RQF LEVEL: 5

TRADE: Interior Design

MODULE CODE: INDDF501

TEACHER'S GUIDE

Module name: DESIGNING FURNITURE

Table of Contents

Acronyms

RQF: Rwanda qualifications framework.

RTB : Rwanda TVET Baord

PPE : personal protective Equipment

TVET : technical and vocational education and training

CAD: Computer-aided design

Introduction

Establishing a single definition to explain a great interior design is not possible as interior design is not a skill but in fact an art. It's an art that not only speaks differently but is also implemented and perceived uniquely by everyone. For a few combinations of paint, textures, and fabrics in different ways can create a great design but for a few; simple, clean straight lines blended with modern furniture are enough to create a statement.

Good interior design from a user point of view is the one that results in a comfortable, functional, practical and convenient interior that defines or reflects their mood, lifestyle, personality, and taste. Today, generally large and open houses from the past have been reduced to small living spaces, due to economy and convenience, such as studios, apartments, and tiny homes. This new lifestyle and space require careful planning of interior that should be practical, functional, utilize every inch of space (in fact increase it by vertical space usage), and at the same time look aesthetically pleasing. Artificially created feelings or Illusions of space combined with brilliantly designed furniture pieces, practical storage ideas, and thought out organizational plans combined with basic interior design principles for small spaces can only help us achieve the required interior

Module Code and Title: INDDF501 DESIGNING FURNITURE

Learning Units:

1. Identify furniture types, styles and materials
2. Select furniture types, styles and materials
3. Develop design concept
4. Implement the design

Learning Unit 1: Identify furniture types, styles and materials

Picture/s reflecting the Learning unit 1

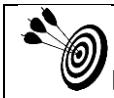
.jpg (281×300) (pinimg.com)

STRUCTURE OF LEARNING UNIT

Learning outcomes:
1.1. Identify furniture types
1.2. Identify furniture styles
1.3. Identify furniture materials
1.4. Identify furniture finishes

Learning outcome 1.1. Identify furniture types

Duration: 3hrs

 Learning outcome 1 objectives:

By the end of the learning outcome, the trainees will be able to:

1. Identify Properly the types of furniture

2. Identify Properly styles of furniture

3. Identify Properly furniture's materials

4. Identify Properly the furniture finishes

 **Resources**

Equipment	**Tools**	**Materials**
Computers Projector	- Books - Flip chart - Marker pen	- Varnish - Lacquer - Polyurethane - Sanding sealer - paint - primer – stain, Board, Hardwood, Softwood Metals, Fabrics, Leather, Synthetic woods MDF Plywood

 **Advance preparation:**

Sample of furnitures

Content1.1.1 Types of furniture

Furniture refers to movable objects intended to support various human activities such as seating (e.g., chairs, stools, and sofas), eating (tables), and sleeping (e.g., beds). Furniture is also used to hold objects at a convenient height for work (as horizontal surfaces above the ground, such as tables and desks), or to store things (e.g., cupboards and shelves). Furniture can be a product of design and is considered a form of decorative art. In addition to furniture's functional role, it can serve a symbolic or religious purpose. Are classified as below.

Types of furniture

Living room furniture: we all know it's the living room! We spend so much time in our lounge, chilling out, watching tv, and now maybe even working from home – so our living room furniture has got to work hard.

The furniture essentials for most living rooms; Seating has to be the biggest consideration - guide to the best sofas of the year will help you track down stylish, comfortable, and affordable options - alongside storage, a place to put the TV and home tech, and occasional tables So it should be furniture that looks stylish, suits your budget and is going to last. This include; sofas, tables, couches.etc….

Dining room and kitchen furniture: these are the types of furniture which is mostly used for cooking food and eating. This include, ex dining tables, chairs

Bedroom furniture: used in sleeping room, it is made with ex : beds, headboards, dressers, and armoires

Bathroom furniture:" Those specific to the **bathroom** are "**bathroom fixtures**." Those specific to handling bodily wastes (toilets and urinals) are **known as** "sanitary **fixtures**.

Office furniture: its help to deliver service to the clients.

Ex: desks, clerical **desks**, secretarial **desks**, typing **desks**, and other special **desks**. Most offices include at least one or two office **tables**

Outdoor: these are used for recreation purpose and relaxing ex daybed, garden tablets, etc…….

Commercial furniture

Commercial Furniture (otherwise known as *contract furniture*) relates to furnishings that have been specifically designed and tested for use in business interiors where they will be used regularly or constantly be large volumes of people over long periods of time.


Theoretical learning Activity

Brainstorm about the types of furnitures within groups)


Points to Remember (Take home message)

Types of furniture

 Learning outcome 1 formative assessment

Written assessment

Furniture refers to movable objects intended to support various human activities such as seating, eating and sleeping True false

Answer: **True**

The types of furniture are: Living room furniture, Dressing Room Furniture, dining room and kitchen furniture, Bedroom furniture, Dressing Room Furniture, Office furniture except Outdoor furniture and Commercial furniture True false

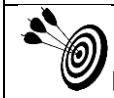
Answer: **false**

Q3. What are the types of living room furnitures?

Answer: sofas, tables, couches.

Learning outcome 1.2: Identify furniture styles

 **Duration:3hrs**

 Learning outcome 1 objectives:

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		Leather, Synthetic woods MDF Plywood

Advance preparation:

Availability of sample of furniture

Content 1.2.1 styles of furniture

1. styles of furniture

Contemporary: Contemporary style encompasses (to include) a range of styles developed in the latter half of the 20th **century**. Pieces feature(structure) softened and rounded lines as opposed to the stark or (hard) lines seen in modern design. **Interiors contain neutral elements and bold color, and they focus on the basics of line, shape and form**.

Contemporary style furniture is easily recognizable for its simple and sleek (having any even surface) lines.

What's the meaning of contemporary?

Existing, occurring, or living at the same time; belonging to the same time:

<u>To identify contemporary furniture, look for the following characteristics</u>:

What are the characteristics of contemporary furniture?

Splashes (small amount of color) of vivid (clear or detailed) accent color, perhaps in throw pillows (cushion used on chair or sofa) or wall art.

Hard edges and gentle(soft) curves, such **as** in our Fleming Accent Chair.
Natural materials, including wood, glass, and stainless steel.

Contemporary homes often have minimalist (seeking to minimize or to reduce to a minimum) appeal;
Furniture appears **light**,
Airy and visually appealing with a modest **appearance**.
Credenzas,
Dressers and entertainment centers present with smooth, lustrous surfaces and lines in natural neutral or dark woods or glossy black for a shiny, reflective surface

The difference between contemporary and modern furniture

Contemporary is, by definition, what's happening in design at this very moment in time. This definition makes it more fluid (it can be modified easly and hard to pin down (to identify or to specify). **Modern** design, on the other hand, has a distinguishable aesthetic that emphasizes crisp (something seen) lines, warm neutrals, and balance.

Traditional style: The **traditional style** offers a combination of comfortable furniture, classic designs and casual (coming without regularity) décor. It is a term that includes several design elements, including warm colors and symmetrical (proportional arrangement) lines and. ... The **traditional style** may have curves and designs, but it is not extremely ornate (finely finished) or ostentatious (intended to attract notie)

What Is Traditional Style Decorating

Traditional decorating is calm(smoothly finished), orderly, and predictable. There is nothing wild or chaotic in a traditional room.
Furnishings are classic and might feel outdated. Nothing is a surprise. Pieces match and are consistent (dependable nature).
Furniture and accessories are placed in pairs and centred in the room. There is nothing out of place or of a different style. Everything has the look that it goes together.
Traditional rooms are not ostentatious but rather somewhat casual. Furniture pieces are often reproductions. Modern, eclectic pieces have no room in a traditional space.
Traditional style homes feel comfortable for any age group. It's a familiar look that you'd see in magazines or furniture showrooms. A traditional room is not a place to showcase a piece of modern art or stainless steel furniture.
Modern furniture: design features sleek(smooth), straight lines with smooth and shiny surfaces. The focus is on simple geometric shapes rather than heavy ornamentation(decoration). The objective is to create an uncluttered look(multy-color), free from chaotic(disorganised) lines and color schemes.
Its main principles include:
Minimalist design
Smooth surfaces
Clean, straight lines

Warm neutral colors, accented by vivid hues
Materials that include both woods and metals
This movement would remain popular during the 1950s and 1960s through the mid-century modern design movement.

Vintage:

What is vintage style furniture?

Vintage furniture is anything that's at least 20 years old. If a piece of **furniture** is at least 20 years old, but has been restored, it's still considered **vintage**.

Key characteristics of the style

This style has a lot of feminine charm (successfully comvince).
It has a very playful, very lightweight look.
Wood in its natural color won't be seen in vintage.
Just like in Scandinavian style only light, tinted(slightly colored) wood tones painted in white will be used here.
The Couch (3 seater max.) Often has a bright color with romantic floral (connected with flower) decoration or in pastel colors like mint green, rose, vanilla yellow and bright blue

Minimalist

What is a minimalist style?

Minimalist fashion is defined by one major principle: keep it simple! Streamlined (having been more simple and strait forward) shapes, a small selection of colors and even a bare minimum (gasp!) Amount of clothing in your closet. Simplicity is the key to pinpointing this **style**

Minimalist Design It's characterised by simplicity, clean lines, and a monochromatic (having one color) palette (range of colors) with colour used as an accent. It usually combines an open floor plan, lots of light, and functional *furniture*, and it focuses on the shape, colour and texture of just a handful of essential elements

Antique

Furniture is one of the most traditional and wide-ranging sectors in the art and antiques market.

The different styles of antique furniture.

Antique Furniture Styles

Chippendale Style Furniture.
Eastlake Furniture.
Hepplewhite Style Furniture.
Soundalikes: Régence Vs. Regency.
Sheraton Style Furniture.
Queen Anne Style Furniture.

How can you tell if furniture is antique?

- Generally speaking, square nails and worm holes together in a piece of **furniture** would indicate an **antique**. But somebody could build a new piece with old nails, or use old

wood with new nails, so look carefully.

Difference between antique and vintage:

Antique: a collectible item at least 100 years old.

7.**Vintage**: A culturally significant item ranging from 20-99 years in age, worthy of being collected

8.**Casual luxe**

The *Luxe style* speaks to us of precious metals, reflective surfaces, exotic timber, velvet (is a type of woven tufted fabric in which the cut threads are evenly distributed, with a short dense pile, giving it a distinctive soft feel.) And silk. It spells elegance. You're individual and imaginative, and attention to detail is key, with daring colour palettes, extreme scale, sexy and lavish fabrics creating an intriguing and sumptuous space.

 Theoretical learning Activity

Brainstorm about different types of furniture styles within groups)

 Practical learning Activity

Trainees in pair perform different types of furniture styles)

 Points to Remember (Take home message)

Styles of furniture

 Learning outcome 2 formative assessment

Written assessment

The styles of furniture are: vintage, minimalist, antique, vintage, casual luxe, contemporary, except traditional and modern furniture True false

Answer: false

What are the characteristics of contemporary furniture?

Answer: Hard edges and gentle(soft) curves, Natural materials, Splashes of vivid accent color, perhaps in throw pillows

Differentiate antique from vintage

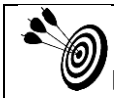
Answer:

Antique: a collectible item at least 100 years old.

Vintage: A culturally significant item ranging from 20-99 years in age, worthy of being collected

Learning outcome 1.3: Identify furniture materials

Duration: 3hrs

 Learning outcome 1 objectives:

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 **Advance preparation:**

Availability of sample of furniture

content 1.3.1 Historic uses of furniture materials

Historic uses of furniture materials

Furniture can be made from many materials, including metal, plastic, and wood. Furniture can be made using
a variety of woodworking joints which often reflect the local culture.

People have been using natural objects, such as tree stumps, rocks and moss, as furniture since the beginning of human civilisation. Archaeological research shows that from around 30,000 years ago, people started to construct and carve their own furniture, using wood, stone, and animal bones.

Wood

Wood is the material most often used for making furniture. Although there are over a hundred different kinds that can be used for furniture, some woods have natural properties that make them superior to the others.

A relatively cheap material, wood lends itself to various kinds of treatment;

for **example**,

it can be stained, painted, gilded, and glued.

It can be shaped by means of hand- or power-operated cutting and drilling tools. Heated, it can be bent to a certain extent into a predetermined shape and thereafter will retain the shape.

The grain in wood creates a structure with varying character, which in itself provides a natural ornamental surface, in which patterns can be formed by means of precalculated juxtapositions.

Colours range from white, yellow, green, red, brown, gray to black through countless intermediary tones. By juxtaposing wood of different colours, extremely rich effects have been achieved, especially in the 17th and 18th centuries.

Wood, if stored under favorable conditions, is durable, and pieces of furniture from the oldest civilizations—Egypt, for example—are still extant. Lastly, most wood has an aromatic scent.

Ref:Furniture | Definition, History, Styles, & Facts | Britannica

Developments in the sphere of craftsmanship and mechanical techniques, during the past 200 years or so, have made furniture production both cheaper and quicker. Using timber

as a basis and applying techniques such as shredding, heating and glueing, it has been possible to evolve new materials. To an increasing extent, cabinetmakers and furniture factories are using semi-manufactured wood such as **veneer, carcass wood**, **plywood, laminated board, and hardboard (fibreboard).**

Veneer is made by sawing, machine-cutting, and peeling. Saw-cut veneer is of the highest quality, but because of the relatively large loss of wood in the form of sawdust, it is also the most expensive. Therefore, furniture veneer, as a rule, is machine-cut.

Veneering is done on carcass wood, either in the form of a solid surface or a surface composed of several layers glued together. Old furniture is nearly always veneered on solid wood of an inferior quality to the veneer, such as beech, **oak**, or deal. High-quality English **mahogany** furniture made in the 18th century, however, was veneered with mahogany on mahogany.

In the 20th century, machine-made laminated board of various thicknesses was generally used. The advantage of ready-made laminated board **is that it does not shrink**. Wood expands and contracts in various ways, and its strength can vary axially, radially, or tangentially; by blocking the wood—**i.e., glueing pieces of wood together in different directions—such differences are eliminated and equal strength is obtained both longitudinally and laterally.**

The characteristic feature of laminated board is that the veneer on both sides encloses a wooden board composed of narrow strips of wood glued together on edge. The board is therefore thick enough to be suitable for table tops or doors.

If laminated board consists only of single sheets of veneer glued together, it is known as plywood. Plywood is widely used in the manufacture of furniture, particularly as backing for chests and other storage pieces, for the bottoms of drawers, and for shelves

Metal

Metals have been used since antiquity for making and ornamenting furniture. Splendid Egyptian pieces, such as the thrones and stool that were found in the tomb of the youthful Tutankhamen (14th century BCE), were rich in gold mounts (decorative details). In ancient Greece, bronze, iron, and silver were used for making furniture. Finds that were buried in the ashes of Pompeii and Herculaneum in Italy included tables with folding underframes and beds made partly or entirely of metal

Throughout the Middle Ages the metal chair—for example, the 7th-century throne belonging to Dagobert I, king of the Franks—was used for special ceremonies.

Various examples of silver furniture have been preserved; not solid metal, they consist of embossed (decorated with relief) or chased (hammered) plates of silver fastened to a wooden core. Silver furniture was made for palaces in the days when monarchs amassed enormous wealth. In times of war, the silver mountings were melted down and turned into silver coins; it was thus that all the silver furniture disappeared from the royal palaces of France.

Other materials

Among other secondary materials in furniture making, **glass** has been used in the form of **mirrorglass** or as **a purely decorative**, **illusionistic element in cabinets** and **writing desks**.

Italian craftsmen have made glass furniture; that is, wooden furniture covered with silvered glass in various colours.

Ivory and other forms of bone were used as inlay material in Egyptian furniture. During the 17th and 18th centuries, ivory was widely used for inlay work in cupboard doors and table tops and expensive Continental furniture.

Tortoiseshell was also used, as a costly inlay on a silvered ground, in furniture made during the Renaissance and Baroque periods.

Mother-of-pearl has been used, particularly as inlay material and for keyhole escutcheons. **Marble** and, to a certain extent, **plaster of paris** have been used, especially in the 18th century, for the tops of chests of drawers and console tables, and in the 19th century for the tops of washstands and dressing tables.

In Victorian England, **papier-mâché (a molding material made of paper pulped with glue and other additives) was used to make such items of furniture as fire screens, small tables and chairs, and clock cases.**

Finally, since World War II, **various plastic materials** have been used quite extensively in the construction of chairs with seats and backs molded in one piece and provided with a metal base.

 Theoretical learning Activity

brainstorm about the **Historic uses of furniture materials** within groups)

 Practical learning Activity

Trainees in pair perform presentation on historic uses of furniture)

 Points to Remember (Take home message)

Historic uses of furniture materials

Content: 1.3.2 Types of materials used in furniture design:

Types of materials used in furniture design

1. Hardwood: the usually **hard wood** of a tree (as a maple or oak) with broad leaves as distinguished from the wood of a tree (as a pine) with leaves that are needles. A tree that produces **hardwood**

Ex: Types of Hardwood

Merbau.

Oak.

Walnut.

Ash.

Beech.

Mahogany.

Maple.

2. Softwood: Softwood comes from gymnosperm trees, which do not have pores, but instead rely on Medullary rays and tracheids to transport water and produce sap. This characteristic gives softwood a lower **density**. Softwood trees are evergreen, and species include Cedar, Douglas fir, Pine and Hemlock

Types of Softwood

Distinguishing the Different Types of Softwoods. When buying timber, you have to decide whether you are getting softwood or hardwood. ...

Pine. Timber from **Pine** Trees Is the Most Common Softwood Option for Different Applications, Primarily Furniture. ...

Cedar. ...

Redwood. ...

Fir

Advantages of Softwood:

Softwood can be used across a broad **range** of applications and is easier to work with.

Softwoods are considered a very renewable source because the trees for softwoods grow much faster than hardwoods.

The timbers are cheaper and easier to source that's why these woods are less in **cost**

The Difference Between Softwood and Hardwood

Characteristic	**Hardwood**	**Softwood**
Price	More expensive	Less expensive
Density	Typically harder (but not always)	Usually softer (but not always)
Colour	Generally dark	Almost always light
Structure	Lower sap	Higher sap

3.Ceramics: A *ceramic* is any of the various hard, brittle, heat-resistant and corrosion-resistant materials made by shaping and then firing a non-metallic mineral, such as clay, at a high temperature. Common examples are earthenware, porcelain, and brick.

The 3 types of ceramics

There are **three** main **types** of pottery/**ceramic**. These are earthenware, stoneware and porcelain.

4.Fabrics: Fabric is **cloth** or other material produced by weaving together cotton, nylon, wool, silk, or other threads. **Fabrics** are used for making things such as clothes, curtains, and sheets.

5.Glass: *Glass* is a non-crystalline, often transparent amorphous solid, that has widespread practical, technological, and decorative use in, for example, window panes

6.**Leather**: a**nimal skin treated in order to preserve it, and used to make shoes, bags, clothes, equipment, etc.:**

Foam: Foam is an object formed by trapping pockets of gas in a liquid or solid.

7.Cotton: *Cotton* is a soft, fluffy staple fiber that grows in a boll, or protective case, around the seeds of the *cotton* plants of the genus Gossypium in the mallow family

8.Plastic: polymeric material that has the capability of being molded or shaped. This property of plasticity, often found in combination with other special properties such as low density, low electrical conductivity, transparency, and toughness, allows plastics to be made into a great variety of products

9. Synthetic wood: made by chemical synthesis, especially to imitate a natural product.

*Plywood

* MDF

10. Metals

Metal furniture is furniture made with metal parts: iron, carbon steel, aluminium, brass and stainless steel.
Iron and steel products are extensively used in many application, ranging from office furnishings to outdoor settings.
Cast iron is used mainly for outdoor finishings and settings, such as those used for bench legs and solid iron tables. It is suited to outdoor use due to its hardness, heaviness and general tough composition. The main disadvantage to this is that it, being a relatively pure form of iron is subject to corrosion at the hands of the moisture and air.
Stainless steel is used extensively for most modern interior furnishings involving metal. Many hinges, slides, supports and body pieces are composed of stainless. It has a high tensile strength, allowing it to be applied using hollow tubes, reducing weight and increasing user accessibility.
Aluminium is light and corrosion-resistant; it is heavily utilized for stamped and cast furniture, especially for molded chairs

11. **Stone**

Whether you are looking for **Stone Outdoor Furniture** that can mix and match colors, materials, styles, or want **Outdoor Furniture** with a unique, one-of-a-kind feature,

Fg. 2.1. Stone furniture

Theoretical learning Activity

Brainstorm about suitable materials for each furniture type/style within groups)

Practical learning Activity

Trainees in pair perform selection of materials for furniture design)

Points to Remember (Take home message)

The materials used in furniture design should be available

 Learning outcome 3 formative assessment

Written assessment

Chose the correct answer

The types of materials used in furniture design are:

Hardwood, Softwood and Ceramics

Hardwood, Softwood, Ceramics, earthenware, stoneware and porcelain.

Answer: Hardwood, Softwood and Ceramics

Define the term ceramics used in furniture material

Answer: Is any of the various hard, brittle, heat-resistant and corrosion- resistant materials made by shaping and then firing a non-metallic mineral, such as clay, at a high temperature.

Learning outcome 1.4: Identify furniture finishes

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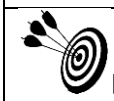
<tr><td colspan="3">  Learning outcome 1 objectives:
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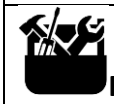
<tr><td colspan="3">  Resources</td></tr>
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Advance preparation:

Availability of sample of furniture finishes

Content1.4.1 Types of furniture finishes:

Clear: Clear finishes are intended to make wood look good and meet the demands to be placed on the finish. Choosing a clear finish should have the following properties:
Appearance, Colorless liquid.

Materials for clear finish:

Varnish: Varnish is a clear transparent hard protective coating or film. It is not a stain. It usually has a yellowish shade due to the manufacturing process and materials used, but it may also be **pigmented** as desired. It is sold commercially in various shades.

Varnish is primarily used as a **wood finish** where, stained or not, the distinctive tones and grains in the wood are intended to be visible. Varnish finishes are naturally glossy, but satin/semi-gloss and flat sheens are available.

Components of varnish

Varnish is traditionally a combination of a **drying oil, a resin,** and a **thinner or solvent** plus a **metal drier** to accelerate the drying.

However, different types of varnish have different components. After being applied, the film-forming substances in varnishes either harden directly, as soon as the solvent has fully **evaporated,** or harden after evaporation of the solvent through curing processes, primarily chemical reaction between oils and oxygen from the air (autoxidation) and chemical reactions between components of the varnish.

Lacquer

Lacquer is a type of hard and usually shiny coating or finish applied to materials such as wood or metal. It is most often made from resin extracted from trees and waxes and has been in use since antiquity

Polyurethane

Polyurethane is a **synthetic resin or plastic polymer** that is made of organic units linked by urethane molecules or carbamate groups. It is formed by combining diisocyanates and polyols

Sanding sealer

Sanding sealer is a clear liquid base finish that is applied to bare natural wood or to any uncoated wood product. Sanding sealer always must be sanded down smooth after it has dried.

Sanding sealer is similar to polyurethane and shellac, with one major difference: zinc stearate additive.

Sanding sealer should be used after the wood has been sanded down to a bare finish but before the topcoat (such as paint) has been applied. Applying sanding sealer to a stained surface is generally not recommended, as the sanding step will scuff away the stain

Opaque: Infinite color possibilities with custom color matching expertise

Colors have excellent durability and stability – will not fade

Tinted primers available for dark colors

Opaque finish make use of:

Paint

Painting is the practice of applying **paint**, **pigment,** color or other medium to a solid surface (called the "matrix or "support").[1] The medium is commonly applied to the base with a brush, but other implements, such as knives, sponges, and airbrushes, can be used

Primer

Stain

 Theoretical learning Activity

Brainstorm about the types of furnitures finishes within groups)

 Practical learning Activity

Trainees in pair perform clear and opaque finishes)

 Points to Remember (Take home message)

Types of furniture finishes:


Learning outcome 4.formative assessment

Written assessment

O.1. What is the step becoming first if we want to finish furniture?

Answer: Cleaning

O.2. The components of varnish are: drying oil, a resin, and a thinner or solvent True, false

Answer: True

Practical assessment

Assessment tools

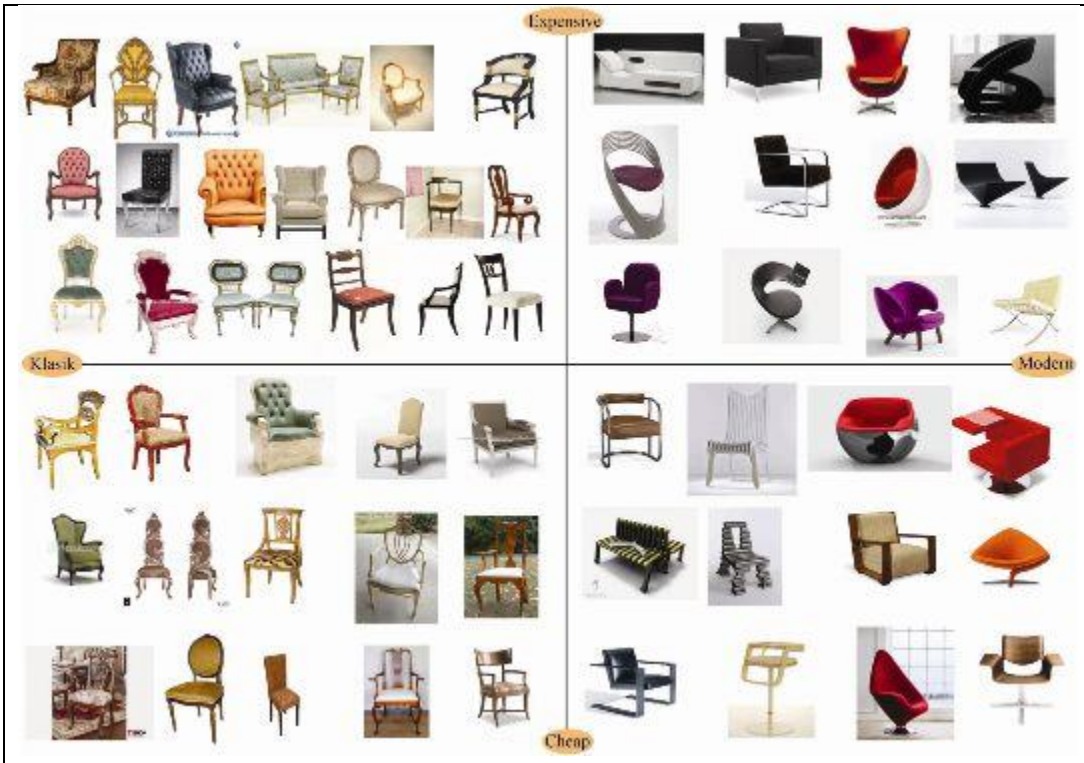
Assay

Task to be performed

Observation checklist

Learning Unit 2: Select furniture types, styles and materials

Picture/s reflecting the Learning unit 2



furniture types, styles and materials

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STRUCTURE OF LEARNING UNIT

Learning outcomes:

2.1. Select furniture types

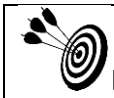
2.2. Select furniture styles

2.3. Select furniture materials

2.4. Select furniture finishes

Learning outcome 2.1. Select furniture types

Duration: 5hrs



Learning outcome 2 objectives:

By the end of the learning outcome, the trainees will be able to:

1. Perform proper selection of furniture types according to the client's needs

2. Perform proper selection of furniture styles according to the client's needs

3. Perform proper selection of furniture materials according to the design concept

4. Perform proper selection of furniture finishes according to the materials

Resources

Equipment	Tools	Materials
Computers **Projector** Flash cards	**Flip chart - Marker pen,** Board, Books	**Fabrics,** Hardwood Softwood,Metals,Fabrics Leather,Synthetic,woods MDF /Plywood and Foam **Oks - Internet ,**

Advance preparation:

. sample of Furniture's materials should be available

. sample of Furniture finishes should be available

Content 2.1.1 Descriptions of furniture types.

Descriptions of furniture types:
Living room: living room may contain furnishings such as a sofa, **chairs**, occasional tables, coffee tables, bookshelves, televisions, electric lamps, rugs, or other **furniture**.

Dining room and kitchen: A dining room is a room for consuming food. In modern times it is usually adjacent to the kitchen for convenience in serving, it's made up with dining tables, chairs, bar stools, benches, buffets, kitchen islands and more.

Bedroom: it is an accommodation unit characterised by its usage for sleeping. A typical bedroom contains as bedroom furniture one or two beds, a clothes closet, and bedside table and dressing table

Bathroom: bathroom furniture that most often combines a sink, countertop, and mirror.

Office: Office furniture means any furnishing that is free standing and does not require installation with component parts. Examples are desks, chairs, file cabinets, tables, lounge seating, and computer desks

Outdoor: Outdoor recreation or outdoor activity refers to recreation engaged in out of doors, most commonly in natural settings. Its include Garden chairs and Garden table **etc….**

Commercial: this include Restaurant Tables Chair Carts, and Dollies Baby Bedding Child Safety Chairs Strollers Provide Your Customers with an Outdoor Dining Option by Using Durable Commercial Outdoor Furniture


Theoretical learning Activity

brainstorm about Descriptions of furniture types within groups)


Practical learning Activity

Trainees in pair perform Selection of type of furniture)


Points to Remember (Take home message)

Types of furniture

Content 2.1.2 Uses of furniture

Uses of furniture
Furniture serve us to support various human activities such as: seating, eating, and sleeping. Furniture is also used to hold objects at a convenient height for work (as horizontal surfaces above the ground, such as tables and desks), or to store things (e.g., cupboards and shelves). Furniture can be a product of design and is considered a form of decorative art. In addition to furniture's functional role, it can serve a symbolic or religious purpose

 Theoretical learning Activity

brainstorm about uses of furniture within groups)

 Practical learning Activity

Trainees in pair perform Description of uses of furniture)

 Points to Remember (Take home message)

Sample of different types of furniture

Content 2.1.3 Advantages and disadvantages of types of furniture

Types of furniture:

Living room
Dining room and kitchen
Bedroom
Bathroom
Office
Outdoor

Advantage of furnitures

Commercial Efficient utilization of space
Plenty (adequate amount) of light: allowing as much natural light into the house as possible
Aesthetically appealing design
Lots of room for customization
Earth-friendly home

The Disadvantages of Furniture

Furniture needs space to be placed because if you don't have it you can maybe express a cluttered space.
Furniture is sometimes expensive, depending on the style and designers you like.
Other disadvantages to wood furniture include the following:
Wood is vulnerable to water. Moisture can damage wood finishes and soak into the wood underneath, causing it to split and swell.
Ultraviolet light can change wood's color and damage its surface. In a way that's similar to the effect sunlight has on skin, sunlight can break apart chemical bonds in wood and cause the surface to change colors. If you're not among the wood furniture owners who find this kind of discoloration attractive, a skilled craftsman can restore an old finish to return the color to its original hue. Wood furniture with a durable and protective topcoat over the finish is likely to resist discoloration over time.
Finishes can be scratched or damaged by sharp objects. While the topcoat should make your furniture resistant to damage caused by everyday use, sharp or heavy objects may scratch the finish, which could expose the wood underneath. Check to see if your warranty covers repairs for accidental damage.
Repairing damage requires patience and skill. Fixing scratches on a wood surface requires a craftsman's touch; sanding or removing stains requires patience, care, and attention to detail.

The strength of hardwood makes it ideal for use in furniture. It'll stand up to considerable abuse, and damage can often be repaired or restored. To get the most value from your wood furniture, make sure to always purchase quality, high-end furniture made from solid hardwood.

Theoretical learning Activity

brainstorm about Advantage of furnitures and The Disadvantages of Furniture within groups)

Points to Remember (Take home message)

Advantage of furnitures
The Disadvantages of Furniture

Learning outcome 1 formative assessment

Written assessment

O.1. Read the stament below careful and answer by **true or false**

Advantage of furniture are:

1. Commercial Efficient utilization of space
2. Plenty (adequate amount) of light: allowing as much natural light into the house as possible
3. Aesthetically appealing design
4. Lots of room for customization
5. Earth-friendly home
6. Furniture needs space to be placed because if you don't have it you can maybe express a cluttered space.

Answer: false

Disadvantages of Furniture are :

1. Furniture needs space to be placed because if you don't have it you can maybe express a cluttered space.
2. Furniture is sometimes expensive, depending on the style and designers you like. For example, the Barcelona collection created by Mies van der Rohe is a bit unaffordable for some people.

Answer: true

O.2. What are the uses of furniture?

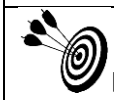
Answer:

1. Furniture serve us to support various human activities.
2. Furniture is also used to hold objects at a convenient height for work or to store things.

3. Furniture can be a product of design and is considered a form of decorative art. In addition to furniture's functional role, it can serve a symbolic or religious purpose

Learning Outcome 2.2: select furniture style

Duration: 5hrs



Learning outcome 2 objectives:

By the end of the learning outcome, the trainees will be able to:

1. Perform proper selection of furniture types according to the client's needs
2. Perform proper selection of furniture styles according to the client's needs
3. **Perform proper selection of furniture materials according to the design concept**
4. Perform proper selection of furniture finishes according to the materials

Resources

Equipment	Tools	Materials
Computers **Projector** Flash cards	**Flip chart - Marker pen,** Board, Books	**Fabrics,** Hardwood Softwood,Metals,Fabrics Leather,Synthetic,woods MDF /Plywood and Foam **Oks - Internet ,**

Advance preparation:

. sample of Furniture's materials should be available

. sample of Furniture finishes should be available

Content 2.2.1 Description of furniture styles

Furniture styles

1. **CONTEMPORARY**

Contemporary furniture design describes the style that's based on present times — "the here and now". In that case it's similar to the modern. Contemporary furniture style is fluid — it may contain smooth shapes and curved lines.

Features:

*Forms***:** simple silhouettes, crisp or curved lines, geometric shapes.

*Colors***:** glossy finishes, neutral colors such as black, white, gray, silver, chrome.

*Materials***:** metal, steel, wood, plastic and glass.

Fabrics and textiles: microfiber and suede, leather, vinyl and PU.

2. **MODERN**

With a sense of simplicity, modern furniture style is defined by clean and crisp lines, a simple design, neutral color palette, and "cold" materials. The style grew out of the decorative arts and was started in the 20th century.

Features:

Forms: clean silhouettes, crisp lines, geometric shapes.

*Colors***:** neutral colors and glossy finishes, black and white palette, gray.

*Materials***:** wood, plastic, metal, steel and glass. Natural wood with wood grain pattern can be found.

*Fabrics and textiles***:** leather, vinyl and faux leather, PU, microfiber.

TRANSITIONAL

Borrowing the best from modern and traditional designs, the transitional is another popular furniture style in current home interiors. The design offers a balance of both classic elegance and modern materials. This style may blend plush and noble furnishings with steel materials and glass elements.

Features:

*Forms***:** straight or curved lines, classic or modern silhouettes.

Colors: mix of wood and glossy finishes. Various colors can be used.

Fabrics and textiles: warm and inviting upholsteries like leather, linen, chenille, velvet.

3. **TRADITIONAL**

Traditional style of furniture Traditional design emphasizes elegance and simplicity. The main characteristics are deep colors and wood tones, decorative details and a variety of ornamental elements.

Features:

Forms: classic silhouettes, curved lines, wing and Queen Anne backs, claw and bun feet.

*Colors***:** deep wood finishes, rich shades of brown, cherry, espresso, merlot, black and white.

Fabrics and textiles: upholstery in rich and solid colors. Noble materials like leather, velvet, silk are used. This style can also include more affordable fabrics, such as chenille, linen or cotton. Floral, foliar or damasks patterns are widely used.
*Accents***:** decorative details like Moldings, panelling, intricate embellishments, throw pillows are abundantly used.

4. **MID-CENTURY MODERN**

Mid-Century Modern is the style known for the most iconic furniture pieces in modern design. An architectural and interior design describes mid-20th century progress in development from 1933 to 1965.

Features:

*Forms***:** minimalist silhouettes, sophisticated lines, handmade and hand-painted elements.
*Colors***:** natural wood finishes, oak, pine, brown, walnut, maple.
*Materials***:** wood, sometimes with natural wood grain patterns.
*Fabrics and textiles***:** upholstery in solid colors. Chenille, linen, cotton materials are frequently used.
Minimalist**;**
The new **styles** focused on the purity and simplicity of geometric lines and proportions, simple cuts and balanced silhouettes. ... They both favoured total black looks, garment deconstruction and a clean focus on the oversized silhouette

5. **Vintage; Vintage Home Features Will Never Go Out of Style**

Original hardwood floors. There's a reason why every HGTV renovation show has at least a couple of minutes dedicated to...
Embellished windows. Modern windows may be more energy efficient, but they don't have the pizzazz of the etched or...
Built-ins. Built-in shelving units or bookcases—often a feature of Arts and...

Protected porches

Whether it's the outdoor space beneath the deep eaves of a mid-century modern or the area underneath the columns of a Craftsman, protected porches are always going to be a desirable feature and a way to extend the living space of your home. Because who doesn't love a big, deep porch?
Saving your vintage features but want to maintain a current feel? Try incorporating one of these up-and-coming trends that experts love into your living room.

6. **Antique**: An **antique** is usually an item that is collected or desirable because of its age, beauty, rarity, condition, utility, personal emotional connection, and/or other unique **features**. It is an object that represents a previous era or time period in human history.
7. **Casual** luxe

Classic
Modern


Theoretical learning Activity

brainstorm about Furniture styles within groups)


Practical learning Activity

Trainees in pair perform Selection of furniture styles)


Points to Remember (Take home message)

Types of furniture styles

Content 2.2.2 Advantages and disadvantages of each furniture style

Advantages of Contemporary

- Contemporary furniture meets modern lifestyle. They are often stylish, light, and flexible to use and are a combination of functionality and aesthetics.
- Unlike traditional hoarded furniture, usually made from massive teak or other similar woods that require high maintenance, contemporary designs are generally made of lightweight materials that are easy to maintain
- while the contemporary trend is the simple look, which is also maintenance-free.
- Contemporary furniture mainly uses recyclable stuff like glass. New techniques, like injection molding routines, are used when creating contemporary furniture

- The unique feature of the contemporary style is that most furniture can be used for more than one purpose.
- Contemporary furniture uses bright colors such as metallic finishes, which add vibrancy and charm to a room.
- In general, contemporary furniture emphasizes line, balance and structure. They give more importance to practicality and functionality without compromising appearance and add a spark of sparkle to your home
- Contemporary homes are eco-friendly.

DISADVANTAGE

- Nowadays most furniture is made from termite-free products which are also in high demand. Traditional furniture requires a more decorative and artistic look,
- they are expensive.
- it is quite difficult to combine other styles in such a home.

Modern Design: The Pros

There are multiple reasons why modern design is so prevalent everywhere – it has multiple advantages over the other types:

- It doesn't draw unnecessary attention to your house's design: if you want something inoffensive and common, you should go with a variety of modern design.
- People are so used to it that they don't normally pay too much attention to a room with a normal modern design. That's why if you don't want to stand out, you should go with this option.
- A larger selection of furniture: from the modern tv stand to the contemporary sideboards, there are millions of pieces of furniture you can buy for a modern home. This is due to the massive popularity of this style.
- The cheapest option in most instances: along with the wider availability of the furniture, it is also cheaper in most instances. Due to the economy of scale and demand, modern pieces of furniture are manufactured at much larger quantities than other types of furniture. That's why you'll often find the equivalent modern design cheaper than its counterpart. If you're striped for cash and just want the cheapest remodelling option, going with a modern design seems to be the most sensible choice.

- **The Drawbacks of Modern Designing**

Of course, the modern design isn't without its drawbacks, even if its pros seem to be overwhelming. Here are a few drawbacks you might experience if you decide to go this route:

It is much harder to make your rooms stand out with a modern design: even though the veriety of shape and size of the modern design is larger than any that came before it, they all still share a je-ne-sais-quoi characteristic that makes them feel familiar to people.

This makes it much harder for an interior designer to create a room that stands out from others with a modern design. Even spending unrealistic budgets and importing furniture from other countries will make people look twice only. Going with a more quaint or

traditional design, however, might mesmerize some people, and it sure will make your house memorable.
Modern design doesn't fit every home: the rooms' design and furniture need to fit with the general spirit of the home.

If the walls and the exterior of your house give off a classical feeling, it will be pretty unusual and mismatched if your interior was very modern. Even if it is designed excellently, this mismatch might turn off visitors. In keeping with the exterior of your house, it is generally a good idea to find matching classic looking pieces of furniture for your classic homE

 Theoretical learning Activity

brainstorm about the advantages and disadvantages of each furniture style within groups)

 Practical learning Activity

Trainees in pair perform Presentation on furniture styles)

 Points to Remember (Take home message)

Advantages and disadvantages of each furniture style

 **Learning outcome 2 formative assessment**

Written assessment

O.1. Read the statement below careful and answer by **true or false**

The furniture style is only: contemporary**,** modern**,** traditional**,** minimalist and vintage.

Answer: false

O.2. What are the different styles of antique furniture?

Answer:

1. Chippendale Style Furniture.
2. Eastlake Furniture.
3. Hepplewhite Style Furniture.
4. Soundalikes: Régence Vs. Regency.
5. Sheraton Style Furniture.

6. Queen Anne Style Furniture.

Content 2.3.1. Furniture material properties

Hardwood:	**Softwood:**	**Metals:**
Hardness	Hardness	Lustrous
Stiffness	Stiffness	Malleable
Color	Color	Ductile
Odor	Odor	Conductivity
Density	Density	Reactivity
Texture	Texture	**Fabrics:**
Workability	Workability	Woven
Warping	Warping	Waterproof
Moisture content	Moisture content	Knitted
Glass:	**Leather:**	Stretch
Hardness	Tensile	Twill
Brittleness	Strength	Natural
Weather	Resistance to tear	Organic
resistance	High resistance to flexing	**Foam:**
Insulation	High resistance to puncture	Size
Color	Good heat insulation	Density
Shape	**Synthetic woods:**	High Flammability
Varieties	MDF	Durability
	Plywood	

 Theoretical learning Activity

brainstorm about on suitable materials for a specific type of furniture

Individual description of leather used in furniture design

Brainstorming on material compatibility within groups)

 Practical learning Activity

Trainees in pair perform Description of furniture materials)

Points to Remember (Take home message)

Types of furniture styles

Content2.3.2. Furniture material compatibility

Furniture material compatibility

When judging style, a key question that often arises is whether or not a pair of objects are compatible with each other.

We also use a joint image-text embedding method that allows for the querying of stylistically compatible furniture items, along with additional attribute constraints based on text. To evaluate our methods, we collect and present a large scale dataset of images of furniture of different style categories accompanied by text attributes.

Our interest in learning about style compatibility of furniture is manifested in two tasks. First and foremost, we would like to be able to assess the style compatibility of two furniture items. We refer to this as the compatibility task.

Secondly, given an image of an item of furniture, we would like to be able to retrieve, without knowing its style, other items which are stylistically compatible. Furthermore, we would like to place constraints on the retrieval, e.g. the type of item, or its color, material etc. We refer to the second task as the retrieval task. To tackle these two tasks, we learn Siamese architectures to serve as a stylistic similarity metric between pairs of furniture images. These architectures can directly address the compatibility task.

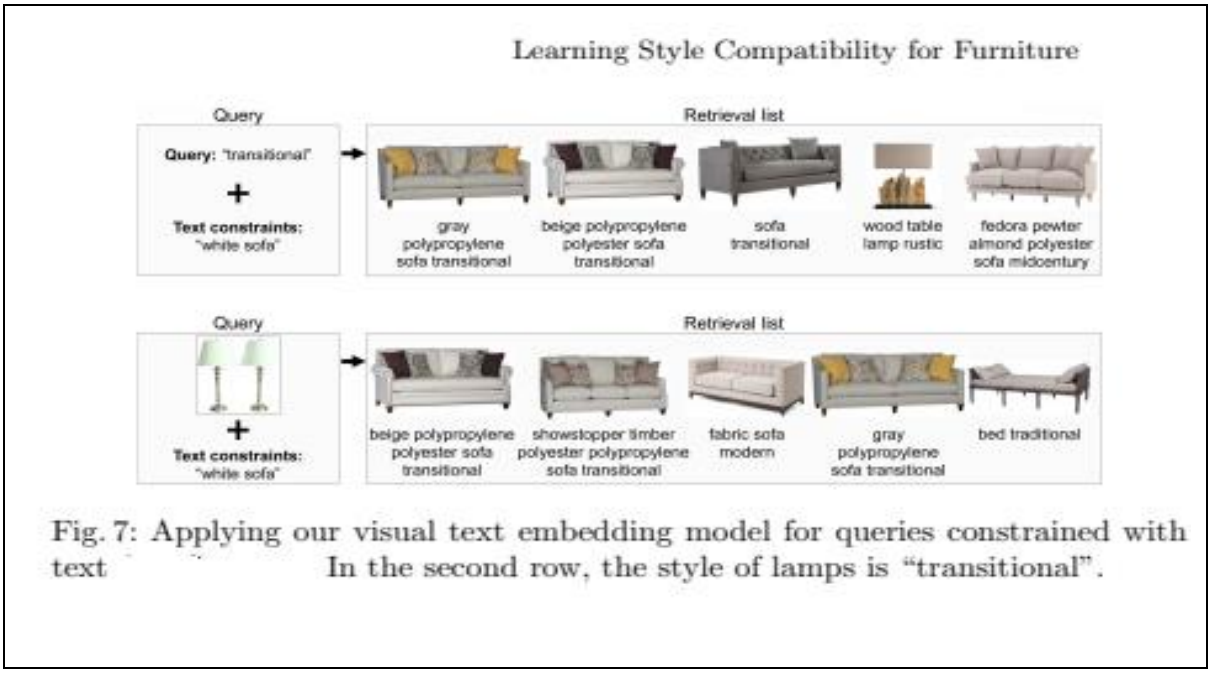


Fig. 7: Applying our visual text embedding model for queries constrained with text In the second row, the style of lamps is "transitional".

Theoretical learning Activity

brainstorm about the **Furniture material compatibility**

within groups)

Practical learning Activity

Trainees in pair perform presentation on material compatibility)

Points to Remember (Take home message)

. Furniture material compatibility

Content.2.3.3. Factors affecting furniture material selection

Factors affecting furniture material selection

Climate: The meteorological conditions, including temperature, precipitation, and wind, that characteristically prevail in a particular region.
Human traffic: Trafficking of people involves the recruitment the type of materials.
Chemical exposer: A **"chemical exposure"** can be defined as the measurement of both the amount of, and the frequency with which, a substance comes into contact with a person or the environment
Location: the area or space to which the materials will be applied.
Sun exposure: SUN EXPOSURE Ultraviolet (UV) rays are a part of sunlight that is an invisible form of radiation. UV rays can penetrate and change the structure of skin cells

Theoretical learning Activity

brainstorm about Factors affecting furniture material selection within groups)


Practical learning Activity

Trainees in pair perform presentation on Factors affecting furniture material selection)

Points to Remember (Take home message)

Factors affecting furniture material selection

Written assessment

O.1. What are the factors affecting furniture material selection?

Answer: Climate, Human traffic, Chemical exposer, Location and Sun exposure

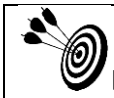
O.2. Among these properties choose ones which are similar to softwood and hardwood.

Hardness, Stiffness, Color, Odor, Density, Waterproof, Knitted, Stretch

Answer: Hardness, Stiffness, Color, Odor, and Density

Learning Outcome 2.4: select furniture finishes

Duration: 5hrs



Learning outcome 2.4 objectives:

By the end of the learning outcome, the trainees will be able to:

1. Perform proper selection of furniture types according to the client's needs

2. Perform proper selection of furniture styles according to the client's needs

3. Perform proper selection of furniture materials according to the design concept

4. Perform proper selection of furniture finishes according to the materials

Resources

Equipment	**Tools**	**Materials**
Computers **Projector** Flash cards	**Flip chart - Marker pen,** Board, Books	**Fabrics,** Hardwood Softwood,Metals,Fabrics Leather,Synthetic,woods MDF /Plywood and Foam **Oks - Internet ,**

Advance preparation:

. sample of Furniture's materials finishes

Criteria for furniture finishes' selection

1. **Type of material**: review materials for their ability to prevent slips and falls and to cushion Design materials to protect both surfaces and people in spaces where potentially dangerous chemicals are in use. Avoid materials that expose people to harmful chemicals or unsafe conditions during their manufacture, delivery, installation, use, or disposal, or that degrade indoor air quality

2. **Climate**

Designers also must consider how a material will perform under the conditions of the project. They rate materials for durability, colorfastness and fading, and stain and water resistance, and evaluate them for ease of maintenance. Materials may be tested and labeled by the manufacturer for light, moderate, or heavy use. And resist to the variation of atmospheric agencies.

3. **Sun exposure**

Ultraviolet light can change wood's color and damage its surface. In a way that's similar to the effect sunlight has on skin, sunlight can break apart chemical bonds in wood and cause the surface to change colors. If you're not among the wood furniture owners who find this kind of discoloration attractive, a skilled craftsman can restore an old finish to return the color to its original hue. Wood furniture with a durable and protective topcoat over the finish is likely to resist discoloration over time.

4. **Space function**

When selecting materials, designers consider what will be within reach of the user. For example: Materials used overhead are generally out of reach, but may be handled to access equipment above the ceiling. A corridor floor must withstand traffic c patterns as well as people leaning against the walls. The edges of counters are rubbed against and sometimes picked at. Chairs are scraped on floors, rubbed against walls, and turned onto tabletops for cleaning. Cleaning equipment bumps into walls and furnishings. All these possibilities have to be considered and factored into the long-term cost of a material.

5. **Aesthetics:** the general appearance should be also taken into account.


Theoretical learning Activity

brainstorm about Criteria for furniture finishes' selection within groups)

Practical learning Activity

Trainees in pair perform presentation on Criteria for furniture finishes' selection)

Points to Remember (Take home message)

Criteria for furniture finishes' selection

Content.2.4.2 Properties of furniture finishes

Describing the Properties of Materials

1. Color: Depends on quality and quantity of light; materials have one or more innate colors; other integral colors if processed.
2. Durability: The ability to resist destructive forces, retain its original appearance, and continue to function as intended.
3. Elasticity: Resiliency or flexibility; ability of a material to return to initial form after deformation.
4. Form: Three-dimensional quality defined by length, width, and depth. Linear form: One dimension significantly larger than others; provides vertical support, spans space, defines edges and corners, creates texture and patterns. Planar form: Length and width dominate thickness; defines edges of shapes; visual weight and stability; has color, texture, and acoustic properties. Blocklike form: Three-dimensional solid form with similar length, width, and depth.
5. Plasticity: Ability to be formed or shaped; pliancy; continuous deformation without rupturing or relaxing. Refinement: Ability to form and retain precise, thin, closely spaced elements; depends on strength, durability, and manufacturing process.
6. Strength: Ability to resist stress, to bend without breaking; long spans express resisting tension; massive materials resist compression.
7. Texture: Relative smoothness or roughness of surface; has scale.

Tactile texture can be felt. Visual texture is seen; depends on patterns of light and shadow, suggesting tactile texture.

8. Workability: Ease of altering from primary form

Theoretical learning Activity

brainstorm about the Properties of furniture finishes within groups)

 Practical learning Activity

Trainees in pair perform presentation on Properties of furniture finishes)

 Points to Remember (Take home message)

- Properties of furniture finishes

 Learning outcome 1 formative assessment

Written assessment

Describe the disadvantage of furniture

Furniture needs space to be placed because if you don't have it you can maybe express a cluttered space.

Furniture is sometimes expensive, depending on the style and designers you like.

Wood is vulnerable to water. Moisture can damage wood finishes and soak into the wood underneath, causing it to split and swell.

Ultraviolet light can change wood's color and damage its surface. In a way that's similar to the effect sunlight has on skin, sunlight can break apart chemical bonds in wood and cause the surface to change colors

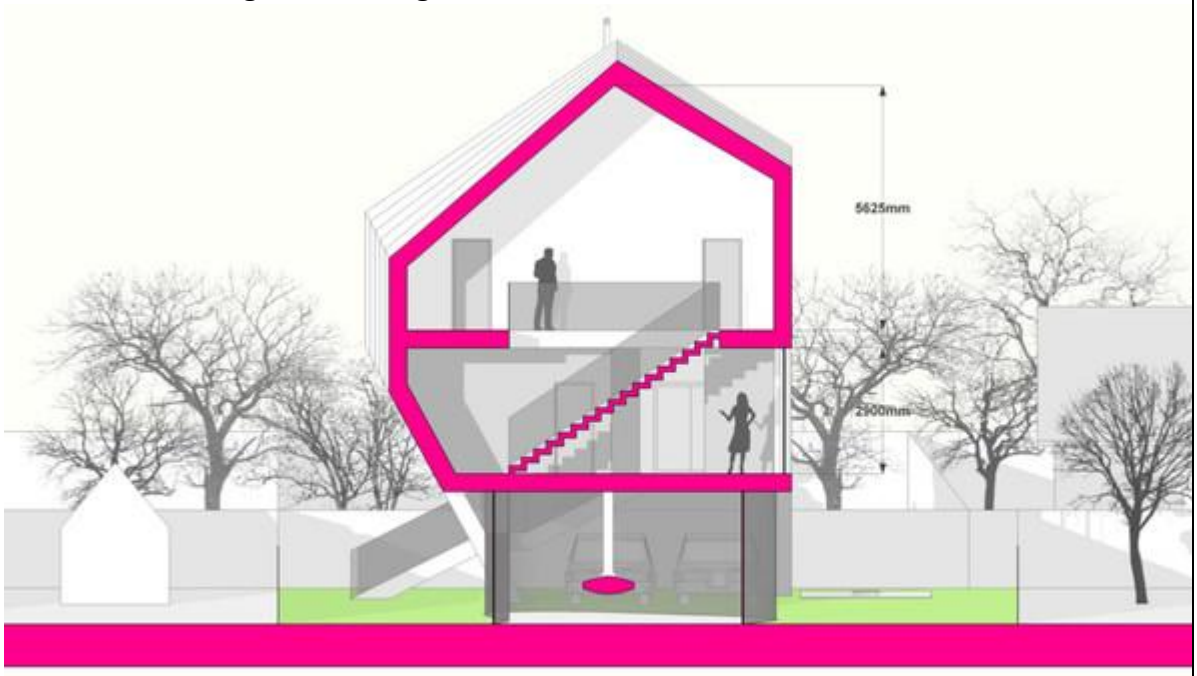
Finishes can be scratched or damaged by sharp objects. While the topcoat should make your furniture resistant to damage caused by everyday use, sharp or heavy objects may scratch the finish, which could expose the wood underneath. Check to see if your warranty covers repairs for accidental damage.

Repairing damage requires patience and skill. Fixing scratches on a wood surface requires a craftsman's touch; sanding or removing stains requires patience, care, and attention to detail.

Learning Unit 3: Develop design concept

Learning Unit 3: Select furniture types, styles and materials

Picture/s reflecting the Learning unit 3



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STRUCTURE OF LEARNING UNIT

1. Develop preliminary sketches
2. Develop drawings using CAD
3. Render images
4. Prepare design presentation

Learning outcome 3.1. Develop preliminary sketches

Duration: 40hrs

Learning unit 3 objectives:

By the end of the learning outcome, the trainees will be able to:

1. Develop properly the preliminary sketches according to the type of furniture.

2. Develop precise drawings using CAD

3. Perform neat rendering of images

4. Perform proper preparation of the design presentation

Resources

Equipment	Tools	Materials
Computers- Projector -	**Internet -** Google Sketch up, Solid works, Visual aid	Sketch books - Pencils - Drawing boards, Printer, papers

Advance preparation:

. Working area and needed devices like computers papers and other drawing equipment

Content 3.1.1. Definition of preliminary sketches and steps for developing preliminary sketches

1. Definition of preliminary sketches:

Preliminary sketches" are the simple sketches or even detailed drawings an artist creates prior to painting the final picture. They are line drawings/sketches that are usually created in pencil but could be quick painted lines

Preliminary drawings and plans are the initial set of sketches, drawings and plans used to visually convey concepts, designs ideas, and project requirements among design professionals, clients, landlords, and other project stakeholders.

2. Steps of developing preliminary sketches:

Development of small thumbnail sketches

Development of large sketch
Development of final sketch

Practicing Sketching

1.Get the right materials. Just like with any art form, it is difficult to sketch when using poor quality (or the wrong) materials. You can easily find all the proper sketching materials at a local arts and crafts store. Spend a few dollars and gather up all the right materials, including:
H pencils. H pencils are the hardest pencils, and are used for sketching thin, straight, non-blend-able lines. These are mostly used for architecture and business sketches. Get an assortment including 8H, 6H, 4H, and 2H pencils (8H is the hardest, 2H is the softest).
B pencils. B pencils are the softest pencils, and are used for making smudged and blurry lines and for shading your sketch. These are the favorites of many artists. Get an assortment including 8B, 6B, 4B, and 2B (8B is the softest, 2B is the hardest).
Fine art paper. Sketching on regular printer paper may be easy, but the paper is thin and doesn't hold the pencil as well. Use fine art paper with a bit of texture for the easiest time sketching, and for the best overall appearance.

2.Practice some hand movements, before you start sketching. For example, you can draw circles or horizontal lines for five-ten minutes to warm up your hand.

3.Start with an H pencil. Use light strokes with loose hands. Move your hand very quickly, using minimal pressure, almost glossing over the page without stopping. Get comfortable

with the paper you are working with. At this initial stage, you should barely be able to see the strokes. Consider this to be the foundation of your sketch.

4.Use the darker 6B pencil for the next stage. When you achieve the perfect shape in Step 3, you can then define your strokes more precisely with this darker pencil.[3] Keep adding details. Start adding inner shapes. Make sure they are to scale. For example, when drawing a parking ramp, you want to make sure that the entrances and parking spots are the appropriate size.

When you are finished using this pencil, you will notice smudges on the pages since the lead on this pencil is softer than the previous one. Remove all smudges with the eraser.

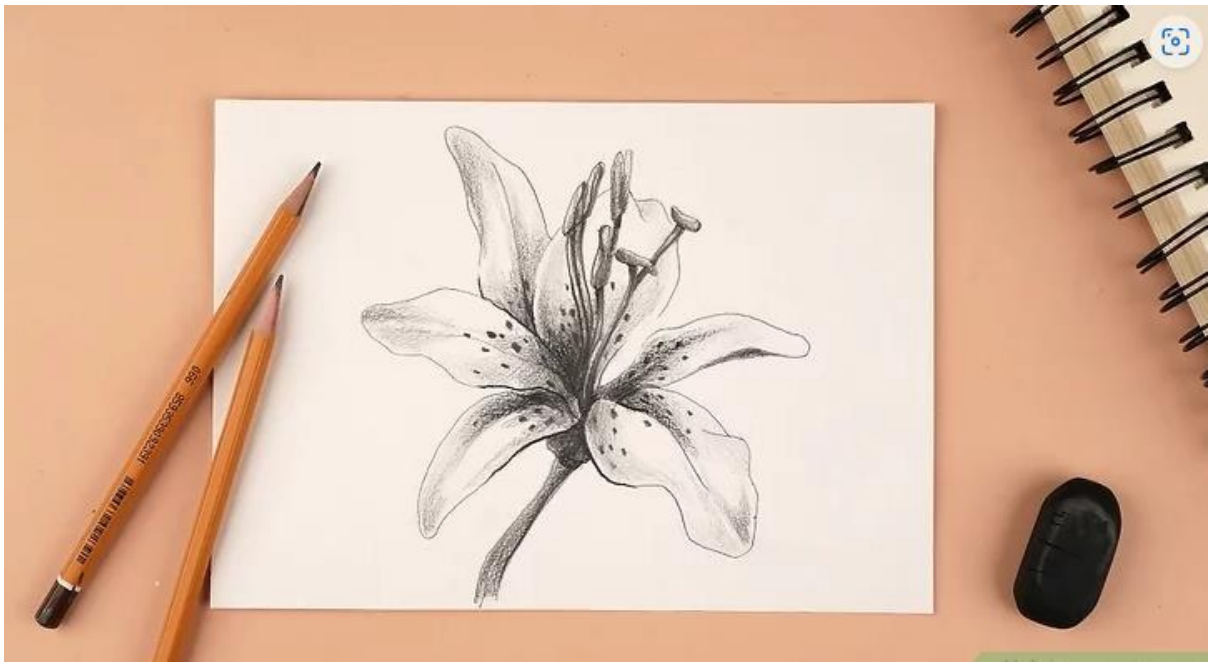
Make sure you use a soft eraser like the putty eraser so that your erasing does not rip off the top layer of the page. The putty eraser will lighten your lines, not completely eradicate them

5.Add further details. Perfect your lines and presentation until you are satisfied that you have captured the perfect representation.

6.Seal your work. When you have completed your sketch, apply a fixative to seal the image. Use a mirror when drawing. Periodically, look at your drawing and the thing you are drawing in the mirror.

Leonardo davinci did this and recommended it.

It helps to see your drawing differently and note the mistakes



Theoretical learning Activity

Brainstorm about preliminary sketches and Steps of developing preliminary sketches within groups)

Practical learning Activity

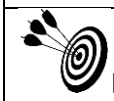
- ✓ Trainees in pair perform sketching)

Points to Remember (Take home message)

➢ Definition of preliminary sketches ➢ Steps of developing preliminary sketches

Learning unit 3.2: Develop drawings using CAD

Duration: ….hrs



Learning unit 3 objectives:

By the end of the learning outcome, the trainees will be able to:

1. Develop properly the preliminary sketches according to the type of furniture.

2. Develop precise drawings using CAD

3. Perform neat rendering of images

4. Perform proper preparation of the design presentation

Resources

Equipment	Tools	Materials

Computers- Projector -	**Internet -** Google Sketch up, Solid works, Visual aid	Sketch books - Pencils - Drawing boards, Printer, papers

Advance preparation:

. Working area and needed devices like computers papers and other drawing equipment

Content 3.2.1 Steps of developing drawings using CAD:

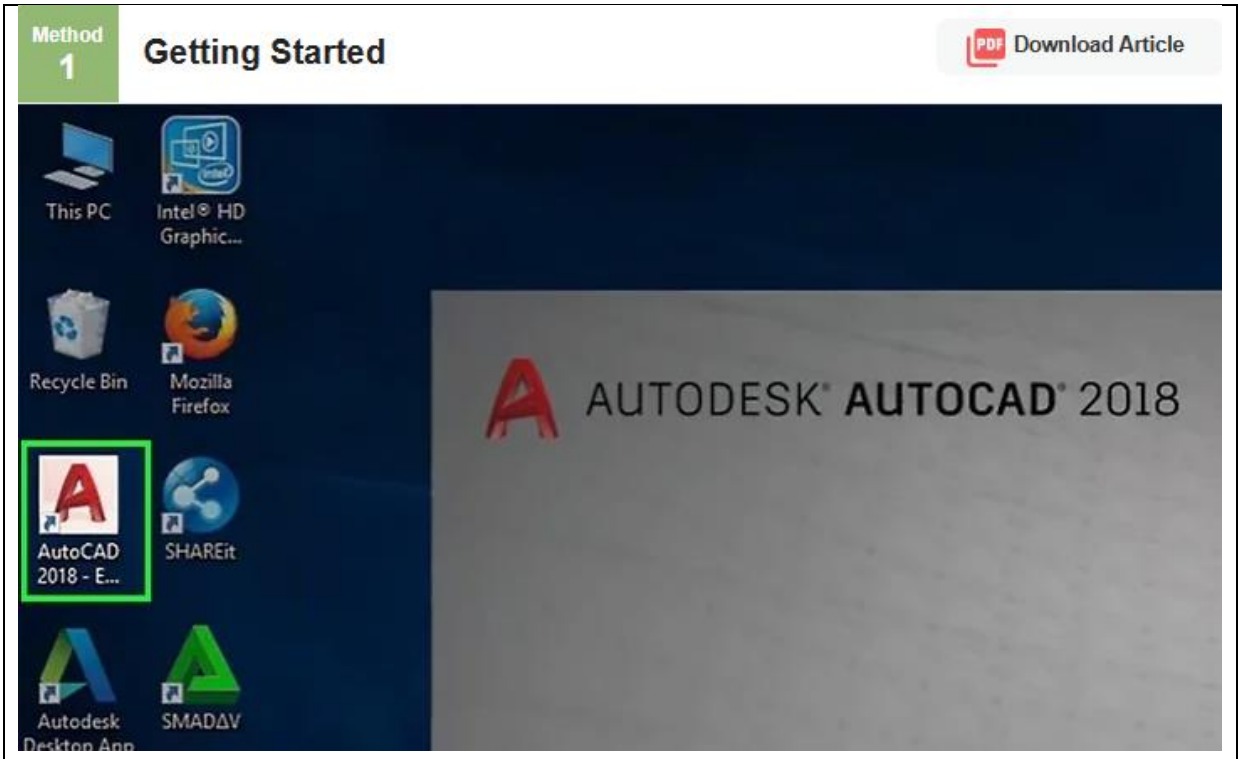
Computer-aided design (**CAD**) is the use of computers (or workstations) to aid in the creation, modification, analysis, or optimization of a design.
This software is used to increase the productivity of the designer, improve the quality of design, improve communications through documentation, and to create a database for manufacturing.

1. Steps of developing drawings using CAD:

- Creation of geometric shapes and bodies
- Scaling design components
- Design component manipulation:
- Move, Drag, Align, Crop, Connect, Mirror/duplicate, cut/copy & paste, Animation Color/paint, Pull & push; Intersect, Filet & chamfer, Trim; Split; Resize

Example for AutoCAD.
Practicing drawing by using AutoCAD
Getting Started

1. **Open AutoCAD.** You'll find it in the Windows menu or your Mac's Applications folder.



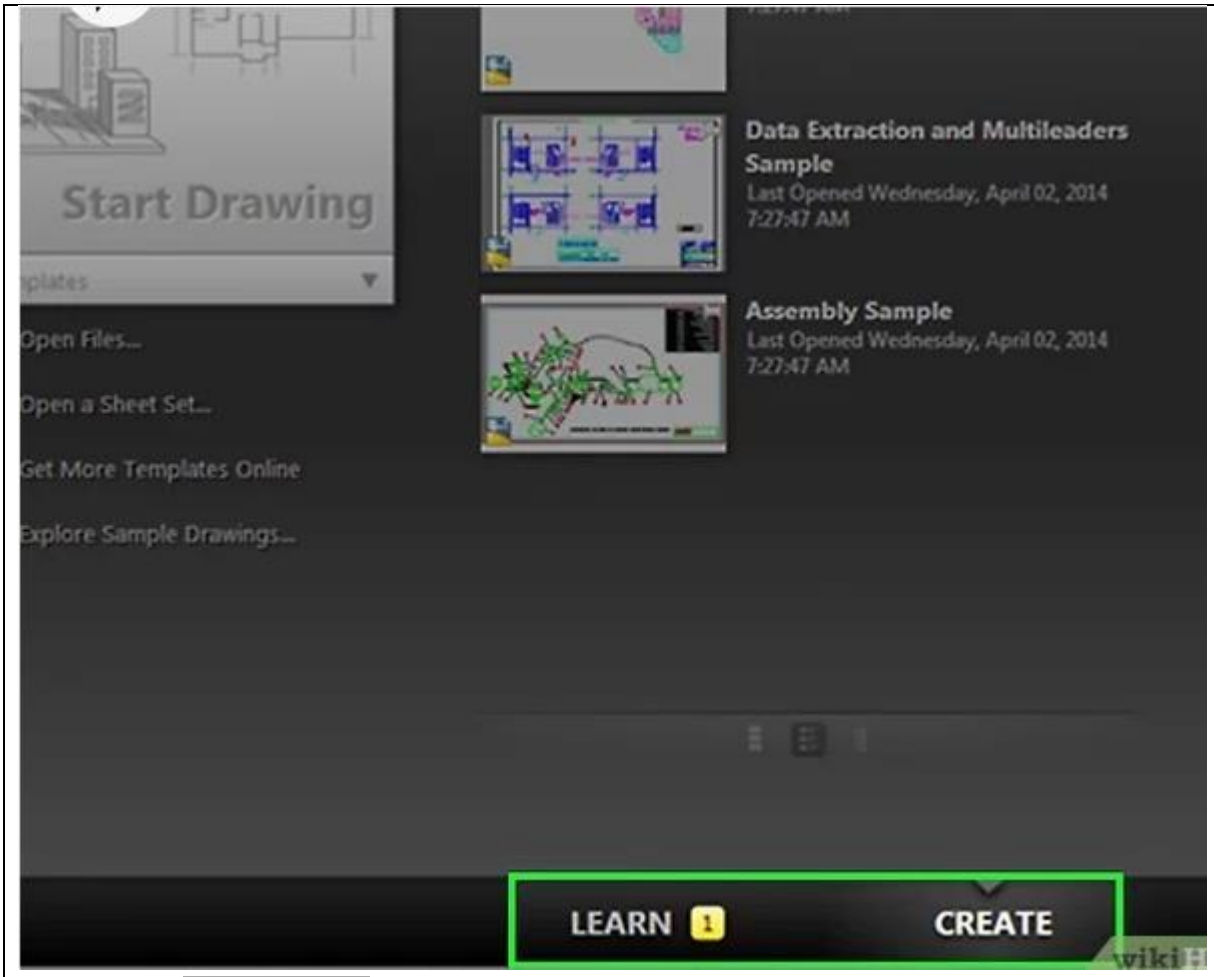
2. **Browse the Start screen.** When you open autocad, you'll see two tabs on the bottom—**LEARN** and **CREATE** (the default tab). If you click the **LEARN** tab, you'll find helpful videos to get you started with your project. If you click back to the **CREATE** tab, you'll find the following areas:

In the "Get Started" section on the left, you can select **Start Drawing** to create a new project, **Open Files** to choose an existing project, or click the **Templates** menu to start from a template.[1]

If there are any recent autocad documents to work on, they'll appear in the Recent Documents section at the middle of the screen.

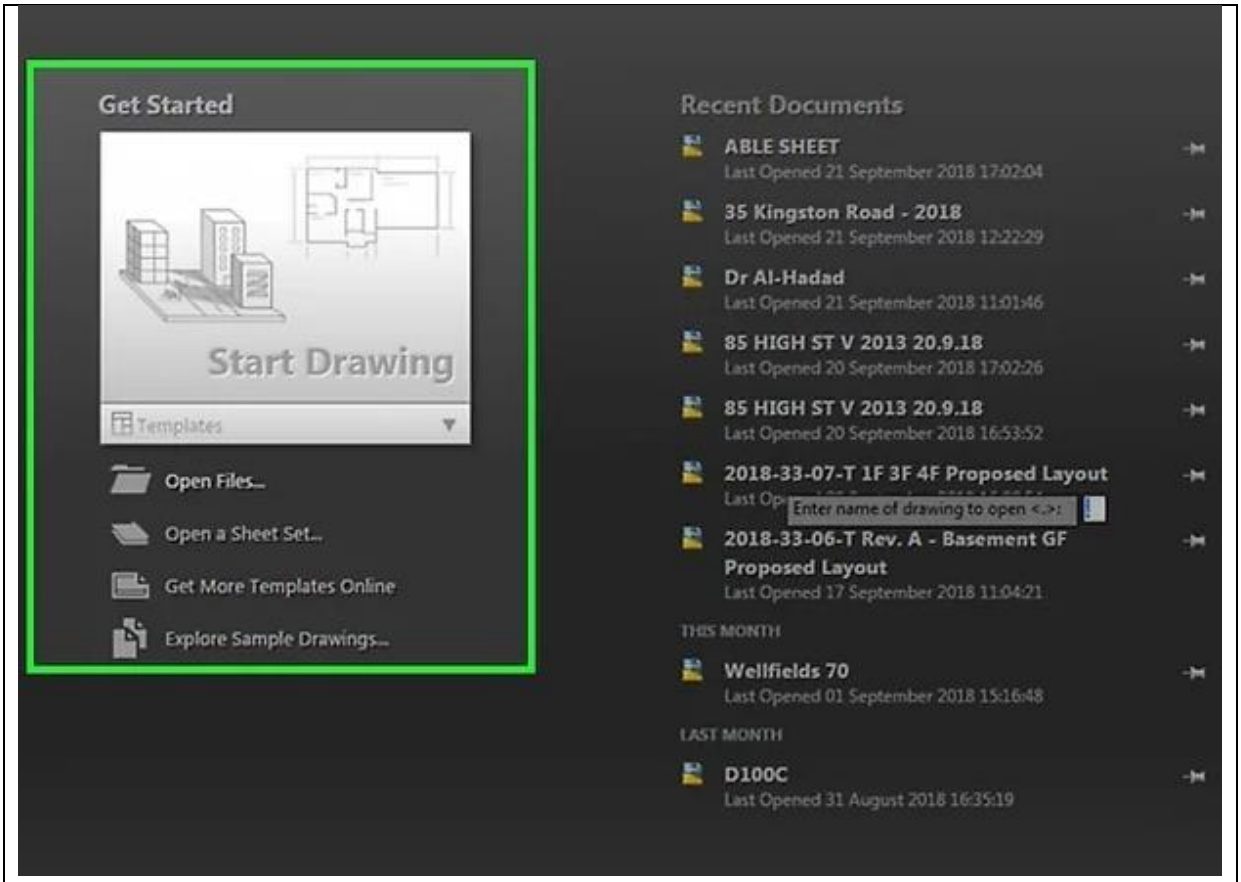
If any updates are available, they'll appear in the Notifications area at the top-right corner.

You can also sign in to your A360 account by clicking **Sign In** at the bottom-right corner.



3. **Click Start Drawing or open an existing file.** If you want to start a new project from a template, choose that template instead.[2]

If you don't see the option to do so, click the **File** menu and select **New** to create a new drawing now.



4. **Familiarize yourself with the workspace layout.** Once you've opened a drawing, take some time to acquaint yourself with the locations of menus and tools:

The drawing area is the part of the workspace with a gridded background. At the top-left corner of this area are two tabs: one is for the current drawing (which will have a name like "Drawing1") and the other can take you back to the **Start** screen. If you open more than one drawing at once, each will have its own tab above the drawing area.

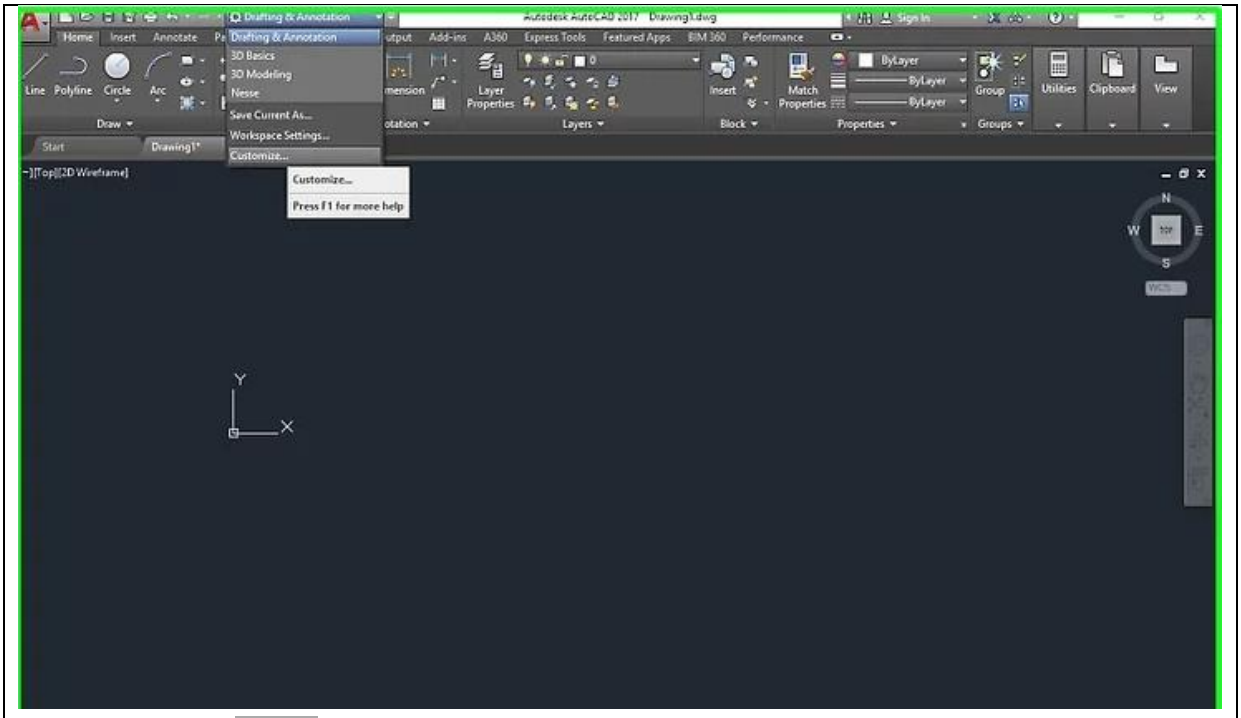
The Y-axis appears in green on the left side of the drawing area, and the X-axis is the red line along the bottom.

The View cube is the square with a directional compass around it—you can use this to adjust your perspective when working in 3D.

The ribbon toolbar at the top above the drawing area contains your tools on a series of tabs (**Home**, **Insert**, **Annotate**, etc.).

Click the **View** tab at the top to show and hide tools and features on the workspace.

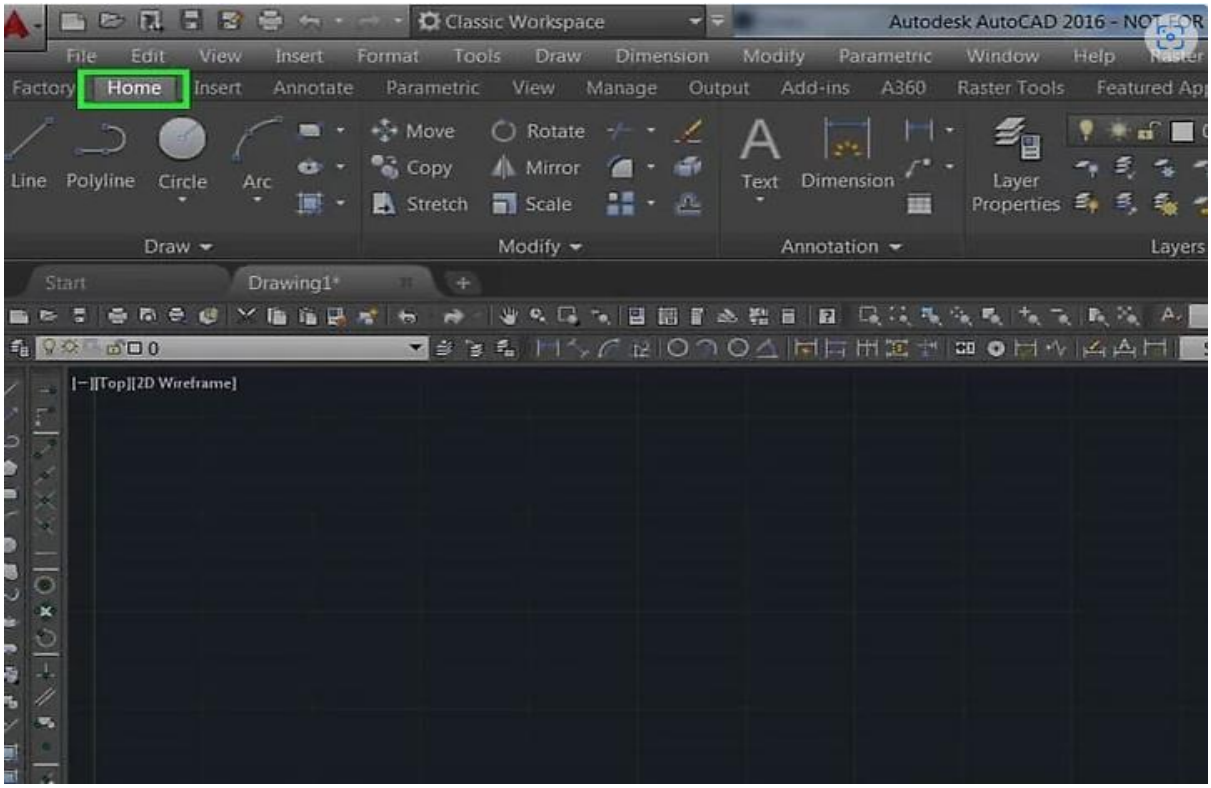
The "Type a command" area at the bottom lets you type in commands and tool functions once you get a bit more acquainted with the app.[3]



5. **Click the Home tab.** It's at the top-left corner of autocad. You'll see your drawing tools in the "Draw" area on the left side of the ribbon toolbar.

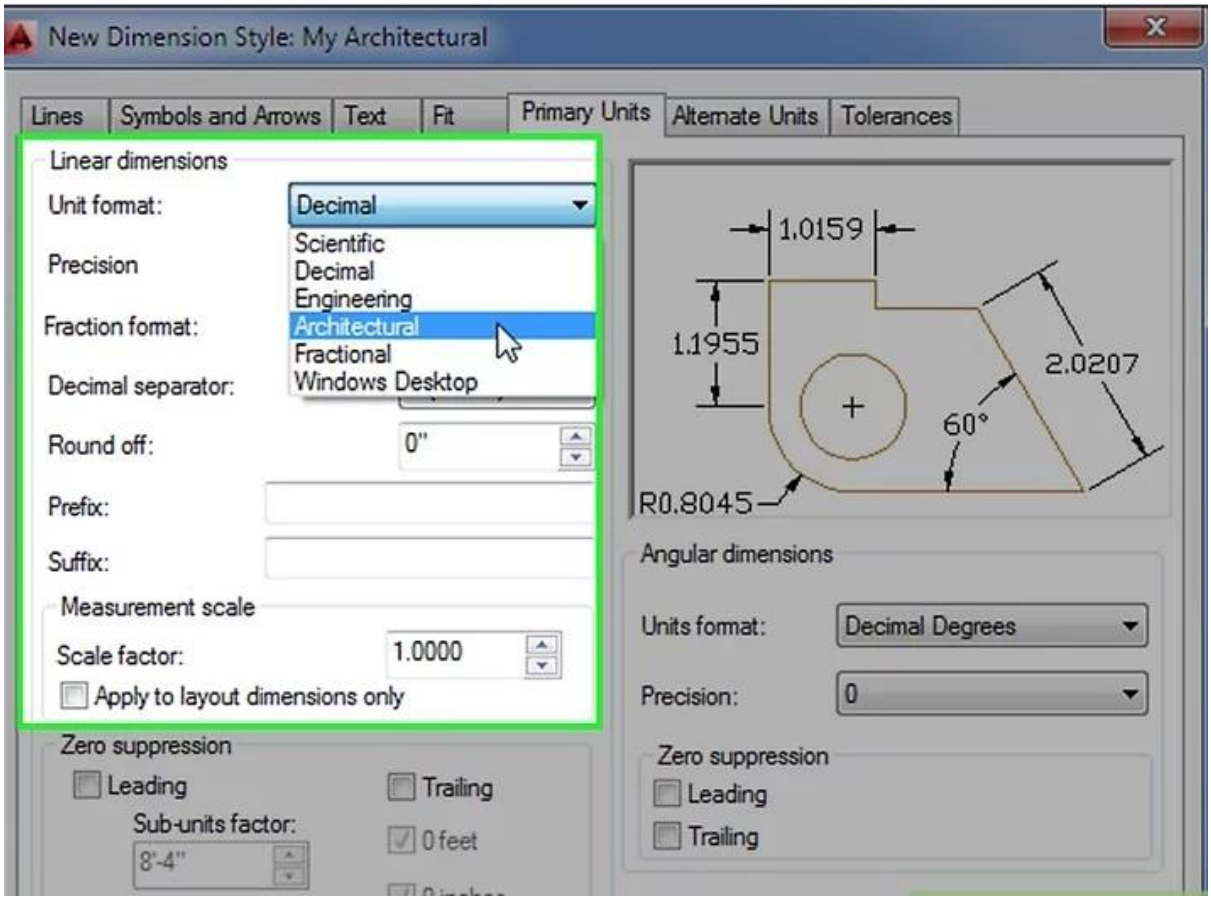
Hover your mouse over any of the tools to see more information about what they do, as well as instructions for finding more help about their uses.

As you draw with any tool, you'll see useful measurements near the cursor, such as length and angle



6. **Set your default measurement formats.** If you need to change the way the scale, length, or angle measurements appear on the screen, `units` into the command prompt and pressing **Enter** or **Return** to bring up the Drawing Units panel. For

example, if you're seeing measurements in microns and you need to see them in meters, you can make that change here whenever you want.



Drawing in AutoCAD

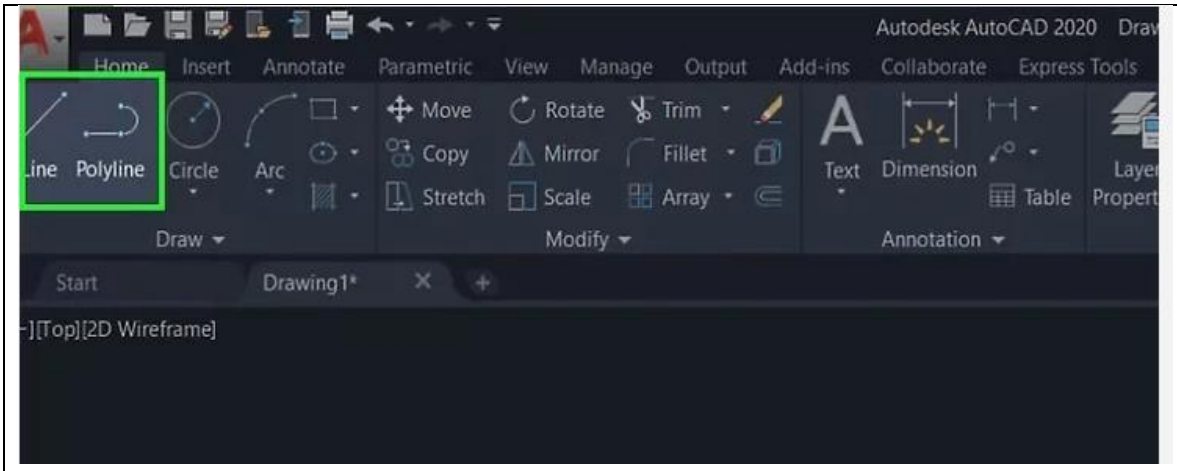
1. Click the Line or Polyline tool to draw lines. Both tools are at the top-left corner. The Line tool is for drawing individual line segments, while the Polyline tool lets you create a single object from a series of line segments.[4] To draw your first lines:

Click the mouse at the starting point of your line segment.

Move the mouse to the place where you'd like to end the segment, and click the mouse at the ending point. If you're using the Line tool, this completes your first segment/line.

If you're using the Polyline tool, move the mouse again and click to continue creating segments. When you're finished, hit the **Esc** key to stop drawing.

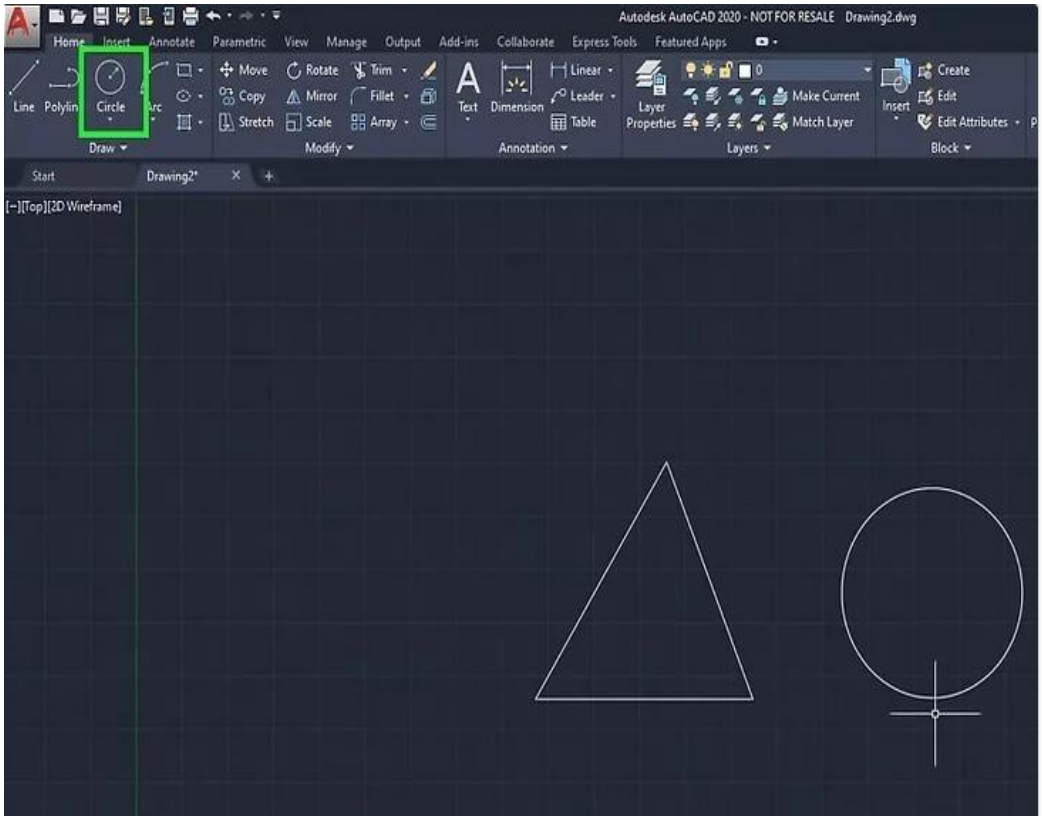
If you need to set precise measurements for your segments (and this is true for any tool), type the desired measurement into the box near the cursor instead of clicking a segment endpoint. When you press **Enter** or **Return**, the endpoint will be placed at the distance you entered.



2.Click the Circle tool to draw a circle. It's to the right of the Polyline tool in the toolbar. To draw a circle:

Click the location on the drawing area where the circle's center should be.

Drag the mouse outward and click to select the radius.



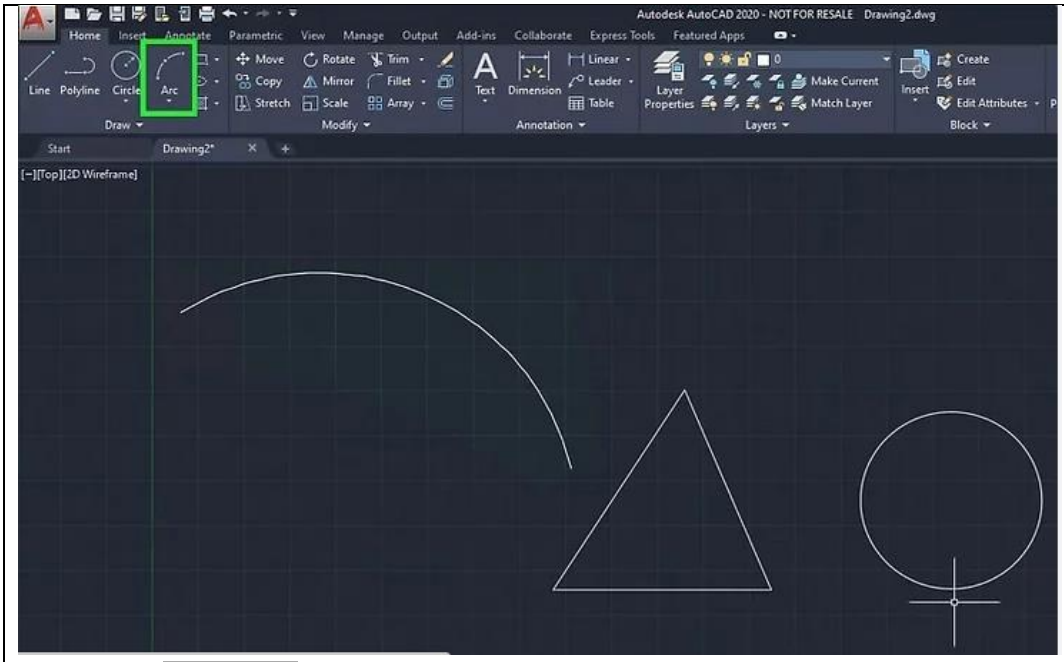
3.Click the Arc tool to draw a curved line. It's to the right of the Circle tool in the toolbar.

To draw an arced line:

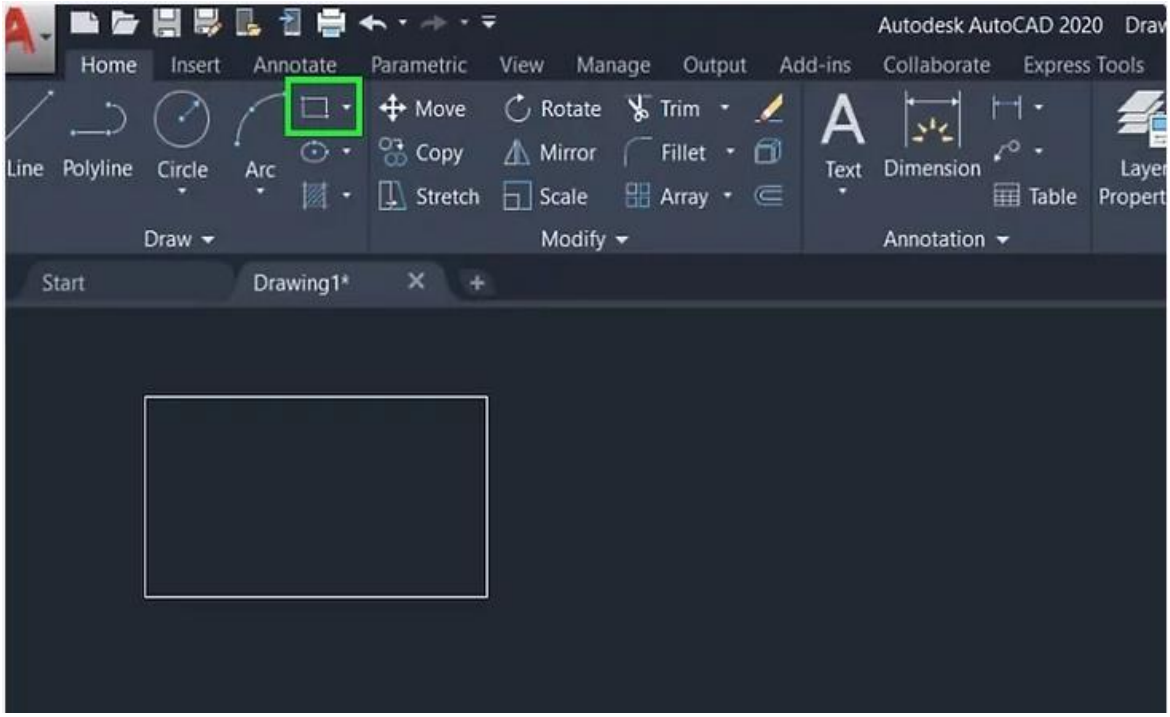
Click the mouse at the starting point.

Move the mouse and then click to end the segment.

Move the mouse in the direction of the curve you want and click to curve the line.



4.Click the Rectangle tool to create a rectangle. The rectangle tool is simple—click the first point, which will be any corner of the rectangle, and then drag the mouse until the rectangle is the size you want. Click the mouse to place the rectangle.

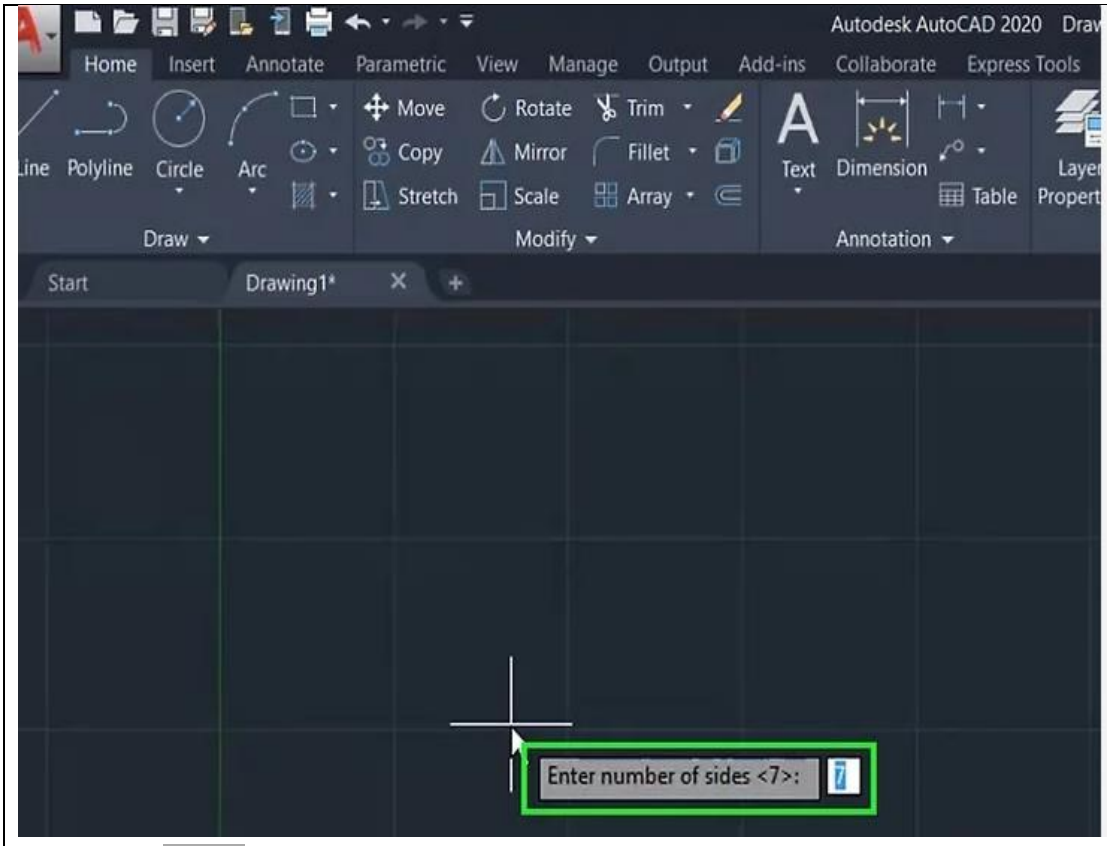


5.Click the Polygon tool to a multi-sided shape. Here's how:

Move the cursor to the drawing area—you'll see a box that says "Enter the number of sides." Type the number of sized and press **Enter** or **Return**.

Click the center point of your shape.

Move the mouse to the desired size and click to place the shape

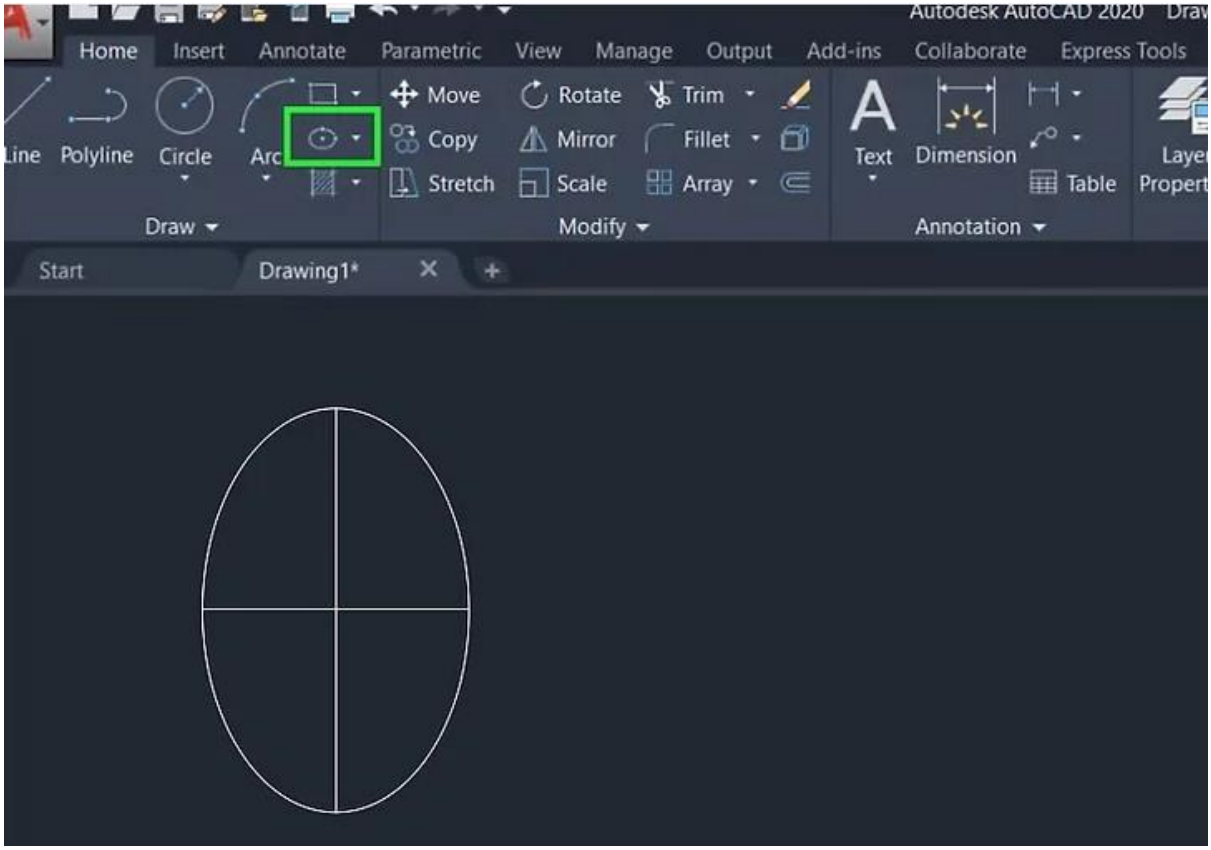


6.Click the Elipse tool to create an oval. An ellipse is created by placing three points. Here's how:

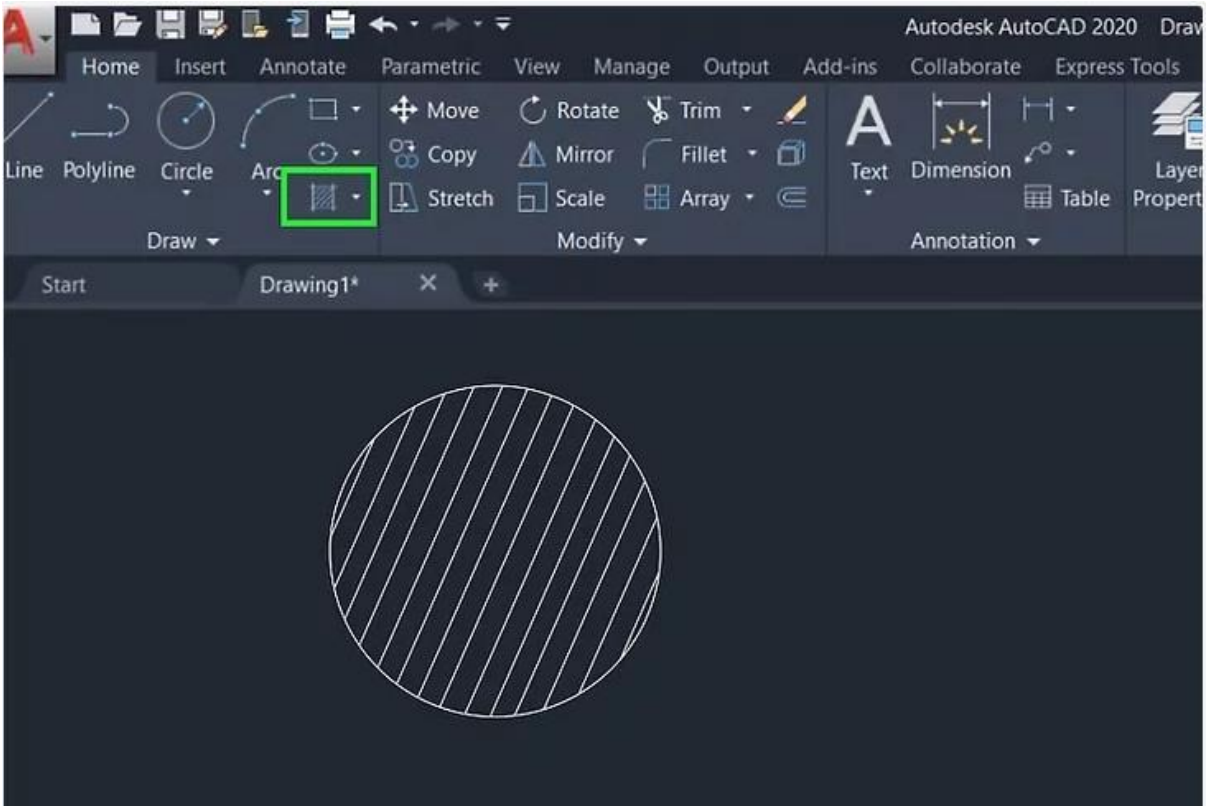
Click the desired center point.

Move the mouse to the desired size and click a second point.

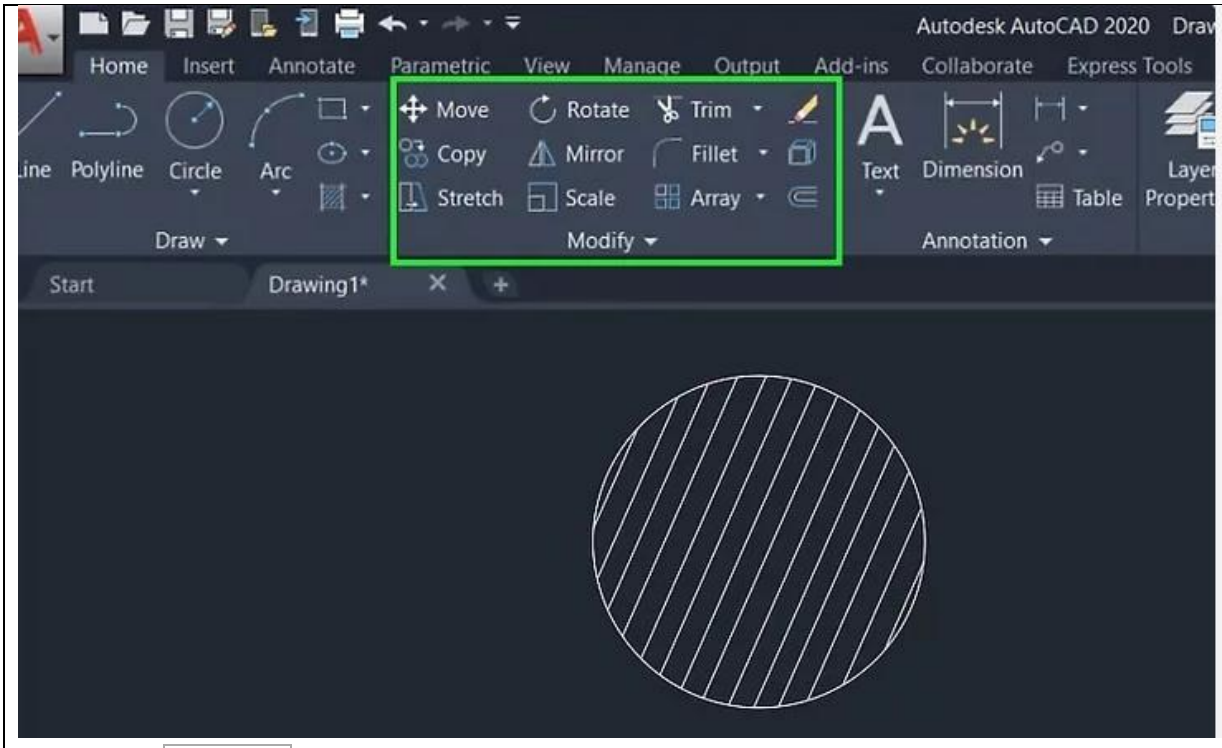
Move the mouse to shape the ellipse and click to place the shape.



7.Use the Hatch tool to fill a shape with a pattern. It's the square at the bottom-right corner of the Draw panel in the toolbar. Click the tool, then click a shape to fill it. You can choose any of the patterns or solid fills that appear in the "Pattern" panel that shows in the toolbar while Hatch is enabled



8.Use the tools in the "Modify" panel to edit your shapes. First, if you just click a shape or line without selecting a tool first, anchor points will appear—you can drag these anchor points to modify the shape if you'd like. There are lots of other modifications you can make:
Click **Move** to move a line or shape. After clicking the tool, click the object you want to move, and then drag it anywhere. You can select multiple objects at once to move them as a group
Click **Rotate** and then a shape to turn it clockwise or counter clockwise. If you want to flip the image, use the **Mirror** tool.
Click **Scale** and then a shape to change its size. Check out How to Scale in autocad to learn more about what you can do with scaling.
Click **Stretch** if you want to resize an image by stretching it rather than keeping it scaled.
Click one of the Array tools (**Rectangular Array**, **Path Array**, or **Polar Array**) to create an array of the object you select.
The **Trim** tool lets you cut a segment or side of an object that meets the border of another object, turning them into a single object.
The **Fillet** and **Chamfer** tools let you create curved and sharp vertices by intersecting two selected sides.

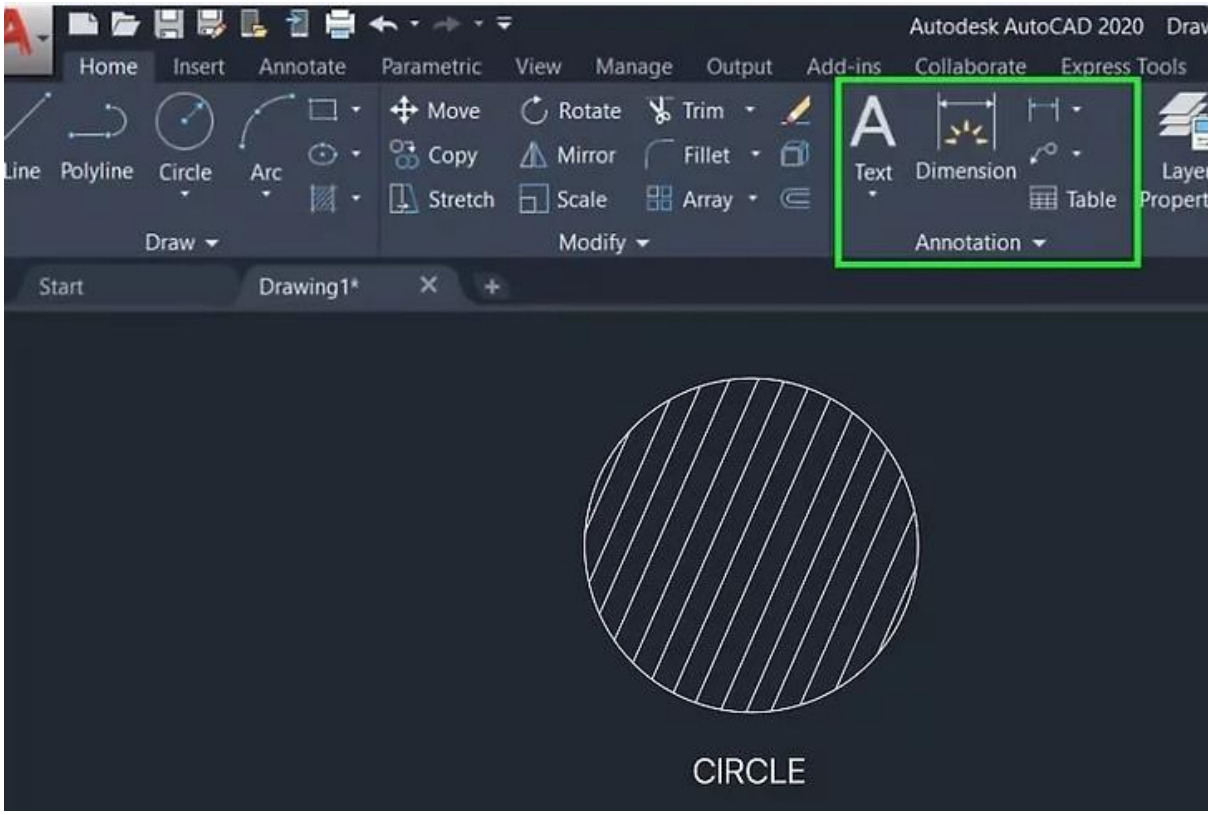


9.Click the Annotate tab to add text and tables. The tab is next to the "Insert" tab at the top. This is where you can create text boxes, add tables with multiple rows and/or columns, and more.

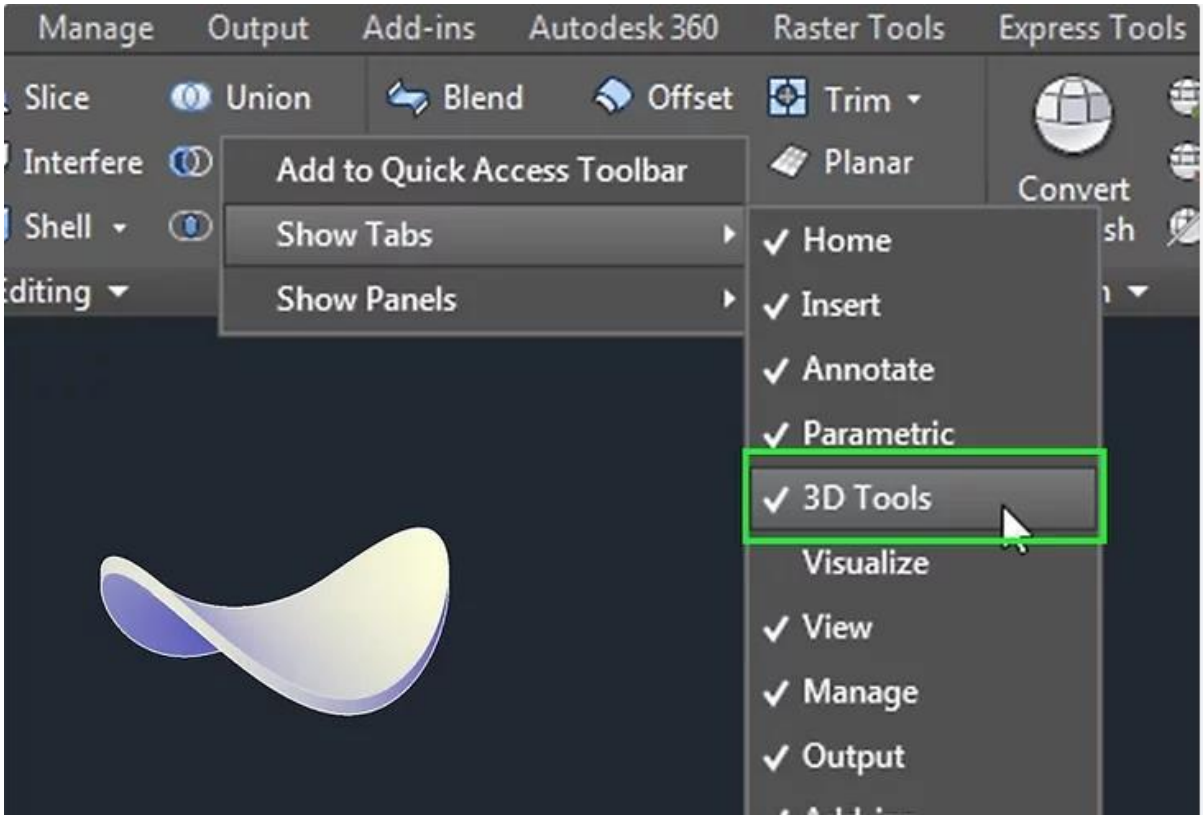
Click **Single Line** or **Multi Line** on the top-left side of the ribbon toolbar to switch between text styles.

Any text you add will also act as a single object that you can move.

This tab also has a "Dimensions" panel that lets you annotate dimensions of shapes and lines.

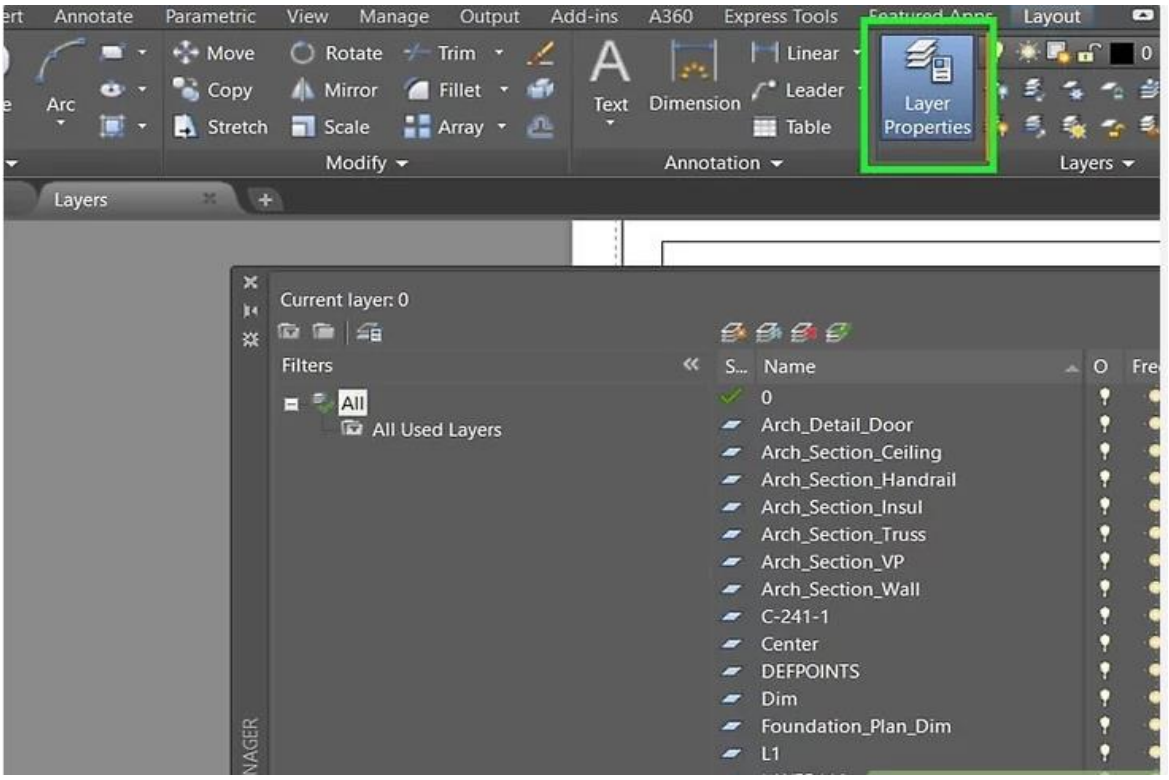


10.Work with 3D objects. There are two ways to switch to a 3D view—one is to drag the Viewcube at the top-right corner of the drawing area in any direction, and the other is to click the **Orbit** icon in the right panel—it's the circle with an upward-pointing arrow inside.
Click the **3D Tools** tab at the top to open editing tools specific to 3D design. If you don't see this tab, right-click the blank area after the last tab above the ribbon toolbar, open **Show tabs**, and select **3D Tools**.
Click the down-arrow below "Box" in the "Modeling" panel of the toolbar view and select different 3D objects to draw (e.g., **Cone**, **Sphere**, **Pyramid**). You'll draw the images similar to how you did in regular 2D format, but this time you'll have another axis (the blue line) to work with.
The shapes will appear as 3D line drawings rather than with volume. You can change this by clicking **2D Wireframe** near the top-left corner of the drawing area and selecting another view, such as **Shaded**, **Realistic**, or **X-ray**.
To turn a 2D object into a 3D one, use the **Extrude** tool to increase its depth, and/or **Revolve** to rotate it around an axis.
You can modify 3D objects similarly to 2D objects—click an object to show the blue draggable nodes, then move them around as needed.
The "Solid Editing" and "Surfaces" panels contain advanced editing tools for creating and editing complex shapes.

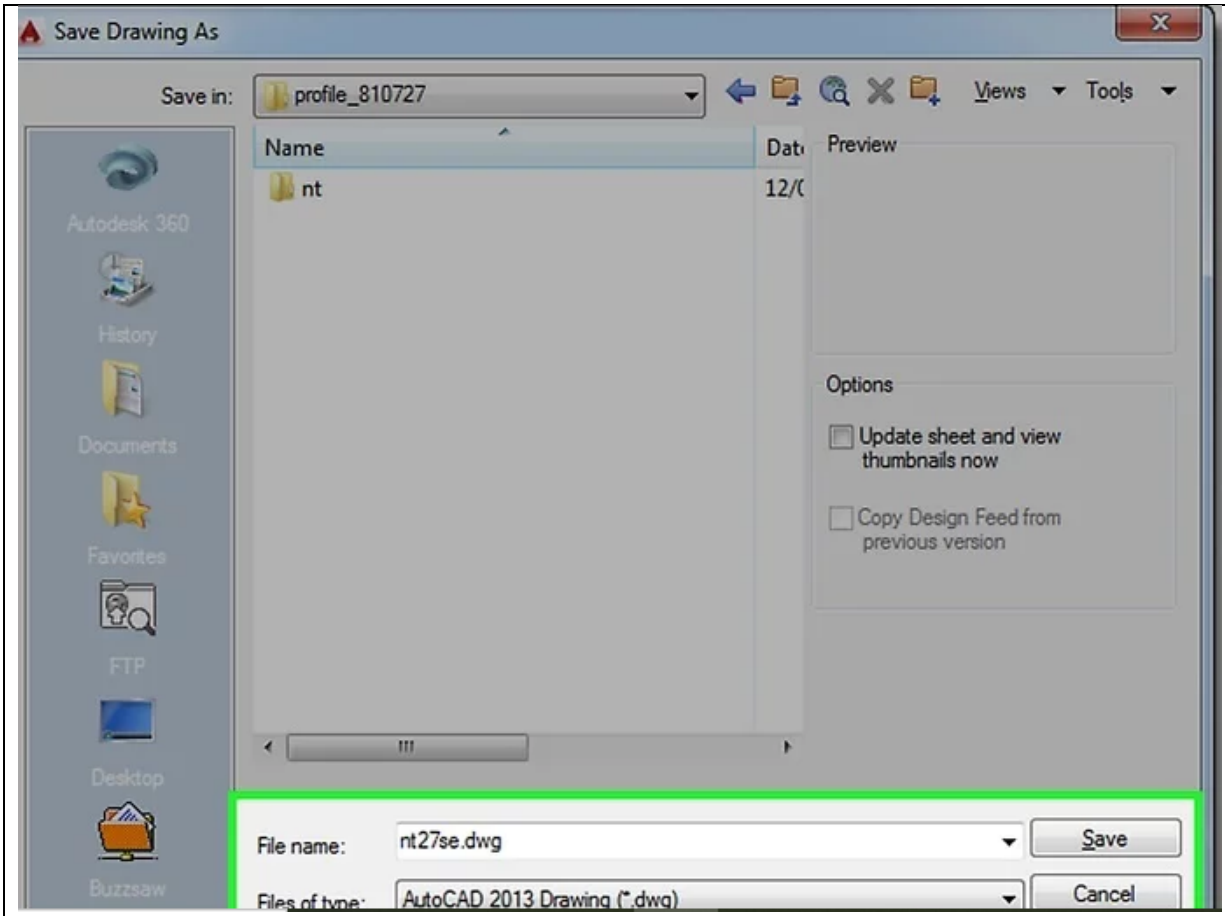


11.Place drawings on different layers. When you're working on more complicated drawings, it can be beneficial to place parts on different layers that you can edit, hide, view, and rearrange.[6] Here's some basics to get you started with layers:
On the **Home** tab, click the **Layer Properties** icon in the "Layers" panel to display the Layer Properties panel. This shows all layers and what you can do with them.

Click the icon of three sheets of paper with a red-and-yellow circle on its left side (it's the first icon on top of the Layer Properties panel) to create and name a new layer. Now you'll have two layers in the panel.
Double-click a layer to select it. The layer with the checkmark is the current layer.
Click the lightbulb on a layer to toggle to hide it/show it. If you're working with particularly large files, use the sun icon to freeze the layer instead of hiding it.
Use the padlock icon to protect a layer from accidental edits by locking it



12.Save your drawing. To save what you're working on, click the **A** menu at the top-left corner and select **Save As**, and choose **Drawing**. This lets you save your work as a DWG file, which is the default autocad format.
Now that you've got the basics down, try drawing an L-shaped stairway or a step pyramid! As you become proficient with autocad, you'll be able to convert lines into surfaces, surfaces into 3D solids, add realistic material representations, and manipulate light and shadows.



Theoretical learning Activity

Brainstorm about **Steps of developing drawings using CAD** within groups)

Practical learning Activity

Trainees in pair Practicing drawing by using AutoCAD within a group)

Points to Remember (Take home message)

Steps of developing drawings using CAD

Learning outcome 3.3: Render images

Duration: ….hrs

Learning unit 3 objectives:

By the end of the learning outcome, the trainees will be able to:

1. Develop properly the preliminary sketches according to the type of furniture.

2. Develop precise drawings using CAD

3. Perform neat rendering of images

4. Perform proper preparation of the design presentation

Resources

Equipment	Tools	Materials
Computers- Projector -	**Internet -** Google Sketch up, Solid works, Visual aid	Sketch books - Pencils - Drawing boards, Printer, papers

Advance preparation:

. Working area and needed devices like computers papers and other drawing equipment

Content 3.3.1 Steps of rendering an image

Rendering or **image synthesis** is the process of generating a photorealistic or non-photorealistic image from a 2D or 3D model by means of a computer program.[*citation needed*] The resulting image is referred to as the **render**.
When the pre-image (a wireframe sketch usually) is complete, rendering is used, which adds in bitmap textures or procedural textures, lights, bump mapping and relative position to other objects. The result is a completed image the consumer or intended viewer sees.

For movie animations, several images (frames) must be rendered, and stitched together in a program capable of making an animation of this sort. Most 3D image editing programs can do this.

- **Steps of rendering an image**

1. Selection of the view to render
2. Editing the render settings by adjusting:
   Lighting, Textures, Color, Background, Resolution, Save & rename
3. **Run the rendering**

Therefore, the light transport modelling techniques have emerged:
Rasterization, including scanline rendering, geometrically projects objects in the scene to an image plane, without advanced optical effects;
Ray casting considers the scene as observed from a specific point of view, calculating the observed image based only on geometry and very basic optical laws of reflection intensity, and perhaps using Monte Carlo techniques to reduce artifacts;
Ray tracing is similar to ray casting, but employs more advanced optical simulation, and usually uses Monte Carlo techniques to obtain more realistic results at a speed that is often orders of magnitude faster.
The fourth type of light transport technique, radiosity is not usually implemented as a rendering technique but instead calculates the passage of light as it leaves the light source and illuminates surfaces. These surfaces are usually rendered to the display using one of the other three techniques.
Most advanced software combines two or more of the techniques to obtain good-enough results at reasonable cost.
Scanline rendering and rasterization
Main article: Rasterization

Rendering of the European Extremely Large Telescope
A high-level representation of an image necessarily contains elements in a different domain from pixels. These elements are referred to as primitives. In a schematic drawing, for instance, line segments and curves might be primitives. In a graphical user interface, windows and buttons might be the primitives. In rendering of 3D models, triangles and polygons in space might be primitives.
The older form of rasterization is characterized by rendering an entire face (primitive) as a single color. Alternatively, rasterization can be done in a more complicated manner by first rendering the vertices of a face and then rendering the pixels of that face as a blending of the vertex colors.

Ray casting involves calculating the "view direction" (from camera position), and incrementally following along that "ray cast" through "solid 3d objects" in the scene, while accumulating the resulting value from each point in 3D space. This is related and similar to "ray tracing" except that the raycast is usually not "bounced" off surfaces (where the "ray tracing" indicates that it is tracing out the lights path including bounces).
Ray tracing

Ray tracing (graphics)

Ray tracing aims to simulate the natural flow of light, interpreted as particles.
Or hardware ray tracing.
Neural rendering
Neural rendering is a rendering method using artificial neural networks.
Neural rendering includes image-based rendering methods that are used to reconstruct 3D models from 2-dimensional images.
One of these methods are photogrammetry, which is a method in which a collection of images from multiple angles of an object are turned into a 3D model

. Radiosity is a method which attempts to simulate the way in which directly illuminated surfaces act as indirect light sources that illuminate other surfaces.

Theoretical learning Activity

Brainstorm about Steps of rendering of image, Editing the render settings and Run the rendering

Within groups)

Practical learning Activity

Trainees in pair Run the rendering)

Points to Remember (Take home message)

- Steps of rendering an image
- Editing the render settings

Learning outcome 3.4: prepare design presentation

3.4.1 Steps in making layout:
Select drawings
Select rendered images
Align images on the layout
Scale images
Print layouts

3.4.2 Steps of making a scale model:

Cut model components on scale
Assemble model components
Apply finishes:
Color,
Textures

Theoretical learning Activity

Brainstorm about the Steps in making layout, and steps of making a scale model within groups)

Points to Remember (Take home message)

Steps in making layout Steps of making a scale model

Learning outcome 1 formative assessment

Written assessment

1.what do you mean by Preliminary sketches"

Preliminary sketches" are the simple sketches or even detailed drawings an artist creates prior to painting the final picture. They are line drawings/sketches that are usually created in pencil but could be quick painted lines

2.list all the Steps of developing preliminary sketches.

Steps of developing preliminary sketches:

Development of small thumbnail sketches

Development of large sketch

Development of final sketch

3.Define the term Rendering which used in designing furniture.

Rendering or **image synthesis** is the process of generating a photorealistic or non-photorealistic image from a 2D or 3D model by means of a computer program. The resulting image is referred to as the **render**.

Learning Unit 4: Implement the design

STRUCTURE OF LEARNING UNIT

Learning outcomes:

1. Select tools and equipment 2. Wear PPE 3. Cut components 4. Assemble components 5. Apply finishes 6. Clean the workplace

Learning outcome 4.1. Select tools and equipment

Duration: 40hrs
Learning unit 4 objectives: By the end of the learning unit, the trainees will be able to: 1. Perform a proper selection of tools and equipment according to the nature of the project 2. Use PPE according to their types and functionality 3. Perform precise Application of cutting techniques according to the design specification 4. Make a proper Application of material assembling techniques according to the design specifications 5. Make Neat application of finishes according to the design concept 6. Perform a proper cleaning of the work place and proper storage of tools and equipment
Resources

Equipment	**Tools**	**Materials**
Nail gun - Screw driver - Stapler - Planer - Cutter - Meter saw - Jig saw - Electrical Screw driver - grinder - circular saw - drilling machine - electrical planer - laser(level), Sewing machine, Welding machine Welding glasses, Ear mask, Goggles, Safety shoes	Hammer - Cutting blade - Tape measure - Screw driver - Scissor - String - Meter - Saw - Square - gloves - eyeglass - overall - helmet - boots - dust mask	**Timber,** - Nail – Screw, Metals - Wood - Leather - Fabric - Stone - Meter saw - Jig saw - circular saw - Cutting blade - Tape measure - Scissor - String - Meter - Saw - Square - Cutter

Advance preparation:

. Furniture's materials should be available

. Furniture finishes should be available

Learning outcome 4.1. Select tools and equipment

Types of tools used in furniture design:

The tools used in furniture design are classified as flow:

Measuring and marking tools: ex: Tape measure, Square
Cutting and shaving tools: Cutting blade, Screw driver; Scissor, Saws, Planer Cutter
Fixing tools: Nail gun, Stapler, Hammer
Holding tools: bench works, clamps And
Boring or drilling tools: drill bits, drill braces, chisel

Types of equipment used in furniture design are classified into

1.heavy duty machine

Meter saw
Jig saw
Circular saw

2.portable machine

Drilling machine
Electrical planer
Grinder
Electrical Screw driver
Laser cutter

3.PPE (personal protective equipment)

Gloves
Eyeglass
Overall
Helmet
Boot
Dust mask


Theoretical learning Activity

Brainstorm about **Types of tools used in furniture design**, **Types of equipment used in furniture design** within groups)


Points to Remember (Take home message)

Types of tools used in furniture design
Types of equipment used in furniture design are classified

Learning outcome 4.2: Use PPE

4.2.1. Types of PPE
Respirators Gas mask Skin Protection Gloves Eye Protection Goggles Face Shields Hearing Protection Ear Plugs Protective clothing Helmets Overalls Safety shoes

 Theoretical learning Activity

Brainstorm about **Types of PPE** within groups)

 Practical learning Activity

Trainees in pair perform the selection of PPE within a group)

 Points to Remember (Take home message)

Types of PPE

Learning Outcome 4.3: Apply cutting techniques

4.3.1. Cutting techniques based on materials Material cutting techniques on: **Metals**: Laser cutting, Turning Drilling, Welding Flame Plasma, Grinding Water jet **Wood**: Saw cutting, Drilling, Laser cutting, (Chamfering, Cross cutting and Lipping) **Leather** Scissor cutting, Laser cutting, Water jet cutting **Fabric** Scissor cutting Laser cutting Water jet cutting **Stone** Saw Cutting Drilling Laser cutting Chamfering Water jet cutting

Theoretical learning Activity

Brainstorm about Cutting techniques based on materials within groups)

Practical learning Activity

Trainees in pair perform Cutting of different materials used in furniture)

Points to Remember (Take home message)

Cutting techniques based on materials

Learning Outcome 4.4: Apply material assembling techniques

4.4.1. Types of joints

Bridle
Biscuit
Butt
Dovetail
Finger

4.4.2. Material assembly techniques on:

Metals: metals can be assembled by Welding, Bolting, and Screwing
Wood: Gluing, Bolting and Screwing, Nailing, Stapling
Leather: Sewing and Gluing
Fabric: Sewing
Stone: Grouting, Cement binding


Theoretical learning Activity

Brainstorm about Types of joints and material assembly techniques within groups)


Points to Remember (Take home message)

Types of joints
Material assembly techniques

Learning Outcome 4.5: apply finishes

4.5.1 Furniture material finishing techniques

 Metals Stain-and-clear finish Paint finish High exposure finishing Cleaning and maintenance

⍰ Wood Stain-and-clear finish Paint finish High exposure finishing Cleaning and maintenance 4.5.2 Techniques of finishing Antiques Brushed Hammered Polished Satin


Theoretical learning Activity

Brainstorm about Furniture material finishing techniques within groups)


Points to Remember (Take home message)

Furniture material finishing techniques Techniques of finishing


Learning Outcome 4.6: clean the workplace

4.6.1. Cleaning tools and equipment

Workshops tend to be covered with grease and oil and whilst this is to be expected, it's important to know how to properly clean your workshop in order to keep your equipment in top notch condition. Tools like hammers, screwdrivers, chisels, blades and wrenches can quickly accumulate dirt over time, which can affect their performance and worsen their condition over time. Instead of spending extra money replacing your tools, it's better to keep them well maintained so you can always rely on your workshop equipment when you need it most The best way to approach tool maintenance is to choose the right cleaning agent for the job.

If your cutting tools catch a coat of resin, what you should do is cleaning it with a pitch and resign remover. You can further polish your blades as an additional cleaning measure. If you don't keep your cutting tools

such as blades clean, eventually they will build up extra heat. And there can be issues like drag and vibration.

4.6.2. Cleaning materials and product

Dish soap.

Pour warm water

Abrasive pad

Sponge

Washcloth or rag

Linseed oil

Vinegar

Wire-bristled brush or wheel

Soft-grit sandpaper.

Oxalic acid.

Wire brush.

Baking soda

4.6.3. Cleaning Methods

Cleaning with bases

Cleaning with acids

Let your tools soak in the mixture for 20 minutes. Arrange the metal, rusty portions of your tools in the acidic solution, then set a timer for 20 minutes. If your tools are made entirely of metal, you can place the entire item in the bucket. If the items have wooden handles, only place the metal surface into the bucket.

While oxalic acid isn't as potent as other acids, it's still a pretty strong substance. To prevent your wooden handles from getting degraded, try to keep them out of the solution altogether.

Cleaning with solvents

Chemical cleaning

Methods of storing tools and equipment

Hints for good store

Store clean tools in an empty plastic container

Hang tools up on a rack

Gloves should always be kept in closed container

Have a Designated place for each kind of tools

Wash and dry properly before storing

 Theoretical learning Activity

Brainstorm about Cleaning tools and equipment, cleaning materials and product, Cleaning Methods, Methods of storing tools and equipment within groups)

 Points to Remember (Take home message)

Cleaning tools and equipment Cleaning materials and product Cleaning Methods Methods of storing tools and equipment

 Learning outcome 1 formative assessment

Written assessment

Assessment tools

True or false questions

Multiple choice

Open ended questions

Case studies

 **Please mix different assessment tools for triangulation and relevancy of assessment**

Practical assessment

Assessment tools

Assay

Task to be performed

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