acknowledge the grievance and empathize.
- Maintain confidentiality of the entire matter.
- Invite witnesses, if deemed absolutely necessary.
- Depending on the complexity of the grievance, continue with further investigation.
- Gather information to support your decision.
- Take the final decision.
- Convey your decision to the worker.
- Escalate the matter to the immediately next level, if the worker is not happy with the decision taken.

3. Addressing Client's Grievance

- Do not contradict with or prevent the client from talking.
- Listen actively and patiently.
- Apologize (even if you are not wrong) and empathize with the client.
- Listen to the grievance/complaint with an open mind.
- Promise that you will get back to him/her with a permanent solution, at the earliest.
- Keep your promise and respond to the client with a solution within the standard TAT.
- If you are unable to resolve the issue on your own, escalate the same to your next level.
- Follow up with the concerned officials till the grievance is addressed and the issue resolved.
- Inform the client over email or phone that his / her grievance has been taken care of.

Importance and Ways of Managing Interpersonal Conflict Effectively

Interpersonal Conflict can be defined as a serious quarrel or disagreement between two or more persons. Conflict Management is extremely crucial in maintaining a good work environment and the standard productivity of the organization.

The five stages involved in resolving a conflict are:

• Identifying a safe place and time to talk

- Clarify individual perceptions involved in the conflict
- Arranging for a discussion with witnesses, if required
- Adopting an active and empathetic listening approach
- Searching for options with the aim of a win-win outcome
- Arriving at a conclusion agreed upon by all parties in the conflict

The common strategies involved in managing Interpersonal Conflict are:

- Collaborating
- Accommodating
- Avoiding
- Competing
- Compromising
- Forcing

Unit 5.2: Work Effectively

Unit Objectives

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

- 1. State the responsibilities and objectives of the role
- 2. Relate the principle of furniture and fittings manufacturing and installation
- 3. State the importance of working effectively with others to achieve organizations goals
- 4. Analyse and share information with team to enhance quality and productivity at workplace
- 5. Demonstrate how to keep work area clean and tidy and its importance

5.2.1 Responsibilities and Objectives of the Role ____

Objectives

The objective of a furniture designer is to contribute their technical and creative skills to design modern and latest furniture used by both residential and corporate clients.

Responsibilities

Amongst the various responsibilities of an assistant furniture designer, the prominent ones include:

- Preparation of freehand design and sketches of various furniture types
- · Creating a prototype and seeking approval from management and customer's side
- Designing customized furniture pieces or sets as per the requirement of the clients
- Creating schedules, estimates, and budgets for different types of projects
- Using AutoCAD and different types of 3D designing software for creating realistic looking furnishing designs
- calculating the available furniture space after site inspection and suggesting the appropriate type of furniture that can sit fit in that area
- Maintaining and repairing old furniture to give those an upgraded and modern look

Own Roles and Responsibilities

Roles: Creativity is an important aspect that is required as the chief element in an assistant furniture designer. The individuals' designs should have the perfect balance of aesthetic appeal as well as modern and innovative designs. When we talk about the role of an assistant furniture designer, in times of requirement, the person may have to act as:

- Sales person
- Production manager
- Maintenance engineer
- Designer
- Buyer of raw materials
- Accountant

Responsibilities

The responsibility of an assistant furniture designer is not limited to the creation of various furniture designs. There are times when he or she has to act as like-minded craftspeople (assembler, carpenter, etc.). There are various tasks that come as the responsibilities of the furniture designer.

Some of the relevant ones are:

- Studying about the types of modular furniture that are in trend
- Researching more about furniture and making proper planning regarding its designing process
- Looking out for ways to upgrade furniture that are already manufactured or they may have sold to customers
- Before starting with the first draft of the designing work sitting with the client for their requirement and feedback
- Choosing the appropriate material for furniture making
- Taking the help of CAD (computer-aided design) to generate sample designs, hard prototypes, sketches, card models, etc.
- Understanding the project in a better way and taking the complete advantage of the various software packages like Photoshop, Solid Works, Inventor, and AutoCAD
- Liaising with production department staff like design engineers, marketing staff, production managers, and craftsmen
- Knowing more about the required tools, finished furniture items, and raw materials to complete the given project

5.2.2 Principle of Furniture and Fittings Manufacturing and Installation

The principles of Furniture and Fittings Manufacturing and Installation comprise the following:

Knowledge about:

- o The various organizational processes, rules, codes, guidelines and standards and escalation hierarchy and matrix
- o The statutory responsibilities under organizational legislation and regulations
- o Information about the organization clients
- o The various types of designs of the products
- o The about assembly process/product line
- o The proper disposal system for waste and by-product

Adherence with:

- The relevant safety and security procedures to be followed
- The organization procedures and formalities to be completed during work

Knowledge of:

- o About furniture making terminology, abbreviations, symbols, dimension matrix etc.
- These have been explained in details in Chapter 2.

Importance of Having Correct Understanding of Work Task and Objective

An assistant furniture designer must understand the client's requirements thoroughly and have an appropriate and correct understanding of the work task, in terms of:

- Objectives of the task/assignment
- Specifications as per the Blueprint and AutoCAD drawings
- Phase-wise feedback on the task provided by the client
- TAT adherence, in terms of phase-wise and final delivery of the finished products
- Working with the sole aim of putting in one's best efforts to abide my all client requirements, thus, in turn, completely satisfying the client and earning appreciations
- Ensuring that there is no communication gap between the designer and the client in understanding requirements and specifications. This can be done by providing the client with daily or weekly (as prescribed by the organization) updates on the different phases of the assignment

Applicable Quality Standards for Assigned Work Task and Objective

Quality, according to the ISO 8402-1986 standard, can be defined as "the totality of features and characteristics of a product or service that bears its ability to satisfy stated or implied needs".

An assistant furniture designer must implement the applicable quality standards for the assigned work task via a well-known mechanism called Quality Control or QC.

The primary objectives of Quality Control and management are:

- Eliminating gaps between the specifications of the accomplished tasks and the client's requirements, thus ensuring that the worker has fully understood the client's requirements
- Eliminating chances of product recall (return of the delivered product consignment, partially or wholly, to the workshop, by the client)
- Identifying defects in the process of assembly and installation
- Identifying defects in the products (work-in-progress stage)

All quality control and management standards, across industries and across nations, are based on the principles developed by an autonomous body called the International Organization for Standardization commonly known as the ISO.

The seven Quality Management principles (QMP) directed and standardized by the ISO 9000: 2015 and ISO 9001:2015 are:

Customer Focus

- Recognizing the needs of existing and potential customers
- Exceeding customer expectations

Leadership

- Setting up mission, vision and goals for the organization and the team
- Empowering team members
- Adhering to all aspects of quality

Engagement of People

- Utilizing and appreciating people's abilities and contributions
- Encouraging knowledge sharing, learning and upgradation of skills

Process Approach

- Dividing and conquering an assignment / project by breaking it down into small tasks
- · Utilizing resources optimally

Improvement

• Aiming for continual improvement (KAIZEN)

Evidence-based Decision Making

- Taking apt and correct decisions on time, to save time and money
- Supporting decisions with adequate evidence and data

Relationship Management

- Efficient Vendor Management to manage costs, allocate resources and create values
- · Identifying clients and vendors as 'Partners' to secure long term relationships

Few ISO standards, related to the Furniture & Fittings industry are:

ISO 21015:2007 Workplace Chairs		Method of testing the stability, strength and durability	
ISO 24496:2017 Workplace Chairs		Determination of Dimensions	
ISO 21016:2007	Workplace tables and desks	Method of testing the stability, strength and durability	
ISO 3055:1985 Kitchen Furniture and Equipment		Coordinating and organizing sizes	
Chairs, tables and desks for educational institutions		Functional Sizes	
Storage Units (commercial and domestic)		Method of testing the stability, strength and durability	

5.2.3 Working Effectively with Others to Achieve Goals

It is a common yet important saying that "United we stand, divided we fall". An assistant furniture designer must work effectively with the other members in the team to achieve the common organizational goals and targets.

1. Best Practices in the Industry

- Knowing the areas of strength of each team member and assign roles accordingly
- Discussing but never argue
- Think out-of-the-box to impart creativity amidst chaos
- Accepting and learning from mistakes

- Sharing a common mission and vision to align oneself and the team with the organization targets
- Staying alert, humble and polite
- Respecting diversity and differences
- Listening attentively and actively
- Staying precise and curt while communicating
- Avoiding backstabbing and gossips
- · Apologizing for mistakes committed by oneself
- Avoiding jargons and explaining technical concepts, using real-life examples
- Sharing, exchanging and transferring knowledge
- Abiding by discipline and decorum

2. Principles of Team Work

T.E.A.M - Together Everyone Achieves More.....

- Team work is defined as the "actions of individuals, brought together for a common purpose or goal which subordinates the needs of the individual to the needs of the group".
- Each person on the team puts aside his or her individual needs to work towards the larger group objective. The interaction among the members and the work they complete is called teamwork. Team work i extremely important for the Field Technician to accomplish hi job responsibilities efficiently.
- The sum of the efforts undertaken by each team member for the achievement of the team's objective is called team work.
- Every member in a team has to perform and contribute in his best possible way to achieve a common predefined goal.
- Individual performances do not count in a team and it is the collective performance of the team workers which matters the most.

3. Benefits of Team Work

- Promotes Creativity and Learning
- Combines Complimentary Strengths
- Builds Trust
- Teaches Conflict Resolution Skills
- Promotes a Wider Sense of Ownership
- Teaches Effective Risk Management

4. Components of Team Work

- Effective Communication
- Active Listening
- Resolving Conflict
- Diversity
- Motivation

5. Dos and Don'ts of Effective Team Work

- Dos:
 - Be willing to collaborate
 - o Keep an open mind towards learning from other team members
 - o Control your ego
 - o Step up to be a leader and step down to be a team member when needed

• Don'ts:

- o Don't take things personally
- o Don't underestimate a team member
- o Don't get involved in gossip and grapevine conversation
- o Don't show your back to criticism

Coordinate and Cooperate With Colleagues to Achieve Work Objectives

- · Listen actively with minimal barriers
- Build trust, but do not get too casual
- Be aware of your tone
- Watch your body language
- Participate and coordinate
- Ask questions to clarify
- Discuss task lists, schedules and activities
- Share best practices with peers

Display Courteous Behavior at all Times

- Come what may, one must always display courtesy to clients, supervisors and colleagues alike.
- This must be practiced to secure long term working relationship with them.

Respond Politely to Customer Queries and other Team Members

- Customer Centricity is one of the most vital personal attributes that an assistant furniture designer must have, since a designer must interact with innumerable clients in daily life.
- A client may have several doubts and queries, which the assistant furniture designer must listen proactively and clarify politely.
- By responding politely to all queries of clients, an assistant furniture designer fulfils the following:
 - o **Understand customer requirements and time lines and respond as per their needs** Answering customer's queries helps in understanding the task requirements very clearly. This, in turn, helps in working with less confusion and interruptions and in delivering the task perfectly on time.
 - o Being courteous with customers and ability to handle different types of customers Different customers have different types of nature. The nature of customers can range between being very polite to extremely demanding and critical of whatever you do.
 - Being aware of different customer cultures / faiths and responding appropriately Irrespective of the culture, colour, nationality, creed and economic status, a customer is always the King for an Assistant Furniture Designer.

Respecting diversity implies that Customer Centricity should be practised irrespective of the customer's background. A designer must always remain neutral and truly professional while dealing with customers from diverse backgrounds.

- o Work and deliver output as per client requirement and satisfaction The end result of any project is ultimate client delight. Meeting client's requirements about a project and exceeding the client's value expectations help in retaining a client and earning his / her loyalty.
- This behavioural trait must not only be practiced with one's clients but also with the other team members as well.

Follow Work Place Dress Code

Workplace Dress Codes are of utmost importance. Being an assistant furniture designer you have to meet with client often. During those interactions regarding design approval or required changes in the software generated models, the clients get the chance to meet their furniture in person. The other important aspects include:

- Dress code helps a person in identifying himself or herself as an inseparable component of the organization.
- Maintaining the dress code helps in strengthening the security of the organization.
- Dress code mandates that only authorized persons are allowed to access and control the premises.
- Adhering to the organization's dress code is an important part of Work Ethics in the work area.
- It is best to dress appropriately (clean and formal clothes, combed hair, trimmed nails, brushed mouth and polished shoes)

Adhere to Time Lines and Quality Standards

- Deadline, TAT adherence and quality assurance are important aspects of project management.
- While working on a project, one must maintain a borderline between the delivery time and the quality standards required by the client as well as directed by the organization.
- It is important to deliver the project on or before the deadline, but care must be taken that one does not deviate from the client's specifications and quality standards.

Follow Organizational Policies and Procedures

- A good employee is expected to respect and follow the organizational policies and procedures.
- Such policies involve adherence to Standard Operating procedures, safety guidelines, Instruction manuals, HR policies etc.
- Adherence to and respect for the organizational mission and vision are mandatory to align a person with the organizational goals and targets.
- Following organizational policies and procedures make a person an integrated part of the organization, thus making him / her family member.

Keep Work Area in a Tidy and Organized State

- Control dust and debris
- Clear clutter and spills to avoid slips, trips and falls
- Follow a specific frequency of cleaning operations
- Maintain a written set of guidelines on cleaning and tidying the work area, in the form of SOPs (Standard Operating Procedures)
- Store tools and equipment appropriately, in their designated storage locations
- Store and maintain PPE appropriately
- Effectively move waste materials to designated locations and treat them duly

5.2.4 Share Information with Team to Enhance Quality and Productivity

- A team must follow a very effective and strong communication cycle.
- Accurate and undistorted information must be shared with the team, so that all members in the team are perfectly aligned with the task requirements and expectations.
- Sharing accurate information eliminates communication gaps between the designer and the other members in the team.
- This is also effective in managing emergency situations since it is very crucial to impart accurate and appropriate instructions while handling such circumstances.

Work Together with Co-Workers in a Synchronized Manner

- An assistant furniture designer must be an excellent team player because it is practically impossible to accomplish a project or task without proper synchronization.
- The various stages in a project must be treated discretely and yet there must exist a seamless link or flow between them, in other words, synchronization.
- The deadline for delivery of the entire project can be met only if each component of the project is delivered on time.
- The outcomes of each stage of a project become the inputs to the next one and the process must continue in a synchronized manner until the final product is obtained.

Communicate With Others Clearly, At A Pace And In A Manner That Helps Them To Understand

The foremost thing regarding giving clear information is respecting the audience. When you communicate and put forth the information to the listener, you should be clear about the message that you would be giving to them

The next aspect is to stick to the instruction that you want to give to the workers working in the furniture workshop.

Information exchange makes the process of imparting information smoothly. If the speaker knows what they want to convey, they should also know what the audience is grasping. This decreases the chance of confusion as the listener gets the opportunity to ask about the instruction or about correct selection of tools and clearing their doubts then and there.

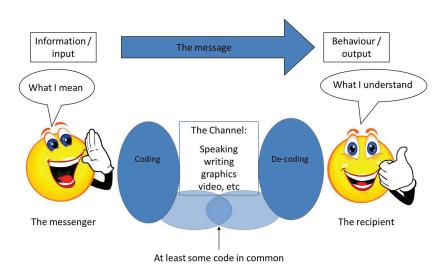


Fig. 5.2.4.1: Clear information Exchange

Show Respect To Other And Their Work

- Appreciation for other team members works as "Positive Reinforcement", i.e. it encourages and rewards them for their performance and contribution towards the project.
- Appreciation for others in the team promotes mutual respect, which is one of the most important aspects in good team work.
- Showing respect to others would imply that one shall earn respect and appreciation in return.
- Thus habit promotes collaboration in a team to boost productivity and improve quality of work.

Display Active Listening Skills While Interacting With Others at Work

The steps involved in Effective and Active Listening are:

- · Facing the speaker and maintaining an eye contact
- Attentively listen and comprehend the information given by the speaker
- Staying attentive yet relaxed
- · Keeping an open, receiving mind
- Listening to the words and trying to visualize what the speaker is saying
- Never interrupting or imposing your "solutions"
- Waiting for the speaker to pause to ask clarifying questions
- · Asking questions only to ensure understanding
- Communicate clearly on the issues being faced and clarify queries
- Trying to empathize with the speaker
- Providing the speaker with constructive feedback

The barriers in Active Listening are:

- Distractions
- Noise
- Interruptions
- Prejudice and Preconceived Ideas
- Lack of Interest in the conversation

Demonstrate Responsible and Disciplined Behaviors at the Workplace

- Learning about discipline alone does not make one disciplined at the workplace.
- One must implement what has been learned, by demonstrating responsible and disciplined behavior at the workplace.

Disciplined Behaviors

- Punctuality This is the behavioural trait that encourages a person to be always "On Time". Punctuality
 inculcates the habit of deadline adherence and effective time management, thus completing tasks as
 per given time and standards. Practising punctuality can be an efficient tool in delighting customers and
 earning their retention and loyalty.
- Avoiding Wastage An assistant furniture designer must stick to the policy of "Zero Wastage". Resources must be properly planned, allocated and utilized to the fullest. Such resources include people, time, raw materials and money. Wastage of time, by loitering unnecessarily, idling and gossiping, etc. must be condemned and prevented.
- **Integrity and Honesty** An employee with high standards of ethics, honesty and moral values is considered a valuable asset to the organization.

5.2.5 Keep Work Area Clean and Tidy and its Importance

Organise workshop in such way, that you get:

- Enough space to move around safely
- Enough space for storage of materials and tools
- Enough space to work and use materials and tools

Always remember:

- Keep your workshop neat and clean.
- Do not store any material on the way so that there is no hindrance in walking or working.
- Do not allow clutter to get accumulate at workplace.
- Store the tools in their right place.
- Keep fire extinguisher at the place where anyone can reach easily.

Plan a Good Housekeeping Program

- Wood workshop 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 work area.
- Workshop must be cleaned in the morning before starting the work and before leaving the work in the
 evening.
- Regular cleaning will limit the dust accumulation and cleaning of machines and tools will ensure their long and trouble-free life.

A good housekeeping program includes responsibilities for the following:

- · Clean up during the shift
- Day-to-day clean up
- Waste disposal
- Removal of unused materials
- Checklist/Inspection to ensure clean-up is complete

Summary



- 1. Quality, according to the ISO 8402-1986 standard, can be defined as "the totality of features and characteristics of a product or service that bears its ability to satisfy stated or implied needs".
- 2. An assistant furniture designer must work effectively with the other members in the team to achieve the common organizational goals and targets.
- 3. Team work is defined as the "actions of individuals, brought together for a common purpose or goal which subordinates the needs of the individual to the needs of the group".
- 4. The importance of discipline and ethics is to achieve professional success can be elaborated with the help of the following elements.
- 5. An employee with high standards of ethics, honesty and moral values is considered a valuable asset to the organization.
- 6. Active listening is the process by which an individual secures information from another individual or group.
- 7. A Protocol Deviation is said to have occurred, when there is a minor or moderate divergence from the sanctioned design, blueprint, and processes in the organization.
- 8. Effective Communication is a two way information sharing process which involves one party sending a message that is easily understood by the receiving party.
- 9. Non-verbal Communication involves the use of Body Language and gestures to convey messages
- 10. Habit promotes collaboration in a team to boost productivity and improve quality of work.
- 11. A supportive environment undoubtedly leads to a better working atmosphere.
- 12. Dress code mandates that only authorized persons are allowed to access and control the premises.

–Notes 🗒 –	

__ Exercise



	the		

FIII	I in the Blanks		
1.	TAT adherence and quality assurance are important aspects of		
	a) Time management	b) Project management	c) Company management
2.	Non-compliance or Non-conformit	y occurs through Protocol Violations and	·
	a) aggression	b) Protocol Deviations	c) Conformation deviation
	A: Protocol Deviations		
3.	3, according to the Dictionary, is "a complaint or a strong feeling that one has been treate unfairly".		
	a) Grievance	b) Conformity	c) Complaint
	A: Grievance		
4.	communica messages.	tion involves the use of language spok	en verbally or orally to convey
	a) Oral	b) Physical	c) Grievance

Activity



Video Session

- In this session, the Trainer will play 4 videos.
- The Trainer has the discretion of playing all the 4 videos or the number of videos he or she may deem fit.
- The first video will be about types of communication
- The YouTube link for the video is: https://www.youtube.com/watch?v=kxFQrv97Rcc
- The second video will be about barriers in communication
- The YouTube link for the video is: https://www.youtube.com/watch?v=evC3873ySg4
- The third video will be about team work and working effectively with others
- The YouTube link for the video is: https://www.youtube.com/watch?v=fm1gh5GAmWc
- The fourth video will be about the power of decision making
- The YouTube link for the video is: https://www.youtube.com/watch?v=542qgGgL1s4
- The students will watch the video attentively with pin drop silence.
- They can note down pointers from the video that they may find relevant.
- Trainees will maintain decorum in the class and will not talk, whisper or discuss in the class.
- In case of any queries or confusions, students will write those down in their notebooks.
- After the videos end, the students can ask questions of you.
- The students will raise their hands, and you will pick up the students who will place their questions.
- The answering session will be in the form of a discussion where the answers can be given by either you or any of the students knowing the answer.

Activity



Add and Consolidate Session

- This activity is in the form of "Add and Consolidate".
- The Trainer will divide the class into 3-4 groups depending on the batch size.
- The Trainer provides each group with a list comprising few job responsibilities (2-3 in number) of Assembler.
- Each group will receive a separate subset of job responsibilities.
- The members of each group on receiving the list will discuss among themselves and will unanimously add one more job responsibility to it.
- While deciding on the point to be added, members of each group will use their own discretion and prior knowledge, if any.
- After adding the point, the students will hand over the list to the trainer.
- On receiving all lists, the Trainer will consolidate all the points and jot them down on the whiteboard with a marker.











6. Employability & Entrepreneurship Skills

Unit 6.1 - Personal Strengths & Value Systems

Unit 6.2 - Digital Literacy: A Recap

Unit 6.3 - Money Matters

Unit 6.4 - Preparing for Employment & Self Employment

Unit 6.5 - Understanding Entrepreneurship

Unit 6.6: Preparing to be an Entrepreneur



Key Learning Outcomes



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

- Explain the meaning of health
- 2. List common health issues
- 3. Discuss tips to prevent common health issues
- 4. Explain the meaning of hygiene
- 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 the functions of basic computer keys
- 36. Discuss the main applications of MS Office
- 37. Discuss the benefits of Microsoft Outlook
- 38. Discuss the different types of e-commerce
- 39. List the benefits of e-commerce for retailers and customers
- 40. Discuss how the Digital India campaign will help boost e-commerce in India
- 41. Describe how you will sell a product or service on an e-commerce platform

- 42. Discuss the importance of saving money
- 43. Discuss the benefits of saving money
- 44. Discuss the main types of bank accounts
- 45. Describe the process of opening a bank account
- 46. Differentiate between fixed and variable costs
- 47. Describe the main types of investment options
- 48. Describe the different types of insurance products
- 49. Describe the different types of taxes
- 50. Discuss the uses of online banking
- 51. Discuss the main types of electronic funds transfers
- 52. Discuss the steps to prepare for an interview
- 53. Discuss the steps to create an effective Resume
- 54. Discuss the most frequently asked interview questions
- 55. Discuss how to answer the most frequently asked interview questions
- 56. Discuss basic workplace terminology
- 57. Discuss the concept of entrepreneurship
- 58. Discuss the importance of entrepreneurship
- 59. Describe the characteristics of an entrepreneur
- 60. Describe the different types of enterprises
- 61. List the qualities of an effective leader
- 62. Discuss the benefits of effective leadership
- 63. List the traits of an effective team
- 64. Discuss the importance of listening effectively
- 65. Discuss how to listen effectively
- 66. Discuss the importance of speaking effectively
- 67. Discuss how to speak effectively
- 68. Discuss how to solve problems
- 69. List important problem solving traits
- 70. Discuss ways to assess problem solving skills
- 71. Discuss the importance of negotiation
- 72. Discuss how to negotiate
- 73. Discuss how to identify new business opportunities
- 74. Discuss how to identify business opportunities within your business
- 75. Explain the meaning of entrepreneur
- 76. Describe the different types of entrepreneurs
- 77. List the characteristics of entrepreneurs
- 78. Recall entrepreneur success stories
- 79. Discuss the entrepreneurial process
- 80. Describe the entrepreneurship ecosystem
- 81. Discuss the purpose of the Make in India campaign
- 82. Discuss key schemes to promote entrepreneurs
- 83. Discuss the relationship between entrepreneurship and risk appetite
- 84. Discuss the relationship between entrepreneurship and resilience

- 85. Describe the characteristics of a resilient entrepreneur
- 86. Discuss how to deal with failure
- 87. Discuss how market research is carried out
- 88. Describe the 4 Ps of marketing
- 89. Discuss the importance of idea generation
- 90. Recall basic business terminology
- 91. Discuss the need for CRM
- 92. Discuss the benefits of CRM
- 93. Discuss the need for networking
- 94. Discuss the benefits of networking
- 95. Discuss the importance of setting goals
- 96. Differentiate between short-term, medium-term and long-term goals
- 97. Discuss how to write a business plan
- 98. Explain the financial planning process
- 99. Discuss ways to manage your risk
- 100. Describe the procedure and formalities for applying for bank finance
- 101. Discuss how to manage your own enterprise
- 102. List important questions that every entrepreneur should ask before starting an enterprise

Unit 6.1: Personal Strengths & Value Systems

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. Understand 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. Understand 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 how to maintain a positive attitude
- 15. Discuss the role of attitude in self-analysis
- 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

6.1.1 Health, Habits, Hygiene: What is Health

As per the World Health Organization (WHO), health is a "State of complete physical, mental, and social wellbeing, 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

6.1.1.1 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 meditation

Но	w 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	

6.1.1.2 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.	Ш
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!

6.1.1.3 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!

6.1.1.4 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

6.1.1.5 Tips



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

6.1.2 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

6.1.2.1 Negotiable Employee Safety Habits

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:

- 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

6.1.2.2 Tips



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

6.1.3 Self Analysis – Attitude, Achievement Motivation

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.

6.1.3.1 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.

6.1.3.2 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.

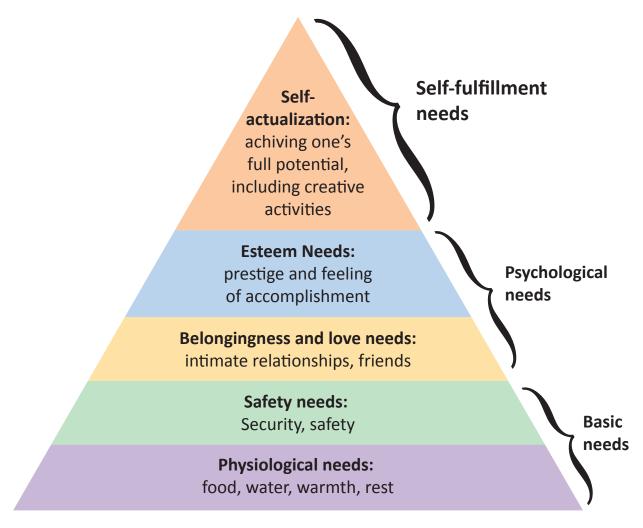


Fig. 6.1.3.2.1: Mashlow's Hierarchy of Needs

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.

6.1.3.3 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?

6.1.3.4 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

6.1.3.5 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.

-6.1.3.6 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

6.1.3.7 Tips



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

6.1.4 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.

6.1.4.1 Qualities of Honest People

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

- 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.
- 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.
- They are think skinned. This means they are not affected by others judging them harshly for their honest opinions.

• 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.

They are trusted by their peers. They are seen as people who can be counted on for truthful and objective feedback and advice.

- **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.

6.1.4.2 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.

6.1.4.3 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.

6.1.4.4 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.

6.1.4.5 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.

6.1.4.6 Tips



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

6.1.5 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

6.1.5.1 Tips



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

6.1.6 Time Management

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

Not managing time effectively can result in undesirable consequences like:

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

6.1.6.1 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

6.1.6.2 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.

6.1.6.3 Tips



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

6.1.7 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.

6.1.7.1 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:

- Take a deep breath from your diaphragm (don't breathe from your chest)
- Visualize your breath coming up from your stomach
- Keep repeating a calming word like 'relax' or 'take it easy' (remember to keep breathing deeply while repeating the word)
- 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.

6.1.7.2 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.

6.1.8 Stress Management

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

-6.1.8.1 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 Concentration issues Lack of judgement Pessimism Anxiety Constant worrying 	 Depression Agitation Irritability Loneliness Anxiety Anger

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

6.1.8.2 Tips for Stress Management



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.

Unit 6.2: Digital Literacy: A Recap

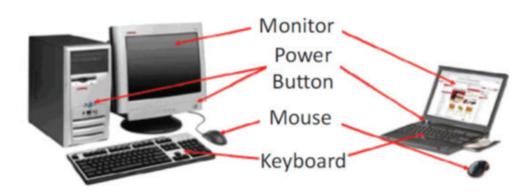
Unit Objectives



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

6.2.1 Computer and Internet Basics



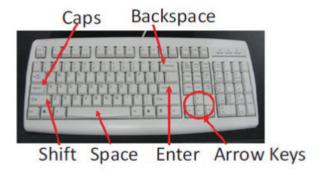


Fig. 6.2.1.1: Computer and Internet Basics

6.2.1.1 Basic Parts of a Computer

- 1. Central Processing Unit (CPU): The brain of the computer. It interprets and carries out program instructions.
- 2. Hard Drive: A device that stores large amounts of data.
- 3. Monitor: The device that contains the computer screen where the information is visually displayed.
- **4. Desktop:** The first screen displayed after the operating system loads.
- **5. Background:** The image that fills the background of the desktop.
- 6. Mouse: A hand-held device used to point to items on the monitor.
- 7. Speakers: Devices that enable you to hear sound from the computer.
- **8. Printer:** A device that converts output from a computer into printed paper documents.
- **9. Icon:** A small picture or image that visually represents something on your computer.
- **10. Cursor:** An arrow which indicates where you are positioned on the screen.
- 11. Program Menu: A list of programs on your computer that can be accessed from the Start menu.
- **12. Taskbar:** The horizontal bar at the bottom of the computer screen that lists applications that are currently in use.
- **13. Recycle Bin:** A temporary storage for deleted files.

6.2.1.2 Basic Internet Terms

- The Internet: Avast, 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.

6.2.1.3 Basic Computer Keys

- 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.

6.2.1.4 Tips



- 1. 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)
- 2. Press the Ctrl key and press the + or to increase and decrease the size of text.
- 3. Press F5 or Ctrl + R to refresh or reload a web page.

6.2.2 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:

- 1. Microsoft Word: Allows users to type text and add images to a document.
- 2. Microsoft Excel: Allows users to enter data into a spreadsheet and create calculations and graphs.
- 3. Microsoft PowerPoint: Allows users to add text, pictures and media and create slideshows and presentations.
- 4. Microsoft Outlook: Allows users to send and receive email.
- 5. Microsoft OneNote: Allows users to make drawings and notes with the feel of a pen on paper.
- **6. 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 One Note and...your phone!
- Offline access to email: No Internet? No problem! Write emails offline and send them when you're connected again.

6.2.2.1 Tips



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

6.2.3 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:

- 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.

- 6.2.3.1 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

6.2.3.2 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.

6.2.3.3 Tips



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

Unit 6.3: 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

6.3.1 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.

6.3.1.1 Tips



- 1. 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.
- 2. Decide that you will not buy anything on certain days or weeks and stick to your word.

6.3.2 Types of Bank Accounts

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

- 1. Current Accounts
- 2. Savings Accounts
- 3. Recurring Deposit Accounts
- 4. 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.

6.3.2.1 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!

6.3.2.2 Tips



- 1. Select the right type of account.
- 2. Fill in complete nomination details.
- 3. Ask about fees.
- 4. Understand the rules.
- 5. Check for online banking it's convenient!
- 6. Keep an eye on your bank balance.

- 6.3.3 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
A cost that stays the same, regardless of the output produced.		A cost that changes when the
Nature	Time related.	Incurred
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.

Table 6.3.3.1: Differences Between Fixed and Variable Costs

6.3.3.1 Tips



1. 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.

6.3.4 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:

- 1. Life Insurance
- 2. Non-Life or General Insurance.

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.
- Money Back Life Insurance: While the policyholder is alive, periodic payments of the partial survival benefits are made during the policy tenure. On the death of the insured, the insurance company pays the full sum assured along with survival benefits.
- Whole Life Insurance: It offers the dual benefit of insurance and investment. It offers insurance cover for the whole life of the person or up to 100 years whichever is earlier.

General Insurance

General Insurance deals with all insurance covering assets like animals, agricultural crops, goods, factories, cars

General Insurance Products:

- Motor Insurance: This can be divided into Four Wheeler Insurance and Two Wheeler Insurance.
- **Health Insurance:** The main types of health insurance are individual health insurance, family floater health insurance, comprehensive health insurance and critical illness insurance.
- **Travel Insurance:** This can be categorised into Individual Travel Policy, Family Travel Policy, Student Travel Insurance and Senior Citizen Health Insurance.
- **Home Insurance:** This protects the house and its contents from risk.
- Marine Insurance: This insurance covers goods, freight, cargo etc. against loss or damage during transit by rail, road, sea and/or air.

Taxes

There are two types of taxes:

- 1. Direct Taxes
- 2. Indirect Taxes.

Direct Tax

Direct taxes are levied directly on an entity or a person and are non-transferrable. Some examples of Direct Taxes are:

• **Income Tax:** This tax is levied on your earning in a financial year. It is applicable to both, individuals and companies.

- Capital Gains Tax: This tax is payable whenever you receive a sizable amount of money. It is usually of two types short term capital gains from investments held for less than 36 months and long term capital gains from investments held for longer than 36 months.
- **Securities Transaction Tax:** This tax is added to the price of a share. It is levied every time you buy or sell shares.
- Perquisite Tax: This tax is levied is on perks that have been acquired by a company or used by an employee.
- **Corporate Tax:** Corporate tax is paid by companies from the revenue they earn.

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.

6.3.4.1 Tips



- 1. Think about how quickly you need your money back and pick an investment option accordingly.
- 2. Ensure that you are buying the right type of insurance policy for yourself.
- 3. Remember, not paying taxes can result in penalties ranging from fines to imprisonment.

6.3.5 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

- 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 account number
- Beneficiary's bank address
- 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:

- Link his mobile number with his respective account
- Receive the MMID from the bank

In order to initiate a money transfer through IMPS, you will need to enter the following information:

- The beneficiary's mobile number
- The beneficiary's MMID
- The transfer amount
- 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.

- 6.3.5.1 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
Timing on Mon- day to Friday	8.00 am - 6.30 pm	9.00 am - 4.30 pm	24x7
Timing on Sat- urday	8.00 am - 7.00 p.m.	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

6.3.5.2 Tips



- 1. Never click on any links in any e-mail message to access your online banking website.
- 2. You will never be asked for your credit or debit card details while using online banking.
- 3. Change your online banking password regularly.

Unit 6.4: Preparing for Employment & Self Employment

- Unit Objectives



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

- 1. Discuss the steps to prepare for an interview
- 2. Discuss the steps to create an effective Resume
- 3. Discuss the most frequently asked interview questions
- 4. Discuss how to answer the most frequently asked interview questions
- 5. Discuss basic workplace terminology

6.4.1 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.

- Stud^ying 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 guestions 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.

6.4.1.1 Tips



- 1. Ask insightful and probing questions.
- 2. 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.

- 6.4.2 Preparing 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 résumé 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:

Jasmine Watts Breach Candy, mumbai - India Contact No. +91 2223678270 Email: jasmine.watts@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 Content Writer gratuated from University of Strathclyde having 6 years of experience in writing website copy.
- Core expertise lies in content creation for e-learning courses, specifically for the k-12 segment.

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:

Educetional Qualification

- Masters in International Management (2007) from Columbia University with 8.8 CPI.
- Bachelor of Management Studios (2004) from Mumbai University with 87% marks.
- 10+2 with Math, Stats (2001) from Maharastra Board with 91% marks.
- High School (1999) from Maharastra Board with 93% marks.

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

- Flash
- Photoshop

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:

Example:

Project title	Organization	Platform used
Contribution	Description	

Academic Projects

Project Title: Different Communication Skills

Organization: True Blue Solutions

Platform used: Articilate

Contribution: Content writing and graphic zisualization

Description: Development of storyboards for corporate induction & training programs.

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

- Mamber of the Debate Club
- Played tennis at at national level
- Won first prizes in the All India Camel Contest, 2010

Step 8: Write Your Personal Details

The last section of your résumé must include the following personal information:

- Date of birth
- Gender & marital status
- Nationality
- Languages known

Example:

Personal Details

Date of Birth: 25th May, 1981 Gender & marital status: Female, Single

Nationality: Indian

English, Hindi, Tamil, French Languages known:

6.4.2.1 Tips



- 1. Keep your resume file name short, simple and informational.
- 2. Make sure the resume is neat and free from typing errors.
- 3. Always create your resume on plain white paper.

6.4.3 Interview FAQs

Take a look at some of the most frequently asked interview questions, and some helpful tips on how to answer them.

1. 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.

2. 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.

3. 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.

4. 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.

5. 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.

6. 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.

7. 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.

8. 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.

9. 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.

10. 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.

11. 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.

12. 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.

6.4.3.1 Tips



- 1. Be honest and confident while answering.
- 2. Use examples of your past experiences wherever possible to make your answers more impactful.

6.4.4 Work Readiness – Terms & Terminologies

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 6.5: Understanding Entrepreneurship

- Unit Objectives 🏻 🍏



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

- 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. Understand 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 government's role in the entrepreneurship ecosystem
- 26. Discuss the current entrepreneurship ecosystem in India
- 27. Understand the purpose of the Make in India campaign
- 28. Discuss the relationship between entrepreneurship and risk appetite
- 29. Discuss the relationship between entrepreneurship and resilience
- 30. Describe the characteristics of a resilient entrepreneur
- 31. Discuss how to deal with failure

6.5.1 Concept Introduction

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.

6.5.1.1 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

6.5.1.2 Characteristics of Entrepreneurs

All successful entrepreneurs have certain characteristics in common.

They are all:

- 1. Extremely passionate about their work
- 2. Confident in themselves
- 3. Disciplined and dedicated
- 4. Motivated and driven
- 5. Highly creative
- 6. Visionaries
- 7. Open-minded
- 8. Decisive

Entrepreneurs also have a tendency to:

- 1. Have a high risk tolerance
- 2. Thoroughly plan everything
- 3. Manage their money wisely
- 4. Make their customers their priority
- 5. Understand their offering and their market in detail
- 6. Ask for advice from experts when required
- 7. Know when to cut their losses

6.5.1.3 Examples of Famous Entrepreneurs

Some famous entrepreneurs are:

- Bill Gates (Founder of Microsoft)
- Steve Jobs (Co-founder of Apple)
- Mark Zuckerberg (Founder of Facebook)
- Pierre Omidyar (Founder of eBay)

6.5.1.4 Types of Enterprises

As an entrepreneur in India, you can own and run any of the following types of enterprises:

Sole Proprietorship

In a sole proprietorship, a single individual owns, manages and controls the enterprise. This type of business is the easiest to form with respect to legal formalities. The business and the owner have no separate legal existence. All profit belongs to the proprietor, as do all the losses- the liability of the entrepreneur is unlimited.

Partnership

A partnership firm is formed by two or more people. The owners of the enterprise are called partners. A partnership deed must be signed by all the partners. The firm and its partners have no separate legal existence. The profits are shared by the partners. With respect to losses, the liability of the partners is unlimited. A firm has a limited life span and must be dissolved when any one of the partners dies, retires, claims bankruptcy or goes insane.

Limited Liability Partnership (LLP)

In a Limited Liability Partnership or LLP, the partners of the firm enjoy perpetual existence as well as the advantage of limited liability. Each partner's liability is limited to their agreed contribution to the LLP. The partnership and its partners have a separate legal existence.

6.5.1.5 Tips



- 1. Learn from others' failures.
- 2. Be certain that this is what you want.
- 3. Search for a problem to solve, rather than look for a problem to attach to your idea.

6.5.2 Leadership & Teamwork: Leadership and Leaders

Leadership means setting an example for others to follow. Setting a good example means t 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.

6.5.2.1 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.

6.5.2.2 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

6.5.2.3 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.

6.5.2.4 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.

6.5.2.5 Tips



- 1. Don't get too attached to your original idea. Allow it to evolve and change.
- 2. Be aware of your weaknesses and build a team that will complement your shortfalls.
- 3. Hiring the right people is not enough. You need to promote or incentivize your most talented people to keep them motivated.
- 4. Earn your team's respect

6.5.3 Communication Skills

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.

6.5.3.1 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
- 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

6.5.3.2 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.

6.5.3.3 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.

6.5.3.4 Tips



- 1. If you're finding it difficult to focus on what someone is saying, try repeating their words in your head.
- 2. 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.

6.5.4 Problem Solving & Negotiation skills

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.

6.5.4.1 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

6.5.4.2 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
- Asking the right questions
- Being proactive
- Not panicking
- Having a positive attitude
- Focusing on the right problem

6.5.4.3 Important Traits for Problem Solving

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:

- Application forms: Ask for proof of the candidate's problem solving skills in the application form.
- **Psychometric tests:** Give potential candidates logical reasoning and critical thinking tests and see how they fare.
- **Interviews:** Create hypothetical problematic situations or raise ethical questions and see how the candidates respond.
- Technical questions: Give candidates examples of real life problems and evaluate their thought process.

6.5.4.4 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.

6.5.4.5 Tips



- 1. Know exactly what you want before you work towards getting it
- 2. Give more importance to listening and thinking, than speaking
- 3. Focus on building a relationship rather than winning
- 4. Remember that your people skills will affect the outcome
- 5. Know when to walk away sometimes reaching an agreement may not be possible

6.5.5 Business Opportunities Identification

"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

- **Identify Market Inefficiencies:** When looking at a market, consider what inefficiencies are present in the market. Think about ways to correct these inefficiencies.
- **Remove Key Hassles:** Rather than create a new product or service, you can innovatively improve a product, service or process.
- **Create Something New:** Think about how you can create a new experience for customers, based on existing business models.
- **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.
- 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

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:



Fig. 6.5.5.1: SWOT Analysis parameters

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.

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

6.5.5.1 Tips



- 1. Remember, opportunities are situational.
- 2. Look for a proven track record.
- 3. Avoid the latest craze.
- 4. Love your idea.

6.5.6 Entrepreneurship Support Eco-System

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 office assistant. 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

6.5.6.1 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

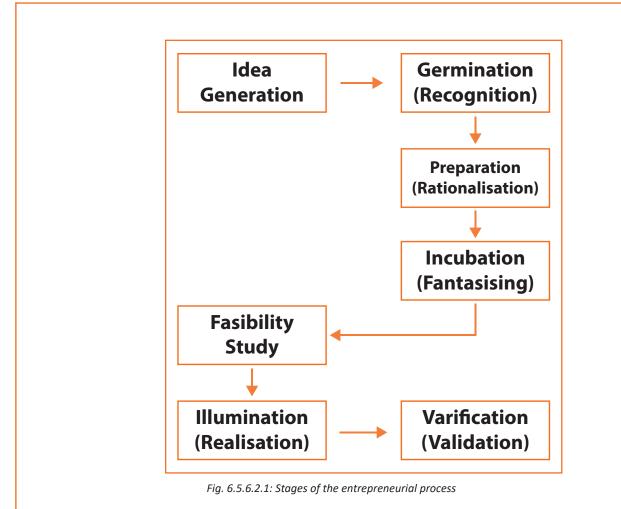
Karsanbhai Patel made detergent powder in the backyard of his house. He sold his product door-to-door and offered a money back guarantee with every pack that was sold. He charged Rs. 3 per kg when the cheapest detergent at that time was Rs.13 per kg. Dr. Patel eventually started Nirma which became a whole new segment in the Indian domestic detergent market.

6.5.6.2 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.



6.5.6.3 What is an Entrepreneur?

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.

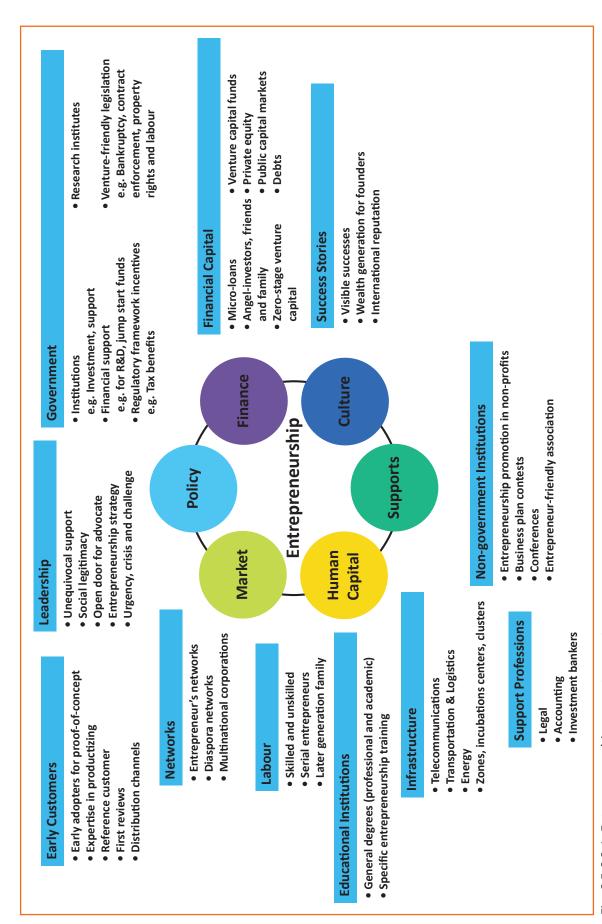


Fig. 6.5.6.3.1: Entrepreneurship support ecosystem

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.

6.5.6.4 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

6.5.6.5 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:

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
- 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

Pradhan Mantri MUDRA Yojana, - Micro Units Development and Refinance Agency (MUDRA)

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:

- Shishu: Covering loans upto Rs.50,000/-
- Kishor: Covering loans above Rs. 50,000/- and upto Rs.5 lakh
- 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).

Stand Up India

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

Prime Minister Employment Generation Programme (PMEGP)

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
Conoral Catagory	10%	15%
General Category		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.

International Cooperation Description

The Scheme would cover the following activities:

- 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.
- 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.
- 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?:

- State/Central Government Organisations;
- Industry/Enterprise Associations; and
- Registered Societies/Trusts and Organisations associated with the promotion and development of MSMEs

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

Who can apply?: Any enterprise registered in India as a micro or small enterprise is eligible to apply.

Marketing Assistance Scheme Description

The assistance is provided for the following activities:

- Organizing exhibitions abroad and participation in international exhibitions/trade fairs
- Co-sponsoring of exhibitions organized by other organisations/industry associations/agencies
- 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.

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.

Enabling Participation of MSMEs in State/District Level Trade Fairs and Provide Funding Support

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:

- Free registration for participating in trade fairs. The selection of participants would be done by the MSME-DIs post the submission of application.
- 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).
- 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.

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?:

- Banks and financial institutions can apply to DC-MSME for availing support.
- 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.

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.

Reimbursement of certification fees for acquiring ISO standards - ISO 9000/ISO 14001 Certification Reimbursement

The Goal 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.

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.

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.

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.

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.

6.5.6.6 Tips



- 1. Research the existing market, network with other entrepreneurs, venture capitalists, angel investors, and thoroughly review the policies in place to enable your entrepreneurship.
- 2. 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.
- 3. Be proactive in your ecosystem. Identify the key features of your ecosystem and enrich them to ensure self-sustainability of your entrepreneurship support ecosystem.

6.5.7 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.167

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

6.5.7.1 Tips



- 1. 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.
- 2. Don't dwell on setbacks. Focus on what the you need to do next to get moving again.
- 3. While you should try and curtail expenses, ensure that it is not at the cost of your growth.

6.5.8 Success & Failures

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!

6.5.8.1 Tips



- 1. Remember that nothing is impossible.
- 2. Identify your mission and your purpose before you start.
- 3. Plan your next steps don't make decisions hastily.

Unit 6.6: 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. Understand 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

6.6.1 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.

6.6.1.1 The 4 Ps of Marketing

The 4 Ps of marketing are:

- 1. Product,
- 2. Price,
- 3. Promotion and
- 4. 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.173 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.

6.6.1.2 Tips



- 1. Keep in mind that good ideas do not always have to be unique.
- 2. Remember that timing plays a huge role in determining the success of your idea.
- 3. Situations and circumstances will always change, so be flexible and adapt your idea accordingly.

6.6.2 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.

6.6.3 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
- 7. 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; <math>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.

6.6.4 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.

Benifits 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

6.3.4.1 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.

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

6.6.4.2 Tips



- 1. Use social media interactions to identify needs and gather feedback.
- 2. When networking, ask open-ended questions rather than yes/no type questions.

6.6.5 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.

6.6.5.1 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.

6.6.5.2 Tips



- 1. Ensure all the important elements are covered in your plan.
- 2. Scrutinize the numbers thoroughly.
- 3. Be concise and realistic.
- 4. Be conservative in your approach and your projections.
- 5. Use visuals like charts, graphs and images wherever possible.

6.6.6 Procedure and Formalities for Bank Finance

The Need for Bank Finance

For entrepreneurs, one of the most difficult challenges faced involves securing funds for start-ups. 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 start-ups, offering funding to thousands of start-ups every year.

6.6.6.1 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
- Profit-and-Loss Account
- Cash-Flow Statement
- Projected Sales and Revenues
- Business Plan
- 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.

6.6.6.2 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.

- Submit your application form and all other required documents to the bank.
- 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.
- The bank will make a decision as to whether or not you should be given funding.

6.6.6.3 Tips



- 1. Get advice on funding options from experienced bankers.
- 2. 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.

6.6.7 Enterprise Management - An Overview

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!

6.6.7.1 Tips



- 1. Get advice on funding options from experienced bankers.
- 2. 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.

6.6.7.2 Considering Entrepreneurship

Questions to Ask Yourself Before Considering Entrepreneurship

- Why am I starting a business?
- What problem am I solving?
- Have others attempted to solve this problem before? Did they succeed or fail?
- Do I have a mentor1 or industry expert that I can call on?
- Who is my ideal customer2?
- Who are my competitors3?

- What makes my business idea different from other business ideas?
- What are the key features of my product or service?
- Have I done a SWOT4 analysis?
- What is the size of the market that will buy my product or service?
- What would it take to build a minimum viable product5 to test the market?
- How much money do I need to get started?
- Will I need to get a loan?
- How soon will my products or services be available?
- When will I break even6 or make a profit?
- How will those who invest in my idea make a profit?
- How should I set up the legal structure7 of my business?
- What taxes8 will I need to pay?
- What kind of insurance9 will I need?
- Have I reached out to potential customers for feedback

6.6.7.3 Tips



- 1. It is very important to validate your business ideas before you invest significant time, money and resources into it.
- 2. 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.













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