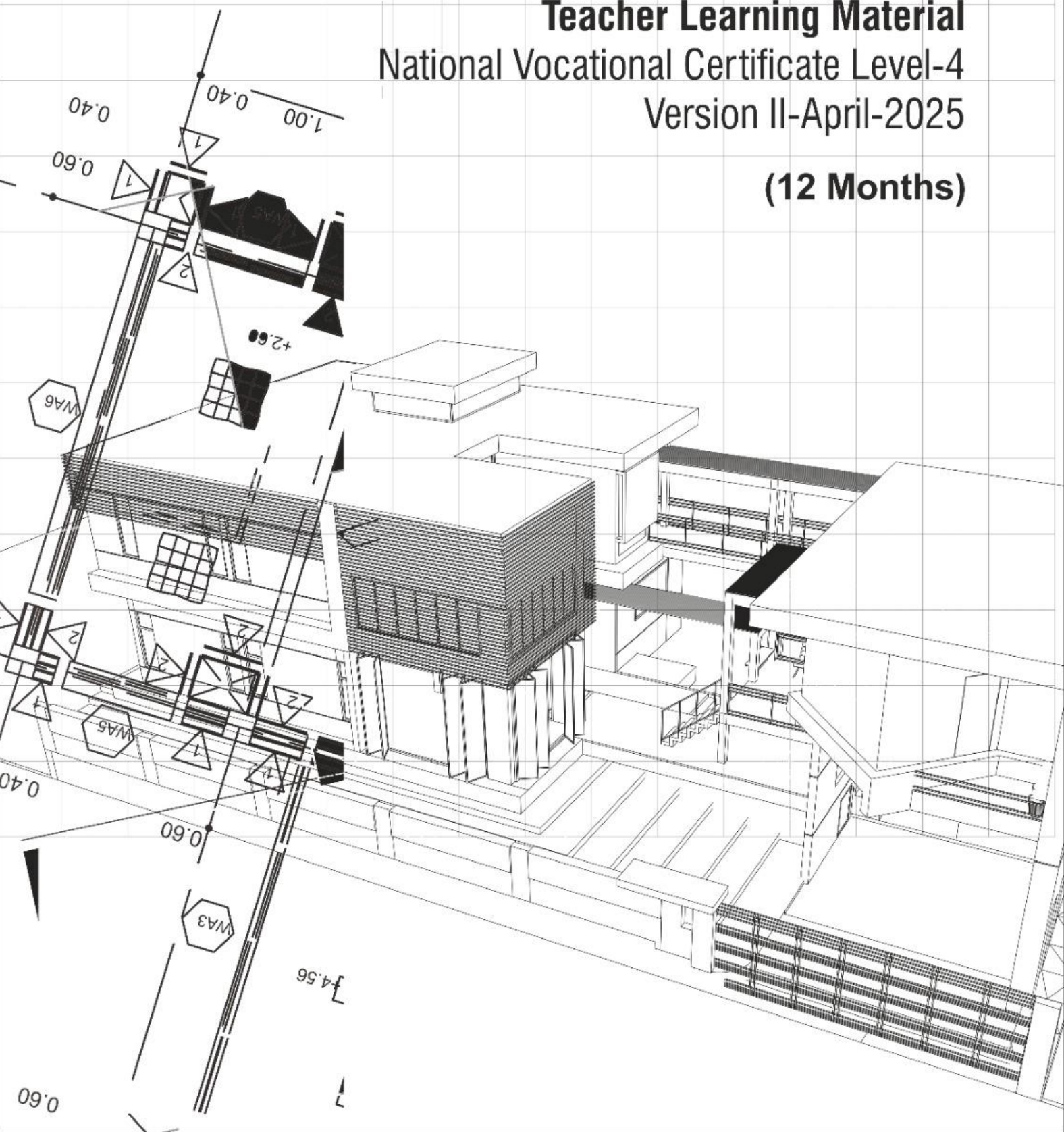


Architectural Drafting

LEVEL 4

Teacher Learning Material
National Vocational Certificate Level-4
Version II-April-2025

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Islamabad, Pakistan

INTRODUCTION

Architectural drafting is a critical skill used by architects, draftsmen, and design professionals to create precise construction drawings, floor plans, and structural layouts. This discipline extends beyond architecture, playing a key role in engineering, interior design, and product development through detailed 2D and 3D representations.

To standardize expertise in this field, the National Vocational & Technical Training Commission (NAVTTTC) has introduced the “National Vocational Certificate Level-2 in Information Technology (Architectural Drafting).” Developed in consultation with industry leaders and employers, this qualification ensures alignment with current sector demands and professional drafting standards.

Based on national competency guidelines, this Teaching and Learning Material (TLM) is structured into following key topics to develop essential architectural drafting skills:

- Fundamentals of Advance Architectural Drafting
- Technical Drawing & 3D Modeling Techniques
- Real-World Applications and Project-Based Practice
- Designed to bridge theory and practice, this material equips learners with the necessary skills to excel in architectural drafting and related technical professions.

- Module 1:** Maintain Machines and Tools
- Module 2:** Manipulate Images in Adobe Photoshop
- Module 3:** Develop 3D Model in Sketch Up
- Module 4:** Develop 3D Model in Autodesk REVIT
- Module 5:** Plan Market and Visit Site
- Module 6:** Develop Entrepreneurial Skills

This TLM provides support for more effective training and productive learning. Each of the learning modules contains learning outcomes and information regarding learning elements in the form of knowledge, skills and attitudes. At the end of every learning module are Frequently Asked Questions (FAQs) and Test Yourself which will help learners in self-assessment before proceeding to modular or final assessment.

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Module No. 1	Perform Advance Architectural Graphics	
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Learning Outcomes:

After completion of this module, trainee will be able to:

- Draw Perspectives
- Perform Advance Manual Rendering
- Prepare Basic Model

Learning Unit 1.1	Draw Perspectives
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Learning Outcomes

After completion of this learning unit, trainee will be able to:

- Arrange tools and material
- Draw One point perspective
- Draw two-point perspective
- Draw Three-point perspective
- Draw Bird-eye view perspective
- Use both sides of drawing sheets for drawing

1.1.1 Introduction to Perspective Drawing

Perspective drawing is a technique used to represent three-dimensional objects on a two-dimensional surface (like paper) in a way that looks realistic and accurate. It helps artists and designers show depth, space, and distance in their drawings. Perspective adds a sense of depth, making things appear closer or farther away—just like we see them in real life.



1.1.2 Elements of Perspective Drawing

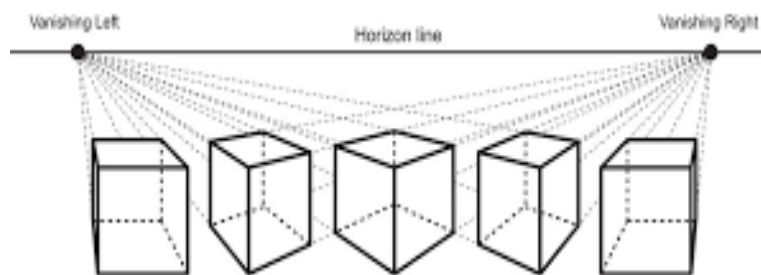
Perspective drawing uses several key elements to create the illusion of depth and space. These elements work together to make a flat image look 3D and realistic.



Horizon Line

In perspective drawing, the horizon line represents the viewer's eye level and is a crucial tool for creating realistic depth and perspective, serving as a foundation for establishing vanishing points where parallel lines appear to converge.

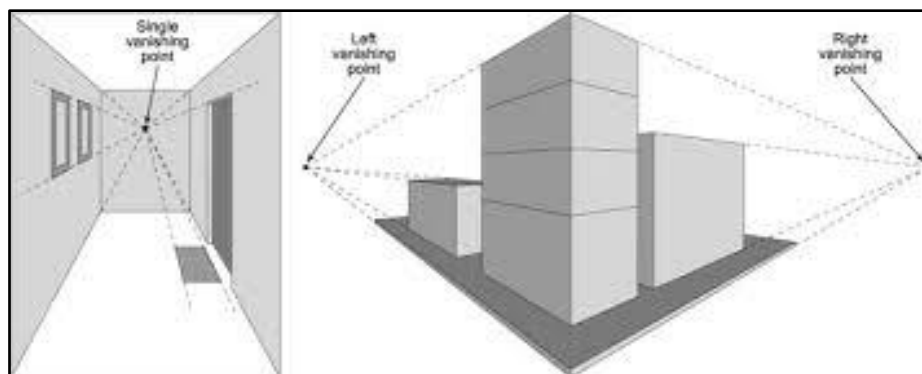
- A horizontal line that represents the viewer's eye level.
- Everything above the horizon line appears above the viewer's eye level, and everything below it appears below.
- All vanishing points lie on the horizon line (in linear perspective).

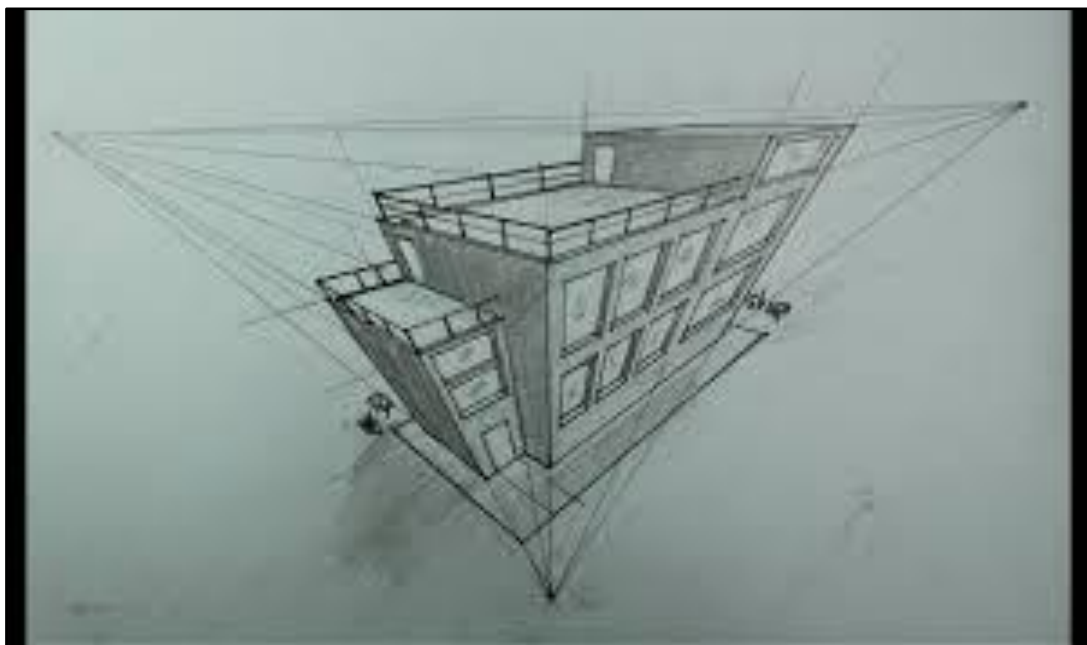
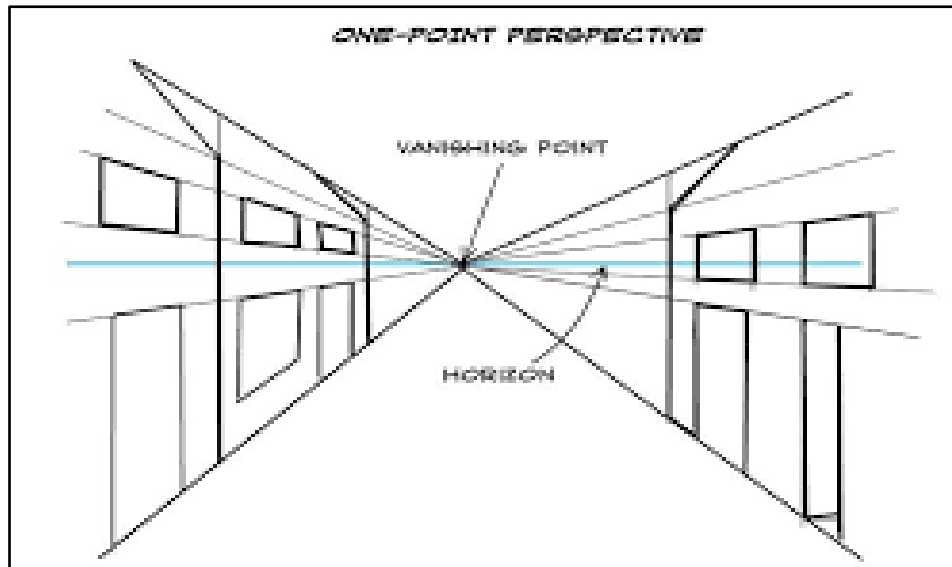


Vanishing Point(s)

In perspective drawing, vanishing points are the points on the horizon line where parallel lines appear to converge as they recede into the distance, creating an illusion of depth and realism. The point(s) on the horizon line where parallel lines appear to converge. The number of vanishing points depends on the type of perspective:

- 1-point perspective: one vanishing point
- 2-point perspective: two vanishing points



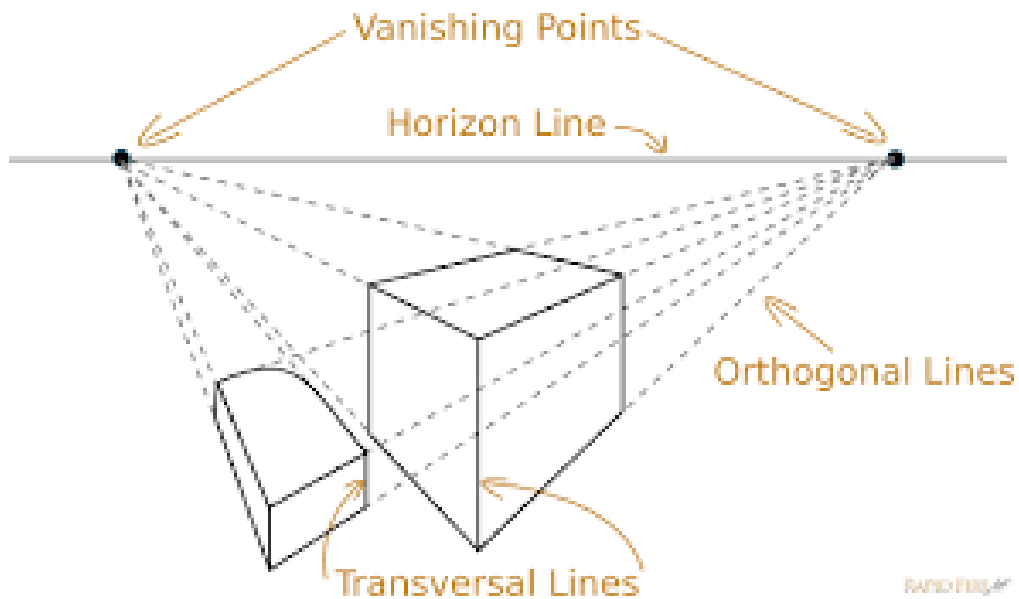


- 3-point perspective: three vanishing points

Orthogonal Lines

In perspective drawing, orthogonal lines are imaginary lines that recede towards a vanishing point, helping to create the illusion of depth and spatial relationships in a 2D representation of a 3D scene. These are diagonal lines that lead to the vanishing point(s). They help in guiding the edges of objects to make them appear in proper perspective.

For example, the edges of a road, railway tracks, or the sides of a box.

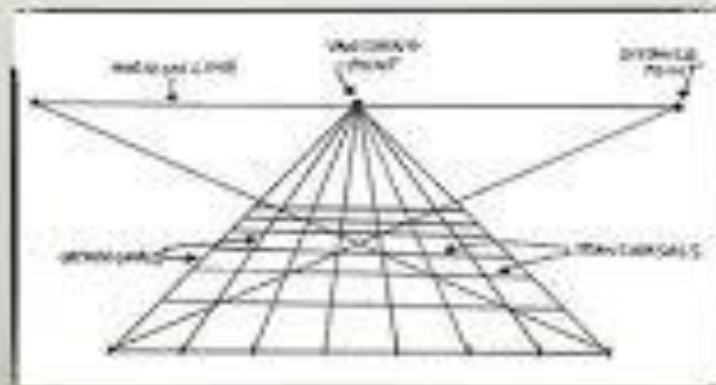


Transversal lines

Always at right angles to the orthogonals.

Parallel to the picture plane and to one another.

Form the nearest and furthest edges of a rectangle as it recedes from view.



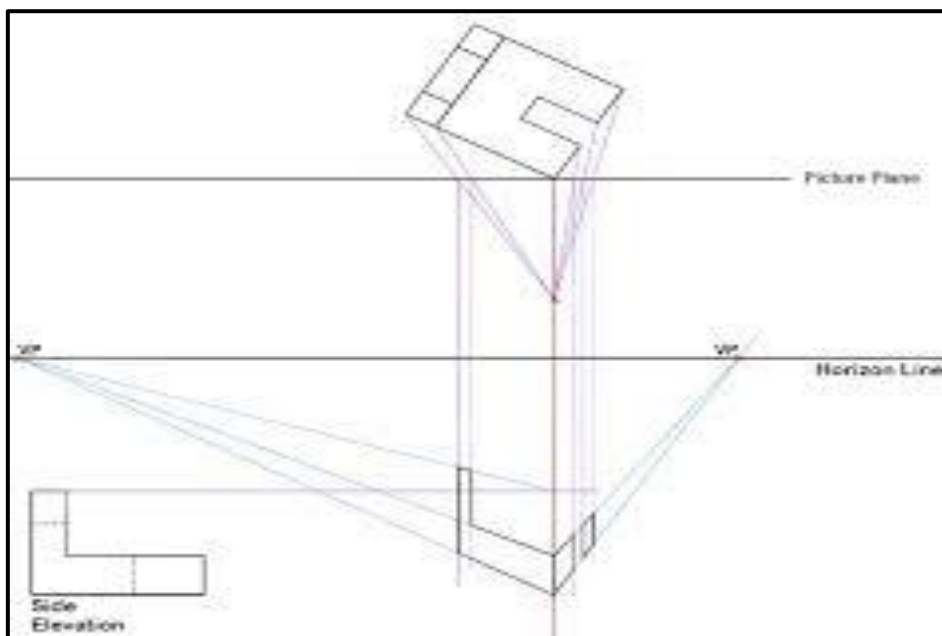
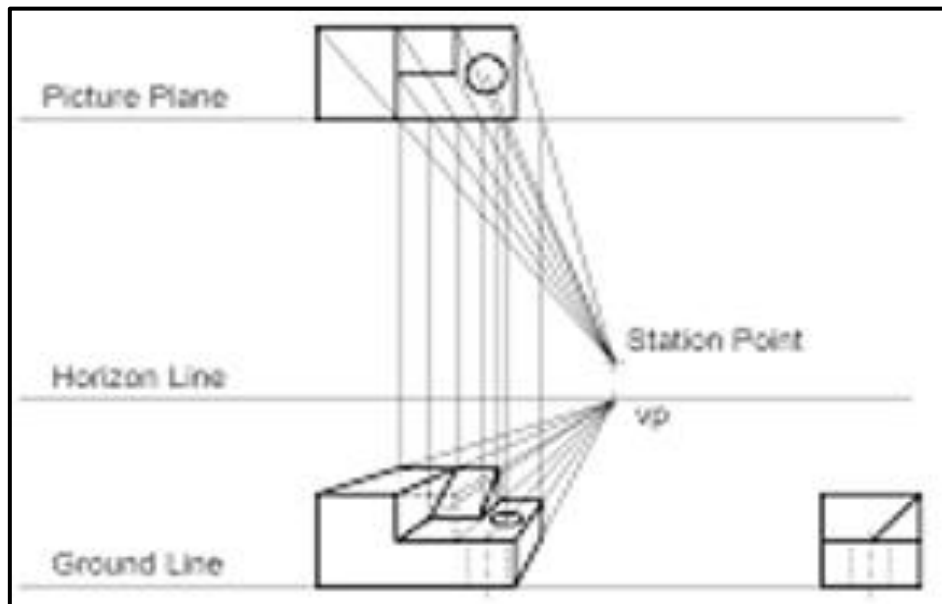
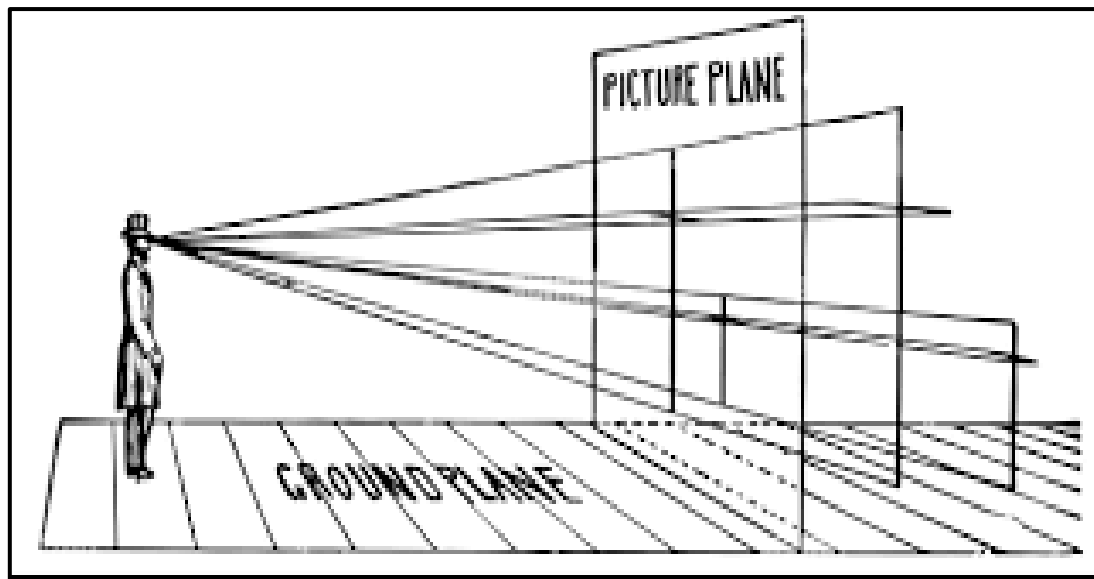
Transversal Lines

In perspective drawing, transversal lines are those that are parallel to the picture plane and to each other, establishing a fixed height or width between orthogonal lines, which converge at a vanishing point. They stay horizontal and vertical and do not go to the vanishing point.

Often used to mark height or width of objects, like windows, doors, or floors.

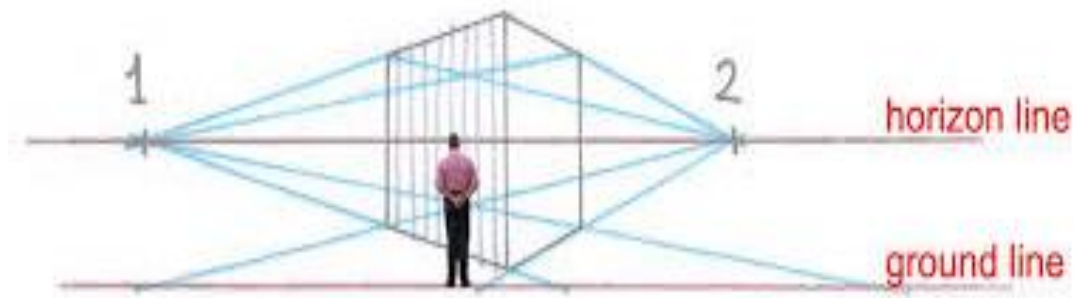
Picture Plane

A picture plane is an image plane located between the "eye point" and the object being viewed and is usually coextensive to the material surface of the work. The imaginary flat surface that is between the viewer and the scene.



Ground Line

In perspective drawing, the “ground line” (GL) is the intersection of the picture plane (the surface on which the drawing is made) and the ground plane (the surface on which the viewer stands), marking the base for objects in the scene. The line at the bottom of the drawing, representing the ground level in the scene, it helps in aligning objects and determining their base level.

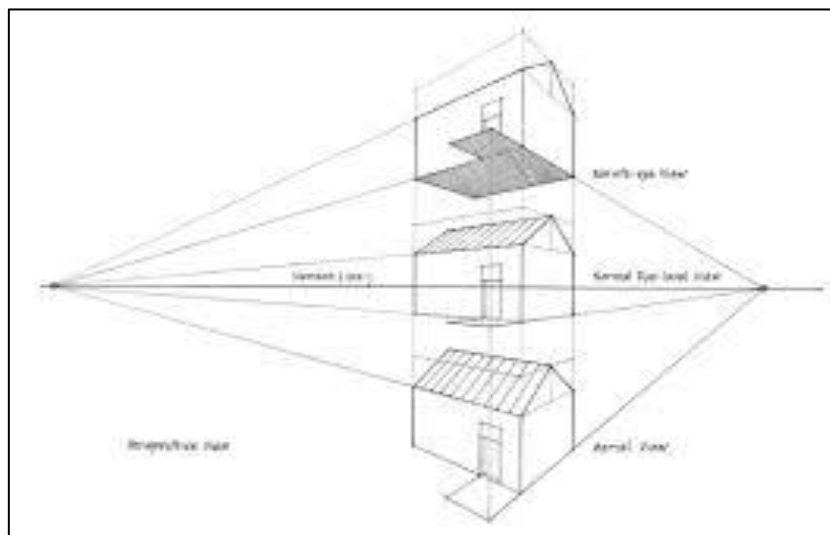


How can I find my Eye-Level Line?

Hold out a pencil horizontally in front of your eyes. Don't tilt your head even the slightest bit up or down, just look straight ahead. Find something in your view where you can pin this horizontal line as a visual reference while you sketch.

TIP

It's a good idea to always draw your eye-level line lightly into your sketch for reference.



Eye Level

In perspective drawing, the “eye level” or “horizon line” is the viewer’s imaginary eye level, a horizontal line representing the point where the sky and ground meet, and is crucial for creating the illusion of depth and three-dimensionality. This is often the same as the horizon line. It shows the height of the viewer’s eyes and affects how objects are seen—whether you’re looking up, down, or straight ahead.

Difference Between Interior and Exterior Perspective

Interior perspective focuses on the inside view and feel of a space, while exterior perspective focuses on the outside appearance of buildings and structures, including their relationship with the surrounding landscape.



Interior perspective



exterior perspective

Activity 1:

Practice to draw one-point interior perspective

Activity 2:

Practice to draw two-point interior perspective

Activity 3:

Practice to draw two-point exterior view perspective

Activity 4:

Practice to draw three-point interior/exterior perspective.

Activity 5:

Practice to draw birds eye view interior perspective

Learning Unit 1.2

Perform Advance Manual Rendering

Learning Outcomes

After completion of this learning unit, trainee will be able to:

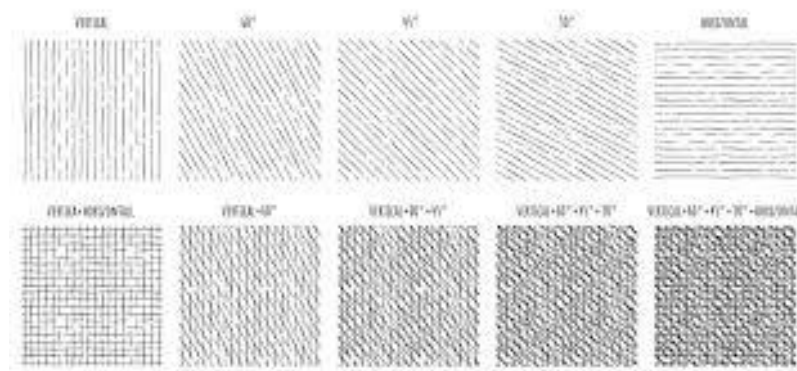
- Arrange tools and materials
- Render design with types of colouring material

1.2.1 Rendering Techniques

Rendering is the process of adding shading, texture, and detail to a drawing to make it look more realistic and three-dimensional. It helps how light, shadow, and surface qualities affect an object.

❖ Hatching

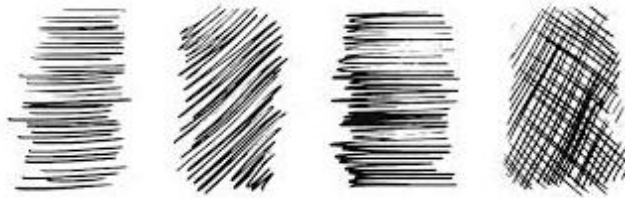
Hatching is a drawing method that uses lines to create light, shadow, and texture. It's one of the most common rendering techniques in pencil, pen, or ink drawings.



i. Parallel Hatching

Parallel hatching is one of the most basic forms of hatching, and it's still a very effective way of demonstrating value (light and dark) in a drawing. It consists of rows of parallel lines placed closely together.

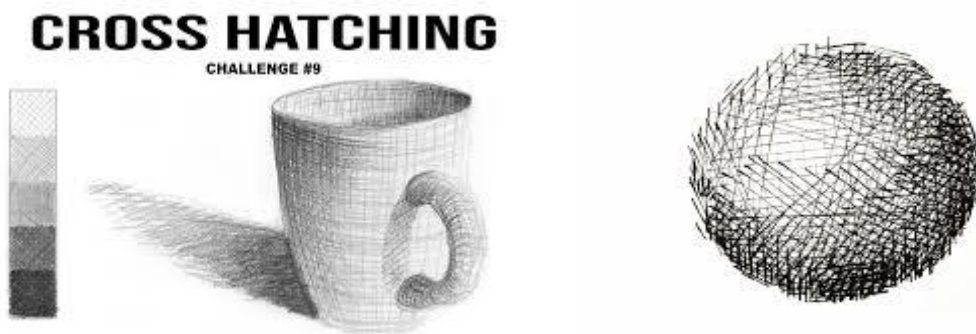
- Straight parallel lines drawn in the same direction.
- The closer the lines, the darker the tone.
- Used for basic shading and to show light direction.



ii. Cross-Hatching

Cross-hatching is an artistic technique where lines are drawn in overlapping directions to create shading and tonal effects, often used to depict light and shadow in drawings.

- Two or more layers of intersecting lines.
- First layer goes in one direction, second crosses it.
- Creates a richer and deeper shadow



❖ Stippling

Stippling is an artistic technique where small dots are used to create texture, shading, and tonal effects, offering a unique way to render images and convey depth without relying on traditional lines.

- Using tiny dots to create tone and texture.
- More dots = darker areas.
- Takes time but gives a soft, detailed effect.



❖ Blending

It is a technique used to soften edges and create smooth transitions between tones and colors, often achieved with tools like blending stumps or fingers/tissue. It's a crucial skill for achieving realism, adding depth, and creating subtle shading

- Smoothing out pencil marks to create soft gradients of light and shadow.

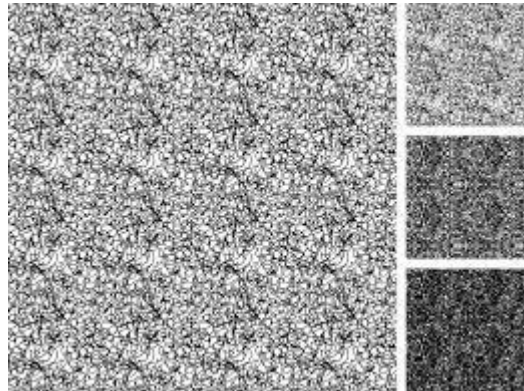
- Common in realistic pencil drawings.



❖ **Scribbling (Scumbling)**

Scribbling, sometimes referred to as “scumbling” in a drawing context, is a technique of creating texture and shading by making quick, unstructured marks, often with lines, circles, or squiggles, to build up tonal values and create a textured effect.

- Using loose, overlapping circular or scribbled lines.
- Good for organic textures like hair, foliage, or fabric.



❖ **Contour Shading**

Contour shading is a drawing technique where lines follow the contours or outlines of a subject, creating a sense of form and three-dimensionality through shading, similar to hatching but with curved lines

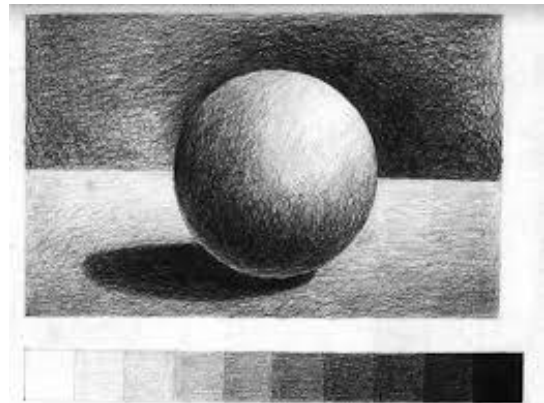
- Following the curved shape of the object with your shading lines.
- Helps emphasize the form and volume of the object.



❖ **Tonal Shading (Value Shading)**

Tonal shading, also known as value shading, is a drawing technique that uses variations in the lightness or darkness of a color (or grayscale) to create the illusion of depth and three-dimensionality in a drawing or artwork.

- Using different shades of light and dark to show depth.
- Helps create realistic light and shadow transitions.



1.2.2 Types of Colour Schemes

A colour scheme is a combination of colours that are used together to create a certain look, mood, or harmony in an artwork or design. These schemes are based on the colour wheel.

❖ Monochromatic

Monochromatic color schemes use a single color with varying shades and tints to produce a consistent look and feel. Although it lacks color.

- Simple, clean, and calming.
- Example: Light blue, sky blue, navy blue.etc

MONOCHROMATIC COLOR COMBINATIONS



SHADES

base color
+ black



TONES

base color
+ gray



TINTS

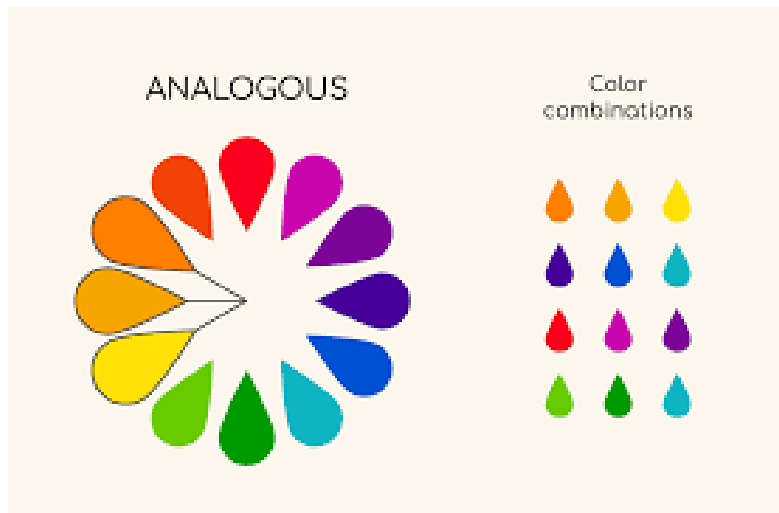
base color
+ white



❖ Analogous

An analogous color scheme is formed of three or five colors that are located next to each other on the color wheel.

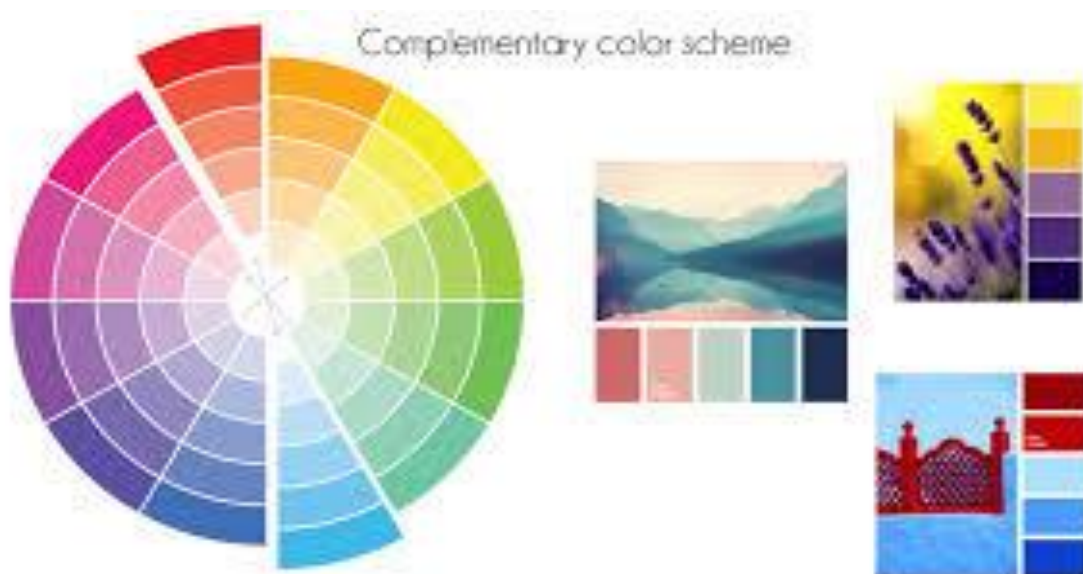
- They blend well and are pleasing to the eye.
- Example: Yellow, yellow-orange, orange.



❖ Complementary

A complementary color scheme uses colors that are directly opposite each other on the color wheel, creating high contrast and vibrant looks. Common examples include red and green, blue and orange, and yellow and purple.

- Creates strong contrast and high energy.
- Example: Red and green, blue and orange.



❖ Split-Complementary

A split-complementary color scheme uses a base color and the two colors adjacent to its direct complement on the color wheel, creating a balanced and visually engaging palette.

- Less intense than complementary, but still dynamic.
- Example: Blue with red-orange and yellow-orange.

Split-Complementary Color Scheme



Pair Examples



1.2.3 Drawing and Colour Mediums

Here's a list of common color mediums used:

Pens: Suitable for various artistic styles, including pen art and calligraphy



Colored Pencils: Precise control for detailed work and illustrations



Markers: Versatile and easy to use for coloring and outlining



Watercolors: Uses water as a solvent, creating transparent and delicate effects.



Inks: Used for calligraphy, illustrations, and fine lines.	
Acrylics: A fast-drying, versatile paint that can be used on various surfaces	
Oil Paints: A slower-drying paint that allows for blending and layering.	
Spray Paint: A quick and easy way to cover large areas with color	
Crayons: A solid stick of colored wax, often used for drawing and coloring	
Pastels: Soft, chalky sticks that are ideal for creating smooth, blended color	

Poster Paint: A water-based paint often used in education, similar to gouache.	
Graphite: Easy to erase, suitable for sketching and drawing.	
Charcoal: Creates soft, dark lines with varying degrees of thickness	

Activity 1:

Practice to render perspectives with following rendering techniques:

Hatching	Blending	Contour shading	Monochromatic	Complementary
Stippling	Scribbling	Tonal shading	Analogous	Split complementary

Learning Unit 1.3	Prepare Basic Model
--------------------------	----------------------------

Learning Outcomes

After completion of this learning unit, trainee will be able to:

- Arrange tools and material
- Collect waste material (Water Bottles, paper carton boxes) for model making
- Apply waste materials for model finishing (Bottle caps, nuts shell, crumbled papers etc.)
- Design prototype
- Cut required parts
- Assemble all parts
- Finish and render model

1.3.1 Types of Models/Prototypes

A prototype /model is a preliminary version of a software or product that allows for early evaluation and refinement before a final product is developed. It's particularly useful when project requirements are not fully defined, allowing for iterative development and feedback loops.

- Physical Models
- Digital Models
- Scale Models
- Conceptual Models

Physical Model

It is three-dimensional, tangible model made from materials like cardboard, wood, or plastic. Physical architectural models offer a hands-on experience, allowing you to see and touch the design. They are often used in presentations to help clients and stakeholders visualize the final product.



Digital Model

It is created using computer software and digital models provide a virtual view of the building. It can rotate, zoom in, and view them from different angles. Digital models are excellent for detailed visualizations and simulations.



Scale Models

Scale models are smaller, proportional replicas of buildings or structures, designed to represent the original in a reduced size while maintaining accurate proportions. For example, if a building is 100 feet tall, a scale model of that building might be 10 feet tall, keeping the same proportions and design features. These models are especially useful for making complex designs easier to understand and for presenting ideas. By providing a tangible and manageable version of the final project, scale models help architects, clients, and stakeholders visualize and evaluate the design before construction begins.



Conceptual Models

These are simplified versions used for brainstorming and exploring ideas. They are not as detailed as physical or digital models but are useful in the early stages of design to quickly test different concepts.



1.3.2 Materials for Model Making

Below mention materials and tools which can use in model making:

Material	Tools
Foam board / Cardboard / Chipboard: Cheap and easy to cut.	Cutting tools (X-Acto knife, laser cutter)

Balsa wood / Basswood: Lightweight and clean for structural or finish models.	Ruler, T-square, compass
Acrylic sheets: Plexiglass for windows, sleek presentation.	Glue (PVA, hot glue, or superglue)
3D Printing Filaments: PLA or resin for intricate models.	CAD software (SketchUp, Rhino, Revit, AutoCAD)
Clay: Modeling paste for terrain or organic shapes.	Rendering tools (Lumion, Enscape, V-Ray)

Tips for Model Building

- Start rough, then refine. Don't go for perfection right away.
- Match the scale to your purpose. Common scales are 1:100, 1:200, or 1:500.
- Use color wisely. Monochrome for concept, realistic colors for presentation.
- Label key features. Especially if it's for a presentation or group review.

1.3.3 Importance of Recycling Material

Using recycled materials in model making is important because it promotes sustainability, reduces waste, conserves resources, and encourages creativity. By repurposing materials like paper, cardboard, and plastics, model makers can minimize environmental impact and learn about resource management.

Environmental Benefits:

- **Reduced Waste:**
Using recycled materials diverts waste from landfills and incinerators, preventing pollution and conserving valuable landfill space
- **Resource conservation:**
Recycling reduces the need for raw materials, minimizing the environmental impact of mining, logging, and other resource extraction activities
- **Energy savings:**
Producing new materials from recycled sources requires less energy than extracting and processing raw materials.
- **Lower carbon footprint:**
Recycling reduces greenhouse gas emissions associated with waste disposal and the production of new materials.

Educational and Creative Benefits:

- **Promotes sustainability:**
Engaging in model making with recycled materials can instill a sense of environmental responsibility and promote sustainable practices.
- **Encourages creativity:**
The limited nature of recycled materials can inspire creative problem-solving and innovative design thinking
- **Educational tool:**
Model making with recycled materials can be a valuable educational tool, teaching children and adults about waste management, recycling, and resourcefulness.

Economic Benefits:

- **Cost-effective:**
Recycled materials are often cheaper than new materials, especially when factoring in disposal costs.
- **Stimulates local economies:**
Recycling can create jobs in the waste management and recycling industries.

Activity 1:

Prepare model of building.

FAQ

Q1: Define One-Point Perspective

Ans: In this technique, all lines recede toward a single vanishing point on the horizon, creating depth. It's commonly used to illustrate scenes viewed directly from the front, like a road or hallway

Q2: Define Two-Point Perspective

Ans: In this technique, lines recede toward two vanishing points on the horizon, giving depth to objects seen from an angle. It's commonly used for depicting corners and angled views, like buildings or rooms.

Q3: Define Three-Point Perspective.

Ans: In this technique, lines recede toward three vanishing points—two on the horizon and one above or below. This method creates a sense of height and depth, ideal for dramatic, towering views or looking down from a high vantage point.

Q4: Enlist different hatching techniques.

Ans: Parallel hatching, cross hatching, stripping, zigzag hatching, contouring hatching, tick hatching

Q5: Differentiate between hatching and rendering

Hatching uses lines to build up value and texture, whereas rendering focuses on smooth shading and tone transitions for a realistic finish.

Q6: Name basic types of models.

Ans: 1. Physical model 2. Digital model 3. Scale model 4. Conceptual model

Q7: Enlist the sustainable materials for model making.

Ans. Bamboo, cork, cotton, jute, clay, Reused or Recycled Metal

MCQS

1. What is the defining characteristic of a one-point perspective drawing?

- a) It uses two vanishing points on the horizon line
- b) All lines converge toward a single vanishing point
- c) Objects appear the same size regardless of distance
- d) It does not use a horizon line

2. What is the defining characteristic of a two-point perspective drawing?

- a) It uses curved lines to show depth
- b) All vertical lines converge at one point
- c) It uses two vanishing points on the horizon line to show depth from two angles
- d) It does not show any depth or dimension

3. What is the defining characteristic of a three-point perspective drawing?

- a) It uses one vanishing point on the horizon line
- b) It uses two vanishing points and one curved horizon line
- c) It uses three vanishing points to show height, width, and depth
- d) All lines remain parallel and never converge

4. What is the role of the horizon line in perspective drawing?

- a. It represents the outline of objects in a scene
- b) It marks where the ground ends and the sky begins
- c) It indicates the viewer's eye level and where vanishing points are placed
- d) It divides the page into equal sections for balance

5. What is the function of vanishing points in perspective drawing?

- a) To decorate the background of the scene
- b) To create shadows and lighting effects
- c) To show where parallel lines appear to converge, creating depth
- d) To mark the center of the paper

6. What does the eye level represent in perspective drawing?

- a) The height of the tallest object in the scene
- b) The distance between two vanishing points

- c) The viewer's height or point of view, usually the same as the horizon line
- d) The exact center of the drawing paper

7. What is typically the main focus of an interior perspective drawing?

- a) The exterior details of buildings and landscapes
- b) The arrangement and depth of objects within an enclosed space
- c) The use of aerial perspective to show distance
- d) The reflection of natural elements like trees and clouds

8. What is the primary focus of an exterior perspective drawing?

- a) The layout of furniture inside a room
- b) The emotional tone of a character in a scene
- c) The representation of buildings, landscapes, and outdoor environments with depth
- d) The texture and patterns on interior walls

9. What is the primary purpose of rendering in perspective drawing?

- a) To create a flat, two-dimensional representation of the object
- b) To add shading, texture, and details to give objects a realistic appearance
- c) To define the outline of the objects without showing any depth
- d) To make the drawing colorful and bright

10. Which of the following color schemes uses colors that are next to each other on the color wheel?

- a) Complementary
- b) Split-complementary
- c) Analogous
- d) Triadic

11. What is the primary purpose of hatching in drawing?

- a) To add texture and shading by using parallel lines
- b) To outline the edges of objects
- c) To create bright highlights on a surface
- d) To blend colors smoothly without visible lines

12. What is the primary characteristic of parallel hatching in drawing?

- a) The use of overlapping lines at different angles to create texture
- b) The use of evenly spaced, parallel lines to create shading and texture
- c) The use of dotted lines to represent shadows
- d) The use of thick, bold lines to outline objects

13. Which of the following coloring materials is most commonly used for creating smooth, blended color transitions in a drawing?

- a) Watercolor paints
- b) Colored pencils
- c) Charcoal
- d) Ink pens

14. What is a characteristic of pastel colors?

- a) They are bright, highly saturated colors
- b) They are created by mixing a small amount of color with a large amount of white
- c) They are only used in painting and not in drawing
- d) They are typically used to create dark, dramatic effects

15. Which of the following types of building models is commonly used to represent the overall design and massing of a building at a small scale?

- a) Detail model
- b) Conceptual model
- c) Structural model
- d) Site model

Answer Key

1.	b	2.	C	3.	C	4.	C
5.	C	6.	C	7.	B	8.	C
9.	b	10.	C	11.	A	12.	B
13.	A	14.	B	15.	b		

Module No. 2	Manipulate Images in Adobe Photoshop
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Learning Outcomes:

After completion of this learning module, trainee will be able to:

- Format Image in Adobe Photoshop
- Design Layers in Moving Objects
- Design Objects
- Render Images

Learning Unit 2.1	Format Image in Adobe Photoshop
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Learning Outcomes:

After completion of this learning unit, trainee will be able to:

- Open Image in software
- Select required tool and apply on image
- Check image

2.1.1 Introduction to Adobe Photoshop

Photoshop is a powerful image editing software developed by Adobe Systems. It is used by photographers, designers, artists, and other creative professionals for a variety of purposes.

Before the interface fully loads, Photoshop will prompt you with the New Document dialog box, where you set up the basic parameters of your document, such as:

Name: Assign a name to your document.

Presets: Choose from various preset document sizes (like A4, Web, or Print) or create a custom size.

Width & Height: Specify the dimensions of your document in pixels, inches, or centimeters.

Resolution: Choose the resolution (typically 72 pixels per inch (PPI) for web and 300 PPI for print).

Color Mode: Select color modes like RGB for digital and CMYK for print.

Background Contents: Choose a background (white, transparent, or a custom color).

2.1.2 Photoshop Interface

Photoshop interface includes:

Menu Bar (Top of the Screen)

- Located at the very top.
- Includes drop-down menus like:
 - File (Open, Save, Export)
 - Edit (Undo, Transform)
 - Image (Adjustments, Image Size)
 - Layer (New Layer, Merge, Mask)
 - Select, Filter, View, Window, and Help

Options Bar (Below Menu Bar)

- Context-sensitive: changes based on the selected tool.
- Adjustable settings like brush size, opacity, blending modes, etc.

Tools Panel (Left Side)

- Vertical bar containing tools for:
 - Selection (Move, Marquee, Lasso)
 - Editing (Brush, Eraser, Gradient)
 - Drawing (Pen, Shape, Type)
 - Navigation (Zoom, Hand tool)

Document Window (Center)

- Displays the image or design you're working on.
- You can open multiple documents in tabs.

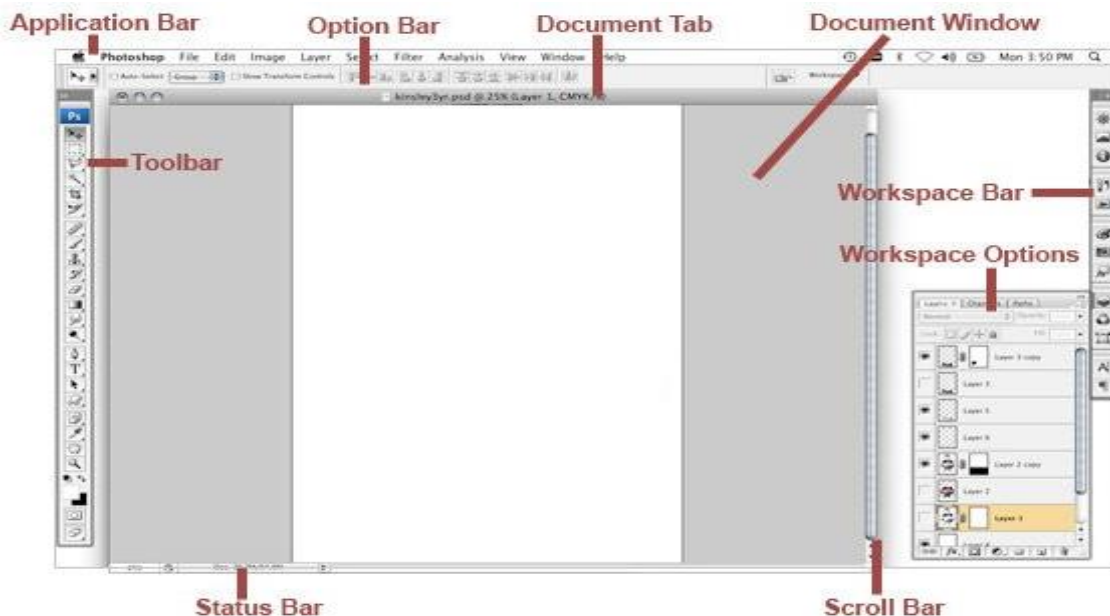
Panels / Palettes (Right Side)

- Common panels include:
 - Layers (shows all the layers and layer effects)
 - Properties (adjustments and smart object properties)

- Color, Swatches, Brushes
- Adjustments (Brightness, Contrast, Levels)
- History (undo/redo steps)

Layer Panel (Bottom Right)

- Essential for working non-destructively.
- Includes visibility toggles, blending modes, masks, and group options.



2.1.3 Customization of Workspace

Workspace

- **Essentials:** The default layout.
- **Photography:** Optimized for photo editing.
- **Graphic and Web:** Focuses on design and layout tools (3D, Motion, Painting, etc.)
- **Go to:** Window > Workspace > [Choose Workspace]

Re-arranging Panels and Tools

- **Drag Panels:** Click and drag any panel (like Layers, History, or Color) to move it.
- **Dock Panels:** Drop them onto the edges of other panels to dock them.
- **Collapse/Expand:** Click the double-arrow icon (►) on a panel to collapse or expand it.
- **Float Panels:** You can keep panels floating freely instead of docking them.

2.1.4 Customizing the Toolbar

Edit Toolbar:

Go to Edit > Toolbar

You can hide, rearrange, or group tools the way you prefer.

Show/Hide Panels

You can add or remove panels by: ⌘ Window > [Panel Name]
(e.g., Window > Layers, Window > Properties)

✓ Checked = Panel is visible

✗ Unchecked = Panel is hidden

Remember

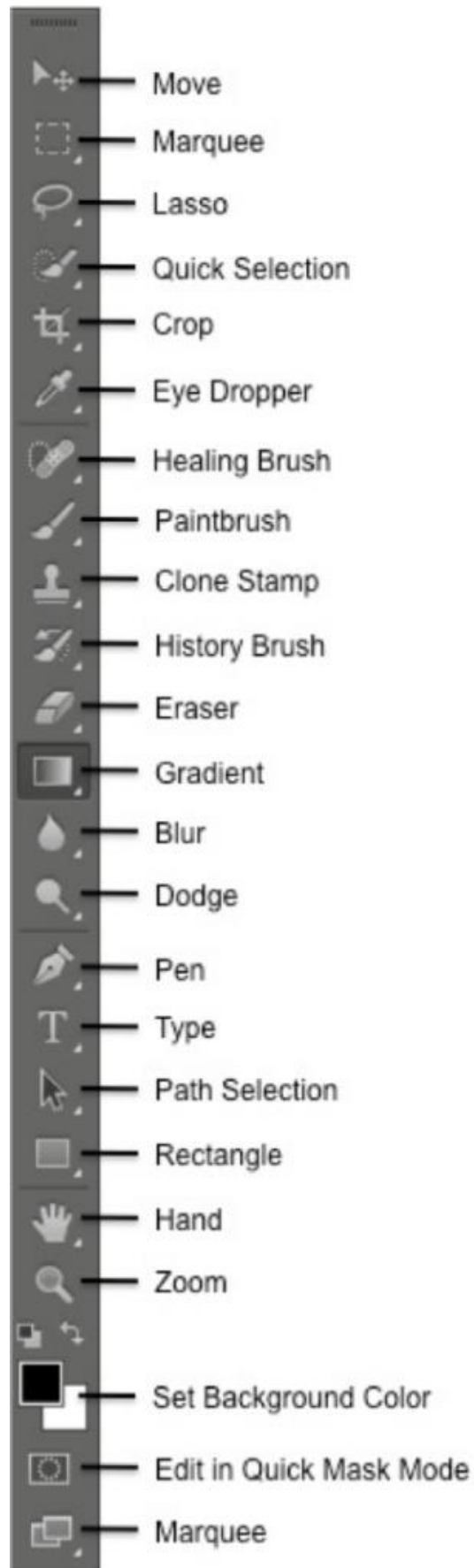
You can prevent panels from filling all the space in a dock. Drag the bottom edge of the dock up so it no longer meets the edge of the workspace.



2.1.5 Tools and Tabs of Photoshop

Tools	Function
Move Tool (V)	Moves selected objects or layers
Marquee Tool (M)	Selects rectangular/elliptical areas
Lasso Tool (L)	Freehand selection tool
Quick Selection/Magic Wand Tool (W)	Auto-selects based on color or edges
Crop Tool ©	Trims images or canvas
Eyedropper Tool (I)	Picks color from the image
Spot Healing Brush (J)	Removes blemishes or unwanted elements
Brush Tool (B)	Draws with color (customizable size & hardness)
Clone Stamp Tool (S)	Copies pixels from one area to another
Eraser Tool (E)	Erases pixels from layers
Gradient Tool (G)	Creates gradient color fills
Blur/Sharpen/Smudge Tools	Softens, sharpens, or smudges pixels
Dodge/Burn/Sponge Tools	Lighten, darken, or adjust saturation
Pen Tool (P)	Creates paths and shapes (vector drawing)
Type Tool (T)	Adds text to your design
Shape Tool (U)	Draws shapes like rectangles, circles, lines
Hand Tool (H)	Moves the view around the canvas
Zoom Tool (Z)	Zooms in or out on the canvas
Foreground/Background Color	Sets primary and secondary color
Quick Mask Mode (Q)	Allows detailed selections using brushes

Main Tools in the Toolbar



The **Toolbar** (usually on the left) contains most of the core tools used for editing.

Main Tabs/Menus at the Top

These are your **main tabs** (aka **Menu Bar**) that control everything in Photoshop:

File Edit Image Layer Select Filter Analysis View Window Help	
☐ Resize Windows To Fit ☐ Zoom All Windows Actual Pixels Fit Screen Print Size Workspace ▼	
Tab	Function
File	New: Create a new document. Open: Open an existing file. Save: Save your current document. Save As: Save the document with a new name or in a different format. Export: Export your document to different formats (e.g., PNG, JPG). Print: Print the document. Close: Close the current document.
Edit	Undo/Redo: Undo or redo actions. Preferences: Change Photoshop settings (general, tools, performance). Fill: Fill a selected area with color or pattern. Content: Aware Fill – Fill areas based on surrounding content. Free Transform: Resize, rotate, or distort a selected area.
Image	Image Size: Adjust the resolution and dimensions of the image. Canvas Size: Resize the document's canvas. Adjustments: Modify brightness, contrast, hue, etc. Mode: Change the color mode (e.g., RGB, CMYK). Rotate Canvas: Rotate the document (90 degrees or custom angle).
Layer	New Layer: Add a new layer to your document. Layer Style: Apply effects like shadows or glows to a layer. Merge Layers: Combine selected layers into one. Group Layers: Group multiple layers together for better organization. Flatten Image: Combine all layers into a single background layer.
Type	Text options and formatting
Select	All: Select the entire document. Deselect: Remove the current selection. Inverse: Select everything except the current selection. Modify: Expand, contract, or feather selections. Transform Selection: Resize or reshape the selection.
Filter	Blur: Apply different types of blur effects. Sharpen: Enhance image sharpness. Distort: Apply distortions to the image. Render: Add effects like lens flares, clouds, or lighting. Other: Includes specialized filters (e.g., High Pass, Noise Reduction).
View	Zoom In/Out: Zoom in or out of the canvas. Fit on Screen: Automatically adjust the view to fit the document. Rulers: Toggle rulers for precise measurements. Guides: Show or hide guides for alignment. Actual Pixels: View the document at 100% zoom.
Window	Workspace: Switch between different workspace layouts. Layers: Toggle the visibility of the Layers panel. History: Show the History panel to track changes. Brushes: Access the Brushes panel. Info: Display image properties and data (e.g., resolution, color mode). Properties: View and adjust properties of selected layers.
Help	Photoshop Help: Access the official Photoshop help documentation. System Info: View information about your current Photoshop setup.

Tab	Function
	Updates: Check for updates to the software.

Activity: 1

Practice to Customize paper size and import images.

Steps

- Open Photoshop and Create a New Document
- Go to File > New (or press Ctrl + N)
- In the New Document dialog box:
- Set a custom paper size (e.g., 8.5 x 11 inches or 1920 x 1080 pixels).
- Set the resolution (e.g., 300 ppi for print or 72 ppi for web).
- Choose the color mode (RGB for digital/web, CMYK for print).
- Click Create.
- Import an Image
- Go to File > Place Embedded (or drag and drop an image from your file explorer).
- Choose an image from your computer and click Place.
- The image will appear in your document on a new layer.
- Save the Document
- Go to File > Save As to save your document.

Learning Unit 2.2	Design Layers in Moving Objects
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Learning Outcomes:

After completion of this learning unit, trainee will be able to:

- Create and name the layers
- Select objects on specific layers
- Insert new layers to add additional design elements
- Merge layers to simplify the drawing

2.2.1 Functions of Layers in Adobe Photoshop

In Adobe Photoshop, Layers like **transparent sheets** stacked on top of each other. You can draw, paint, write text, or insert images on each layer — and edit them **individually** without disturbing others.

- Go to Layer > New > Layer or press Shift + Ctrl + N
- Alternatively, click the '+' icon at the bottom of the Layers panel to create a new layer.

Types of Layers

- **Layer Group:** This puts layers into a folder. Layers can be dragged in or out of groups in the Layers panel.
- **Type Layer:** The same as an image layer, except this layer contains type that can be edited;(change character, colour, font or size)

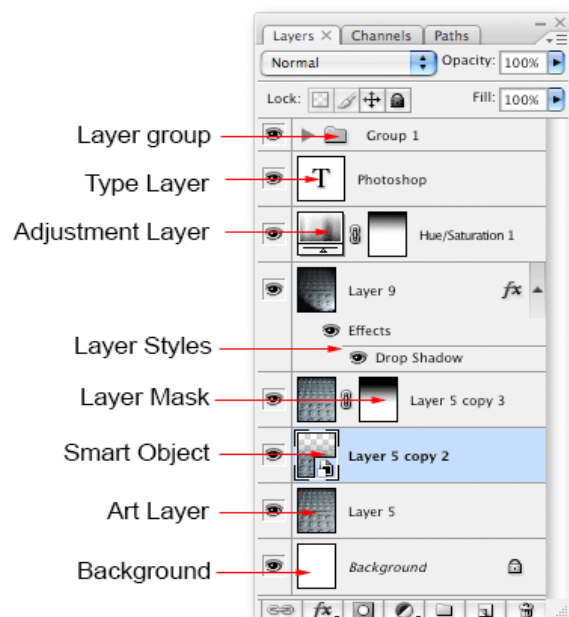
How to Open Layers Panel

- Go to Window > Layers
- Or press F7 to open the Layers Panel
- You'll see background and other layers here.

Adding Content to Layers

Add an Image:

- Drag and drop an image into Photoshop. It creates a new layer automatically.



Add Text:

- Select the Type Tool (T)
- Click and type → it creates a text layer.

Add Shapes:

- Use Rectangle Tool (U) or any shape tool
- Each shape is added as a vector layer.

Adjustment Layers (For Non-Destructive Edits)

- These layers adjust color, brightness, and contrast without touching the original image. How to Add:
 - Go to Layer > New Adjustment Layer
 - Choose: Brightness/Contrast, Levels, Hue/Saturation, etc.
 - Or click the half-filled circle icon ●○ at the bottom of the Layers Panel.

Use Layer Masks (Selective Editing)

- Layer masks allow you to hide/show parts of a layer.

Add Layer Mask:

Select a layer → Click the Add Layer Mask icon (rectangle with circle inside) at the bottom of Layers Panel.

Use Brush Tool:

- Select Brush Tool (B)
- Paint on the mask:
 - Black hides
 - White reveals
 - Gray partially hides
- You can undo changes without losing data!

Use Clipping Masks

A clipping mask lets one layer affect only the layer below.

How to Apply:

- Place an adjustment or effect layer above the target layer.
- Right-click → Create Clipping Mask

Now the effect applies only to the layer directly below, not everything else.

Organizing Layers

Rename a Layer:

- Double-click on the layer name and type a new one.
- Group Layers:
 - Select multiple layers → Press Ctrl+G
- Arrange Layers:
 - Drag layers up or down in the Layers Panel to change which one appears on top.

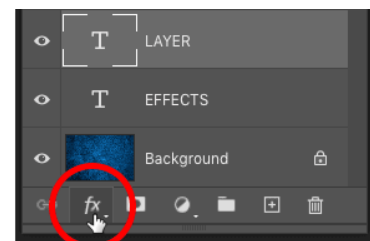
Apply Layer Styles

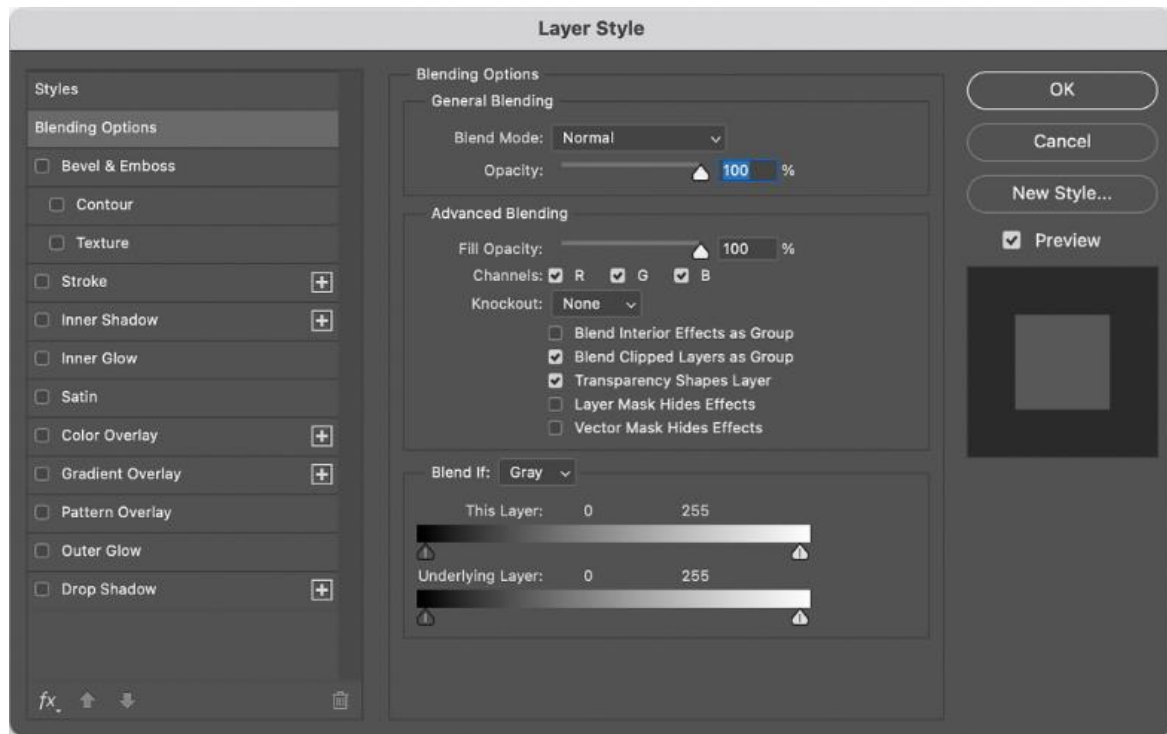
- Select the layer (text, image, or shape).
- Click the FX icon at the bottom of the Layers panel.
- Choose a style like Drop Shadow, Bevel & Emboss, etc.
- Customize settings in the Layer Style dialog box.
- Click OK to apply.

OR: Right-click the layer > “Blending Options”

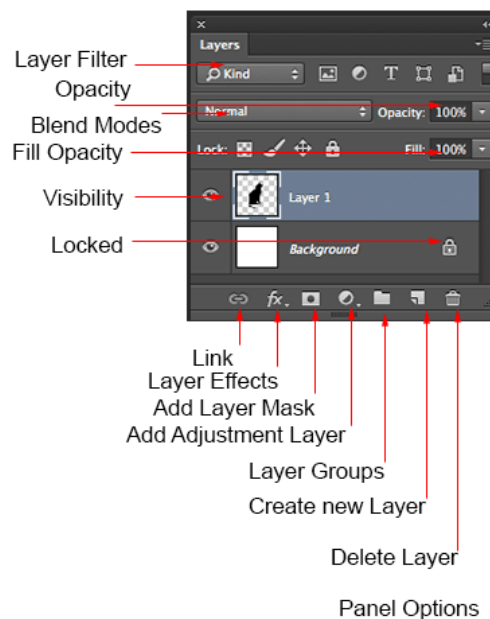
Remember

Apply a New Effect
Select your layer (text, shape, image).
Click the FX icon at the bottom of the Layers panel.
Choose a style like Drop Shadow, Stroke, etc.
The Layer Style dialog box opens
adjust the settings.
Click OK to apply.





Layers Panels



Layer Filter: This enables you to hide layers based on different things. Makes it easier to find the layers that you want to work with.

Opacity: 0= transparent 100 = fully opaque. press number keys on keyboard to instantly set to multiples of 10, or adjust the slider for an exact amount of transparency on each layer.

Blend Modes: Change these to change the way that the selected layer blends with the layers underneath it. Great for compositing and special effects. (With the move tool selected, press Shift+ or Shift- to cycle through blending modes.

Fill opacity: Adjusts the amount of opacity of the pixels only, but any layer styles are unaffected and remain 100% opaque.

Visibility: If the eye is showing that layer is visible. Click on the eye and the layer will still be there but invisible until you click on the eye again.

Locked: The padlock means that something is locked in the layer. (Also click in the 4 icons in the “lock” next to fill opacity to make certain things editable or locked). Here are the different things that can be locked/unlocked.

Lock all: If the box is checked the layer is totally protected from any editing.

Lock Position: You can make any changes except for moving the image.

Lock Image pixels: You cannot draw on this layer if checked.

Lock transparent: You can paint on this layer but not where it is transparent.

Useful tools at the bottom of the panel

Link: Enabled you to link layers. These will all move together unless unlinked.

Layer Effects (Styles): Special effects applied to your image layer. Noted by the little f. Each effect will be listed. Multiple effects may be used at once.

Add Layer Mask: This is the button to press to add a layer mask to the currently selected layer. Allows you to paint away parts of your layer without damaging your original image.

Add Adjustment Layer: The best way to apply image adjustments. There can change the color or tone of an image. All layers are affected underneath an adjustment layer (Unless clipped). This is a good option to using Image>Adjustments because adjustment layers are non-destructive and re-editable.

Layer Groups: A good organizational tool. This puts layers into a folder. You can choose multiple layers and press Ctrl+G to put them in a group, or create a group by clicking this icon. Layers can be dragged in or out of groups in the Layers panel.

Create New Layer: Press this icon to create a new layer. Drag an existing layer into this icon to create a duplicate of that layer,

Delete Layer: Drag a layer into this icon to remove it. Or select the layer and then press this icon to get the same result.

Panel Options: This will open a drop-down menu that provides a number of options, many that aren't listed anywhere else.

Merge layers to simplify the drawing

Merge Selected Layers

- Select multiple layers (hold Ctrl + click each one).
- Right-click one of the selected layers.
- Choose Merge Layers (Ctrl + E /)

Merge Visible

- Hide the layers you don't want to merge (click eye icons).
- Go to menu: Layer > Merge Visible or press Shift + Ctrl + E.

Flatten Image

- Merges all layers into one.
- Go to Layer > Flatten Image (best for final export only).

Why Use Layers?

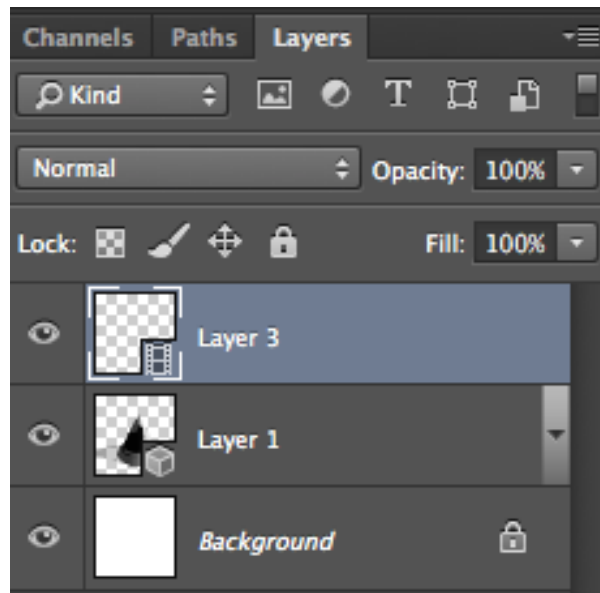
Benefit	Description
Non-destructive Edits	Original image stays safe. You can reverse or edit effects anytime.
Editable Elements	Text, shapes, filters, and images can be changed or moved independently.
Easy Organization	Layers can be grouped, hidden, locked, or reordered easily.

Special Types of Layers

Remember

You can lock other layers to prevent accidentally selecting them.

Use Shift + Click to select multiple layers. Use Auto-Select (with Move Tool) to quickly select the object and layer it's on (turn it on/off from the top bar).



Video Layer: This indicates that there is video on this layer. Photoshop is now able to be used as a video editor, to work with video, animated slideshows and motion graphics. See Video in Photoshop if you want to learn about video editing in Photoshop.

Tips for Working with Layers

Tool/Option	Purpose
Lock Layer	Prevent accidental changes
Eye Icon	Toggle visibility of a layer
Opacity Slider	Adjust transparency of the layer
Blending Modes	Control how layers mix visually (e.g., Multiply, Screen)
Smart Objects	Embed files or images to edit them non-destructively

Activity: 1

Practice to prepare layers for requirements of images.
Make a 600x400px banner using layers.

Steps:

Layer 1 – Background:

Fill with a solid color or gradient.

Layer 2 – Image:

Insert any image (e.g., a product or scenery).

Layer 3 – Text:

Add a heading (e.g., “New Arrival” or “Welcome”).

Layer 4 – Logo:

Add a small logo or icon in a corner.

Save the file in layered format (e.g., PSD).

Learning Unit 2.3

Design Objects

Learning Outcomes:

After completion of this learning unit, trainee will be able to:

- Draw different shapes as required
- Reshape the objects
- Align the objects as required
- Transform the objects as required
- Save edited object

2.3.1 Main Components of Photoshop

Menu Bar

File

Command	Shortcut	Description
New	Ctrl + N	Create a new document with customizable settings—dimensions (width/height), resolution (ppi), color mode (RGB/CMYK/Grayscale), and background contents (transparent, white, or custom color).
Open	Ctrl+O	Opens files with the option to choose a specific color mode or channel configuration.
Save/Save As	Ctrl+S/ Ctrl+Shift+S	Save your work in Photoshop's native PSD format or choose alternate formats (JPEG, PNG, TIFF, etc.). "Save a Copy" is also available to preserve layers while creating a flattened version
Export	Ctrl+E)	Provides various export options (Export As, Save for Web [Legacy]) that allow optimization for web use, including file size and quality adjustments.
Place		Allows you to add a photo, art, or any supported file as a Smart Object to your document, enabling non-destructive scaling, positioning, and transformations.
Print	Ctrl+P	Opens the print dialog to adjust print settings such as paper size, orientation, and color management.
Automate		Includes batch processing, slideshow creation, and scripting options for repetitive tasks.

Edit

➤ Undo / Redo

Command	Shortcut	Description
Undo/Redo	Ctrl + Z	Toggles between your last two actions. Press repeatedly to switch back and forth.
Step Forward	Shift + Ctrl + Z	Moves one step forward in your history (if available).
Step Backward	Alt + Ctrl + Z	Moves one step backward in your history. Great for fixing mistakes.

➤ Cut, Copy, Paste

Command	Shortcut	Description
Cut	Ctrl + X	Removes the selected area/layer and stores it in clipboard.
Copy	Ctrl + C	Copies selected content.
Copy Merged	Shift + Ctrl + C	Copies all visible layers merged together.
Paste	Ctrl + V	Pastes clipboard content onto a new layer.
Paste in Place	Shift + Ctrl + V	Pastes in the same position as copied from.
Paste Into	—	Pastes image into a selection, creating a layer mask.

➤ Content-Aware Features

Feature	Use
Content-Aware Fill	Automatically fills selected area based on surrounding pixels (ideal for object removal).
Content-Aware Scale	Scales image while protecting important content.
Puppet Warp	Let's you bend and twist objects by placing pins.
Perspective Warp	Adjusts the perspective of part of an image.

Transform

➤ Edit > Transform

Option	Shortcut	Description
Free Transform	Ctrl + T	Resize, rotate, skew, flip, or distort selected object/layer.
Scale / Rotate / Skew / Distort / Perspective / Warp	—	Use for specific types of transformation. Warp allows detailed shape bending.
Flip Horizontal / Vertical	—	Mirrors the layer/object along the specified axis.

➤ Fill and Stroke

Command	Shortcut	Use
Fill	Shift + F5	Fills a selection with color, pattern, or content-aware.
Stroke	—	Adds an outline (stroke) to a selection or object.

➤ Preferences and Menus

Option	Description
Menus...	Customize what items show in menus.
Keyboard Shortcuts	Create or edit shortcuts.
Preferences	Change Photoshop settings (performance, tools, UI, etc.). Shortcut: Ctrl + K

➤ Image

Mode

Image > Mode

Determines how the image data is interpreted.

Mode	Description
RGB Color	Standard mode for digital images (Red, Green, Blue channels).
CMYK Color	Used for print (Cyan, Magenta, Yellow, Black).
Grayscale	Converts to black-and-white tones.
Bitmap / Indexed Color	Used for limited-color images (like web graphics or logos).
Duotone	Creates images using 1–4 inks for stylized color.
Changing mode may flatten layers or discard color info.	

➤ Adjustments

Image > Adjustments

Applies global image corrections (or to selected layers/areas).

Command	Use
Brightness/Contrast	Simple tone control.
Levels	Adjusts shadows, midtones, and highlights.
Curves	Precise tonal and contrast adjustment.
Exposure	Fix over/underexposed images.
Hue/Saturation	Modify color intensity and tone.
Color Balance	Shift color tint (warm/cool).
Black & White	Converts while allowing tonal control.
Photo Filter	Applies color filters like warming/cooling.
Channel Mixer	Customizes RGB channels.
Invert	Reverses colors.
Posturize	Reduces colors for stylized look.
Threshold	Converts image to black/white based on brightness.
Gradient Map	Maps gradient to tone levels.
Selective Color	Targeted color shifts (great for color correction).

Use Adjustment Layers (via the Layers panel or Layer > New Adjustment Layer) to make non-destructive edits.

➤ Image Size

Image > Image Size

Feature	Use
Width/Height	Resize image (in pixels, cm, inches, %).
Resolution	Adjust print quality (300 ppi for print, 72 ppi for web).
Resample	Adds or removes pixels to change image size.

➤ **Canvas Size**

Image > Canvas Size

Changes canvas dimensions without affecting image size. Useful to add borders, margins, or white space.

➤ **Image Rotation**

Image > Image Rotation

Option	Use
180°, 90° CW, 90° CCW	Rotate entire canvas.
Arbitrary	Enter custom angle.
Flip Canvas Horizontal/Vertical	Mirrors image. Useful for layout reviews.

➤ **Crop and Trim**

Image > Trim

Crop Tool ©

- Trim removes transparent or solid-color edges.
- Crop removes unwanted image areas interactively.

Apply Image / Calculations

Advanced options used for:

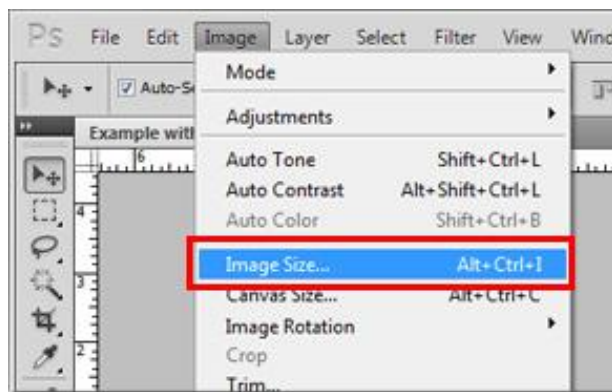
- Blending different image channels.
- Creating masks or effects.
- Often used in high-end retouching.

Image Size:

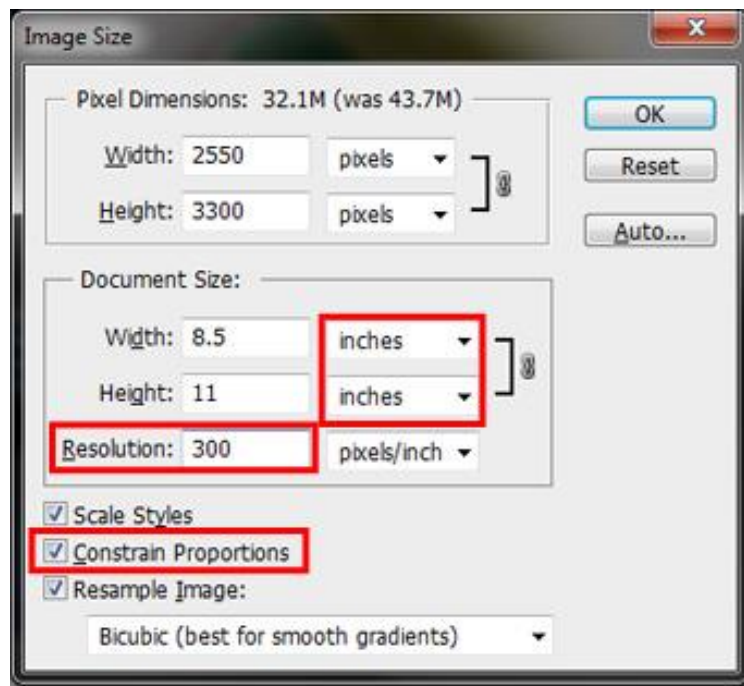
Adjust overall dimensions, resolution, and resampling methods to enlarge or reduce an image while maintaining quality.

To resize an image in Photoshop:

- Open your image in Photoshop.
- Go to “Image,” located at the top of the window.
- Select “Image Size.”



- A new window will open.
- To maintain the proportions of your image, click the box next to “Constrain Proportions”.
- Under “Document Size”:



Select "inches" for the unit of measurement.

Check that the resolution is no lower than "200 pixels/inch", however "300 pixels/inch" is ideal for printing.

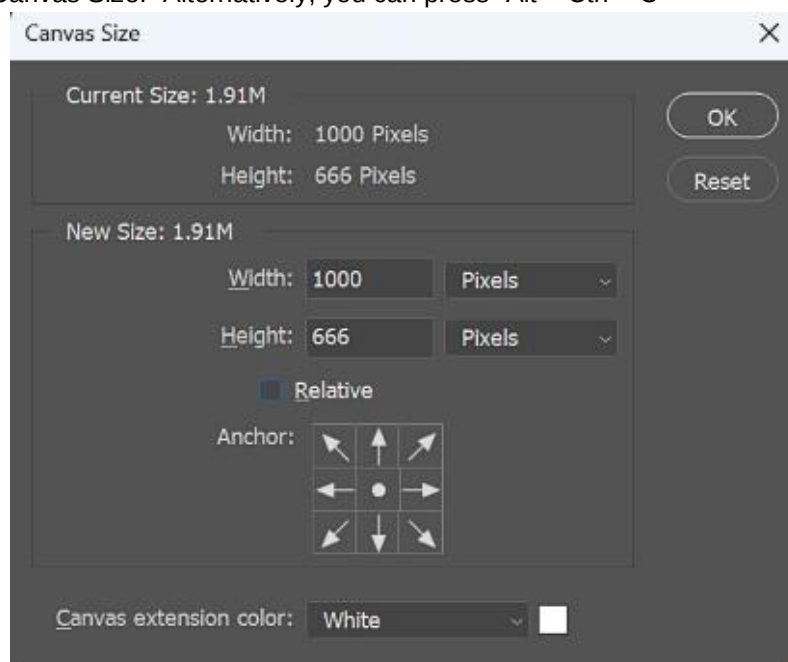
Input the width and height you desire.

If your original image has different proportions than your desired print size, it will be necessary to crop your image after resizing it (see below).

Click, "OK."

Canvas Size:

Change the size of the workspace without altering the image's content, with anchor point selection. In the menu bar at the top of the Photoshop interface, click on "Image." This will open a dropdown menu for you. Select "Canvas Size." Alternatively, you can press "Alt + Ctrl + C"



Mode:

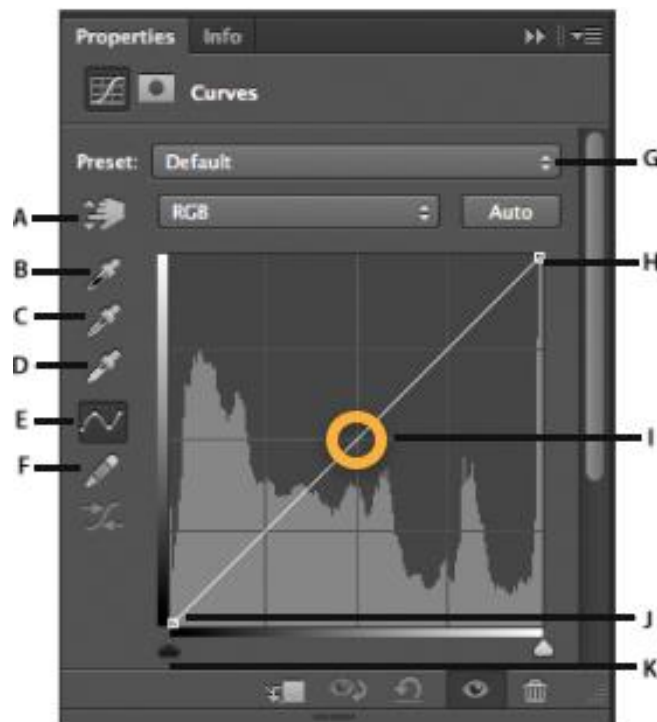
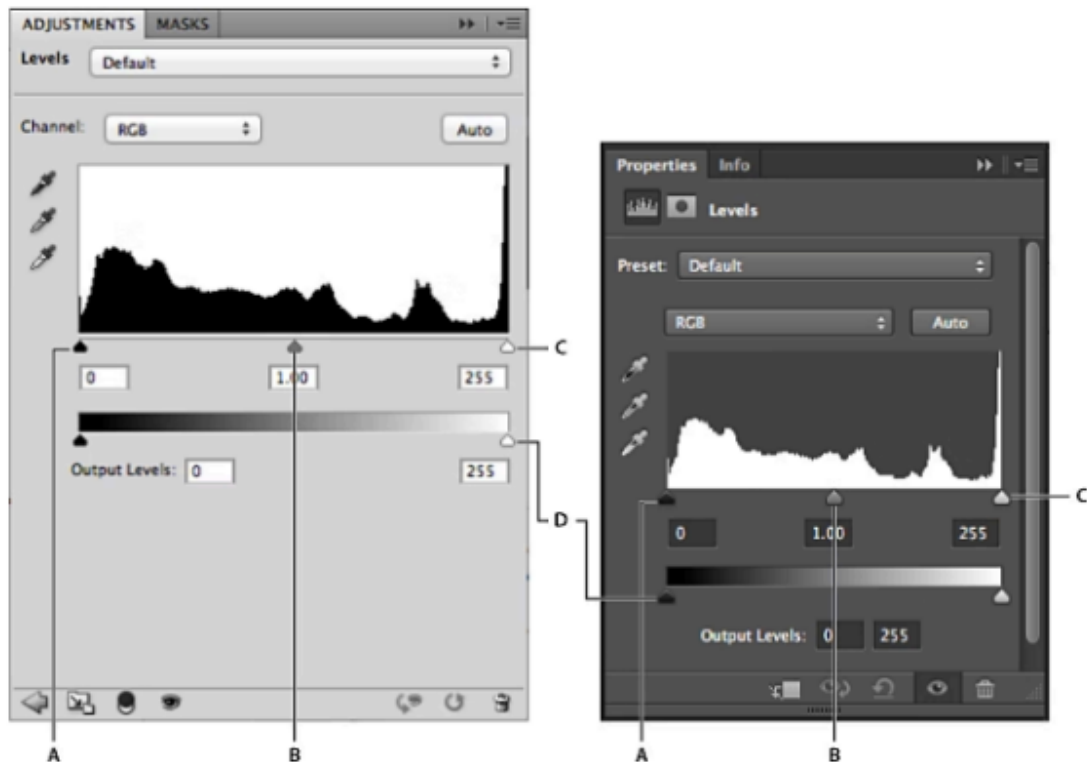
Switch between color modes (RGB, CMYK, Grayscale, Lab) and bit depth changes.

Adjustments:

Provides tools for fine-tuning image attributes such as Brightness/Contrast, Levels, Curves, Exposure, Hue/Saturation, Vibrance, Color Balance, and more.

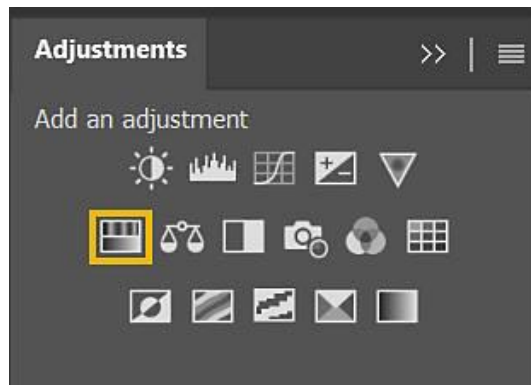
➤ Levels:

- Click the Levels icon  in the Adjustments panel, or choose Levels from the panel menu.
- Choose Layer > New Adjustment Layer > Levels. Click OK in the New Layer dialog box.



➤ Adjusting levels

A. Shadows B. Midtones C. Highlights D. Output Level slider



➤ **Curve:**

- Click the Curves icon  in the Adjustments panel.
- Choose Layer > New Adjustment Layer > Curves. Click OK in the New Layer dialog box.

➤ **Hue/Saturation:**

From the Preset menu, choose a Hue/Saturation preset.

➤ **From the menu to the right of the On-image adjustment tool :**

- Choose Master to adjust all colors at once.
- Choose one of the other preset color ranges listed for the color you want to adjust - To modify the color range.

➤ **To adjust the hue, do any of the following:**

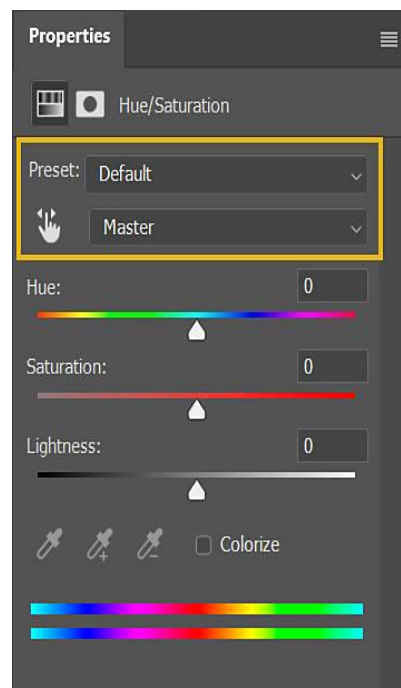
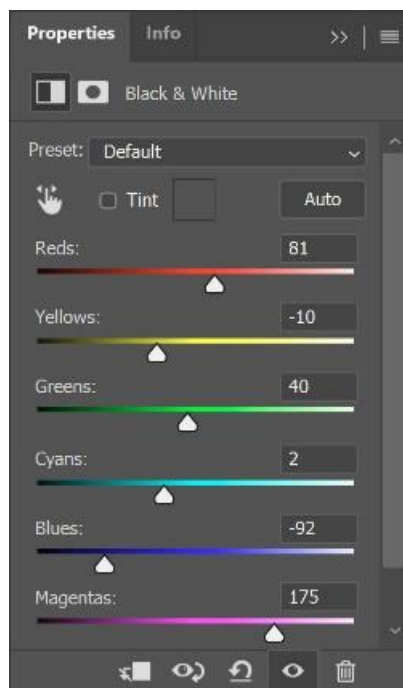
Drag the Hue slider or enter a value until you are satisfied with the colors.

The values displayed in the box reflect the number of degrees of rotation around a color wheel from the original color of the pixel. A positive value indicates clockwise rotation; a negative value indicates counterclockwise rotation. Values can range from -180 to +180.

Select the On-image adjustment tool . Then Ctrl-click (Windows) or Command-click (Mac OS) a color in the image and drag left or right in the image to modify the Hue value.

➤ **To adjust the saturation, do any of the following:**

Enter a value or drag the Saturation slider to the right to increase the saturation or to the left to decrease it.



Values can range from -100 (percentage of desaturation, duller colors) to +100 (percentage of saturation increase).

Select the On-image adjustment tool  and click a color in the image. Drag left or right in the image to decrease or increase saturation of the color range that includes the pixel you clicked.

For **Lightness**, enter a value or drag the slider to the right to increase the lightness (add white to a color) or to the left to decrease it (add black to a color). Values can range from -100 (percentage of black) to +100 (percentage of white).

To undo a Hue/Saturation setting, click the reset button  at the bottom in the **Properties** panel.

Black and white

To access the **Black & White** adjustment layer, do one of the following:

- Select Window > Adjustments. Click the Black & White icon () in the Adjustments panel that opens.
- Choose **Layer > New Adjustment Layer > Black & White**. In the **New Layer** dialog box, type a name for the adjustment layer and then click OK.
- Clicking the “Tint” box allows you tint the photo a certain color, over a black and white photo. It lets you adjust each color category individually, underneath the color overlay, giving you rich tones.

Remember

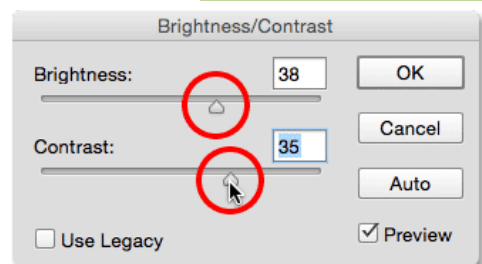
If the image is in RGB mode, you first convert to Grayscale mode. Choose Image > Mode > Grayscale. Photoshop asks to discard color information.

Brightness/Contrast

To adjust brightness and contrast in Photoshop, navigate to Image > Adjustments > Brightness/Contrast, then use the sliders to modify the overall brightness and the difference between light and dark areas.

Auto Tone, Auto Contrast, Auto Color:

- Quick, one-click fixes that adjust tonal and color balance.



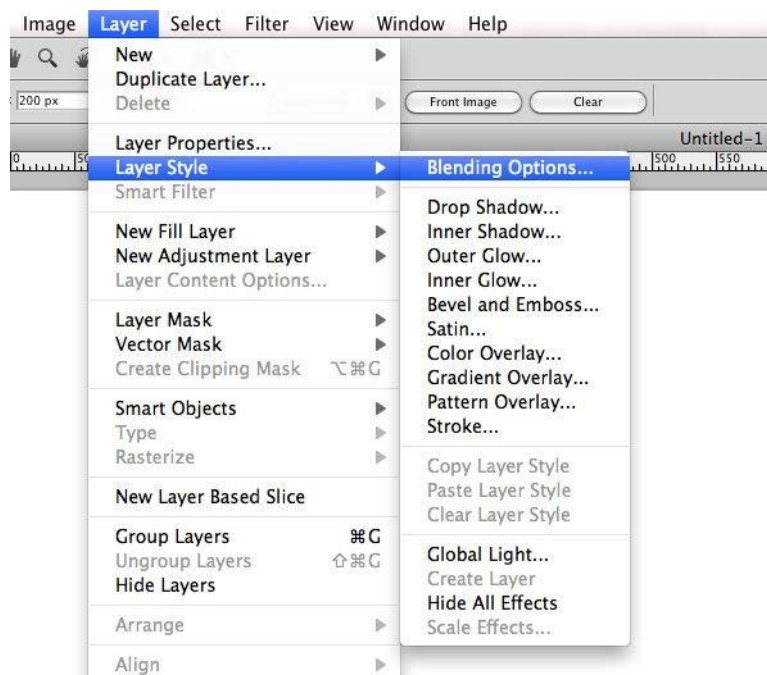
Rotate and Flip Canvas:

- Options to rotate the image in 90° increments or flip horizontally/vertically.

Duplicate:

- Create a copy of the image for alternative editing without affecting the original.

Layer



Layer Feature	Description	Shortcut/How to Access
Smart Filters	Applies filters to a Smart Object, allowing them to be modified or removed non-destructively.	Apply filter on a Smart Object (Filter > Convert for Smart Filters)
Layer Styles (fx)	A collection of effects (drop shadow, bevel, emboss, etc.) that can be applied to a layer. These are editable and can be stacked.	Right-click on layer > Blending Options
Opacity & Fill	Opacity adjusts the transparency of the entire layer, while Fill controls the transparency of just the content (without affecting layer styles).	Opacity and Fill sliders in the Layers panel
Rasterize Layer	Converts a vector layer (such as text or shape) into a raster layer, so it can be edited pixel-by-pixel.	Right-click on layer > Rasterize Layer
Convert to Shape	Converts rasterized text or image layers into editable vector shapes.	Right-click on text or shape layer > Convert to Shape
Adjustment Layers	Used for applying color and tonal corrections (Brightness/Contrast, Hue/Saturation) without directly affecting the layer beneath it.	Layer > New Adjustment Layer or the Adjustment Layers icons at the bottom of the Layers panel
Layer Opacity Masks	Masks the opacity of a layer, blending it with the background based on the mask's grayscale values.	Right-click layer > Add Layer Mask > Reveal All/Hide All
Clipping Mask	Applies the effect of the layer directly beneath it (such as an adjustment layer) only to the layer immediately above it.	Alt + Ctrl + G to clip the upper layer to the one below
Fill Color (Solid Color)	Fills a layer with a solid color. Useful for backgrounds, gradients, or masks.	Layer > New Fill Layer > Solid Color
Pattern Overlay	Applies a repeating pattern to a layer, which can be scaled, moved, and adjusted.	Right-click on layer > Blending Options > Pattern Overlay
Gradient Overlay	Adds a gradient effect to the layer, with full control over colors, angle, and opacity.	Right-click on layer > Blending Options > Gradient Overlay
Stroke	Adds a border around a layer or its content, allowing for control over width, position, color, and blending mode.	Right-click on layer > Blending Options > Stroke
Layer Alignment and Distribution	Aligns multiple selected layers relative to each other or distributes them evenly across the canvas.	Use the Align and Distribute tools in the top bar or Ctrl + A to select all layers
Layer Locking Options	Locks the layer to prevent modifications. Specific types of locks (position, content, or all) can be enabled to restrict specific changes.	Lock icons at the top of the Layers panel
Group Layers	Combines several layers into one folder to keep your workspace organized and tidy.	Ctrl + G (or Layer > Group Layers)
Linking Layers	Allows you to link multiple layers together so you can move or edit them simultaneously without merging them.	Ctrl + Alt + G or select layers and use Link in the Layers panel
Quick Actions	A collection of one-click commands for layer actions like rotating, flipping, aligning, and arranging.	Right-click on the layer or in the context menu for options
Merge Layers	Combines multiple selected layers into one single layer.	Ctrl + E or Right-click > Merge Layers
Merge Visible	Merges only the visible layers (the ones with an eye icon next to them).	Shift + Ctrl + E

Layer Feature	Description	Shortcut/How to Access
Flatten Image	Merges all layers into one layer. It is a destructive action that reduces file size, typically used for preparing images for web or print.	Layer > Flatten Image
Convert to Smart Object	Converts raster or vector layers into a Smart Object, which allows you to apply non-destructive transformations and filters.	Right-click on the layer > Convert to Smart Object

Alignment Options

Icon	Name	Function
↑ TOP	Align Top Edges	Aligns the top of all selected layers to the topmost one.
▼	Align Vertical Centers	Centers all layers vertically in relation to each other.
▼	Align Bottom Edges	Aligns all layers to the bottom edge.
↔	Align Left Edges	Aligns the left sides of selected layers.
→	Align Horizontal Centers	Centers all layers horizontally.
↘	Align Right Edges	Aligns all right edges.

Distribution Options (Even Spacing between Layers)

Icon	Name	Function
↑↓	Distribute Top Edges	Equal vertical spacing based on the top edges.
↔	Distribute Vertical Centers	Even vertical spacing based on center points.
↻	Distribute Bottom Edges	Spreads layers equally using bottom edges.
←→	Distribute Left/Right Edges	Spreads objects evenly from side to side.

Command	Shortcut	What It Does
Bring to Front	Shift + Ctrl +]	Moves the selected layer to the very top of the layer stack.
Bring Forward	Ctrl +]	Moves the selected layer up one level in the stack.
Send Backward	Ctrl + [	Moves the selected layer down one level.
Send to Back	Shift + Ctrl + [	Moves the selected layer to the very bottom.
Reverse	—	Reverses the stacking order of multiple selected layers.
Align Linked	—	Aligns layers that are linked together.
Distribute Linked	—	Distributes linked layers evenly.

Select

All / Deselect / Reselect / Inverse:

Basic selection management to select all content, clear selections, or invert current selections.

Color Range:

Select parts of the image based on color similarity, allowing fine control of selection based on hue and saturation.

Modify:

Options such as Expand, Contract, Feather, and Smooth to refine selections.

Grow / Similar:

Automatically expand the selection to include similar pixels or areas of similar color values.

Load Selection / Save Selection:

Import or store selection outlines for future editing sessions.

Select Menu Features:

Tool/Option	Description	How to Access
All	Selects the entire canvas.	Ctrl + A or Select > All
Deselect	Deselects any active selection, meaning no part of the image will be selected.	Shift + Ctrl + D or Select > Deselect

Remember

Use the Layers Panel too! Simply drag and drop layers up or down to rearrange their position — a quicker way to visually organize.

Tool/Option	Description	How to Access
Inverse	Inverts the current selection, selecting everything that was previously unselected and vice versa.	Shift + Ctrl + I or Select > Inverse
Feather	Softens the edges of the selection, creating a gradual transition between the selected and unselected areas.	Select > Modify > Feather or Shift + F6
Transform Selection	Allows you to scale, rotate, or manipulate the selection itself, without affecting the image content.	Select > Transform Selection
Modify	A group of tools that can modify an existing selection (expand, contract, smooth, etc.).	Select > Modify > Expand/Contract/Smooth/Border
Select All Layers	Selects all visible layers in the Layers panel. Useful for working with multiple layers at once.	Select > All Layers
Reselect	Re-applies the last selection, useful if you've deselected something by accident.	Select > Reselect
Color Range	Allows you to select parts of the image based on color values, making it easier to select areas of a specific color.	Select > Color Range
Gamut Warning	Highlights areas of the image that are outside the printable gamut (inaccessible colors in printing).	Select > Gamut Warning
Load Selection	Allows you to load a previous selection stored in a different channel or a selection saved as a mask.	Select > Load Selection
Save Selection	Saves the current selection to be used again later as a channel.	Select > Save Selection
Select Subject	Uses Photoshop's AI to automatically select the most prominent subject in the image.	Select > Subject
Select and Mask	A workspace that refines the selection, especially for difficult edges like hair or fur, giving you fine control over it.	Select > Select and Mask

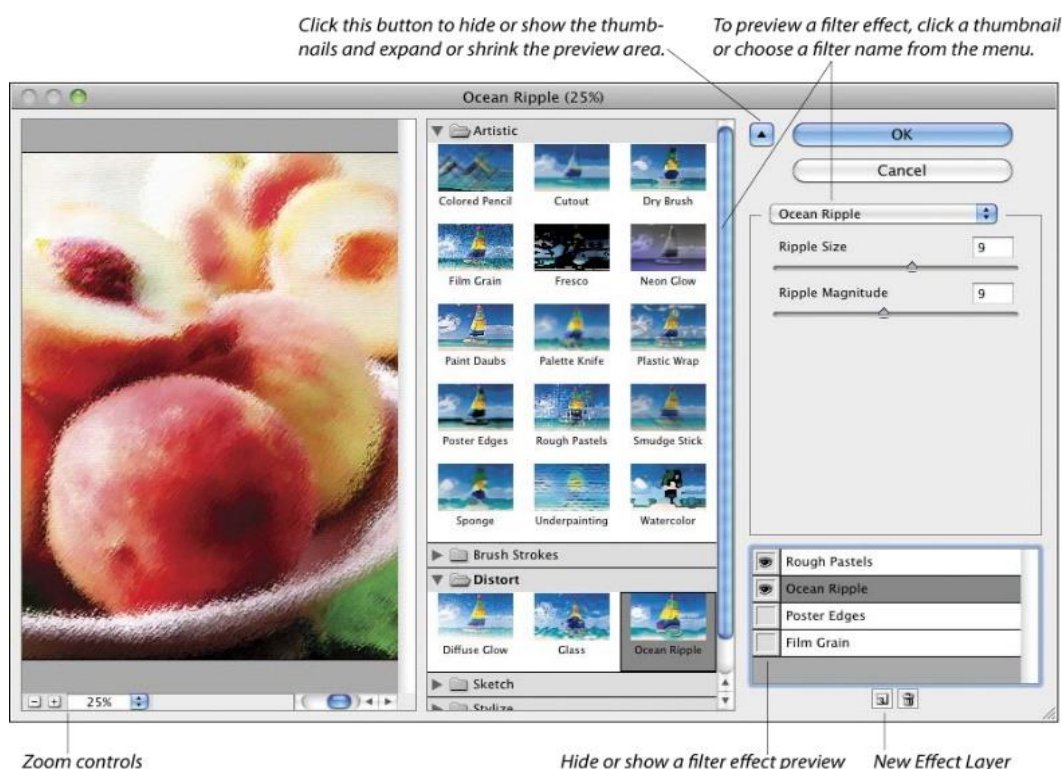
Common Selection Tools in Photoshop:

Marquee Tools (Rectangular, Elliptical, Single Row/Column): Make basic rectangular or elliptical selections.
Lasso Tools (Lasso, Polygonal Lasso, Magnetic Lasso): For freeform or polygonal selections.
Quick Selection Tool: Brushes over the area to automatically select parts of the image based on color and texture.
Magic Wand Tool: Selects areas based on color similarity, useful for selecting solid-color areas.

Types of Filters in Photoshop:

Blur Filters	Gaussian Blur: Smooths out the image by blurring it with a soft, uniform effect. Motion Blur: Simulates the effect of a moving subject, useful for creating a sense of speed. Lens Blur: Simulates the blur produced by a camera lens when focusing on a specific area.
Sharpen Filters	Unsharp Mask: Enhances the sharpness by emphasizing the contrast around edges. Smart Sharpen: More control over sharpening, including options for removing noise and adjusting for lens blur.

Distort Filters	Wave: Creates a wave-like distortion effect in the image, which can simulate water or fluid motion. Twirl: Spins the image in a circular fashion, creating a vortex-like distortion. Ripple: Simulates a ripple effect, as if the image were disturbed by a moving object on a water surface.
Noise Filters	Add Noise: Adds random color or luminance noise to the image, often used to create grain or texture. Reduce Noise: Reduces random pixel variations (grain or noise) often caused by high ISO settings in cameras.
Stylize Filters	Emboss: Applies a raised effect on the image, which mimics the appearance of a 3D surface. Find Edges: Detects edges in the image and outlines them, often used for creating drawing-like effects.
Pixelate Filters	Mosaic: Breaks the image into pixelated blocks. Crystallize: Creates a crystallized effect by applying a blocky pattern to the image.
Render Filters	Lens Flare: Simulates the lens flare effect caused by bright light sources in photography. Clouds: Generates a cloud-like texture based on the current foreground and background colors.
Texture Filters	Grain: Adds film grain to the image, simulating the appearance of traditional photography. Texturizer: Applies a texture to the image, such as canvas, sandstone, or brick.
Smart Filters	Smart Filters are a non-destructive way of applying filters. You can apply filters to a Smart Object, which allows you to edit or remove the filters at any time.



Additional Notes:

Filter Mask: Some filters, such as Gaussian Blur, allow you to apply a mask to the filter, so you can selectively control where the filter affects the image.

Layer Mask with Filters: Using layer masks with filters can give you more control, allowing you to hide or reveal parts of the filter effect.

Keyboard Shortcuts:

Filter > Filter Gallery: Shift + Ctrl + F

Gaussian Blur: Ctrl + F (repeats last filter applied)

Tips for Using Filters Effectively:

Use with Layer Masks: Apply filters to a duplicate layer, then use a mask to control the effect's visibility.

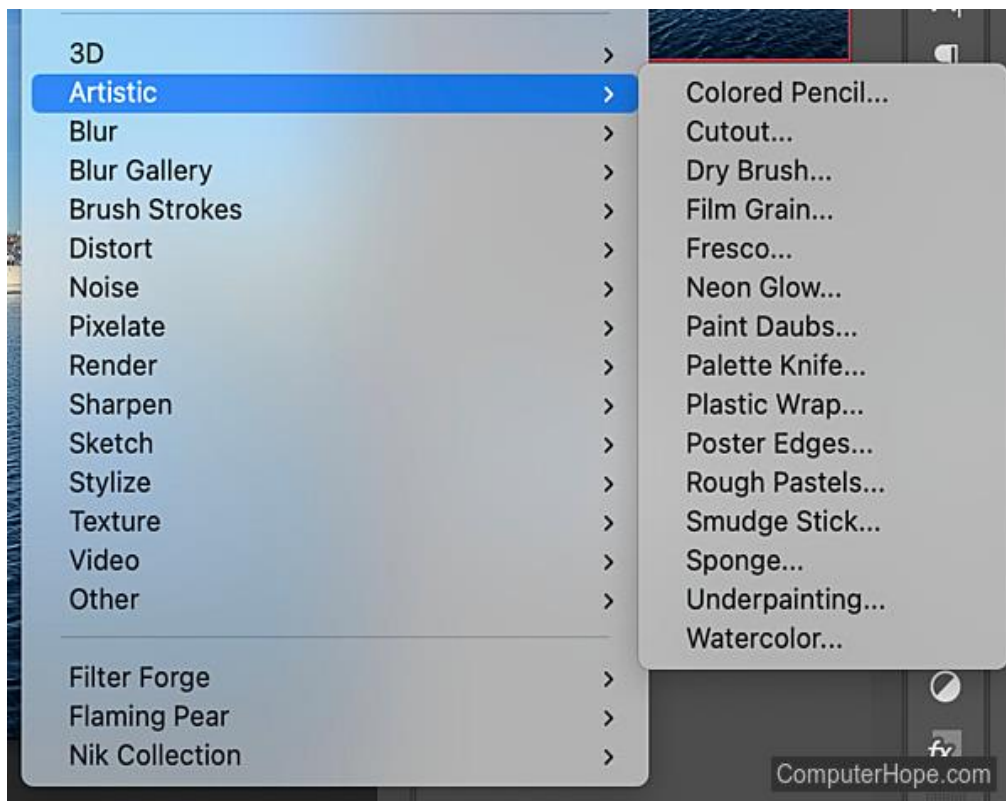
Experiment with Multiple Filters: Stack different filters for more complex and creative effects.

Smart Objects: Always consider using Smart Objects for non-destructive editing.

Previewing Filters: Most filters have a real-time preview option so you can adjust them before applying.

Remember

Use with Layer Masks: Apply filters to a duplicate layer, then use a mask to control the effect's visibility. Experiment with Multiple Filters: Stack different filters for more complex and creative effects.



New 3D Layer	New 3D Layer from File: Allows you to import an external 3D model file (e.g., .obj, .stl, .3ds) into your Photoshop document. New 3D Layer from PostScript: Converts a 2D shape or text layer into a 3D object by extruding it. New 3D Extrusion from Selected Layer: Creates a 3D version of a selected shape or text layer, turning it into an extrusion with depth.
3D Layers	Merge 3D Layers: Combines multiple 3D layers into one, which can help simplify editing when working with several 3D elements.

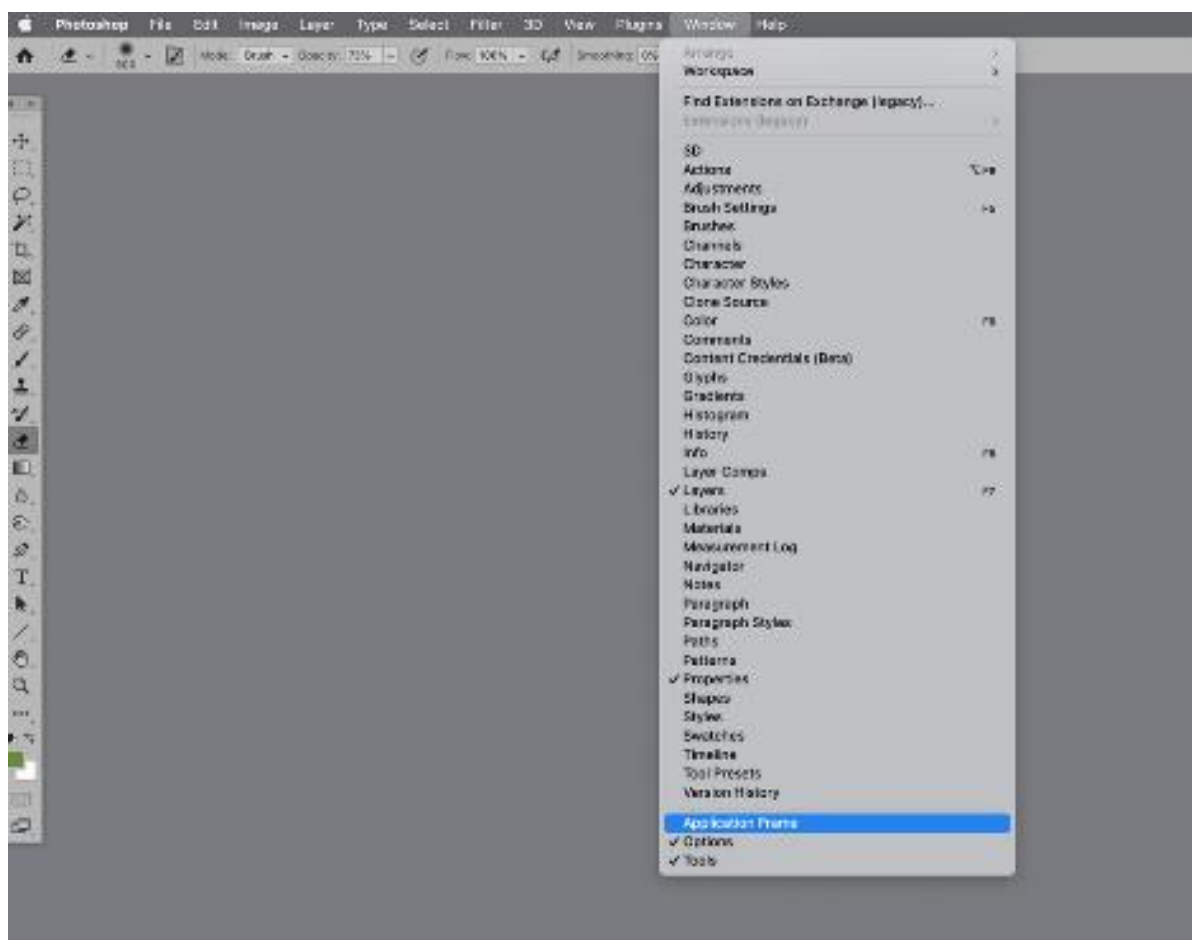
	Group 3D Layers: Groups 3D layers together to move or apply changes to them as one unit. Convert to 3D PostScript Layer: Converts a 2D layer into a 3D object. Edit 3D PostScript: Allows further adjustments to a converted 3D object.
3D Camera	New Camera: Adds a new camera to the scene, allowing you to adjust the view. Set Camera from View: Adjusts the camera's angle and position to match the current view in the workspace. Reset Camera: Resets the camera position to its default view. Camera Settings: Opens options to control the camera's field of view, focal length, and other settings for perspective control.
Lights	New Light: Adds a new light source to the scene (choose from Spotlight, Point Light, or Infinite Light). Edit Light: Opens a dialog to edit the selected light source's position, intensity, color, and other properties. Delete Light: Removes the selected light from the scene. Toggle Light Visibility: Enables or disables the visibility of selected light sources in the scene.
3D Material	Edit 3D Material: Allows you to adjust the material properties applied to a 3D object, such as color, reflection, and textures. Apply Material: Applies a new material to a selected surface on the 3D object.
Render	Render 3D Layer: Begins rendering the 3D scene, producing a final, high-quality output image of the 3D object. Render Settings: Opens the render settings panel, where you can choose options like quality and lighting effects for the render. Cancel Rendering: Stops the current rendering process if it's taking too long or you no longer wish to proceed. Cancel All Render Tasks: Cancels all ongoing rendering tasks at once.
3D Panel	Show 3D Panel: Opens the 3D panel, which lets you view and manage all the 3D objects, lights, and cameras in the scene. 3D Panel Options: Customize how the 3D panel displays the objects, including labels and viewing preferences.
Export 3D Layer	Export 3D Layer: Allows you to export the 3D model to an external file format such as .Obj, .stl, or .3ds. Export As: Exports the current 3D layer as a 2D image file, such as JPEG, PNG, or TIFF, after it has been rendered.
3D Selection Tools	3D Select Tool: Selects a 3D object in the scene for manipulation or editing. 3D Move Tool: Moves 3D objects along the X, Y, and Z axes. 3D Rotate Tool: Rotates the selected 3D object on various axes (X, Y, Z).

	3D Scale Tool: Adjusts the size of the selected 3D object.
3D Object Properties	Extrusion: Modifies the depth of an extrusion on 3D text or vector shapes. Bevel: Adds beveled edges to a 3D object, allowing you to control the angle and size of the bevel. Inflation: Applies an inflation effect to the front or back surface of a 3D object to add depth.

View	
Screen Modes: Screen modes change how the Photoshop workspace is displayed.	
Standard Screen Mode: This is the default mode. It shows the image with the menus, panels, and other interface elements visible.	
Full Screen Mode: In this mode, the Photoshop interface, including the panels, is hidden. Only the image and the toolbar remain visible. You can toggle between this mode and the standard screen mode using the F key.	
Full Screen with Menubar: This mode hides all panels but keeps the Photoshop menu bar visible. You can toggle between this mode and the standard screen mode using the F key.	
Zoom In/Out	
These options help adjust how much of the image is visible at a given time.	
Zoom In (Ctrl + + / Command + +): Increases the magnification of your image.	
Zoom Out (Ctrl + - / Command + -): Decreases the magnification of your image.	
You can also use the Zoom Tool (Z) for more interactive zooming, allowing you to click on the image to zoom in and out.	
Actual Pixels (100% View)	
This option shows the image at 100% zoom, meaning each pixel in the image is represented by a single pixel on your screen. It's useful for checking pixel-level details in your image.	
Shortcut: Press Ctrl + 1	
Fit on Screen	
This option fits the entire image in the workspace, adjusting the zoom level so the whole image is visible.	
Shortcut: Press Ctrl + 1	
Navigator Panel	
The Navigator panel provides a thumbnail of your image that allows you to quickly navigate to different areas of the image.	
Rulers	
Rulers are helpful for precise measurements and layout in Photoshop.	
To show rulers: View > Rulers (Ctrl + R)	
The rulers appear along the top and left sides of the workspace. You can drag guides from these rulers to assist with aligning objects and elements within your image.	
Guides	
Guides are non-printing lines that help you align and position elements within your design.	
New Guide: Go to View > New Guide , where you can create a horizontal or vertical guide at a specific position.	
Clear Guides: This removes all guides from the image, going to View > Clear Guides .	
Grid	
The grid is a useful tool for aligning and positioning elements. It divides your workspace into a series of evenly spaced horizontal and vertical lines.	
Show Grid: Go to View > Show > Grid .	
Snap to Grid: Ensures that your elements align precisely with the grid. This can be turned on or off in View > Snap To > Grid .	
Snap	
The Snap option pulls elements (like layers, guides, or selections) toward other objects in your image, helping you align them easily.	
Turn Snap On/Off: Go to View > Snap to toggle this feature.	
Snap To: You can choose specific objects for snapping, such as guides, layers, or the grid, by going to View > Snap To .	

Show:
This submenu controls the visibility of various tools in your workspace.
Extras: Shows or hides guides, grids, and any other extras.
Rulers: Shows or hides the rulers.
Grid: Toggles the grid on or off.
Guides: Toggles the visibility of guides.
Layer Edges: Displays the edges of each layer in your document.
Proof Setup: Proof setup options are used to simulate how an image will look when printed or displayed in a particular color space.
Proof Colors: Toggles proofing colors on or off. It simulates how your image will appear in a specific color profile.
Custom Proof Setup: Allows you to set up a custom color proof to match a specific device or output.
Shortcut: Press Ctrl + 1
Actual Pixels: This option shows the image at 100% size, meaning the pixels are displayed at their actual size on the screen.
Hide Extras
This option hides all extras like guides, grids, and layer edges, making it easier to focus on the image itself.
Shortcut: Press Ctrl + H
Window
The Window menu is designed to help you manage various panels, tools, and workspace settings. It controls the visibility of the panels and provides options for organizing your workspace. Below is a detailed breakdown of the options available in the Window menu.
Workspace: It allows you to choose and manage different preset layouts for panels and tools. This is especially useful for customizing workspace based on the task at hand, whether you are working with photography, graphic design, or digital painting.
Essentials: Default workspace layout for general use
Photography: Optimized workspace for photographers, focusing on tools such as Camera Raw and editing panels.
Graphic and Web: Focuses on tools related to web design and vector-based graphics.
3D: Provides tools and panels for 3D design and modeling.
Motion: Provides options for video editing and motion graphics.
Painting: Customized for digital painting, including brushes and other related panels. You can also create your own custom workspace by choosing Window > Workspace > New Workspace .
Arrange
This section controls how you organize multiple open documents in Photoshop.
Tile: This option arranges all open documents in a tiled format, allowing you to see multiple files at once.
Cascade: This option arranges the windows in a cascade layout, with each document window slightly overlapping the next.
Consolidate All to Tabs: This option arranges all open documents as tabs within a single window, simplifying your workspace.
Panels and Tools
The Window menu provides access to the various panels and tools you use while working in Photoshop. You can toggle the visibility of these panels or tools by selecting them from the Window menu. Below are some commonly used panels.
Layers: Controls all layers in your image (toggle with F7).
Adjustments: Provides quick access to adjustment layers such as Brightness/Contrast, Curves, etc.
Color: Displays the color picker and allows you to modify colors.
Tools: Displays the full list of tools in the left toolbar.
History: Tracks your recent actions, letting you undo or step back through previous states of your image.
Brushes: Provides options to adjust and manage brushes.
Paths: Displays and allows you to manipulate paths created using the Pen Tool.
Styles: Displays styles and affects you can apply to layers.
Navigator: Helps you move around your image and zoom in and out.

Character: Allows you to adjust text attributes like font, size, and spacing.
Paragraph: Provides paragraph formatting options for text.
Channels: Allows you to view and work with the red, green, and blue channels (for RGB images) or individual channels in other color modes.
Actions: Lets you create and play actions that automate repetitive tasks.
Paths: Displays and allows you to manipulate paths created using the Pen Tool.
Managing Panel Visibility To toggle any panel on or off: Checkmark: A checked option means the panel is visible. Uncheck: An unchecked option means the panel is hidden. For example: Window > Layers: Opens or closes the Layers panel. Window > History: Opens or closes the History panel. Window > Brushes: Opens or closes the Brushes panel.
Docking Panels You can dock panels in Photoshop for a more organized workspace: To dock a panel, drag it to the side of the Photoshop workspace, where it will snap into place. To undock a panel, simply drag it away from its docked position.
Extensions If you have installed plugins or extensions for Photoshop, you can manage them here: Window > Extensions: This submenu displays all installed extensions that provide additional functionality to Photoshop.
Tools The Window menu also gives you access to the Tools panel, which contains the essential tools for editing and creating images. Tools Panel: The tools are stacked vertically on the left side of the Photoshop workspace. You can toggle the visibility of this panel through the Window > Tools option. Tool Presets: This section allows you to manage preset tools and their settings.



What You Can Find in the Help Menu:

Photoshop Help: This opens Adobe's online help documentation, which provides a full guide on all features and tools in Photoshop.

Search Photoshop Help: You can search for specific topics or features you need help with (e.g., "how to use layer masks").

Product Updates: You can check for any new updates to Photoshop and install them if needed.

Tutorials: Access built-in tutorials that help you learn different aspects of Photoshop, from beginner to advanced skills.

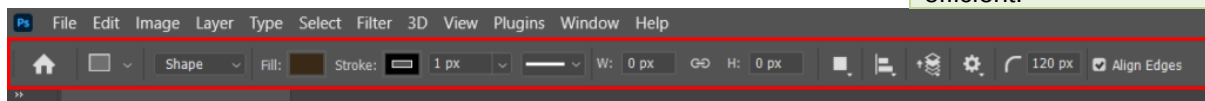
Support: Direct links to Adobe's support page if you encounter technical issues or need further assistance.

Community: Access Adobe's forums and communities where users discuss and share Photoshop tips and solutions.

Option Bar

Remember

The Window menu in Photoshop is crucial for efficiently organizing your workspace and controlling the visibility of panels and tools. Customizing your workspace based on your needs can significantly improve your workflow and make your work more efficient.



To work effectively with the **Option Bar** in Photoshop, you need to understand how to use it with various tools and settings. Here's a step-by-step guide on how to **work with the Option Bar** and adjust your tools for specific tasks.

✓ Locate the Option Bar

- The **Option Bar** is located at the top of the Photoshop workspace, just below the Menu Bar.
- If the Option Bar is not visible, go to **Window > Options** to enable it.

✓ Select a Tool

- The **Option Bar** changes based on the tool you have selected from the **Tools Panel** (on the left side of the workspace).
- Example: When you select the **Brush Tool**, the Option Bar will display options like **brush size**, **hardness**, and **opacity**.

✓ Adjust Tool-Specific Settings in the Option Bar

The **Option Bar** provides additional settings and controls for the selected tool. Below are the steps for adjusting the settings based on the selected tool:

Using the Brush Tool

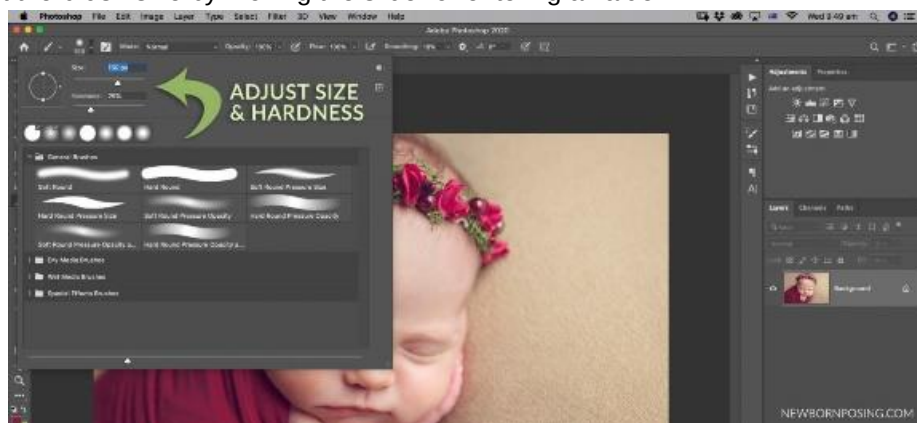
Select the Brush Tool:

From the Tools Panel, click the **Brush Tool (B)** or press **B** on your keyboard.

Adjust Settings in the Option Bar:

Brush Preset: Choose a specific brush style by clicking the dropdown next to the brush icon.

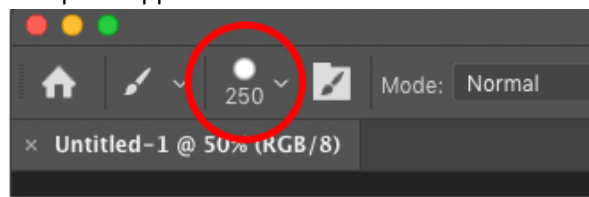
Size: Adjust the brush size by moving the slider or entering a value.



Hardness: Set how soft or hard the brush edges will be. A lower percentage makes the brush softer, while a higher percentage makes it sharper.

Opacity: Control the transparency of your strokes. Lower opacity means more transparency.

Flow: Controls the amount of paint applied with each stroke. Lower flow means less paint is applied.



Start Using the Brush Tool:

Click and drag on your canvas to apply the brush settings.

You can make real-time adjustments in the Option Bar as you paint, allowing you to experiment and perfect your strokes

Using the Text Tool

Select the Text Tool:

From the Tools Panel, click the **Text Tool (T)** or press **T** on your keyboard.

Adjust Settings in the Option Bar:

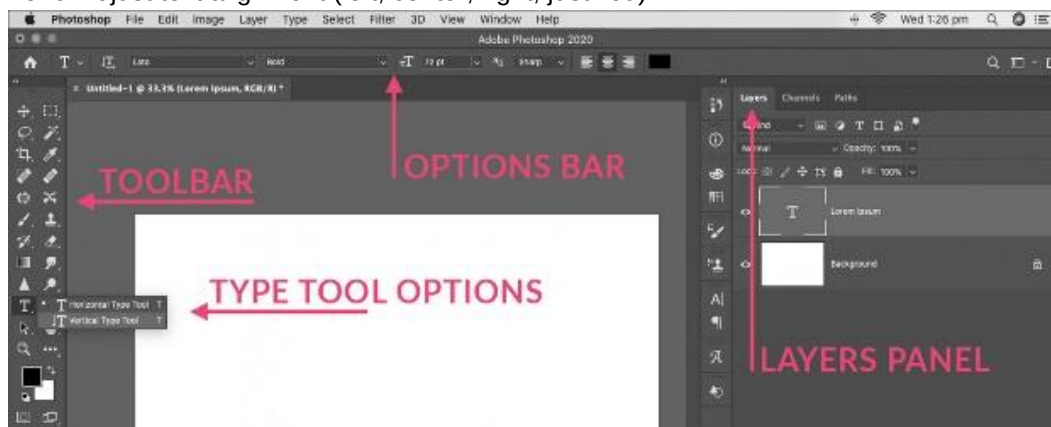
Font: Select a font style from the dropdown menu.

Size: Set the size of the text.

Leading: Adjust the line spacing between the lines of text.

Color: Set the text color by clicking the color swatch next to the font options.

Alignment: Adjust text alignment (left, center, right, justified).



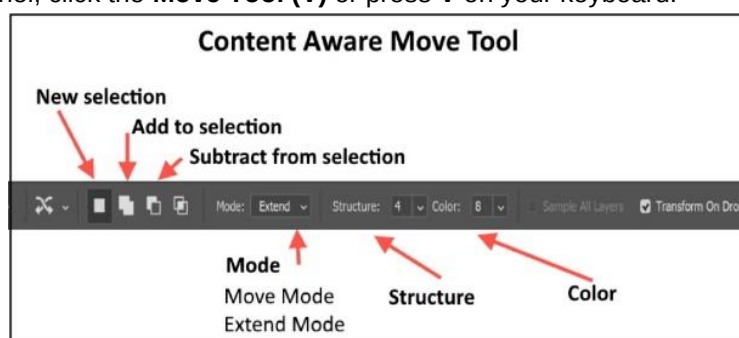
Start Typing:

Click on the canvas and start typing your text. The text will follow the font and size settings you've chosen in the Option Bar.

Using the Move Tool

Select the Move Tool:

From the Tools Panel, click the **Move Tool (V)** or press **V** on your keyboard.



Adjust Settings in the Option Bar:

Auto-Select:

Check this option if you want Photoshop to automatically select the topmost layer when you click on an object in the document.

Align and Distribute:

These options allow you to align layers relative to each other or distribute them evenly across the canvas.

Show Transform Controls:

Enable this to display handles on selected layers, allowing you to move and resize them.

Move Objects:

Click and drag elements or layers to move them on your canvas.

Using the Crop Tool**Select the Crop Tool:**

From the Tools Panel, click the Crop Tool  or press C on your keyboard.

Adjust Settings in the Option Bar:

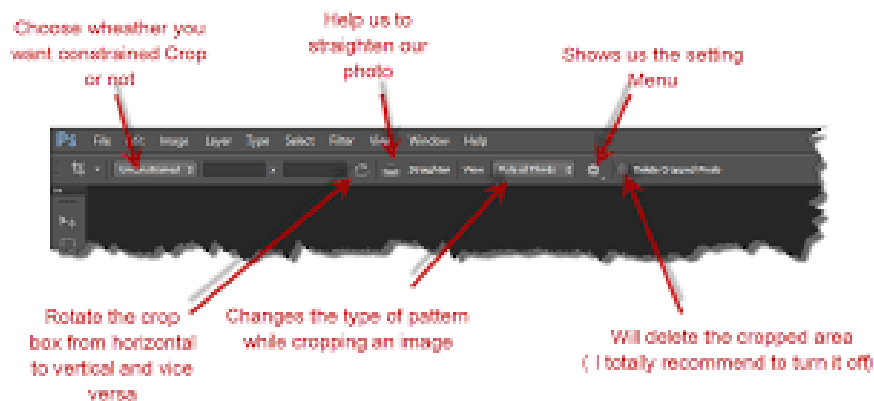
Ratio: Choose a preset aspect ratio (e.g., 16:9, square) or input custom dimensions for the crop.

Straighten: Click this button to straighten your image using the Crop Tool.

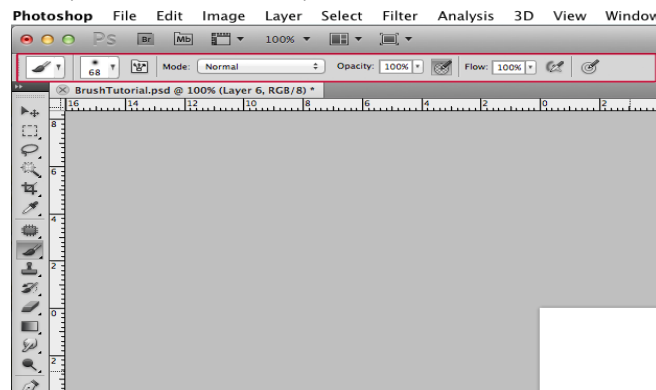
Hide Option: If you want to hide the crop box and apply the crop directly, click this option.

Apply the Crop:

Click and drag to create a crop area, then press Enter to apply it.

**Quick Tips for Working with the Option Bar**

- **Real-Time Adjustments:** Changes in the Option Bar apply immediately, for example, adjusting the opacity on the Brush Tool will show you how much transparency is applied to each brushstroke.
- **Experiment and Reset:** If you want to revert back to the default settings, you can often reset them by right-clicking on the tool icon in the Option Bar and selecting Reset Tool.
- **Keyboard Shortcuts:** Keyboard shortcuts for common tasks to speed up workflow. For example, B for the Brush Tool, T for the Text Tool, and V for the Move Tool.



Gradient Tool

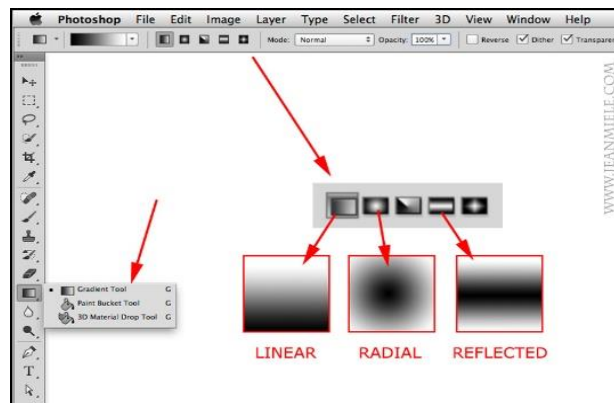
- In the Tools panel, click the Gradient Tool (shortcut G).

Option Bar Settings for Gradient Tool

- Gradient Type: Choose between Linear, Radial, Angle, Reflected, or Diamond gradients.
- Gradient Preview: Click to open the Gradient Editor where you can select or create custom gradients.
- Reverse: Switch the direction of the gradient (swap colors).
- Dither: Smooths the gradient to avoid banding.
- Opacity Stops: Adjust where the gradient fades to transparency.

Apply the Gradient

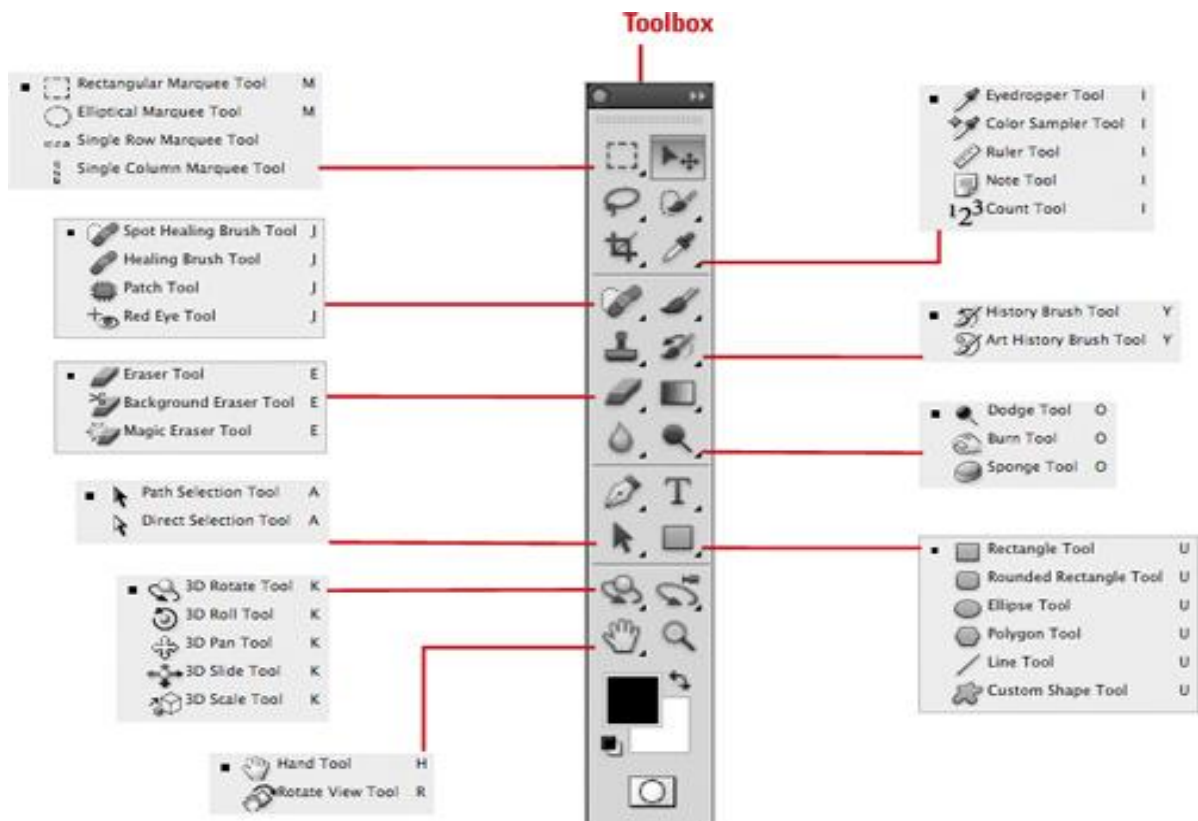
- Click and drag on the canvas to apply the gradient. The direction and length of the drag will control the gradient's flow.



2.3.2 Tools Palette

Detailed Breakdown

Each tool in the Photoshop Toolbar is grouped based on functionality. Tools with a small triangle in the corner have more related tools nested under them.



Selection Tools

Selection Tools are used to isolate parts of an image so you can make edits without affecting the rest of the canvas.

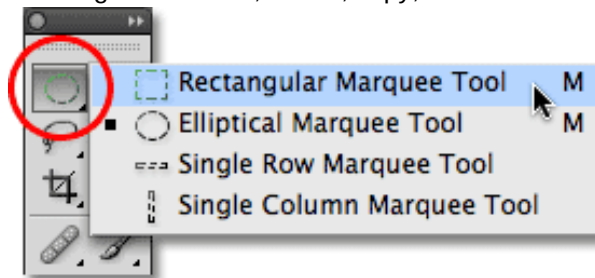
Main Selection Tools & Their Uses

Tool	Shortcut	Function	Best Use
Marquee Tool	M	Selects rectangular or elliptical areas	Simple, geometric selections
Lasso Tool	L	Freehand selection of irregular shapes	Drawing around objects manually
Polygonal Lasso Tool	L (under Lasso)	Straight-edged selections	Angular shapes, quick edges
Magnetic Lasso Tool	L (under Lasso)	Snap to edges of contrast automatically	Selecting objects with defined edges
Quick Selection Tool	W	Paints a selection using edge detection	Fast object selection
Magic Wand Tool	W (under Quick Select)	Selects pixels of similar color	Background removal, solid colors
Object Selection Tool	W (latest versions)	Auto-detects and selects a specific object	Ideal for people, items, etc.

Detailed Overview

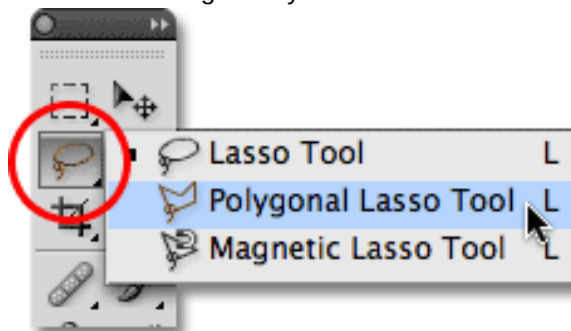
Marquee Tool

- Types: Rectangular, Elliptical, Single Row, Single Column
- Uses: Cropping, selecting areas for fill, stroke, copy, etc.



Lasso Tools

- **Lasso Tool:** Draw selection freehand
- **Polygonal Lasso Tool:** Click to place straight lines
- **Magnetic Lasso Tool:** Detects edges as you draw



Quick Selection Tool

- Auto detects edges and textures as you paint with the brush.

Magic Wand Tool

- Click an area to select all pixels with similar tone and color.
- Adjust **tolerance** to increase or decrease range.

Object Selection Tool

- Draw a box around an object; Photoshop auto-selects it.
- Works best with people, animals, or products



Useful Selection Options

- Add to Selection: Hold Shift
- Subtract from Selection: Hold Alt/Option
- Intersect Selections: Hold Shift + Alt/Option
- Refine Edge/Select & Mask: Smooth or feather selections for cleaner results

After Selection You Can:

- Apply filters
- Fill or stroke the selection
- Mask the selected part
- Move it to a new layer
- Invert the selection (Ctrl+Shift+I)

Crop & Slice Tools in Photoshop

These tools are used to **trim, straighten, divide, or slice images** for layout, web, or design purposes.

Main Crop & Slice Tools

Tool	Shortcut	Function	Best Use
Crop Tool	C	Trims the canvas or image based on a selected area	Resizing and removing extra space
Perspective Crop Tool	C (click & hold Crop Tool)	Crops and corrects perspective distortions	Adjusting skewed images
Slice Tool	C (click & hold)	Divides an image into smaller sections	Web graphics or interface design
Slice Select Tool	C (click & hold)	Edits or moves slices created with Slice Tool	Modifying or refining slices

Detailed Overview of Each Tool

Crop Tool

- Allows you to trim edges, change composition, straighten, and resize your canvas.

Steps:

- Select the Crop Tool.
- Drag to define the area to keep.
- Press Enter to crop.

Options Bar Features:

- Aspect Ratio presets (1:1, 4:5, etc.)
- Straighten Tool

Content-Aware Fill (to fill in cropped-out areas) Perspective Crop Tool

Adjusts the image's perspective while cropping (like photos taken at an angle).

How to Use:

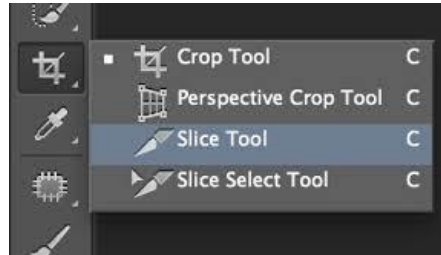
- Select the tool.
- Drag around the area.
- Adjust the corner handles to match perspective lines.
- Hit Enter — the tool flattens and crops the image.

Slice Tool

- Creates HTML-friendly image slices for websites or UI.

How to Use:

- Select the Slice Tool.
- Click and drag to create slices.
- Slices can be exported individually for web use.



Remember

- Use Guides (View > New Guide) to help align slices accurately.
- Use “Save for Web” to export individual slices for optimized online use.
- Undo Crops non-destructively by unchecking “Delete Cropped Pixels” in the options bar before cropping

Slice Select Tool

- Select, move, resize, and name slices created with the Slice Tool.
- Useful when managing many slices on a single layout.

Measuring Tools

These tools help measure distances, sample colors, inspect image properties, and ensure precision in your designs.

Main Measuring Tools & Their Functions

Tool	Shortcut	Function	Best Use
Eyedropper Tool	I	Samples colors from any part of the canvas	Picking accurate color values
3D Material Eyedropper Tool	I (under Eyedropper)	Samples materials in 3D artwork	For use in 3D projects
Color Sampler Tool	I (under Eyedropper)	Marks up to 10 points and shows RGB/CMYK values	Monitoring color values across design
Ruler Tool	I (under Eyedropper)	Measures distances and angles	Aligning and straightening objects
Note Tool	I (under Eyedropper)	Adds text notes to an image	Collaboration and feedback
Count Tool	I (under Eyedropper)	Adds numbered markers for counting objects	Scientific, medical, or pattern analysis

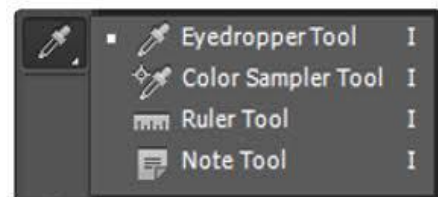
Detailed Overview of Each Tool

Eyedropper Tool

Click anywhere on the canvas to pick a color.

The sampled color becomes your Foreground Color.

You can change the sample size (point sample, 3x3, 5x5 average) from the Options Bar.



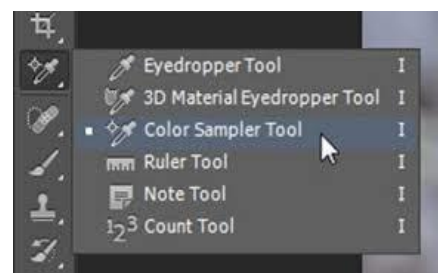
Color Sampler Tool

- Place up to 10 sampling points on your image.
- View precise RGB, CMYK, Lab, or Grayscale values in the Info panel.
- Helps maintain consistent color across different areas.

Ruler Tool

- Click and drag to measure distance, angle, and position.
- Great for straightening images.

Use Image > Image Rotation > Arbitrary after measuring a slanted horizon.



Note Tool

- Click on the canvas to place a small text note.
- Useful for providing feedback, instructions, or collaboration notes.
- Notes can be exported or viewed in shared files.

Count Tool

- Click on the canvas to place sequential count markers.
- Great for labeling repeated items, tracking objects, or scientific analysis (like cell counting).
- Counts can be reset, grouped, or styled using Count Tool options

Helpful Panels for Measuring Tools

- Info Panel: Displays live data like cursor position, color values, measurement units.
- Histogram Panel: Shows tonal distribution — useful for analysis and corrections.
- Navigator Panel: Helps zoom and pan during precise editing.

Remember

Combine Ruler Tool with Guides (View > New Guide) for accurate layout work. Use Preferences > Units & Rulers to change measurements (pixels, inches, cm, etc.). Hold Shift while using the Ruler Tool to constrain angle increments.

Retouching & Healing Tools

These tools are designed to fix imperfections, remove unwanted objects, smooth skin, or blend textures seamlessly — essential for photographers, designers, and editors.

Main Retouching & Healing Tools

Tool	Shortcut	Function	Best Use
Spot Healing Brush Tool	J	Quickly removes blemishes, spots, or small distractions	Quick fixes on portraits or objects
Healing Brush Tool	J (hold)	Paints with sampled pixels while matching texture, lighting, etc.	More control than Spot Healing
Patch Tool	J (hold)	Fixes large areas by dragging over and replacing with a sample	Repairing wrinkles, patterns, areas
Content-Aware Move Tool	J (hold)	Moves part of the image and intelligently fills the gap	Relocating elements naturally
Red Eye Tool	J (hold)	Removes red-eye effect caused by camera flash	Eye correction in portraits
Clone Stamp Tool	S	Paints with an exact copy of another area	Duplicating patterns, textures, fixing
Pattern Stamp Tool	S (under Clone Stamp)	Paints with a defined pattern	Applying textures like fabric or walls
Eraser Tool	E	Erases pixels (raster-based)	Deleting parts of a layer
Background Eraser Tool	E (hold)	Removes background while preserving foreground edges	Cutting out subjects
Magic Eraser Tool	E (hold)	Deletes solid-colored areas automatically	One-click background removal
Blur, Sharpen, Smudge	R	Softens, enhances, or distorts pixels manually	Blending edges, enhancing focus
Dodge, Burn, Sponge	O	Lightens, darkens, or changes saturation	Enhancing highlights, shadows, tones

Detailed Overview

Spot Healing Brush Tool

- Automatically samples surrounding pixels and blends the area.
- Ideal for pimples, dust, scratches.

- Just click or paint over the blemish.

Healing Brush Tool

- Like Spot Healing but you choose the source.
- Alt + click to define source, then paint to blend over the target.
- Blends texture, color, and lighting.

Patch Tool

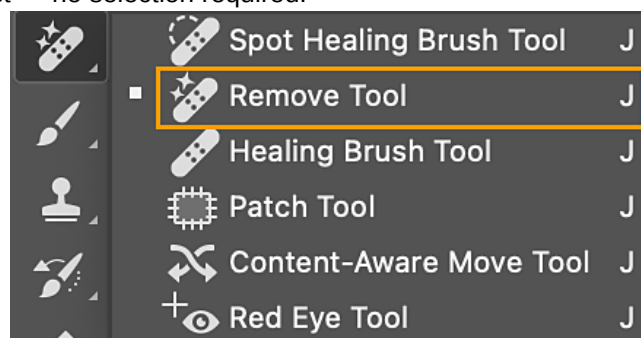
- Select the flawed area, drag to a clean area to patch.
- Good for larger damaged zones or textured backgrounds.
- Works with Content-Aware mode too.

Content-Aware Move Tool

- Select an object, drag it to a new position — Photoshop fills in the background.
- Great for repositioning elements like flowers, buildings, people.

Red Eye Tool

- Click directly on red-eye to remove it.
- Simple and fast — no selection required.



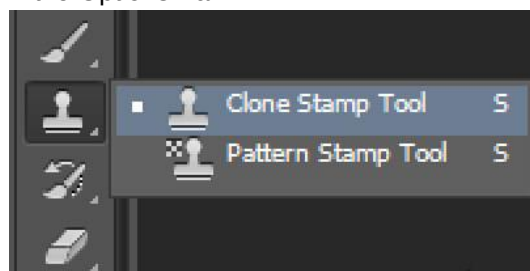
Clone & Pattern Tools

Clone Stamp Tool

- Select a source area with Alt + Click, then paint over target.
- Copies exact pixels.
- Great for removing logos, duplicating textures, or repairing complex areas.

Pattern Stamp Tool

- Paints with pre-defined patterns.
- Choose patterns from the Options Bar.



Tool Details

Clone Stamp Tool (S)

- Alt + Click to sample a source point, then click or drag to paint the sampled pixels elsewhere.
- Use this tool for precise cloning and retouching.

Available options:

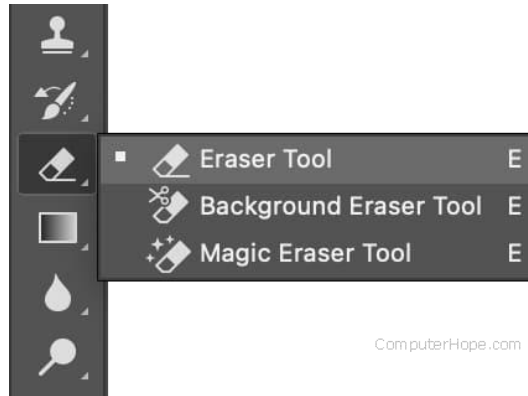
- Aligned: keeps the relative position between source and target.
- Sample: choose Current Layer or All Layers.
- Opacity & Flow: control how strong the effect is.
- Example Uses: Remove blemishes, clone scenery, duplicate textures.

Pattern Stamp Tool

- Paints with a repeating pattern instead of sampled pixels.
- Select a pattern from the Pattern Picker in the Options Bar.
- Use this to add texture (e.g., fabric patterns, decorative art).

Eraser Tools

- Works like a brush but removes pixels.
- Erasing on a **normal layer** makes areas transparent.
- Erasing on the **Background Layer** replaces with background color.



Tool	Use
Eraser Tool	Standard pixel erasing, like a brush
Background Eraser Tool	Erases background based on color sampling
Magic Eraser Tool	One-click removal of solid colors or backgrounds color

Background Eraser Tool

- Samples the color beneath your cursor and deletes only that color as you drag.

Options:

- Limits: Contiguous or Discontiguous
- Sampling: Continuous or Once
- Tolerance: Controls how much similar color is erased
- Removing backgrounds with clear color separation (e.g., portraits with solid backgrounds).

Magic Eraser Tool

- Works like the Magic Wand Tool + Eraser.
- Click to erase similar colored pixels instantly.
- Adjust tolerance to control sensitivity.

Painting Tools

Painting tools allow you to **add color, design, textures, or effects** directly to your canvas. These are essential for digital artists, graphic designers, and editors.

Main Painting Tools

Tool	Shortcut	Function	Best Use
Brush Tool	B	Paints soft or hard strokes with customizable brush tips	Drawing, painting, retouching
Pencil Tool	B (hold)	Paints hard-edged lines with pixel precision	Pixel art, hard-line sketching
Color Replacement Tool	B (hold)	Replaces selected color with foreground color	Changing color of objects
Mixer Brush Tool	B (hold)	Simulates realistic painting using color blending	Digital painting with realism

Remember

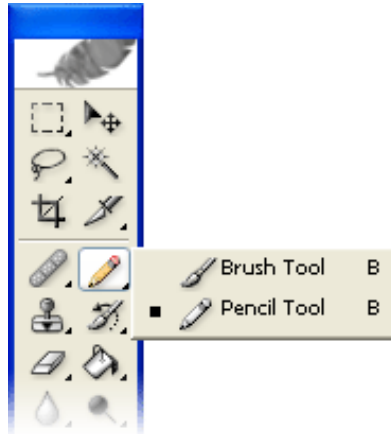
Always duplicate your layer before using erasing tools to protect the original. For better control, use Layer Masks instead of the Eraser Tool. Use Clone Stamp Tool with a soft brush for seamless blending. Combine Clone Stamp with Healing Brush for advanced touch-ups.

Tool	Shortcut	Function	Best Use
Paint Bucket Tool	G	Fills an area with foreground color or pattern	Coloring solid areas
Gradient Tool	G (hold)	Creates gradual blend between multiple colors	Backgrounds, lighting effects

Detailed Overview of Painting Tools

Brush Tool (B)

- Highly customizable: choose different brush presets, sizes, shapes, and dynamics.
- Use Pressure Sensitivity with a tablet for natural results.
- Opacity and Flow settings control the strength of your stroke.
- Found in the Options Bar: size, mode, opacity, flow, smoothing.



Applications:

- Painting skin, textures, light effects, sketching.

Pencil Tool (under Brush Tool)

- Similar to Brush, but creates sharp, pixel-based lines.

Great for pixel art or creating retro graphics.

- Doesn't anti-alias, meaning edges are crisp and jagged.

Color Replacement Tool

- Click and drag over an image to replace a specific color with your foreground color.
- Keeps the shading and texture intact while swapping colors.
- Adjust tolerance in the Options Bar to control how much gets replaced.

Mixer Brush Tool

- Simulates realistic paint mixing — like oils and watercolors.
- Uses wetness, load, mix, and flow settings to control how paint behaves.
- You can sample colors from the canvas and blend them in real time.

Paint Bucket Tool (G)

- Fills an area with the foreground color or a pattern.
- Works based on color similarity (use tolerance level).
- **Options:** Contiguous (adjacent areas only), All Layers (samples across layers).

Gradient Tool (G)

- Creates smooth transitions between two or more colors.
- Presets include: Linear, Radial, Angle, Reflected, Diamond gradients.
- You can also edit gradient stops, colors, and transparency in the Gradient Editor

Remember

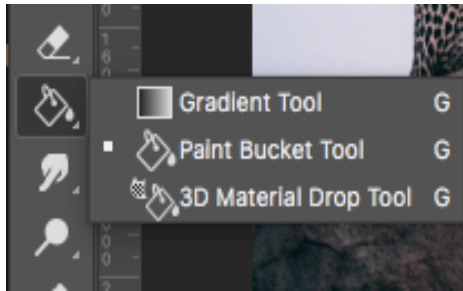
Use with a stylus for best results

Remember

Combine with Layer Masks for advanced effects.

Remember

Use layer masks instead of erasing to paint non-destructively. You can download custom brush packs (grunge, watercolor, calligraphy, etc.). Use Blending Modes in the Layers panel to combine painted elements with background. Always paint on a new layer to allow for changes later



Color Picker, Swatches & Foreground/Background Colors

- Double-click foreground/background swatch to open the Color Picker.
- Press X to toggle foreground and background colors.
- Press D to reset to default black and white.
- Swatches panel allows you to save and use custom color palettes.

Use it for: Quick cleanup of simple backgrounds.

Remember

Use a soft brush and low strength (10–20%) for gradual smoothing.

Blur, Sharpen & Smudge Tools

These tools are grouped together in the Toolbar and are used for localized editing of pixel clarity and texture.

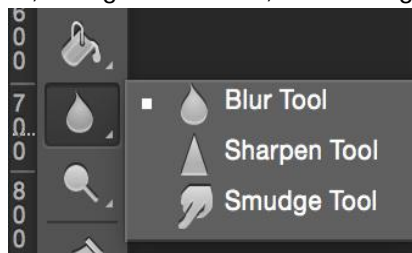
Main Tools Overview

Tool	Short cut	Function	Best For
Blur Tool	R	Softens hard edges or reduces detail	Portrait retouching, background blur
Sharpen Tool	R (hold)	Enhances edge definition and makes details crisper	Enhancing textures, improving clarity
Smudge Tool	R (hold)	Smears pixels in a drag motion, simulating paint or finger smudge	Blending, liquify effects, textures

Detailed Explanation & Settings

Blur Tool

- Works like a brush — click and drag to reduce focus/sharpness.
- Perfect for smoothing skin, background bokeh, or reducing noise.



Options Bar Settings:

- Brush Size & Hardness
- Strength: Controls the intensity of the blur (0% to 100%)
- Sample All Layers: Applies effect using merged data from all visible layers

Sharpen Tool

- Increases edge contrast to make the image appear sharper.
- Best used sparingly to enhance small areas

Options Bar Settings:

- Brush Size & Hardness
- Strength: Controls how much sharpness is applied
- Protect Detail (Checkbox): Helps reduce noise while sharpening

Remember

Always use this tool gently over-sharpening can introduce noise.

Smudge Tool

- Simulates the effect of dragging a finger through wet paint.

- Moves pixels around like a smear or blend.

Options Bar Settings:

- Brush Size & Hardness
- Strength: Controls how far pixels are pushed
- Sample All Layers
- Finger Painting: Adds foreground color at the beginning of each stroke (like digital paint)

Creative Use:

- Blending skin tones, hair strands, or abstract textures
- Creating surreal or liquid effects in artworks

Pro Techniques

- Use the Smudge Tool to blend painted strokes or create custom digital painting effects.
- Combine the Blur Tool with Layer Masks for non-destructive softening.
- Use Sharpen Tool on the eyes and lips in a portrait to draw attention.
- For high-end retouching, use Frequency Separation + Blur/Smudge for clean skin edits.

Dodge, Burn & Sponge Tools

Dodge Tool

- Lightens shadows, midtones, or highlights Use to draw attention or add contrast in a photo.

Options Bar Settings:

- Brush Size & Hardness
- **Range:** Choose what part of the tone to affect (Shadows / Midtones / Highlights)
- **Exposure:** Controls intensity (usually between 5–20% is best)
- **Protect Tones:** Maintains natural tonal range and avoids color shifts

Best Use:

- Brighten the whites of the eyes or teeth
- Lighten facial highlights for dimensional edits

Burn Tool

- **Opposite of Dodge:** it darkens selected areas of your image.
- Excellent for adding drama, depth, or emphasizing features.

Options Bar Settings:

Same as Dodge Tool:

- **Range:** Shadows / Midtones / Highlights
- **Exposure:** Start low to avoid harsh results
- **Protect Tones:** Preserves color accuracy

Sponge Tool

- Adjusts color saturation (not brightness).

Set to either:

- Desaturate (remove color)
- Saturate (enhance color)

Options Bar Settings:

- Brush Size & Hardness
- Mode: Saturate or Desaturate
- Flow: Adjusts intensity (lower = subtle, higher = strong effect)
- Protect Texture: Retains surface detail while adjusting color

Techniques

- Use low exposure or flow (5–10%) and multiple strokes for subtle effects
- Use on duplicate layers to keep your editing non-destructive
- Combine Dodge and Burn for high-end portrait retouching or digital makeup
- Use Sponge (Desaturate) to neutralize overly warm or red skin tones
- Use Layer Masks to selectively apply the effects

Remember

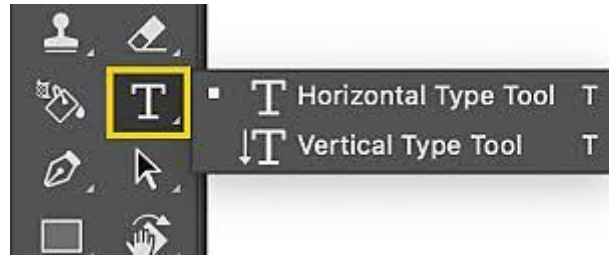
Deepen shadows around cheekbones or jawline
Add focus and contour in product or portrait shots

Remember

Remove color from unwanted areas (like blemishes)
Boost colors in clothing, eyes, or landscapes

Type Tools

These tools let you add, style, and customize text — essential for creating posters, flyers, social media graphics, or any layout involving typography.



Main Type Tools Overview

Tool Name	Shortcut	Function
Horizontal Type Tool	T	Adds horizontal (left to right) text
Vertical Type Tool	T (Hold)	Adds vertical (top to bottom) text
Horizontal Type Mask Tool	T (Hold)	Creates horizontal text-shaped selection
Vertical Type Mask Tool	T (Hold)	Creates vertical text-shaped selection

Horizontal & Vertical Type Tools

Horizontal Type Tool (most commonly used)

- Adds text in a straight horizontal line.
- Great for titles, captions, headers, and body text.

Vertical Type Tool

- Adds vertical text.
- Useful for Asian typography or creative layouts.

How to Use:

- Select the Type Tool (T).
- Click anywhere on the canvas.
- Start typing — Photoshop will create a new Type Layer.

Use the Options Bar to:

- Change font
- Adjust size, color, alignment
- Set anti-aliasing (smooths edges)

Type Mask Tools

These tools create selections in the shape of text rather than editable type layers.

Horizontal Type Mask Tool

- Creates a selection that matches your typed text in horizontal form.

Vertical Type Mask Tool

- Same, but with vertical orientation.

Usage:

- Select the tool.
- Type your text.
- When confirmed, your text becomes a selection, not editable text.
- Use this to create text-shaped image cutouts or masks.

Type Tool Options Bar

Setting	Function
Font Family	Choose from installed fonts
Font Style	Regular, Bold, Italic, etc.
Font Size	Set the size in pt (points)
Alignment	Left, Center, Right

Setting	Function
Color	Changes text fill color
Warp Text	Apply distortions like arc, wave, etc.
Anti-aliasing	Smooths edge of the text (Sharp, Crisp, Strong, Smooth)
Toggle Character Panel	Opens the advanced typography settings

Character Panel (Window > Character)

Offers precise control over type appearance:

- Leading: Vertical space between lines
- Tracking: Space between all characters
- Kerning: Space between two specific letters
- Baseline Shift: Move text above or below line
- Horizontal/Vertical Scale: Stretch text
- All Caps / Small Caps / Superscript / Subscript

Paragraph Panel (Window > Paragraph)

Controls **text blocks and alignment**, especially useful for paragraphs and body text.

- Align Left, Center, Right, Justify
- Indentation (left, right, first line)
- Space before/after paragraphs
- Hyphenation options

Text Effects with Layer Styles (fx)

Apply effects like:

- Drop Shadow
- Outer Glow
- Stroke
- Bevel & Emboss

How:

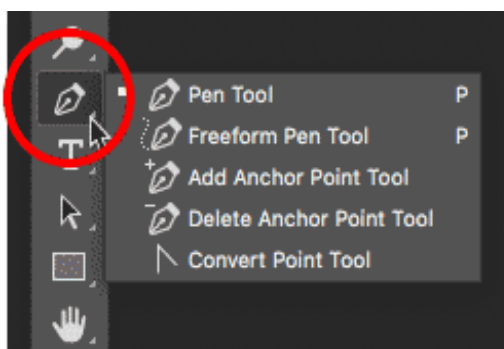
- Right-click the Type Layer > Blending Options
- Choose the effects you want to apply

Pen & Path Tools

The Pen Tool is used to draw paths, which can be turned into selections, masks, or shapes. It offers precision and control, making it ideal for graphic design, tracing, and clean cutouts.

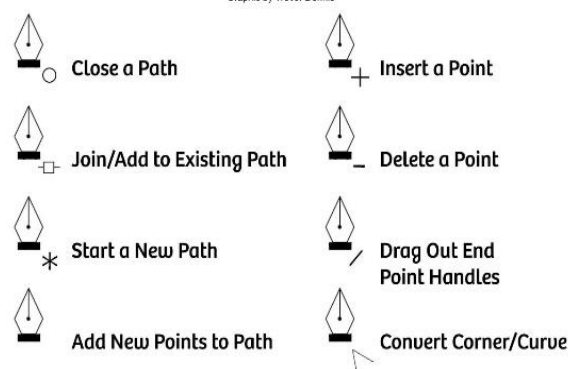
Where to Find the Pen Tool

- Location: Toolbar (left side)
- Shortcut: Press P on your keyboard



PEN TOOL ICONS

Graphic by Trevor Dennis



Types of Pen & Path Tools

Tool	Icon	Purpose
Pen Tool		Draw straight or curved paths with anchor points
Freeform Pen Tool		Draw paths like a pencil—freehand
Curvature Pen Tool		Simplified way to draw curves and shapes
Add Anchor Point Tool		Add points to an existing path
Delete Anchor Point Tool		Remove points from a path
Convert Point Tool		Convert smooth points to corner points and vice versa
Path Selection Tool		Move the entire path
Direct Selection Tool		Select and move anchor points or path segments individually

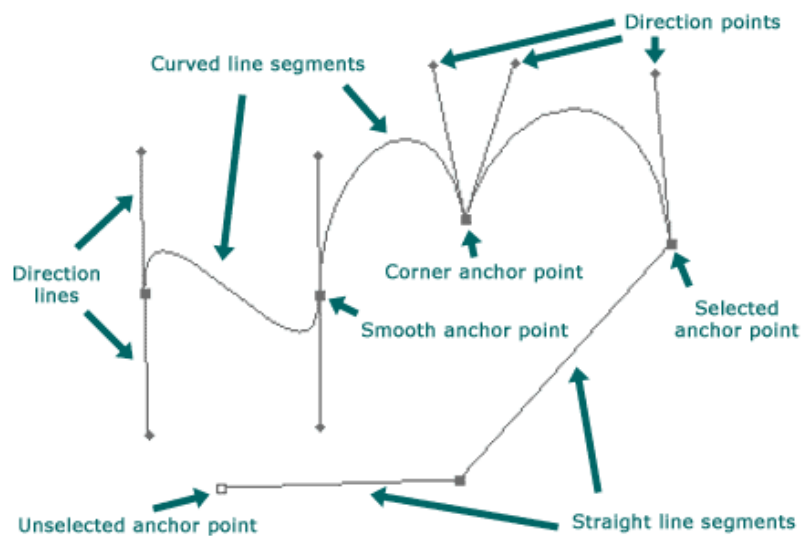
How to Use the Pen Tool

Drawing a Path:

- Select the Pen Tool (P).
- Click to create a straight point.
- Click again for another straight segment.

To create curves:

- Click and drag to create direction handles.
- Click and drag again at the next point to complete a curve.

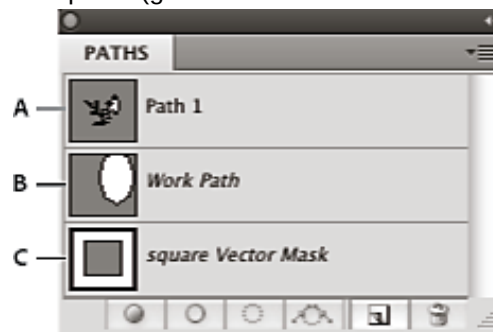


Close a path:

- Click back on the first anchor point to complete a shape.

Understanding Paths

- Paths are vector outlines—they do not have pixels.
- You can fill them with color, stroke them with a line, or convert them into selections.
- Paths appear in the Paths panel (go to Window > Paths if not visible).



Using Paths

Action	How to Do It
Fill Path	Right-click > Fill Path
Stroke Path	Right-click > Stroke Path (choose brush, pencil, etc.)
Make Selection	Right-click > Make Selection
Create Vector Mask	In Layers panel > right-click > Create Vector Mask

Curvature Pen Tool (Simplified Version)

- Each click creates a smooth curve by default.
- Double-click a point to convert it into a sharp corner.
- Easier for beginners to create complex shapes.

Practical Uses of Pen Tool & Paths

Use Case	Description
Cutting Out Objects	Precisely trace around an object and make a selection
Creating Custom Shapes	Design logos, symbols, and icons
Smooth Selections for Hair or Edges	Great for photo editing and compositing
Drawing Vector Masks	Non-destructive masking for clean design layers

Convert Path to Shape

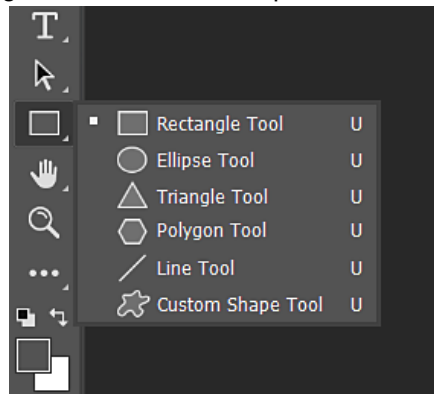
Draw your path.

Right-click > Define Custom Shape or choose Make Shape.

You now have a scalable vector graphic

Shape Tools

- Rectangle, Ellipse, Polygon, Line, Custom Shape



Shape Tools in Photoshop

The Shape Tools in Photoshop are essential for creating precise geometric shapes like rectangles, circles, and custom polygons. These tools allow you to add vector shapes, which can be resized and edited without losing quality.

Main Shape Tools Overview

Detailed Explanation & Usage of Each Tool

Rectangle Tool

- Creates perfect rectangles and squares.
- Shift: Hold to create a square.

How to Use:

- Select the Rectangle Tool (U).
- Click and drag on the canvas to draw.
- Optionally, use the Options Bar to modify stroke (border) and fill colors.

Rounded Rectangle Tool

- Creates rectangles with rounded corners.

How to Use:

- Select the Rounded Rectangle Tool (U) from the toolbar.
- Click on the canvas and drag to create the shape.
- Adjust the corner radius (roundedness) in the Options Bar.

Ellipse Tool

- Creates ellipses and circles.
- Shift: Hold to create a perfect circle.

How to Use:

- Select the Ellipse Tool (U).
- Hold Shift to make a circle, or release Shift for an ellipse.
- Customize the fill and stroke settings.

Polygon Tool

- Creates polygons with any number of sides.

How to Use:

- Select the Polygon Tool (U).
- In the Options Bar, set the number of sides for your polygon.
- Click and drag to draw the shape.
- Shift: Hold to constrain angles (e.g., for triangles).

Line Tool

- Draws straight lines of any length.

How to Use:

- Select the Line Tool (U).
- In the Options Bar, set the weight (thickness) of the line.
- Click and drag to draw the line.
- Shift: Hold to draw lines at 45° angles (straight vertical, horizontal, or diagonal).

Custom Shape Tool

- Allows you to create predefined shapes or custom vector shapes.

How to Use:

- Select the Custom Shape Tool (U).
- Click on the shape icon in the Options Bar to choose from a variety of predefined shapes (like stars, hearts, arrows, etc.).
- Draw the shape on the canvas, then modify its size and color.

Shape Tool Options Bar Settings

Option	Function
Fill	The interior color of the shape (solid color or gradient).
Stroke	The outline of the shape, including color and thickness.
Path Operations	Determines how new shapes interact with existing ones.
Align to Path	Aligns the shape to the path you've drawn.
Shape	Allows you to choose between vector shapes, pixels, or paths.
Shape Mode	Path, Shape, or Pixels (defines how shapes are created).

Path Operations (Combining Shapes)

Path Operations in the Options Bar help you control how newly drawn shapes interact with existing ones:

Operation	Function
Add to Shape Area	Combines multiple shapes into one shape layer.
Subtract Front Shape	Removes the top shape from the shape beneath it.
Intersect Shape Areas	Keeps only the overlapping area of two shapes.
Exclude Overlapping Shapes	Removes the overlapping area of two shapes.

Working with Shape Layers

- Each shape is placed on its own Shape Layer, which can be easily moved, resized, or modified.

Editing Shape Layers:

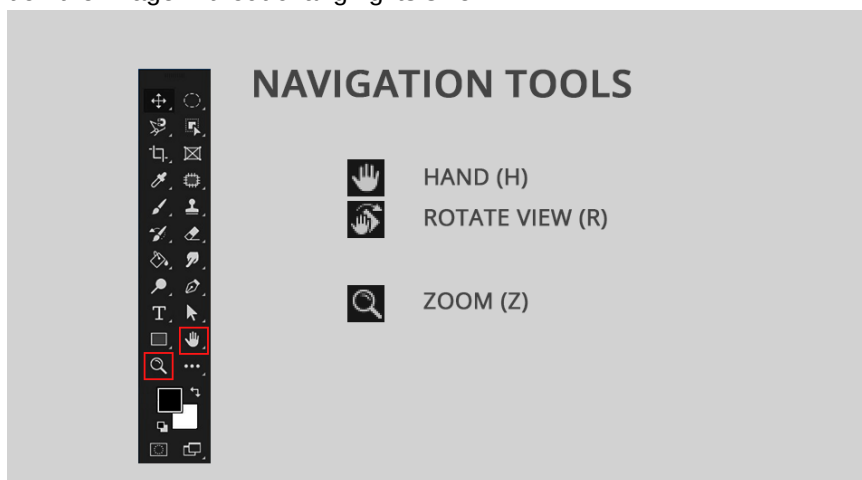
- Direct Selection Tool (A): Use this to move individual anchor points or path segments.
- Pen Tool (P): Modify the path of the shape.

Creating Custom Shapes

- You can create your own shapes by combining multiple shapes or by using the Pen Tool to draw custom vector paths.
- Once created, save them as Custom Shapes for future use.
- Use Layer Styles (fx) to add effects like shadows, strokes, or gradients to shapes. Combine multiple shapes with Path Operations to create more complex objects. Convert shapes into Smart Objects for non-destructive transformations and scaling. If you're working with several shapes, consider organizing them into Groups (Ctrl+G) for better management.

Navigation Tools Hand Tool (H) Function:

- The Hand Tool is used to move around the canvas when zoomed in. It allows you to drag and reposition the image without changing its size.



How to Use:

- Activate: Press H on the keyboard, or hold the Spacebar while using another tool.
- Click and drag: Hold and drag the canvas to move it around.
- Modifier: Hold Spacebar to temporarily activate the Hand Tool from other tools.

Zoom Tool (Z)

Function:

- The Zoom Tool allows you to zoom in and out of your image.

How to Use:

- Activate: Press Z on the keyboard.
- Zoom In: Click on the image to zoom in.
- Zoom Out: Hold Alt (Windows) or Option (Mac) and click to zoom out.
- Drag: Click and drag to create a zoom box for a specific area you want to zoom into.
- Keyboard Shortcut: Ctrl+ (Windows) or Cmd+ (Mac) to zoom in; Ctrl- (Windows) or Cmd- (Mac) to zoom out.

Function:

- The Navigator panel gives you an overview of your entire image and lets you zoom and pan around your project.

How to Use:

- Open the Navigator: Go to Window > Navigator to open it.
- Zooming: Use the Zoom Slider at the bottom of the Navigator to zoom in or out.
- Move Around: Drag the red box to move around the image quickly.

- Fit to Screen: Click on the “Fit on Screen” button to automatically adjust the image to fit the workspace.

Scroll Bars

Function:

- Scroll bars allow you to move the viewable area of your canvas left, right, up, or down.

How to Use:

- Horizontal Scroll: Use the horizontal scroll bar to move left or right across the canvas.
- Vertical Scroll: Use the vertical scroll bar to move up or down.

Fit to Screen and Actual Pixels

Function:

- These options adjust how your image fits in the workspace.

How to Use:

- Fit to Screen: To fit the image into the workspace (100% view), press Ctrl+0
- Actual Pixels: To view the image at actual pixel size, press Ctrl+1 This shows the image as it will appear on-screen without any zooming.

Navigator View

- The Navigator View gives a smaller preview of the full image, helping you locate specific areas for detailed editing.

How to Use:

- View the Whole Image: The smaller window shows a thumbnail of your entire image.
- Red Box: The red box inside the navigator represents your current view.
- Click and Drag: You can drag the red box around to change the area you are currently working on.

Zoom Tool on the Options Bar

- The Zoom Tool in the Options Bar allows you to zoom in and out while editing.

How to Use:

- Click on the Zoom Tool in the Options Bar.
- Zoom In: Click the + button to zoom in.
- Zoom Out: Click the - button to zoom out.

Hand Tool (Temporary with Spacebar)

- Allows you to quickly access the Hand Tool temporarily to move the image while you're working with other tools.

How to Use:

- Press and hold the Spacebar: While using any tool, press and hold the Spacebar to temporarily switch to the Hand Tool.
- Release: Once you release the Spacebar, you'll return to the previous tool.

Scroll Wheel (Mouse)

Function:

- The scroll wheel on your mouse or trackpad can be used for zooming in and out.

How to Use:

- Zoom In/Out: Scroll the mouse wheel up or down to zoom in or out.
- Modifier Key: Hold Alt (Windows) or Option (Mac) and scroll to zoom in or out more smoothly.

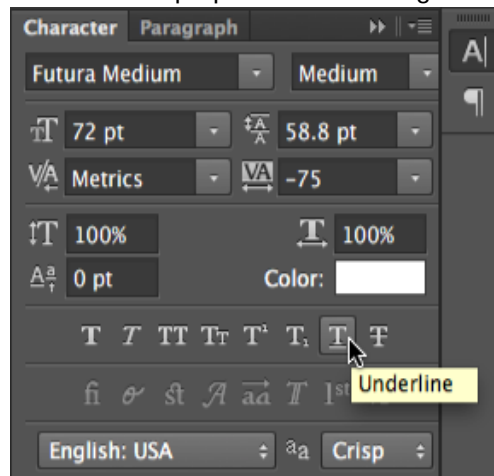
Pro Tips for Navigation

- Zoom In and Out with the Keyboard: Use Ctrl+ and Ctrl- (to quickly zoom in and out.
- Smooth Zooming: Hold Ctrl while using the mouse wheel to zoom in/out.
- Move Without Zooming: Hold Spacebar while working with other tools to quickly move the image around without altering the zoom level.
- Text Tool Overview: The Text Tool is used to add text to your designs. It's an essential tool in graphic design, image editing, and digital art. In software like Adobe Photoshop, it allows you

to create both point text (text in a specific area) and paragraph text (text that spans multiple lines).

Text Tool Properties

- Here's a breakdown of the different properties and settings available with the Text Tool:



Font Family

- Function: Allows you to select the font style you want to use. You can choose from standard fonts like Arial, Times New Roman, or more creative ones.
- How It Works: Choose the font family from the dropdown list in the toolbar or properties panel.

Font Size

- Function: Determines the size of the text.
- How It Works: You can either manually adjust the font size by entering a value or use the up/down arrows to change the size.

Font Style

- Function: Allows you to modify the style of the text.
- How It Works: You can apply bold, italic, underline, or strikethrough. Some fonts may also have additional styles like condensed or expanded versions.

Text Alignment

- Function: Controls how your text is positioned in the box.
- How It Works: You can align text to the left, center, or right, or even justify it (for a uniform edge on both sides).

Leading (Line Spacing)

- Function: Adjusts the space between lines of text in a paragraph.
- How It Works: Increase or decrease leading to make the text more or less spaced out. This is useful for making the text look more readable.

Tracking (Character Spacing)

- Function: Controls the spacing between all characters in the text.
- How It Works: Increasing tracking spaces, the text out, while decreasing it brings characters closer together.

Kerning

- Function: Adjusts the space between two specific characters.
- How It Works: You can manually adjust the kerning to improve the visual appearance of specific letter combinations (e.g., adjusting the space between "A" and "V").

Vertical Scaling

- Function: Stretches or compresses text vertically.
- How It Works: Increase or decrease the vertical scaling percentage to make the text taller or shorter without changing the font size.

Horizontal Scaling

- Function: Stretches or compresses text horizontally.
- How It Works: Adjust the horizontal scale percentage to elongate or condense the text.

Text Color

- Function: Allows you to change the color of the text.
- How It Works: Choose a color from the color picker or input the color code in RGB, CMYK, or Hex.

Text Transformation

- Function: Offers the ability to apply specific transformations like uppercase, lowercase, or title case.
- How It Works: You can convert the text into all uppercase or lowercase letters easily, or you can apply special transformations to each letter.

Text Warp (Text Effects)

- Function: Adds different warping effects to the text.
- How It Works: You can distort the text into various shapes like an arc, wave, or bulge, depending on the style you want to achieve.

Stroke and Fill

- Function: Adds an outline (stroke) to the text and a fill color to the text itself.
- How It Works: You can apply a border color and thickness, as well as a background color for the text, making it stand out more.

Opacity

- Function: Adjusts the transparency of the text.
- How It Works: Reducing opacity will make the text see-through, useful for layering effects or adding subtle text.

Paragraph Text Properties

- Function: Deals with paragraph-level adjustments like alignment, indentation, and line spacing.
- How It Works: You can manage how text wraps within the text box and adjust the spacing between paragraphs or align it according to your layout.

Text on a Path

- Function: This allows you to make text follow a path (like a circle, line, or curve).
- How It Works: Draw a path with the Pen Tool or another shape tool, then select the Text Tool and click on the path to make the text follow its shape.

Remember

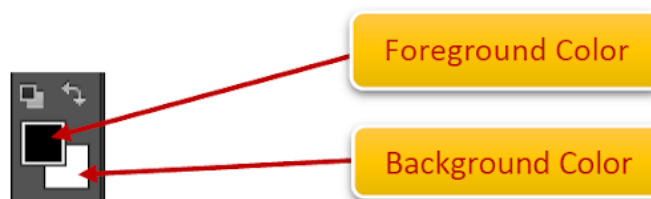
Select the Text Tool from the toolbar (usually represented by a “T” icon).

How to Apply the Text Tool

- Click on the canvas to add Point Text or drag to create a Text Box for Paragraph Text.
- Type your text and then use the Properties Bar or Character Panel to adjust the settings listed above.

Foreground / Background Color Boxes

- Shows current colors for tools.
- Click to open color picker.
- Press X to switch between foreground/background.
- Press D to reset to default (Black/White).



Quick Mask Mode (Q)

- Enables quick editing of selections using a red overlay.
- Exit Quick Mask to convert back to selection.

Screen Mode (F)

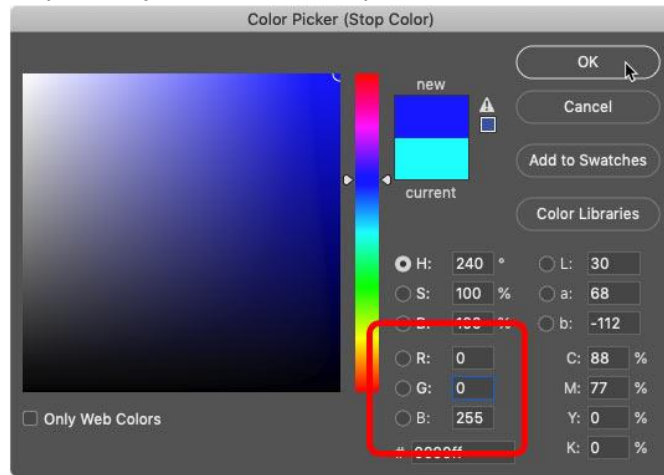
- Toggles between Standard, Full Screen with Menu Bar, and Full Screen.

Color Modes in Photoshop

- Color modes determine how colors are interpreted and displayed in your image. Each mode defines a color model (like RGB or CMYK) and dictates the range of colors available (called a color gamut).

How to Change Color Mode in Photoshop

- Go to the menu bar and select:
Image > Mode > (choose your desired mode)



Common Color Modes in Photoshop

Color Mode	Use Case	Color Channels	Best For
RGB Color	Red, Green, Blue light	3 Channels	Web, screens, digital images
CMYK Color	Cyan, Magenta, Yellow, Black ink	4 Channels	Print materials like brochures, magazines
Grayscale	Shades of black/white	1 Channel	Black & white images, effects
Bitmap	Pure black or white	1-bit	Line art, logos, sharp contrast art
Lab Color	Lightness, a (green-red), b (blue-yellow)	3 Channels	High-end color correction
Indexed Color	Max 256 colors	1 Channel	GIFs, low file size images
Duotone	1-4 inks (Monotone, Duotone, Tritone, Quadtone)	1 Channel	Artistic grayscale printing

Explanation of Major Color Modes

RGB Color Mode

Channels: Red, Green, Blue (each 8 bits)

Range: 16.7 million colors

- **Purpose:** Displays images on screens (monitors, TVs, phones)
- **When to Use:** Web design, social media graphics, app UI

Remember

Always work in RGB first, then convert to CMYK for printing

CMYK Color Mode

- Channels: Cyan, Magenta, Yellow, Black
- Purpose: Optimized for printing with ink

- When to Use: Brochures, posters, business cards, packaging
- CMYK has a smaller color range than RGB, so some bright RGB colors might dull when converted.

Grayscale

- Channels: Black (0–255)
- Purpose: Converts image into shades of gray

When to Use:

- Artistic black-and-white images, newspapers, sketch effects

Bitmap

- Channels: 1-bit (black or white only)
- Purpose: Sharp black-and-white graphics
- When to Use: Line art, stamp designs, engravings

Lab Color

- L = Lightness, a = green-red, b = blue-yellow
- Purpose: Device-independent color
- When to Use: Precise color correction, high-end photo retouching

Indexed Color

- Limited to 256 colors
- Purpose: Reduce file size
- When to Use: GIF images, web graphics where small file size matters

Duotone

Monotone/Duotone/ Tritone/Quadtone using spot inks

Purpose: Print grayscale images using one or more custom inks

When to Use: Artistic printing effects

Workflow

- Always start in RGB mode (it supports full editing and filters).
- Convert to CMYK only before final printing.
- Use Proof Colors (View > Proof Colors) to preview CMYK while working in RGB.

In Adobe Photoshop, the term “Switches” isn’t a dedicated panel or tool, but it often refers to:

Switches

Switch Type	Where It’s Found	Purpose / What It Does
Foreground/Background Color Switch	Bottom of the Toolbar (D, X)	Switches between the foreground and background color swatches
Tool Mode Switches	Options Bar (top of workspace)	Changes the behavior/mode of tools like Brush, Gradient, etc.
Layer Visibility Switch (Eye Icon )	Layers Panel	Turns layer visibility on or off
Quick Mask Mode Switch (Q key)	Bottom of Toolbar	Toggles Quick Mask on/off for fine selections
Color Mode Switch (Image > Mode)	Menu Bar	Switches between RGB, CMYK, Grayscale, etc.
Workspace Switcher	Top-right of Photoshop (Window > Workspace)	Switches between Essentials, 3D, Motion, Painting, etc.
Toggle Layer Style Effects	Layers Panel (fx icon)	Show/hide layer style effects
Screen Mode Switch	Press F or go to View > Screen Mode	Switches between Standard, Full Screen, or Full Screen with Menu Bar

Remember

Lab Color retains more color data than RGB or CMYK, but not ideal for final export.

Example: Foreground/Background Switch

- Found in the **Toolbar** (bottom left, looks like two overlapping color boxes).
- Shortcut:
- Press **D** to reset to default black/white.

Press X to switch between the

- Let's dive into **Gradient Swatches in Photoshop** — what they are, where to find them, and how to use them with full control

What Are Gradient Swatches in Photoshop?

Gradient Swatches are pre-made or custom sets of color blends that transition smoothly from one color to another. These swatches save time and ensure consistency in your designs.

Where to Find Gradient Swatches

Method 1: From the Gradients Panel

- Go to Window > Gradients (to open the Gradients panel).

You'll see default gradient groups like:

- Basics
- Blues
- Purples
- Oranges
- Special Effects, etc.
- Each tile represents a gradient swatch.
- Click any swatch to apply it.

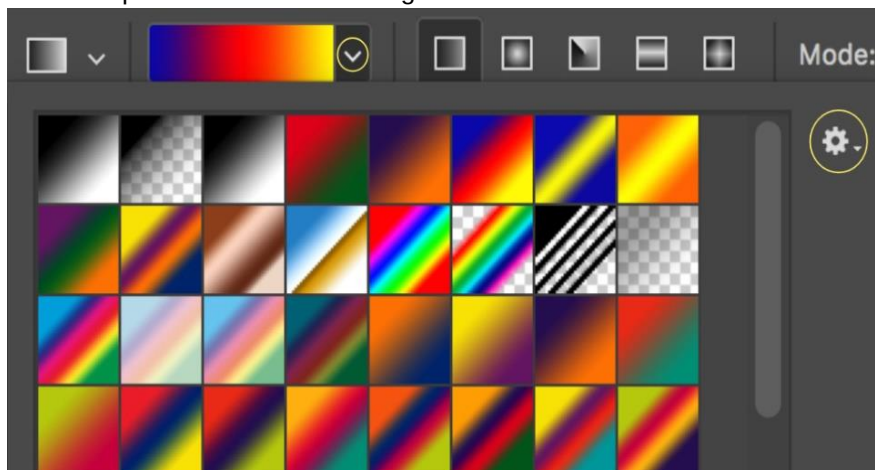
Method 2: From the Gradient Tool (G)

- Select the Gradient Tool from the Toolbar or press G.
- In the Options Bar at the top, click on the gradient preview bar.
- This opens the Gradient Editor, where:
- You can select, edit, or create gradient swatches.
- You can save new custom gradients as swatches.

Types of Gradients

Type	Shape	When to Use
Linear	Straight transition	Backgrounds, light effects
Radial	Circle from center	Buttons, glow, vignettes
Angle	Rotates around a point	Abstract, artistic effects
Reflected	Mirror linear gradient	Reflections, metallic shine
Diamond	Diamond shape from center	Design accents

Select the type in the Options Bar after selecting the Gradient Tool.



How to Apply Gradient Swatches

Method 1: Using the Gradient Tool

- Choose the Gradient Tool (G).
- In the Options Bar, pick your gradient swatch.

- Click and drag on your canvas to apply it.

Tip: Hold Shift while dragging to constrain the angle (perfect straight gradients).

Method 2: Fill a Shape or Layer

- Create a shape layer or raster layer.
- Select the layer.
- Go to Layer > Layer Style > Gradient Overlay
- Choose the desired gradient swatch

Creating Custom Gradient Swatches

- Click on the gradient preview in the Options Bar.

In the Gradient Editor, you can:

- Add color stops
- Change opacity
- Set midpoint location
- Click New to save it as a custom swatch.
- Click Save to export your swatches (GRD file).

Importing More Gradients

- In the Gradients panel, click the hamburger menu (≡) in the top right.
- Select Legacy Gradients or Import Gradients to load. grd files.

Exporting & Saving Gradient Swatches

- From the Gradient Editor > click Save to create a. grd file.
- You can share or reuse this in other Photoshop projects.

Activity: 1

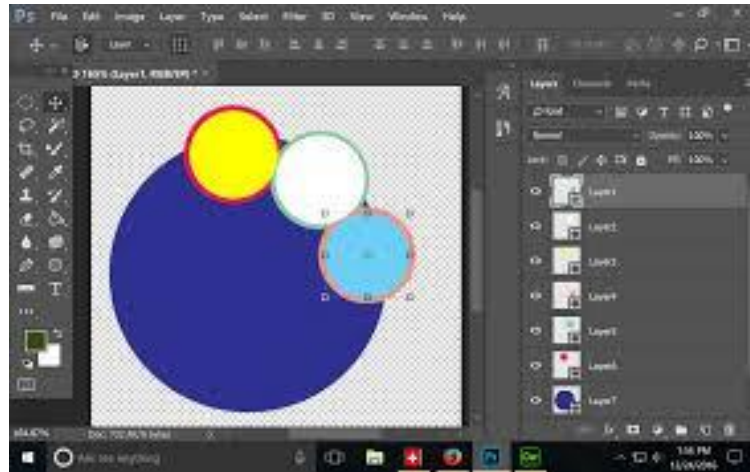
- Practice to draw basic objects as per requirement

Create 5 Circles:

- Creating multiple circles of different sizes and colors. Each time, experiment with changing the Stroke thickness or adding gradients to the fill color.
- Layer Management: For each circle, create a new layer by clicking Layer > New > Layer. This way, you can manage each circle separately

Steps:

- Start by opening Adobe Photoshop and creating a new document.
- Go to File > New and set the document size (e.g., 800x800 pixels for a square canvas).
- Select the Ellipse Tool:
- In the Tools Panel, select the Ellipse Tool (U).
- If you don't see it, right-click the Rectangle Tool and choose the Ellipse Tool from the menu.
- Draw the Circle:
- Hold down the Shift key (to constrain the proportions) while you click and drag on the canvas to create a circle. The Shift key ensures that the width and height are the same, creating a perfect circle.
- At the top of the screen, in the Options Bar, you can adjust the Fill Color of the circle. Click the color box next to Fill to open the color picker and choose a color.
- Alternatively, you can use the Color Picker (from the right toolbar) to pick a color you like.
- If you'd like to add an outline to the circle, you can set a Stroke (the outline color).
- In the Options Bar, find the Stroke setting next to the Fill color.
- Choose a Stroke Color and adjust the thickness.
- To move the circle, use the Move Tool (V). Simply drag the circle to a different location on the canvas.
- If you need to resize it, press Ctrl + to enter Free Transform mode. Hold Shift to maintain the proportions and adjust the size.



Activity: 2

To practice using Photoshop tools to trace and design a black silhouette of a famous building in a visually appealing way. This exercise will improve your skills with the Pen Tool, Layers, and Fills.

Tools You Will Use:

- Pen Tool (P)
- Move Tool (V)
- Layer Panel
- Fill (Shift + F5)
- Gradient Tool (G) (optional)
- Blending Options / Layer Styles (optional)

Steps:

Create a New File

- Open Photoshop.
- Go to File > New.
- Set size to: Width: 1200 px, Height: 800 px, Resolution: 72 ppi, Background: White.

Place a Reference Image

- Go to File > Place Embedded.
- Choose a famous building image (e.g., Eiffel Tower, Burj Khalifa, Taj Mahal).
- Reduce opacity to 50% and lock the layer.

Trace the Building

- Select Pen Tool (P).
- Start tracing the outline of the building with anchor points.
- For curves, click and drag handles.
- Once done, Right-click > Make Selection.
- Then go to Edit > Fill > Use: Black.

Add a Background

- Create a new layer below the silhouette.
- Use the Gradient Tool (G) to add a sky effect.
- Example: Blue to Orange gradient for sunset.

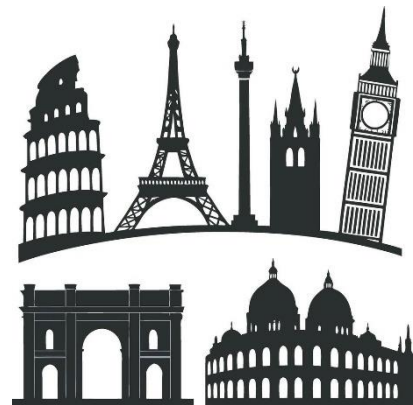
Output Example:

- A black silhouette of a landmark building on a stylized background.
- Clean lines and professional appearance.

Submission Requirements:

- PSD File (with all layers intact).
- Final JPG/PNG of the silhouette artwork.

Suggestions for Buildings:



- Eiffel Tower (Paris)
- Minar-e-Pakistan (Lahore)
- Burj Khalifa (Dubai)
- Big Ben (London)
- Taj Mahal (Agra)

Activity: 3

To practice creating a 2D architectural floor plan of a small studio apartment using Photoshop. This task enhances your understanding of layout, scale, and the use of shapes and lines for space planning.

Tools:

- Rectangle Tool (U)
- Line Tool (U)
- Text Tool (T)
- Move Tool (V)
- Layers Panel
- Ruler & Grid (View > Rulers / View > Show > Grid)
- Transform Tool (Ctrl + T)

Steps:

Create a New Canvas

- Go to File > New.
- Set dimensions to: Width: 1000 px, Height: 800 px, Resolution: 72 or 150 ppi, Background: White.

Enable Rulers and Grid

- Go to View > Rulers.
- Then View > Show > Grid to align furniture and walls properly.
- Use Snap to Grid (View > Snap To > Grid) for precision.

Draw the Floor Outline

- Use the Rectangle Tool (U) to draw the outer walls of the studio.
- Use Stroke instead of Fill to represent walls (e.g., 3–5 px gray stroke).

Add Interior Elements

Use Rectangle Tool or Line Tool to draw:

- Bed Area
- Sofa/Living space
- Kitchen Counter
- Bathroom space
- Storage/Wardrobe
- Dining Table

Label the Spaces

Use the Text Tool (T) to name areas:

- “Bed Area”
- “Kitchen”
- “Bathroom”
- “Living Area”
- “Entry”

Optional Styling

- Add light colors for each zone for clarity.
- Use Drop Shadow or Outer Glow (Blending Options) to highlight sections.
- Add small icons (toilet, sink, chair) for visual enhancement.

Submission Requirements:

- Final design saved as PSD and PNG/JPEG.
- Clear division of functional areas in the studio.

- Labels and elements must be aligned and properly placed.



Activity: 4

To practice isolating and designing a detailed architectural element—such as a window, door, or column—to enhance observation, precision drawing, and stylized rendering skills in Adobe Photoshop.

Tools:

- Pen Tool (P)
- Shape Tools (Rectangle, Ellipse, Polygon)
- Brush Tool (B) for artistic effect
- Zoom Tool (Z) for detailed work
- Layer Styles (fx) for shadows/highlights
- Gradient Tool (G) for depth
- Selection Tools for clean outlines
- Rulers/Guides for symmetry (View > Rulers / Guides)

Steps

Choose Your Subject

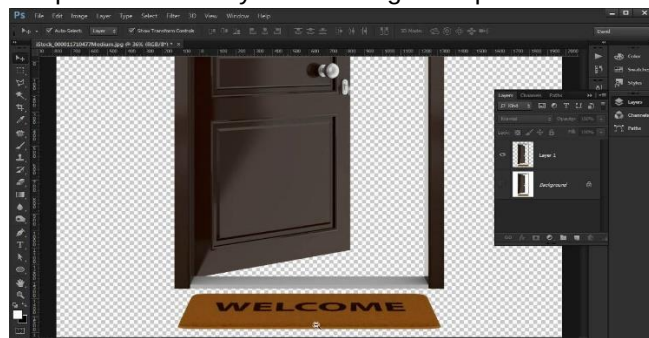
- Decide on one architectural detail to focus on, such as:
- Ornamental window
- Wooden door
- Decorative column (e.g., Ionic, Doric)

Set Up Your Canvas

- Go to File > New
- Recommended size: 1000 x 1000 px, resolution 150–300 ppi

Use a Reference Image (Optional)

- Import a reference photo on one layer for tracing or inspiration.



Draw the Base Shape

- Use Shape Tools or Pen Tool to outline the basic form of the detail.

Add Depth and Detailing

Use Layer Styles (fx) for:

- Drop shadows
- Inner glow
- Bevel & Emboss
- Use Brush Tool or Eraser Tool to create highlights, textures, or carvings.

Apply Textures or Gradients

- Use Gradient Tool (G) to give metallic or stone look.
- Import textures (wood grain, stone, glass) and apply using Clipping Mask.

Add Finishing Touches

- Create subtle lighting using soft white brushes.
- Enhance outlines with stroke effects.
- Name and organize layers clearly.

Submission Requirements:

- File format: PSD + PNG or JPEG

Focus piece must:

- Highlight one architectural feature
- Show depth, texture, and detail
- Be visually appealing and structurally accurate

Example:

If you choose Mughal Architecture:

- Colors might include: Red Sandstone, Gold, Ivory, Jade Green, Royal Blue

Activity: 5

Practice to Develop a Color Palette Inspired by a Specific Architectural Style

Steps:

- Select an Architectural Style
- (e.g., Mughal, Gothic, Modern, Mediterranean)
- Collect Reference Images
- Use Google or Pinterest
- Look for patterns, materials, and wall textures
- Open Photoshop
- Create a new file 800x800 px
- Use the Eyedropper Tool (I)
- Pick colors from your reference images
- Add to Swatches Panel
- Create Color Swatches
- Use Rectangle Tool (U) to draw boxes
- Fill with selected colors
- Arrange side by side as your palette
- Label Each Color (Optional)
- Add names like "Terracotta", "Ivory", "Royal Blue", etc.
- Save Your Palette
- Save PSD + Export as JPEG for presentation

If you choose Mughal Architecture:

- Colors might include: Red Sandstone, Gold, Ivory, Jade Green, Royal Blue

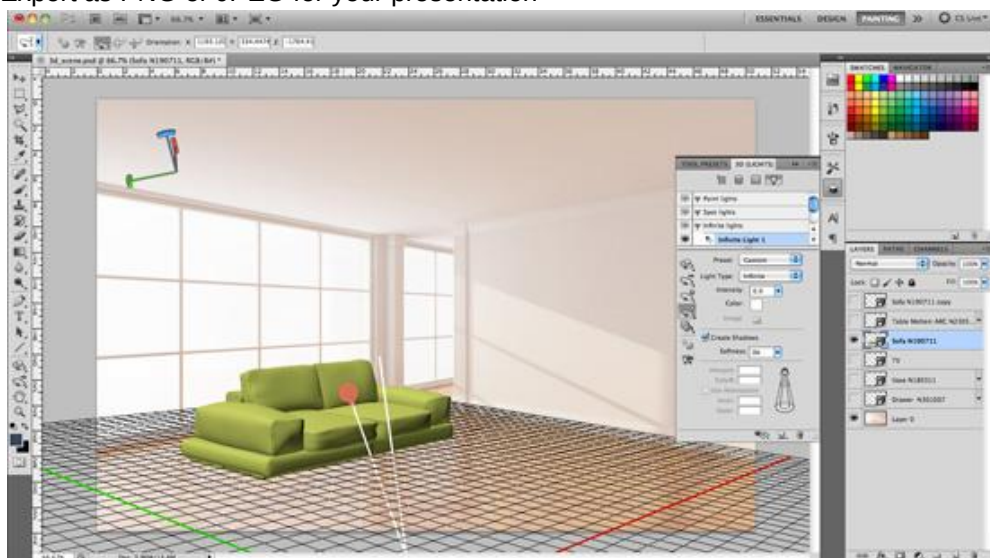


Activity: 6

Practice to design a basic 3D object related to architecture (e.g., a chair or lamp).

Steps:

- Create a new document (1000x1000 px, 300 ppi)
- Use Pen Tool (P) or Shape Tool (U) to draw the side view of a simple chair/lamp
- Go to 3D > New 3D Extrusion from Selected Layer
- Adjust Depth and Angle in the 3D Properties panel
- In the 3D panel, apply colors or materials to different parts (wood texture, metal, etc.)
- Use the 3D Light Panel to position a light source and create shadows/highlights
- Use the 3D Camera Tool to rotate and position your object in a natural view
- Finalize with 3D > Render 3D Layer
- Save the PSD
- Export as PNG or JPEG for your presentation



Learning Outcomes:

After completion of this learning unit, trainee will be able to:

- Open JPG image in software
- Apply paint tools on image for rendering
- Apply required filters on image
- Apply textures as per design
- Insert text on image
- Save image in required format (jpg, PNG etc.)

2.4.1 Types of Rendering in Software

Types of rendering in software

- Filter Rendering (for textures & effects)
- Clouds

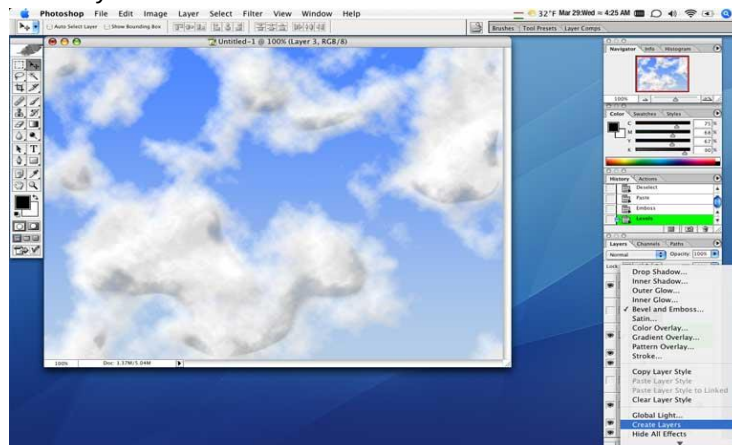
Steps:

Open a new document (File > New).

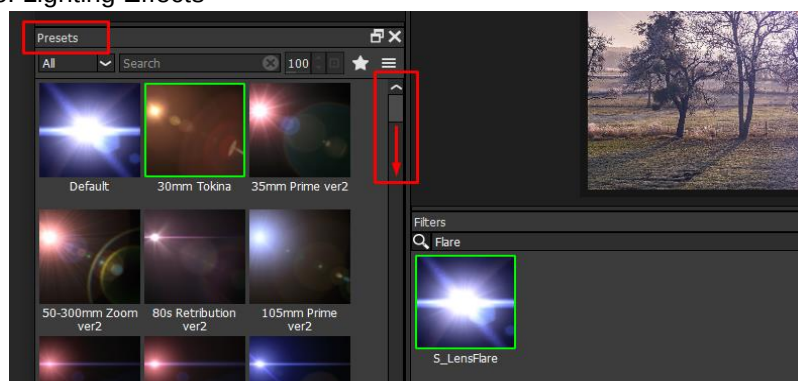
Set foreground and background colors (like white and black).

Go to **Filter > Render > Clouds**.

Clouds will appear randomly based on the selected colors.⁵⁵

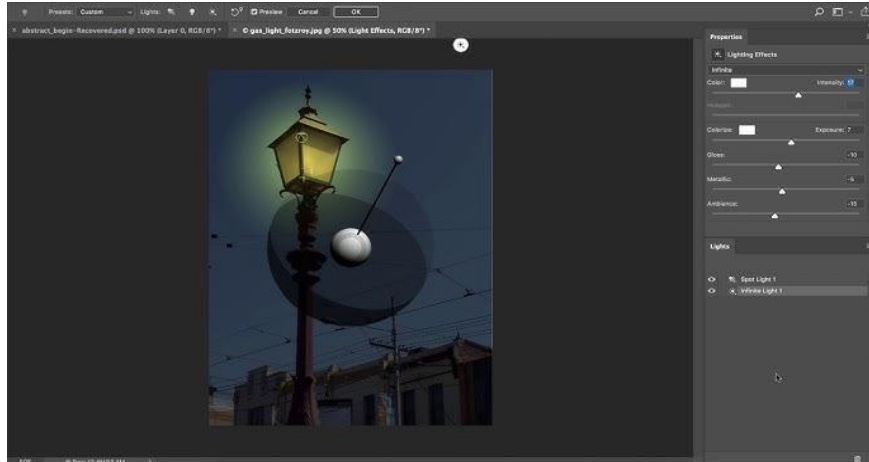
**Example: Lens Flare****Steps:**

- Open an image or create a new dark background.
- Go to Filter > Render > Lens Flare.
- Choose the type of lens and position the flare.
- Click OK to apply.
- Example: Lighting Effects



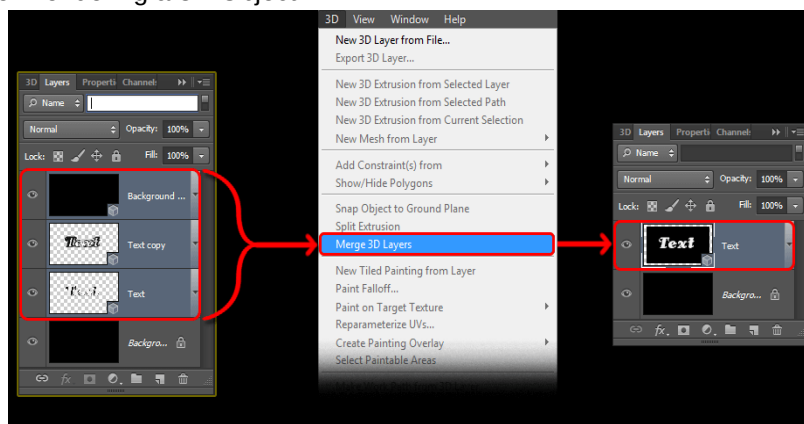
Steps:

- Go to Filter > Render > Lighting Effects.
- A new window will open with lighting controls.
- Adjust the light type (Spot, Point, Infinite).
- Move the light and change intensity or color.
- Click OK.



Steps:

- 3D Rendering (if your Photoshop supports 3D)
- Example: Rendering a 3D Object



Steps:

- Go to 3D > New 3D Layer from File or create a shape.
- Use the 3D panel to adjust materials and lighting.
- When done, go to 3D > Render 3D Layer.
- Photoshop will take a few moments to render the object with lighting.
- Render a Video or Animation

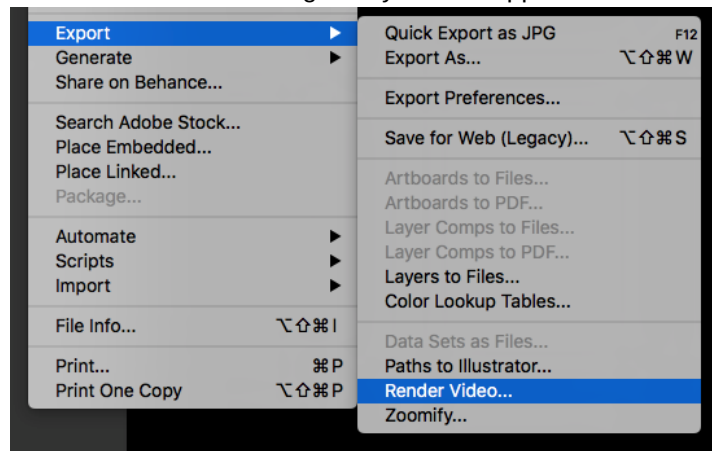
Steps:

- Create an animation using the Timeline panel (Window > Timeline).
- Go to File > Export > Render Video.
- Choose format (e.g., H.264), resolution, and name.
- Click Render.
- Text Rendering Settings

Steps:

- Select the Text Tool (T).
- Type your text.
- In the top bar, change the Anti-aliasing option to:
- Sharp

- Crisp
- Strong
- Smooth
- This controls how clean or soft the edges of your text appear.



✓ Site Plan Rendering

To show the building's location, surrounding landscape, paths, roads, and vegetation.

- Import a CAD-exported (AutoCAD or Revit) black and white line drawing.
- Add textures for roads, water, grass, or concrete using image overlays and clipping masks.
- Use custom brushes or downloaded assets for trees, cars, and people.
- Apply drop shadows to show depth and height difference.
- Adjust color balance to make greenery more natural.

✓ Floor Plan Rendering

To present the interior layout of each floor attractively.

- Add flooring textures like wood, marble, or tiles.
- Use icons or images for furniture, rugs, and appliances.
- Apply color coding for room types (bedroom, kitchen, etc.).
- Add lighting and shadow effects for realism.
- Use layer masks and blending modes to refine edges.



✓ Roof Plan Rendering

To shows the design, material, and slope of a roof structure.

- Add roof textures (tiles, shingles, metal sheets).
- Indicate slopes using shading and arrows.
- Show solar panels or skylights with highlights and reflections.
- Add surroundings like chimneys, vents, and HVAC units.



✓ Landscape Plan Rendering

Focuses on outdoor elements like gardens, parks, and recreational areas.

- Use green and earthy tones for natural areas.
- Add high-resolution textures for grass, gravel, water features, and pavement.
- Place shadowed trees, benches, pergolas, and lighting poles using PNG cutouts.
- Apply a slight blur in background areas for depth of field.



✓ **Urban or Master Plan Rendering**

Shows a large-scale area, like a city block or neighborhood.

- Add aerial textures, roads, building footprints, and zoning color codes.
- Use top-down trees and people to scale the scene.
- Apply atmospheric effects like haze or ambient light.
- Include legend, north arrow, and scale bar.



✓ **Axonometric or Isometric Plan Rendering**

A 3D-like plan view to show spatial relationships.

- Combine exported 3D model base with hand-drawn effects.
- Add textures on different layers (walls, floors, furniture).
- Use gradient overlays for depth.
- Add exploded elements to highlight structure and materials.

✓ **Conceptual or Artistic Rendering Plan**

For competitions or early-stage design concepts to express mood and idea.

- Use watercolor brushes, textures, and overlays.
- Apply artistic filters (cutout, poster edges).
- Include handwritten annotations or sketch lines.
- Use minimal color schemes (black & white with accent color)



✓ Presentation Board Rendering

Combines multiple rendered plans into a final presentation layout.

- Arrange rendered plans, sections, and elevations.
- Add branding, title blocks, scale bars, and legends.
- Use grid layout and white space for clarity.
- Apply consistent color themes across all elements.



2.4.2 Tools for Rendering

Rendering Architectural Plans

Step 1: Set Up Your Workspace

- Open Photoshop and import your line drawing (JPG, PNG, or PDF).
- Ensure your drawing is on a separate layer named "Linework".
- Set Canvas size based on final output (A3, A2, etc.).

Step 2: Organize Layers

Create layers for:

- Flooring
- Walls
- Furniture
- Shadows
- Labels/Annotations
- Textures
- Group them properly for better control. Lock the Linework layer to avoid accidental edits.



Step 3: Make Selections

Use these tools to select parts of your plan:

- Polygonal Lasso Tool (L): for straight-edge areas (e.g. walls, rooms).
- Magic Wand Tool (W): for quick selection inside closed spaces.
- Save selections via Select > Save Selection (optional for re-use).

Step 4: Add Base Colors or Textures

- Use Paint Bucket Tool (G) to fill selected areas with base colors. OR use Clipping Masks to apply flooring, tiles, or wall textures:
- Paste texture above the target layer
- Right-click → Create Clipping Mask

Step 5: Add Shadows & Highlights

Create a new layer named “Shadows”.

- Use a soft round Brush Tool (B) with low opacity black.
- Paint shadows under walls, furniture, or trees.
- For highlights, use a soft white brush.

Step 6: Add PNG Cutouts

Import furniture, people, trees, cars, etc. in PNG format.

- Resize using Ctrl+T (Transform Tool).
- Arrange them naturally for a lively look.

Step 7: Apply Gradient or Sky Background (Optional)

- Use the Gradient Tool (G) to add a subtle color fade or sky.
- Can be applied to background or elevation sky.

Step 8: Add Labels and Scale

- Use the Text Tool (T) to name rooms, directions (North), or notes.
- Include scale bars, legends, and any symbols.

Step 9: Adjust Colors and Contrast

- Use Adjustment Layers (Hue/Saturation, Brightness/Contrast) for color grading.
- Fine-tune the mood and style of the drawing.

Step 10: Final Touches and Export

Review all layers.

- Flatten or group layers if needed.
- Go to File > Export > Save for Web or File > Export As PNG/JPG.
- Choose 300 DPI for print or 72 DPI for digital use.

Optional Enhancements

- Add sketchy lines with brushes for a hand-drawn feel.
- Include material boards or project information panels.
- Add watercolor wash or pastel effect using overlay layers.

Paint Tools

Tools Included:

- Brush Tool (B)
- Paint Bucket Tool (G)
- Gradient Tool (G)

Use in Plan Rendering:

- Add solid colors to rooms, walls, roads, etc.
- Use soft brushes to add shadows, highlights, or sunlight.
- Apply gradients for sky, water bodies, or backgrounds.

Clone Stamp Tool (Shortcut: S)

- **Function:**
Copy and replicate a specific texture or design pattern across the plan.

Remember

Use high resolution materials for realistic results.

Remember

Use Gaussian Blur to soften shadow edges

Remember

Use shadows under people/trees for realism.

Remember

Use clean, professional fonts like Roboto or Arial

Remember

Use custom brushes (e.g., grass, clouds, foliage) for natural effects.

Remember

Hold Alt + Click to select the source, then paint.

Remember

Apply filters non-destructively using Smart Objects

Use in Plan Rendering:

- Extend floor textures, brick walls, tiles, etc.
- Fix or fill areas with repeated patterns.

Filters

Examples:

Gaussian Blur

- Motion Blur
- Oil Paint
- Sharpen
- Camera Raw Filter

Use in Plan Rendering:

- Blur shadows and depth to soften look.
- Add visual effects (e.g., glow or lighting overlays).
- Sharpen details in plans for better clarity.

Textures

Types:

- Wood
- Tiles
- Grass
- Concrete
- Water, Sand, etc.

Use in Plan Rendering:

Import textures and use Clipping Mask to apply them to specific areas (e.g., floor, walls, outdoors).

Step 1: Open Your Base Artwork

Open Photoshop.

Go to File > Open and select your main project file (this file should include separate layers or shapes for the floor, wall, etc.).

Step 2: Import Texture

- Go to File > Place Embedded...
- Choose the texture file (e.g., wood texture for floor, brick for wall).
- The texture will appear on top of your canvas.
- Use the handles to resize/rotate it as needed to fit the area.
- Press Enter/Return to confirm placement.

Step 3: Position the Texture Above the Target Area

- In the Layers panel, drag the texture layer above the area you want to apply it to (e.g., above the "Floor" layer).

Step 4: Create a Clipping Mask

- Right-click on the texture layer in the Layers panel.
- Click Create Clipping Mask.
- Now, the texture will only appear within the boundaries of the layer directly below it!

Step 5: Adjust Texture

- Use the Move Tool (V) to reposition the texture as needed.
- You can resize using Ctrl + T for Free Transform.
- Press Enter to confirm.

Step 6: Refine with Layer Mask (Optional)

- Select the texture layer.
- Click the Add Layer Mask button at the bottom of the Layers panel.
- Use a soft black brush to paint on the mask and hide parts of the texture if needed (for blending or shaping).

Step 7: Repeat for Other Areas

Repeat Steps 2–6 for the wall, outdoor area, etc., using different textures.

Use Adjustment Layers

- Add a Hue/Saturation, Brightness/Contrast, or Color Balance adjustment layer (clipped to the texture) to match lighting or mood.

Use Opacity, Blending Modes, or Layer Masks to blend textures naturally.

Text Tool (Shortcut: T)

Function:

Add textual information to your plan.

Use in Plan Rendering:

- Room names (e.g., Bedroom, Kitchen)
- Direction indicator (e.g., North arrow)
- Dimensions, scale bar, legend
- Annotations or labels for trees, materials, roads, etc.

Remember

Use high-resolution seamless textures for better realism

All Together in a Plan: Example Use

Area	Tool Used	Purpose
Bedrooms	Paint Bucket Tool	Fill color for flooring
Floor Texture	Clone Stamp / Clipping Mask	Apply tiled texture across rooms
Shadows	Brush Tool + Blur Filter	Create drop shadows under walls/furniture
Garden Area	Custom Grass Brush	Add natural feel to lawn
Road	Texture + Gradient	Show depth and surface feel
Labels	Text Tool	Add room names and legend

2.4.3 Formats for Images Saving

Following formats are suitable for images saving:

Abbreviation	File Format	File Extension(s)
GIF	Graphics Interchange FormaT	.gif
GPEG	Joint Photographic Expert Group imag	.jpg , .jpeg , .jfif , .pjpeg , .pjp
PNG	Portable Network Graphics	.png
SVG	Scalable Vector Graphics	.svg
PDF	Portable Document Format	.pdf
TIFF	Tag Image File Format	.tiff/.tif

How to Save Files in Different Formats in Photoshop?

Step 1: Finalize Your Design

Before saving:

- Flatten the image if needed (Layer > Flatten Image)
- Or keep layers intact if saving as PSD/TIFF

Set resolution:

- 300 DPI = Print
- 72 DPI = Web

Step 2: Go to Save/Export

Choose one of these based on what you want:

For standard save:

- File > Save As

For optimized web/image formats:

- File > Export > Save for Web (Legacy)
Or
- File > Export > Export A

JPEG (.jpg / .jpeg)

Steps:

- File > Save As > Format: JPE
- Choose quality (0–12) in pop-up window

Best For:

- Web and digital sharing
- Low file size
- Not transparent background

Remember

Compression may slightly reduce quality

GIF (.gif)**Steps:**

- File > Export > Save for Web (Legacy)
- Select format: GIF
- Choose “Loop Forever” for animations

Best For:

- Simple web graphics
- Limited colors (256 max)
- Animations (short frame-based)

Remember

Does not support full-color images or gradients smoothly

TIFF (.tif / .tiff)**Steps:**

- File > Save As > Format: TIFF
- Choose compression (LZW recommended)

Best For:

- High-quality print-ready files
- Supports layers and transparency
- Used in publishing/printing industry

PDF (.pdf)**Steps:**

- File > Save As > Format: Photoshop PDF

In options, check “Preserve Photoshop Editing Capabilities” (if needed)

Best For:

- Printing documents or sharing
- Preserves text and vector quality
- Can combine multiple pages

Remember

Can be viewed in Adobe Acrobat or browser

PNG (.png)**Steps:**

- File > Export > Export As > Format: PNG
- Or File > Save As > PNG in newer versions

Best For:**Web images with transparent backgrounds**

- Icons, logos, architectural cutouts

Remember

Lossless quality, larger than JPEG

Remember

PNG is not suitable for printing or sharing directly

PSD (.psd)**Steps:**

- File > Save As > Format: Photoshop (.psd)

Best For:

- Keeping all layers, effects, masks
- Editable master file

Quick Comparison Table

Format	Transparency	Layers	Compression	Best Use
JPEG	✗ No	✗ No	✓ Lossy	Web, Email

Format	Transparency	Layers	Compression	Best Use
PNG	✓ Yes	✗ No	✓ Lossless	Web, Cutouts
GIF	✓ Basic	✗ No	✓ Limited	Animations
TIFF	✓ Yes	✓ Yes	✓ Optional	Print, Archiving
PDF	✓ Yes	✓ Yes	✓ Vector/Text	Documents
PSD	✓ Yes	✓ Yes	✗ No	Editable Design

Activity: 1

Practice to render exterior view(jpg.) of any building

- You can either use your own render from 3D software (like SketchUp, Blender, or Revit) or find a base image of a building to manipulate.
- Stock photos for textures and backgrounds: For example, you can use photos of trees, skies, and streets.
- Custom Photoshop brushes can help you add realistic details like foliage, clouds, or grass.
- If you're working with a pre-rendered image (JPG/PNG), open the image in Photoshop.
- If it's a photo of a real building, make sure the image is high resolution and has the correct perspective.
- If the perspective isn't perfect or you want to change the angle slightly, use the Transform Tool (Ctrl + T).
- You can also use Vanishing Point under the Filter menu to align and adjust perspectives more accurately.
- Use Adjustment Layers (such as Brightness/Contrast, Curves, or Levels) to adjust the overall lighting of the building.
- Use a soft round brush with a low opacity on a new layer to paint shadows under areas like eaves, windows, or along the ground. Use Gaussian Blur to soften them.
- Paint light highlights along the edges where light would naturally hit (e.g., the top edges of windows, doors, and roofs).
- If the exterior walls are smooth or lack detail, you can overlay a texture (e.g., concrete, brick, wood) to give it a more realistic feel.
- Use Layer Masking and Blending Modes (like Overlay or Soft Light) to seamlessly integrate the texture into your building.
- Adjust the texture's opacity or scale to match the perspective.
- Windows and Glass: You can use a soft gradient or glass texture to create reflections and make the windows look more realistic.
- If the image has no sky or the sky looks too plain, you can use a stock photo of a sky. Use a layer mask to blend it into your render smoothly.
- Landscape: Add trees, plants, cars, or people to make the scene feel more alive. You can find stock photos of these elements, or paint them using brushes.
- Use Gaussian Blur for elements in the background to simulate depth of field (blurred background).
- If you want to add special effects, like glowing lights (for windows or exterior lighting), use the Outer Glow or Inner Glow effect in the Layer Styles panel.
- Reflection: For glass windows or shiny surfaces, use a gradient reflection technique. Duplicate the window layer, flip it vertically, and then add a gradient mask to simulate reflection.
- Add grass, trees, and bushes using stock images or custom brushes.
- Textures for Pavement or Roads: Use textures for the ground surface in front of the building, adding details like cracks, stones, or concrete.
- You can add people for scale or realism. Use images of people with transparent backgrounds, placing them strategically to blend into the scene.

- Apply overall color grading using Adjustment Layers like Hue/Saturation, Color Balance, or Selective Color to match the mood or lighting you want for the scene.
- Sharpening: Apply a slight sharpening filter to the final image if you feel the details are too soft.
- Once you're satisfied with the final render, save it as a JPG.
- Go to File > Export > Export As, and choose JPG format for web-friendly file size.
- Adjust the quality to high (80-100) for better resolution.

Activity: 2

Practice to render interior view(jpg.) of any building

- **3D Render:** If you have a 3D model or render of a building, open the render in Photoshop. You can use software like **SketchUp**, **Blender**, or **AutoCAD** to generate the initial render.
- **Stock Image:** If you don't have your own render, you can practice using a stock photo of a building or architectural rendering as your base image. Sites like **Unsplash**, **Pexels**, or **Shutterstock** have free-to-use building images.
- Open your base image (JPG format) in Photoshop.
- If needed, crop or adjust the image to fit the desired aspect ratio (e.g., 16:9 for landscape or 4:3).
- If you need to adjust the perspective (e.g., straighten a leaning building or adjust the camera angle), use the Transform Tool (Ctrl+T).
- Use Perspective Warp (Edit > Perspective Warp) to fix any perspective distortion in the building.
- You can also use the Lens Correction Filter (Filter > Lens Correction) to correct any lens distortion.
- **Lighting:** Go to Layer > New Adjustment Layer > Brightness/Contrast or Curves and adjust the overall lighting to match the time of day or desired mood (daylight, evening, etc.).
- **Shadows and Highlights:** Use dodge and burn techniques to manually lighten (dodge) or darken (burn) areas to add depth and realism to the shadows and highlights.
- Use a soft round brush with low opacity and paint on a new layer for subtle shadow or highlight effects.
- If the walls or surfaces of the building look too smooth or unrealistic, you can overlay textures such as concrete, wood, or brick.
- Download high-quality textures from sites like Textures.com or Poliigon.
- Use Layer Masking and Blending Modes (e.g., Overlay, Soft Light, Multiply) to blend the texture into the building's surfaces seamlessly.
- Adjust the opacity of the texture layer to make it more subtle or realistic.
- Add reflections to windows to simulate the real-world behavior of glass.
- You can create reflections by duplicating the window area, flipping it vertically, and adding a gradient or Gaussian Blur to simulate the reflection.
- **Ground and Landscaping:** Add elements like grass, roads, trees, or flowers to make the scene feel more alive.
- Use Gaussian Blur on background elements like trees or roads to simulate depth of field (the background is blurred to give the sense of focus on the building).
- If your image lacks a proper sky or background, add one.
- Use stock photos of skies (e.g., clear sky, sunset, cloudy) to give context to your building.
- Blend the edges of the background using Layer Masks to seamlessly integrate it into the scene.
- Use Adjustment Layers like Hue/Saturation, Color Balance, or Selective Color to tweak the overall color tone of the image.
- This step is essential to match lighting conditions, enhance the mood, or correct color imbalances.
- Add a Vignette effect to draw attention to the center of the image (Image > Adjustments > Vignette).
- Optionally, use Sharpening (Filter > Sharpen > Unsharp Mask) to make the details pop.

- Add smaller details like people, cars, or street signs to add life to the image. You can either paint them manually or use stock images and mask them into the scene.
- You can add special effects like fog, light flares, or even digital lighting using custom brushes or stock photo overlays.
- Save final image. Go to File > Export > Export As and choose JPG format for high-quality results. Ensure the quality is set to 100 for optimal clarity.

Activity: 3

Practice to render House plan (jpg. 35'x65'/30'x70')

Start with the Basic House Plan (Floor Plan)

You can create basic house plan yourself using software like AutoCAD, SketchUp, or Revit, or you can download a template or floor plan from a free resource. The floor plan should have:

- Room layout (bedrooms, living room, kitchen, etc.)
- Doors and windows marked
- Dimensions of each room, walls, and doors

Import or Create the Floor Plan in Photoshop

- If your house plan is already created in 2D (using AutoCAD or similar tools), export it to JPG or PNG format and open it in Photoshop.

Add Textures and Materials

- Flooring textures: Wood, tile, or carpet for the floor.
- Wall textures: Wallpaper, paint, or tiles for walls.
- Windows and doors: Add transparency or reflections to simulate glass.
- Use stock images or custom brushes to add realistic textures.

Add Lighting and Shadows

- Lighting Effects: You can simulate natural or artificial lighting in Photoshop.
- Shadows: Use dodge and burn tools to add shadows around walls, doors, and furniture.

Refine the House Plan Rendering

- Adjust brightness/contrast to match the lighting conditions.
- Use selective coloring or color grading to set the mood (e.g., warm tones for daytime, cooler tones for evening).
- Apply sharpness to important details like windows and edges to make them stand out.

Export the Final Image

Once you're completed render image:

- Go to File > Export > Export As and choose JPG format.
- Adjust the quality to high for clear details.

Activity: 4

Practice to landscaping/lawn plan (jpg.) of 20 Marla house

- Open Photoshop and import an image create with high resolution
- Set the dimensions according to the plot size of the house (e.g., for a 20 Marla house with dimensions of 50' x 80', you can set the canvas size in inches or pixels to fit this aspect ratio).
- Start planning the following landscaping elements for lawn/garden:
 - Lawn Area: Create a green lawn area using the Rectangle Tool or Pen Tool to draw the lawn. Use a green color fill for the grass area.
 - Apply a texture to the lawn to make it look more realistic (such as grass or turf textures). Import textures from stock image sites or create your own.
 - Use the Ellipse Tool or Pen Tool to outline areas for flower beds and shrubs.
 - Import tree and plant images or use Photoshop brushes to create trees and bushes.
 - You can find tree brushes or stock images of trees and bushes online, or you can create your own using the Brush Tool.
- Create paths or walkways using the Pen Tool or Shape Tool. For example, you can design a curved path leading from the driveway to the front door. Use brown, grey, or stone textures for a realistic look.

- Draw the driveway area using a Rectangle Tool and fill it with a grey or asphalt texture to simulate concrete or paved surfaces.
- Add outdoor Furniture, like benches or a patio, in the yard or garden area. Use the Shape Tool or import furniture stock images to represent these areas.
- Adding a fountain, pond, or pool in the backyard or front yard. Use the Ellipse Tool or import an image of a water feature and adjust it to fit the scale of the plan.
- Add landscape lighting such as lamps or spotlights along paths or around the garden.
- Use stone or brick textures for creating borders around flower beds, paths, or the lawn.
- Add a background to the image, such as a neighboring house, to give the landscaping context.
- Lighting and Mood: You can use Gradient Tool to create a soft lighting effect, such as a sunset or daylight effect, depending on the mood you want.
- Layering: Make sure all your elements are on separate layers so that you can easily edit or move them.
- Apply color grading or adjust the Hue/Saturation for a more realistic or artistic effect.
- Apply a slight sharpening filter (Filter > Sharpen > Unsharp Mask) to bring out the details of landscaping.
- Once you're satisfied with the landscaping plan, save your project.
- Go to File > Export > Export As and save your final image as a JPG file.

Activity: 5

Practice to render front elevation (jpg.) of any building.

- You can practice using a stock photo of a building or architectural rendering as your base image. Sites like Unsplash, Pexels, or Shutterstock have free-to-use building images.
- Open your base image (JPG format) in Photoshop.
- If needed, crop or adjust the image to fit the desired aspect ratio (e.g., 16:9 for landscape or 4:3).
- If you need to adjust the perspective (e.g., straighten a leaning building or adjust the camera angle), use the Transform Tool (Ctrl+T).
- Use Perspective Warp (Edit > Perspective Warp) to fix any perspective distortion in the building.
- You can also use the Lens Correction Filter (Filter > Lens Correction) to correct any lens distortion.
- Lighting: Go to Layer > New Adjustment Layer > Brightness/Contrast or Curves and adjust the overall lighting to match the time of day or desired mood (daylight, evening, etc.).
- Shadows and Highlights: Use dodge and burn techniques to manually lighten (dodge) or darken (burn) areas to add depth and realism to the shadows and highlights.
- Use a soft round brush with low opacity and paint on a new layer for subtle shadow or highlight effects.
- Download high-quality textures from sites like Textures.com or Polygon.
- Use Layer Masking and Blending Modes (e.g., Overlay, Soft Light, Multiply) to blend the texture into the building's surfaces seamlessly.
- You can create reflections by duplicating the window area, flipping it vertically, and adding a gradient or Gaussian Blur to simulate the reflection.
- Add elements like grass, roads, trees, or flowers to make the scene feel more alive.
- Use stock photos or custom brushes for elements like trees or clouds.
- Use stock photos of skies (e.g., clear sky, sunset, cloudy) to give context to your building.
- Use Adjustment Layers like Hue/Saturation, Color Balance, or Selective Color to tweak the overall color tone of the image.
- This step is essential to match lighting conditions, enhance the mood, or correct color imbalances.
- Add a Vignette effect to draw attention to the center of the image (Image > Adjustments > Vignette).

- Add smaller details like people, cars, or street signs to add life to the image. You can either paint them manually or use stock images and mask them into the scene.
- Add special effects like fog, light flares, or even digital lighting with custom brushes or stock photo overlays.
- Go to File > Export > Export As and choose JPG format for high-quality results. Ensure the quality is set to 100 for optimal clarity.

Summary

Adobe Photoshop is a powerful image editing software widely used for digital manipulation, design, and photo enhancement. It provides a vast array of tools for tasks such as cropping, resizing, color correction, retouching, and compositing images. Photoshop's layer-based editing system allows for non-destructive changes, giving users the ability to manipulate photos and designs with precision. Its advanced features include text manipulation, filters, brushes, and masks, enabling endless creative possibilities. Whether for professional photographers, graphic designers, or digital artists, Photoshop is essential for transforming and refining visual content.

FAQs:

Q1. What is Adobe Photoshop used for?

Ans. It is a powerful image editing software used for photo manipulation, graphic design, digital painting, retouching, and creating visual compositions.

Q2. What is the purpose of layers in Adobe Photoshop?

Ans. Layers are allowed for non-destructive editing by separating different elements of an image. Each layer can hold individual content (such as text, shapes, or images), which can be edited independently of other layers.

Q3. How can you remove a background in Photoshop?

Ans. Use the Quick Selection Tool or Magic Wand Tool to select the background. Once the background is selected, press the Delete key to remove it. Alternatively, you can create a Layer Mask to hide the background non-destructively.

Q4. How do you apply filters in Photoshop?

Ans. Select the layer you want to apply the filter to. Go to the Filter menu at the top. Choose the desired filter (e.g., Gaussian Blur, Sharpen, Noise, etc.). Adjust the filter settings and click OK to apply it.

Q5. What is the difference between the Healing Brush and the Clone Stamp tool in Photoshop?

Ans. The Healing Brush tool is used to fix blemishes or unwanted elements by blending the texture, color, and lighting of the surrounding pixels with the selected area. The Clone Stamp tool allows to copy pixels from one part of an image and apply them to another part. It does not blend the texture as smoothly as the Healing Brush.

Q6. How do you change the color of an object in Photoshop?

Ans. Use the Magic Wand Tool or Quick Selection Tool to select the object.

Q7. What is the use of the Pen Tool in Photoshop?

Ans. It is used to create precise paths and shapes. You can use it to draw straight lines, curves, and complex shapes, which can later be converted into selections, masks, or vector shapes for further editing or design.

Q8. How can you add text to an image in Photoshop?

Ans. Select the Type Tool (T) from the toolbar. You can adjust the font, size, color, and other settings from the options bar at the top. Use the Move Tool (V) to position the text where desired.

Q9. What is the difference between RGB and CMYK color modes in Photoshop?

Ans. RGB (Red, Green, Blue): Used for digital images and screens (like monitors and phones). The colors are created by mixing different intensities of red, green, and blue light.

CMYK (Cyan, Magenta, Yellow, Black): Used for print media. Colors are created by mixing four ink colors.

Q10. How do you create a selection in Photoshop?

Ans. Use selection tools like the Marquee Tool, Lasso Tool, or Quick Selection Tool.

Click and drag to outline the area you want to select.

Once the area is selected, you can modify, copy, or apply effects to it.

Q11. How can you save an image for the web in Photoshop?

Ans. Go to File > Export > Save for Web (Legacy).

Choose the desired file format (e.g., JPEG, PNG, GIF) and adjust settings such as image quality and resolution.

Click Save to export the image optimized for web use

Q12. What file formats are suitable for saving rendered images in Photoshop?

Ans. JPEG: Good for web images with reduced file size but without transparency.

PNG: Best for images with transparency and high-quality web graphics.

TIFF: suitable for professional print work.

PSD: Photoshop's native format, preserving layers and effects for future edits.

MCQS

1. The 'Move Tool' in Photoshop is used to

- a. Draw shapes
- b. Move layers and selections
- c. Change image resolution
- d. Apply filters

2. What is the shortcut key for creating a new layer?

- a. Ctrl + L
- b. Ctrl + J
- c. Ctrl + N
- d. Shift + Ctrl + N

3. Which tool is used to clone parts of an image?

- a. Healing Brush Tool
- b. Clone Stamp Tool
- c. Patch Tool
- d. Lasso Tool

4. Which panel in Photoshop lets you manage and organize your layers?

- a. Layers Panel
- b. Brush Panel
- c. History Panel
- d. Navigator Panel

5. What does the 'Feather' option do in selection tools?

- a. Sharpens edges
- b. Fills the selection with color
- c. Softens the edges of the selection
- d. Locks the selection

6. Which menu contains the 'Free Transform' option?

- a. File
- b. Edit
- c. Image
- d. Filter

7. Which of the following file formats supports transparency?

- a. JPEG
- b. BMP
- c. PNG
- d. PDF

8. Which of these options appears in the Options Bar when the Crop Tool is selected?

- a. Opacity
- b. Gradient Type
- c. Text Alignment
- d. Straighten

9. When using the Type Tool, which of the following settings is NOT found in the Options Bar?

- a. Font Size
- b. Line Spacing
- c. Text Color
- d. Font Style

10. The Eyedropper Tool in Photoshop is used to:

- a. Pick up and set the foreground color
- b. Fill the selection with color
- c. Change the color mode
- d. Create custom gradients

Answer Key

1.	b	2.	d	3.	b	4.	a
5.	c	6.	b	7.	a	8.	d
9.	b	10.	a				

Learning Outcomes:

After completion of this learning module, trainee will be able to:

- Develop 3D Objects.
- Modify 3D Objects
- Apply Material and Textures on 3D Objects
- Render 3D Model

Learning Unit 3.1**Develop 3D Objects****Learning Outcomes:**

After completion of this Learning unit trainee will be able to:

- Set up template for required specifications.
- Import/create 2D Drawing/image as per assigned specification.
- Create 3D object from 2D drawing/image in line with given measurements.

3.1.1 Sketchup Interface

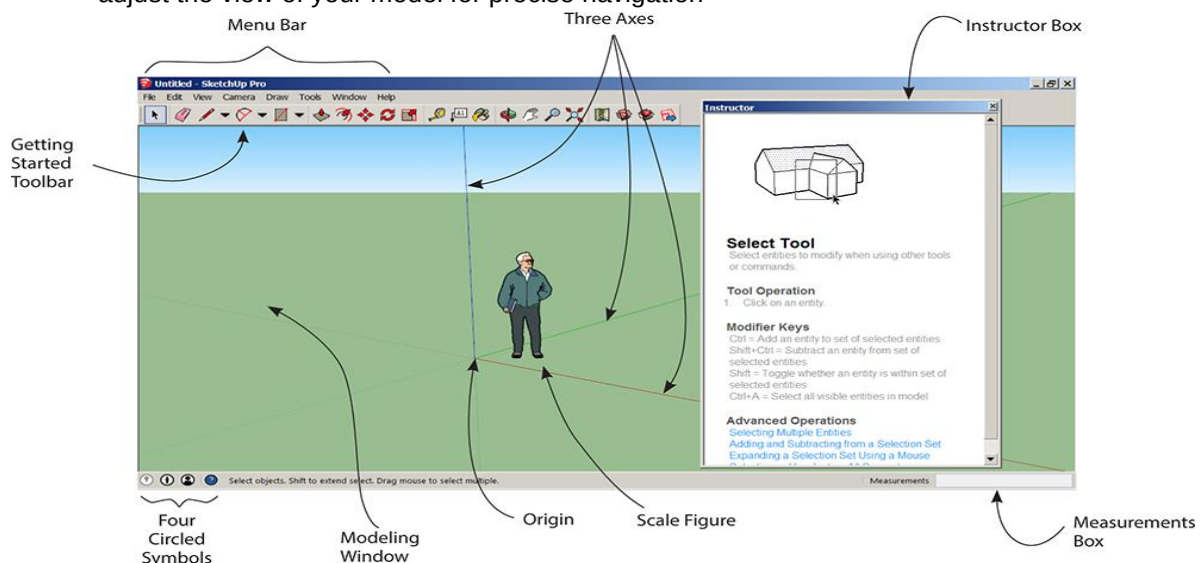
SketchUp is a powerful, user-friendly 3D modeling software used across various industries, including architecture, interior design, engineering, construction, and more. It allows users to create 3D models of buildings, landscapes, and objects, providing a simple yet effective platform for designing, visualizing, and presenting projects. SketchUp makes complex design tasks accessible to both beginners and advanced users.

Sketchup Interface Includes following.

- **Menu Bar:** Provides access to all the primary tools, settings, and features organized under dropdown menus like File, Edit, View, Camera, Draw, Tools, Window, and Help.
- **Default toolbar:** Offers quick access to commonly used tools such as Select, Eraser, Line, Rectangle, Push/Pull, Orbit, Pan, and Zoom for basic 3D modeling operations.
- **Trat and panels:** Provide organized access to tools like Entity Info, Components, Materials, Styles, and Layers for managing and editing model properties efficiently.
- **Status bar:** Displays helpful tips, tool instructions, and the Measurements box for precise input during modeling.
- **Measurements box:** Displays and accepts precise dimensions and values for drawing and editing tools, enabling accurate modeling.
- **Zoom menu:** It includes tools like Zoom, Zoom Extents, and Zoom Window to control and adjust the view of your model for precise navigation

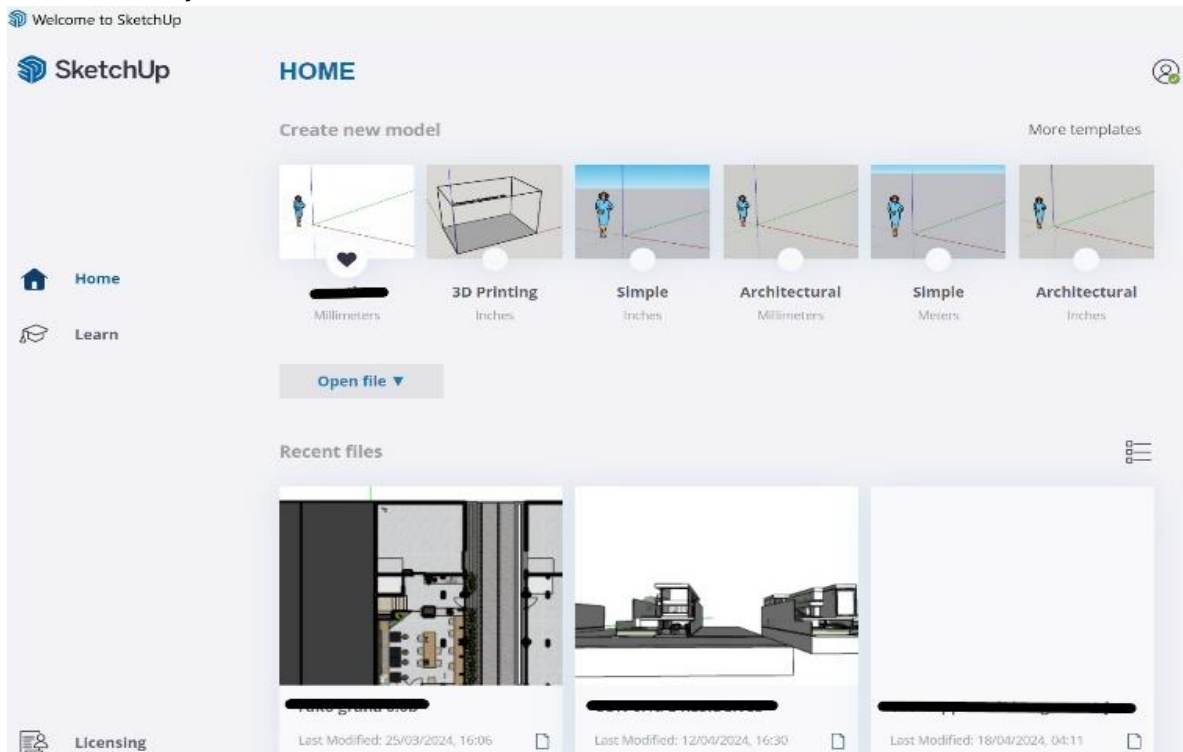
Remember

SketchUp turns your imagination into 3D reality with simple tools and powerful features. Whether you're designing a house or a spaceship.

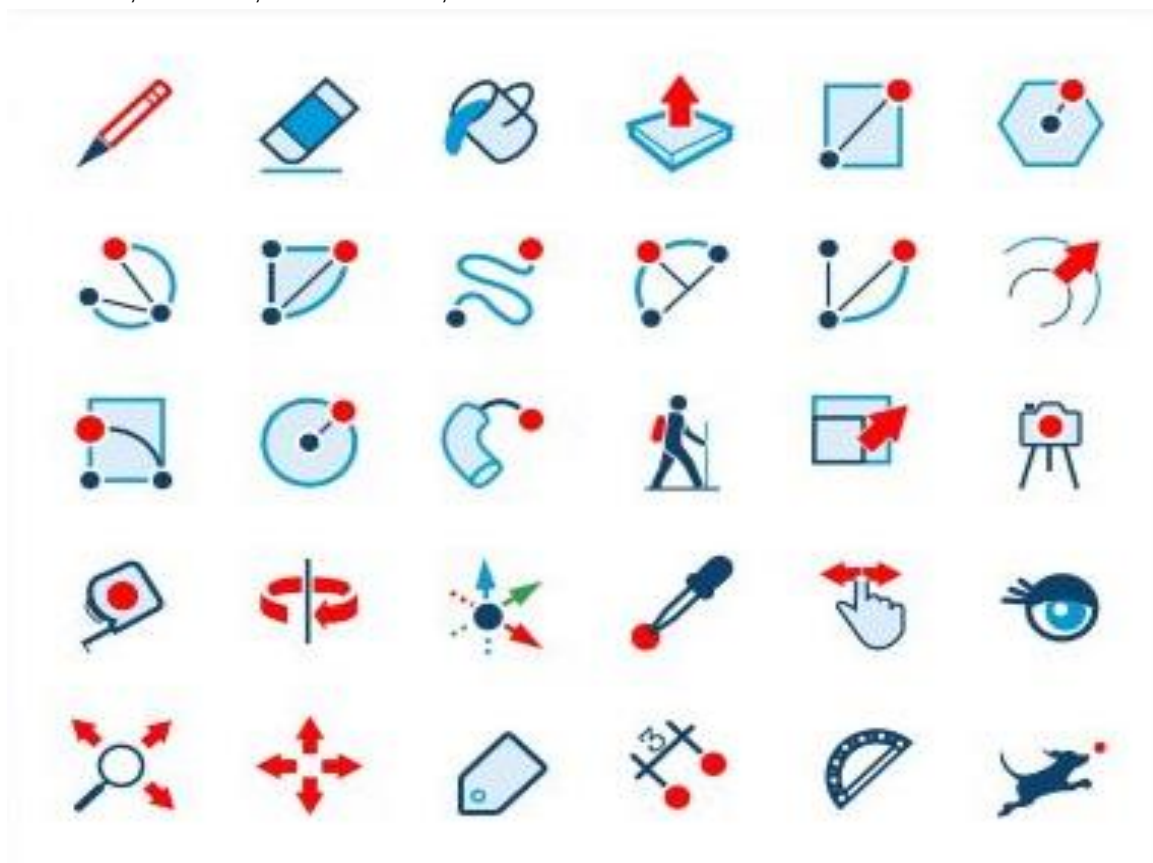


Open and Usage:

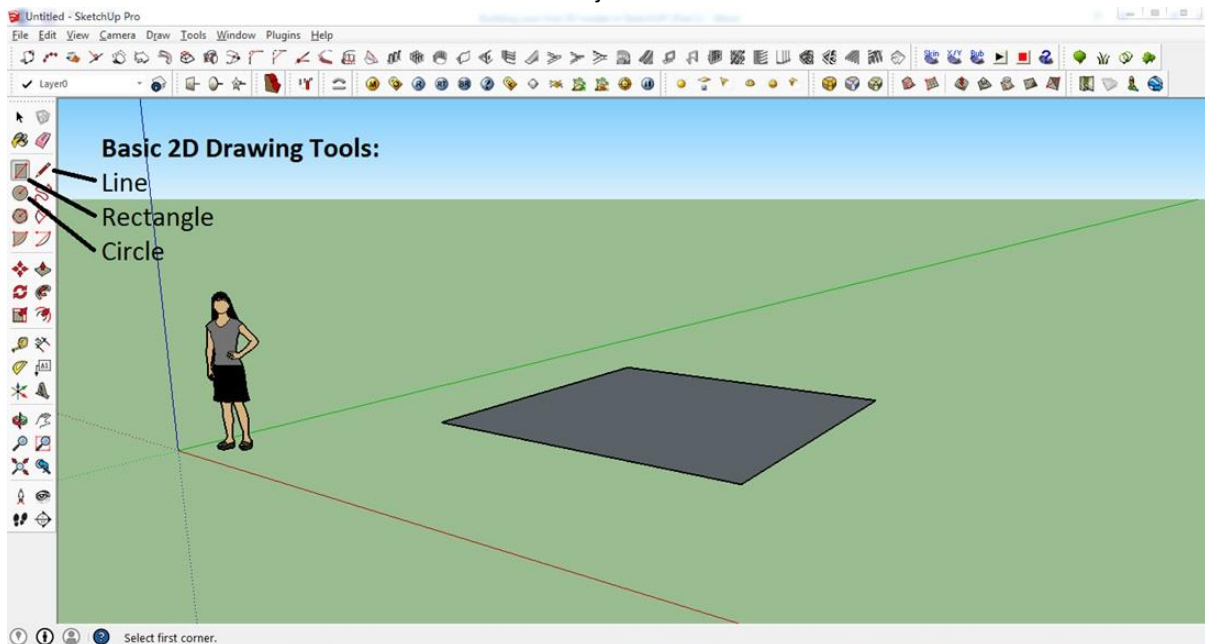
- **Open SketchUp:** Start the program, select a template (e.g., architectural or construction), and choose your unit of measurement.



- **Explore the Default Toolbars:** Familiarize yourself with essential tools such as the Select Tool, Line Tool, Push/Pull Tool, and Move Tool.

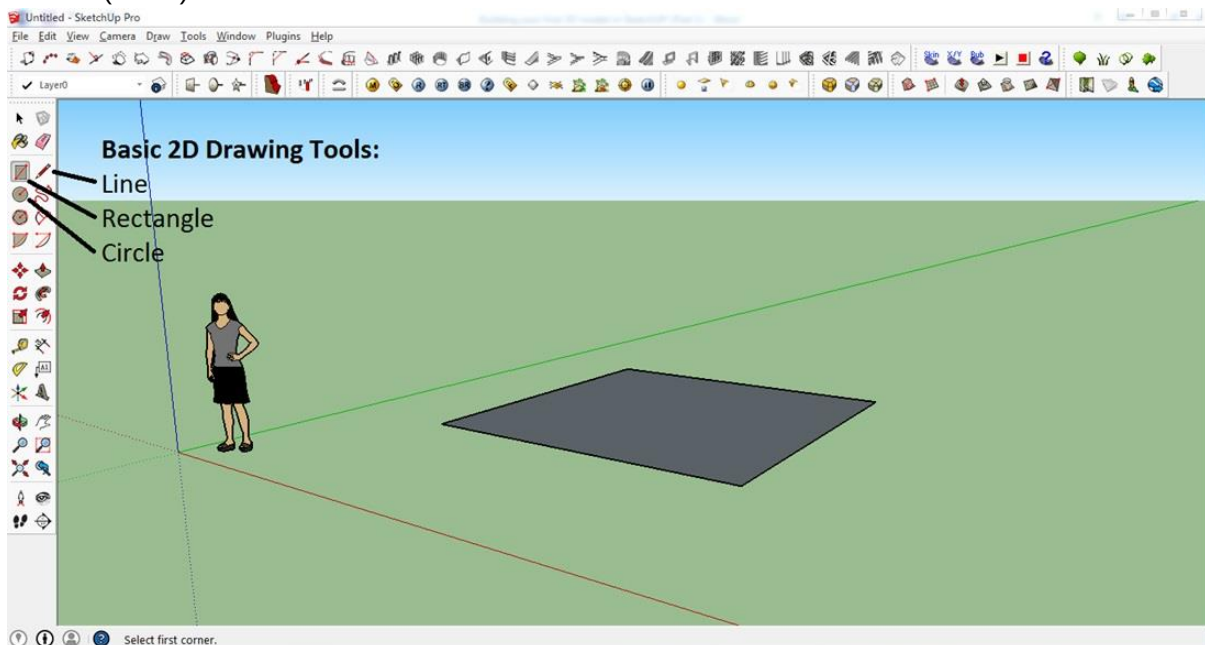


- **Start Drawing:** Begin by drawing basic shapes (lines, rectangles, circles) and use the Push/Pull Tool to extrude them into 3D objects.



Basic 2D Drawing – Lines, Rectangles, Circles:

- To get started, let's draw Lines, Rectangles, and Circles. These are the fundamentals of our (future) 3D models.



Drawing a Line:

- To draw a line, first click the Pencil symbol on the toolbar or simply press L on your keyboard.
- Click anywhere on your screen to assign the first point.
- Drag the mouse to the desired location of the second point and click.
- To specify the length (in this case I entered 5), simply type the value right after Step 2 and press Enter.

Remember

As you have probably already noticed, you can align any line to the red, green, or blue axis of the workspace.

Drawing Rectangles/Squares:

- To draw a rectangle/square, first, click the **Rectangle** icon on the left beside the pencil symbol or simply press **R** on your keyboard.

- Click the desired location to assign the first corner of your rectangle/square.
- Drag the mouse to the desired location for the opposite corner and click.

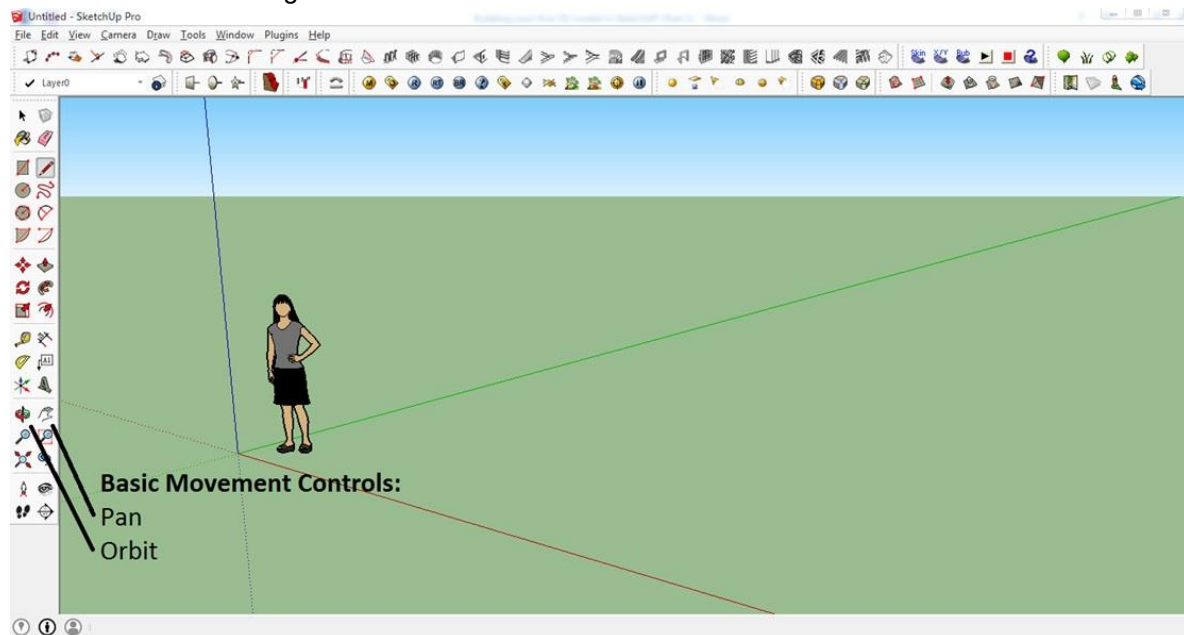
You can also enter the length and width of your rectangle/square: enter the values after Step 2 and press Enter on keyboard. The first value you enter corresponds to the length/width along the red axis and the second value corresponds to the length/width along the green axis. Enter the values like this: 4, 4, Enter.

Drawing circles:

- To draw a **Circle**, first click the icon below the rectangle icon or simply press **C** on your keyboard
- Click the desired point to assign the midpoint of your circle
- Drag the cursor anywhere on the screen to make the circle and then click
- To specify the radius (i.e. radius = 2), simply enter the value right after Step 2 and press Enter.

Movement Controls:

Let's learn how to change our view with the basic movement tools of **Pan** and **Orbit**.



Pan:

- To use **Pan**, click the icon or simply press **H** on your keyboard
- Click to set the origin, hold the mouse button and just drag. This will allow you to move your view

Orbit:

- To use **Orbit**, click the icon on the toolbar or simply press **O** on your keyboard
- Click anywhere, hold and drag to rotate the whole view
- You can also use the mouse wheel to Orbit

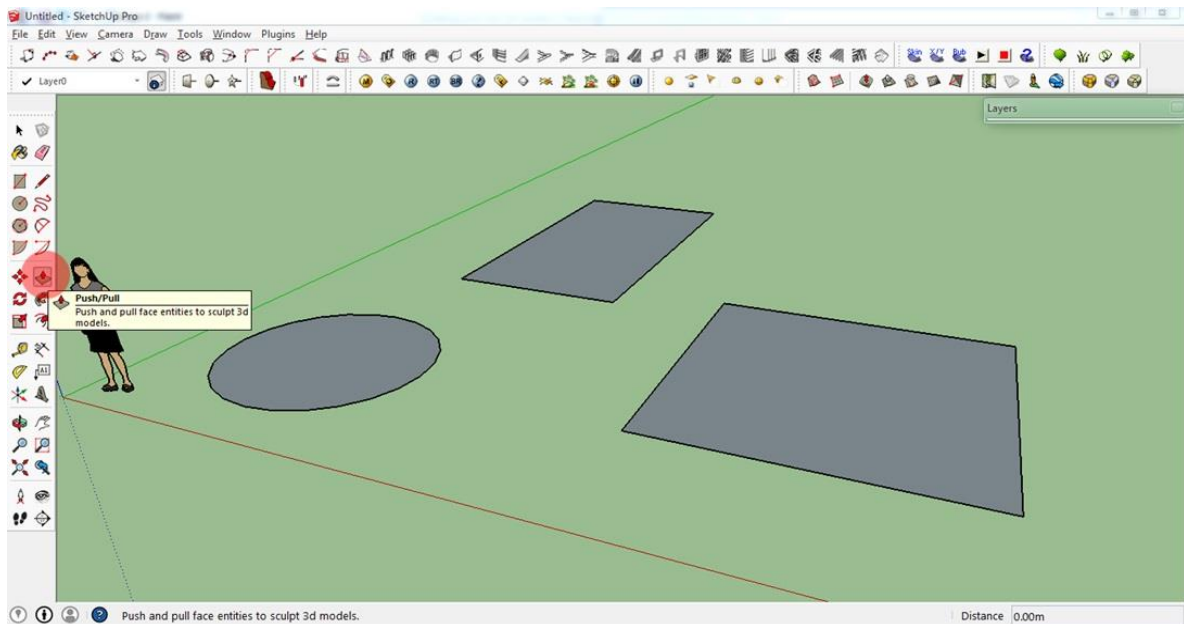
Being on the Safe Side – Undo and Saving

If you made a mistake, simply click on **Edit > Undo** and you will be taken back to your previous step. You can also press **Alt + Backspace** to achieve this. In order not to lose your progress, make sure to save your file from time to time. To do this, click **File > Save** or simply press **Ctrl + S** on your keyboard. Enter the filename and select the directory you want your file to be stored in.

Making Your First 3D Object

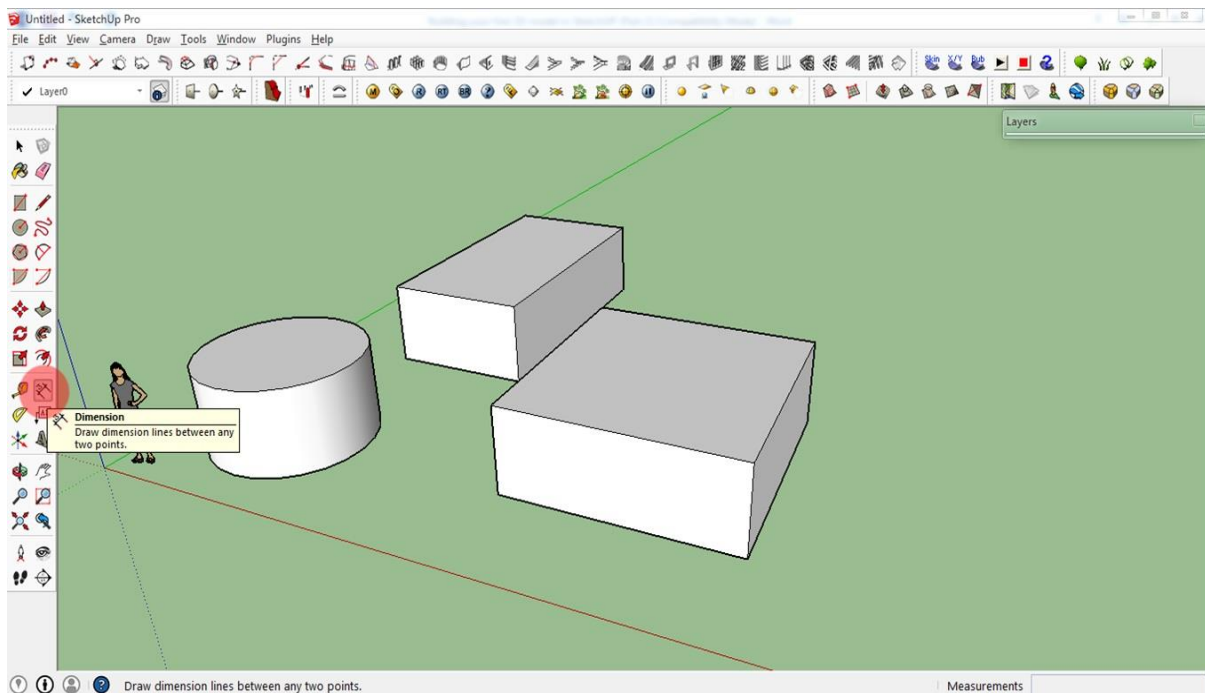
We've already created 2D shapes. Let's turn them into 3D objects.

- First, zoom in on one of your 2D shapes by using your mouse wheel button
- Click the Push/Pull icon on the toolbar or simply press **P** on your keyboard



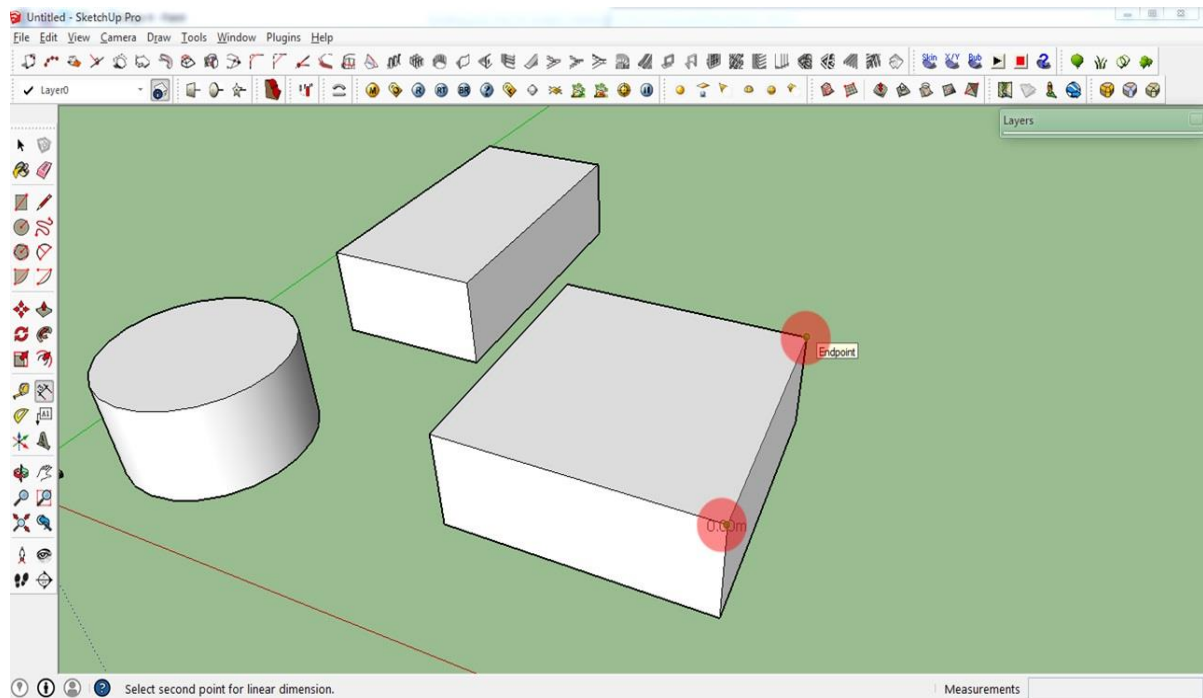
- Hover your mouse cursor over the plane of the circle
- When you see the plane is highlighted (i.e., when the plane shows a dotted texture on it), click on it and simply drag it upwards. Click the left mouse button again to set the height of your cylinder, cube or cuboid. Or type the height after the first click
- Now 2D shape has converted into a 3D object.

Dimension Tools:

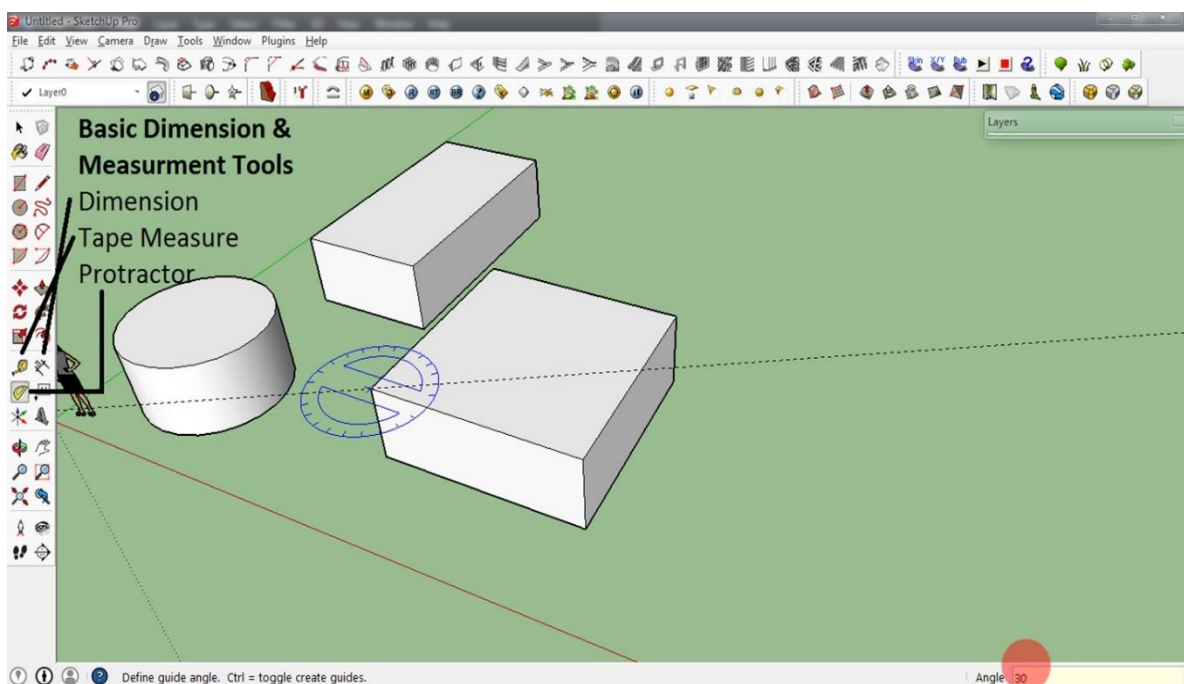


This tool allows you to check the dimensions of your model.

- To use this tool, simply click the Dimension icon on the toolbar
- Click the starting point and then the end point of the line you want to measure. Or simply click the line.

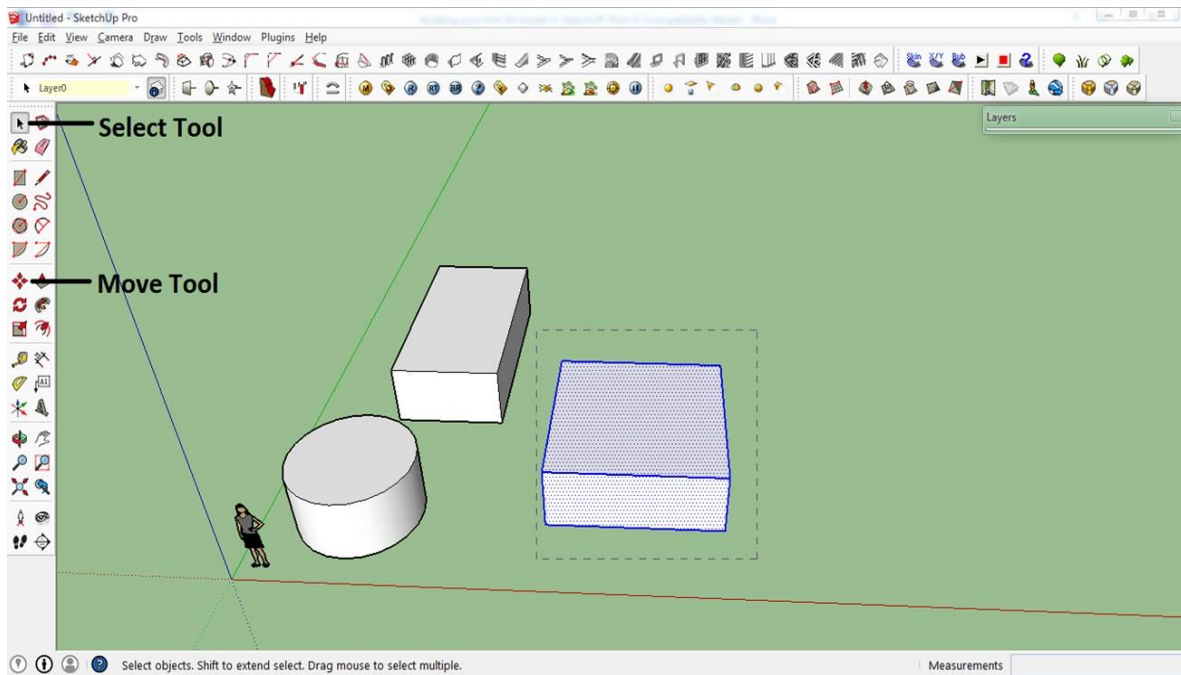


You can also use this Tape Measure Tool to measure distances more freely and the Protractor Tool to check different angles. The best way to learn how to use these tools is by playing around with them. You can see the results of the Tape Measure Tool and the Protractor Tool in the lower right corner (see screenshot below).



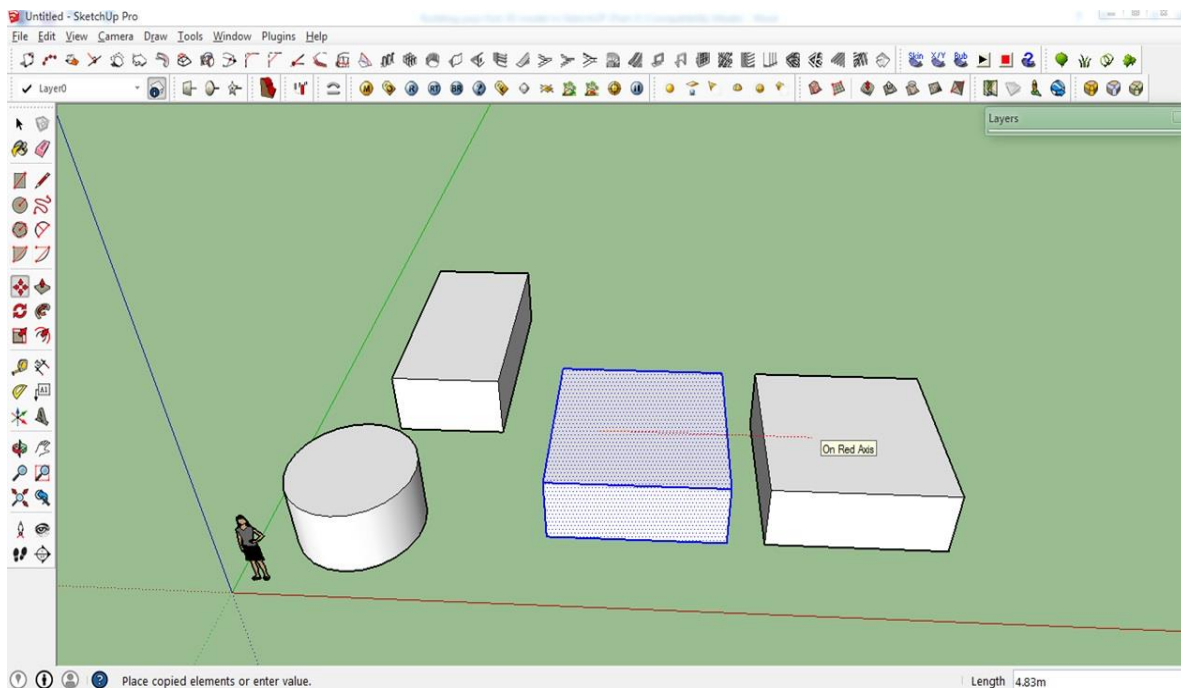
Moving and Maneuvering Objects:

- Select the object you want to move. Do this by clicking on the Select tool and 'drawing' a selection net around your object
- Click the Move tool or simply press M on your keyboard.
- Click the selected object and drag it. Simply click again when you reach the desired location



Creating Copies of Your Object:

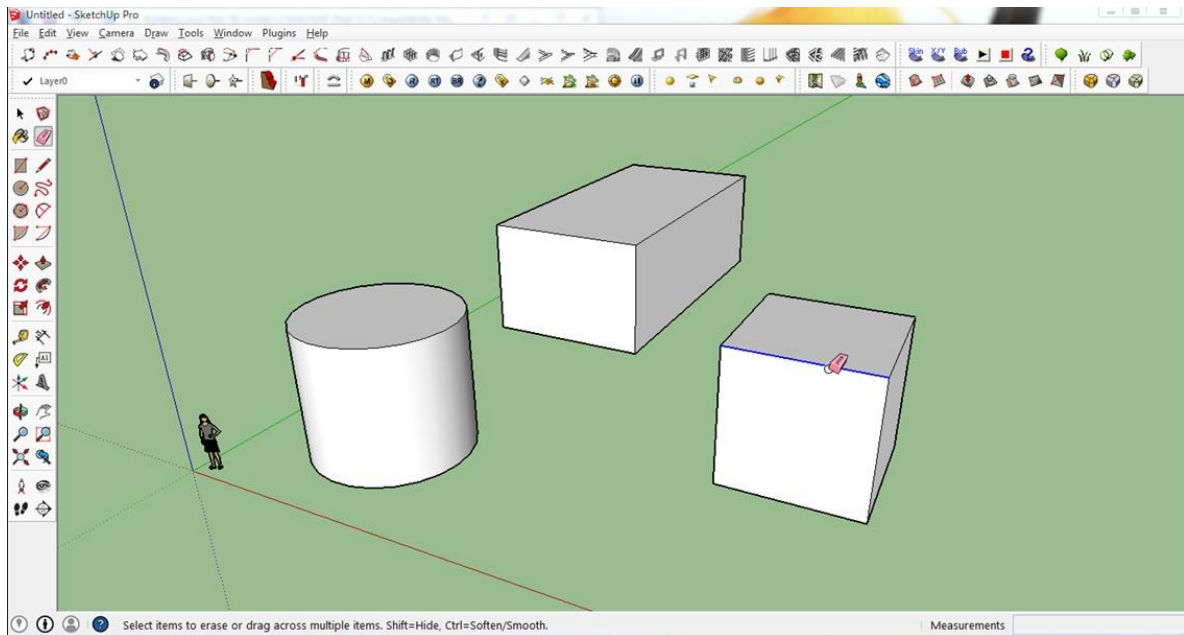
- To create a copy of your object, select it again (as seen just above).
- Press Ctrl on your keyboard to create a copy of the model.
- Left-click again to place the copied model in the desired location



Erase Tool:

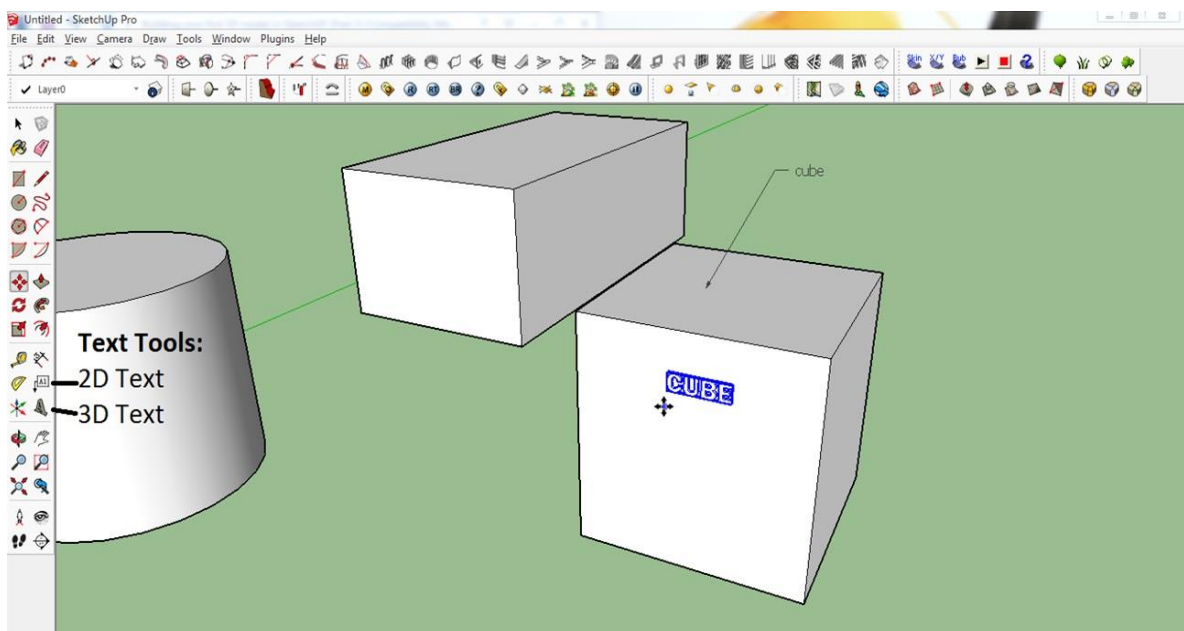
This tool works like a basic eraser: it erases lines or planes you have created.

- First click on the Eraser tool on the toolbar
- Once the eraser icon appears, click on the lines you want to erase (you can also select a line with the Select tool and then hit the delete button)



Text

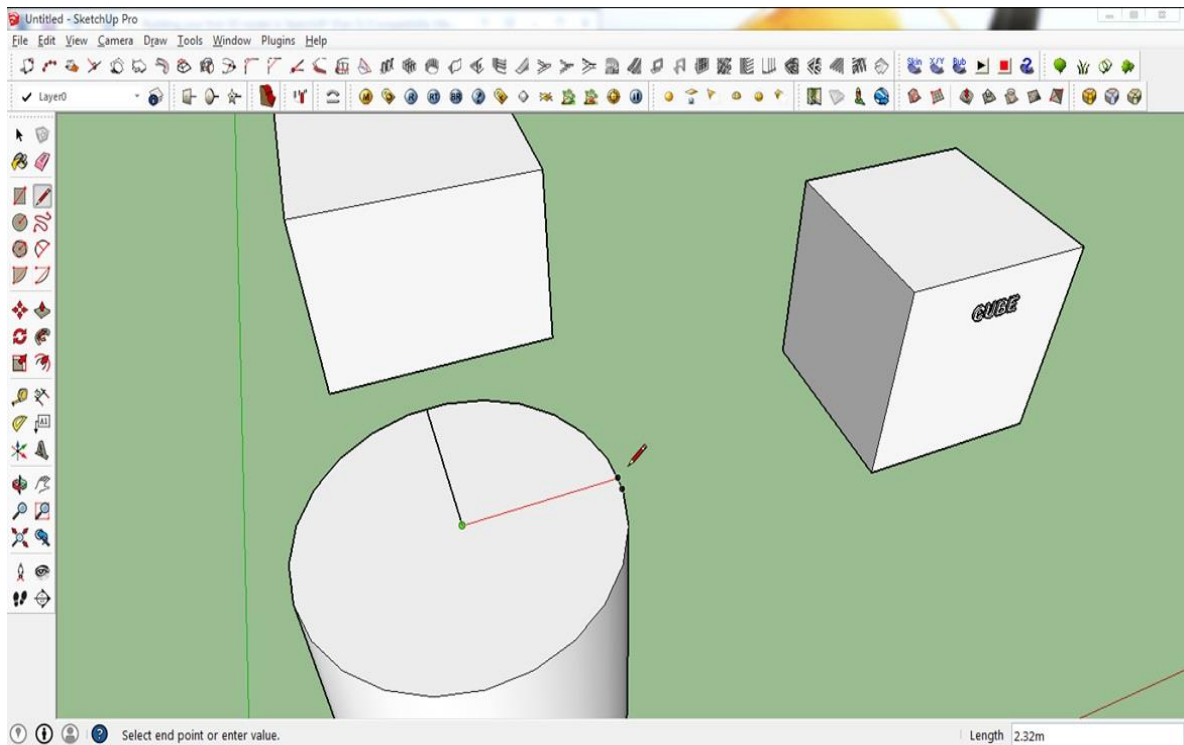
- The 2D text tool allows to calculate base areas of planes and to place labels. In the picture below it was used to label the object as a 'cube'. The arrow indicates which object was labeled.
- The 3D text tool actually creates the text as a 3D object that is part of your design. As always, it makes sense to simply play around with these two tools.



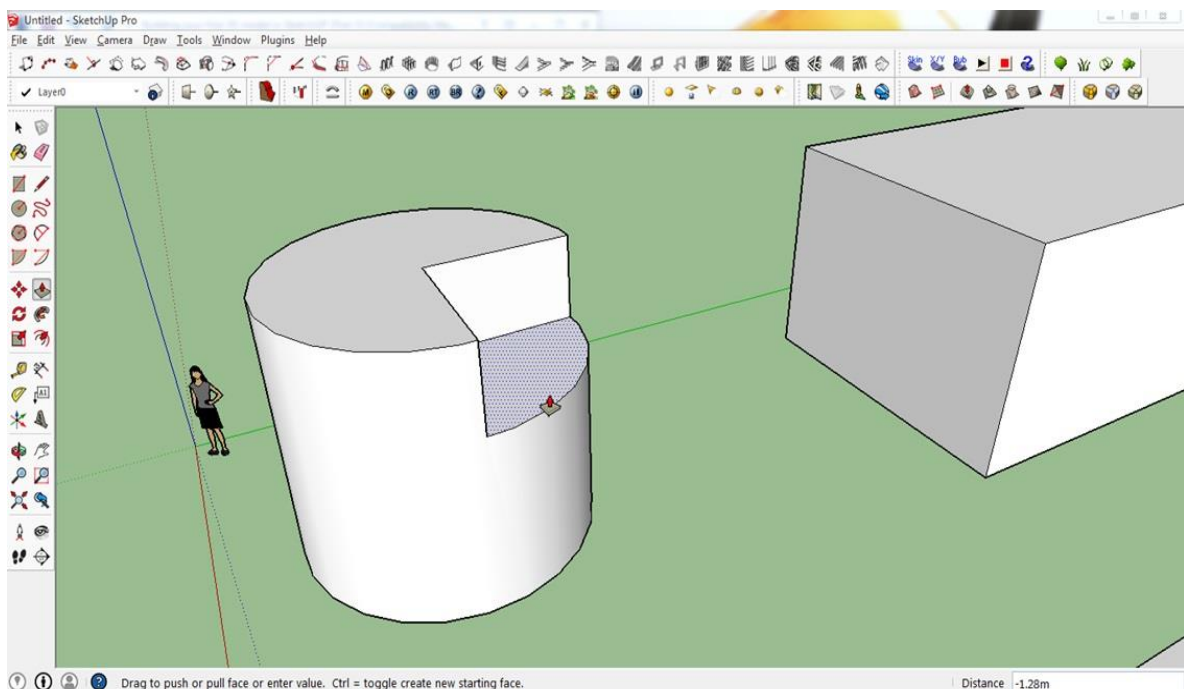
Basic Cutting

This tool allows you to cut or eliminate a section of your model. To show you how to use this tool, we used the cylinder.

- Click on the Pencil tool in the toolbar to draw a line (we used this tool at the beginning of the tutorial)
- For this tutorial, make a line on three points of the surface of the cylinder. Mark the first at any point on the edge of the top surface of the cylinder. Second, make a point in the center and third, make a point that aligns to the red axis

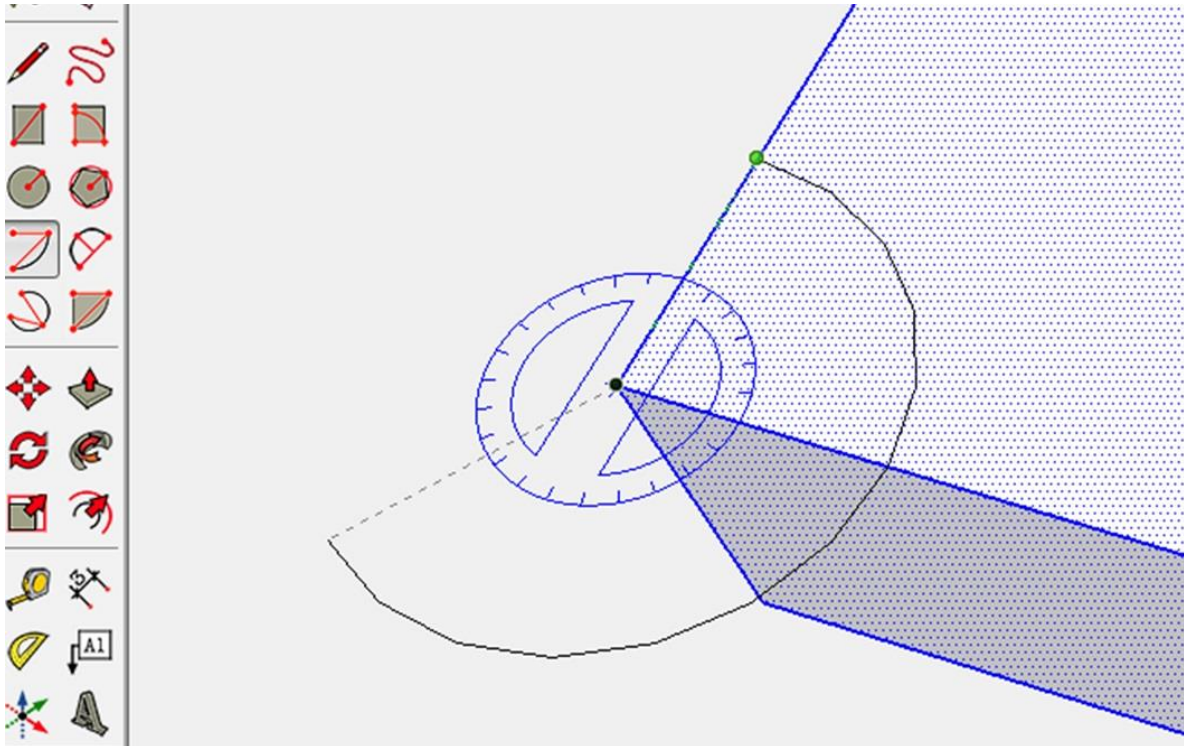


- Click on the Push/Pull tool on the toolbar
- Click on one half of the top surface of the cylinder and push it downwards to create the cut and click to finalize.



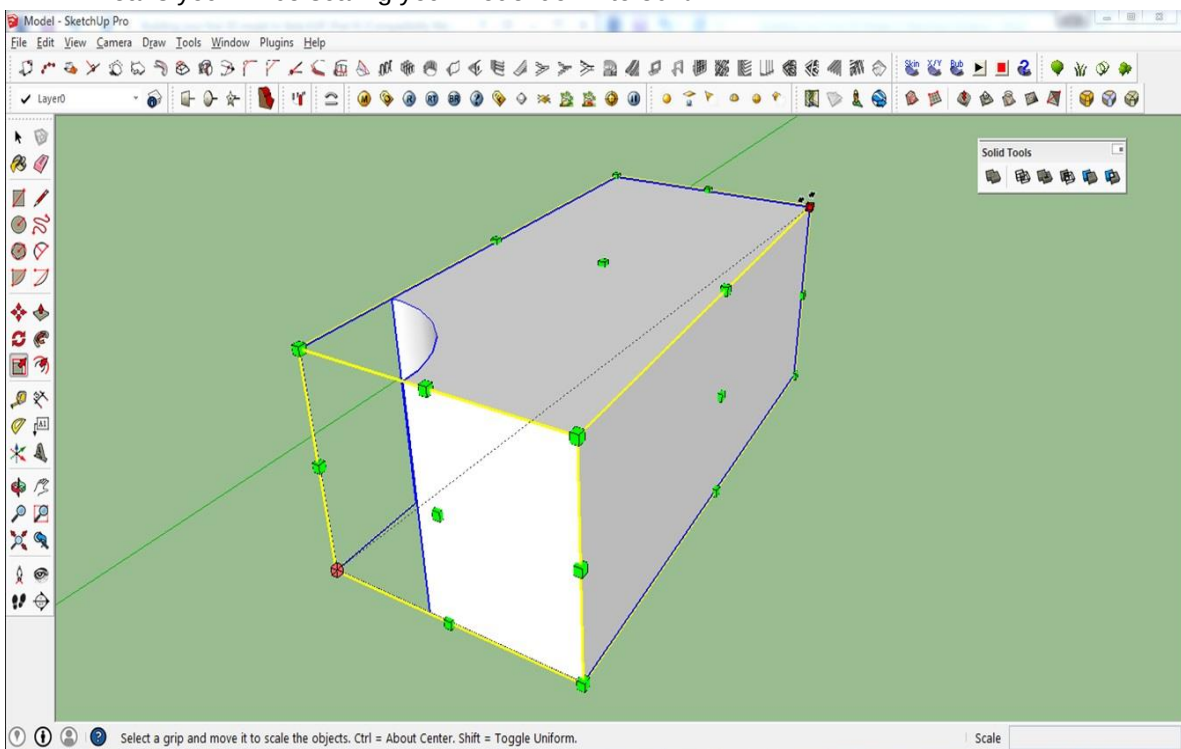
Drawing an Arc

- After selecting the tool, click on one of the corner points of a cube. Then click somewhere on one of its top axes and draw an arc.
- After having drawn your arc, use the Pull/Push tool to cut this part off.



Scaling and Stretching

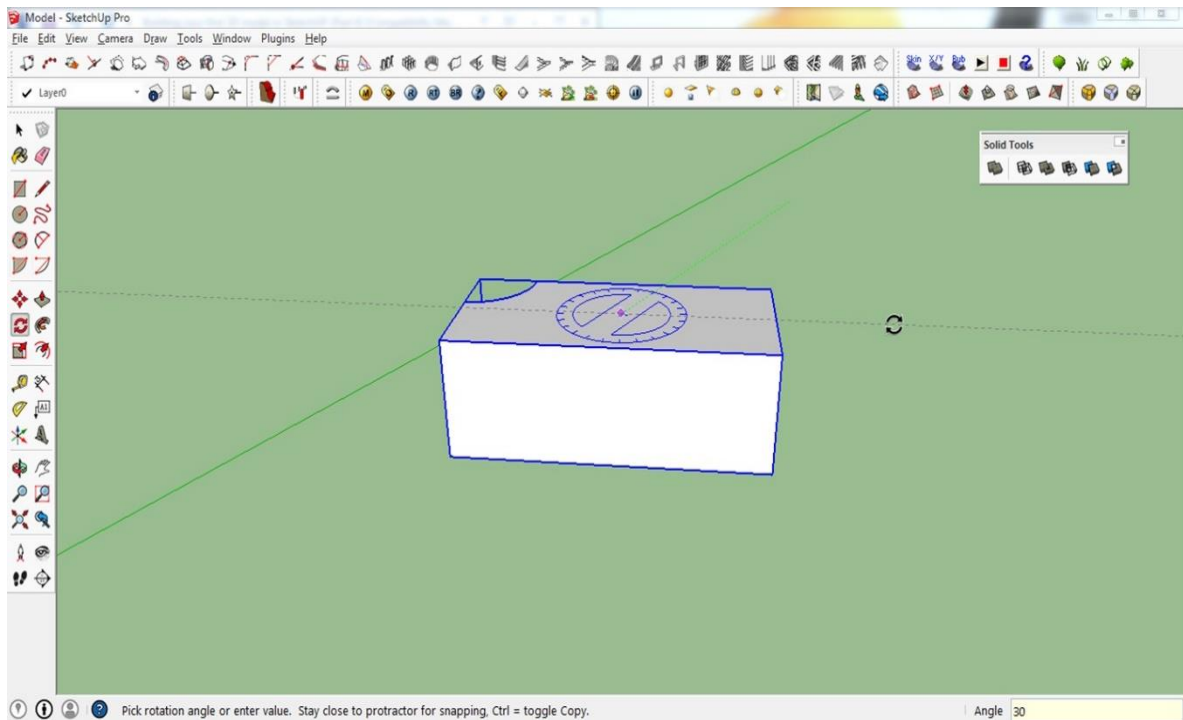
- This tool allows you to adjust your model accordingly or to the desired scale.
- To use this tool, simply select your model first and click on the **Scale** tool on the right or press S on your keyboard. This will show you the different scaling points you can use. You can scale and stretch the object by clicking on the green dots that appear.
- If you want to scale our model up or down while maintaining the ratio and proportion of our rectangular box (this is called uniform scaling) you need to click on one of the 8 corner points of the rectangular box.
- You will see the value of your scaling in the lower right corner of the window. A value of 0.50 means you will be scaling your model down to 50%.



Rotating

This feature is very useful when you experience orientation issues. This is when you have your model facing the opposite/wrong direction.

- First **select** the model you want to rotate and select the **Rotate** tool or press **Q** on your keyboard
- **Click** on the center of the top surface of the rectangular box to set your axis. Extend your cursor towards the green or red axis to select the baseline of your rotation
- Rotate the model to the desired direction or simply input an angle value. In this case, we entered **30°**



Activity 1:

Practice to set up a template for a building project with correct units, scales, and a custom title block.

1. Open Design Software

A screenshot of the 'File' menu in SketchUp Pro. The menu is open, showing options like New, Opens, Open Recent, Close, Save, Save &..., Save & Template..., Report, Add Location..., Import..., Export..., Generate Report..., Send to Layout, and Print... The 'Print...' option is highlighted.

2. Set Up Correct Units

A screenshot of the 'Model Info' dialog box in SketchUp Pro, with the 'Units' tab selected. The 'Units' section shows 'Format' set to 'Decimal', 'Length' set to '1/16inches', 'Precision' set to '1dpl', and 'Enable Length Snapping' checked. The 'Shop Length' is set to '1 mm'.

3. Set the Correct Scale

A screenshot of the 'Create' dialog box in SketchUp Pro. The 'Template name' field is empty. The 'Type' dropdown is set to 'Feet (1/4" = 1'-0")'. The 'Save' button is highlighted.

4. Create a Custom Title Block

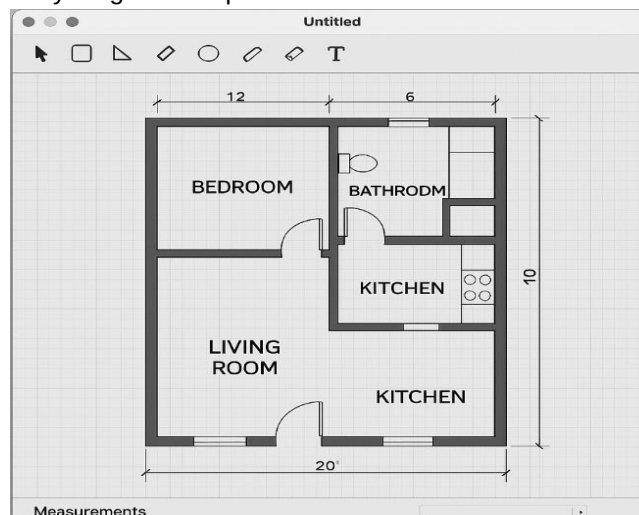
A screenshot of a custom title block layout. It features a 3D model of a person standing on a green ground plane. Below the model is a table with the following content:

PROJECT TITLE	
DATE	SCALE 1/4" = 1'-0"
CHECKED BY	DRAWN BY
CHECKED BY	CHECKED BY

Activity 2:

Practice to draw a 2D floor plan for a small structure, ensuring all dimensions meet the project's specifications.

- **Setup Your Workspace**
 - Open SketchUp and choose the “Plan View” (Top View).
 - Set the unit system (inches, feet, millimeters, etc.) via:
Window → Model Info → Units
- **Start with the Outer Walls**
 - Use the Rectangle Tool ®.
 - Click and type dimensions like:
20',30' → Press Enter
This creates a 20 feet x 30 feet outer rectangle.
- **Draw the Wall Thickness**
 - Use the Offset Tool (F).
 - Click on the outer rectangle and drag inward.
 - Type 6" (or 150mm) → Press Enter
(Standard residential wall thickness)
- **Divide Interior Spaces**
 - Use the **Line Tool (L)** to divide the space:
 - Bedroom: 12'x12'
 - Bathroom: 6'x8'
 - Kitchen: 6'x10'
 - Living area: remaining space
 - Use **Tape Measure Tool (T)** to mark guidelines and draw accurate internal walls.
- **Add Doors and Windows**
 - Standard Door width: 3'
 - Window width: 4', height: 3'
 - Use Rectangle Tool to cut spaces:
 - Make rectangles on the wall edges for door/window spaces
 - Use the Push/Pull Tool (P) if in 3D, or just mark spaces in 2D.
- **Label Each Room**
 - Use the Text Tool (T)
 - Label: Bedroom, Kitchen, Bathroom, Living
- **Add Dimensions**
 - Use Dimension Tool (D):
 - Click two points to show length (e.g., wall lengths, room sizes)
 - Ensure everything meets spec dimensions



Activity 3:

Practice to convert a 2D floor plan into a 3D building model with accurate height and depth.

➤ **Extrude the Walls of the 2D Plan**

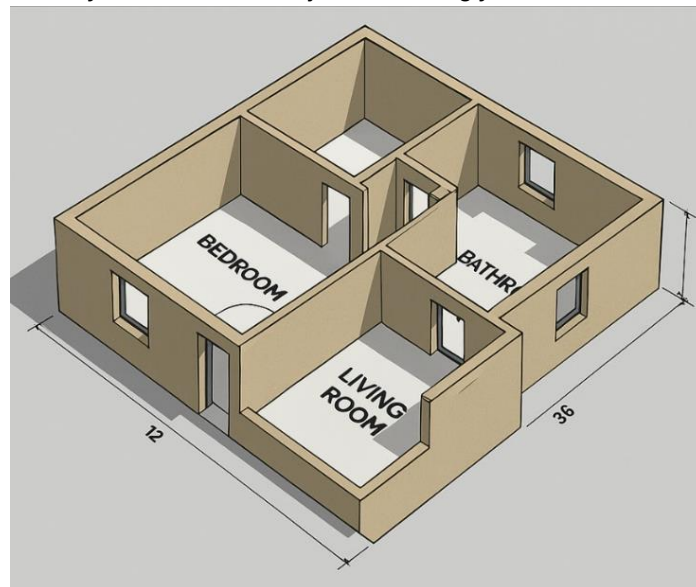
- Use Push/Pull Tool (P).
- Select inside the walls and pull them **upward**.
- Residential walls = 10 feet
- Commercial = 12+ feet

➤ **Create Openings for Doors and Windows**

- Use the **Rectangle Tool** ® to draw on the vertical faces of walls where doors/windows go.
- Standard sizes:
- Door = 3' wide x 7' tall
- Window = 4' wide x 3' tall
- Use **Push/Pull Tool (P)** to “cut” through the wall.

➤ **Add Doors and Windows (Optional)**

- Use prebuilt components:
- Window → 3D Warehouse → Search for “door” or “window”
- Place them in your model and adjust accordingly.



Learning Unit 3.2

Modify 3D Objects

Learning Outcomes:

After completion of this Learning unit trainee will be able to:

- Navigate 3D objects as per required job.
- Modify 3D objects in line with requirements.

3.2.1 Scaling and Stretching

Scaling

Resize an object uniformly or non-uniformly (stretch in one direction).

Tool Used:

- Scale Tool (S)

How to Use:

- Select the object or group/component you want to scale.
- Press S or click the Scale Tool.
- You'll see a bounding box with green handles.
- Click and drag a handle:

Remember

Type real dimensions too, e.g., 10' to scale to an exact size.

- Corner handles scale in two or more directions.
- Edge/face handles scale along one axis.
- Hold Shift to scale uniformly (same ratio in all directions).
- Type a value like 1.5 (150%) or 0.5 (50%) and press Enter.

Stretching

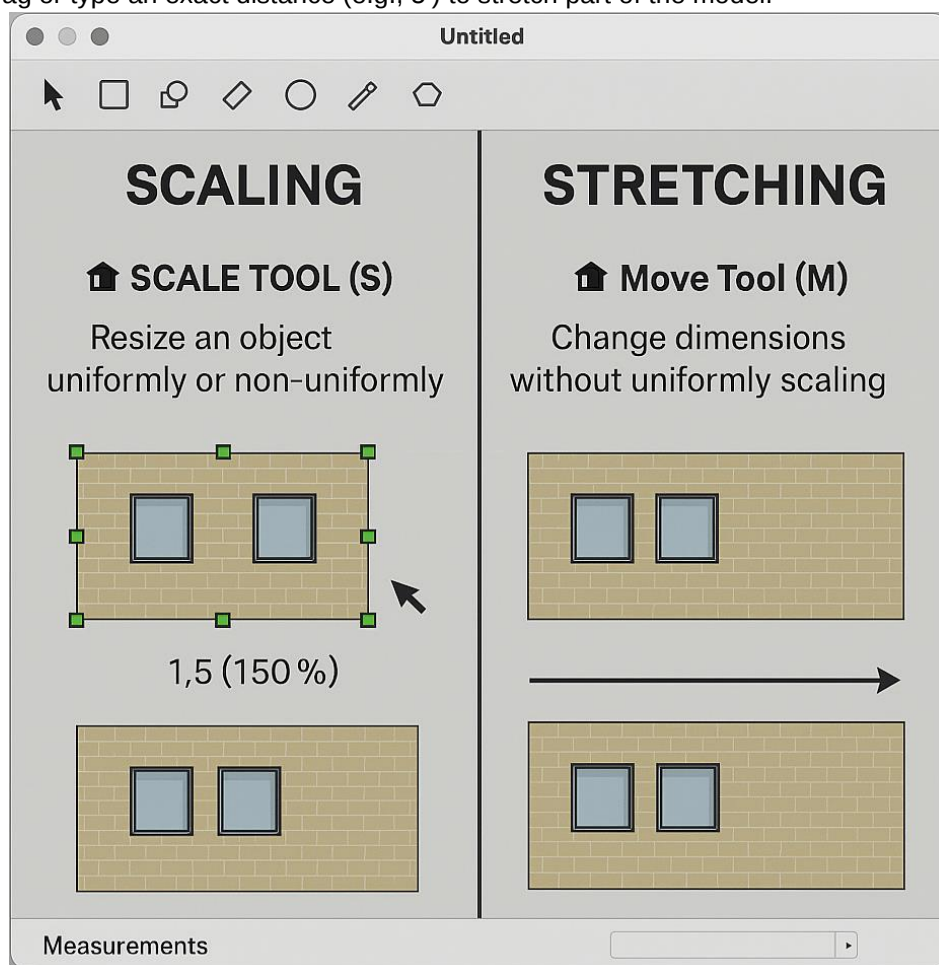
Change dimensions without uniformly scaling everything (e.g., make a wall longer but keep windows the same).

Tools Used:

- Move Tool (M)
- Selection Tool

How to Stretch:

- Use Select Tool and choose only the geometry (edges, faces) you want to move.
- Use the Move Tool (M).
- Grab from a fixed point (e.g., an endpoint or edge).
- Drag or type an exact distance (e.g., 5') to stretch part of the model.



3.2.2 Scale and paper sizes

Once the paper size is set, you can set the scale of your SketchUp model in Layout.

Steps for Setting the Scale in Layout:

Select a Viewport:

- Click on the viewport that contains your model in Layout.
- A viewport is an area where your SketchUp model is displayed in Layout.

Open the SketchUp Model Dialog:

- With the viewport selected, the SketchUp Model toolbar will appear on the right side (or under Window > SketchUp Model).

- Set the Scale:
- In the SketchUp Model dialog, you'll see an option labeled Scale.
- Use the dropdown menu to select the scale you want for your model (e.g., 1:50, 1:100, etc.).

Tip: The scale you choose determines how your model will appear on the page. A scale of 1:100 means that every 1 unit in your model will be represented as 100 units on paper.

Adjust the View:

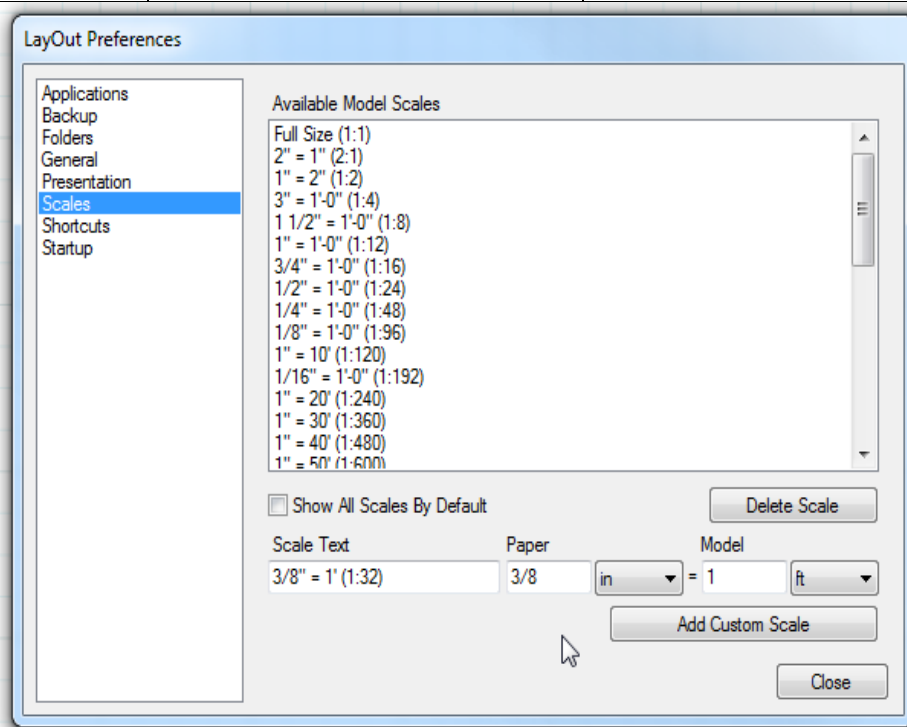
- After selecting the scale, you may need to adjust the zoom or positioning of your model within the viewport to make sure it fits well on the paper. You can do this by resizing the viewport or adjusting the model's view.

Model Space:

- You always model full size (1:1 scale).
- E.g., a 10' wall is drawn as 10 feet, not scaled down.

Common Architectural Scales

Scale Type	Metric Equivalent	Imperial Equivalent
1:50	1 cm = 0.5 m	$\frac{1}{4}" = 1'-0"$
1:100	1 cm = 1 m	$\frac{1}{8}" = 1'-0"$
1:20	1 cm = 0.2 m	$\frac{3}{4}" = 1'-0"$
Full Scale	1:1	1" = 1"



Paper sizes

Paper size settings are done in **LayOut**, the companion application for presentation and printing.

Steps for Paper Size in LayOut:

Open LayOut:

- After creating your model in SketchUp, go to File > Send to Layout. This will open your model in LayOut.

Choose a Template:

- When you open a new LayOut document, you'll be prompted to select a template.
- Choose a template that corresponds to your desired paper size, such as A4, Letter, A3, Tabloid, etc.
- You can also select a custom template if you need a specific paper size.

Adjust Paper Size:

- If you want to customize the paper size further, go to File > Document Setup.
- Under the Paper tab, you can select from standard sizes like A4, A3, or Letter.
- You can also set a custom size if you need something specific (such as a custom sheet for printing).

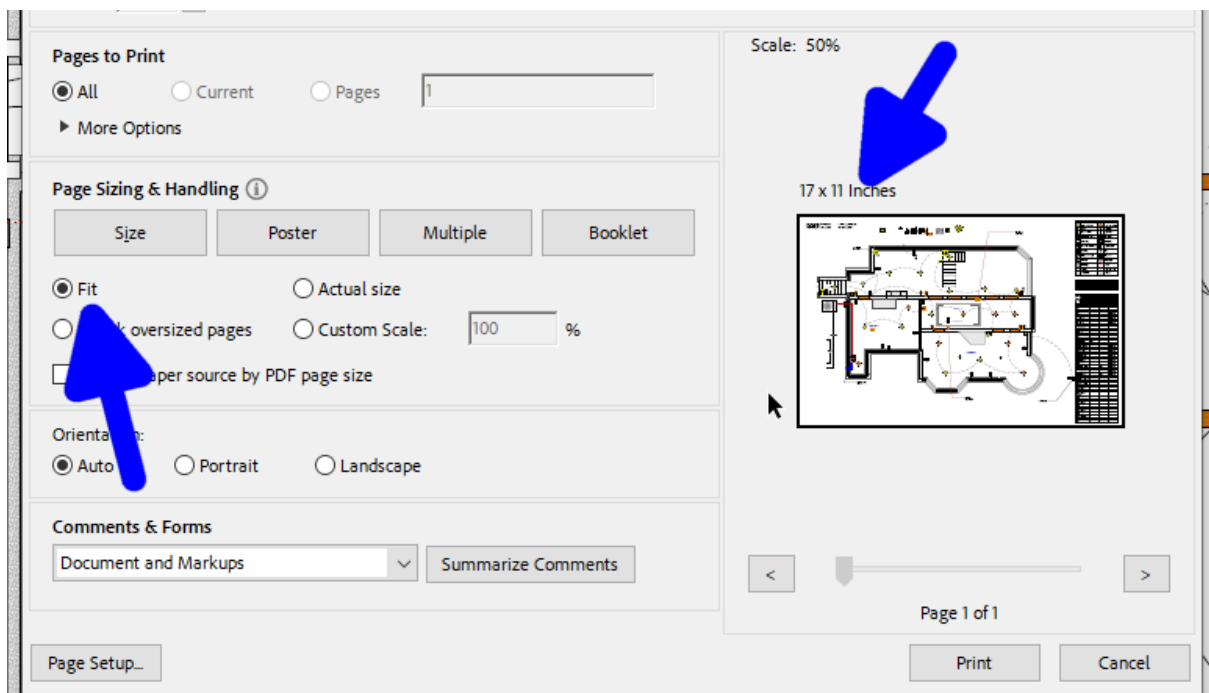
Modify Page Orientation:

- You can set your layout page to Portrait or Landscape depending on the orientation you want for printing.

Paper Space (LayOut or Print View):

- You set scale when exporting/printing (e.g., 1:50, 1/4" = 1').
- Used in SketchUp LayOut or via Print Preview if printing directly.
- Paper Sizes for SketchUp (in LayOut or Print)

Paper Size	Dimensions (mm)	Dimensions (in)	Usage
A4	210 x 297	8.3" x 11.7"	Small prints, reports
A3	297 x 420	11.7" x 16.5"	Medium-size plans
A2	420 x 594	16.5" x 23.4"	Detailed architectural
A1	594 x 841	23.4" x 33.1"	Large presentation sheets
A0	841 x 1189	33.1" x 46.8"	Full-size detailed plans



Activity 1:

Practice to inspect a 3D model from various angles, zoom into detailed areas, and reset to a standard view.

Activity 2:

Practice to modify an existing 3D model by resizing, rotating, and adjusting features such as chamfers and fillets.

Learning Outcomes:

After completion of this Learning unit trainee will be able to:

- Create/assign specified materials and textures to 3D Model.
- Edit materials/textures to get realistic outcome.

3.3.1 Material and Texture

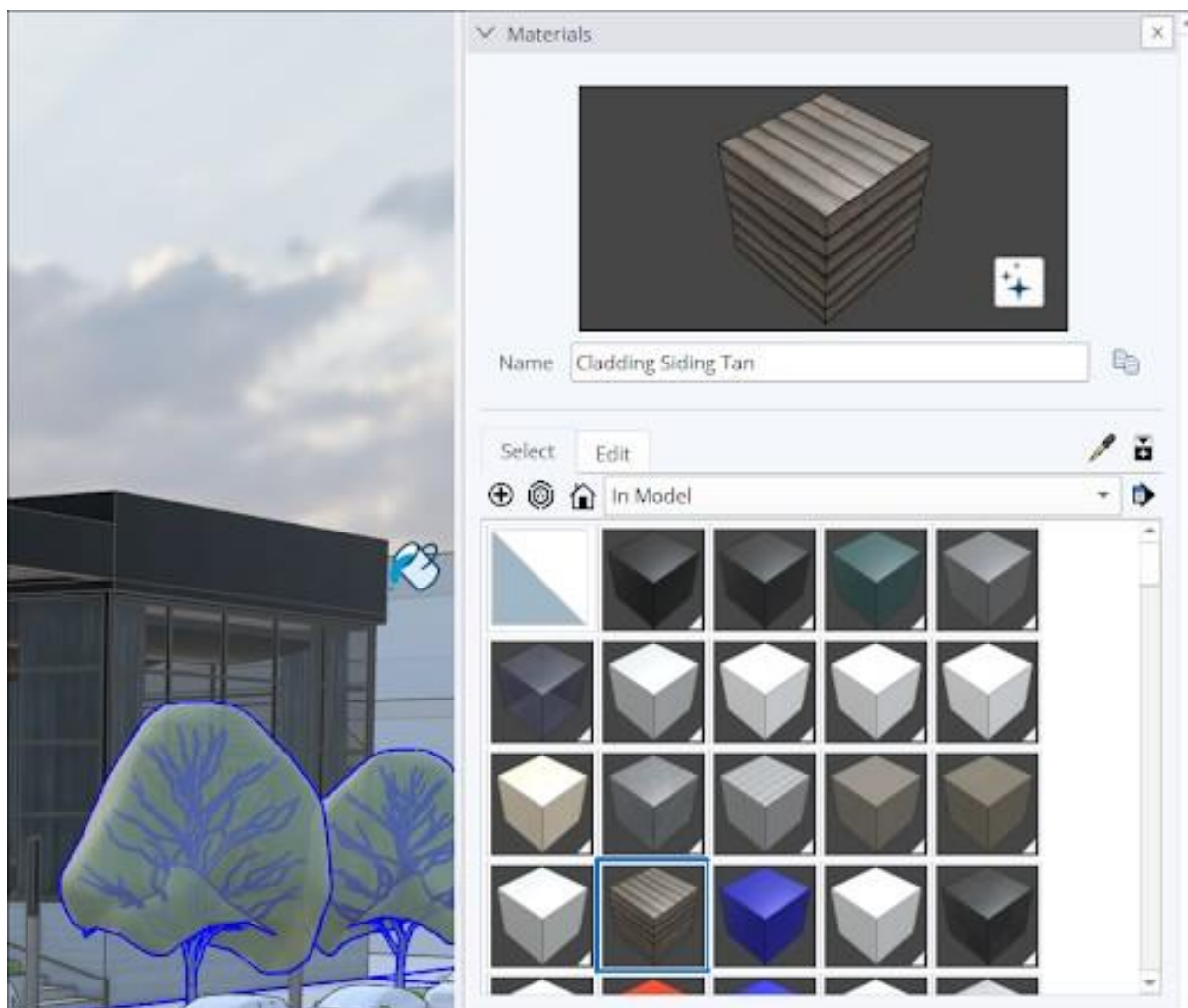
SketchUp's default materials support Physically Based Rendering (PBR) texture maps. These materials can simulate the physical properties of surfaces like roughness or metalness. That means materials can be basic, like a color with some transparency, or as specific as you want them to be, like a Mediterranean flooring tile with deep grout lines. You can keep it simple and choose to paint a basic color to represent a surface (white for kitchen counters, gray for sinks). Or you can choose richer materials that simulate design elements like textured paint on an interior wall or the finish of wood paneling on the floor.

Do you Know

The Shaded face style will just show color, while the Photoreal Materials face style will show all the details of a material.

Materials Panel:

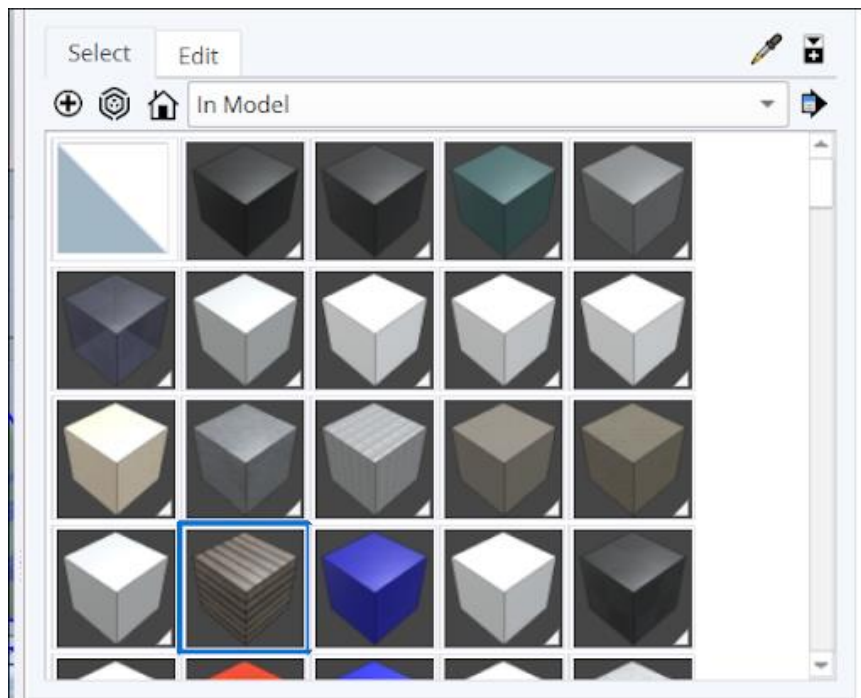
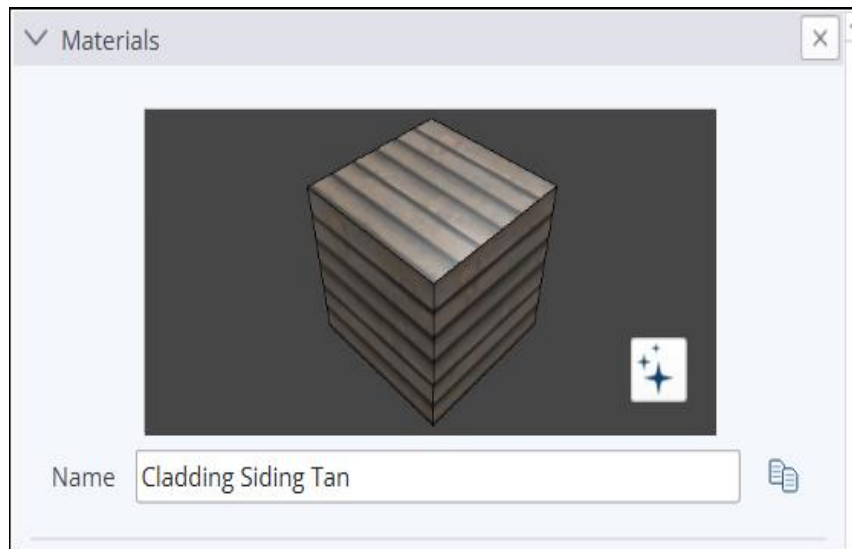
- The Materials panel helps you find, manage, and even create materials for use in your SketchUp models.



The top of the window will show a preview of the active, selected material and that material's name. To duplicate this material and create a unique copy of it click Copy.

Select

The Select tab is where you view and manage the materials in your model. You can also browse for new ones in SketchUp's default material libraries using the dropdown menu, and even add materials found in 3D Warehouse.



The following additional features and options are available on the Select tab:

Create Material Opens the Create Materials window. See Creating Materials for more information.

3D Warehouse Launches 3D Warehouse to SketchUp's full materials library. 3D Warehouse is a great way to find and use even more materials for your designs.

In Model Resets the panel to show materials in the current model.

Sample Paint Activates the Sample tool. Click on any face in your model to "sample" its material, allowing you to paint that material to another entity.

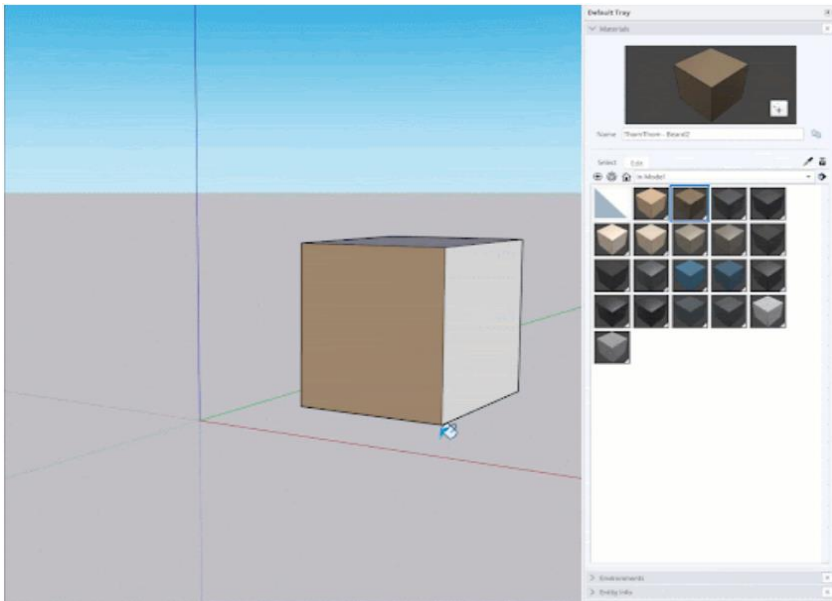
Applying Materials:

- Learn how to apply a material using the Paint Bucket tool and the Materials panel.
- (Optional) You can pre-select the faces and edges you want to apply the material to.
- Open the Materials panel or activate the Paint Bucket tool. The default shortcut is B for Bucket!
- On the Select tab, browse and select a material

- If you pre-selected faces or edges, SketchUp will apply the material to your selection.
- If you didn't pre-select anything, click the face or edge you want to apply that material to.
- SketchUp applies the material to your selection.
- To restore a face to the default colors, use the Default option listed at the top of the in-model library

Do you Know

Pressing Alt while using the Paint Bucket tool activates Sample. While activated, you can click to sample any material already in your model and click on another face to apply it to another face.



Remember

Styles can prevent faces, the back of faces, or edges in your model from showing applied materials. Check your style settings if your material isn't appearing as expected.

You can also apply materials to a group or component. Pre-select multiple objects, or click one object at a time to paint it or to any geometry within a group

Replacing a Material:

A guide to replacing a material in your model with another material using the Materials panel.

By replacing one material with another you can experiment with different materials in your designs without having to pick each face or group one by one. The Paint Bucket tool can help you achieve this through its optional tool modes:

All Matching: Applies the material to all faces in your model using the same material as the entity you click to paint.

Example: Multiple buildings in your model use the same material on external walls. Activating All Matching and replacing a material on one external wall will change the material on each of them.

All Connected: Applies the material to all faces using the same material connected to the selected face.

Example: A countertop and backsplash are connected faces in your bathroom model. The bathtub uses the same material as both, but you want to see what they would look like with a different material without changing the bathtub. Activating All Connected and replacing the material on the countertop will also change the backsplash but not the bathtub.

All on Same Object: Applies the material to all faces using the same material within the same group or component as the selected face.

Example: A living room model contains two identical chairs. The cushions in the chairs aren't connected faces but all share the same material. You would like to see what one would look like with different colored cushions. Activating All on Same Object and replacing the material on the cushions on one chair will not change the other.

Icon	Function	Windows Shortcut
	All Matching	Shift
	All Connected	Ctrl
	All on Same Object	Ctrl+Shift

Create Your Own Materials:

Learn how to create a material using your own images.

SketchUp's material libraries offer a variety of useful materials that you can add to your models. To meet your design intent, you may need to create materials using 2D image files as a starting point.

To create a new material from your own files or color codes open the Materials panel and follow these steps:

On the Select tab, click **Create New Material**. The Create Material dialog will open.

Type a name for the new material in the text field.

Use the color wheel to choose a color.

To use an image, add, select **Use Texture Image**.

In the File Explorer window that appears locate and select an image file.

Adjust the texture size and opacity. If you have corresponding texture maps for your image texture, you can add and adjust them here.

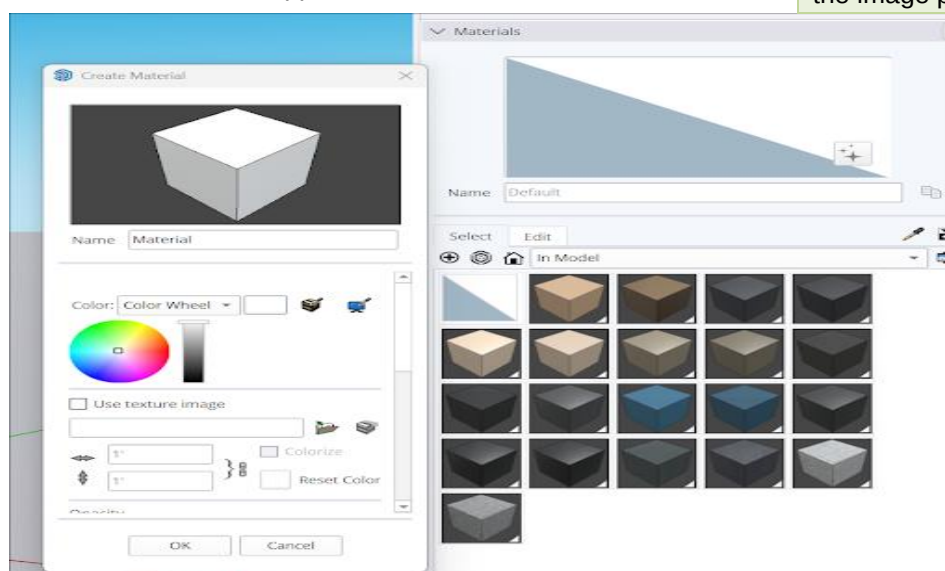
Click **OK**. Your new material will appear selected in the In Model collection.

Do you Know

Before you create a new material, try searching 3D Warehouse! Materials for almost everything you can think of are available for download.

Remember

If you want to add texture maps so that your material can react to environments, click Generate Textures in the image preview.

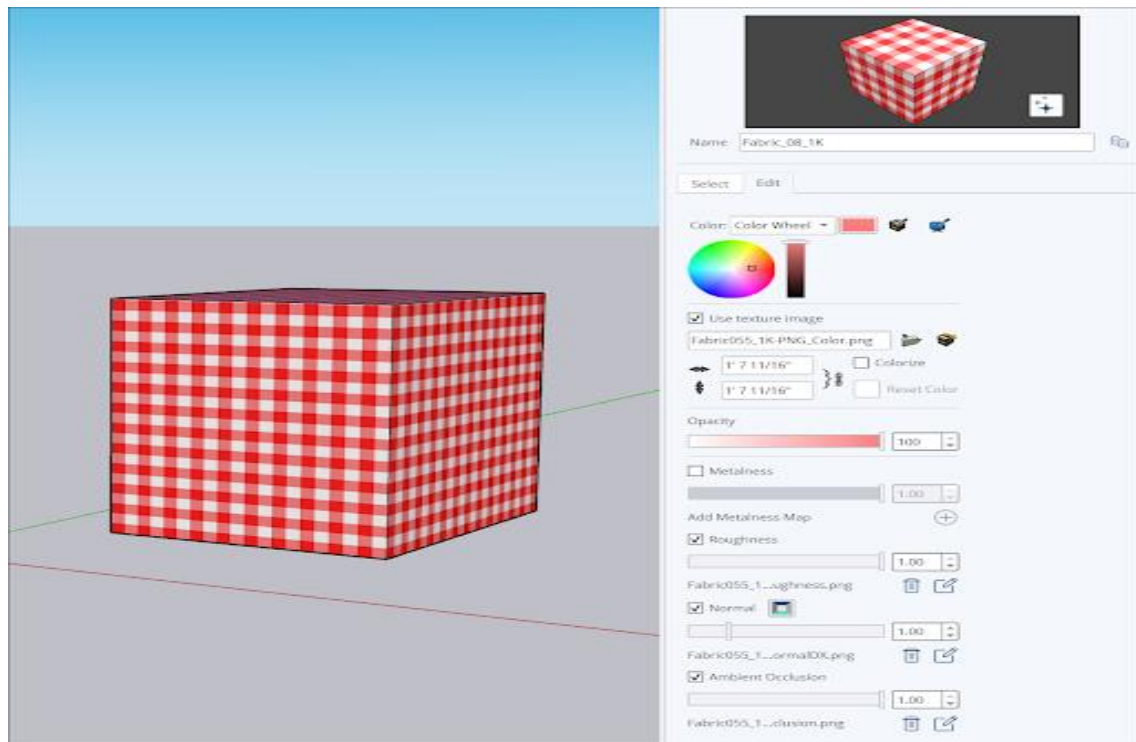


Editing Materials:

Each material is fully customizable. Learn about the options available in the Edit tab of the Materials panel and how to use them.

The Edit tab of the Materials panel provides plenty of options to adjust materials to better suit your intentions or desired look and feel.

The Edit options are:



Material Name: Change the name of your material.

Color: Customize the color of your material using a color wheel or RGB, HSL, or HEX values. As you make changes, you can see them in real-time in the modeling window. Click **Reset Color** to revert your changes, if needed.

Image options: Add or change an image texture by choosing a 2D image from your file system. Use the fields provided to adjust the size of the texture tile used

in the material. When you type in a value, SketchUp will preserve the image's aspect ratio. Click the chain icon if you need to distort the image texture aspect ratio. You can also edit your texture image in an external editor such as Adobe Photoshop. (Go to *Preferences > Applications* to designate an image editor).

Opacity: Edit how transparent or opaque the material is. Use the slider or type in a value to change this setting. 0 is fully transparent, and 100 is totally opaque.

Photoreal textures: Photoreal textures and their settings can convey more detail and create more dynamic lighting effects when using an environment:

Metalness: determines how shiny your material appears when reflecting light. A higher value means your material will have a stronger, more colorful reflection.

Roughness: determines how smooth or bumpy the surface of your material appears when reflecting light. A low value means the material appears more polished. A high value would produce a more matte style of reflection.

Normal: uses a normal texture map to simulate detailed surface geometry when reflecting light. A higher value provides the illusion of depth without changing the geometry of your face.

Remember

Materials must be applied to an entity in your model and appear under the In Model collection for the Edit tab to be available. Then, switch over to the Edit tab in the Materials panel.

NOTE

Not all Styles utilize photoreal materials and environments. Make sure your selected Style uses the Display Photoreal Materials face style.

Ambient Occlusion: adds depth and realism by simulating how light interacts with surfaces, notably on edges and when entities are close together. A higher value adds a higher degree of darkening, mimicking natural shadows. This texture requires a dedicated texture map.

Generate Textures:

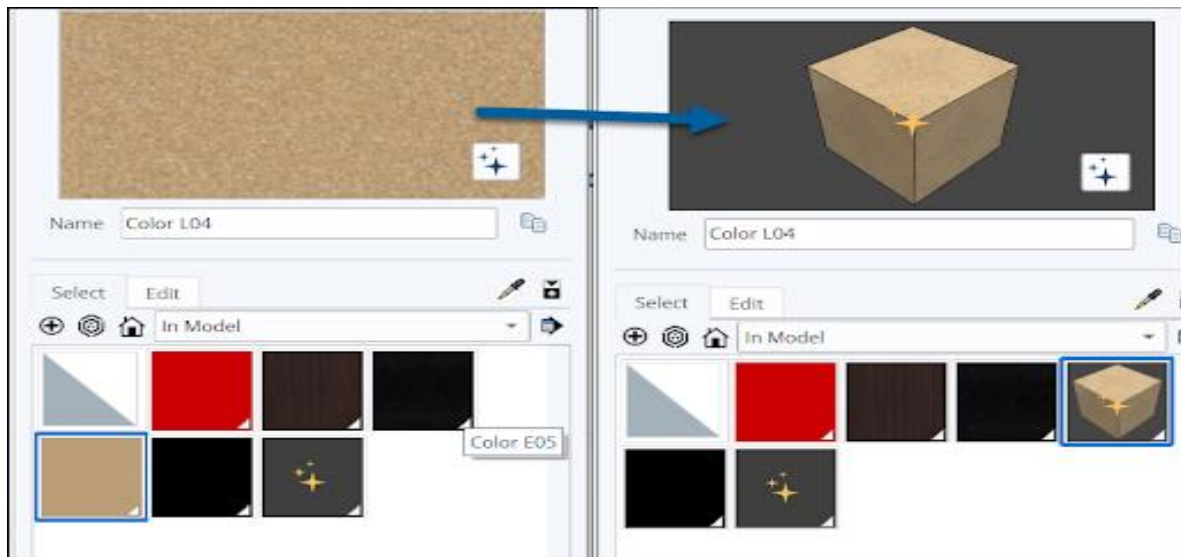
- An AI service that helps transform a basic material into a photo real material by creating and adding more textures.
- With Generate Textures, SketchUp can help you create Physically Based Rendering (PBR) texture maps for materials that don't have them. With the help of AI, SketchUp will analyze your material and create corresponding texture maps for Metalness, Roughness, Normal, and Ambient Occlusion.

NOTE

If you have activated the Photoreal Materials face style, the appearance of the material you generated textures for will also change in the modeling window Face Styles.

To generate texture maps for a material:

- Open the Materials panel and find the material you want to enhance or sample the material in your model.
- In the Edit tab, a preview of the material appears with Generate Textures in the lower right.
- Click the icon to begin texture generation. This can take a few seconds.
- Once SketchUp assigns the material texture maps, the preview will change to a cube. A gold sparkle symbol will appear on the cube representing the material to help show the Generate Textures feature was used.



After generating textures, you can adjust the material's appearance by editing the metalness, roughness, normal, or ambient occlusion values.

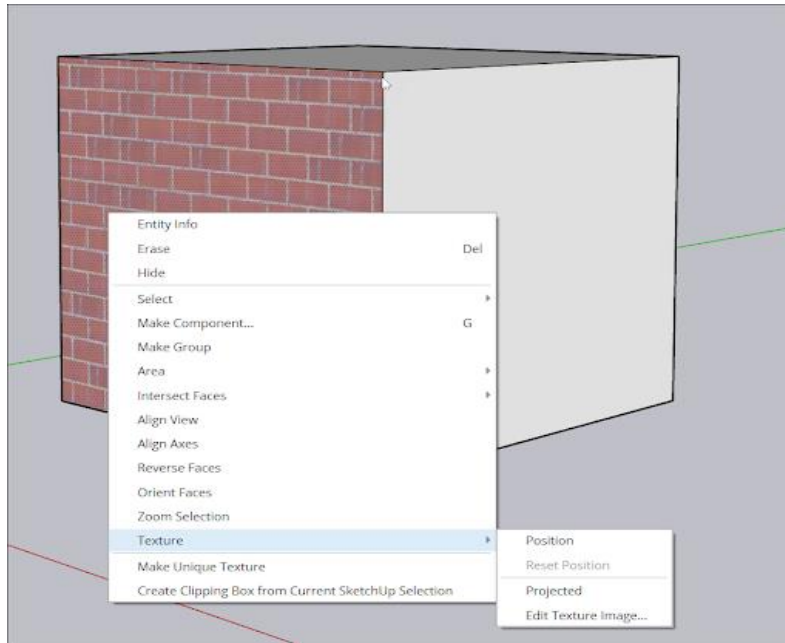
Remember

You can always undo, or click the icon again, and SketchUp will generate new texture maps.

Positioning Textures:

After you apply a material with an image texture to one or more faces in a 3D model, you can adjust how that texture displays on a face.

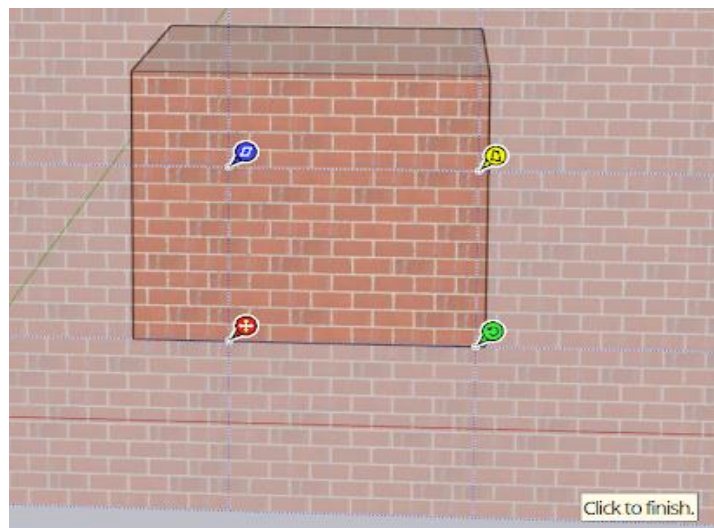
To change the position of a texture, context click the face with the material and select Texture > Position.



A grid appears distinguishing multiple tiles of the image texture. Each of the four colored pins manipulates the texture in a different way:

- The green pin scales or rotates. Most of the time you will be using the green pin to fine-tune the scale of a texture or make sure it is oriented in the right direction.
- The red pin moves.
- The blue pin scales or shears.
- The yellow pin distorts.

Drag each pin to change the position of the texture. Right click on the grid for transformation options like flip, rotate, reset, and Free Pin mode, or to exit. When you are finished, you can click anywhere outside of the grid.

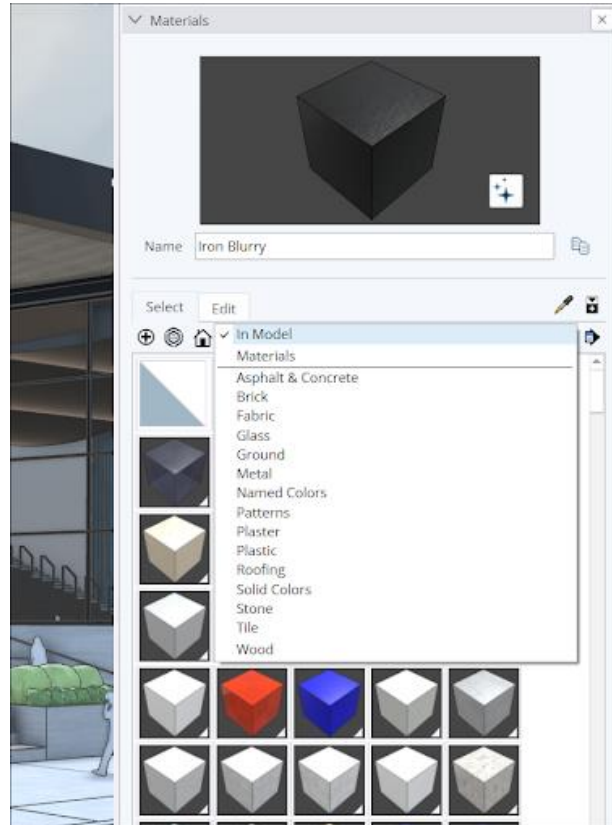


If you switch to Free Pin mode, the pins turn white and can be moved to adjust the corners of the texture, allowing to directly scale the texture swatch to geometry in a model. For instance, you can use free pins to scale a picture of a door directly to the four corners of a door in a model.

Managing and Organizing Materials:

The Materials panel provides all you need to track the materials used in your model, clear out unwanted materials, and manage or create collections. The Materials panel provides options to help you find and organize materials. If you want to see materials used in your current model, select **In Model** from the list or click Home. You can create a collection for a specific project, custom materials that you create, a specific color scheme, themes, and more. On the Select tab, click the Details arrow.

To add a frequently used collection to your favorites, go to the Select tab, click Details.



You can also remove materials from your model or from a collection. Removing unused materials can help improve performance. To remove materials:

One Material: Context click the material you wish to remove and select **Delete**.

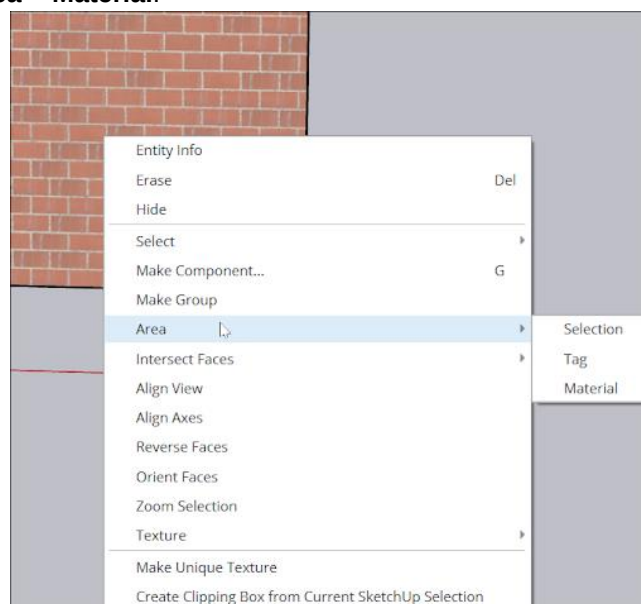
Unused Materials: Select **In Model** from the list of collections and click Details. From the available options select **Purge Unused**.

All Materials: Select **In Model** from the list of collections and click Details. From the available options select **Delete All**.

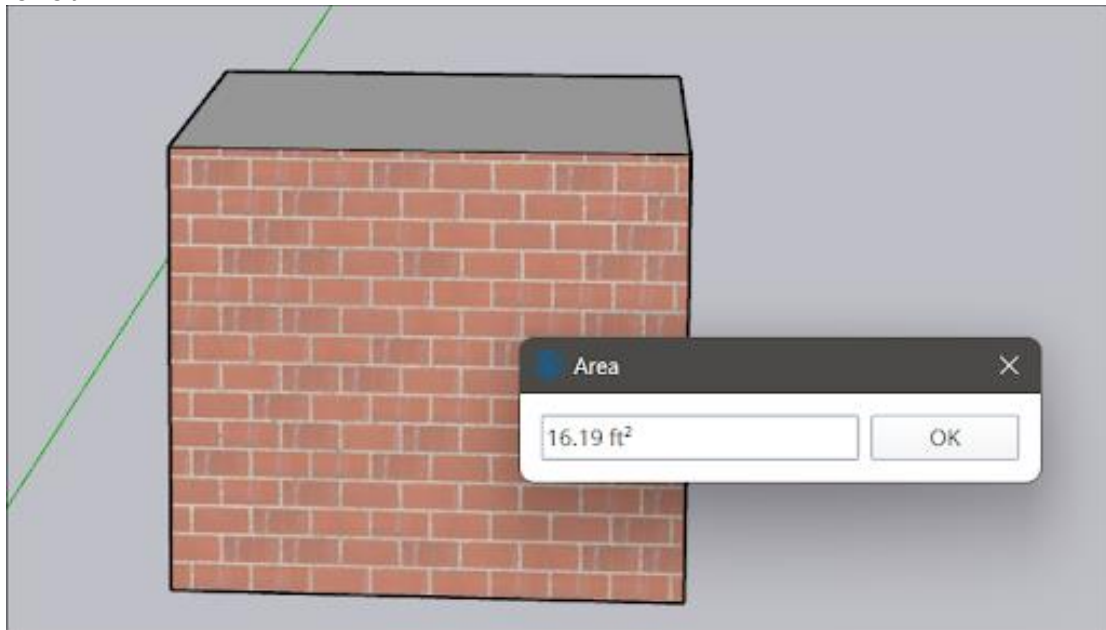
Calculating Material Area:

The Materials panel can help you calculate the surface area painted with each material you use.

If you want SketchUp to calculate the surface area painted with a material, you can context-click the material and select **Area > Material**.



An Area dialog box shows the total area of faces to which the selected material is applied. The units used depend on the units specified in your template. See Model Templates for details about changing your default units.



Importing and Using 2D Images:

You can import and use 2D images in a SketchUp model in a variety of ways:

- **Import an image as its own image entity.** An image entity is similar to a face and can be rotated or resized.
- **Import an image as a texture.** Importing as a texture allows you to apply that image to a face in your model and also creates a material for that image.
- **Import the image as a matched photo.** Importing an image as a matched photo enables Matched Photo mode. For more information, see Matching a Photo to a Model.

Remember

In Windows, you can also context-click the material in the Materials panel, and select Area from the menu. If the Area menu item is grey, the material isn't applied to any faces.

Image Entities

To import an image as an image entity:

- Select File > Import.
- In the import dialog, locate the image file on your device and select it.
- Select Use As Image.
- Click Import. The image entity will appear in your model.
- Click where you want to place the first corner of the image in your model.
- As you move your cursor the image will grow or shrink. Clicking again places the opposite corner and determines the size of the image.
- Use the Move, Rotate, and Scale tools to adjust the image as needed.

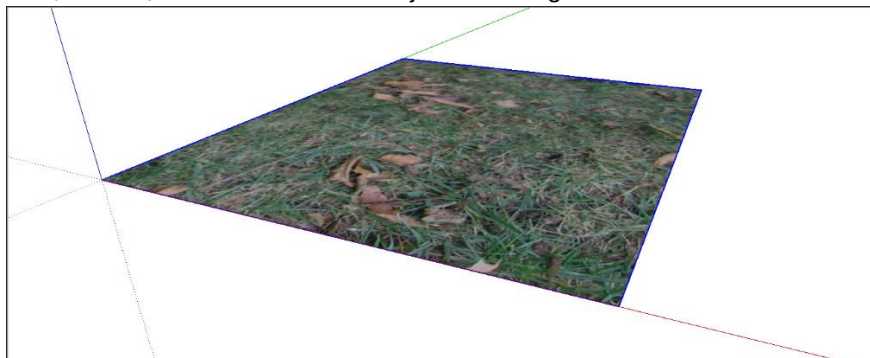
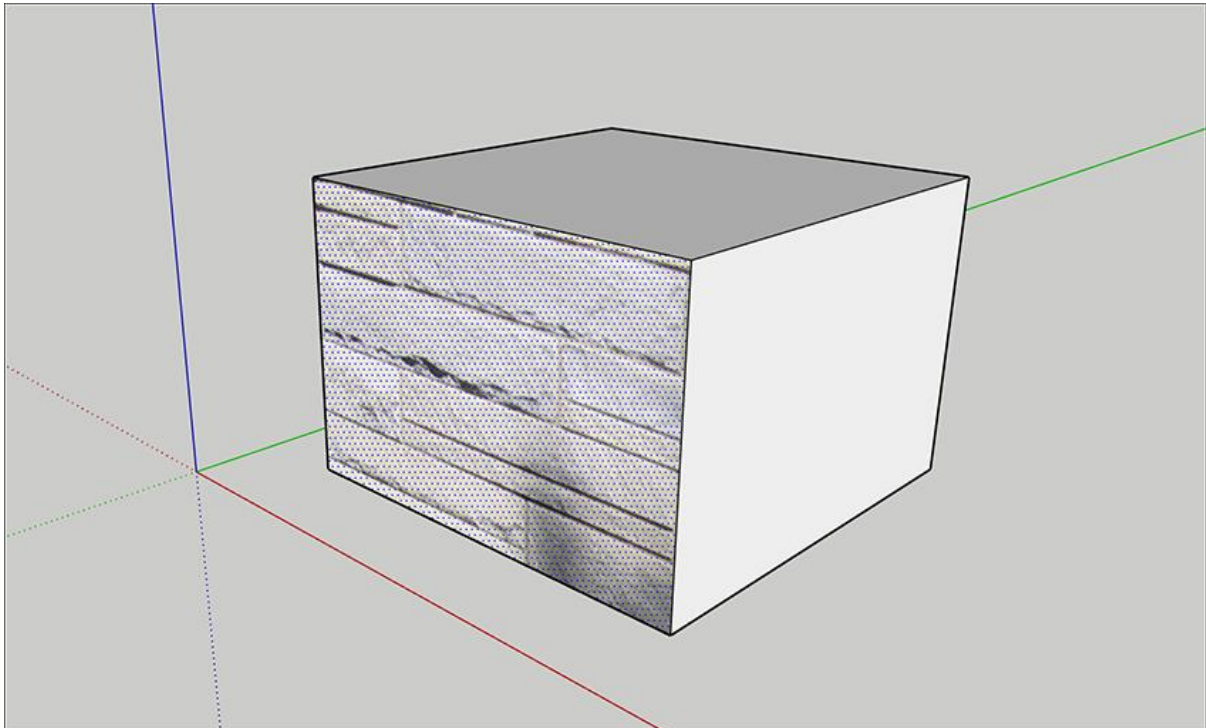


Image Textures

- Select File > Import.
- In the import dialog, locate the image file on your device and select it.
- Select Use As Texture.
- In your model, select the location on the face where you want to apply the image as a texture.
- As you move your cursor the image will grow or shrink. Clicking again places the opposite corner and determines the size of the image.
- Click again to apply the image as a texture. If you only covered a portion of the face, the image will tile to fill out the rest of it.
- To further edit how the texture appears on the face, see Applying Materials and Editing Materials.



Tracing an Image

Tracing an imported image is an easy way to create a floorplan in SketchUp you can turn into a 3D model, or a good way to trace a 2D design that you want to place somewhere. To start tracing an image:

- Import your image into SketchUp.
- Click where you want to place the top-left corner of the image, and click again to place the lower-right corner, which scales the image.
- (Optional) Select **Camera > Standard Views > Top** to get a top view of your image. You may want to enable Parallel Projection.
- Select a drawing tool to start tracing the image.

Activity 1:

Practice to assign specified materials to a 3D object (e.g., wood for doors, concrete for walls, glass for windows).

Activity 2:

Practice to apply a roughness map to a surface for added realism (Scale, tiling, or placement of a texture)

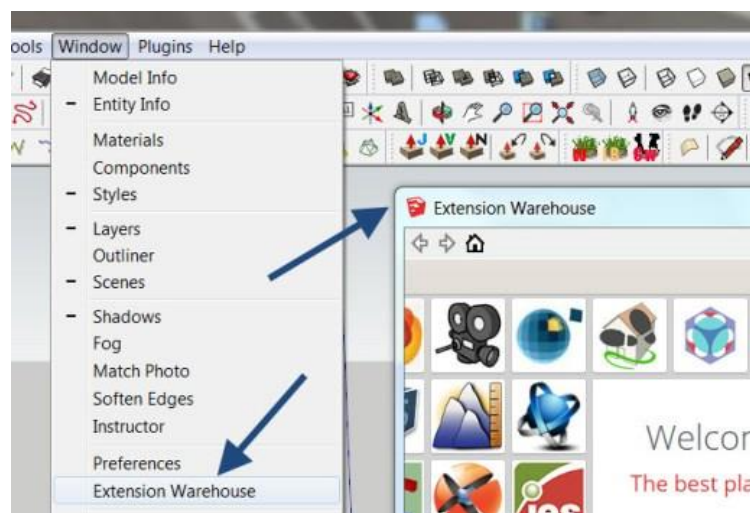
Learning Outcomes

After completion of this Learning Unit, trainee will be able to:

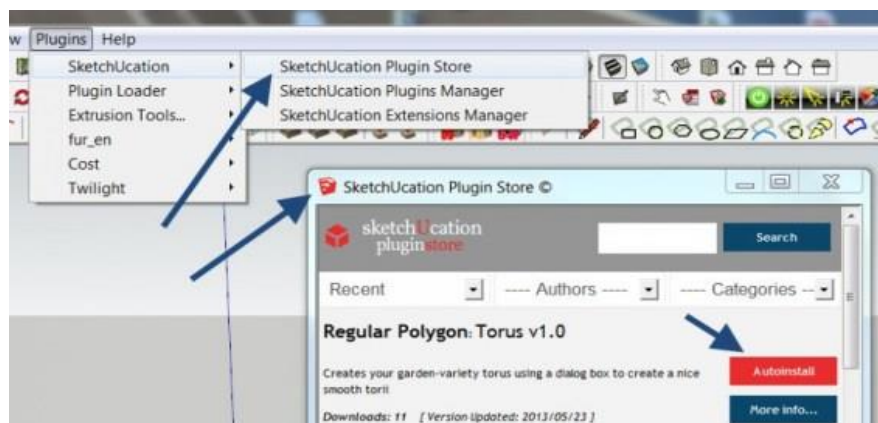
- Install plug-ins to meet specific outcome as per requirement.
- Add scene of 3D model according to specification
- Add cameras as per requirement
- Add lights for illumination to get the requisite scene of 3D model.
- Assign cameras to execute different views of 3D Model.
- Add Render Components to make scene more realistic.
- Render 3D model according to required image size or resolution & orientation.
- Create portfolio in PDF format (Soft Copy)

3.4.1 Sketchup Plugin for Rendering

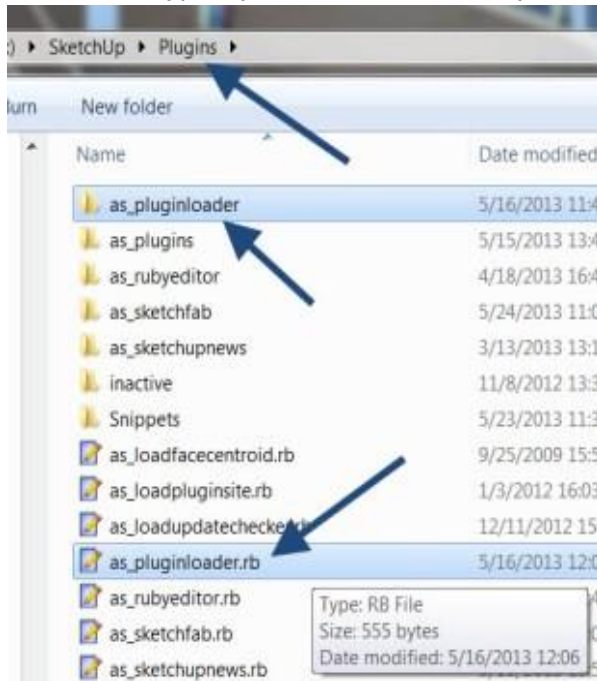
Rendering is the process of generating a photorealistic or artistic image of a model. Since the Extension Warehouse is a Trimble product that is tightly interwoven with SketchUp. To find a plugin there, Go to Window > Extension Warehouse from within SketchUp, log in and find and install the plugins required. This will set up update notifications when a newer version is available. Enable/disable plugins and coordinate plugins between multiple SketchUp installations when required.



For those plugins that are not available in the EW, go to the SketchUcation Plugin Store. Install their store plugin manually (it is not hosted in the Extension Warehouse). Just download the RBZ and go to Window > Preferences > Extensions tab > Install extension... to install it into SketchUp. Afterwards go to Plugins > SketchUcation > SketchUcation Plugin Store to search for and install the other plugins you like.



At this point, look at your old SketchUp version's Plugins folder (where SketchUp stores plugins). On Windows, this is at: C:\Program Files (x86) \Google\Google SketchUp 8\Plugins and on the Mac, it is at /Library/Application Support/Google SketchUp 8/SketchUp/Plugins. Now copy other plugins that can't be installed from the above-mentioned locations by simply copying them from here to the new installation path (on Windows it's C:\Program Files (x86) \SketchUp\SketchUp 2013\Plugins and on the Mac the new plugins folder is located at Macintosh HD/Users/Library/Application/Support/SketchUp 2013/SketchUp/Plugins). Make sure always copy the main plugin's RB file AND all of its miscellaneous files that are typically contained in a similarly-named subfolder.



Do you know

The number of plugins will likely increase quickly very soon when more and more developers move their plugins there.

Remember

You can always install plugins by downloading the RBZ or ZIP file and then going to Window > Preferences > Extensions tab > Install extension... to install it into SketchUp

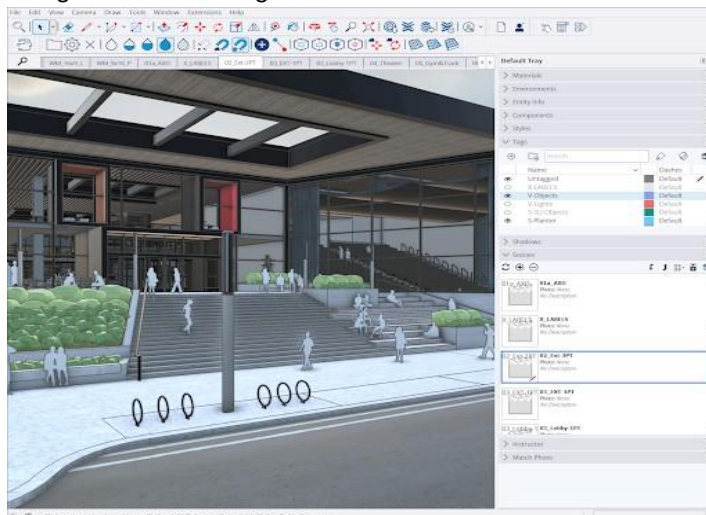
Although plugins now install without the need to restart SketchUp, sometimes it might still need to do this. Also, when plugin toolbars don't show up immediately, try toggling the toolbar display (**go to View > Toolbars...**) and see if it shows up.

3.4.2 Adding Scenes in Sketch up

Scenes allow you to save specific views of your model.

Creating Scenes

Scenes help to save different model views and properties, then present those views to show off different aspects of model. Each scene created appears in a tab along the top of the modeling window, allowing for easy navigation and management.



Do you know

You can disable plugins on the Window > Preferences > Extensions tab and now in the Extension Warehouse (as long as you access it from within SketchUp).

Adding a Scene

Before creating a scene, set the view and apply any styles, fog, shadows, or section cuts. Also, hide any geometry or adjust tag visibility as needed. Each of these properties will be saved in the scene created.

Once you have prepped your model, follow these steps to create a scene:

- Open the Scenes panel.
- Click Add Scenes. SketchUp will add the new scene in the Scenes panel.
- Click Show Details to adjust the scene's details. Rename it, add a description, or change saved properties.

Do you know

With scenes you can: Quickly change to a different view while modeling.

Save a view you want to represent your model to stakeholders or when sharing to 3D Warehouse.

Animate a sequence of scenes to make a presentation.

Managing Scene Properties

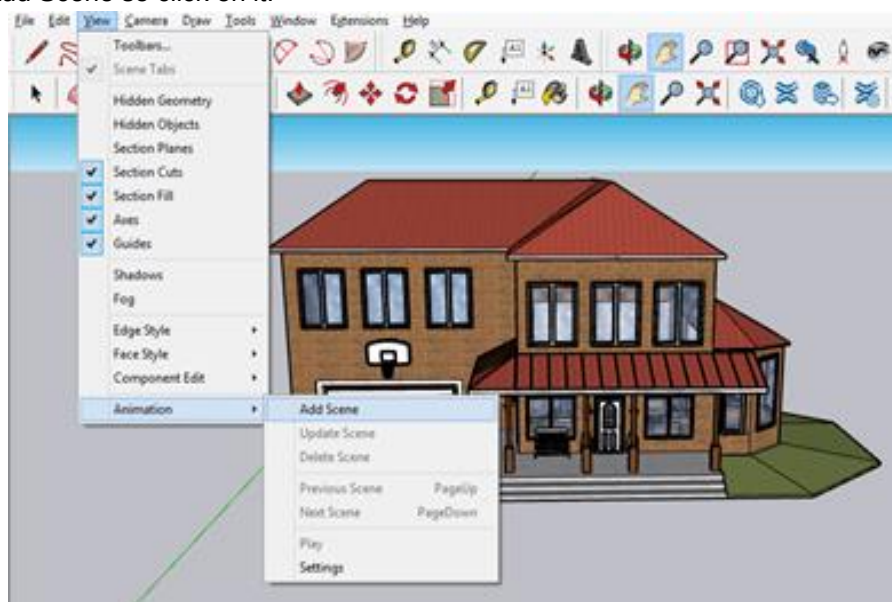
☒	Include in animation
Name:	Scene 18
Description:	
Properties to save:	☒ Camera Location
	☒ Top-Level Hidden Geometry
	☒ Hidden Objects
	☒ Visible Tags
	☒ Active Section Planes
	☒ Style and Fog
	☒ Shadow Settings
	☐ Environment Settings
	☒ Axes Location

Remember

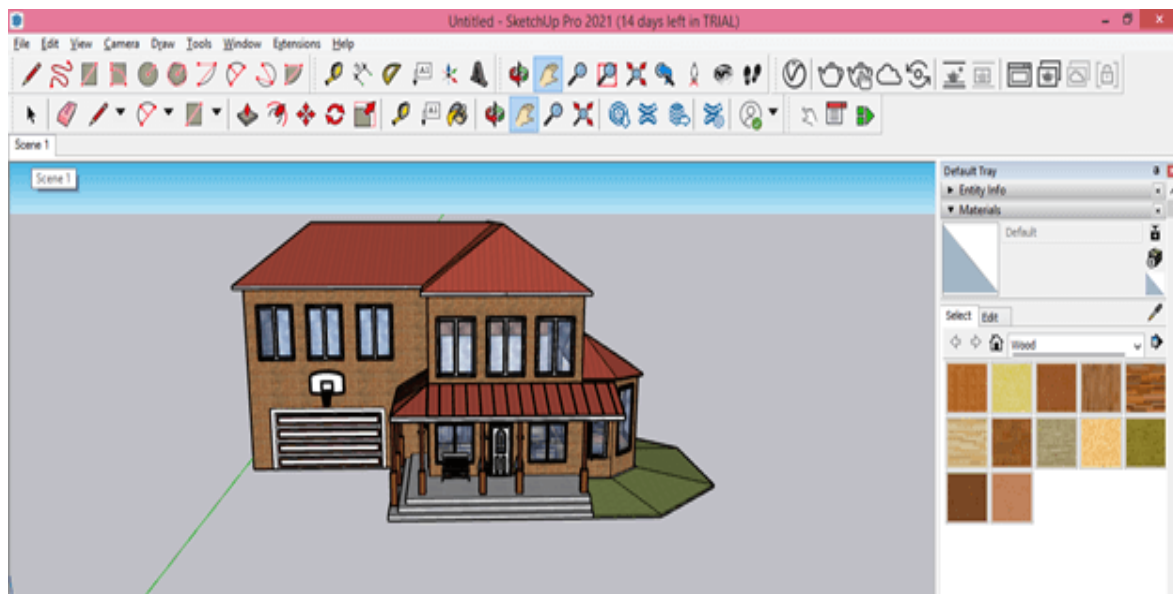
Want to create a new model from a photo? Click Details and select Add Scene with Matched Photo to start off with that photo as a scene in your model. .

3.4.3 Adding Animation in Sketch Up

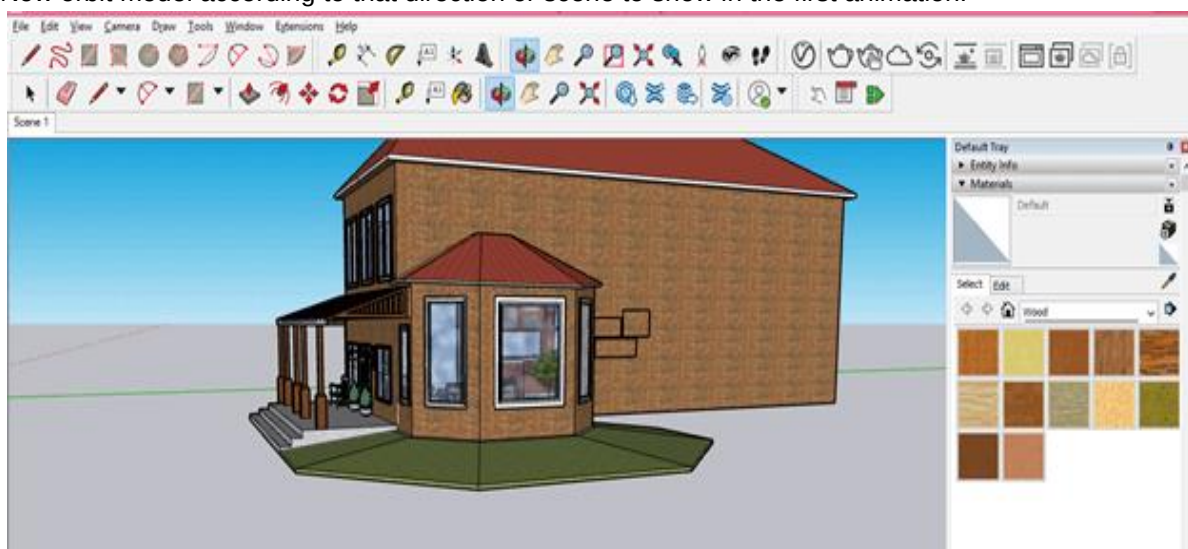
The first step of creating animation is go to the View menu of the menu bar, clicking on it, and then going to the Animation option of the drop-down list. Here we have some sub-option for animation. The first one is Add Scene so click on it.



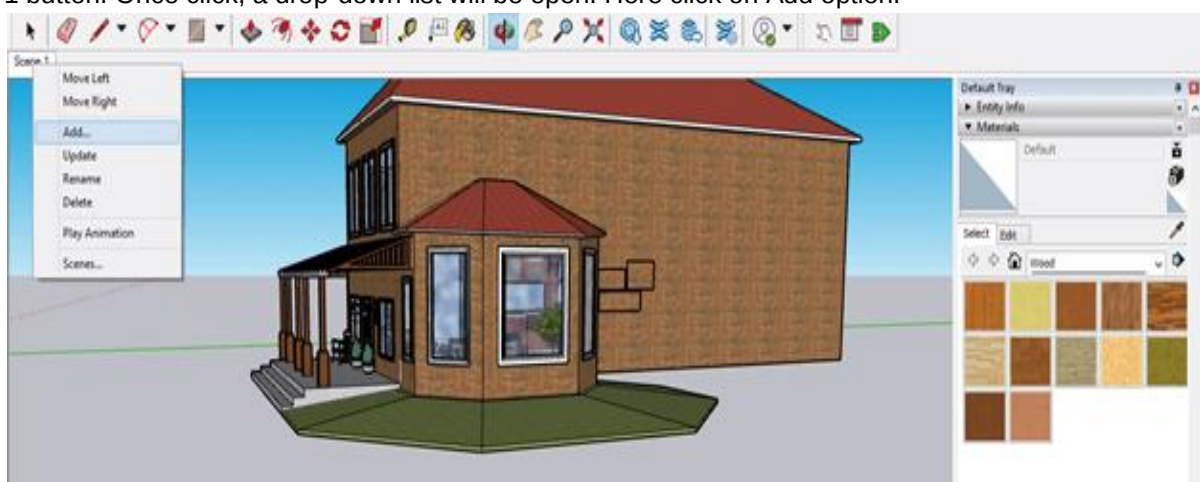
Once click on it, you will have the Scene 1 tab here below the toolbar. This is a tab in which we do animation.



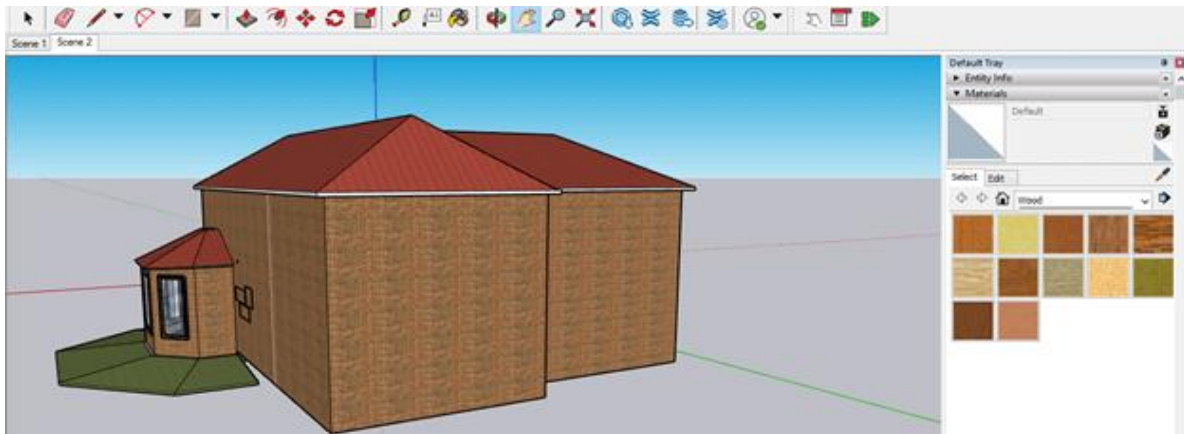
Now orbit model according to that direction or scene to show in the first animation.



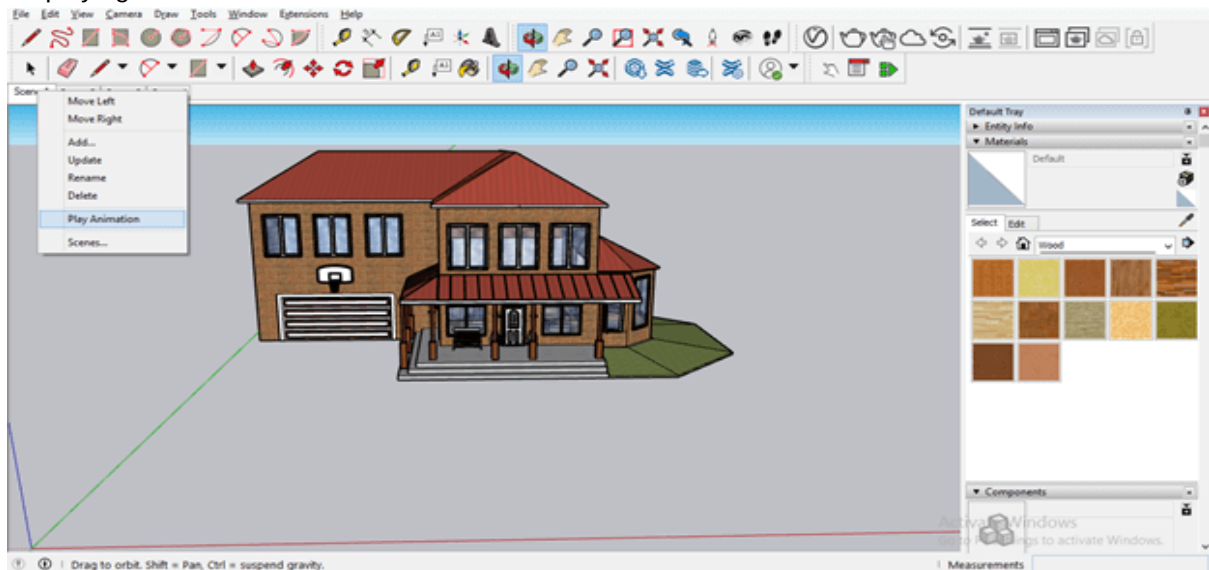
Now add the next screen, and for that, repeat previous steps or simple make right click on this Scene 1 button. Once click, a drop-down list will be open. Here click on Add option.



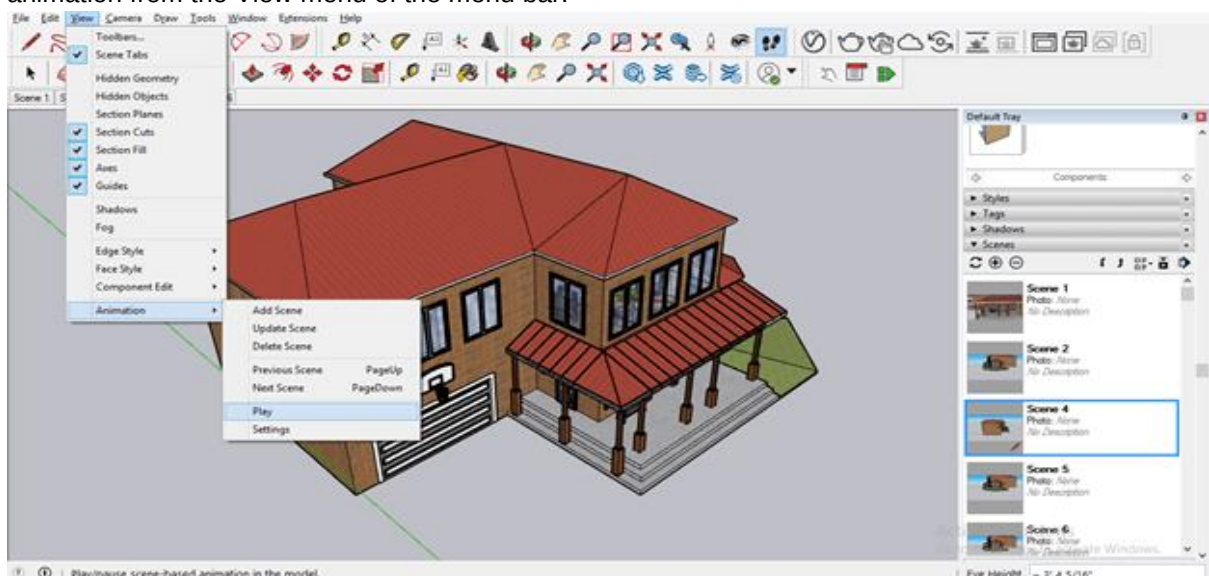
The next scene tab will be added here with the name Scene 2. Now animate this scene.



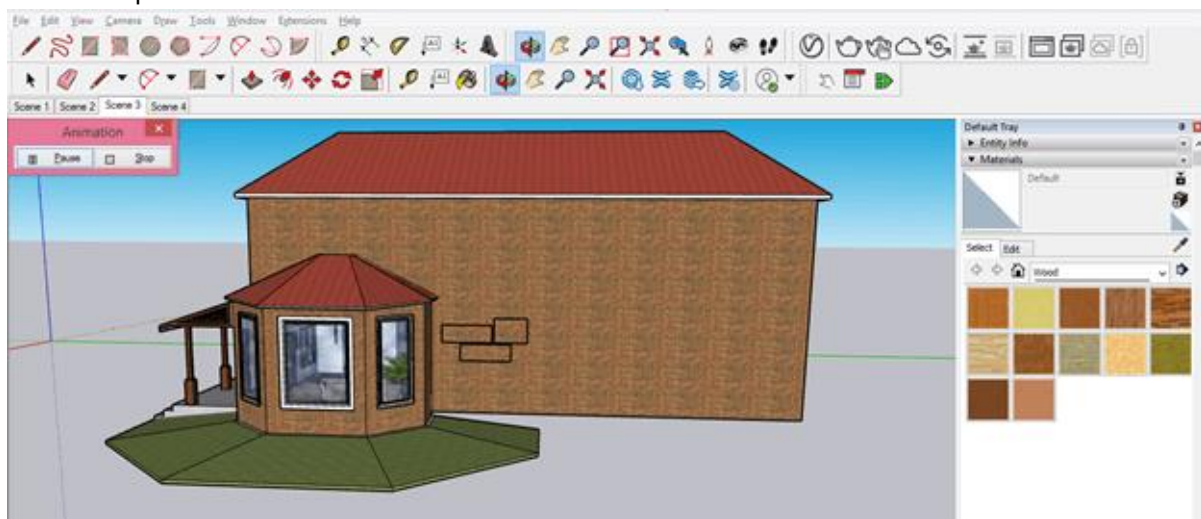
Now go to the tab of that scene from where to play this animation. For example, click on Scene 1 and then make a right-click on it. Again a drop-down list will be open. Here click on the Play Animation option for playing it.



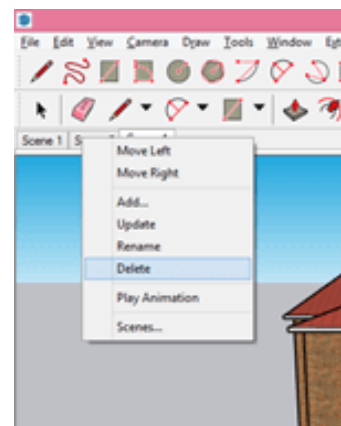
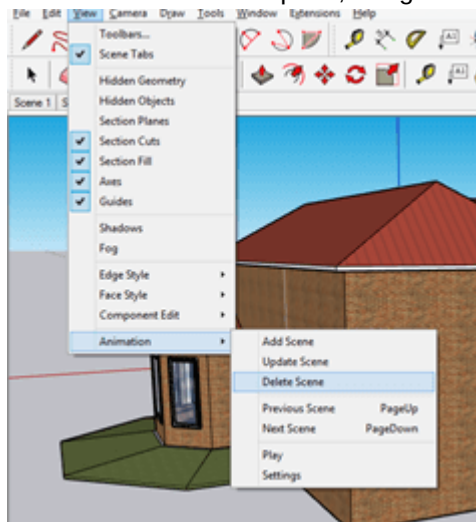
Just go to the view menu, then click on the Play option of the drop-down list of Animation to play animation from the View menu of the menu bar.



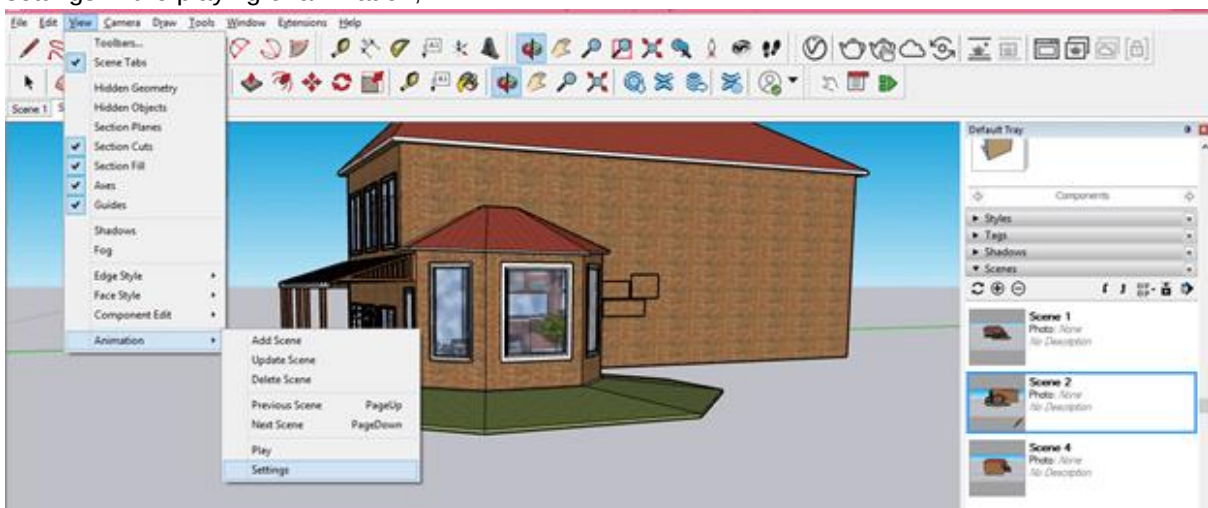
Now animation will play according to set animation scene. There is a small dialog box of Animation at the left corner of the display window area of this software. Click on the Pause button for holding animation, and by again clicking on the same button, play it again. The next Stop button of this dialog box will stop animation.



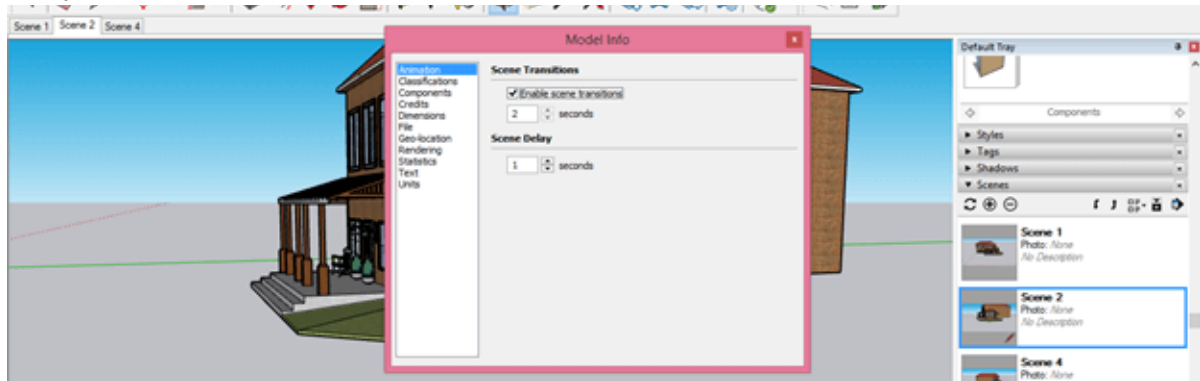
Delete the unwanted scene, and for that select, that scene, then goes to the Animation option again and click on the Delete scene option, or right-click options of that scene.



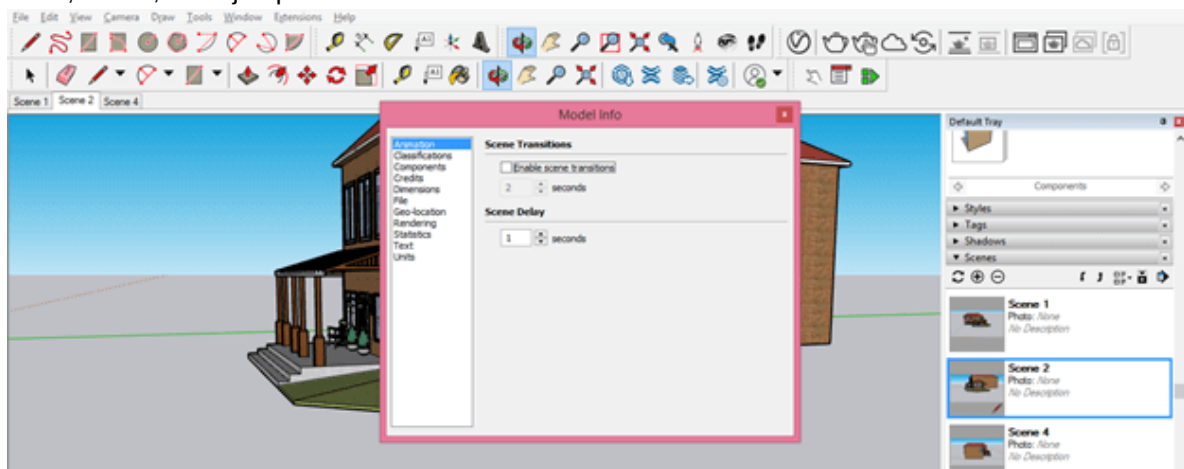
Go to view menu again then Animation option and click on Settings option of the drop-down list of it for settings in the playing of animation,



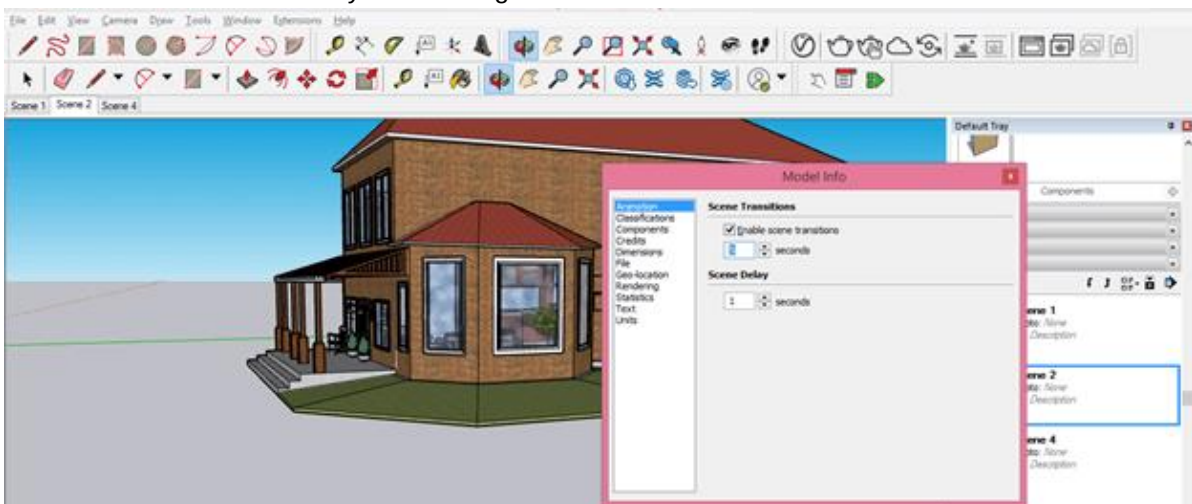
Here in the dialog box of Settings of animation, there are two main parameters: Scene Transitions and Scene Delay. So, for example, set the time for animation change between two scenes with scene transpiration.



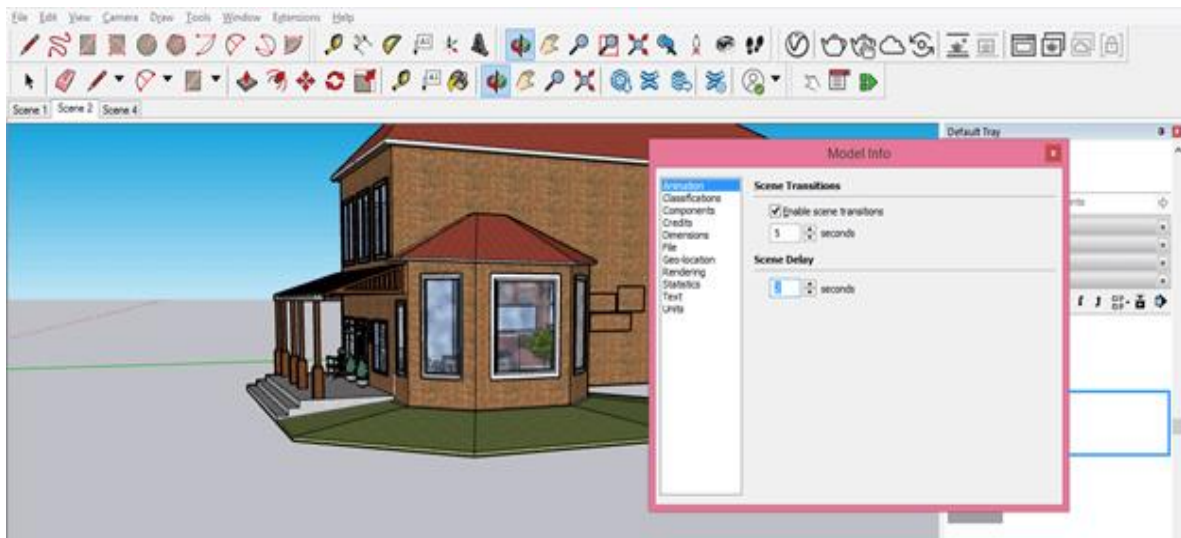
If uncheck the box of 'Enable Scene Transition', the animation will not move from one scene to another scene; in fact, it will jump from one scene to another scene.



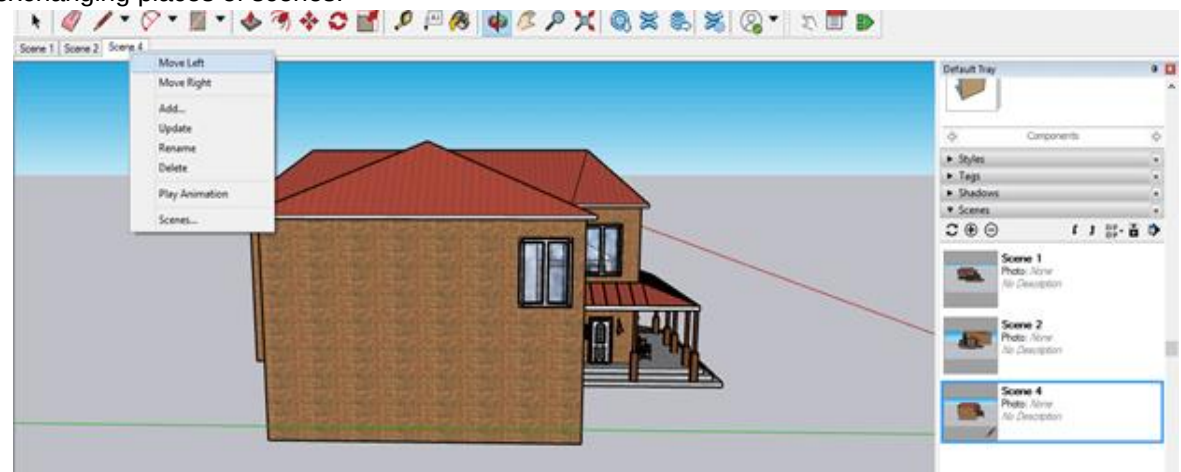
Set a time for how long it will take to move from one scene to the next screen. If there is high time, then the animation will move slowly for reaching to next screen.



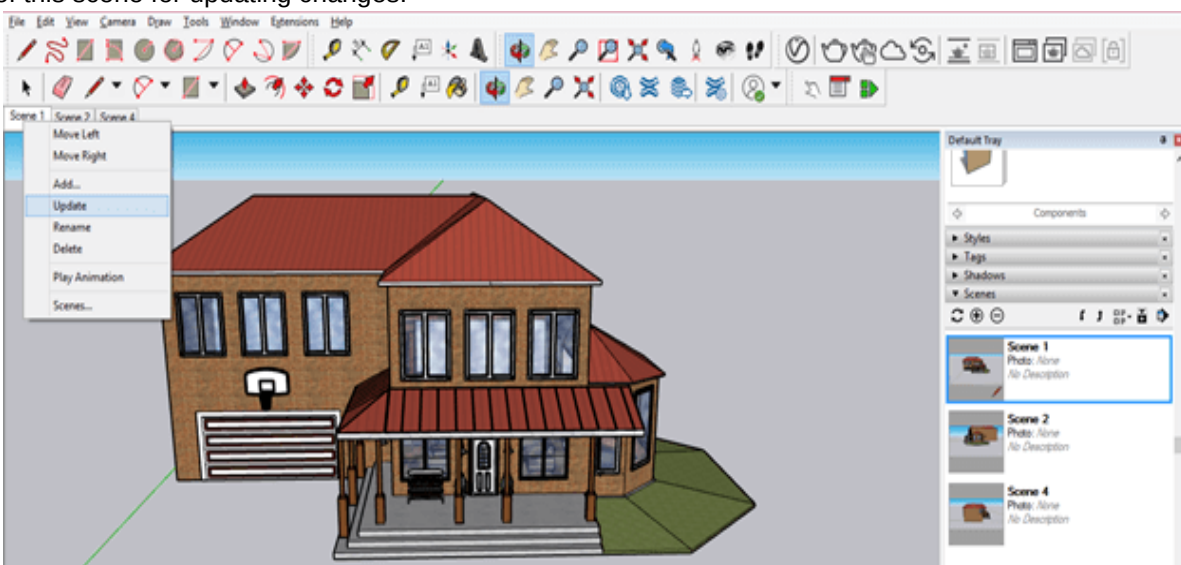
Once the first animation scene ends and the second animation scene starts, there is a small-time gap between the animation and the previous scene for instants of time. For a high value of time, the animation will hold at the scene for a longer time. For not holding time, make this time like 0 sec by entering a value in the Scene delay option.



Change the sequence of scenes with each other such as to show scene 4 before scene 2 the; just make click on scene 4 and then make a right-click. Then, click on Move Left or Move Right according to exchanging places of scenes.



To make some changes to previous animation. Just go to that scene to change animation, then make changes, then make a right click on that scene. Then, click on the Update button of the drop-down list of this scene for updating changes.



Same as the animation for the outer face of the model, the interior of this model can be animated. Set the camera angle for that.

Exporting video animations

- To export your animation on Windows, follow these steps:
- Select **File > Export > Animation > Video**. The Export Animation dialog box appears.
- Navigate to the place where you want to save your video file.
- Type a name for the file in the **File Name** text box.
- Select a file format from the **Save As Type** drop-down list. The following table explains your file format options.
- Click **Options** to open the Export Options dialog box, where you can set the resolution, aspect ratio, frame size, frame rate, and more. See the upcoming list for details about each option.
- After you finish setting your options, click **OK** in the Export Options dialog box to return to the Export Animation dialog box.
- Click **Export** and SketchUp renders your animation as a video file.

Remember

You can create a number of scenes and animate them as per the requirement of your model and brief your model in just one click; you need not use the orbit tool again and again for going your particular viewpoint.

3.4.4 Adding Camera in Sketch up

While SketchUp doesn't have physical cameras, simulate camera views. To add cameras and lights to a 3D model in SketchUp, use SketchUp's built-in camera tools or plugins like Advanced Camera Tools to create and adjust camera views, and use rendering extensions like V-Ray or Enscape to add realistic lighting effects.

Adding Cameras:

- **Access Camera Tools:**
 - Use the Camera tools to adjust how a model appears within your layout documents.
- **Create a Scene:**
 - Use the Camera tools to create and adjust camera views, and then save them as a scene.
- **Advanced Camera Tools:**
 - For more precise control, consider using the Advanced Camera Tools plugin.
- **Locking Camera Views:**
 - Once a camera view set, lock it to prevent accidental changes.
- **Edit Camera:**
 - Edit aspects of camera, such as focal length and aspect ratio, according to SketchUp.
- **Position the Camera:**
 - Select the Camera tool from the toolbar.
 - Click on the point where you want the camera to be placed.
- **Adjust Camera Settings:**
 - Use the Field of View tool to set the desired angle.
 - Navigate to Camera > Two-Point Perspective for architectural views.

3.4.5 Adding Lighting in Sketch Up

Lighting is a core component in 3D visualization. It enhances realism, depth, mood, and clarity of a scene. There are different types of lighting simulations:

- Daylight: Simulates sunlight and sky light, useful for exteriors or rooms with natural exposure.
- Night scenes: Use artificial lights like bulbs, spotlights, and IES profiles.
- Indoor lighting: A mix of ambient, task, and accent lighting

To add realistic lighting, a rendering plug-in like V-Ray or Enscape is required.

Render Extensions:

Use rendering extensions like V-Ray or Enscape to add realistic lighting effects.

Emissive Materials:

Use the "Emissive" material feature within these extensions to create light sources.

Light Sources:

Do you know

Rendering plug-ins often come with extensive material libraries to assist in this process.

Create different types of light sources, such as sphere lights, spotlight, line lights, and rectangle lights, as demonstrated in this video.

Light Placement:

Carefully position your light sources to achieve the desired lighting effect.

Light Mix:

If you are using V-Ray, you can also add a light mix to control the different light sources in your scene.

3.4.6 Adding shadows in sketch up

With SketchUp's Shadows feature, model cast a basic shadow or see how the sun casts shadows on or around a geolocated model.

When casting real-world shadows, SketchUp's calculations are based on the following:

- The model's latitude and longitude
- The model's cardinal orientation (north, south, east or west; see Adjusting the Drawing Axes for details about how the drawing axes are aligned to the cardinal directions)
- The selected time zone

Tip: Before you can cast real-world shadows in a model, your model must be geolocated. To geolocate your model in SketchUp Pro 2017, you can import terrain using the Add Location tool. Or to add a location manually in any version of SketchUp, select **Window > Model Info**, select the **Geolocation** option in the sidebar on the left, click **Set Manual Location**, and enter a latitude and longitude in the dialog box that appears. After model is geolocated, SketchUp knows (roughly) how the sun will shine on model.

To turn on shadows and see shadows at different times of day, follow these steps:

Select **View > Shadows**. This enables the Shadows feature.

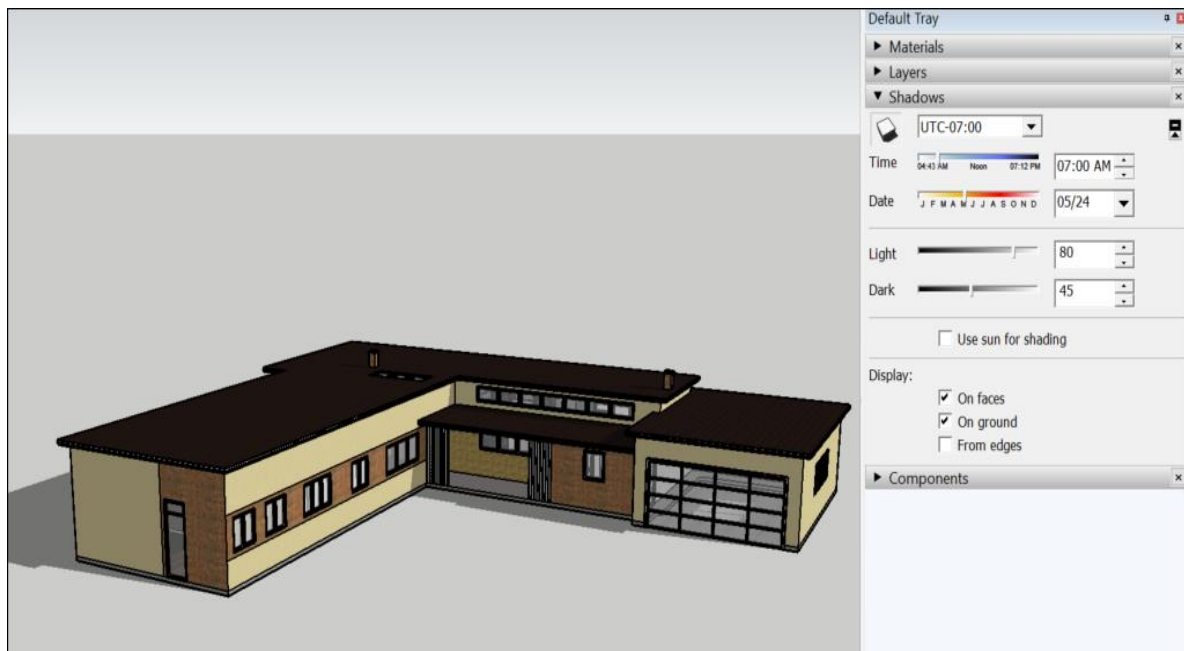
Open the **Shadows** panel in the **Default Tray**, where you can control how the shadows appear. (Alternately, you can display the Shadows toolbar.)

To select the time of day, drag the **Time** slider along the timeline or enter a time in the Time box.

To select a month and day, drag the **Date** slider or enter a date in the Date box.

Remember

By default, shadows are turned off, because they can use a lot of your computer's processing ability.



Beyond the basic shadow settings outlined in the preceding steps list, you can customize a few more shadow attributes in the Shadow Settings dialog box:

- The **Display Shadows** button in the upper left toggles the shadow display on and off.
- The **Time Zone** drop-down list enables you to choose a new time zone. If your model is geolocated, this time zone should be accurate, but you can check that it's correct or change it if you like.
- The **Light** slider controls the light's intensity. This option effectively lightens and darkens illuminated surfaces.
- The **Dark** slider controls the shadow's intensity. With this option, you can lighten or darken areas under shade or shadows.
- When the **Use Sun for Shading** checkbox is selected, SketchUp's simulated sun shades parts of your model even if shadows are toggled off.
- The **On Faces** checkbox enables faces to cast shadows on other faces. This feature gobbles up your graphics card's processing power, so you might try deselecting this option if you want to display shadows but the feature is causing a performance problem.
- When the **On Ground** checkbox is selected, your geometry can cast shadows on the ground plane.
- The **From Edges** checkbox controls whether edges that are not associated with a face cast a shadow. By default, this option is deselected.

Remember

If you want a transparent face to cast shadows, edit the material's Opacity setting to 70% or higher.

3.4.7 Resolution and Orientation

Render resolution impacts clarity and file size:

- Common resolutions: 1280×720 (HD), 1920×1080 (Full HD), 3840×2160 (4K).

Orientation:

- Landscape for exteriors and floor plans.
- Portrait for vertical views like interior elevations.

Rendering transforms your model into a photorealistic image

Click on this render button to see the render's output result.



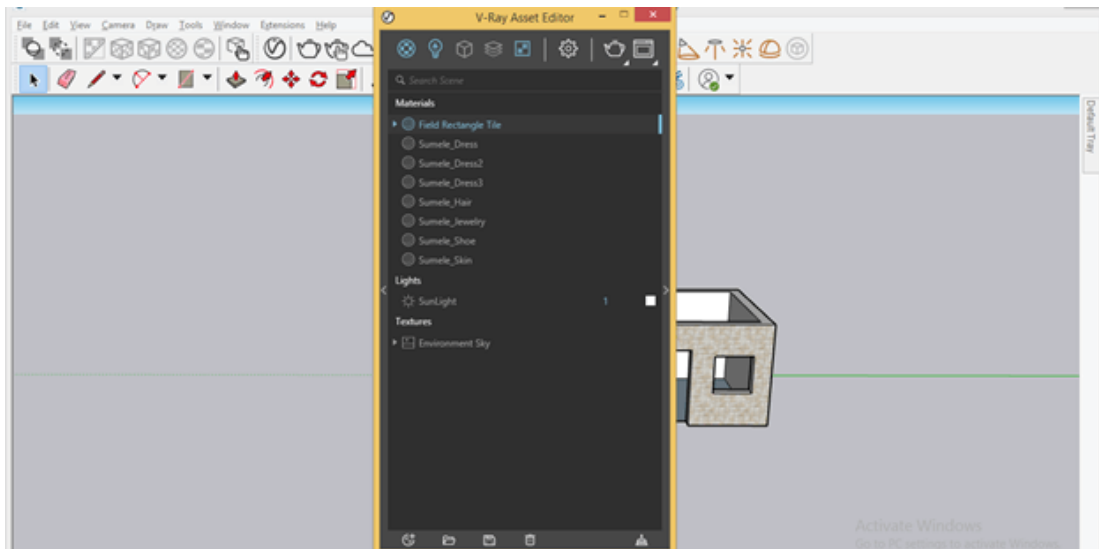
There is one more button here in this panel: Render Interactive, which means with this rendering button, to see live changes (that you make in your model) in your render dialog box during the rendering process of your model.



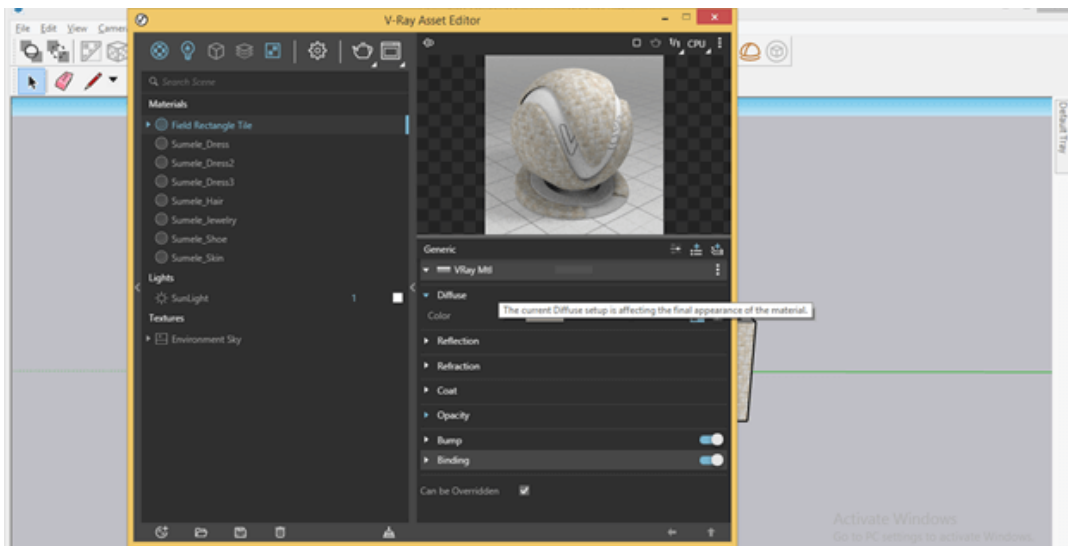
Click on the Asset Editor button of the V-ray panel.



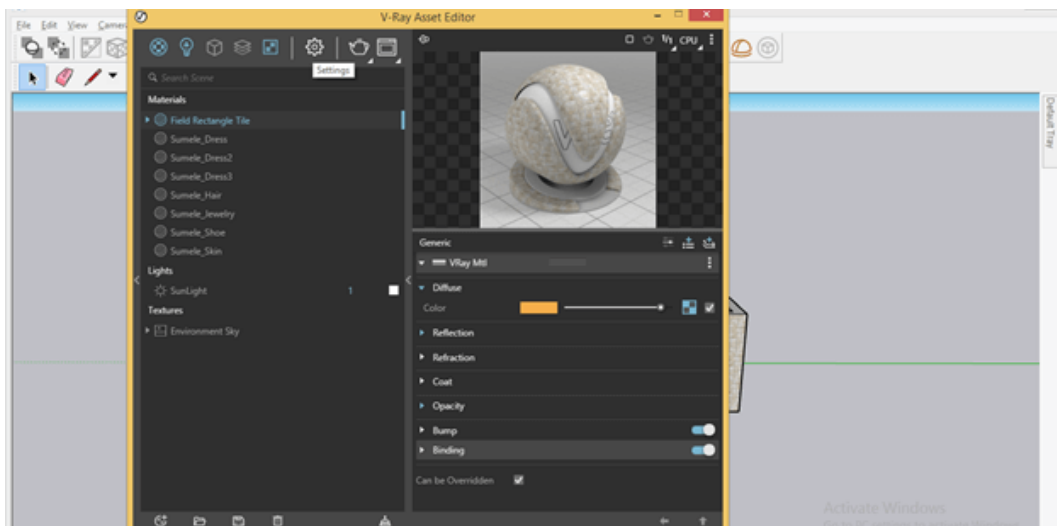
And once you click on it, the Asset Editor dialog box will be open. It will show a list of all applied material here in the Materials option. So, for example, it will right now show the material of the wall of the house and materials of dummy characters cutout.



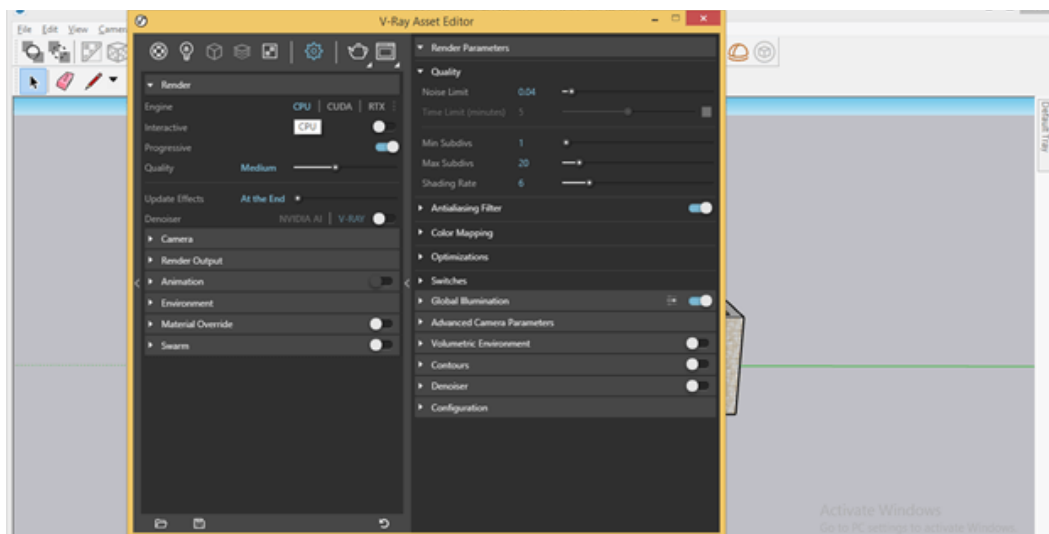
Now click on the side arrow button for opening the materials editor parameter box. Here in this box, create high quality of material formodel by making some settings in its parameter.



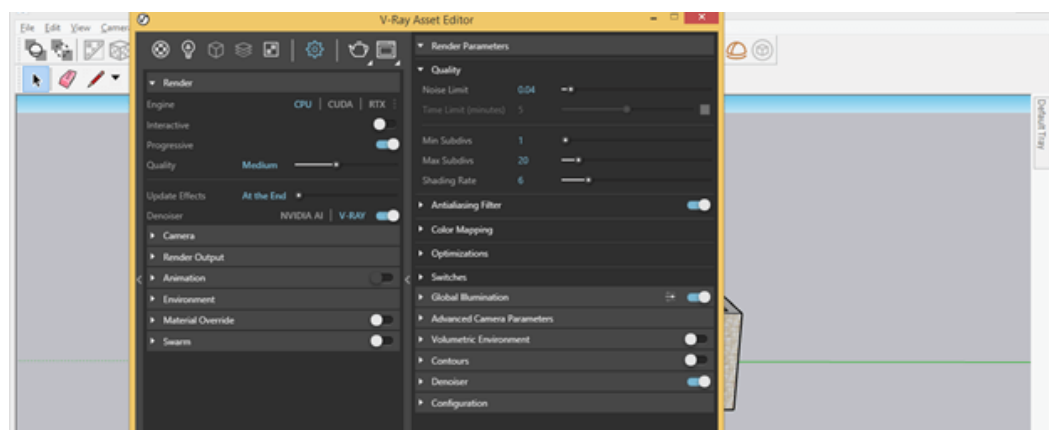
So apply good quality of material on your model, then click on the Settings button of this dialog box.



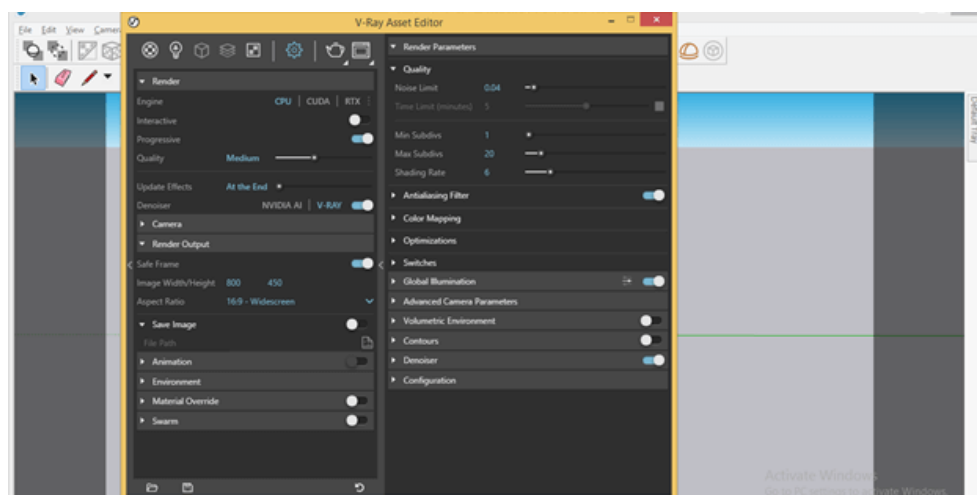
Once click on this button, these settings appear. First, click on the drop-down arrow key of the Render option of this box, and then to select CPU in the Engine option.



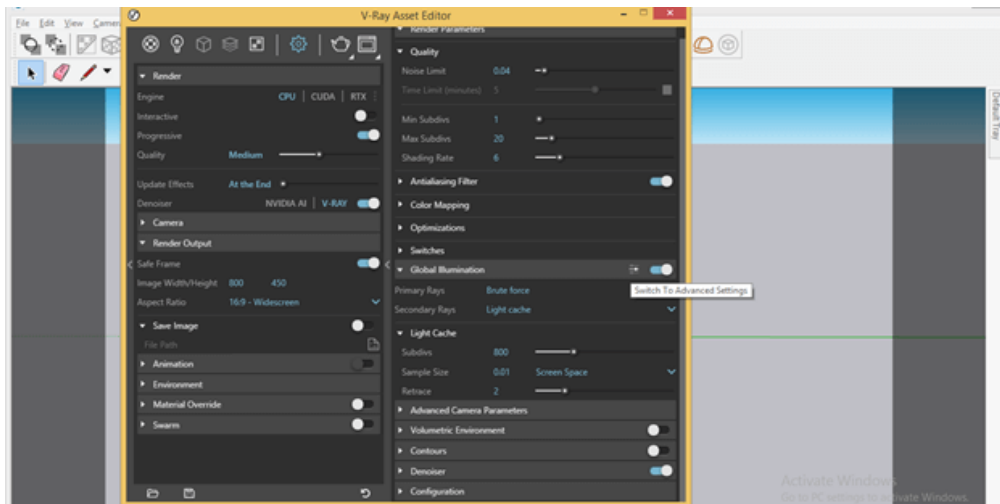
Then enable V-ray (option of Denoiser) by sliding its slider button in the On side direction.



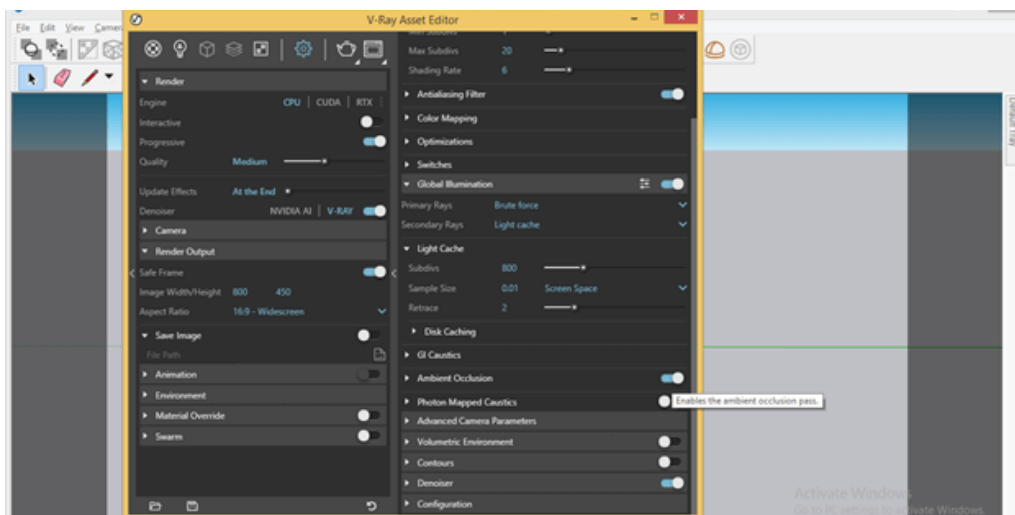
Now click on the drop-down arrow key of the Render Output option and enable the Safe Frame option.



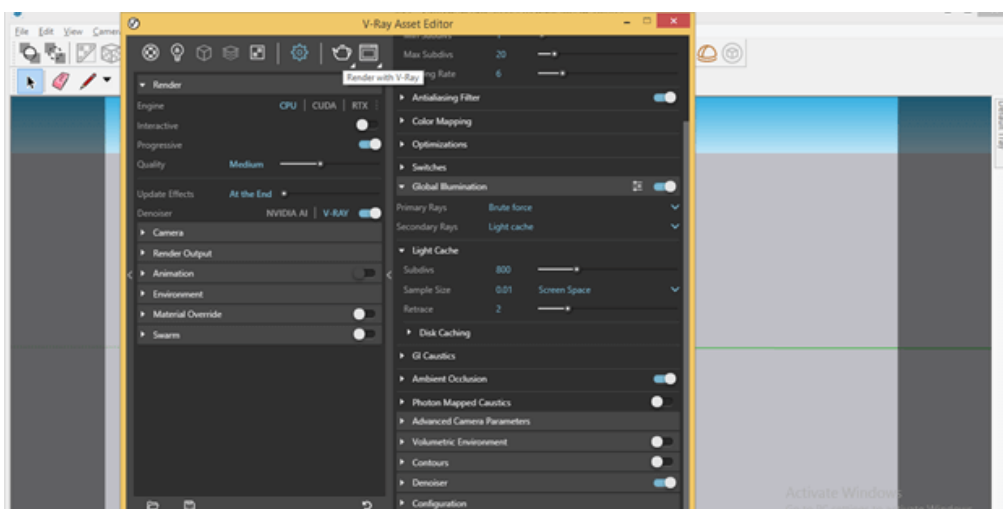
Come to the Global Illumination option and click on its button for enabling advanced settings of it.



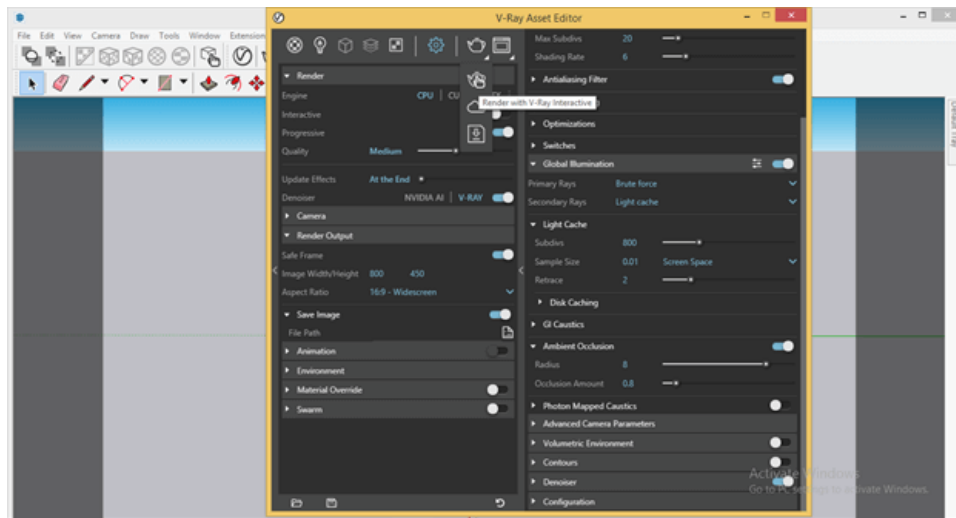
In its advanced settings, find the Ambient Occlusion option so enables this too. In addition, it will maintain whiteness and darkness (highlight) during rendering for proving more clarity to the model.



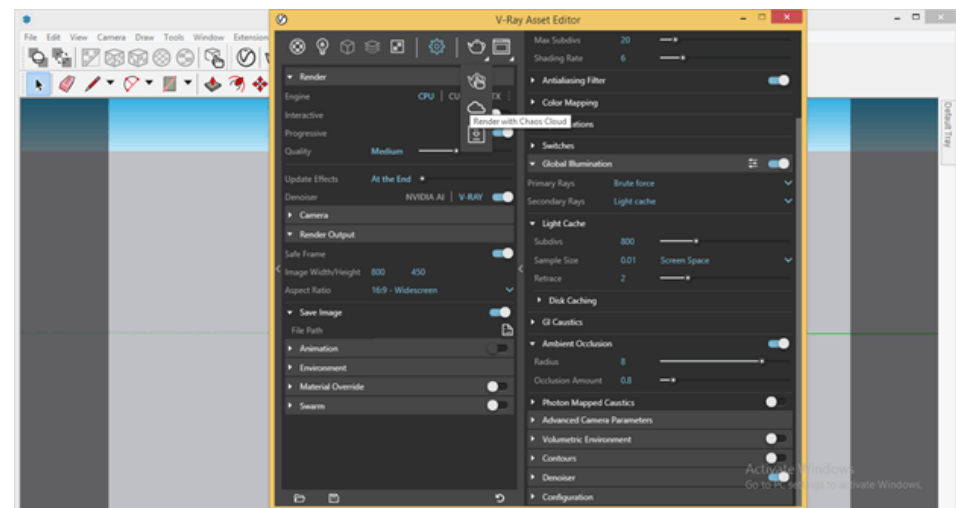
Now after making all the settings for better render output, click on Render with the V-ray button of this Asset Editor dialog box.



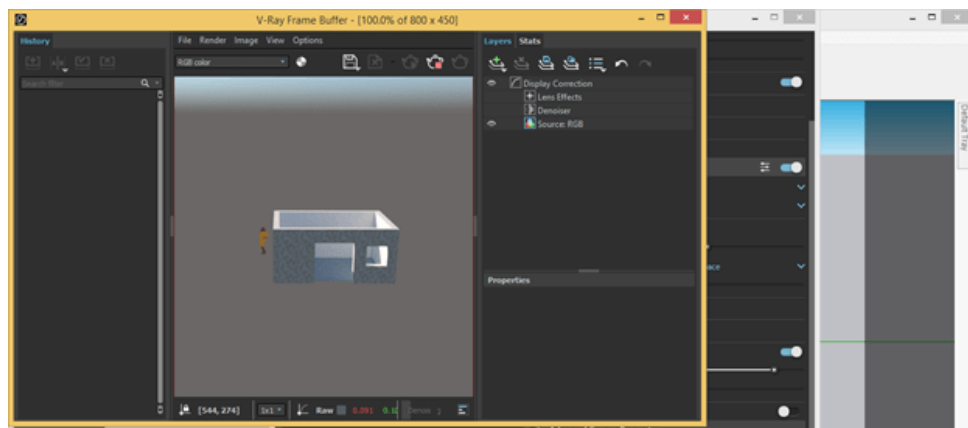
Render here by clicking on Render with V-ray Interactive button.



One more option is Render with Chaos Cloud, which means it will render model on Cloud so that you can connect your model render online with others.



Now click on Render with the V-ray button; then get this Render output dialog box with the name V-Ray Frame Buffer. The output will depend on a number of factors such as quality of applied material, the capacity of computer system, settings of V-ray panel and so on.



Activity1:

Practice to create a 3D scene, place cameras and add appropriate lighting to simulate daylight, night scenes, or indoor lighting o capture views from different angles, including close-ups and wide shots.

Activity2:

Practice to render a 3D model according to the specified resolution, size, and orientation as per instructor

Activity3:

Create a Portfolio in PDF Format (Soft Copy):

SUMMARY

SketchUp allows users to create realistic 3D renders by adjusting lighting, camera views, shadows, and scene settings. Proper use of lighting and shadow controls enhances depth and realism. Camera angles help in presenting the model from various perspectives. Resolution settings affect output quality, useful when exporting scenes for presentation.

FAQs:

Q1.What is the purpose of using shadows in SketchUp rendering?

Ans: Shadows provide depth and help in visualizing how natural light interacts with the 3D model throughout the day.

Q2.How can lighting be adjusted in SketchUp without external plugins?

Ans: Lighting can be controlled using the Shadow Settings panel by adjusting time, date, and geographic location

Q3.What is a scene in SketchUp?

Ans: A scene is a saved view of the model including camera angle, shadow settings, style, and layers for easy presentation.

Q4.How do you improve the output quality of a SketchUp render?

Ans: By increasing the resolution when exporting images and optimizing lighting and shadows

Q5.What is the function of the camera tool in SketchUp?

Ans: It allows users to set perspective, field of view, and angles for accurate 3D viewing and presentation.

Q6.What is the difference between a Group and a Component in SketchUp?

A group is used to bundle geometry together to avoid it sticking to other geometry. Changes made to one group do not affect other groups.

Components are reusable objects. Changes made to one instance of a component will automatically update **all other instances** of that component in the model.

Q7.How can you import a 2D floor plan into SketchUp?

Click File → Import.

Choose your 2D floor plan (image, PDF, or CAD file like .dwg/.dxf).

Select the correct file type from the dropdown list.

Click to place it on the drawing area.

Use the **Tape Measure Tool** to scale the plan accurately.

Trace over it with SketchUp drawing tools to convert it into 3D geometry

Q8.Explain how to apply and edit materials in SketchUp.

To Apply a Material:

Open the **Materials window** (Window → Materials).

Choose a material from the categories (e.g., Wood, Brick, Glass).

Use the **Paint Bucket Tool (B)** and click on a face to apply.

To Edit a Material:

In the Materials window, go to the **Edit tab**.

Change the **color**, **opacity**, or **scale** of the texture.

Adjust the position or rotation if needed using the **Texture > Position** option from right-click.

Q9. How do you set an exact dimension for a shape you draw?

Start drawing a shape (e.g., Line or Rectangle).

Before clicking again, type the exact dimensions into the **Measurements Box** (lower right corner).

For example: 10', 20' for a rectangle.

Press **Enter**, and the shape will be created with those exact dimensions.

Q10. What are scenes used for in SketchUp?

Scenes are used to save specific views or configurations of your model.

Common uses:

Presentations, Design walkthroughs, Animations, Exporting multiple views to LayOut

MCQs

- 1. What does adjust the shadow settings in SketchUp affect?**
 - a. Lighting only
 - b. Model color
 - c. Time of day and light direction
 - d. Scene transitions
- 2. What tool is used to set a perspective view in SketchUp?**
 - a. Layers
 - b. Styles
 - c. Camera
 - d. Texture
- 3. What are SketchUp scenes used for?**
 - a. Editing models
 - b. Saving views and settings
 - c. Adding lighting
 - d. Changing resolution
- 4. Which setting enhances image clarity during export?**
 - a. Scene tabs
 - b. Camera angle
 - c. Shadow intensity
 - d. Resolution setting
- 5. How is natural lighting simulated in SketchUp?**
 - a. Using artificial lights
 - b. Using shadows and time/date
 - c. Changing styles
 - d. Importing lights
- 6. What does the field of view in the camera tool control?**
 - a. Model scale
 - b. Background color
 - c. Zoom and perspective angle
 - d. Export resolution
- 7. Where can you find shadow controls in SketchUp?**
 - a. Styles panel
 - b. Entity Info
 - c. Shadows tray
 - d. Materials panel
- 8. What happens when you add multiple scenes in SketchUp?**
 - a. Model duplicates
 - b. Animation can be created
 - c. Rendering slows down
 - d. Shadows reset
- 9. What is the default unit used in shadow time settings?**
 - a. Minutes
 - b. Hours
 - c. Seconds
 - d. Days
- 10. What increases render output clarity?**
 - a. Low DPI
 - b. Default style
 - c. High resolution export
 - d. Disabling shadows
- 11. Which tool helps create architectural walkthroughs?**
 - a. Orbit
 - b. Scenes with transitions
 - c. Layer manager
 - d. Section cuts
- 12. What defines the clarity of exported images?**
 - a. View style
 - b. Resolution setting
 - c. Texture size
 - d. Model scale
- 13. Which setting helps to visualize lighting throughout the day?**
 - a. Scene name
 - b. Layers
 - c. Shadows
 - d. Tags
- 14. Where can you adjust date and time for shadows?**
 - a. Scene manager
 - b. Shadow Settings panel
 - c. Camera tool
 - d. Outliner
- 15. What type of rendering does SketchUp natively support?**
 - a. Photorealistic
 - b. Ambient Occlusion
 - c. Sketch-style
 - d. None
- 16. Why are scenes important in presentations?**

- a. They animate textures
- b. Help change layers
- c. Save consistent views
- d. Disable resolution

17. Which factor does not directly affect rendering in SketchUp?

- a. Camera
- b. Lighting
- c. Text labels
- d. Shadows

18. Export resolution settings are found under:

- a. 3D Warehouse
- b. File > Export
- c. View > Shadows
- d. Window > Styles

Answer Key

1.	C	2.	C	3.	B	4.	D
5.	B	6.	C	7.	C	8.	B
9.	B	10.	C	11.	B	12.	B
13.	C	14.	B	15.	C	16.	C
17.	C	18.	b				

Module No. 4	Develop 3D Model in Autodesk REVIT
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Learning Outcomes:

After completion of this learning module, trainee will be able to:

- Setup Interface
- Create Building Layout
- Perform Advance Modeling and Visualization Techniques
- Create Construction Document
- Render Model
- Add Rendering Plugin
- Apply AI Tools for Planning
- Create Building Information Modeling Model

Learning Unit 4.1	Setup Interface
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Learning Outcomes:

After completion of this learning unit, the trainee will be able to:

- Create custom user interface as per requirement of specific trade.
- Create and apply Families as per given specifications and requirements on required template.

4.1.1 User Interface as per Requirement of Specific Trade

File Tab

- Access file-related options like New, Open, Save, Print, and Export.
- Think of this as your “main menu.”
- Quick Access Toolbar (QAT)
- Contains frequently used tools like Undo, Redo, Save, and more.
- You can customize it to keep your favourite tools handy.

Application Title Bar

- Shows the name of the project you’re working on.
- Useful for quickly confirming which file you have open.

Info Center

Provides help resources, user sign-in, and search functionality.
Ideal for beginners looking for quick help.

Ribbon: Tabs

- Categories like Architecture, Structure, Insert, etc.
- Click a tab to switch between different types of tools.

Ribbon: Panel

- Inside each tab, panels group similar tools (e.g., “Build,” “Model,” “Circulation”).
- Organizes tools for easy access.

Ribbon: Tool

- Actual commands/tools like Wall, Door, Window, etc., found within panels.
- Click these to perform actions in your model.

Options Bar

- Shows options/settings related to the selected tool.
- Example: When drawing a wall, you can change its height or justification here.

Properties Palette

- Displays and allows editing of properties for selected elements.
- Crucial for setting dimensions, materials, visibility, etc.
- Type Selector (on Properties Palette)
- Let’s you change the type of selected object (e.g., change a single door to a double door).

Project Browser

- Shows the structure of your project, including floor plans, elevations, views, sheets, etc.

Remember		
Install	Revit	from
official	Autodesk	
website	only	
www.autodesk.com		

- Double-click to switch between views.
- Drawing Window
- The main canvas where you create and edit your building model.
- Interactive and zoomable work area.
- Navigation Bar
- Quick access to navigation tools like Zoom, Pan, Orbit, and ViewCube.
- Helps control your view of the model.

Context Menu

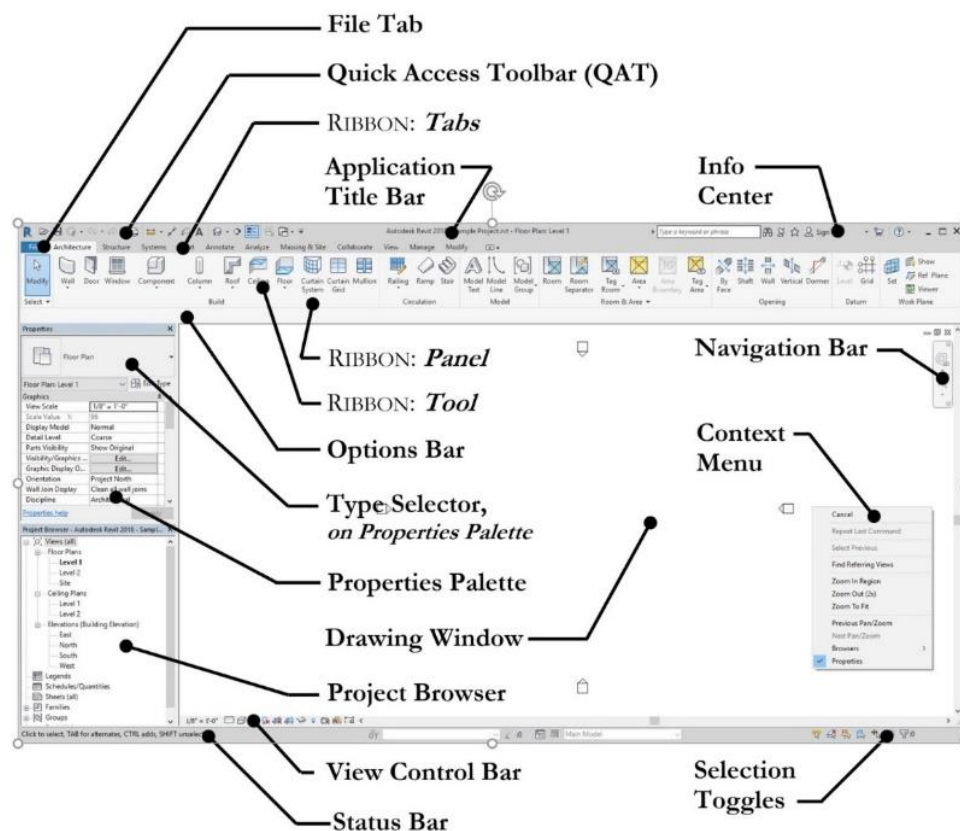
- Right-click menu with actions like Cancel, Zoom In Region, and Properties.
- Offers shortcut commands based on what you're doing.
- View Control Bar
- Controls display settings for the current view (e.g., detail level, visual style, scale).
- Use this to adjust how your drawing appears.

Selection Toggles

- Turn on/off specific selection filters (e.g., only select walls or doors).
- Helps with precision editing.

Status Bar

- Shows messages, tips, and coordinate data.
- Very helpful for understanding what Revit is doing or expecting.

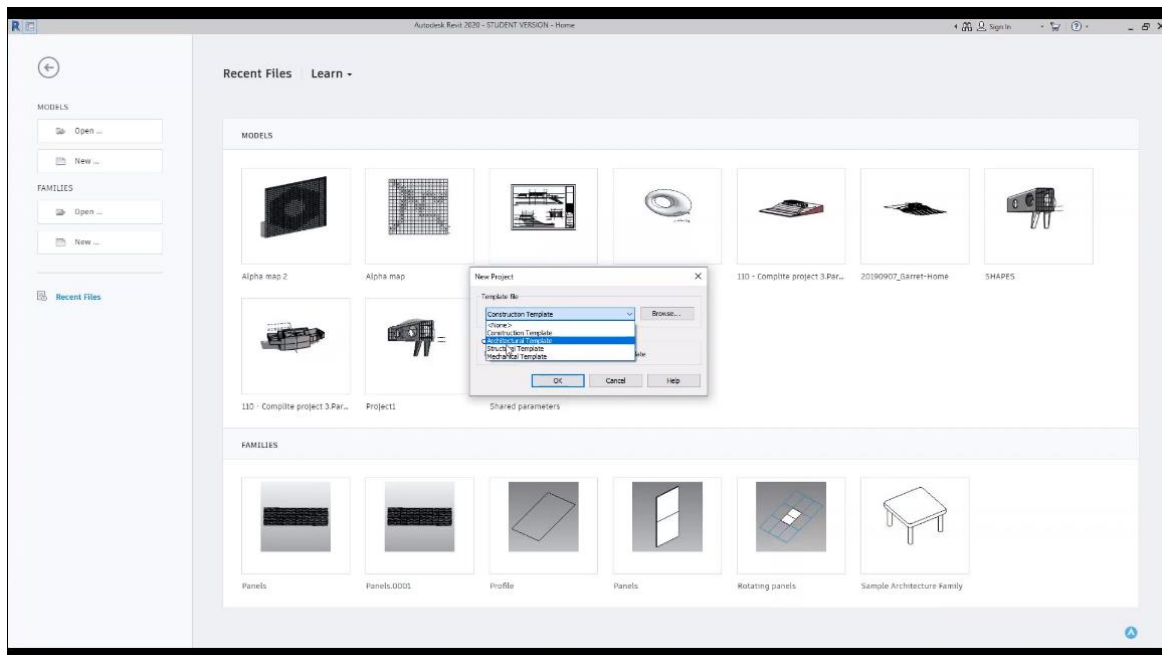


4.1.2 Trade-Specific Interface Needs

- Architectural: Emphasis on modelling tools, visibility of walls, floors, and annotation settings
- Structural: Load-bearing elements, analytical models, rebar visibility
- MEP: Ducts, pipes, systems, and annotation views

Do you know

Revit Provide Separate template for each Discipline



4.1.3 Introduction to Revit Families

In Revit, a family is a collection of elements that share similar properties, behaviours, and graphical representations, serving as the building blocks for BIM models, including walls, doors, windows, and furniture

Types:

- System Families (walls, floors),
- Loadable Families (doors, furniture),
- In-Place Families

In Revit, families are categorized as System, Loadable, and In-Place, with System families (like walls and floors) being built-in, Loadable families (like doors and furniture) being user-created and loadable, and In-Place families being created directly within a project for custom elements.

Creating a Loadable Family

Opening a family template

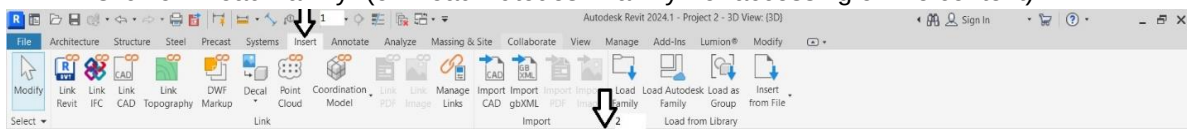
- Using reference planes and parameters
- Adding dimensions and constraints
- Inserting components like solids and voids
- Assigning parameters and types

Applying Families to Projects

Loading families into a project

Locate the Family:

- Open the Revit project where you want to load the family.
- Go to the “Insert” tab on the ribbon.
- Click on “Load Family” (or “Load Autodesk Family” for accessing online content).

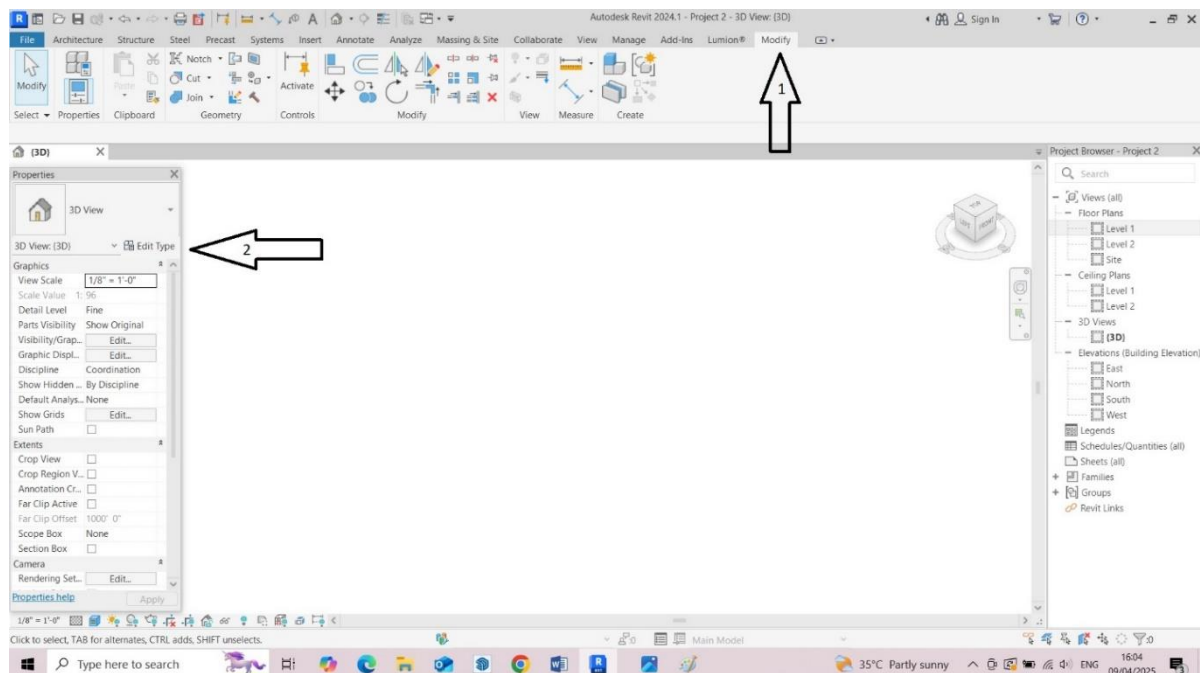


Modifying type properties within the project

To modify type properties within a project, you can access the “Type Properties” dialog by clicking “Modify | <Element> tab Properties panel (Type Properties)” or by clicking “Edit Type” on the Properties palette.

Do you know

In Revit Family mean Pre-made Model which can be used in other Projects



Placing and adjusting family instances

- Locate the Family: Navigate to the Project Browser and find the family you want to place.
- Expand Family Types: Expand the family to see the different types available for placement.
- Create Instance: Right-click on the desired family type and select "Create Instance".
- Placement: Click in the drawing area to place the family instance.

Activity1:

Practice to create Revit file in required template.

Step 1: Choose a trade (Architecture, Structure, or MEP)

Step 2: Modify Revit's interface using Workspaces, View Templates, and Visibility/Graphics settings

Step 3: Save the workspace and take screenshots of your custom interface

Step 4: Present your customization and rationale to the class

Learning Unit 4.2

Create Building Layout

Learning Outcomes:

After completion of this learning unit, the trainee will be able to:

- Create/import drawings to make layout according to the given requirements.
- Load, Create and draw the walls according to the given specifications.
- Load and install building component (door, windows, ventilators etc.).
- Create and draw floor and roofs by boundary according structural specification.
- Install fixture and Furnishers
- Create 3D prototype model of the drawing according to given measurements.

4.2.1 Create/Import Drawings



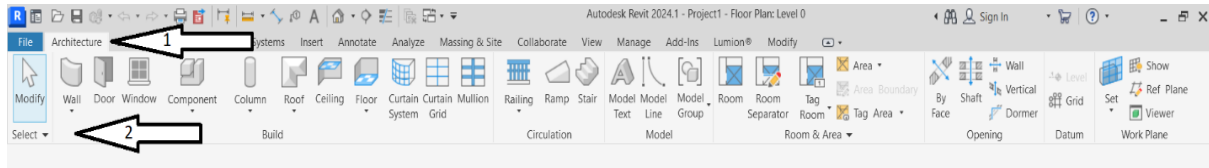
- Open a new Revit project or use a template.
- Go to **Insert Tab > Import CAD**.
- Browse and select the 2D drawing file (e.g., floor plan in DWG).
- Set correct units, positioning (origin to origin), and layers visibility.
- Use Visibility Graphics (VG) to hide unnecessary layers.
- Begin tracing walls, components, and layout boundaries on imported drawing.

Do you know

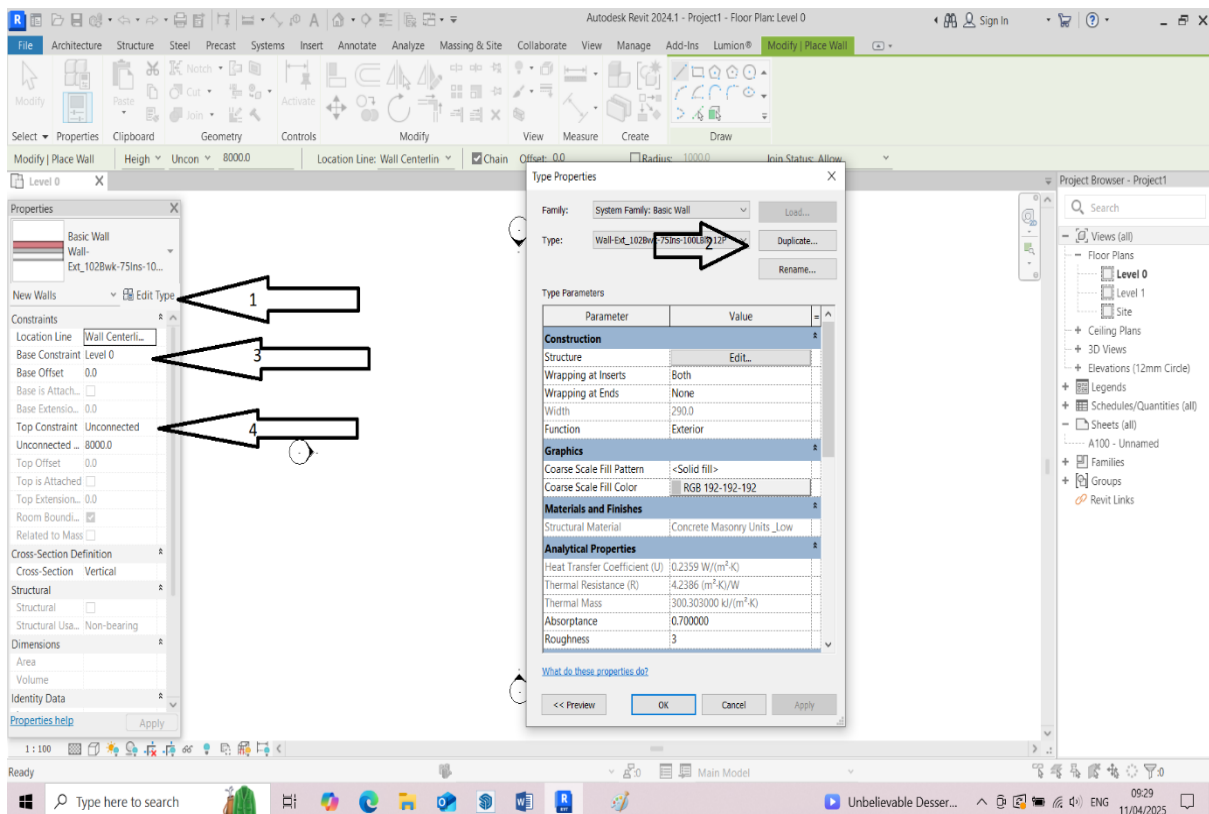
You can also link CAD and another Revit file which is automatically updated when you make changes in linked file

4.2.2 Set Walls, Installation of Components (Doors, Windows etc.)

- Go to Architecture Tab > Wall.



- Choose wall type from **Properties Panel** (modify or duplicate as needed).

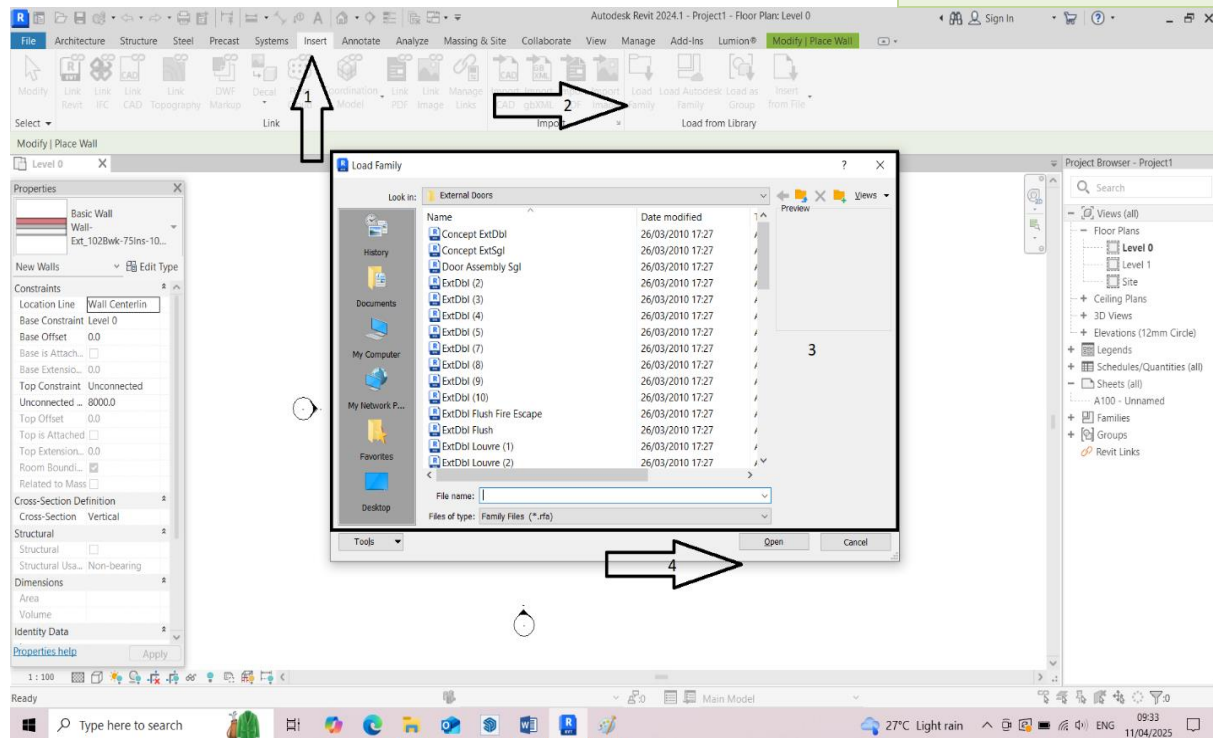


- Define base and top constraints (floor levels).
- Use the Line or Rectangle tool to draw the wall layout.
- Use Trim/Extend/Offset tools for clean connections.
- Use Modify > Edit Profile for custom shapes.

Load and Install Building Component (door, windows, ventilators etc.).

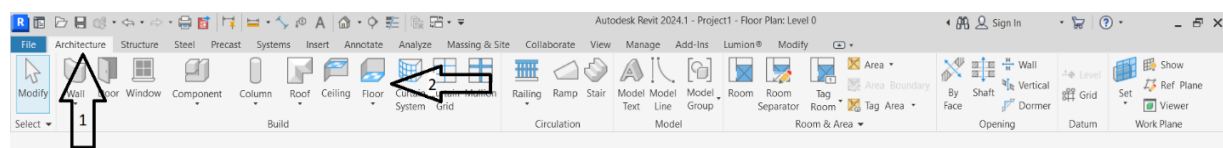
- Use **Insert > Load Family** to import desired component types.
- Go to **Architecture > Door/Window**.
- Select component type from **Properties Panel**.
- Click on host wall to place the component.
- Adjust **size, placement, and swing direction**.
- Use **Modify tools** (Move, Mirror, Rotate) as needed.

Do you know
You can flip Door and windows by double-arrow flip icons (horizontal and vertical)



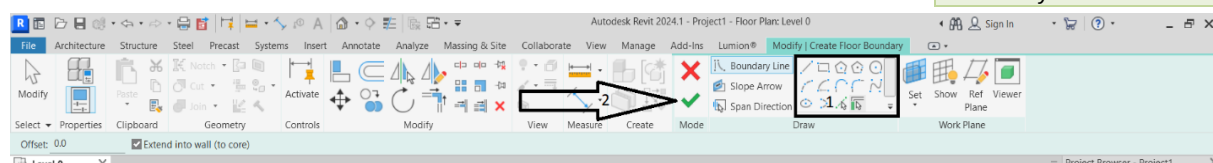
4.2.3 Create Floors and Roofs Based on Structural Specifications

- Go to **Architecture > Floor > Floor: Architectural**.

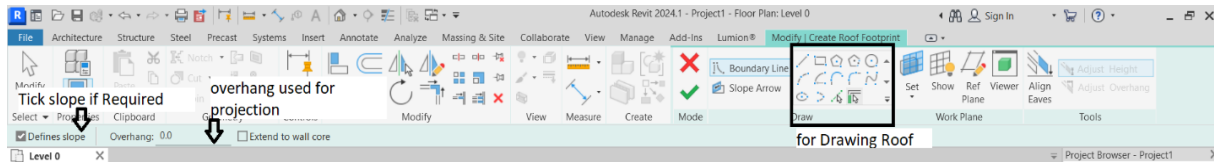
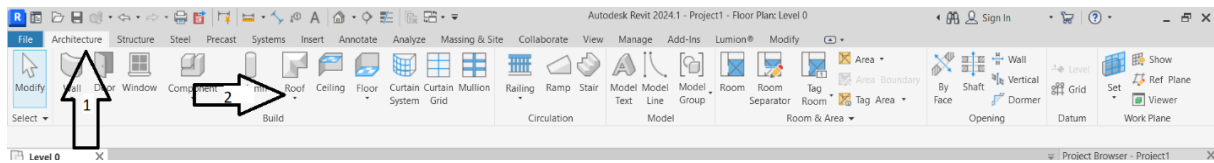


- Use **Line Tool** to draw boundary within wall perimeter.
- Finish the sketch to create the floor.

Remember
Use floor for all Levels and Use roof for last level only

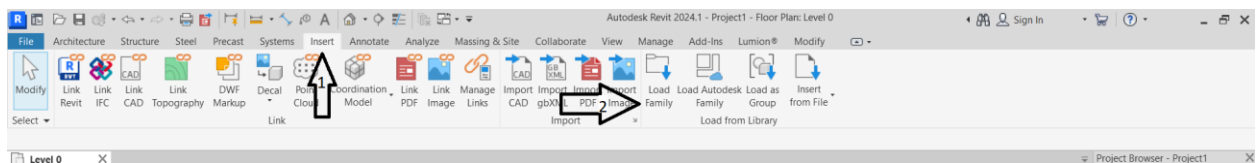


- Go to **Architecture > Roof > Roof by Footprint**.
- Draw roof boundary and set slopes where required.

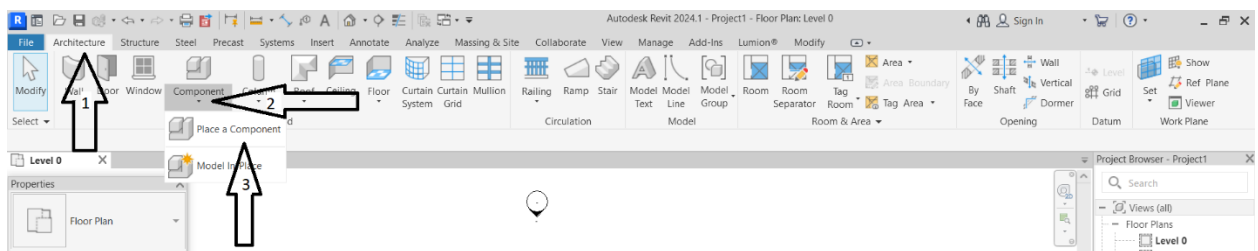


Install Fixture and Furnishers

- Go to Insert > Load Family and load required furniture and fixtures.



- Use Architecture > Component > Place a Component.

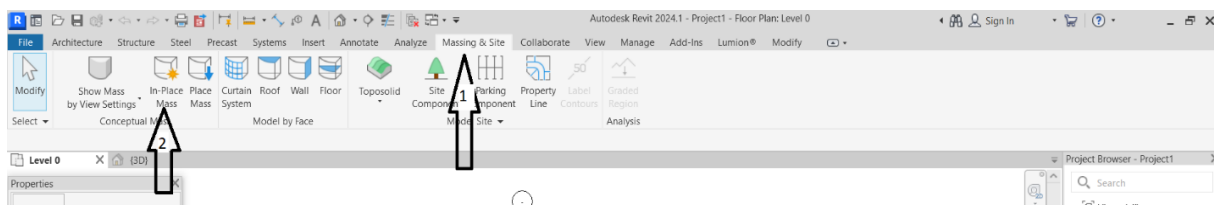


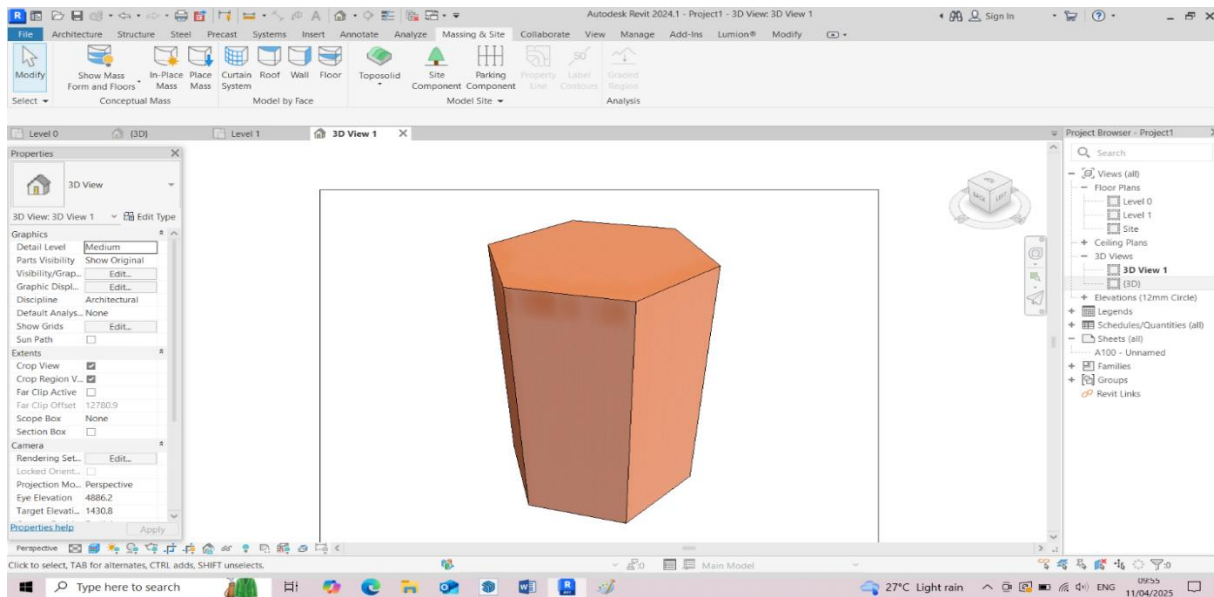
- Place items in appropriate rooms (e.g., bed in bedroom, sink in bath).
- Use **Modify tools** to rotate, align, or move items.
- Adjust item properties (dimensions, material) from **Type Properties**.

4.2.4 Create 3D Prototype Model of the Drawing

- Switch to Default 3D View.
- Enable Massing & Site > Show Mass.
- Use In-Place Mass to create conceptual shapes and volumes.
- Apply materials and lighting settings under Graphics/Render.
- Use Camera View or Render to present the final model.

Do you know
Massing help you
Create you conceptual
Model without any
Constraints





Activity 1:

- Import 2D AutoCAD drawing and convert it, into 3D model by using Revit Architecture.
- Open a new Revit project and set the correct units (Manage > Project Units).
- Go to **Insert > Import CAD** and load the provided 2D AutoCAD floor plan.
- Adjust **import settings** (e.g., origin, positioning, layers).
- Switch to **Level 1 floor plan**, trace the walls using the **Wall tool**.
- Place doors and windows using **Door** and **Window tools**, referencing the imported plan.
- Use **Floor by Boundary** to create the floor slab.

Activity 2:

Practice to develop an architectural 3D model in Revit Architecture of 35' X 65' plot dimension as per the following requirements

- Two Rooms with attached bath
- Lounge
- Drawing
- Kitchen
- Powder Room
- Store
- Servant Bath
- Porch

View the model in 3D View to review the initial structure

- Open a new Revit project and set up Levels (Level 1: Ground Floor, Level 2: Roof).
- Use the **Wall tool** to define the boundary of the plot (35' x 65') and draw internal partitions according to room requirements.
- Insert **doors and windows** in appropriate rooms.
- Create **floors and roof** using boundary method:
- Flat slab for floor
- Sloped or flat roof based on design choice
- Load and place **fixtures and furniture**:
- Beds, sofas, kitchen appliances, WC, washbasins, etc.
- Design a **porch** using floor tool and columns (optional).
- Add a **servant bath** at the back or side with access from outside.
- Switch to **3D View** and review the entire model.
- Apply **materials** to walls, roof, and furniture.
- Use **In-Place Massing** to analyse form or add mass blocks for volumetric study.

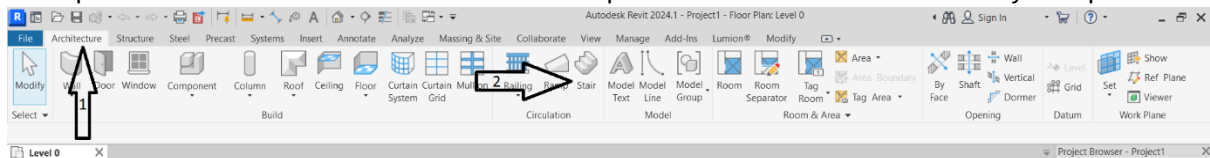
Learning Outcomes:

After completion of this learning unit, the trainee will be able to:

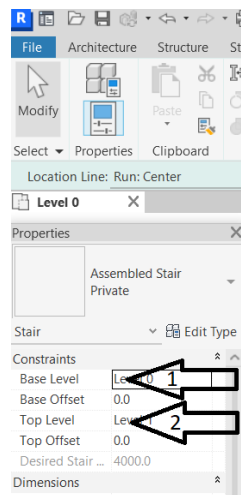
- Place stair by component.
- Model stair and railing by sketch.
- Create Conceptual mass (generic modelling).
- Apply conceptual mass to the project.
- Create families and parameters on building model as per requirement.
- Create and apply materials on building model as per design.
- Model the site and topography
- Model the site using Topo solid.

4.3.1 Stairs

- Open Stair Tool: Architecture tab > Circulation panel > Click Stair > Select Stair by Component.



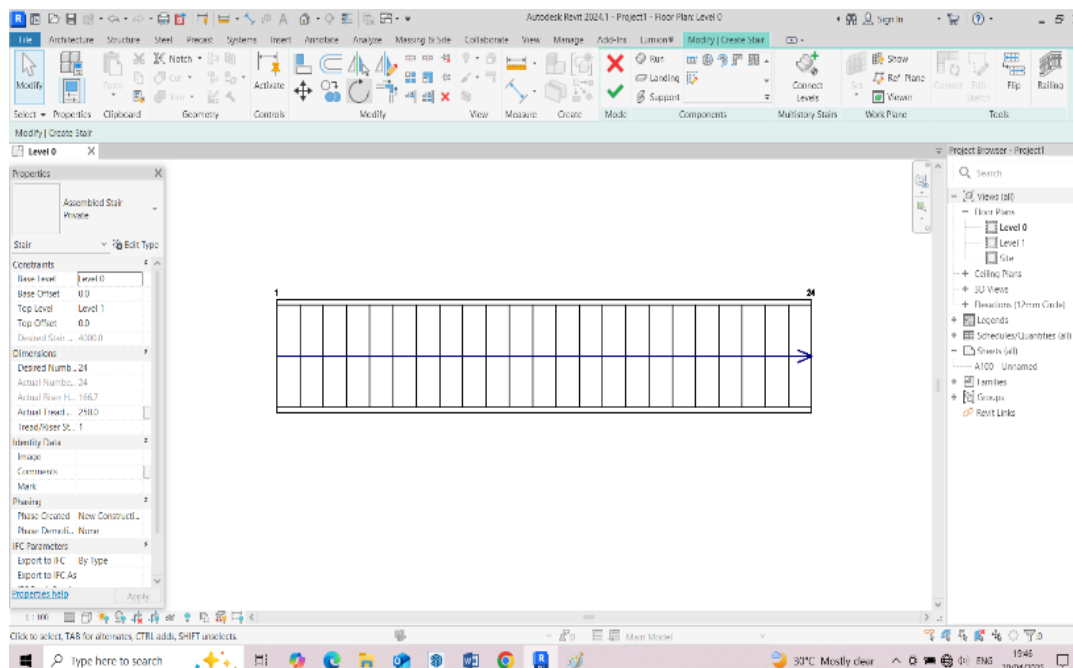
- Set Base & Top Levels: In the Options Bar, set the Base Level and Top Level (e.g., Level 1 to Level 2).



- Define Stair Parameters: Set Desired Riser Height, Tread Depth, and Stair Width.

Type Parameters	
Parameter	Value
Calculation Rules	
Maximum Riser Height	170.0
Minimum Tread Depth	250.0
Minimum Run Width	1000.0
Calculation Rules	Edit...
Construction	

- Draw the Stair Run: Click to start and end the stair run.
- Place Railings: Railings auto-generate on stair edges. Modify via Modify > Railing.
- Finish: Click the Green Checkmark to complete.

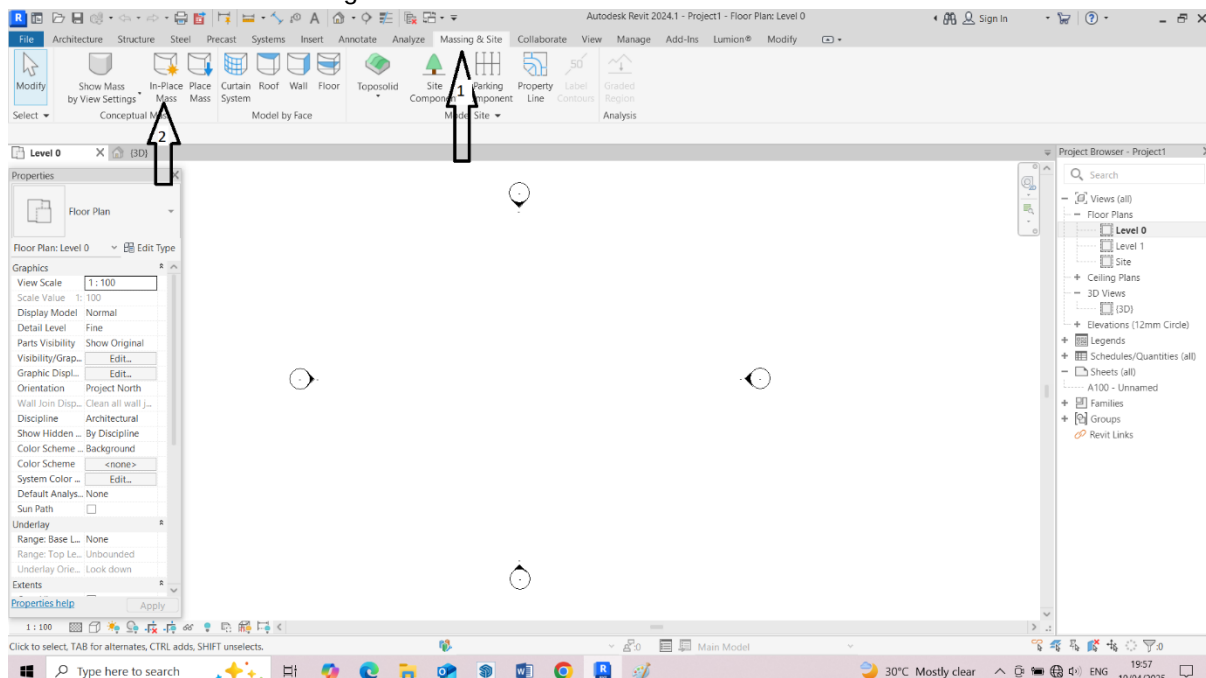


4.3.2 Model Stair and Railing

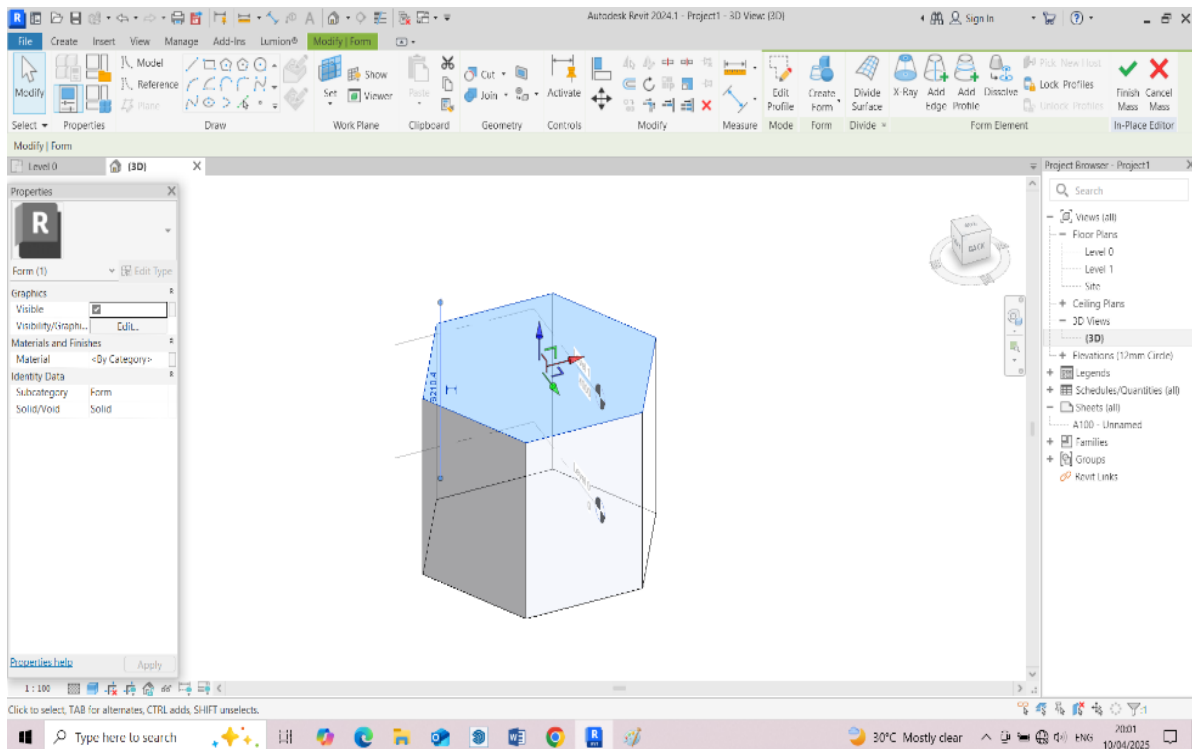
- Open Stair Tool: Architecture tab > Stair > Select Stair by Sketch.
- Sketch Boundaries and Risers using Boundary Tool and Riser Tool.
- Set Run Type: In Properties, choose “Monolithic” or “Precast”.
- Sketch Railings: Select stair > Edit Rail > Sketch railing path.
- Finish: Click the Green Checkmark to finalize.

4.3.3 Conceptual Mass (Generic Modelling)

- Start New Mass: Massing & Site tab > In-Place Mass > Name it.

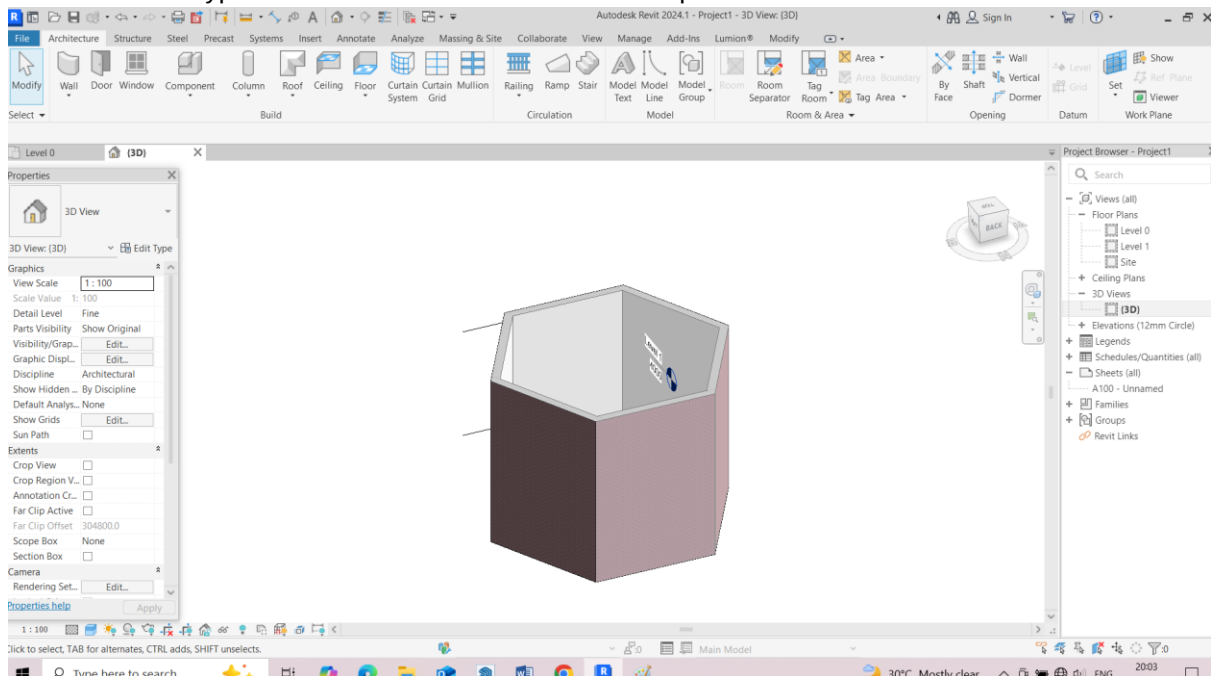


- Draw Profiles using Line, Rectangle, Arc tools.
- Model Solids: Select profiles > Create Form > Choose Solid or Void.
- Modify Form with Push/Pull, Rotate, Scale tools.
- Finish: Click the Green Checkmark to exit.



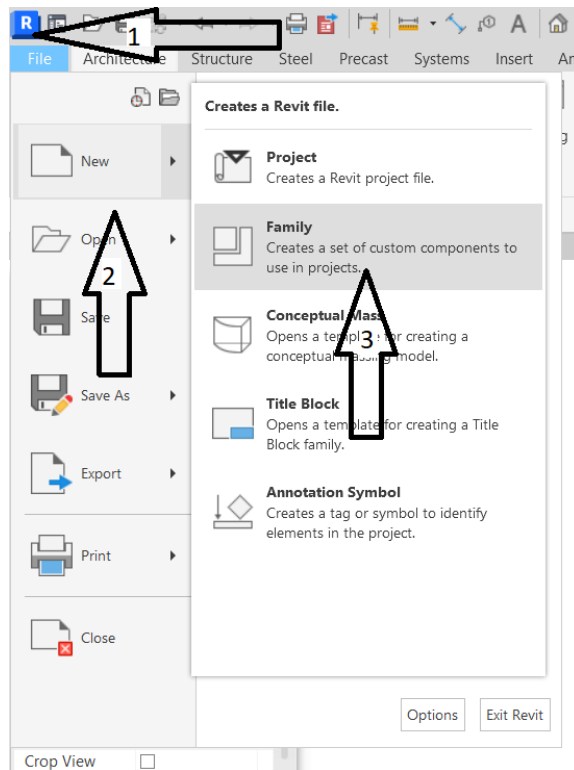
Apply Conceptual Mass to the Project

- Select Mass Faces in project.
- Apply Elements: Use Wall by Face, Roof by Face, and Floor by Face.
- Create Mass Floors: Select Mass > Mass Floors > Check Levels.
- Customize Types for structural and architectural components.



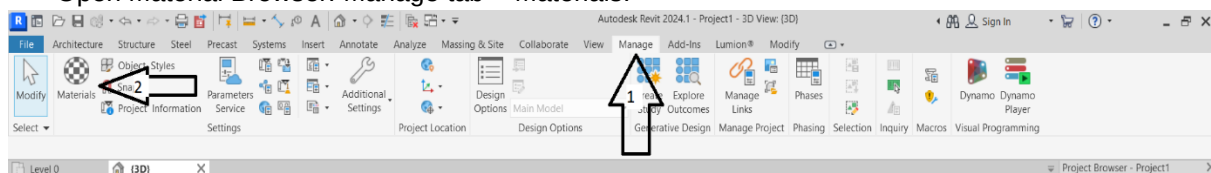
4.3.4 Families and Parameters

- Open New Family: File > New > Family > Choose template.
- Set Reference Planes to define geometry.
- Add Parameters: Create tab > Family Types > Add Length, Width, etc.
- Create Geometry: Use Extrusion, Blend, and Sweep. Lock to reference planes.
- Load into Project and place as needed.

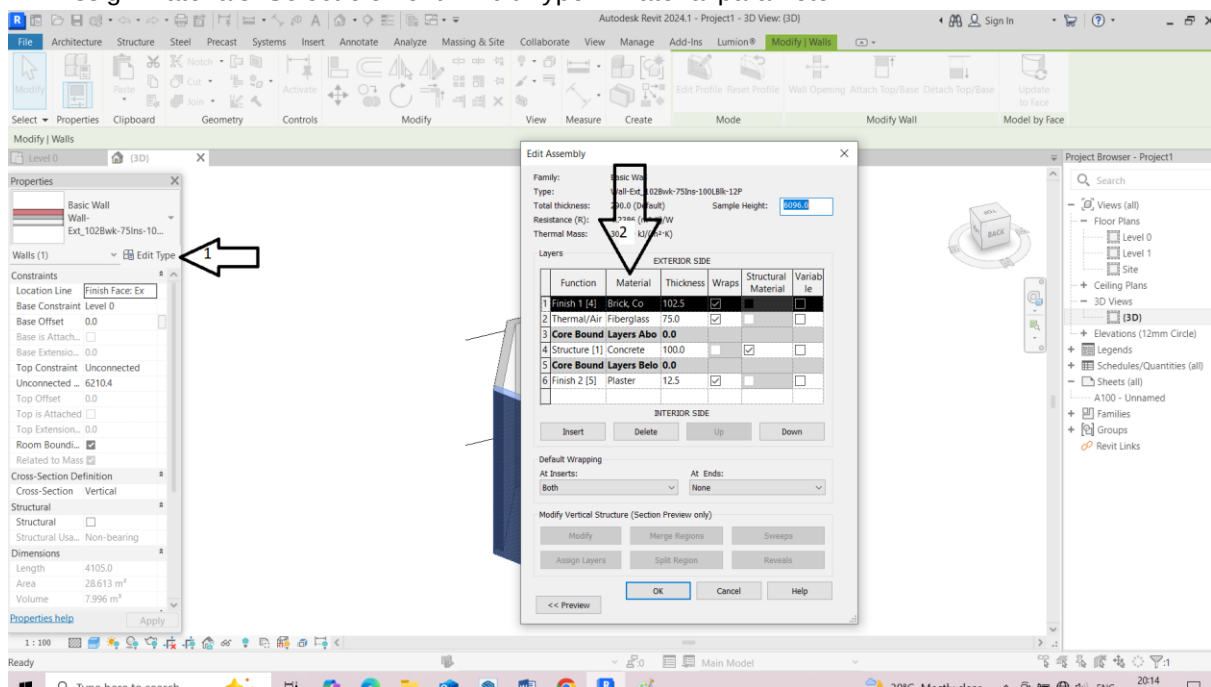


4.3.5 Manage Materials & Textures

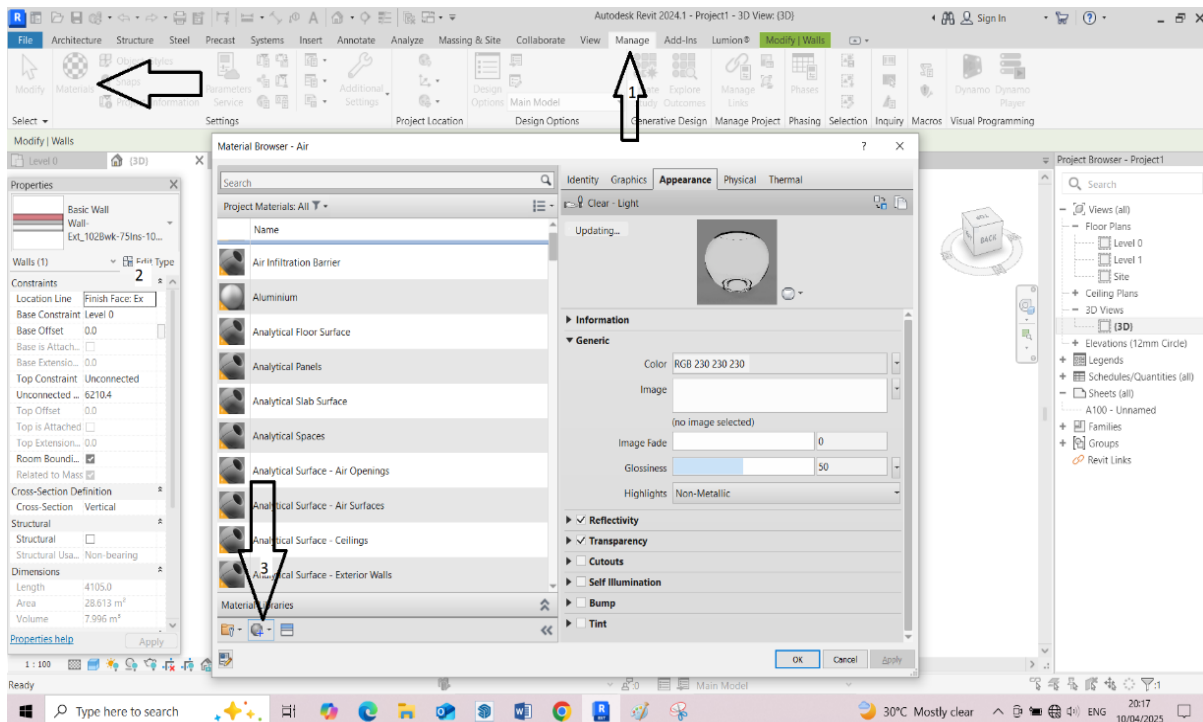
- Open Material Browser: Manage tab > Materials.



- Assign Materials: Select element > Edit Type > Material parameter.



- Create or Duplicate Materials: In Material Browser > Duplicate and Rename.



- Apply Textures: Appearance tab > Add texture or image.
- Render Preview: View in realistic mode or render output.

Activity 1:

Practice to model a custom staircase and railing by sketching, ensuring the design fits specific building measurements.

Steps:

Open the building project in **Floor Plan** or **Section View**.

Go to Architecture tab > Stair > Stair by Sketch.

Use the **Boundary Tool** to define the outer edges of the stair.

Use the **Riser Tool** to place steps according to calculated riser height and tread depth.

Optionally, draw the **Landing** using sketch tools for platforms or breaks in the stair run.

Finish the sketch and preview the stair in **3D View**.

Select the stair > Click **Edit Rail** to modify or add custom railings.

Use the **Sketch Path Tool** to draw railing paths and adjust railing types.

Adjust materials, height, or profile of the railing from the **Properties Palette**.

Review the final staircase and railing system in both plan and 3D view for design accuracy.

Remember

You can Design your Custom material and Texture in Revit

Activity 2:

Practice to create and apply a Conceptual Mass to a Building Project

Steps:

- Open a new or existing project.
- Go to Massing & Site tab > In-Place Mass.
- Give your mass a name and enter the massing environment.
- Sketch 2D profiles using **Lines**, **Arcs**, **Rectangles**, or **Splines**.
- Select profiles > Click **Create Form** > Choose **Solid Form**.
- Use **Push/Pull** or **Modify Tools** to adjust the shape and volume.
- Click **Finish Mass** to return to the project.
- Select the mass > Use tools like:
 - Wall by Face
 - Roof by Face
 - Floor by Face
- Apply materials to these new elements from the **Type Properties**.

- Add Mass Floors for analysis or zoning visualization.

Activity 3:

Practice to model Site Topography and Integrate a Building

Steps:

- Go to **Massing & Site tab > Toposolid** (or Toposurface in older versions).
- Click **Create from Points** to manually add elevation points:
- Place points at varying elevation levels (e.g., 0, 2', 4', etc.).
- Use Smoothing Tools or Contours Display to refine topography.
- Click **Finish Surface** to complete the terrain.
- Add **Building Pads** if needed to embed the structure.
- Insert the building model:
- Import or place components such as floors, ramps, or stairs.
- Ensure building levels align with the terrain base.
- Add **Site Components** like trees, site lighting, or cars for visualization.
- View the integration in **3D View** and use **Section Boxes** to check interaction between model and terrain.

Learning Unit 4.4

Create Construction Document

Learning Outcomes:

After completion of this Learning unit trainee will be able to:

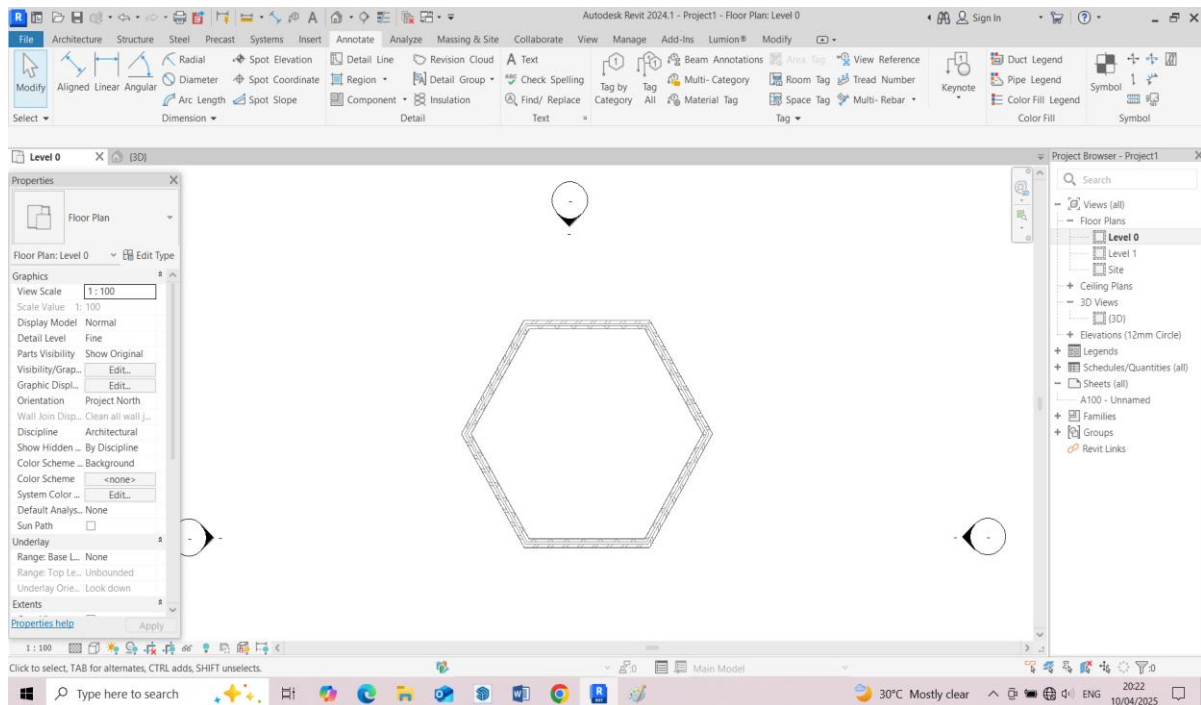
- Create specification/detail for various parts according to given requirements (apply Annotation Tags, area tags, dimensions) on building plans according to requirement.
- Apply Annotation Tags, area tags, dimensions on building plans according to requirement for elevations for building documentation
- Create a section view and Apply Annotation for building documentation
- Create a Callout and Apply Annotation for building documentation
- Create a 2D Render.
- Creating schedules for building documentation
- Creating a material take-off sheet
- Creating a door and window legend
- Work with sheets
- Set for print

4.4.1 Specs and Annotations

- Open a floor or elevation view.
- Use Annotate tab > Select tools like Tag by Category, Area Tag, or Dimension.
- Place area tags on enclosed regions like rooms or zones.
- Add aligned or linear dimensions to show accurate measurements.
- Use Leader Text or Keynotes for detailing.

Do you know

Annotation Help us know Model in Detail

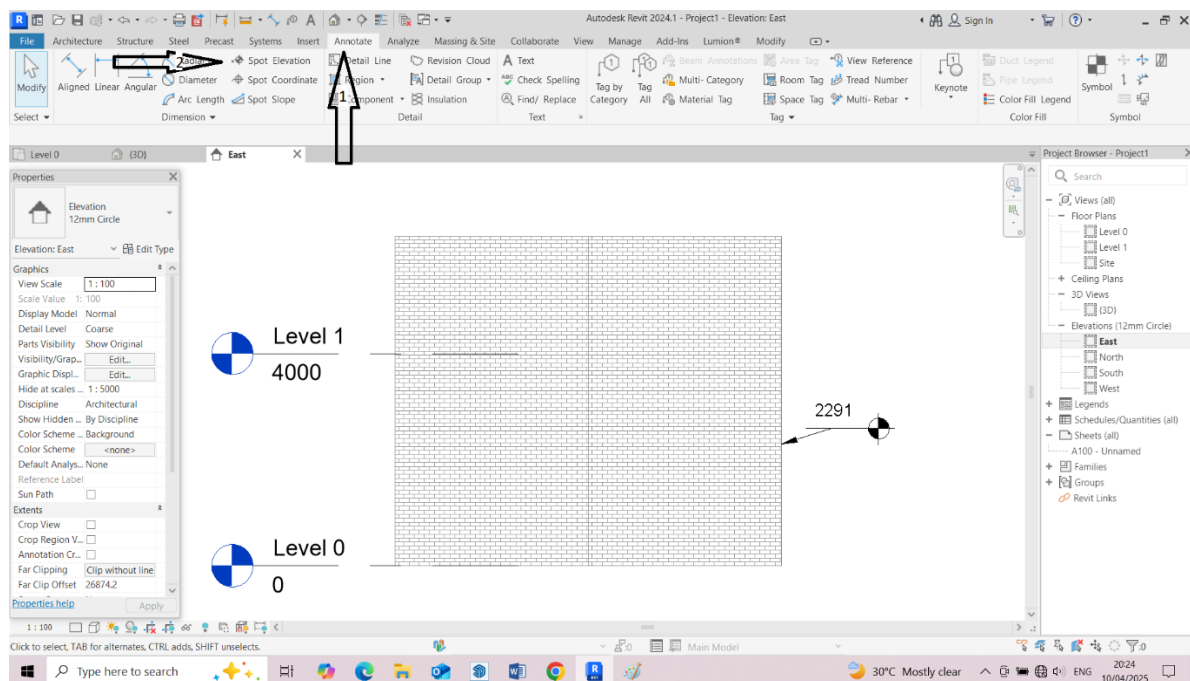


Annotate Elevation Views for Documentation

- Open an Elevation View.
- Annotate tab > Use Spot Elevation, Text Notes, and Dimensions.
- Add area tags to vertical elements if applicable.
- Ensure proper scaling and readable annotations.

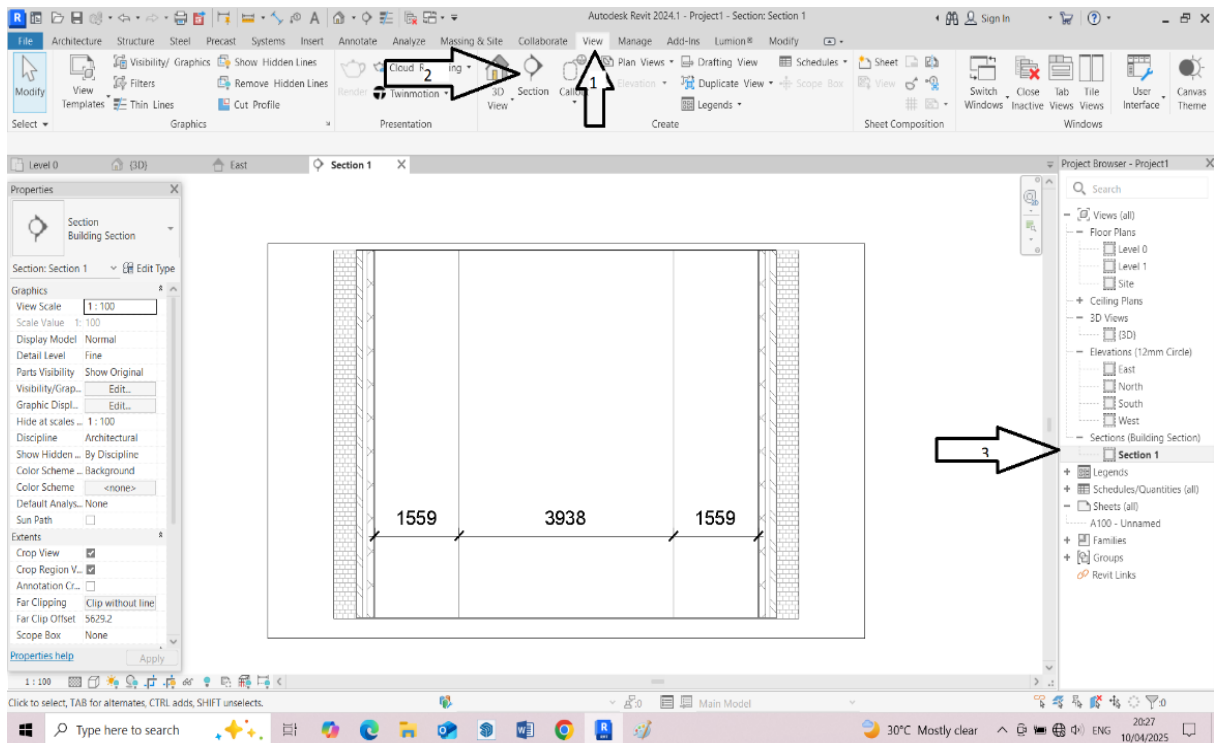
Do you know

Spot elevation helps us know the Exact height of Specific Area



Create Section Views and Apply Annotations

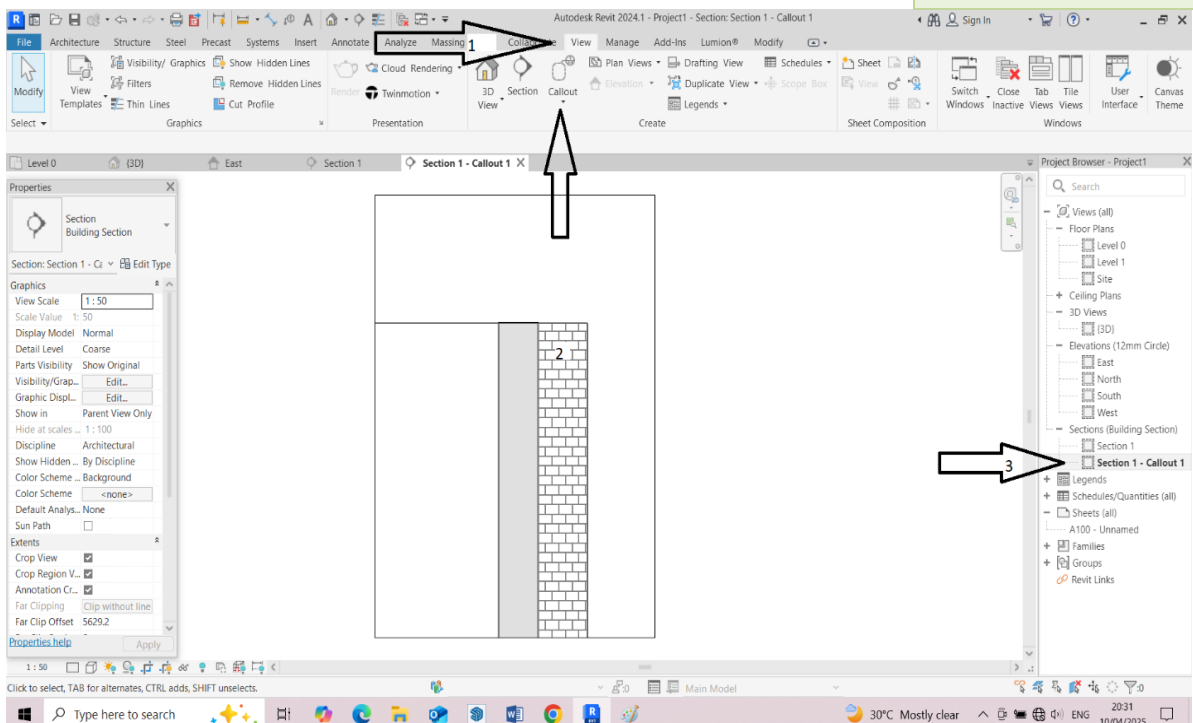
- View tab > Section > Draw section line across the desired location.
- Open the new section from Project Browser.
- Add dimensions, text notes, detail tags, and material identifiers.



4.4.2 Callouts

- View tab > Callout > Click and drag to define the detail region.
- Open callout from Project Browser.
- Use Annotate tools to label parts, add notes, and clarify geometry.

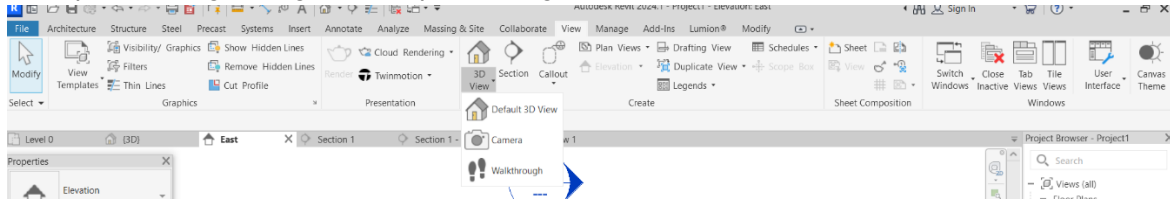
Do you know
Callout use for
Detailed and Zoom
Section of Drawing



4.4.3 2D Rendering

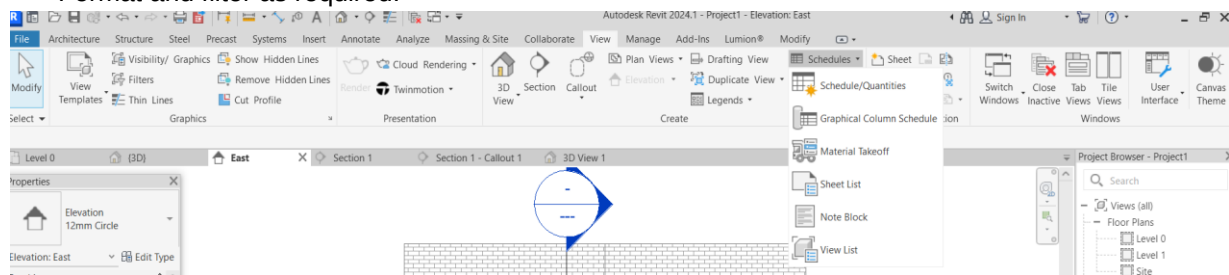
- Open a camera or perspective view.
- Use View Control Bar > Visual Style > Choose "Realistic".
- Apply materials and lighting settings.

- Export as image using File > Export > Image.



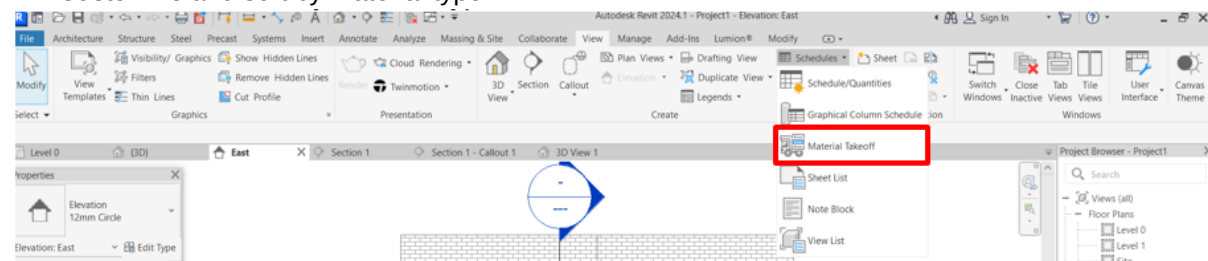
4.4.4 Schedules

- View tab > Schedules > Schedule/Quantities.
- Choose category (e.g., Doors, Windows, and Furniture).
- Select fields such as Type, Count, and Material.
- Format and filter as required.



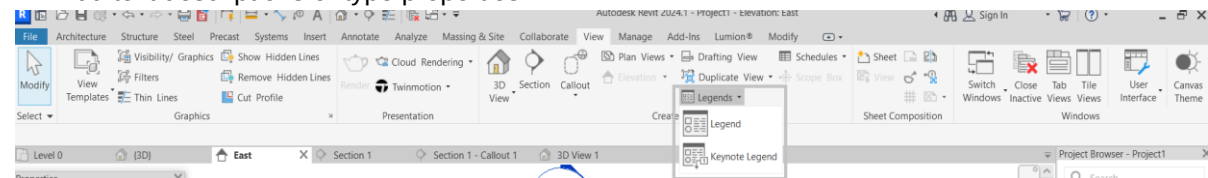
4.4.5 Material Take-Off

- View tab > Schedules > Material Takeoff.
- Select category (e.g., Walls).
- Add material, area, volume, and cost fields.
- Customize and sort by material type.



4.4.6 Door and Window Legends

- View tab > Legends > New Legend.
- Add door/window types manually or drag from Project Browser.
- Add text descriptions or type properties.

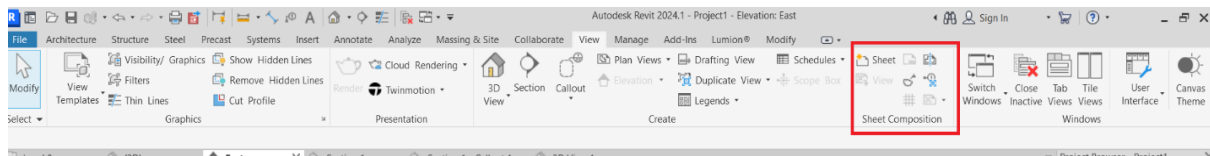


Work with Sheets

- View tab > Sheet Composition > New Sheet.
- Drag views from Project Browser onto the sheet.
- Arrange views with view titles and scale.

Do you know

You can Create Sheets and Load your Customize sheet in Revit

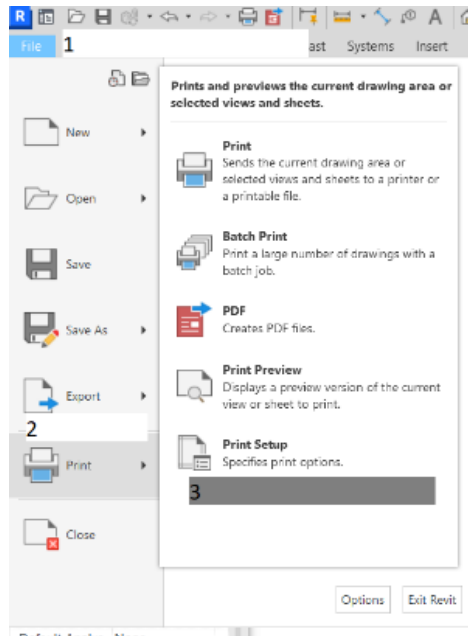


Printing

- File > Print > Print Setup.
- Choose paper size, orientation, and print range.
- Set zoom to fit or specific scale.
- Click Print to export PDF or physical copy.

Remember

Revit Help you Create a Set a Sheets which can Direct export/Print



Activity-1:

Practice to annotate an elevation view with area tags and dimensions, ensuring all critical details are documented.

Steps:

- Open one of the elevation views from the **Project Browser** (e.g., South Elevation).
- Go to the Annotate tab:
- Select **Dimension** > Choose **Aligned** or **Linear**.
- Apply dimensions to key vertical elements such as window heights, floor levels, and facade features.
- Use **Spot Elevation** to mark floor levels, parapets, or other height-relevant elements.
- Apply **Area Tags** to specific regions if applicable (e.g., facade zones or signage panels).
- Add **Text Notes** or **Keynotes** to describe materials, finishes, or other specifications.
- Ensure all annotations are aligned, legible, and scaled appropriately for printing.
- Review the elevation to confirm that it communicates full design intent.

Activity-2:

Practice to create a door and window schedule, as well as a material take-off sheet, for a building project.

Steps:

- Go to View tab > Schedules > Schedule/Quantities.
- Choose Doors or Windows from the category list.
- In the Fields dialog, select relevant parameters such as:

- Type, Count, Width, Height, Level, and Mark.
- Click OK to create the schedule.
- Format columns and group similar items as needed using sorting and formatting tools.
- Repeat steps to create the Material Take-Off:
- View tab > Schedules > Material Take-off.
- Choose a category (e.g., Walls or Floors).
- Select fields like Material, Area, Volume, and Material Name.
- Review schedules and make sure all entries are accurate and organized.
- Place schedules on a sheet for presentation if required.

Activity-3

Practice to set up and Prepare Documentation Sheets for Printing

Steps:

- Go to View tab > Sheet Composition > New Sheet.
- Choose a title block template or load one if required.
- Open the **Project Browser**, drag and drop views (floor plan, elevation, sections, schedules) onto the sheet.

Arrange views:

- Align using guide lines.
- Scale views to fit appropriately within the layout.
- Add **View Titles**, Sheet Numbers, and Sheet Names.
- To prepare for printing:
- Go to File > Print.
- Choose your printer (including "Microsoft Print to PDF" or similar).
- Set print range and view/sheet set.
- Choose paper size, orientation, and zoom to fit or custom scale.
- Click **Print Preview** to check layout.
- Print or export the sheet to a PDF format.

Learning Unit 4.5	Render Model
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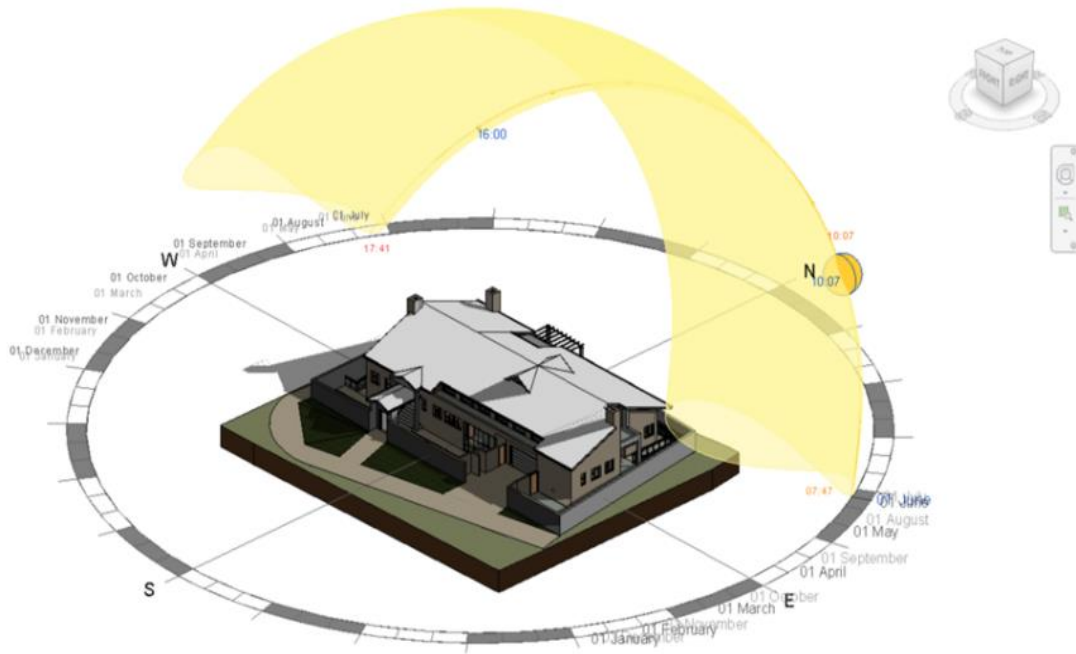
Learning Outcomes:

After completion of this learning unit, trainee will be able to:

- Set Sun and Shadows
- Generate a video walkthrough
- Add lights for illumination to get the requisite scene of 3D model.
- Apply material to the 3D model as per given specification.
- Apply texture to 3D model as per given specification.
- Assign cameras to execute different views of 3D Model.
- Add scene of 3D model according to specification.
- Render the 3D model according to required image size or resolution & orientation.

4.5.1 Sun Settings

- Open a 3D or perspective view.
- Go to View Control Bar > Sun Path > On.
- Click **Sun Settings** > Choose 'Still', 'Single Day', or 'Multi-Day'.
- Adjust **Location, Date, and Time** for realistic sunlight.
- Preview shadows in **Realistic View** mode.

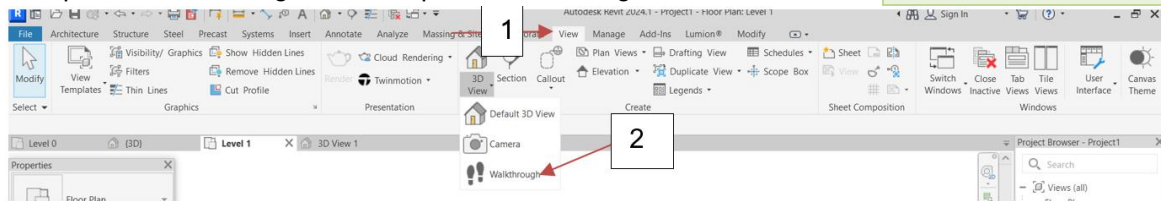


4.5.2 Walkthroughs

- Go to View tab > Create > Walkthrough.
- Click in the view to define the camera path.
- Modify the walkthrough path from the Project Browser.
- Adjust speed, camera height, and frame rate from the Modify tab.
- Export the walkthrough: File > Export > Walkthrough > Choose format.

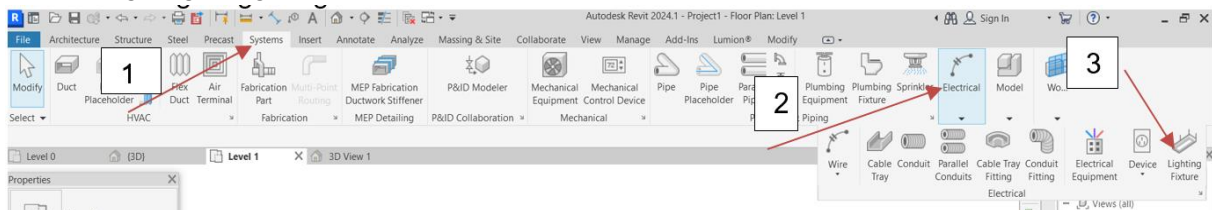
Do you know

In Revit you can Animate you Building and walkthrough you Design



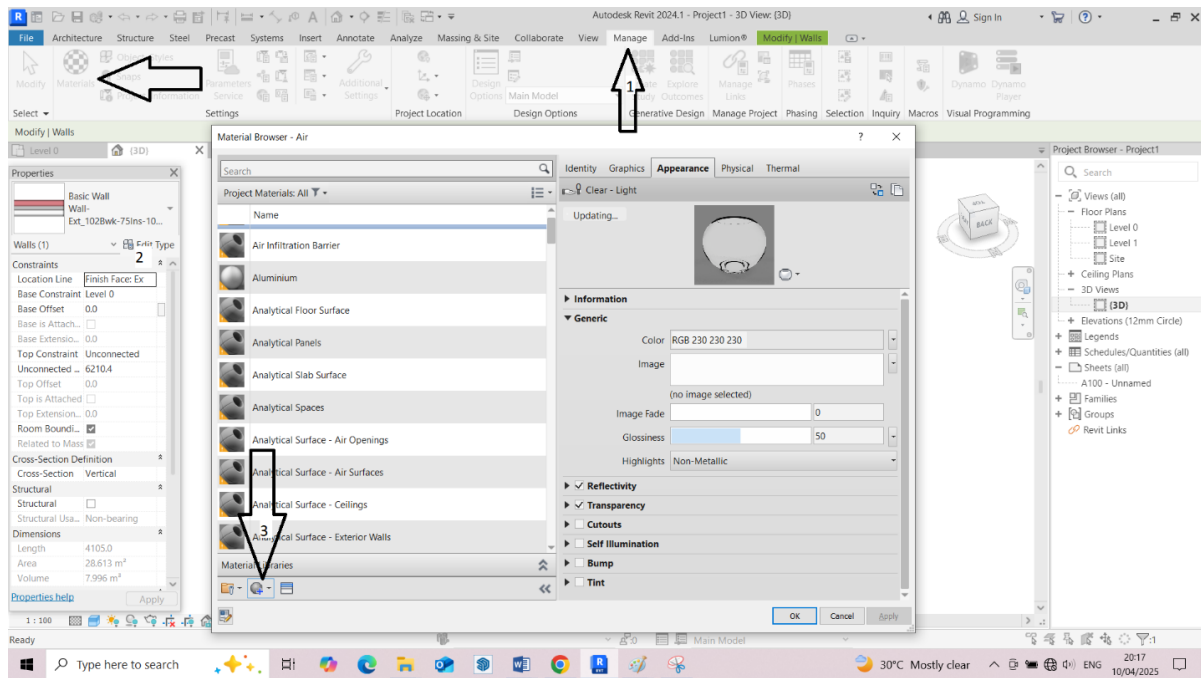
4.5.3 Lighting

- Go to Architecture or Systems tab > Lighting Fixture.
- Load families if needed (e.g., Spotlights, Pendants).
- Place the light in your scene.
- Select the light > Adjust intensity, colour, and type in the Properties Palette.
- Test lighting using Render Preview.



4.5.4 Material

- Select an element > Click **Edit Type > Material > '...'**.
- In **Material Browser**, select or duplicate a material.
- Customize material and apply to the object.

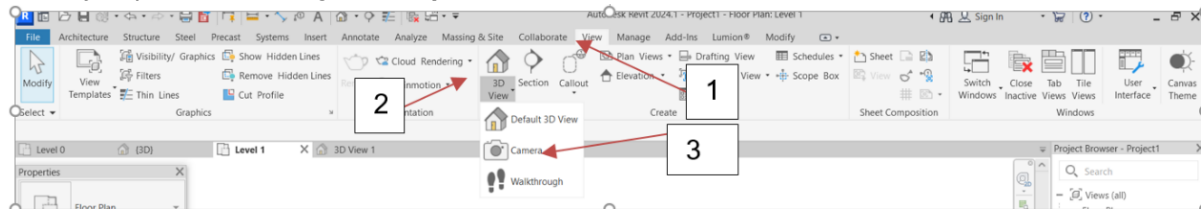


4.5.5 Textures

- Open Material Browser > Appearance Tab.
- Add image to texture slot under **Generic** or **Physical** material.
- Adjust scale, rotation, and positioning.
- View in Realistic Mode.

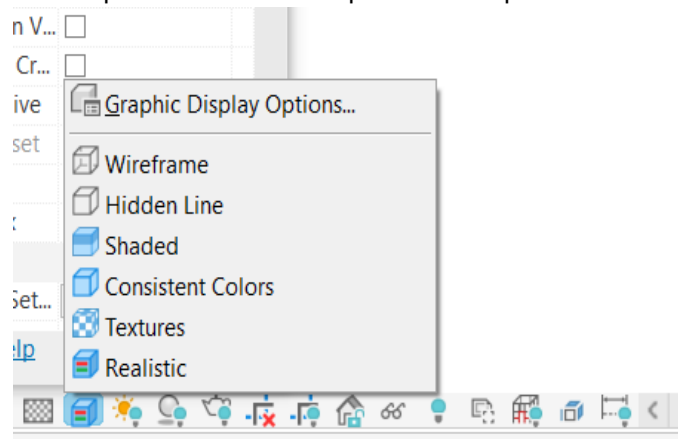
4.5.6 Camera Setting

- Go to View tab > 3D View > Camera.
- Click to place the camera and target location.
- Rename views in **Project Browser**.
- Adjust position and angle in **Properties Palette**.



4.5.7 Add Scene According to Specification

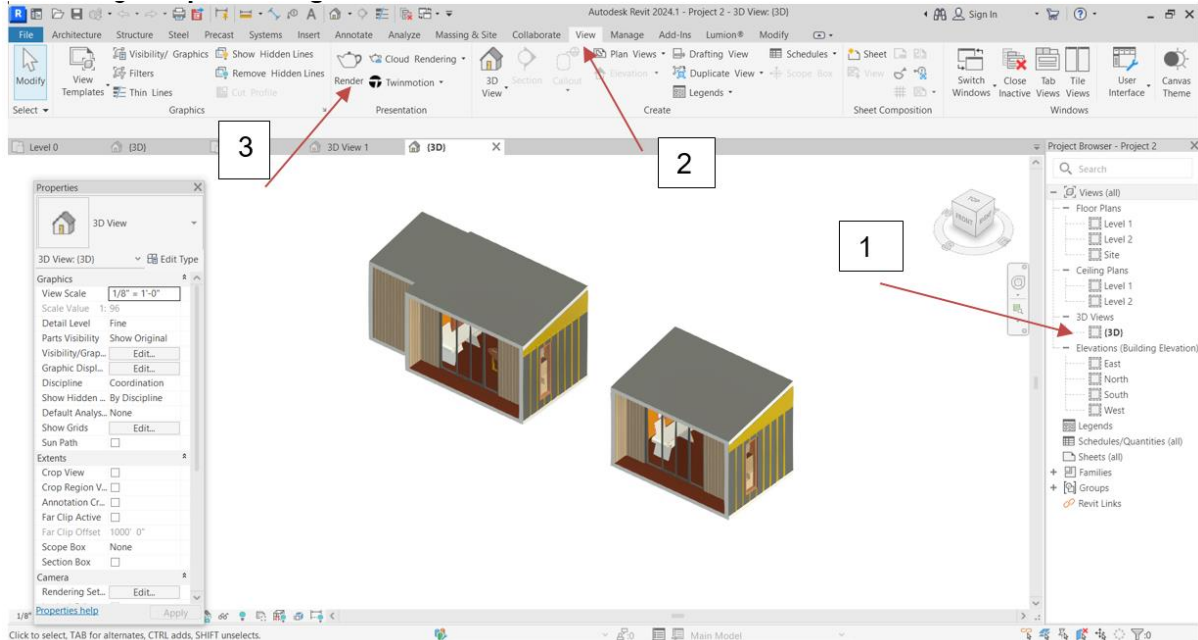
- Set view to **Realistic** or **Rendered**.
- Customize with sun settings, lighting, camera view, and textures.
- Save scene: Right-click > Duplicate View > As Dependent/Independent.



4.5.8 Rendering

- Open any 3D or camera view.
- Go to View tab > Render.
- Set quality, image size, lighting scheme, and background.
- Click **Render**.
- Save image: Export > Image.

Do you know
You can Directly Render
your Model in Revit



Activity 1:

Practice to set up a camera path and generate a video walkthrough of interior and exterior of a 3D building model

Steps:

- Open your completed 3D building model in Revit.
- Go to **View tab > Walkthrough** and start placing the walkthrough path:
- Begin outside the building and move through key exterior features.
- Continue into the interior and navigate key spaces (e.g., lounge, kitchen, rooms).
- Open the walkthrough view from the **Project Browser**.
- Use the Modify Walkthrough tab to:
- Adjust camera height and field of view.
- Set total number of frames and walkthrough speed.
- Preview the walkthrough using the play icon.
- Export the walkthrough:
- Go to File > Export > Walkthrough.
- Choose desired resolution, frame rate, and video format (e.g., AVI).
- Save and review the video output.

Activity 2:

Practice to add lights to scene, adjust their properties, and render the scene to evaluate the illumination

Steps:

- Open an interior 3D view or camera view.
- Go to Systems or Architecture tab > Lighting Fixtures.
- Load light families if necessary (e.g., ceiling lights, wall sconces).
- Place lights in various rooms.
- Select each light > Adjust intensity, light source type (point, spot), and position.
- Go to View tab > Render.

- Set the **Lighting Scheme** to “Interior: Artificial Only” or “Interior: Sun and Artificial”.
- Set render quality to **Draft or Medium** for quick testing.
- Click **Render** to evaluate light effects.
- Adjust placement or properties and re-render as needed.

Activity 3:

Practice to assign Cameras and Render 3D Scenes

Steps:

- Go to View tab > 3D View > Camera.
- Place cameras in various positions:
- One facing the entrance/front façade.
- One inside the main lounge or living area.
- Rename the camera views in the **Project Browser** (e.g., Camera - Entrance, Camera - Lounge).
- Adjust Eye Level, Target, and Field of View in the Properties Palette.
- Go to one of the camera views and click **View tab > Render**.
- Choose settings:
- **Quality:** Medium or High.
- **Resolution:** Printer (300 DPI) or Custom size.
- **Lighting Scheme:** Exterior or Interior as appropriate.
- **Background Style:** Sky, Colour, or Image.
- Click **Render** and save the output using **Export > Image**.

Learning Unit 4.6

Add Rendering Plugin

Learning Outcomes:

After Completion of this learning outcomes, trainee will be able to:

- Install Enscape plugin
- Set environment
- Apply and edit materials on the given model
- Set Resolution and visibility according to the requirement.

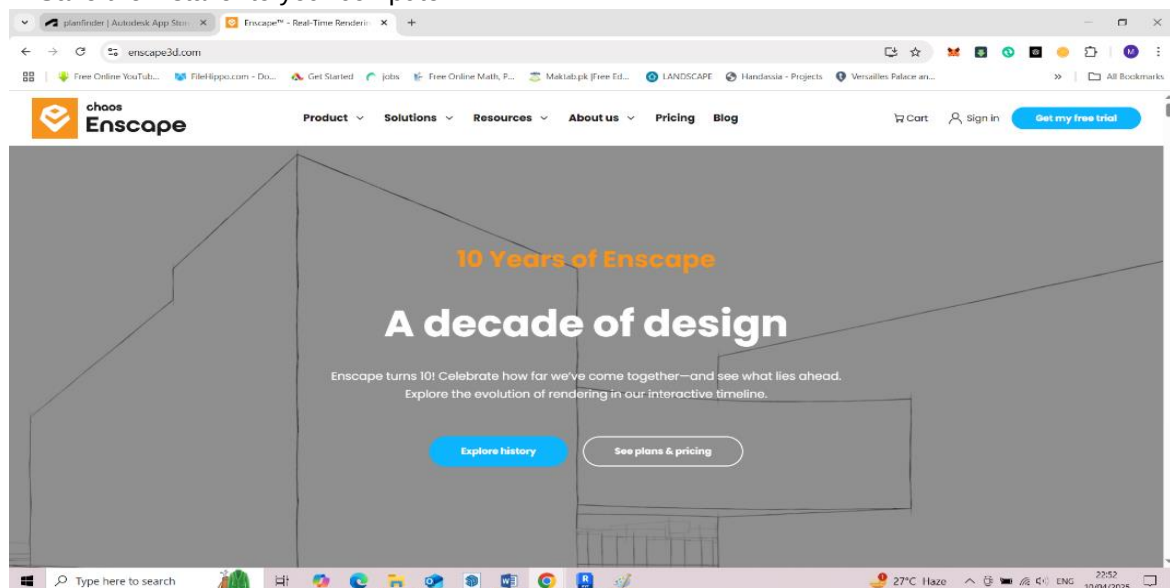
4.6.1 Enscape Interface

Step 1: Download Enscape

- Go to the official Enscape website: <https://enscape3d.com>
- Click on **Free Trial** or **Download** (depending on your license).
- Choose the correct version compatible with your system (Windows 64-bit).
- Save the installer to your computer.

Remember

Enscape is plugin use in Revit for rendering Purposes



Step 2: Run the Installer

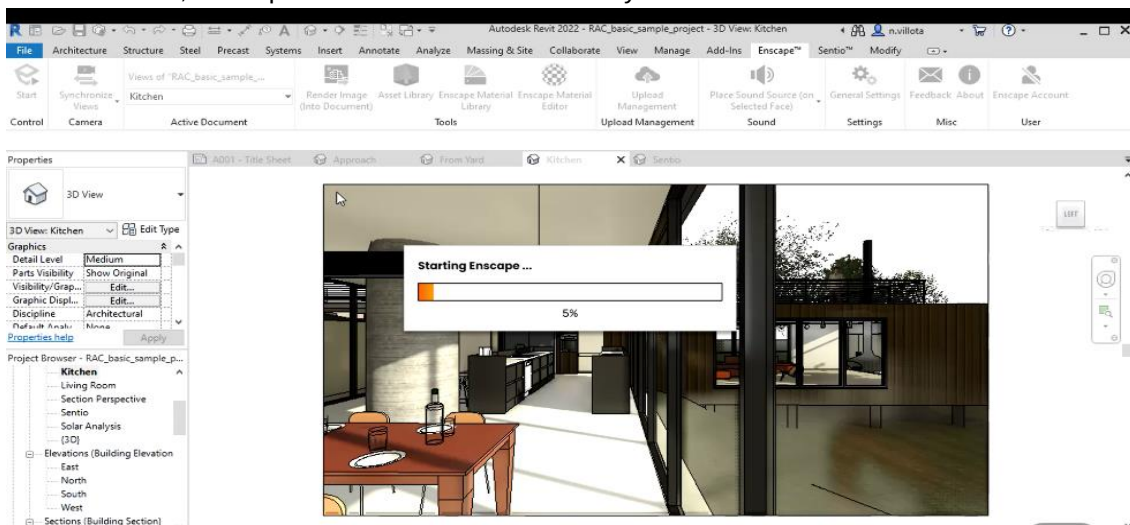
- Double-click the downloaded **Enscape installer (.exe)** file.
- Follow the installation wizard:
- Accept the license agreement.
- Select the versions of Revit (and other software) you want to install Enscape for (e.g., Revit 2021, 2022, etc.).
- Click **Install** and wait for the process to complete.

Step 3: Launch Revit and Activate Enscape

- Open **Revit**.
- You will now see a new tab called **“Enscape”** in the ribbon menu.
- Click on **“Enscape” > About > License Key** (if you have a license).
- For trial users, Enscape will start a trial automatically.

Remember

Trail Version Expire
after some days



Step 4: Start Rendering with Enscape

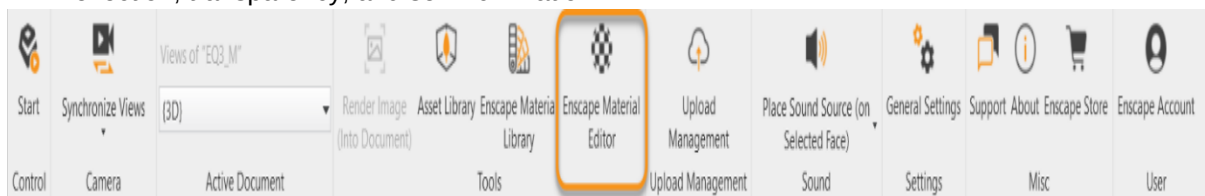
- Open any 3D View in your Revit project.
- Go to the Enscape tab and click **“Start Enscape”**.
- A new window will launch with a real-time rendered view of your model.

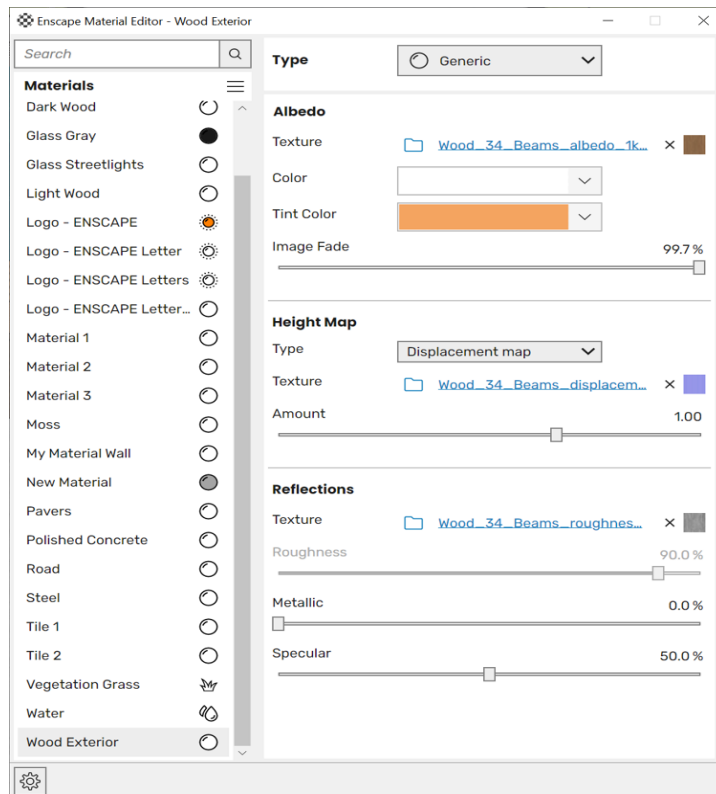
4.6.2 Material Library and Editing

- Select any model element > Open **Type Properties** > Click on the material box (...).
- In the **Material Browser**, switch to **Appearance Tab**.
- Launch the **Enscape Material Editor** from the Enscape tab.

Adjust:

- Material Type (Generic, Grass, Water, etc.)
- Texture maps (albedo, bump, roughness)
- Reflection, transparency, and self-illumination





4.6.3 Resolution and Visibility

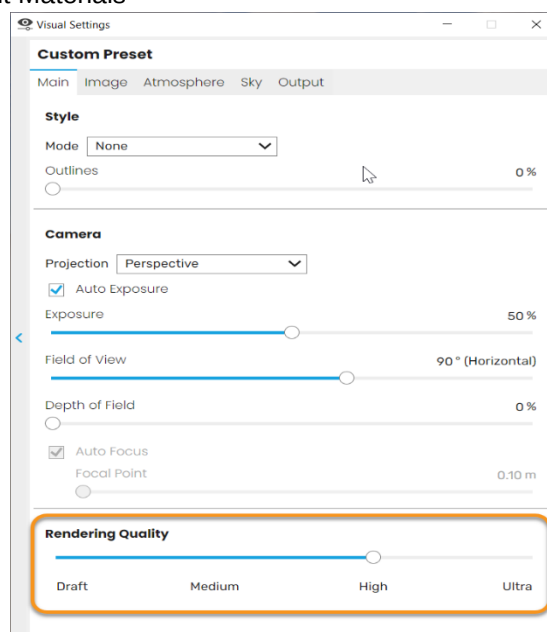
- Open Enscape Visual Settings > Output tab.
- Choose **Render Resolution** (Window Size, HD, Ultra HD, or Custom).
- In General tab, set Field of View, Depth of Field, and Auto Exposure.

Toggle visibility options like:

- White Mode
- Light View
- Outlines or Transparent Materials

Remember

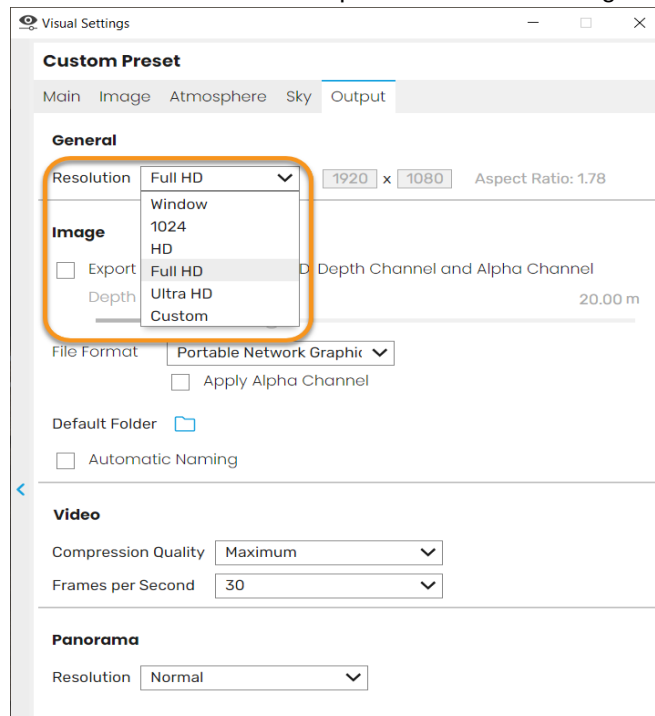
Enscape required high System performance for rendering



4.6.4 Rendering

- Open the scene in Revit and click **Start Enscape**.
- Navigate to the desired camera position in Enscape's live view.
- Click **Screenshot** icon or press **[Render Image]** from the Enscape tab.

- Save the image at the desired location and format (JPG, PNG, etc.).
- For videos: Use the **Video Editor** inside Enscape to create walkthroughs.



Activity 1:

Practice to Use Enscape Plugin and Render a 3D Model

Steps:

- Open a completed architectural model in Revit.
- Ensure Enscape is installed and accessible from the **Revit ribbon**.
- Click **Start Enscape** to launch the real-time renderer.
- Explore the building model through Enscape's live navigation.
- Open **Visual Settings** and configure:
 - **Lighting:** Adjust sun intensity, shadows, and artificial light.
 - **Environment:** Set skybox or custom HDRI.
 - **Depth of Field & Field of View**
- Apply materials using the **Enscape Material Editor**.
- Modify surfaces like walls, glass, wood, and metal.
- Choose a suitable camera angle and render a **high-resolution image**.
- Save the image and share or insert it into a documentation sheet or presentation.

Learning Unit 4.7

Apply AI Tools for Planning

Learning Outcome:

After completion of this learning module, trainee will be able to:

- Install Plan Finder Plugin
- Input Parameters for desired Outputs
- Choose Plan according to the requirements.

4.7.1 Plan Finder Input and Output Parameters

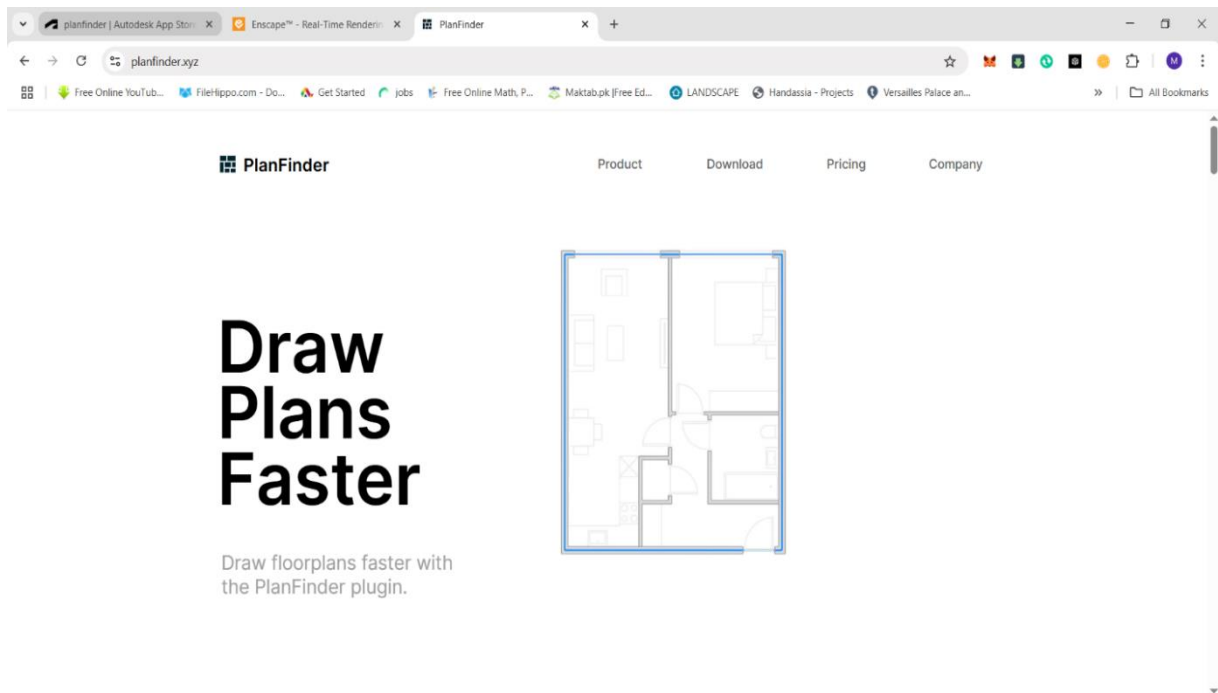
Step 1: Visit Autodesk App Store

Open your browser and go to the official **Autodesk App Store**:

- <https://apps.autodesk.com>
- In the search bar, type "PlanFinder".

Remember

Trail version Expires after sometime



Click on the PlanFinder app from the search results.

Step 2: Download the Plugin

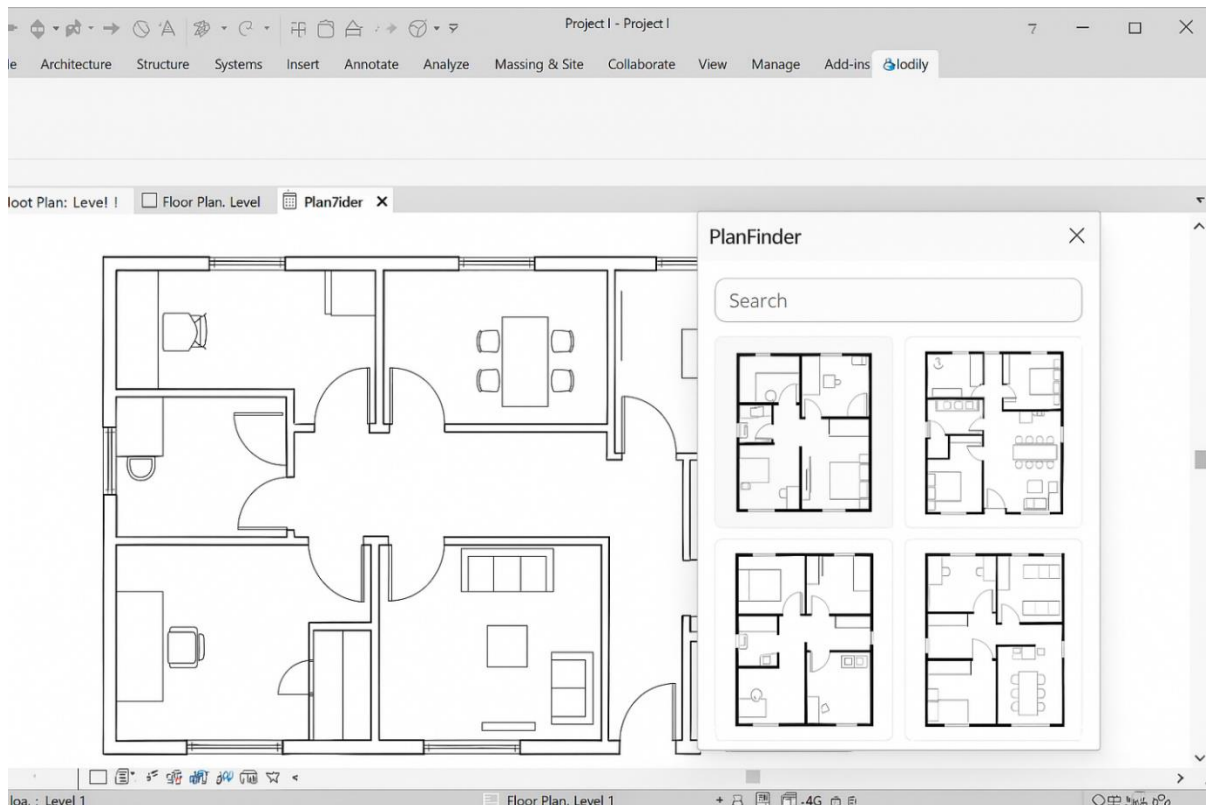
- Click the **Download** button on the PlanFinder plugin page.
- Sign in with your **Autodesk account** (required).
- Download the **.msi installer file** (or .exe depending on the version).

Step 3: Install the Plugin

- Locate the downloaded **PlanFinder installer** on your PC.
- Double-click the file and follow the installation wizard:
- Accept the terms and conditions.
- Choose Revit versions to install for (e.g., 2021, 2022, 2023).
- Complete the installation.

Step 4: Open Revit and Launch PlanFinder

- Launch **Revit**.
- A new **“PlanFinder” tab** should appear in the ribbon menu.
- Click on it to explore available tools, templates, or search options.



Input Parameters for Desired Outputs

- Open the **Plan Finder** tab in Revit.
- Click **Generate Plan** or **Start Planning**.

Input the required design parameters such as:

- Plot Size (e.g., 35' x 65')
- Number of rooms, bathrooms, floors
- Preferred orientation (e.g., north-facing)
- Style (modern, traditional)

Review suggested plan configurations based on your inputs.

4.7.2 Import Selected Plan

- Browse through the AI-generated plan suggestions.
- Use preview and zoom tools to analyze layouts.
- Select the plan that fits your spatial and functional criteria.
- Click **Import to Project** to load it into your Revit workspace.
- Modify or refine elements as per design needs.

Activity 1:

Practice to use Plan Finder Plugin to Generate a Building Plan.

Steps:

- Open Revit and ensure **Plan Finder** is installed and activated.
- Navigate to the **Plan Finder** tab.
- Launch the plugin and define your **Input Parameters**:
- Plot dimensions (length x width)
- Number of floors
- Required spaces (bedrooms, kitchen, lounge, etc.)
- Style preferences and orientation
- Click Generate Plan.
- Review the AI-generated options and select the most appropriate one.
- Import the selected layout into your current Revit project.

Do you know

It help you generate plan automatically through AI

- Adjust room sizes, placements, or add components as needed.
- Export the plan as a PDF or save it as a Revit file for documentation and further modelling.

Learning Unit 4.8

Create Building Information Modeling Model

Learning Outcomes:

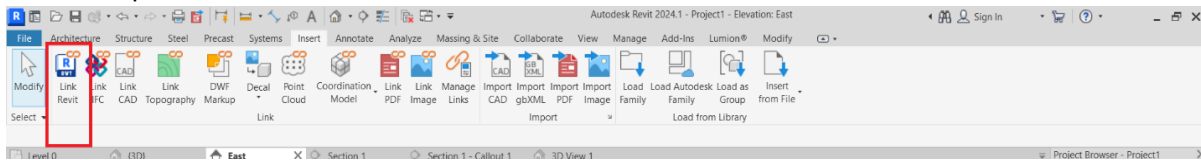
After completion of this unit, the trainee will be able to:

- Import Revit architecture model in Structure template
- Import Revit architecture model in Systems template (MEP)

4.8.1 : Structure Template and Tabs

Trainee will import an architectural model into the structural design environment and explore structural tools.

- Open Revit > Choose the Structure template.
- Go to Insert tab > Click Link Revit > Browse and select the architectural model.
- Position using Auto – Origin to Origin or By Shared Coordinates.
- Use Visibility Graphics (VG) to control linked model display.
- Explore **Structure tab**: Beams, Columns, Foundation, Reinforcement, etc.



4.8.2 : Systems Template (MEP)

Trainee will integrate an architectural model into the MEP template to begin mechanical, electrical, and plumbing layout.

- Launch Revit > Start from **Systems** template.
- Use **Insert tab** > Click **Link Revit** > Import the architecture model.
- Align model properly using origin settings.
- Navigate through **Systems tab**: HVAC, Piping, Electrical fixtures, and ducts.
- Adjust visibility for mechanical spaces and set analytical parameters.

Remember

Each Discipline should use their own template for the best Design and Flexibility of Detail

Activity 1:

Practice to import Revit Architecture Model into Structure Template.

See 4.8.1 for this activity

Activity 2:

Practice to import Revit Architecture Model into Systems (MEP) Template

See 4.8.2 for this activity

SUMMARY

This unit provides practical training in Building Information Modeling (BIM) using Autodesk Revit, enabling learners to confidently design, model, and document complete architectural projects. It covers essential tools for creating building elements, adding components, generating construction documents, applying materials and lighting, and collaborating through work sharing. By the end, participants will be proficient in producing professional 2D and 3D architectural presentations.

(FAQs)

Q1.What is Revit Architecture used for?

Ans: Revit Architecture is used for building information modeling (BIM), allowing users to design, model, and document building projects.

Q2.Can Revit create 3D models directly from 2D plans?

Ans: Yes, Revit allows users to trace over 2D CAD drawings to generate 3D architectural models.

Q3.What is the difference between a family and a component?

Ans: A family refers to a group of elements with common parameters; a component is an instance of that family placed in a project.

Q4.How does Revit handle multi-level building designs?

Ans: Revit uses levels and views to manage multiple floors, allowing users to place elements on specific levels.

Q5.Can I collaborate on the same project with others in Revit?

Ans: Yes, using Revit's worksharing tools, multiple users can work on a central model simultaneously.

Q6.Is it possible to render within Revit?

Ans: Yes, Revit has built-in rendering tools for creating realistic images and walkthroughs.

Q7.How do I create construction documents in Revit?

Ans: Use views, sheets, annotations, schedules, and legends to produce detailed construction documents.

Q8.What kind of schedules can be generated in Revit?

Ans: You can create door, window, material, room, and furniture schedules.

Q9.How is Revit different from AutoCAD?

Ans: AutoCAD is primarily 2D drafting, whereas Revit is BIM-based and focuses on 3D modeling and integrated documentation.

Q10. What file format does Revit use?

Ans: Revit project files use the .rvt file format.

Multiple Choice Questions (MCQs)

- 1. Which tool is used to create wall elements in Revit?**
A. Extrude B. Sweep C. Wall D. Array
- 2. What is the default file extension of a Revit project?**
A. .dwg B. .rvt C. .skp D. .rfa
- 3. Which feature in Revit helps multiple users collaborate on a single model?**
A. Central File B. Shared Parameters C. View Templates D. Linked Model
- 4. What command is used to generate floors?**
A. Region B. Footprint C. Floor D. Pad
- 5. Where can families be loaded from in Revit?**
A. Component tab B. Insert tab C. View tab D. Annotate tab
- 6. Which tab contains the “Door” tool in Revit?**
A. Annotate B. View C. Architecture D. Manage
- 7. To create a building section, which tool should be used?**
A. Cut Plane B. Callout C. Section D. Scope Box
- 8. Which view type provides a horizontal cut-through of the building?**
A. 3D View B. Elevation C. Plan View D. Section
- 9. What is the purpose of the “Tag by Category” tool?**
A. Create a view B. Add annotations C. Label elements D. Link files
- 10. Which rendering option produces realistic materials and lighting?**
A. Wireframe B. Hidden Line C. Realistic D. Sketch

Answer Key

1.	c	2.	b	3.	a	4.	c
5.	b	6.	c	7.	c	8.	c
9.	c	10.	c				

Learning Outcomes:

After completion of this learning module, trainee will be able to:

- Visit Site and Market
- Prepare Visit Report

Learning Unit 5.1**Visit Site and Market****Learning Outcomes:**

After completion of this module, trainee will be able to:

- Visit the construction site
- Observe designing and construction
- Visit the market
- Observe the different types of materials for construction and finishing

5.1.1 Types of Materials for Architecture, Civil and Electrical Works**Architecture and civil works:**

- **Concrete:** Made of cement, sand, and aggregates; used for foundations, roads, and buildings. Strong in compression.
- **Steel:** Strong metal, used in reinforcement and structural components. High tensile strength.
- **Wood:** Natural material, used for framing and finishes. Light but vulnerable to moisture.
- **Brick:** Fired clay used for walls and pavements. Fire-resistant and durable.
- **Glass:** Transparent, used for windows and facades. Fragile but strong in tension.
- **Asphalt:** Bitumen and aggregate mix; used for roads and roofs. Flexible and waterproof.
- **Aluminum:** Lightweight, corrosion-resistant metal; used in windows and roofing.
- **Steel:** Strong alloy used for machine parts, gears, and structures.
- **Cast Iron:** Brittle but strong in compression, used for engine blocks and pipes.
- **Aluminum:** Lightweight and corrosion-resistant, used in machinery and vehicles.
- **Copper:** Good for heat exchangers and electrical components.
- **Brass:** Copper and zinc alloy, used in valves and fittings.
- **Plastic Materials:** Lightweight and moldable, used for bearings and insulation.
- **Rubber:** Elastic, used in seals and shock absorbers.
- **Composite Materials:** Combination of materials, lightweight and strong, used in advanced machinery

Remember

Concrete is the most widely used construction material in the world. Around 10 billion tons of concrete are produced every year, accounting for more than 6% of global carbon dioxide emissions.

**Electrical Works:**

- **Copper:** Excellent conductor, used for wiring and electrical components.
- **Aluminum:** Lightweight alternative to copper, used in power lines.

- **Insulated Cables:** Coated wires for safety in electrical circuits.
- **Circuit Breakers & Switches:** Devices to control and protect electrical circuits.
- **Transformers:** Change voltage in power transmission.
- **Conductive Materials:** Materials like graphite or silver used in circuits.



Activity 1:

Enlist Different Markets for Civil Works and Finishing Materials Available in Town

Construction Material Markets:

- **Location:** Usually located near industrial zones or major construction areas.
- **Materials Available:** Cement, sand, aggregates, bricks, steel, pipes, and concrete blocks.
- **Hardware Stores:**
 - **Location:** Widely available in urban and suburban areas.
 - **Materials Available:** Paints, nails, screws, adhesives, plumbing fittings, and power tools.
- **Tile and Flooring Markets:**
 - **Location:** Often in specialized areas of towns dedicated to flooring and finishing.
 - **Materials Available:** Tiles (ceramic, porcelain, vinyl), marble, granite, and flooring adhesives.
- **Wood and Timber Markets:**
 - **Location:** Typically, in industrial districts.
 - **Materials Available:** Plywood, hardwood, softwood, timber beams, and timber boards.
- **Plumbing and Electrical Markets:**
 - **Location:** Commonly near hardware and appliance stores.
 - **Materials Available:** Pipes, faucets, electrical wires, fittings, switches, and circuit breakers.
- **Paint and Finishing Material Markets:**
 - **Location:** Found in both independent stores and large shopping complexes.
 - **Materials Available:** Paints, varnishes, wallpapers, sealants, and coatings.
- **Glass and Window Markets:**
 - **Location:** Usually in specialized commercial areas.
 - **Materials Available:** Glass panes, window frames, and curtain rods.
- **Stone and Marble Suppliers:**
 - **Location:** Typically, near quarries or major construction zones.
 - **Materials Available:** Marble, granite, stones, countertops, and decorative stones.

Remember

Market is an area or arena in which commercial dealings are conducted.

Activity 2:

Visit a Market and Interact with Vendors to Learn About Different Construction and Finishing Materials

- Choose a Market.
- Select a construction materials market or hardware store in your town to visit.
- Preparation before the Visit.
- List the types of materials you're interested in learning about (e.g., tiles, paint, plumbing materials, etc.).
- Prepare questions regarding the use, advantages, cost, and availability of materials.
- Interaction with Vendors.
- Ask about Types of Materials.
- Understand Material Properties.
- Discuss Cost.
- Learn About Trends.
- Inquire About Quality.
- Observe Material Handling and Usage.
- Take note of how materials are stored and handled.
- Observe the different packaging and product labels that indicate quality, safety, and origin.
- Record Information.
- Take notes or photographs (if allowed) of materials, their specifications, and any important details shared by vendors.
- Make sketches or drawings for future reference if you're learning about materials for AutoCAD projects.
- Post-Visit Reflection.
- After the visit, summarize the key findings and materials learned about, focusing on how they might be used in AutoCAD design and drafting.
- Reflect on how these materials will be represented in your AutoCAD models (e.g., material types, textures, finishes).

Learning Unit 5.2

Prepare Visit Report

Learning Outcomes

After completion of this learning unit, trainee will be able to:

- Collect information
- Compile all information with pictures in E- report
- Submit report

5.2.1 Markets for Architectural Material in the Town

Key Materials:

- Basic Materials: Cement, bricks, steel, wood.
- Finishing Materials: Tiles, paint, glass.
- Exterior Materials: Roofing, siding, insulation.
- Decorative Materials: Wallpaper, marble.

Market Factors:

- Local suppliers vs. larger brands.
- Trends: Eco-friendly materials.
- Demand: Driven by construction growth and urbanization.

5.2.2 Types of Report

- Informational Report: Provides data without analysis. Example: Monthly sales report.
- Analytical Report: Analyzes data and offers recommendations. Example: Market analysis.
- Progress Report: Updates on project progress. Example: Weekly project update.
- Research Report: Presents research findings. Example: Academic paper.
- Business Report: Reviews business performance. Example: Annual report.
- Feasibility Report: Assesses the viability of a project. Example: Business startup evaluation.

- Technical Report: Provides technical details. Example: Product testing.

Activity:

Prepare report with pictures

SUMMARY

This module includes types of materials for civil, electrical, and mechanical works include essential items such as concrete, bricks, steel, and wood for civil construction, wires, cables, and transformers for electrical work, and pipes, pumps, and bearings for mechanical work. The market for architectural materials in town consists of local suppliers providing basic construction materials (cement, bricks), finishing items (paint, tiles), and decorative materials (marble, wallpaper), with trends shifting toward sustainable options due to urbanization and growing construction needs. Lastly, types of reports include informational reports (factual data), analytical reports (data analysis with recommendations), progress reports (project updates), research reports (findings from research), business reports (company performance), feasibility reports (evaluating project viability), and technical reports (detailed technical data).

FAQs:

Q1.What is the objective of this module?

Ans. It teaches how to visit sites and markets and prepare a visit report.

Q2.What are the materials used in civil works?

Ans. Concrete, steel, wood, brick, glass, asphalt, and aluminum.

Q3.What materials are used in electrical works?

Ans. Copper, aluminum, insulated cables, circuit breakers, and transformers.

Q4.What materials are used in mechanical works?

Ans. Steel, cast iron, aluminum, copper, brass, plastic, rubber, and composite materials.

Q5.Where can I find construction materials in my town?

Ans. Construction material markets, hardware stores, tile markets, and plumbing markets.

Q6.What should I ask vendors when visiting a market?

Ans. Inquire about the types, properties, cost, and quality of materials.

Q7.What should be included in a visit report?

Ans. Information, pictures, and notes on materials observed during the visit.

Q8.What are the common types of reports?

Ans. Informational, analytical, progress, research, business, feasibility, and technical reports.

Q9.What are finishing materials for construction?

Ans. Tiles, paint, glass, marble, and wallpaper.

Q10. Why is it important to understand construction materials?

Ans. To make informed decisions for building projects and AutoCAD design.

MCQs:

1. Which material is known for being flexible and waterproof?

- a) Asphalt b) Concrete c) Aluminum d) Steel

2. What is a key feature of cast iron in mechanical works?

- a) High tensile strength b) Strong in compression
c) Lightweight d) Corrosion resistance

3. Which type of report analyzes data and offers recommendations?

- a) Informational report b) Analytical report
c) Feasibility report d) Progress report

4. Which of these materials is often used for flooring?

- a) Copper b) Concrete c) Tiles d) Steel

5. What should be included in a visit report?

- a) Sketches of design
- c) Supplier contact details

- b) Observations and materials
- d) Cost analysis

Answer Key

1.	a	2.	b	3.	b	4.	c
5.	b						

Module No. 6	Develop Entrepreneurial Skills
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Learning Outcomes:

After completion of this module, trainee will be able to:

- Develop Business Plan
- Collect information Regarding Funding Sources
- Develop Marketing Plan

Learning Unit 6.1	Develop Business Plan
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Learning Outcomes:

After completion of this learning unit, you will be able to:

- Conduct market survey to collect information
- Select the best option in terms of cost, service, quality, sales, profit margin, overall expenses
- Compile the information collected through the market survey, in the business plan format

6.1.1 Market Research

Market research is the process of gathering information about customers, competitors, and market trends to make informed business decisions.

Markets research helps

- Understand customer needs (e.g., home designs, office spaces).
- Identifies competitors and their pricing.
- Determines the demand for different architectural services.

Remember

Entrepreneurship is the activity of setting up a business or businesses, taking on financial risks in the hope of profit.

6.1.2 Data Collection Techniques

Data collection is essential for gathering information that helps businesses make decisions. Some common techniques include:

Surveys and Questionnaires:

A method where participants respond to a set of questions to collect data on various topic.

Interviews:

One-on-one discussions with individuals to gain in-depth insights.

Observation:

Collecting data by observing the behavior of people or processes in their natural environment.

Focus Groups:

A small group of people discussing a topic to gather opinions and ideas.

Experiments:

Controlled studies designed to test hypotheses and observe results.

Secondary Data:

Using data that has already been collected for other purposes, such as government reports or industry research.

Case Studies:

In-depth examinations of a particular case or situation to gather detailed information.

Documents and Records:

Collecting data from existing business documents, reports, or databases.

Remember

The average survey completion time for online surveys is around 5-10 minutes, with a response rate of about 30-50% depending on the subject and incentive.

6.1.3 Main Elements of a Business Plan

A business plan is a written document that outlines the goals of a business, the strategy to achieve them, and the financial details. The main elements of a business plan are:

Executive Summary:

- A brief overview of the business, including the business concept, mission, vision, and key objectives.

Business Description:

- Describes the nature of the business, its offerings, the market needs it will address, and the industry in which it operates.

Market Research and Analysis:

- Analyzing the market and identifying target customers, competitors, and industry trends.

Organization and Management:

- Information about the business structure (e.g., LLC, sole proprietorship), the team, and their roles.

Products or Services:

- Details about the products or services offered, including features, benefits, and how they solve customers' problems.

Marketing and Sales Strategy:

- How the business plans to attract and retain customers, including pricing, advertising, promotions, and sales strategies.

Financial Plan:

- Financial projections, including income statements, balance sheets, cash flow statements, and break-even analysis.

Appendix:

- Additional information like resumes, permits, legal documents, and other supplementary materials.

6.1.4 Business Plan Format

The format of a business plan typically includes the following sections:

- Title Page – Includes the name of the business, logo, contact information, and date.
- Table of Contents – Lists all the sections of the business plan.
- Executive Summary – An overview of the business.
- Business Description – Provides in-depth details about the business and industry.
- Market Research and Analysis – Information about the target market, competitors, and trends.
- Products or Services – Description of the products/services.
- Marketing & Sales Strategy – How the business will sell and market.
- Operational Plan – Describes the daily operations of the business.
- Management and Organization – Information on the business structure.
- Financial Plan – Projected financial statements and funding requirements.
- Appendices – Additional supporting documents.

6.1.5 Business Terms Used in the Industry

- Revenue: The total income generated from selling goods or services.
- Profit: The amount of money remaining after all expenses are subtracted from revenue.
- Assets: Resources owned by a business, like property, equipment, and inventory.
- Liabilities: Debts or obligations that the business owes to others.
- Cash Flow: The movement of money into and out of the business.
- Capital: The funds invested in a business to fund operations and growth.
- Market Share: The percentage of an industry's total sales that a business controls.
- Brand: A name, term, or design that distinguishes one business from another.
- B2B (Business to Business): Selling products or services from one business to another.
- B2C (Business to Consumer): Selling products or services directly to consumers.

6.1.6 7 Cs of Business Communication

The 7 Cs are a set of principles to ensure effective communication in business:

- **Clarity:** Be clear about the message you are communicating. Avoid jargon and confusion.
- **Conciseness:** Keep the message brief and to the point. Avoid unnecessary details.
- **Concreteness:** Provide specific facts and figures to support your message.
- **Correctness:** Use proper grammar, punctuation, and spelling.
- **Consideration:** Think about the audience's perspective and adjust your message accordingly.
- **Completeness:** Ensure the message contains all necessary information for the receiver to understand and take action.
- **Courtesy:** Be polite and respectful, considering the feelings and viewpoints of others.

Remember

Short and precise messages have a 30% higher chance of being understood and acted upon compared to long, verbose communications.

Activity 1:

Conduct a Mini Market Survey

Tool: Survey form (Google Forms or printed questionnaires).

Task: Survey 10 people (friends, family, or teachers) about their preferences in home design (e.g., modern, traditional, eco-friendly).

Questions to Ask:

What type of house design do you prefer?

How much would you spend on architectural services?

What features are most important to you (e.g., space, lighting, sustainability)?

Activity 2:

Develop a Business Plan

- Tool: Business plan template (provided by the teacher).
- Task: Fill in basic details for a fictional architectural drafting business.

Learning Unit 6.2

Collect Information Regarding Funding Sources

After completion of this Learning Unit, trainee will be able to:

- Identify the available funding sources based on their terms and conditions, maximum loan limit, payback time, interest rate
- Choose the best available option according to investment requirement
- Prepare documents according to the loan agreement requirement
- Include the information of funding sources in the business plan

6.2.1 Knowledge of Funding Sources

Funding sources help you finance your business. Common sources include:

- Personal Savings: Use your own money.
- Family and Friends: Ask for financial support.
- Bank Loans: Borrow from banks with interest.
- Government Grants: Get financial help from the government.
- Angel Investors: Wealthy individuals invest in exchange for a share of your business.
- Venture Capitalists (VC): Investment firms that help growing businesses.
- Crowdfunding: Raise money from many people online.
- Microfinance: Small loans for entrepreneurs.
- Business Competitions: Win money through contests.

6.2.2 How to Get a Loan to Start a New Business

Steps to get a loan for your business:

- Research Loan Types: Find the best loan for your needs.
- Prepare a Business Plan: Explain your business idea and how you'll repay the loan.
- Check Your Credit: Good credit helps you get approved.
- Decide Loan Amount: Be clear on how much money you need.

- Provide Collateral: Offer assets as security if required.
- Apply for the Loan: Fill out the application and submit documents.
- Wait for Approval: Lenders will review and decide.
- Repay the Loan: Stick to the repayment terms.

6.2.3 Market Survey and Its Tools

A market survey helps understand customer needs and market trends. Key tools include:

- Interviews: One-on-one conversations to gather detailed opinions.
- Questionnaires: Written surveys to collect data from many people.
- Observation: Watching customers' behavior in real-life situations.
- Focus Groups: Group discussions to understand customer views.
- Secondary Data: Using existing reports and data to analyze the market.

Activity 1:

Collect Information Regarding Funding Sources for business/niche.

Instructions:

Identify the Business Idea:

- Choose a business idea, like offering AutoCAD design services or creating templates.
- Research Funding Sources:
- Look for different funding options for your AutoCAD business:
- Personal Savings
- Bank Loans
- Grants/Subsidies
- Crowdfunding
- Angel Investors
- Venture Capital
- Microfinance

Create a Report:

Write a brief report with:

- Description of each funding source
- Advantages and disadvantages
- How to apply for each

Share Findings:

- Present your findings to the class or submit your report.

Learning Unit 6.3

Develop Marketing Plan

After completion of this learning unit, you will be able to:

- Collect information required to devise marketing plan
- Develop a marketing & sales strategy
- Prepare marketing plan for new business

6.3.1 7Ps of Marketing

The 7Ps of marketing are key factors to consider when promoting a product or service:

- Product: What you're selling; it must meet customer needs.
- Price: The cost of the product; it should reflect its value.
- Placement: Where the product is sold and how it gets to customers.
- Promotion: How you advertise and raise awareness about the product.
- People: The staff or individuals involved in providing the product or service.
- Packaging: The design and appearance of the product's packaging.

Remember

A 10% reduction in price can lead to a 20-30% increase in sales for certain products. However, the effect varies greatly by industry.

- **Physical Evidence:** It includes tangible elements, like store layout and employee appearance, that help customers assess a product or service.

Activity 1:

Plan and Develop a Marketing Plan

Steps to Create a Marketing Plan:

- Define Your Product or Service
- Identify Your Target Market
- Set Goals and Objectives
- Choose Your Marketing Strategies
- Budget Planning
- Timeline and Implementation
- Evaluate and Adjust

Learning Unit 6.4

Collect Information Regarding Funding Sources

Learning out comes:

After completion of this learning unit, trainee will be able to:

- Create account on following sites:
 - Fiver
 - Upwork
 - Freelancer.com.etc
- Create content for targeted marketing through AI tools.
- Create portfolios using AI tools.
- Customize profile as per targeted market.

6.4.1 Importance of Portfolio

A portfolio is a collection of your best work that showcases your skills and creativity. In architectural drafting, a strong portfolio helps you:

- Attract clients or employers.
- Display your expertise in drafting and design.
- Stand out in the competitive freelancing market.

6.4.2 How to Build a Portfolio Using AI Tools?

AI tools can help you create professional portfolios quickly. Some useful tools include:

- Canva (for designing portfolio layouts)
- Adobe Spark (for interactive portfolios)
- Behance (to showcase architectural projects)
- AI-powered website builders (like Wix or Squarespace)

Steps to Create a Portfolio:

- Select your best architectural drafts and designs.
- Use AI tools to enhance images and organize them neatly.
- Write short descriptions for each project.
- Publish your portfolio online or share it as a PDF.

6.4.3 Freelancing in Architectural Drafting

Freelancing means working independently for different clients instead of a single company. As a freelancer, you can:

- Work from anywhere.
- Choose projects that interest you.
- Earn money based on your skills.
- How to Start Freelancing?

Create a Strong Profile:

- Use platforms like Fiverr, Upwork, or Freelancer.
- Mention your skills in architectural drafting.

- Add your portfolio link.

Find Clients:

- Search for drafting-related jobs.
- Send proposals explaining why you are the best fit.

Deliver Quality Work:

- Complete projects on time.
- Ask clients for reviews to build trust.

Digital Marketing for Freelancers

To attract more clients, you need to market your skills online.

6.4.4 Creating Content for Targeted Marketing Using AI Tools

AI can help you design ads, write descriptions, and even analyze market trends. Some useful AI tools are:

- ChatGPT (for writing project descriptions)
- MidJourney (for AI-generated architectural visuals)
- Google Analytics (to track website visitors)
- Customizing Profile as per Targeted Market
- Use keywords like “Architectural Drafting Expert” in your profile.
- Highlight skills that clients are looking for (e.g., AutoCAD, 3D modeling).
- Update your portfolio regularly with new projects.

Activity1:

Create Your Freelancer Profile & Portfolio

Tools & Methods:

- Tool: Canva / Behance
- Method: Design a portfolio with at least 3 architectural drafts.
- Tool: Google Docs / Notion
- Method: List 5 ways you can promote your freelancing services online.

Learning Unit 6.5

Perform Social Media Marketing

Learning Outcomes:

After completion of this learning unit, you will be able to:

- Create a business account on following:
 - Instagram,
 - Facebook,
 - WhatsApp Business.
- Select a product line for their business
- Upload content/images/videos/posts

6.5.1 Introduction to Social Media for Business

Social media is a powerful tool for promoting businesses. For architectural drafting, platforms like Instagram, Facebook, and WhatsApp Business can help showcase designs, attract clients, and grow a brand.

Why Use Social Media for Architectural Drafting Business?

- Reach potential customers easily.
- Display architectural designs in photos and videos.
- Engage with clients through comments and messages.

Popular Social Media Platforms for Business:

- Instagram – Best for sharing images and short videos of architectural designs.
- Facebook – Useful for creating business pages, posting updates, and connecting with clients.
- WhatsApp Business – Helps in direct communication with customers.

Creating a Business Account

- Create a Business Account on Instagram
- Download the Instagram app.
- Sign up with an email or phone number.
- Go to Settings → Switch to Professional Account → Business.
- Fill in details like business name, category (e.g., Architecture & Design), and contact info.
- Create a Business Page on Facebook
- Log in to Facebook and go to Pages → Create New Page.
- Enter business name (e.g., “Dream Architects”).
- Select category: “Architectural Designer” or “Home Improvement”.
- Add a profile picture (logo or sample design) and cover photo.
- Set Up WhatsApp Business
- Download WhatsApp Business from the app store.
- Register with a business phone number.
- Complete the business profile (description, email, and address).

6.5.2 Product Line Selection

Before posting on social media, decide what services or products your business will offer.

Possible Product Lines for Architectural Drafting Business:

- 2D/3D House Designs – Share floor plans and 3D models.
- Interior Design Ideas – Post images of room layouts.
- Architectural Sketching Services – Promote hand-drawn sketches.
- Miniature Model Making – Display physical scale models.

Uploading Content (Images/Videos/Posts)

- Type of Content to Post
- Images: Architectural sketches, 3D models, before & after designs.
- Videos: Time-lapse of drafting, virtual tours of designs.
- Posts: Tips on home design, benefits of good architecture.
- Upload Content
- On Instagram/Facebook:
 - Click the “+” (Create Post) button.
 - Select an image/video and add a caption (e.g., “Modern House Design – Contact us!”).
 - Use hashtags like #ArchitectureDesign #HomePlans.
- On WhatsApp Business:
 - Use the Status feature to share updates.
 - Send brochures or design samples to clients directly.

Activity 1:

Create and Promote Your Architectural Drafting Business Online

Tools Needed:

- Smartphone/Computer
- Instagram, Facebook, and WhatsApp Business apps
- Sample architectural designs (sketches, 3D models, or photos)

Method:

Step 1: Create business accounts on Instagram, Facebook, and WhatsApp Business.

Step 2: Select a product line (e.g., 3D House Designs).

Step 3: Upload at least:

- design images on Instagram & Facebook.
- WhatsApp Business status update.

Step 4: Write captions with hashtags (#ArchitectureLovers #DreamHome).

SUMMARY

A business plan outlines the key elements for starting and running a successful business, including its format, business terms, and communication strategies. The 7Cs of business communication emphasize clarity, conciseness, and correct communication practices. Effective data collection techniques like

interviews, questionnaires, and observations help gather essential market information. Understanding funding sources, including personal savings, loans, and investors, is crucial for financing a business. Market surveys using tools like interviews and questionnaires provide insights into customer preferences and trends. The 7Ps of marketing—Product, Price, Placement, Promotion, People, Packaging, and Positioning—are fundamental strategies to ensure a product's success in the market, helping businesses meet customer needs and stay competitive.

FAQs:

Q1.What is a business plan?

Ans. A document outlining business goals, strategy, and financial details.

Q2.What are the main elements of a business plan?

Ans. Executive summary, business description, market research, products/services, marketing strategy, financial plan, and appendix.

Q3.How do I conduct market research?

Ans. Use surveys, interviews, and focus groups to gather customer insights.

Q4.What are common funding sources for a business?

Ans. Personal savings, family/friends, bank loans, grants, investors, crowdfunding, and microfinance.

Q5.How do I get a loan to start my business?

Ans. Research loan types, prepare a business plan, and apply for approval.

Q6.What are the 7Ps of marketing?

Ans. Product, Price, Placement, Promotion, People, Packaging, Positioning.

Q7.How do I create a marketing plan?

Ans. Define your product, target market, set goals, and choose marketing strategies.

Q8.How do I measure the success of my marketing plan?

Ans. Monitor progress and adjust strategies based on goal achievement.

MCQs:

1. What is a business plan?

- | | |
|--|---------------------|
| A) A document outlining business goals | B) A product list |
| C) A marketing strategy | D) A team directory |

2. Which section appears first in a business plan?

- | | |
|----------------------|-------------------|
| A) Executive Summary | B) Marketing Plan |
| C) Financial Plan | D) Products |

3. What does market research help with?

- | | |
|------------------------------|-------------------------------|
| A) Understanding competitors | B) Identifying customer needs |
| C) Setting employee roles | D) Creating products |

4. Which is a funding source?

- | | |
|-----------------------|----------------------|
| A) Personal Savings | B) Product sales |
| C) Marketing Strategy | D) Customer feedback |

5. What does a financial plan include?

- | | |
|--------------------|------------------------|
| A) Employee list | B) Income and expenses |
| C) Market analysis | D) Product features |

6. Which of the following is part of the 7Ps?

- | | | | |
|----------|---------------|----------------|--------------------|
| A) Price | B) Staff size | C) Competitors | D) Industry trends |
|----------|---------------|----------------|--------------------|

7. How do you gather market data?

- | | | | |
|----------------|--------------------|---------------------------|---------------------|
| A) By guessing | B) Through surveys | C) From financial reports | D) From competitors |
|----------------|--------------------|---------------------------|---------------------|

8. What does the executive summary provide?

- | | |
|-----------------------------|---------------------------|
| A) A detailed market survey | B) A business overview |
| C) A product description | D) A financial projection |

9. Which is a marketing strategy?

- | | |
|-------------------------|----------------------------|
| A) Ignoring competitors | B) Social media promotion |
| C) Raising prices | D) Focusing on one product |

10. How do you measure marketing success?

A) By number of products sold
C) By product cost

B) By meeting marketing goals
D) By customer feedback

Answer Key

1.	A	2.	A	3.	B	4.	A
5.	B	6.	A	7.	B	8.	B
9.	B	10.	B				