

SECTION

1

# CONCEPTUAL DRAWING



CONCEPTUAL  
DRAWING



# UNIT 1: CONCEPT SKETCHES

## CONCEPTUAL DRAWING

### Concept Sketches

## INTRODUCTION

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In the world of design, communication is key to bringing creative ideas to life. Designers, architects, and artists use a powerful visual tool known as concept sketches to express and develop their ideas. Concept sketches are quick, freehand drawings that capture the core of a design or concept. These sketches help convey the essence of an idea clearly, making them a fundamental skill in the design process.

This section will guide you in learning how to create concept sketches, transforming simple shapes and forms into visually appealing designs. You will explore the different rendering techniques used to add depth and detail to sketches, while also learning to apply essential principles such as perspective drawing and proportion.

Through this lesson, you will gain the skills needed to explain concept sketches and their role in design, use basic shapes and rendering techniques, and apply perspective and proportion to create impressive designs. By mastering these techniques, you will develop the ability to effectively communicate your creative ideas through sketching.

#### At the end of this section, you should be able to:

- Explain concept sketches and their applications in designing.
- Use basic shapes, forms and rendering techniques in designing.
- Use the principles of perspective drawing and proportion in designing.

#### Key Ideas

- A Concept sketch is a freehand drawing that communicates the most critical aspects of a design, highlighting key aspects without detailed precision and serving as a communication tool for designers, architects, and artists.
- Line quality describes the thinness or thickness of a line, which makes sketches look realistic.
- Line consistency refers to a line with the same style, proper alignment, consistent direction, and equal spacing.
- Shape refers to a two-dimensional (flat surface) enclosed area such as squares and rectangles.
- Forms are three-dimensional objects that have depth and volume, such as spheres and cubes.

- Rendering refers to the techniques used to create an impression on a drawing to make it look more realistic and interesting.
- Shading is a fundamental rendering technique used to add depth, dimension, and realism to a drawing.
- Perspective drawing is the use of techniques such as horizon lines and vanishing point(s) by artists and designers to create the illusion of depth.
- **Eye level** is the height at which your eyes naturally view a scene or object. In perspective drawing, it represents the horizon line where the viewer's line of sight is parallel to the ground.
- **The horizon line** is the line at the eye level of the viewer.
- **The vanishing point** is the point where all parallel lines converge.
- **Vanishing lines** are the lines that extend from the object to the vanishing point.
- One-point perspective is a perspective drawing with a single vanishing point while two-point perspective has two vanishing points.
- **Foreshortening** is the change in size that occurs when an object appears shorter or longer due to its angle relative to the viewer.
- **Proportion** in designing refers to how objects relate to each other in size, scale, shape, and quantities between the various elements of a design.

## CONCEPT SKETCHES

Concept sketches are the initial visual representations of ideas, serving as the foundation for any design process. These sketches allow designers to quickly examine and communicate concepts, refining them as they progress. With simple lines and shapes, concept sketches capture the key features and essence of a design before more detailed work is done. This process plays an important role in brainstorming and developing creative solutions in various fields, from fashion and architecture to product design and visual arts.

Look at these sketches and share your thoughts on the idea they convey with your colleague.



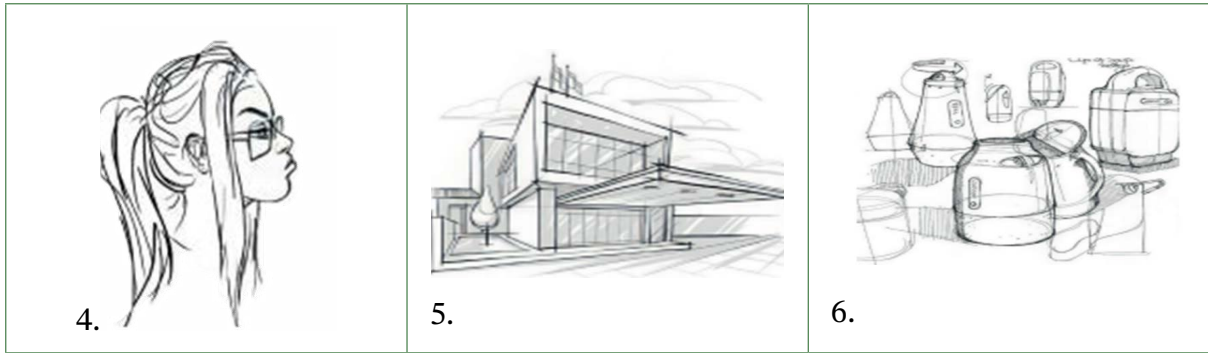


Fig. 1.1.1 Showing examples of sketches

From the above observation, it is obvious that a concept sketch is a freehand drawing that conveys the most essential elements of a design. Whether for a construction project, a product, or any other creative project, a concept sketch offers a visual representation of an idea.

## Types of Sketches

You will remember in Junior High School; you learnt about sketching and several types of sketches. To help you recap, find a partner, and form a pair or in a small group with three/four of your friends, use available books, the internet, or interviews to research what these sketches depict or describe. Present your group’s findings for discussion with the other groups.

Table 1.1.1

No	SKETCH	DESCRIPTION
1.		
2.		





## Tools and Materials Used for Sketching

After identifying the types of sketches, it is important to select and use the right tools and materials to enhance the appearance of the sketches when designing. The following are examples of suitable tools and materials commonly used for sketching:

- **Pencils:** They are available in various grades, from hard (H) to soft (B) leads.
- **Sketch pads:** They provide a smooth surface for drawing and come in different paper weights.
- **Erasers:** Erasers are essential for correcting mistakes and refining details.
- **Pencil sharpener:** Keeps pencils sharp for precise lines.
- **Drawing pens or ink:** Used for adding definition and final details.
- **Blending stumps:** Help to smooth and blend shading for a softer effect.
- **Charcoal:** Ideal for creating bold, dramatic contrasts in sketches.



Fig. 1.1.2 Tools and materials for sketches

## Lines

Lines are used in making concept sketches. They are fundamental elements that artists use to convey various meanings, emotions, and visual effects in their artwork. Line art comes in different shapes, sizes, and lengths. Examples of lines include spiral, horizontal, vertical, curved, zigzag, and many more.

### Type of Lines

Creative artists use various types of lines in sketches and drawings. Below are some examples of these lines.

**Horizontal lines:** These lines add a sense of calm and stability, making the viewer feel a sense of tranquillity, and they are associated with rest and peace. They are used to suggest the horizon, horizontal lines give the impression of distance and depth.

**Vertical lines:** Vertical lines ignite a sense of power and upward movement; these lines create strong visual impact and symbolise growth, progress, and authority.

**Diagonal lines:** They create a sense of movement, tension, and excitement as they break away from the stability of vertical and horizontal lines.

**Zig-zag lines:** They bring vibrant and dynamic rhythm to the composition. They create a sense of movement and action. zig-zag lines can evoke feelings of excitement or tension, depending on how they are used..

**Curved lines:** Guide the lines through composition connecting a sense of elegance and tranquillity, they add visual interest and create a sense of movement and rhythm.

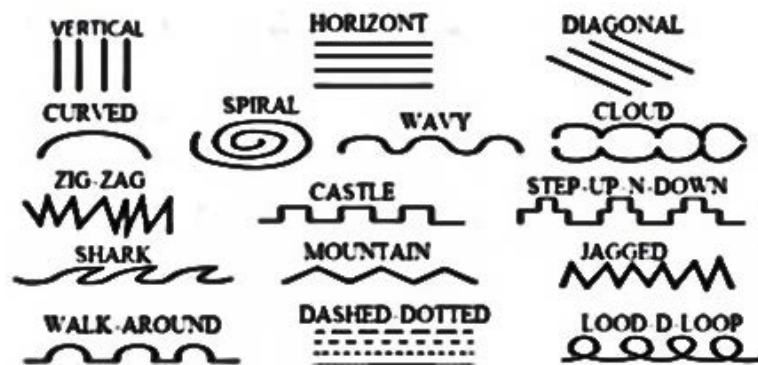


Fig. 1.1.3 type of lines: the artist's view

### Line Quality/Weight

Line quality, also known as line weight, refers to the variation in the thickness or thinness of a line in art. It plays a crucial role in conveying different effects, such as value, texture, depth, material, lighting, and weight. By varying or adjusting line quality, artists can add realism, expression, and clarity to their drawings, making the artwork more engaging and visually compelling and engaging. Additionally, mastering line quality can help to guide the viewer's eye and create a sense of movement within the composition, which brings life and dynamism to the artwork.





## Line Consistency

This refers to how closely the elements (lines) relate within a design or composition in terms of their visual characteristics. When creating visual art, graphic design, or other visual compositions, maintaining consistent lines can significantly impact the overall aesthetic and readability.

Line consistency comprises the following:

- 1. Stroke weight:** Consistent stroke weight ensures that lines have the same thickness throughout the design. Varying stroke weights can create a visual imbalance or confusion.
- 2. Line style:** Whether using solid lines, dashed lines, or other styles, maintaining consistency helps unify the design. For example, if you are creating an infographic, using the same style for all connecting lines ensures clarity.
- 3. Alignment:** Lines should align properly with other design elements. For instance, if you are designing a grid-based layout, ensuring that all horizontal, vertical, or diagonal lines align precisely contributes to a cohesive look.
- 4. Direction:** Consistent line direction (horizontal, vertical, or diagonal) creates harmony and avoids abrupt changes in line direction unless intentional for emphasis.
- 5. Spacing:** Equal spacing between lines (such as grid lines or text baselines) enhances readability. In typography, consistent line spacing is crucial for legibility.

	LINE	DESCRIPTION	GENERAL APPLICATION
A		Continuous thick	<ul style="list-style-type: none"> <li>• Visible outline</li> <li>• Visible edges</li> </ul>
B		Continuous thin (Straight or curve)	<ul style="list-style-type: none"> <li>• Imaginary lines of intersection</li> <li>• Dimension lines</li> <li>• Projection lines</li> <li>• Leader lines</li> <li>• Hatching lines</li> <li>• Outlines lines of revolved sections in place</li> <li>• Short centre lines</li> </ul>




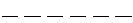
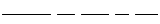
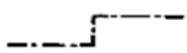
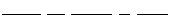
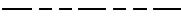
C		Continuous thin free hand	<ul style="list-style-type: none"> <li>Limits of partial or interrupted view and sections, if the limit is not a chain thin.</li> </ul>
D		Continuous thin (straight) with zigzags	<ul style="list-style-type: none"> <li>Long break line</li> </ul>
E		Dashed thick	<ul style="list-style-type: none"> <li>Hidden outline</li> <li>Hidden edges</li> </ul>
F		Dashed thin	<ul style="list-style-type: none"> <li>Hidden outline</li> <li>Hidden edges</li> </ul>
G		Chain thin	<ul style="list-style-type: none"> <li>Centre lines</li> <li>Lines of symmetry</li> <li>Trajectories</li> </ul>
H		Chain thin, thick at ends and changes of direction	<ul style="list-style-type: none"> <li>Cutting planes.</li> </ul>
J		Chain thick	<ul style="list-style-type: none"> <li>Indication of lines of surfaces to which a special requirement applies</li> </ul>
K		Chain thin double dashed	<ul style="list-style-type: none"> <li>Outlines of adjacent parts</li> <li>Alternative or extreme position of movable parts</li> <li>Centroidal lines</li> <li>Initial outlines prior to forming</li> <li>Parts situated in front of the cutting plane</li> </ul>

Fig. 1.1.4 Type of lines: the engineer's view



## Application of Concept Sketches

Concept sketches are utilised in various aspects of design, including:

1. **Architecture:** Architects use concept sketches to explore layouts, site plans, circulation patterns, and settlements. These sketches help architects respond to project briefs and envision the overall form and character of a construction project.
2. **Product design:** Industrial designers create concept sketches to generate ideas for new products or the reengineering of existing ones. These sketches allow designers to visualise how a product might look and function.
3. **Interior design:** Interior designers use concept sketches to plan spatial layouts and furniture placement. Sketches convey the intended mood, colour schemes, and overall aesthetics of an interior space.
4. **Urban planning and landscape design:** Concept sketches aid in understanding site conditions, topography, and natural features. Urban planners use sketches to outline zoning, green spaces, and infrastructure.
5. **Art:** Artists use concept sketches to generate realistic and fascinating artwork; they develop around the concept sketches by modifying and improving them to achieve the desired result.

### Activity 1.1.1

1. In groups, take a walk to your school's main gate. Carefully observe the gate, the road leading to the school, the administration block, and the classroom blocks.
  - a. After your observation, create a simple sketch of the administration block, classroom blocks, main gate, and the street leading into the school. Focus on capturing the basic shapes and layout of the structures rather than making detailed drawings.
  - b. Once your sketches are completed, display them on the classroom walls for everyone to see.
  - c. Pay attention to the shapes, lines, and details used in each sketch. Note down your observations on what makes each sketch effective or clear.
  - d. After this, prepare to share your findings with the whole class in a discussion. Each member should contribute, focusing on how the sketches convey ideas
2. Reflect on the concept of sketches in your notebooks by answering the following questions:
  - a. What are concept sketches, and how do they help communicate ideas?
  - b. How did sketching the school structures help you understand the purpose of concept sketches?

This activity encourages you to explore your environment, apply your observational skills, and gain a practical understanding of concept sketches in a fun and creative way.

### Activity 1.1.2

- In pairs discuss the types of concept sketch depicted in figure 1.1.5 and figure 1.1.6.
- Using reference books and/or the internet, find another two types of concept sketches.
- Discuss with your partner two reasons why you use concept sketch.

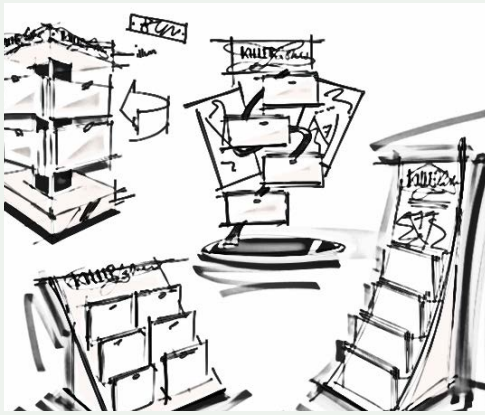


Fig. 1.1.5



Fig. 1.1.6

### Activity 1.1.3

- Form groups of three to five individuals.
- Imagine you are tasked with designing a new eco-friendly smartphone. Your goal is to create concept sketches that showcase your innovative design, focusing on features that make the smartphone environmentally friendly.
- Create Your Sketches:**
  - Materials:** Use paper, pencils, erasers, markers, or coloured pencils to create your sketches.
  - Focus:** Ensure that your sketches clearly communicate your design idea. Don't worry about making perfect artworks—emphasise clarity and the essence of your design.
  - Add notes and explanations to your sketches to explain key features of your sketched design, such as sustainable materials used, energy-efficient components, and recycling options.



#### 4. Prepare Your Presentation

- **Display Your Work:** Prepare a display of your sketches and notes.
- **Share Insights:** Each group will present their eco-friendly smartphone design to the class, explaining the key features and how they contribute to sustainability.

#### Questions to answer as a group:

- How do concept sketches assist in communicating design ideas?
  - Why might concept sketches be more effective than verbal descriptions alone?
  - In what ways can concept sketches help save time and resources during the design process?
5. After your presentation, engage in a class discussion where each group shares their insights on these questions.

## Extended Learning

- Tufnell, R. (1987), *Introducing Design and Communication*, Scot Print Ltd, Great Britain. Pages 82-85.

## BASIC SHAPES, FORMS AND RENDERING TECHNIQUES

Shapes and forms used in our everyday designs can be made to look more attractive. This can be achieved by using different rendering techniques with the basic hand tools and materials used for sketching.

**Shape:** A shape refers to a two-dimensional (flat surface) enclosed area. It represents the outline, outer boundary, or surface of an object. Everything we see in our environment has a shape. Some common two-dimensional shapes include squares, rectangles, and ovals, as shown in Fig. 1.1.7a.

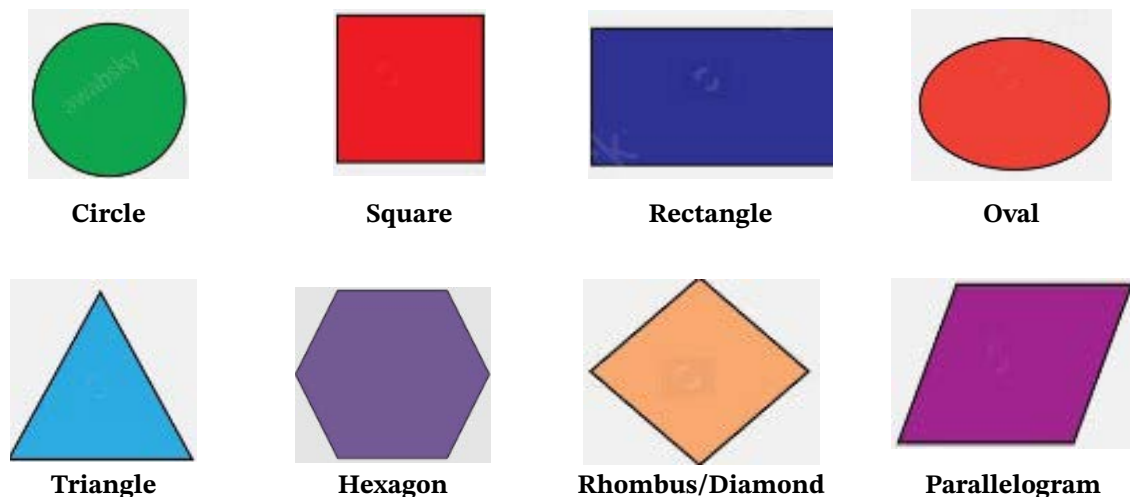


Fig. 1.1.7a Examples of shapes

**Form:** Unlike shapes, forms are three-dimensional and have depth and volume. It is something you can potentially hold in your hand. Some basic three-dimensional forms include spheres, pyramids, and cubes, as shown below. Without shading or perspective, an image can still look like a shape.



Fig. 1.1.7b Examples of Forms

## Creating Forms from Shapes

Forms are usually made with basic two-dimensional shapes transformed into three-dimensional forms. For example, a circle is transformed into a sphere, a triangle into a pyramid, and a square into a building block for the cube.

Another way of creating three-dimensional forms is by combining two or more two-dimensional shapes. For example, an oval and a triangle can be combined to get a cone; a square and two rhombuses can be combined to get a cube; and two triangles can be combined to get a pyramid. Fig. 1.1.7c has examples of what has been described in the text.

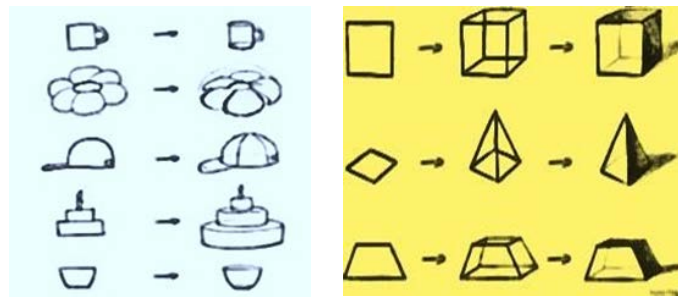


Fig. 1.1.7c Shapes transformed into forms

### SHAPES FORMS

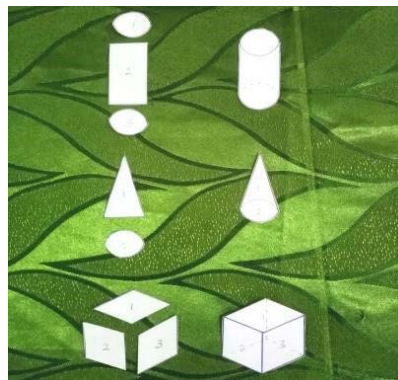


Fig. 1.1.7d Shapes combined to forms



The relationship between shapes and forms occurs in both artwork and science. Refining skills and experimenting with shading, perspective, and composition can breathe life into a design.

## Rendering Techniques

Rendering techniques are essential skills in design, helping to bring sketches and ideas to life with depth, texture, and realism. By applying different shading, colouring, and texturing methods, designers can enhance their drawings and convey visual details more effectively. This section introduces key rendering techniques to elevate your designs and make your sketches more engaging and expressive.

### Shading

Shading is a fundamental rendering technique that artists use to add depth, dimension, and realism to their artwork. Artists add colour, and texture to objects in a scene, giving them a more realistic appearance. The shading process manipulates light and dark levels to add natural effects and make objects appear voluminous. There are various shading techniques, of which three will be discussed in year one. The other methods will be discussed in year two.

- Hatching

This a technique in sketching that where you use parallel lines to fill an area with tone. When the spacing and width (pressure) of the lines you can make areas darker or lighter.

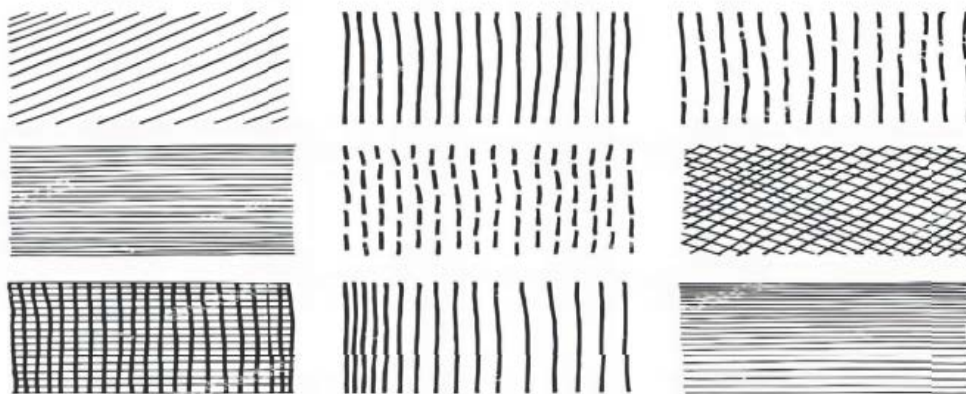


Fig. 1.1.8

- Stippling

Stippling is a drawing technique in which areas of light and shadow are created using nothing but dots. The basic idea is simple: For darker areas, you apply a greater number of dots and keep them close together.

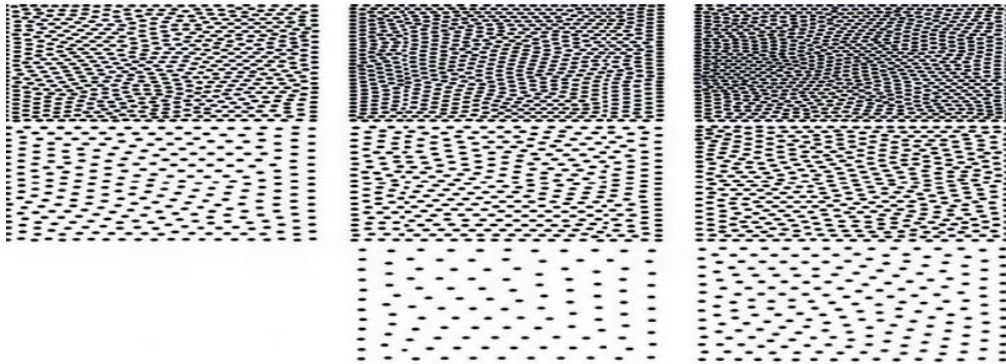


Fig. 1.1.9

- Scribbling

Scribbling is a form of spontaneous drawing that involves making quick and unstructured marks on paper. It can take many forms, including lines, circles, squiggles, and other abstract shapes.

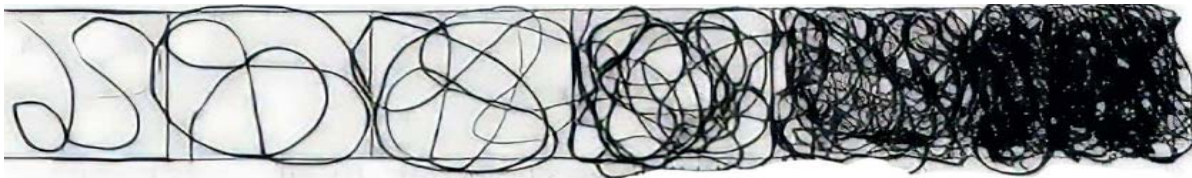


Fig. 1.1.10

Rendering often involves using a combination of techniques rather than relying on just one. By blending multiple methods in a single work, designers and artists can achieve more striking and accurate results. Fig.1.1.11 shows different examples of rendering techniques on the same object.

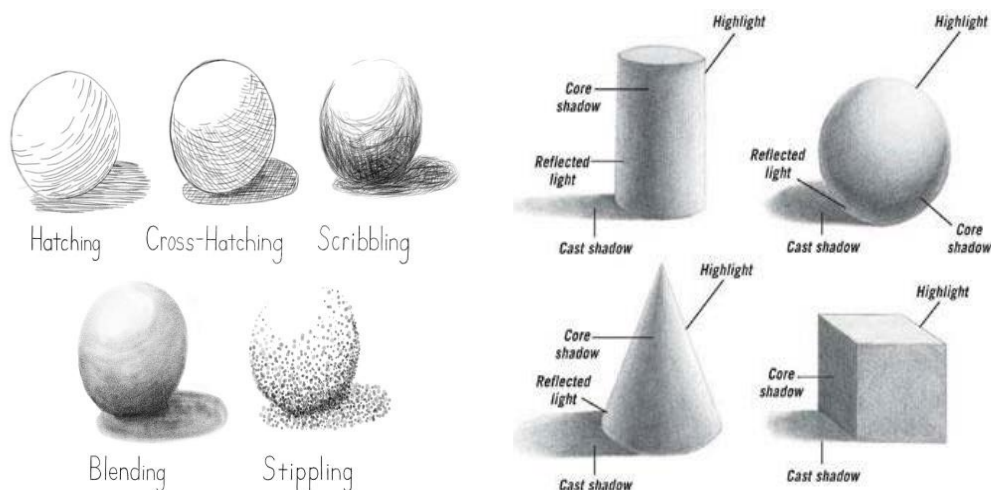


Fig.1.1.11 Different rendering techniques on the same object

The image in Fig. 1.1.12 below shows various shapes transformed into objects, each rendered using different techniques.

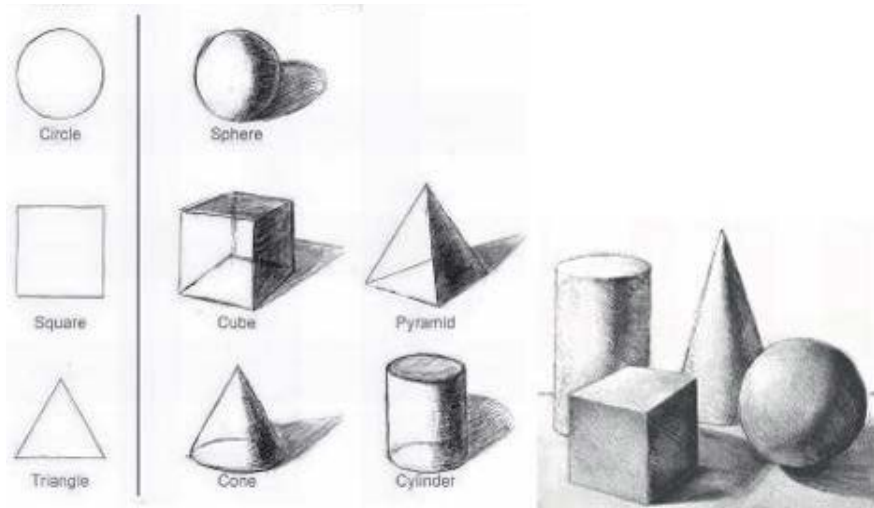


Fig. 1.1.12

### Activity 1.1.4

Mansa, Edem, and Atinga are eager to take on their weekly challenge at the Challenge Club. This week, they're diving into the world of design by exploring shapes and forms. Join them in this creative task and showcase your artistic skills.

- a. Choose at least two or three different shapes from the image provided below. Using freehand drawing, transform these shapes into a 3-dimensional form. You can select each shape more than once and rotate or flip them in any way you like to create an interesting object.

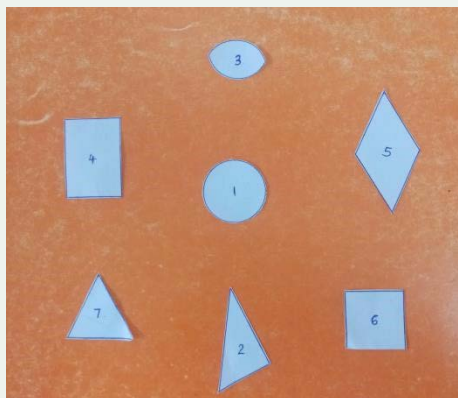


Fig. 1.1.13

- b. Once you've created your 3-dimensional form, think of a creative and fitting name for your object.
- c. Enhance your object by applying two different rendering techniques to give your object distinct textured surfaces, making it more realistic and visually appealing. Name the rendering techniques you use.
- d. After completing your design, display it on the classroom wall for appraisal by your peers.



### Activity 1.1.5

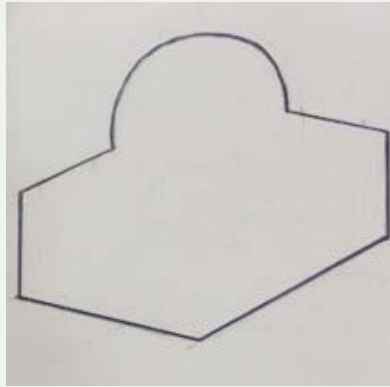


Fig. 1.1.14

The image above is the outline of a fruit placed on top of a wooden box. It was originally created by five children from the Creativity Club in their community, which includes individuals (two boys and three girls) from different ethnic and religious backgrounds.

#### Tasks:

##### 1. Recreate the Image:

- a. **Materials Needed:** Manila card or A4 paper.
- b. Carefully copy the provided outline of the fruit and wooden box onto your chosen material. Ensure you use the appropriate lines to accurately copy the shapes and details of the image.

##### 2. Identify and Name Forms:

- a. Examine the image closely and identify the different forms that make up the fruit and the wooden box.
- b. Name each form in your drawing to show your understanding of their shapes and structures.

##### 3. Apply Rendering Techniques:

- a. **Materials Needed:** Coloured pencils or other available materials.
- b. Bring the image to life by applying different rendering techniques to show the distinct textures of the fruit and the wooden box.

##### 4. Presentation:

- a. Post your completed work on the classroom wall or designated display area.
- b. Share your work with your peers and be open to constructive feedback. Offer suggestions for improvement based on the critiques and observations of your classmates.

## Extended Task

### Project Work:

1. Research on other types of shapes and forms used in designing from any other available source such as textbooks, library or the internet. Make a chart or a table of the findings, to be displayed on the classroom walls to serve as a reference.
2. Find out about other rendering techniques used to create artworks and classify them under the various types.

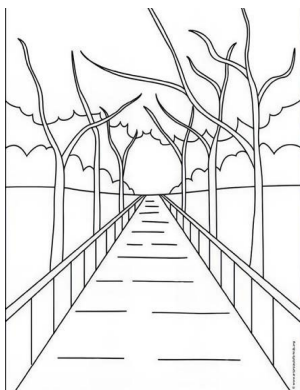
## PRINCIPLES OF PERSPECTIVE DRAWING AND PROPORTION IN DESIGNING

Perspective drawing and proportion are fundamental principles in design that help create realistic and visually appealing compositions. Perspective drawing involves techniques to represent three-dimensional objects on a two-dimensional surface, allowing designers to depict depth and spatial relationships accurately. It helps in achieving a sense of realism by mimicking how objects appear smaller as they recede into the distance.

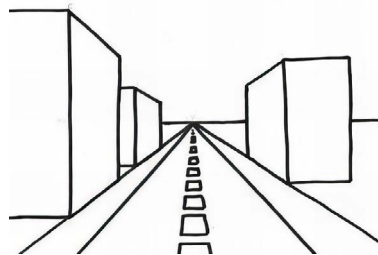
Proportion, on the other hand, refers to the relative size and scale of elements within a design. Understanding and applying proportion ensures that the various parts of a design are in harmonious balance, enhancing its overall coherence and aesthetic appeal. By mastering these principles, designers can create more engaging and believable visuals, whether in illustrations, architectural plans, or product designs.

In this lesson, we will explore a different method of drawing. Before we do that, look closely at pictures A–E and take note of the following:

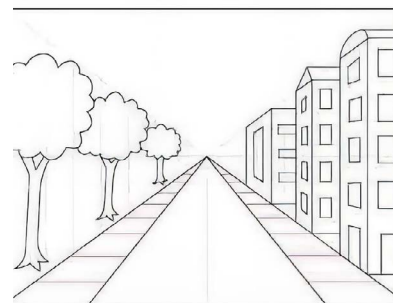
- The size or height of objects in the image.
- Do the parallel lines seem to meet at a point?



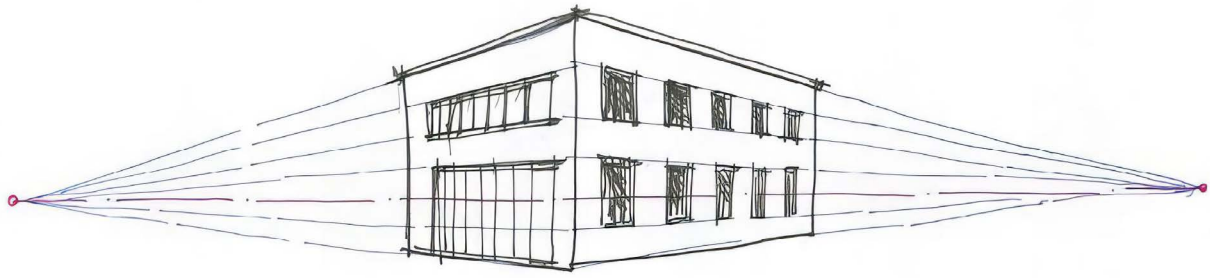
A



B

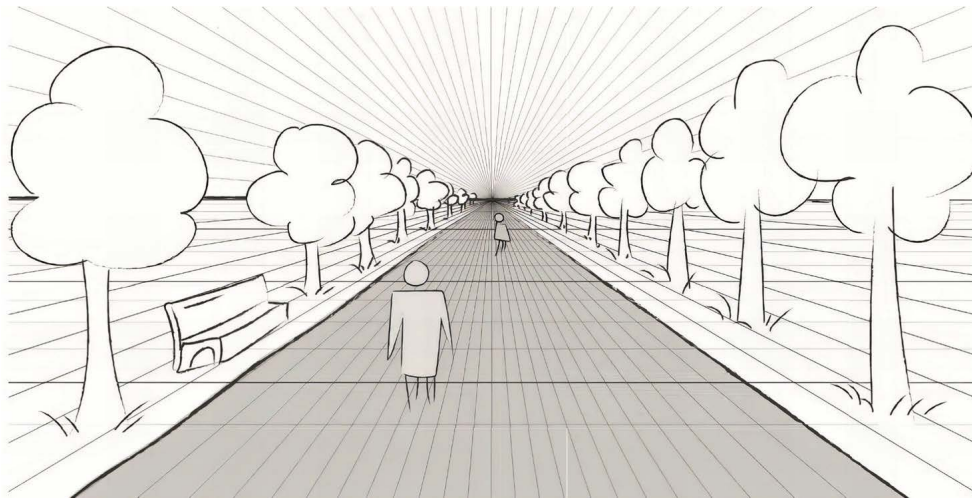


C



D

Fig. 1.1.15 Types of perspective drawing



E

Fig. 1.1.16 Types of perspective drawing

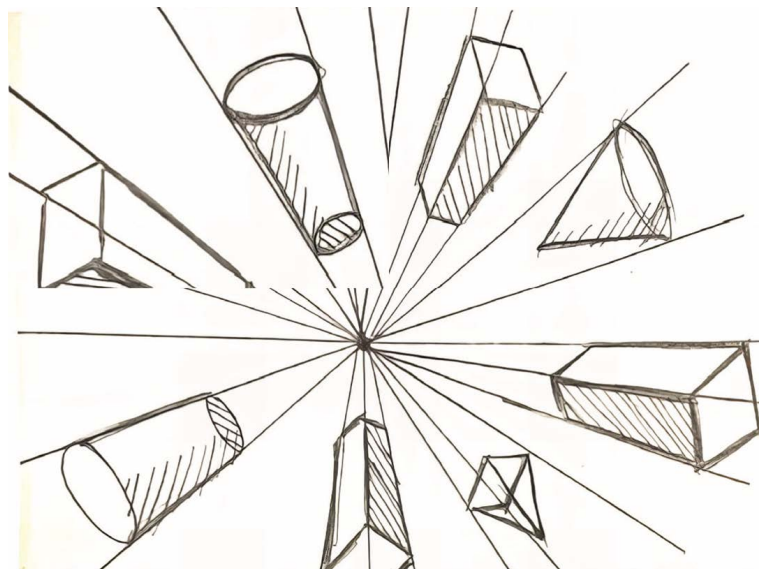


Fig. 1.1.17: One-point multiple perspective drawing

Now that you have observed the images above, we will now delve deeper into **Perspective drawing**, especially about the vanishing point—where two parallel lines seem to meet at a point.

## Perspective Drawing

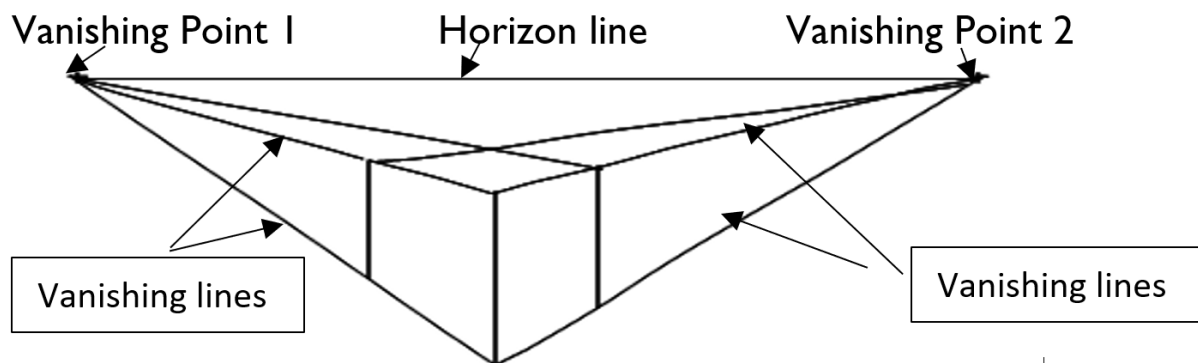
Perspective drawing is a technique employed by artists and designers to generate the illusion of depth and three-dimensional space on a two-dimensional surface. Both perspective and proportion contribute to the overall impact of art and design. Whether you are drawing, sculpting or creating digital graphics, mastering these principles enhances your creative expression. By applying perspective principles, creators can depict how objects appear smaller as they recede into the distance, creating a sense of realism and spatial arrangement.

There are various types of perspectives, including one-point, two-point, and three-point perspectives, each offering different ways to represent depth and angles. Mastery of these techniques allows artists and designers to create more convincing and dynamic compositions, whether they are drawing landscapes, architectural designs, or interior spaces. Understanding and applying perspective enhances the visual accuracy of artworks and designs, making them more engaging and lifelike.

### Principles of Perspective Drawing.

By following certain principles of perspective drawing, such as vanishing points and horizon lines, artists can depict how objects and scenes recede into the distance. Understanding these principles helps in constructing more realistic and proportionate drawings, whether for artistic compositions, architectural plans, or any other visual representation.

Observe the image in **Fig. 1.1.17** below:



**Fig. 1.1.18** Principles of perspective drawing

- **Horizon line:** This line is usually at eye level for the viewer; however, depending on the viewer's height, the horizon line may shift as follows:



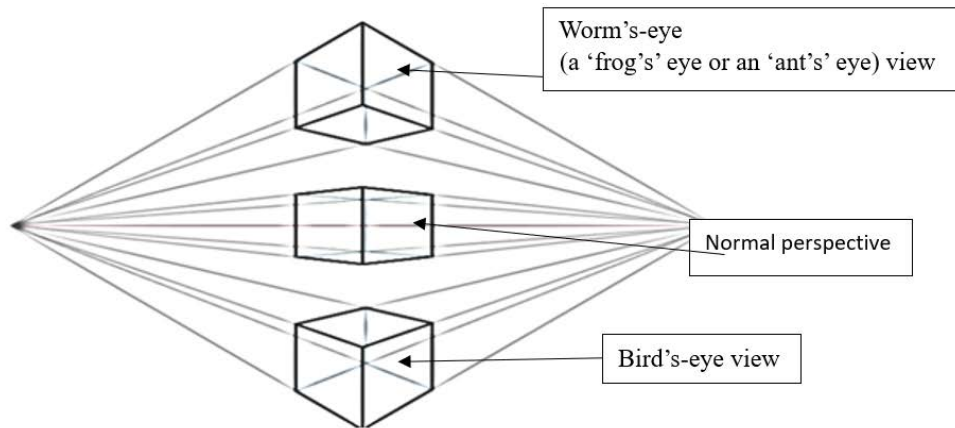


Fig. 1.1.19 Principles of perspective drawing

- **Bird's-eye view/below eye level:** This is the term given to the view you see when looking down from above or from an elevated position.
- **Normal perspective/at eye level:** This is the perspective you see based on our own eye level.
- **Worm's-eye view/above eye level:** This is the term given to the view you see when looking up from below or from a lower position. The worm's-eye view is also called a “**frog's eye view**” or an “**ant's eye view.**”
- **Vanishing Points:** This is where all parallel lines converge. When standing on the road and looking into the distance, the road seems to meet at a point. The vanishing point is always on the horizon line.
- **Vanishing Lines:** These are the lines that extend from the object to the vanishing point. They help create the illusion of depth in drawings.

## Types of Perspective Drawing

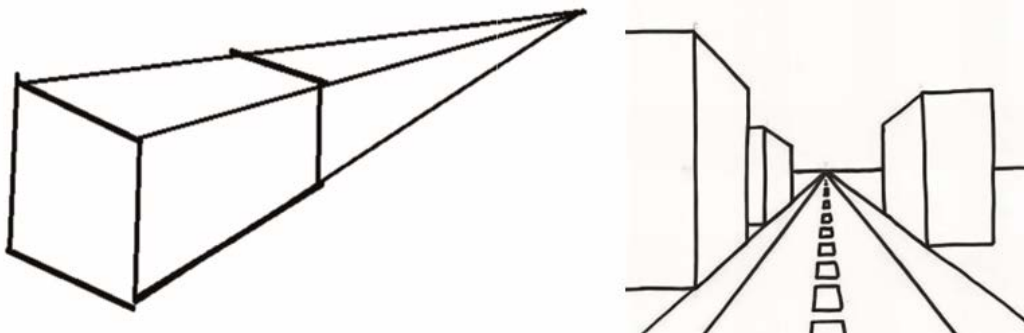
Perspective drawing involves various techniques to represent three-dimensional objects on a two-dimensional surface. Different types of perspective drawing offer unique ways to create depth and dimension in artworks and designs. Each type of perspective drawing serves specific purposes and is suited to different kinds of scenes and compositions.

The following are types of perspective drawing:

**One-point perspective:** One-point perspective gets its name from the single vanishing point depicted in the artwork. An example of this can be seen in an image of railway tracks converging at a vanishing point on the horizon line, illustrating one-point perspective as shown in **Fig 1.1.20a** below.

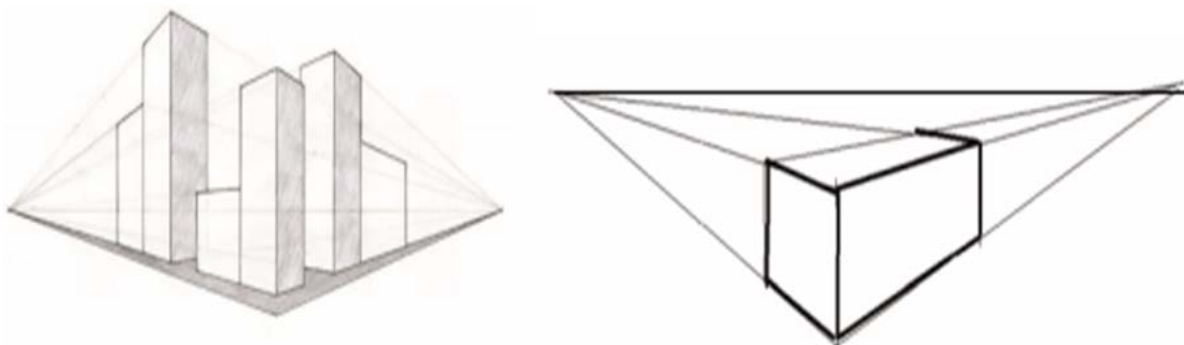


**Fig. 1.1.20a:** One-point perspective drawing



**Fig. 1.1.20b:** One-point perspective drawing

**Two-point perspective:** This type of linear perspective features two vanishing points, typically located on opposite sides of the artwork, at the far left and right. For instance, when drawing a box at an angle, the two perpendicular sets of horizontal lines that form its top edges recede towards two different vanishing points.



**Fig. 1.1.21:** Two-point perspective drawing

## Sketching in Perspective

Sketching in perspective refers to the technique of creating drawings that represent three-dimensional objects on a two-dimensional surface in a realistic manner. By understanding and applying the principles of perspective, such as vanishing points and foreshortening, artists and designers can accurately depict depth, distance, and proportion in their sketches, bringing their compositions to life.

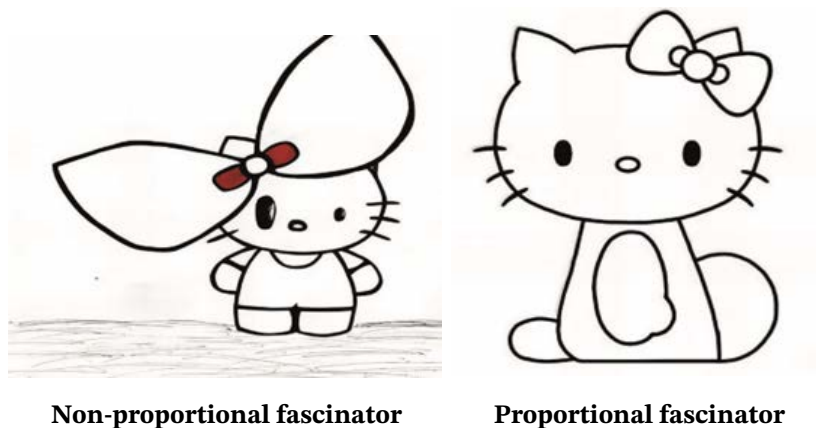
**Locating vanishing point(s):** Locate the vanishing point(s) away from the object to be drawn. The point(s) can be at eye level, below eye level, or above eye level.

**Creating depth:** To accurately depict perspective, draw lines from the bottom, middle, and top of the object to the vanishing point(s). These lines help create the illusion of depth and distance.

**Foreshortening:** Foreshortening is the change in size that occurs when an object appears shorter or longer due to its angle relative to the viewer. Artists/designers/engineers use foreshortening to convey depth convincingly. **Fig. 1.1.21** is an example of this—the tall buildings look shorter due to the perspective of the drawing.

## Proportions in Designing

Proportion is a fundamental design principle that plays a crucial role in creating visually pleasing and smooth compositions. It deals with the idea of the relationship of the individual parts of a body to the whole. Simply put, proportion in design is about how objects relate to each other in size, scale, shape, and the quantities between the various elements of a design.



**Fig. 1.1.22:** Concept of proportion

### Examples of Proportion:

- 1. Size relationships:** Proportion refers to the varied sizes of individual parts that make up an object or composition. It involves maintaining balanced size relationships between elements.

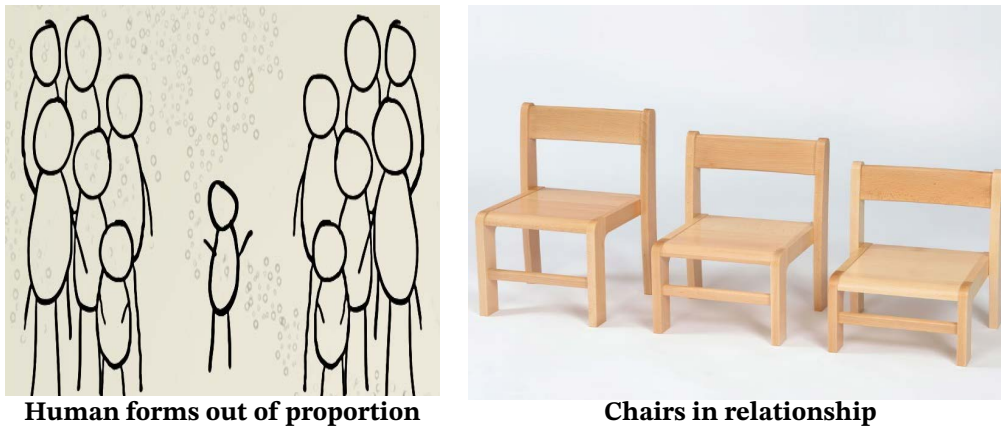


Fig. 1.1.23 Examples of size relationships

2. **Golden ratio:** Artists and designers have long used the **golden ratio** (approximately 1 to 1.618) to create aesthetically pleasing images. Leonardo da Vinci famously applied the golden ratio to calculate perfect proportions in his iconic work, *The Vitruvian Man*.



Fig. 1.1.24 Example of Golden ratio

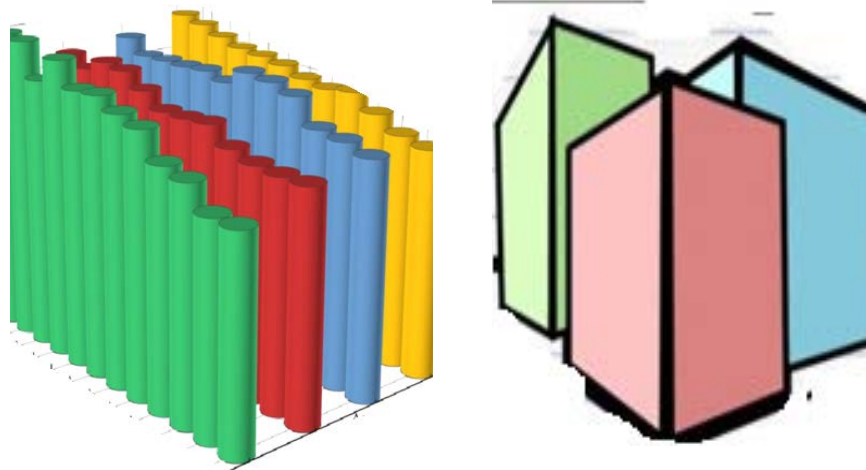
3. **Hieratic scale:** The hieratic scale is an artistic technique where the most essential object in a painting or sculpture is depicted as the largest. Ancient Egyptians used this scale to emphasise the importance of pharaohs and gods.



Fig. 1.1.25 Hieratic scale:

4. **Graphic design:** In graphic design, proportion matters when determining the focal point of a design. Adjusting scale helps highlight tension, contrast, and visual hierarchy.





**Fig. 1.1.26.** Example of graphic design.

### Activity 1.1.6

Use the following guidelines to complete this activity.

1. Observe the environment around your school and select a simple scene that includes a building, trees, and a pathway.
2. Use a pencil and A4 paper to create a basic sketch of the scene, ensuring that you apply the principles of perspective to give depth to your drawing.
3. Focus on how objects appear smaller as they recede into the distance. Once completed, add details (shading) to enhance the sketch.

### Activity 1.1.7

Use the following guidelines to complete this activity.

1. Walk to your school's dining hall or canteen and choose either the building's interior or exterior to sketch.
2. Using a pencil and an A4 paper, create a detailed sketch of the selected area, focusing on accurate perspective and proportion.
3. For the exterior view, include elements such as the building's façade, windows, and entrance. For the interior view, capture details such as tables, chairs, serving counters, and any decorative features.
4. Label key parts of your sketch, such as the foreground, middle ground, and background, to clearly illustrate the depth and spatial arrangement of the scene.

### Activity 1.1.8

Once all activities (**Activity 1.1.7** and **Activity 1.1.8**) are completed:

1. Display your drawings on the classroom walls or share them with your classmates.
2. Engage in providing constructive feedback to your peers and discuss the different perspectives and details each person has captured.
3. Take a moment to reflect on your work by writing a short paragraph in your notebook about what you learned about perspective and proportion. Think about how mastering these principles has improved your ability to create realistic drawings.

## Extended Learning

- Stanyer, P. (2005). *The Complete Book of Drawing Techniques*. New York: Barnes & Noble. Pages 9 – 12.

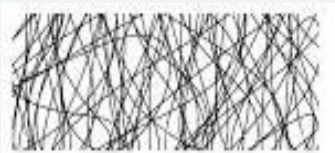
## References

- Acquaye, E. A (2022) *Technical Drawing*, Yetoda Publishing.
- Asomani J and Dzakpasu R. (2021) *Advanced Graphic Communication for Higher Institutions*, Landtech Printing Press.
- Hu, Z.H. Ding, Y.S. Zhang, W.B. et al., An interactive co-evolutionary CAD system for garment pattern design. *Computer. Aided Des.* 40(12), 1094–1104 (2008)
- Rhodes, L. B and Cooks, RS (1982) *Engineering Geometrical Drawing*, Pitman Publishers.
- Venkata Reddy, K, R. (2008). *Textbook of engineering drawing*. BS Publications
- Barber, B. (2001). *The Fundamentals of Drawing*. New York: Barnes & Noble.
- Hlavács, G. (2022). *The Exceptionally Simple Theory of Sketching - Extended Edition*. BIS Publishers.
- Stanyer, P. (2005). *The Complete Book of Drawing Techniques*. New York: Barnes & Noble

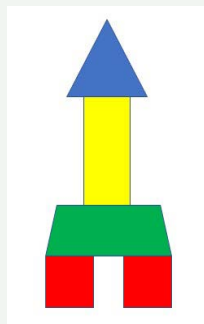
# Review Questions, Unit 1

1. Your friend is struggling with understanding concept sketches and has come to you for help.
2. How would you guide him or her to overcome the difficulty of explaining the meaning of concept sketches using any medium?
3. As a designer, you are tasked with designing a new public park in your community. Identify at least three (3) diverse types of sketches that you would use throughout the public park's design process.
4. Afi and Kwaw joined your class in the second semester and missed the lessons on line quality, line weight, and line consistency. How would you clearly explain and demonstrate these concepts to Afi and Kwaw to help them catch up with the rest of the class?

Name the following rendering techniques:



5. The image below shows a combination of shapes used to create a design.
  - a. How many shapes make up the image?
  - b. Name the shapes you identified in (a).



- c. Select any two of the shapes named in (b) and combine them to create an object in 3-dimension. Suggest a name for the object created.
- d. Use two or more rendering techniques to render the object created. Which effect does the rendering show?



**Fig. 1.1.27** A table

6. Refer to **Fig. 1.1.27**, which shows the table designed for teachers by your school's Design Communication and Technology (D.T.C.) club.
  - a. Sketch the table using a two-point perspective.
  - b. Apply the shading technique to render your work.
  - c. State one benefit of using the shading technique in your drawing.
7.
  - a. Find a comfortable spot under a tree and use your sketchbook to draw an interesting scene.
  - b. Ensure that your drawing incorporates the use of perspective technique, accurate proportion, and appropriate rendering methods.



# Answers to Review Questions, Unit 1

1. By following these steps

- Set specific, achievable goals for yourself to work towards.
- Practice Regularly: Familiarise yourself with the fundamental principles of sketching, such as perspective, proportions, shading, and composition.
- Try using various mediums such as pencils, pens, markers, charcoal, or digital tools.
- Listen to suggestions and use them to refine your skills.
- Do not be afraid to make mistakes.

2. Any three of the following:

- Interior sketching
- Fashion sketching
- Industrial sketching
- Travel sketching

**Advantages:** quickly captures ideas and concepts; portable; can be done anywhere with minimal supplies; helps improve hand-eye coordination and fine motor skills.

**Disadvantages:** lack of detail and refinement; a perception that sketching is just a preliminary step in the creative process, not a final product.

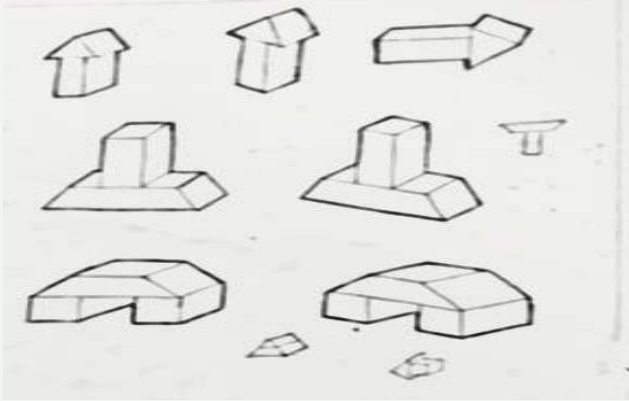
3. Set a suitable time for them and use available materials to demonstrate that:

**Line quality/weight** is a term used in art to describe the thinness or thickness of a line. Line quality can suggest different effects, such as value, texture, depth, material, lighting, and weight. Line quality can make drawings look more realistic, expressive, and readable.

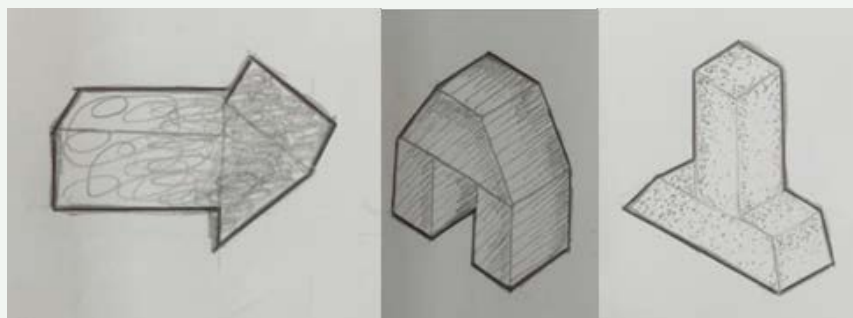
**Line consistency** also refers to how closely the elements (lines) relate within a design or composition in their visual characteristics. When creating visual art, graphic design, or other visual compositions, maintaining consistent lines can significantly impact the overall aesthetic and readability.

4. a) hatching  
b) stippling  
c) scribbling

5. a) Four shapes make up the image.  
 b) A triangle, a rectangle, a trapezium and a square  
 c) Worksheet

i	Sketch	 <p><i>Sample objects. More can be created.</i></p>
ii	Selected shapes	1.
		2.
ii	Name of Object	

(d) Below are possible examples of how the rendered objects may look like.



6. The answers to questions (a) and (b) will depend on the learner’s understanding of the topics treated and creativity and drawing prowess.
- c) Some examples of the importance of the shading technique are:
- Shading makes the sketch real.
  - Shading makes the work beautiful/attractive.
7. The answers to this question will depend on the learner’s creativity and drawing skills in accurately sketching the selected building and correctly applying the shading technique.

## UNIT 2: OBJECT MANIPULATION

# CONCEPTUAL DRAWING

## Object Manipulation in Freehand Drawing

### INTRODUCTION

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This unit examines object manipulation through freehand sketching, which is a foundational skill required for all artistic expression. The analysis considers how perspective, depth, and emotion can be effectively communicated on appropriate surfaces through the employment of certain freehand sketching approaches. Through the study of composition, perspective, proportion, and rendering, among other approaches, the unit seeks to assist learners in effectively expressing their thoughts. This unit delves deeper into the fundamental techniques for faithfully portraying objects, with a focus on form understanding, observational aptitude, and drawing tool competence.

#### At the end of this section, you should be able to:

- Analyse and record the concept of object manipulation and manipulation techniques.
- Experiment with various tools and techniques in drawing to manipulate organic and inorganic shapes, forms and objects.
- Use available media and techniques to manipulate objects based on conceptual, symbols, metaphors and narratives associated with objects.

#### Key Ideas

- Freehand drawing is the act of drawing without using tools such as rulers, compasses, or stencils.
- Object manipulation in freehand drawing is representing objects or generating designs without using tools like templates or rulers.
- Contour drawing refers to drawing only the outline or contour of an object or subject.
- Negative space drawing is a drawing that focuses on the shapes formed around the subject rather than the subject itself.
- Line variation is the process of manipulating line thickness and pressure to convey depth and form.
- Organic shapes and forms are derived from nature and characterised by irregularity, flowing lines, and dynamic contours.
- Inorganic shapes and forms are man-made or developed from non-living materials.

- Concepts are general notions or intentions associated with objects and shapes.
- Symbolism refers to the ideas that objects and shapes represent.
- Metaphor: a creative representation of a design concept or idea through an image that uses analogy or association.
- Narratives refer to the use of imagination to create visual communication of ideas in design.

## OBJECT MANIPULATION IN FREEHAND DRAWING

Object manipulation through freehand drawing is a fundamental skill integral to all forms of artistic expression. This analysis explores how various freehand drawing techniques can be employed to effectively convey perspective, depth, and emotion on appropriate surfaces. Developing object manipulation skills enhances creativity and originality in concept design.

In freehand drawing, object manipulation involves representing objects or creating designs without the use of tools such as templates or rulers. This allows designers to depict three-dimensional objects on a two-dimensional surface. The process requires technical proficiency and keen observation to accurately translate three-dimensional physical or imaginary designs onto a flat surface. Through the manipulation of objects in their drawings, designers continuously refine their techniques and styles.

Figure 1.2.1 illustrates basic shapes that can be manipulated and Figure 1.2.2 shows shapes that have been manipulated into human form.

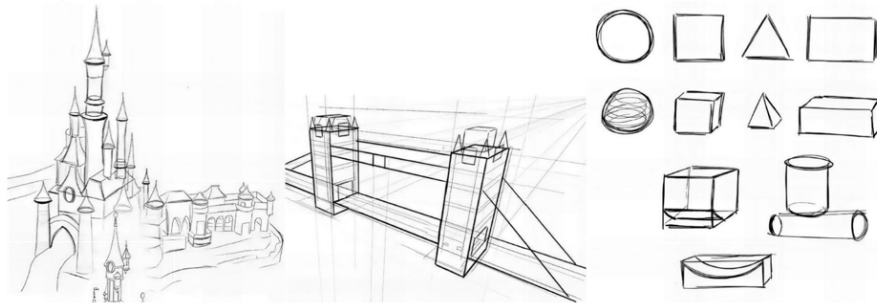


Fig. 1.2.1: Basic shapes to be manipulated.

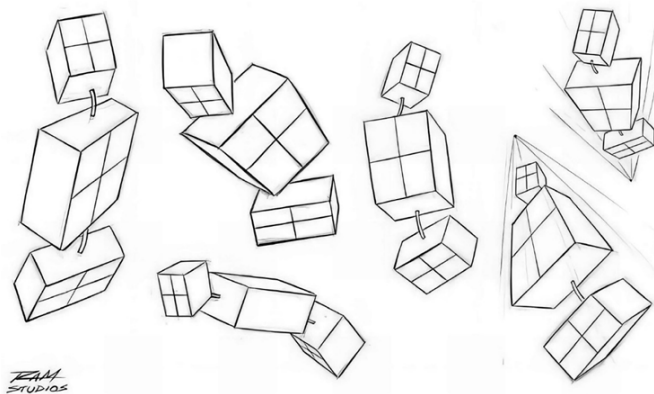


Fig. 1.2.2: Shapes that have been manipulated into human form.

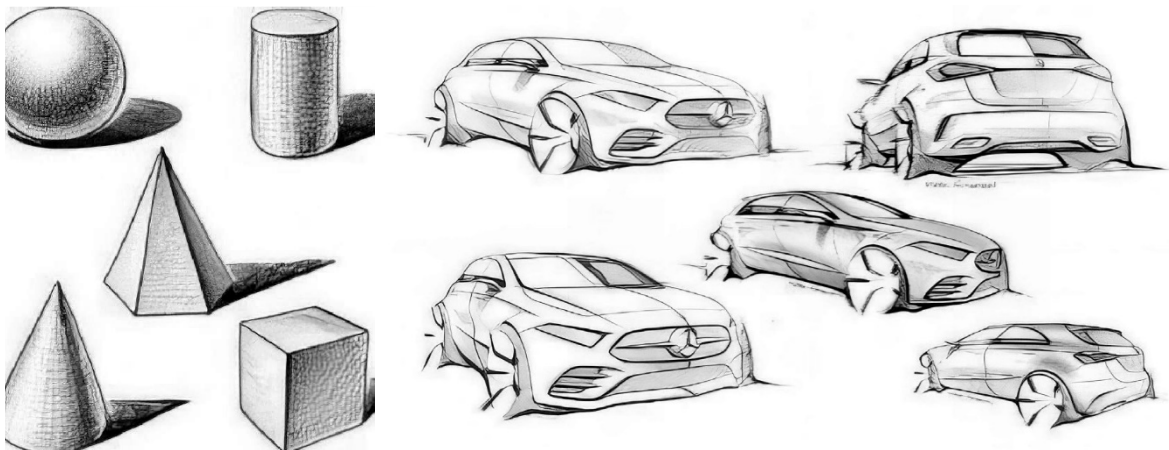


It is important to note that most designers begin their object manipulation through freehand drawing by exploring and practising with basic shapes. Once these simple forms are established, they gradually add details to create new forms and then employ various rendering techniques, such as shading, to introduce depth. The following concepts, studied in Section 1, Unit 1, are particularly useful when engaging in object manipulation:

- Proportions
- Perspective
- Form and Volume
- Composition
- Line Quality
- Rendering Materials

## Freehand Drawing

Freehand drawing is the act of drawing without using tools such as rulers, compasses, or stencils. In this practice, the artist or designer uses only hand-eye coordination, intuition, and skill to create the lines, shapes, and forms directly onto the drawing surface. Freehand drawing is considered a fundamental skill in art and design. It allows designers to express their creativity and capture subjects with a sense of spontaneity and personal style. It is widely used in various art forms, including sketching, illustration, fine art, automobile, mechanical, and architectural drafting.



**Fig 1.2.3** indicates examples of freehand sketches in the various fields of design.



Fig. 1.2.3: Examples of freehand drawing

### Activity 1.2.1

Follow the guidelines below to complete this activity:

1. Study the objects in **Figure 1.2.4**.
2. Choose one object with an interesting shape and details that you would like to sketch and manipulate.
3. Create a freehand sketch of the selected object, focusing on its shape, angle, and proportion.
4. Manipulate the sketch of the object by rotating, tilting, or changing the light source, and then sketch the object in three distinct positions or angles.
5. Record the three sketches in your sketch pad using freehand drawing.
6. Compare and appreciate the sketches created by your peers.

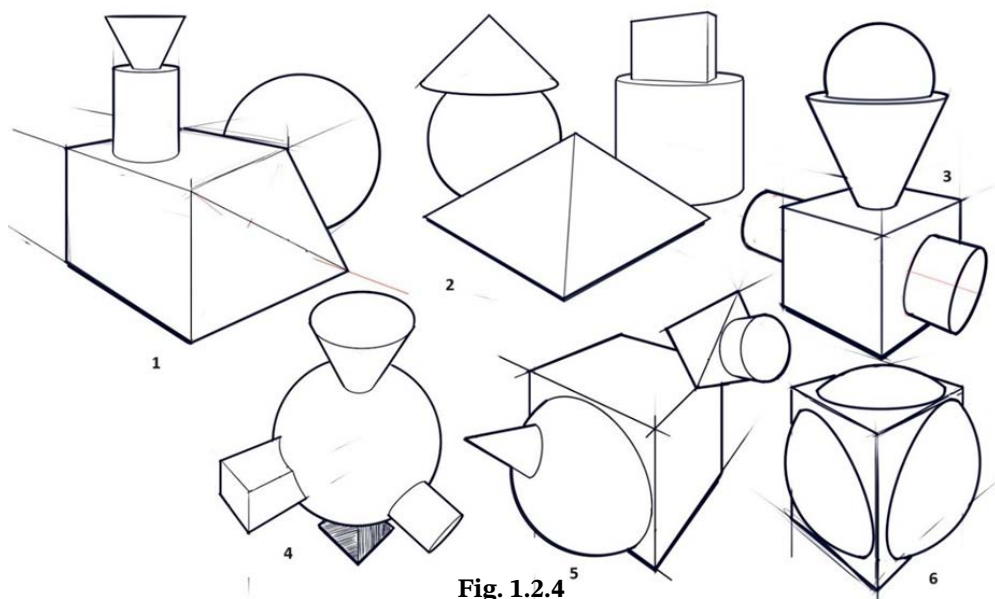


Fig. 1.2.4<sup>5</sup>

## Manipulation Techniques in Freehand Drawing

Freehand drawing involves a combination of technique, skill and creativity. Designers often combine multiple techniques to generate their designs. They also practice, experiment and observe things in their environment to help them develop a personal style.

The techniques include:

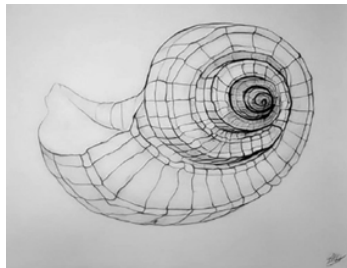
**Contour drawing:** This kind of drawing involves drawing only the outline or contour of an object or subject.

**Shading techniques:** Using shading techniques such as cross-hatching, stippling, scribbling, blending etc.

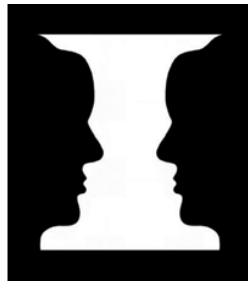
**Negative space drawing:** This technique of drawing focuses on the shapes formed around the subject rather than the subject itself.

**Foreshortening:** This is a technique used to create the illusion of depth and perspective by depicting objects as shorter than their actual length.

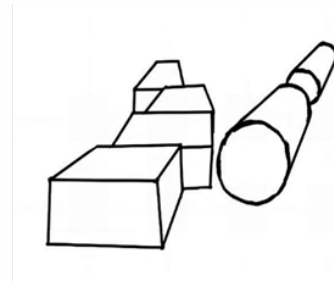
The images in **Figure 1.2.5** below, show examples of manipulation techniques used in freehand drawing.



**Contour Drawing**



**Negative and Positive Space Drawing**



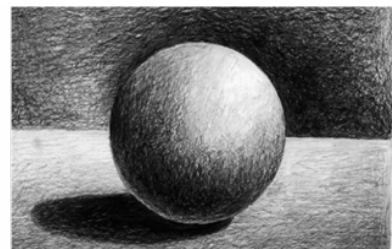
**Foreshortening**



**Cross-hatching**



**Scribbling**



**Blending**

**Fig. 1.2.5:** Example of manipulation techniques in freehand drawing

### Activity 1.2.2

As part of the SRC Week celebrations at your school, the Design and Communication Technology students are tasked with creating a detailed drawing of items typically found in a modern staff common room. In groups of three, you are to design and present a drawing of a sitting unit for the teachers in your school.

Follow the guidelines below to complete your task:

**Note:** Record all your work in your sketchpad. Ensure that your design is detailed and reflects a thoughtful approach to creating a functional and aesthetically pleasing sitting unit for the staff common room.

1. Begin by making three initial sketches of the sitting unit using contour drawing techniques. Focus on capturing the basic shape and outline of the unit.
2. Identify and indicate three distinct shapes that can be manipulated to form the sitting unit. Show how these shapes come together in your design.
3. Create a final drawing of the sitting unit in one-point perspective. Apply shading techniques to add depth and dimension to your drawing. Use any shading technique you are familiar with, such as hatching, cross-hatching, or stippling.

Copy and complete the provided table with relevant details of your design.

Techniques Used for the design	Description of the techniques
1.	
2.	
Tools used for the design	One use each
1.	
2.	
3.	
4.	

### Activity 1.2.3

Complete the following tasks to complete this activity.

1. In your groups, examine the various tools and techniques that can be employed in object manipulation for freehand drawing.
2. Research and look at six (6) examples of traditional drawing tools, as well as six (6) digital tools like drawing tablets.

Create a comparison chart that highlights the advantages and disadvantages of each tool and technique. Present your findings to your class for review.

## Extended Reading

- Fuller, G. (2011). Start Sketching & Drawing Now: Simple techniques for drawing landscapes, people and objects. (Pages 14 – 16)

## FREEHAND DRAWING

In this lesson, you will explore more about freehand drawing. Freehand drawing is an expressive process that relies on the skilful manipulation of tools and techniques to depict specific objects with accuracy and creativity. Using pencils, pens, markers, and techniques such as line variation, shading, perspective, and proportion, designers can create the illusion of depth, realism, and emotion in their drawings. Let us examine how artists use different tools and methods to handle objects when drawing.

### Working Nature of Tools Used in Freehand Drawing

Pencils, pens, pens, and markers are common tools used in freehand drawing. Each tool offers distinct characteristics that influence the outcome.

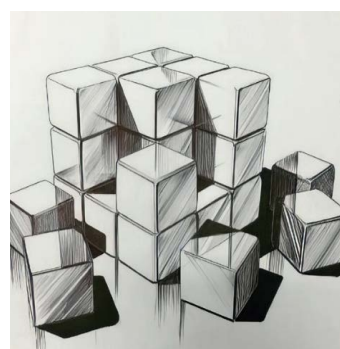
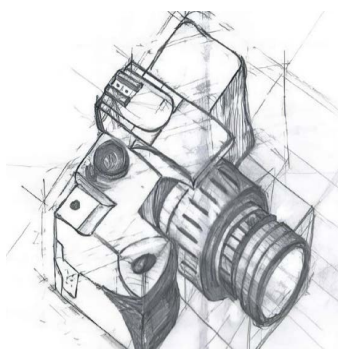


**Pencils:** Provide control and precision, allowing artists to create fine lines and intricate details.

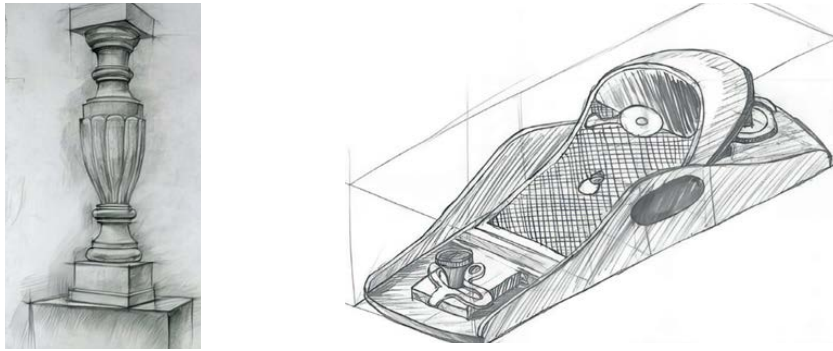


**Pens and markers:** Offer permanence and vibrancy, enabling artists to create crisp outlines and vibrant colours.

Here are some examples of how pencils are used in freehand drawing:

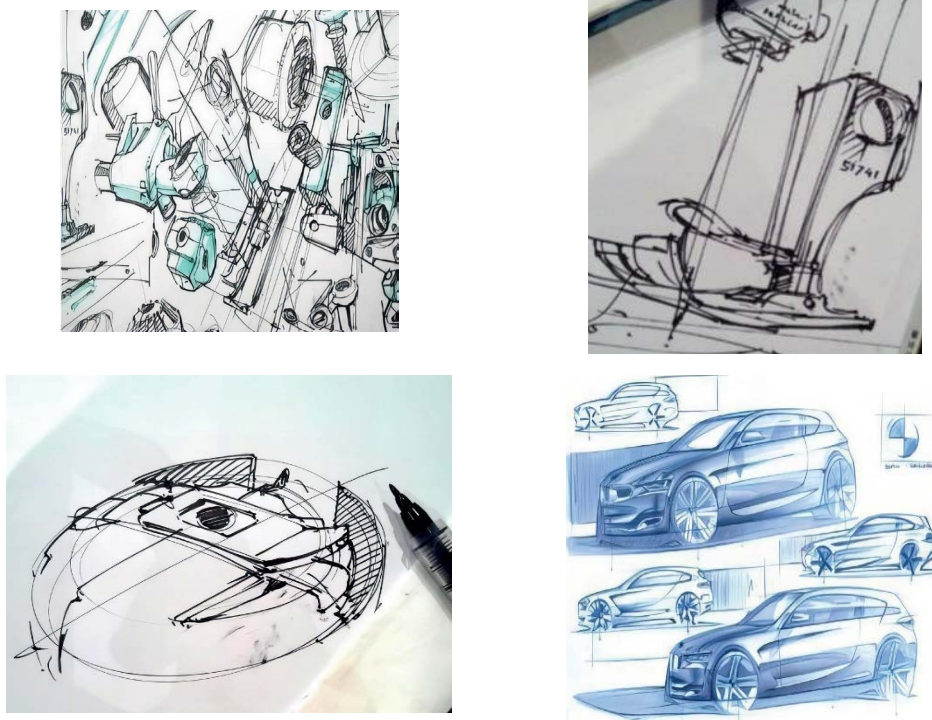




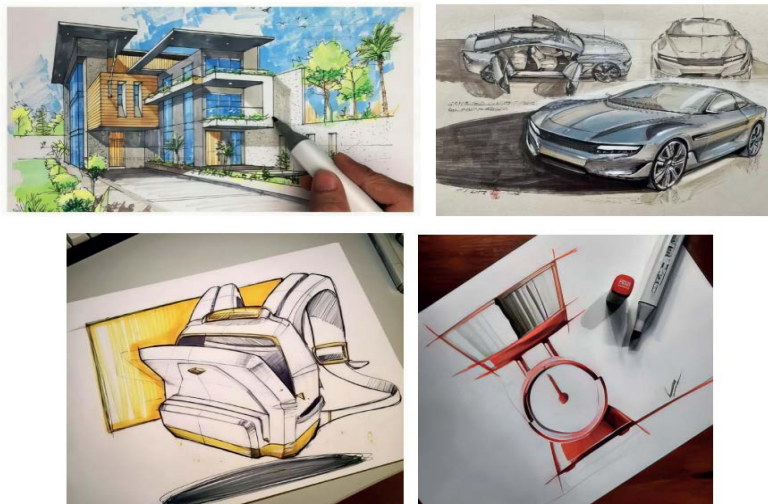


**Fig. 1.2.6:** Designs made by using pencils and freehand drawing.

Here are some examples of how pens are used in freehand drawing:



**Fig. 1.2.7:** Designs made by using pen and freehand drawing.



**Fig. 1.2.8:** Designs made by using a marker and freehand drawing

## Techniques Used to Manipulate Objects Through Freehand Drawing

In the world of drawing, manipulating objects skilfully on paper requires a blend of observation and technique. Mastering these techniques allows artists to accurately represent shapes, proportions, and perspectives, bringing their creative visions to life. Through careful application of various methods, artists can create detailed and dynamic illustrations, capturing the essence and form of the objects they depict. Below are some techniques used to manipulate objects when doing a freehand drawing:

**Line Variation:** This is the process of manipulating line thickness and pressure to convey depth and form. Thicker lines are used to emphasise or show contours and shadows, while lighter strokes can suggest delicate details or highlights.

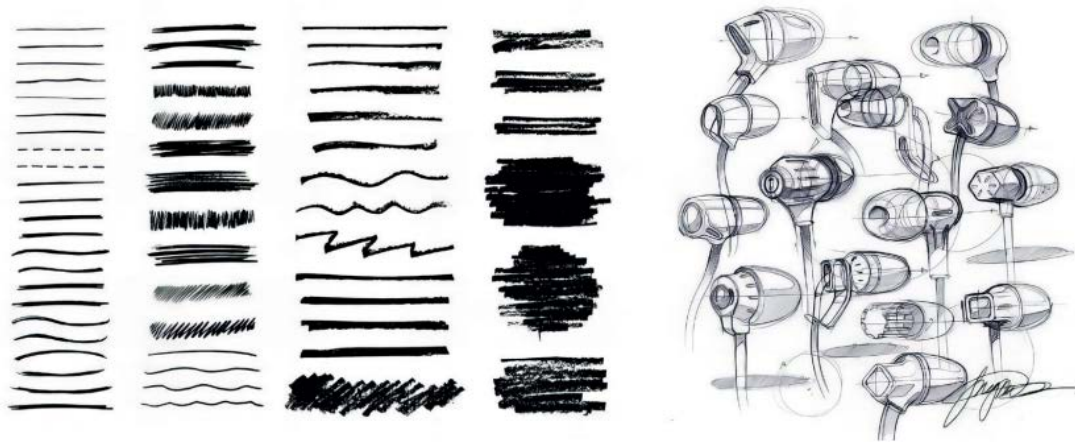


Fig. 1.2.9: Line variation as a manipulation technique

**Shading:** **Shading** is a technique used to create the illusion of volume and texture in a drawing. By varying the density and direction of lines or dots, artists are able to depict light and shadow, depth and dimension in their drawings. Some of the techniques in shading are hatching, cross-hatching, and stippling.

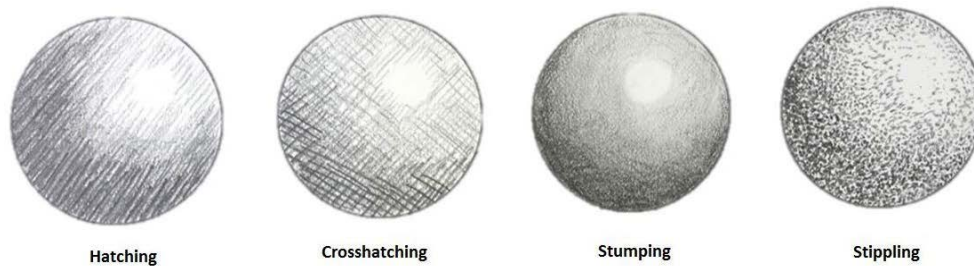


Fig. 1.2.10: Shading as a manipulation technique

**Perspective:** This technique helps the artists to create the impression of three-dimensional space on a two-dimensional surface. In using perspective, artists use methods such as foreshortening, vanishing points, and atmospheric perspective.

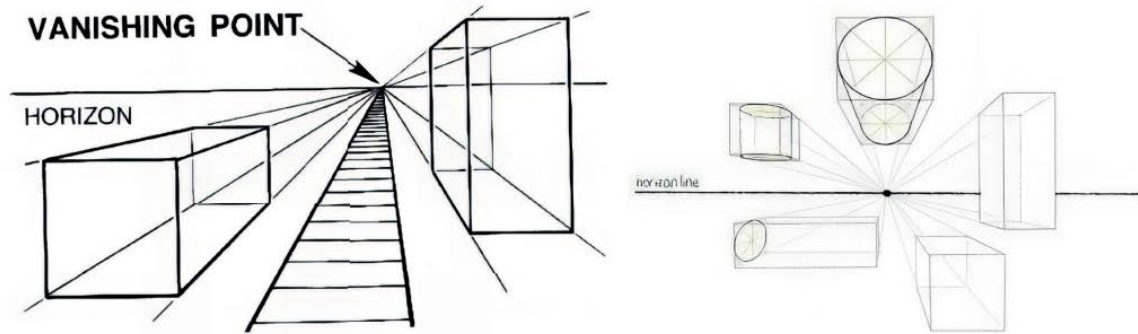


Fig. 1.2.11: Perspective as a manipulation technique

## Steps in Generating a Freehand Drawing

Freehand drawing is a creative and spontaneous process where you draw without the aid of tools like rulers or compasses.

The following steps can be very useful when drawing freehand:

- **Gather your materials and tools, etc.**
- **Choose your subject:** This could be an object, a scene, a person, or anything else that inspires you.
- **Warming up:** This can be doodling, sketching basic shapes, or practicing lines and strokes that will help to loosen up your hand.
- **Observing your subject:** You need to look at your subject to observe shapes, proportions, textures, and any other details that stand out to you.
- **Start with basic shapes:** Begin your drawing by lightly sketching the basic shapes and outlines of your subject.
- **Build up the details:** Add more detail by capturing the specific features and characteristics of your subject.
- **Use light and shadow:** Add shading and highlights to your drawing to give it depth and dimension. This can be achieved when you look at the light source and how it affects the shadows and highlights on your subject.

## Organic and Inorganic Shapes and Forms

Shapes and forms are seen in our everyday activities. Such shapes and forms can be organic or inorganic. Shapes and forms are fundamental elements in the world of design and art, influencing how we perceive and interact with objects. Recognizing the different types of shapes and forms is essential for creating balanced and visually engaging compositions. By exploring and understanding the various characteristics and applications of these shapes and forms, artists and designers can effectively convey their ideas and bring their creative projects to life. Each type of shape and form contributes uniquely to the overall aesthetic and functionality of a design, making their study an important aspect of artistic and design education.



## Organic Shapes and Forms

Organic shapes and forms are derived from nature and characterised by irregularity, flowing lines, and dynamic contours. They often take after the shapes of living organisms, plants, and landscapes. These shapes suggest a sense of natural beauty and harmony. An example of organic shapes is the intricate patterns of tree branches. Other examples can be seen in the intricate patterns of seashells and other types of spiralling forms of shells.

While organic shapes and forms are typically associated with nature, humans have created their own versions. These are often used in art, architecture, and design to create a more natural and flowing aesthetic.

Man-made organic shapes and forms blend human creativity with the beauty of nature. They can be found in various fields, from architecture to fashion, adding a touch of natural elegance and comfort to our everyday lives.



Fig. 1.2.12: Organic shapes and forms in nature



Fig. 1.2.13: Man-made organic shapes and forms

## Inorganic Shapes and Forms

Inorganic shapes and forms are man-made or developed from non-living materials. They often depict geometric precision, straight lines and sharp angles. These shapes are commonly found in architectural structures, machinery, and industrial designs. One prominent example of inorganic shapes is the geometric patterns found in modern skyscrapers. The sleek lines and symmetrical designs of buildings like the Burj Khalifa in Dubai. Another example is the hexagonal shape of a wall clock.



Fig. 1.2.14: Inorganic shapes and forms



**Fig. 1.2.15:** Man-made inorganic shapes and form

### Activity 1.2.4

Follow the steps below to create detailed and varied drawings that showcase your understanding of different techniques.

#### **Step 1: Observe and Choose**

Go outside and look around. Pick one organic object (like a leaf, flower, or tree) and one inorganic object (like a smartphone, lamp, or building).

#### **Step 2: Quick Sketches**

In your sketchbook, draw quick, freehand sketches of the chosen objects. Focus on their basic shapes and forms.

#### **Step 3: Select Your Favourite Sketches**

From the sketches you made in Step 2, choose one sketch of the organic object and one of the inorganic objects that you like best.

#### **Step 4: Create Detailed Drawings**

On a new sheet of paper, create six different drawings based on your selected sketches—three of the organic objects and three of the inorganic objects. Use various tools (pencils, pens, markers) and techniques (line variation, shading, perspective) for each drawing.

#### **Step 5: Share and Explain**

Show your drawings to the class or a group of peers. Explain your choices, the techniques you used, and how they helped you create unique sketches.

### Activity 1.2.5

Follow the steps below to complete this activity.

1. Find a simple object in your home or classroom.
2. Spend time observing the object from different angles and note its unique characteristics.



3. Using only your drawing tools, create a series of sketches of the object, focusing on different aspects such as shape, texture, and proportion.
4. Keep doing this for the next few weeks to build a portfolio of freehand drawings of various objects you encounter. Aim to include a range of objects with different shapes and forms. As you work on each drawing, experiment with different techniques and tools to manipulate the objects effectively.
5. At the end of the term or semester, review your portfolio and select six (6) of your best works.
6. Write a brief reflection or report on the techniques you used and how they assisted you in capturing the details of each object.

Turn the classroom into a gallery by displaying your works and those of your classmates on the walls. Walk around to appreciate everyone's creations and ask questions to gain insight into the techniques and tools they used in their work.

## Extended Reading

- Go to <https://youtu.be/SgRBIpHoyZ8> and watch video on Freehand Drawing Tips for Beginners
- Go to the internet and search for Organic vs Inorganic Objects Must Know Drawing Tips for Beginners.

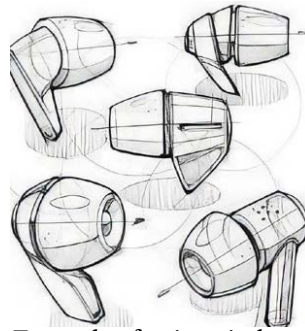
## CONCEPTS, SYMBOLISM, METAPHORS, AND NARRATIVES ASSOCIATED WITH OBJECTS AND SHAPES.

This section focuses on manipulating objects using available media and techniques through concepts, symbolism, metaphors, and narratives associated with various shapes and forms. These shapes and forms carry rich symbolism and meaning across cultural, religious, and personal contexts. Follow every step and guideline outlined in this lesson to gain a comprehensive understanding of this concept.

Designers in the process of generating ideas using freehand drawing use a lot of forms and shapes. Such forms and shapes have rich symbolic and meaning across cultures and contexts. The symbolism of forms and shapes can vary widely depending on cultural, religious and personal contexts. Let us look at some of the concepts, symbolism, metaphors and narratives associated with some shapes and forms.

Examples of how shapes have been used in relation to concepts in freehand drawing are as follows:

1. **Circle:** Unity and wholeness: The circle represents completeness, eternity, and the cyclical nature of life.
  - a. Harmony: Its symmetrical shape symbolises balance and harmony.
  - b. Inclusivity: The absence of corners suggests inclusivity and acceptance.



**Fig. 1.2.16:** Example of using circles and cylinders

2. **Triangle:** Stability and Strength: Triangles are inherently stable shapes, representing strength and resilience.
  - a. Balance: The three sides can symbolise balance, with each side representing a different aspect (mind, body, spirit; past, present, future).
  - b. Progression: Triangles often suggest direction and movement, pointing upward or downward.



**Fig.1.2.17:** Example of using triangles

3. **Square/Rectangle:** Stability and structure: Squares and rectangles symbolise stability, order, and rationality.
  - a. Security: The enclosed shape suggests protection and security.
  - b. Earthiness: In some cultures, squares are associated with the earth and the material world.



**Fig. 1.2.18:** Example of using squares/rectangle

4. **Spiral:** Transformation: Represent growth, evolution, and the journey of life.
  - a. **Eternal change:** The continuous movement of a spiral symbolises perpetual change and cyclical renewal.
  - b. **Cycle of life:** Represent the cyclical nature of life, including birth, growth, death, and rebirth.
  - c. **Energy flow:** Suggests the flow of energy and the interconnectedness of all things.
  - d. **Transformation:** Symbolise transformation, evolution, and personal growth.



**Fig. 1.2.19:** Example of using spirals

5. **Heart:** Love and Affection: Universally symbolises love, affection and emotional connection.
  - a. **Vulnerability:** Its open shape suggests vulnerability and openness.
  - b. **Life Force:** In some cultures, the heart represents the centre of life and vitality.



**Fig. 1.2.20:** Example of using hearts

6. **Star:** Guidance and inspiration: Used as symbols of guidance and inspiration, leading the way in the darkness.
  - a. **Aspiration:** The upward-pointing star symbolises aspiration, hope, and striving for higher ideals.

b. Divinity: Stars are often associated with celestial beings and divine forces.



Fig. 1.2.21: Example of using star

7. **Cross:** Unity of opposites: The cross can symbolise the union of opposites, such as heaven and earth or spirit and matter.

a. Protection: In some cultures, the cross is a protective symbol, warding off evil spirits.

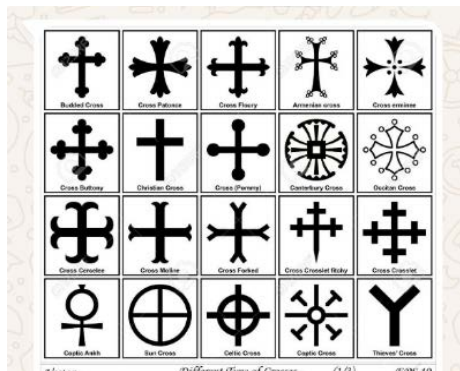


Fig. 1.2.22: Example of using cross

### Activity 1.2.6

In your small groups, select one of the following images of different objects or shapes.



1



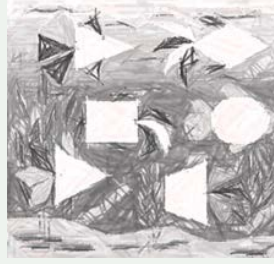
2



3



4



5

In your small groups, select one of the following images of different objects or shapes.

Create a sketch that incorporates the ideas you've learnt. As you work on your design, consider the following:

- a. The concept you wish to convey.
- b. The symbolism and metaphors you can incorporate.
- c. The story or narrative your design tells.
- d. Annotated notes explaining your choices and interpretations.

Once your sketches are complete, present them to the class. Describe the concepts, symbolism, metaphors, and narratives behind your designs. Engage with your classmates by sharing and discussing your responses and interpretations of each group's work.

Keep exploring visual language and concepts in your own time to further develop your skills.

### Activity 1.2.7

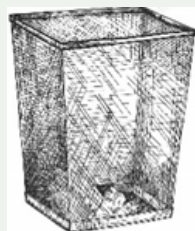
Carefully observe the following images and complete the activities outlined below.



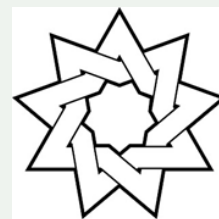
a



b



c



d



e



f



g



Your task is to create an annotated album that showcases various shapes and forms, exploring the concepts, symbolism, metaphors, and narratives associated with each.

### Tools and Materials Needed

- a. **Manual Album:** Drawing paper, notebook or sketchbook; pencils, markers, coloured pencils; scissors and glue.
- b. **Digital Album:** Design software (e.g., Canva, Adobe Spark); access to a computer and internet; digital drawing tools (e.g., drawing tablets, stylus, etc.).

### Steps for Creating a Manual Album

1. **Select Three Images:** Choose three images of shapes or forms from those provided.
2. **Create Your Drawings:** On separate pages of your notebook or sketchbook, draw each of the chosen shapes or forms.
3. **Annotate Your Drawings:** Next to each drawing, include annotations that explain:
  - a. The concept the shape represents.
  - b. The symbolism or metaphors associated with the shape.
  - c. Any narratives or stories related to the shape.
4. **Decorate Creatively:** Enhance your pages with colours, patterns, and additional illustrations to make your album visually engaging.

### Steps for Creating a Digital Album

1. **Select Three Images:** Choose three images of shapes or forms from those provided.
2. **Design Your Pages:** Use graphic design software (such as Canva or Adobe Spark) to create digital pages for your album.
3. **Add Annotations:** Include text boxes to annotate each shape with explanations of its concepts, symbolism, metaphors, and narratives.
4. **Enhance Visually:** Utilise digital tools to add colours, patterns, and additional visuals, making your album visually appealing.

### Presentation and Discussion:

Once your albums are complete, present them to the other small groups. Share your creative choices and any interesting discoveries you made during your research. Discuss the different interpretations and insights you've gained from exploring the shapes and forms.

## Extended Reading

- Patricio, J. (2015). *Perspective Sketching: Freehand and Digital Drawing Techniques for Artists & Designers*. Rockport Publishers, Pages 40 -42.

## References

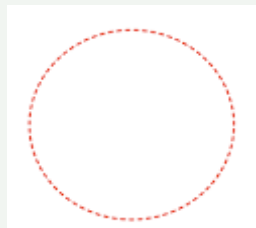
- Design and communication technology curriculum
- Hammond, L. (2018). *Lee Hammond's All New Big Book of Drawing: Beginner's Guide to Realistic Drawing Techniques*. North Light Books.
- Paricio, J. (2015). *Perspective Sketching: Freehand and Digital Drawing Techniques for Artists & Designers*. Rockport Publishers.
- Parks, C. S., & Parks, R. (2009). *The Big Book of Realistic Drawing Secrets: Easy Techniques for Drawing People, Animals, Flowers, and Nature*. North Light Books.
- Velasquez, D. (2016). *Drawing in Black & White: Creative Exercises, Art Techniques, and Explorations in Positive and Negative Design*. Quarry Books.
- Willenbrink, M. (2013). *Drawing Nature for the Absolute Beginner*. Cincinnati, Ohio: North Light Books.

## Review Questions, Unit 2

1. Which basic tool is essential for sketching initial outlines in freehand sketches?
2. What tool would you use to correct mistakes and refine your drawing by removing unwanted lines?
3. The table below shows tools used in object manipulation and their uses. Copy and complete the table.

	Tool	Uses
a.	<b>Pencil</b>	
b.		Used to remove pencil marks and correct mistakes.
c.	<b>Pen</b>	
d.		Used for painting with various media such as watercolour, acrylic, or ink, offering different textures.
e.	<b>Ruler</b>	
f.		Used for drawing precise circles and arcs.
g.	<b>Protractor</b>	
h.		Provides soft, blendable colour for shading and highlighting.
i.	<b>Drawing Board</b>	
j.		Provide coloured lines and shading, allowing for detailed and precise colour work.

4. The image below shows a sketch of a handball.



Make a freehand sketch of the handball to explain the following manipulation techniques used in freehand:

- a. Contour drawing
- b. Cross-hatching
- c. Blending

5. Describe three characteristics each of organic and inorganic shapes and forms.
6. The table below shows the differences between organic and inorganic shapes based on their definition, three (3) examples, and origins. Complete the table with the appropriate responses.

	CHARACTERISTICS	ORGANIC SHAPES	INORGANIC SHAPES
1	DEFINITION		
2	EXAMPLES 1		
	2		
	3		
3	ORIGIN		

7. As an interior designer, your task is to create a piece of art that integrates elements of both organic and inorganic shapes to be placed in a living room. Using freehand drawing techniques, merge and manipulate organic and inorganic objects to form a cohesive design.
  - a. Identify three (3) materials needed.
  - b. State two organic and two inorganic elements that can be used.
  - c. Make a freehand sketch of your design using the elements stated in 3 b) above.
8. Sahana is an art student working on a still-life drawing assignment. The still-life setup includes an apple, a vase, and a folded cloth. Her goal is to create a realistic representation of this arrangement using freehand drawing techniques.
  - Explain how Sahana will use the tools and techniques to manipulate her objects through freehand drawing.
9. Zacharia, a designer, is creating a conceptual art piece for an exhibition with the theme, “Transformation and Growth.” He must create both simple and complex drawings that convey these ideas using a butterfly and a tree. John uses freehand drawing, incorporating various tools, techniques, and references from photographs, videos, sketches, and real objects to explore the concepts, symbolism, metaphors, and narratives associated with these objects. Explain how John will go about his work.
10. Basua, your friend, is to create an album that explores various shapes and forms through freehand drawing. Explain how he would prepare the album, illustrating the concepts, symbolism, metaphors, and narratives associated with each shape and form. Also, explain how he can use both digital and manual drawing techniques to present his work in a cohesive and visually engaging manner.

# Answers to Review Questions, Unit 2

1. Pencil
2. Eraser
- 3.

	Tool	Description
a.	<b>Pencil</b>	A basic drawing tool used for sketching and detailing.
b.	<b>Eraser</b>	Used to remove pencil marks and correct mistakes.
c.	<b>Pen</b>	Provides permanent lines, often used for inking over pencil sketches.
d.	<b>Brushes</b>	Used for painting with various media such as water colour, acrylic, or ink, offering different textures.
e.	<b>Ruler</b>	It helps draw straight lines and measure distances accurately.
f.	<b>Compass</b>	Used for drawing precise circles and arcs.
g.	<b>Protractor</b>	It helps in measuring and drawing angles accurately.
h.	<b>Chalk</b>	Provides soft, blendable colour for shading and highlighting.
i.	<b>Drawing Board</b>	Provides a stable surface for drawing, often adjustable for different angles.
j.	<b>Colour Pencils</b>	Provide coloured lines and shading, allowing for detailed and precise colour work.

4.

a. Contour drawing



or



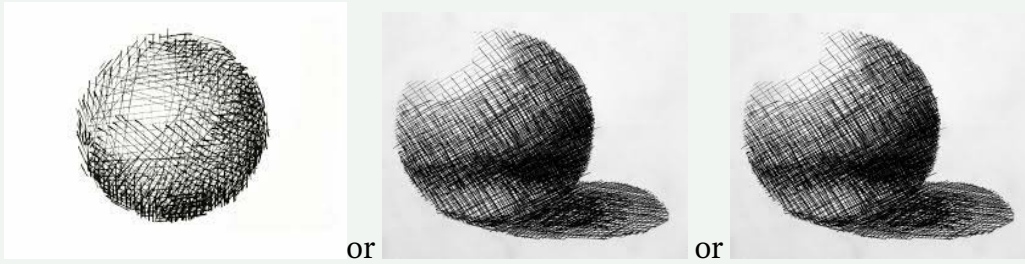
or



Drawing only the outline of the handball.

b. Cross-hatching





Drawing intersecting sets of parallel lines for deeper shading.

c. Blending



Creating smooth transitions between different shades.

5. Organic shapes and forms:

- **Natural and irregular:** These look like shapes from nature, uneven and unpredictable.
- **Soft and flowing:** Have smooth, curvy lines and edges, like waves or clouds.
- **Detailed and complex:** Often have lots of little details, like leaves or animal fur.

Inorganic shapes and forms:

- **Geometric and symmetrical:** Regular shapes like squares, circles, and triangles, often made by man.
- **Sharp and defined:** Have clear, straight edges and corners, like a ruler.
- **Simple and minimalistic:** They are clean and plain, with few decorations, like modern buildings.

6.

	CHARACTERISTICS	ORGANIC SHAPES	INORGANIC SHAPES
1	<b>DEFINITION</b>	Irregular, natural, free-flowing	Geometric, regular, man-made
2	<b>EXAMPLES 1</b>	Leaves	Squares
	<b>2</b>	Clouds	Circles
	<b>3</b>	Animals	Buildings
3	<b>ORIGIN</b>	Nature	Human-made

## 7.

a. **Materials and tools used**

- Pencils
- Pens
- Erasers (regular and kneaded)
- Drawing paper

b. **Elements used**

- **Organic:** leaves, fruits, flowers, etc.
- **Inorganic:** geometric shapes like cubes, spheres, and cylinders.

c. **Sample of free-hand sketches.**

A



B



C



D

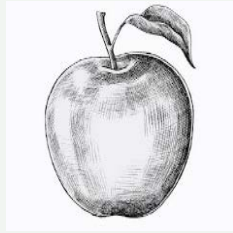


E



F

8. Using graphite pencils, eraser, blending stumps and tortillons, rule (tools) and light source, cross-hatching, contour drawing, and gridding techniques, Sahana can create a realistic and detailed still-life drawing. The vase appears solid and symmetrical, the apple looks round and juicy with highlights, and the cloth shows natural folds and textures. Her shading, blending, and line work bring the drawing to life, showcasing her freehand drawing skills.



An Apple



A Vase

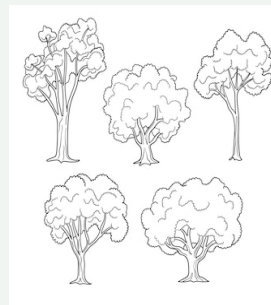


Folded Cloth

9. Zacharia skilfully will use freehand drawing tools and techniques to create both simple and complex depictions of objects. He will carefully combine observation, artistic skill, and symbolism to represent the concepts, metaphors, and stories related to the butterfly and the tree.



A Butterfly



Trees

10. Your friend, Basua, skilfully should use available drawing tools and techniques in freehand drawing to create an album that explores the symbolism and stories behind different shapes. He should also combine both manual and digital methods, showcasing his versatility and creativity as a designer.

## UNIT 3: PATTERN DESIGN

# CONCEPTUAL DRAWING

## Pattern Design

### INTRODUCTION

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Hello learners, This unit uses a practical approach that combines imagination with functionality, using freehand drawing techniques to create templates and patterns for communities. This unit analyse the sources and use of templates and patterns in the community while investigating the designing and creation processes of templates and patterns. This unit further elaborates on the use of appropriate materials, tools, and freehand drawing techniques to design and create 2-dimensional and 3-dimensional patterns as interventions for challenges in the community.

#### At the end of this section, you should be able to:

- Analyse the sources and use of templates and patterns in the community.
- Investigate the designing and creation processes of templates and patterns.
- Use appropriate materials, tools and freehand drawing techniques to design and create 2-dimensional templates and patterns as interventions for challenges in the community.

#### Key Ideas

- A template is a pre-designed tool or stencil used to create consistent shapes, symbols, or patterns on a drawing surface.
- Patterns are repetitive arrangements of shapes, symbols, or elements that create recognisable designs or patterns.
- Inspiration is gathering ideas from various sources such as nature, art, architecture, and cultural motifs.
- Conceptualisation is developing a concept or theme for the template based on the inspiration.
- Inking or finalisation using ink to trace over the lines in a template design to create a definitive outline or using confident strokes to create a bold and expressive design.
- Testing refers to applying a design template to various surfaces or projects to evaluate its visual impact and usability.
- Digitalisation is the use of a scanner, smartphone camera, or graphic design software such as Adobe Illustrator or Photoshop to refine a hand-drawn design to digitise the format.

- Documentation means writing down the design process, including inspiration, sketches, and refinements to keep track of the creative journey.
- Specification refers to indicating details such as dimensions, colours, and materials if the design will be applied to a specific project like stencilling or stamping for PATTERNS.
- Materials are the physical substances or media such as crayons, watercolours, pastels, wood, and paper that are used to create a work of art.
- Tools are the instruments or devices, such as pencils, brushes, sponges, rulers, etching needles, knives, and cutting mats, used to apply shape or manipulate materials to create a work of art.
- Freehand techniques including line drawing, doodling, stippling, and hatching are among the various methods used to create drawings without the aid of tools or devices to express one's creativity and bring their ideas to life. Such techniques require skill, practice, and patience to master.
- 2-dimensional templates are the pre-designed flat layouts or stencils used as a guide to create a specific design or shape on a drawing surface. They are used to create patterns, which are repetitive arrangements of shapes, symbols, or elements to create recognisable designs which are found in textile design, on ceremonial objects such as masks and drums, and on everyday objects like pottery, among others.
- 2-dimensional templates and patterns can be used as interventions for challenges in the community, such as healthcare to simplify complex medical information, making it easier for patients to understand; cultural preservation to document and preserve traditional cultural practices; social welfare in housing to design efficient and affordable housing layouts; and education to help students with math problems, reading comprehension, or writing skills.

## TEMPLATES AND PATTERNS

Templates and patterns are essential tools in community life, playing a key role in design, communication, and problem-solving. This lesson will help you understand the nature of templates and patterns, while offering insights into their sources and uses within the community. These sources include traditional crafts, cultural artefacts, and practices that preserve cultural identity, transmit heritage, and enable aesthetic expression alongside functional adaptation. Templates and patterns enhance efficiency, consistency, and creativity in various fields such as art, design, architecture, and communication.

### What is a Template?

A template in technical drawing is a pre-designed tool or stencil used to create consistent shapes, symbols, or patterns on a drawing surface. Made from durable materials like plastic or metal, templates have precise outlines or markings that ensure uniformity and efficiency in the draughting process (technical drawing or architectural design). They are commonly used in fields like engineering, architecture, and design to reproduce standard elements like circles, squares, arrows, and symbols, enhancing the clarity and precision of technical drawings.



## Types of Templates

Basic technical drawing involves simple shapes and fundamental templates, which serve as foundational tools for beginners. These templates provide guidance and structure, helping them develop draughting skills and an understanding of fundamental principles. Common types include:

### Technical Drawing Templates

1. **Basic shapes template:** This type of template includes outlines of simple geometric shapes such as circles, squares, triangles, rectangles, and ovals, which helps beginners practice drawing and understanding fundamental shapes accurately.

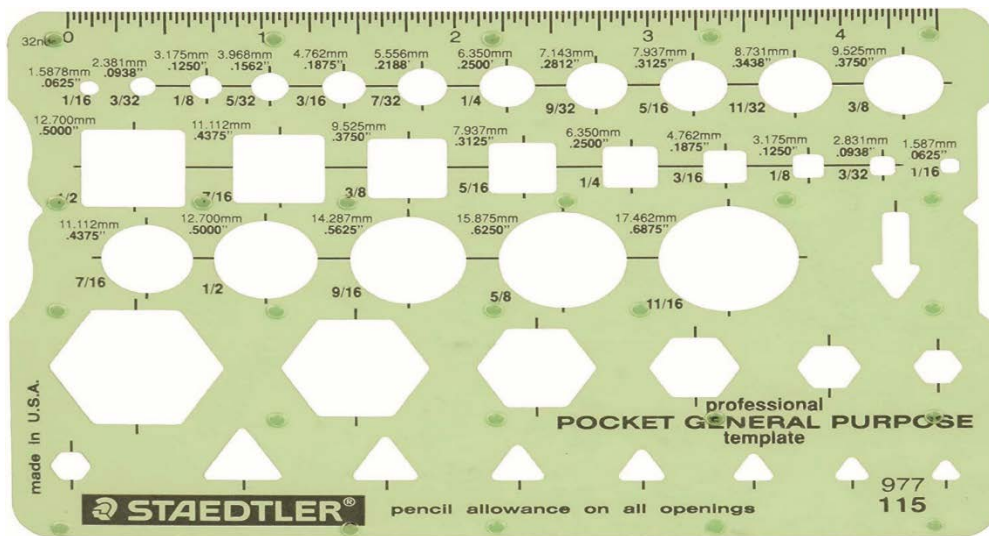


Fig. 1.3.1: Basic Shape Templates

2. **Line weight template:** A line weight template features lines of varying thicknesses that range from thin to thick, to assist learners in practicing line weight consistency and understanding how line thickness can convey depth and emphasis in technical drawings.

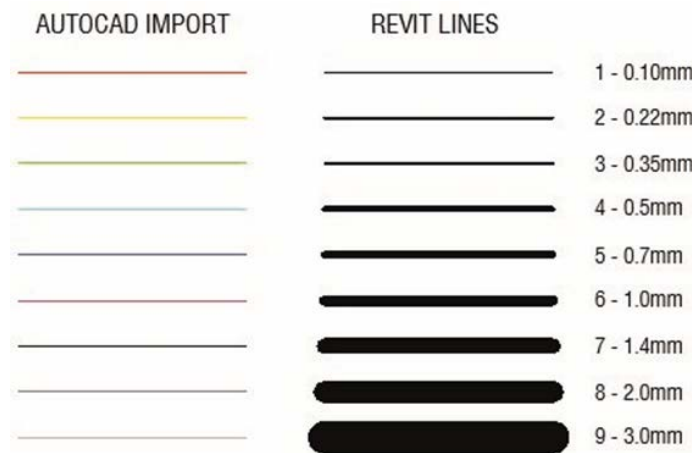


Fig. 1.3.2: Line weight Chart



Fig.1.3.3: Pen points for line weights

3. **Lettering template:** A lettering template contains standardised lettering styles and sizes for titles, labels, and annotations in technical drawings. It helps maintain uniformity and legibility of text throughout the drawing.



Fig. 1.3.4: Lettering template

4. **Scale template:** Scale templates provide standard scales, such as 1:10, 1:20, or 1:50, which are used to accurately represent measurements and dimensions in drawings. They help beginners understand and apply scale principles in technical drawing.

1/1	FULL SCALE	12" = 1'-0"
2/1	ENLARGE SCALE	24" = 1'-0"
1/2	REDUCED SCALE	1/2" = 1'-0"

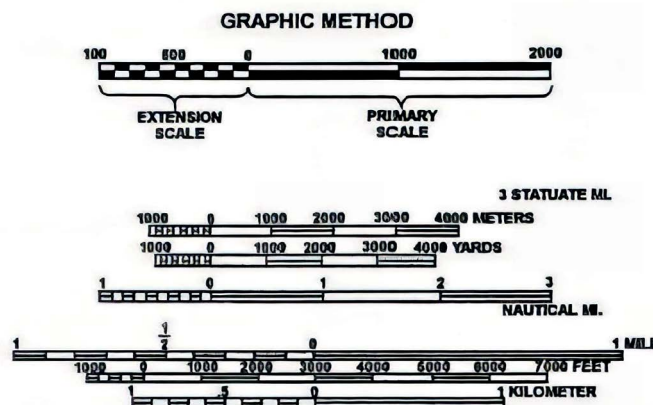


Fig. 1.3.5: Scale template

5. **Grid template:** Grid templates feature grids of evenly spaced horizontal and vertical lines. They aid in aligning and positioning elements within a drawing, improving overall neatness and organisation.

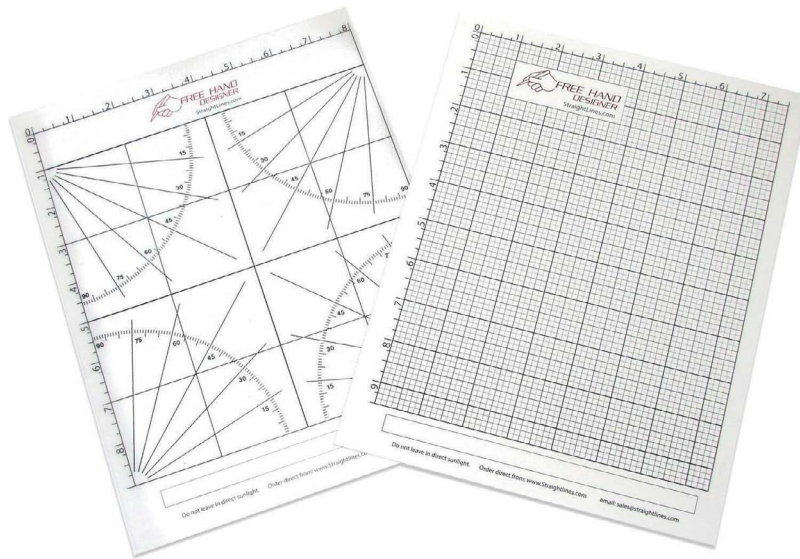


Fig. 1.3.6: Grid Templates

6. **Symbol template:** A symbol template contains commonly used symbols and icons relevant to basic technical drawings such as arrows, circles, squares, triangles, and organic elements like trees, humans, and foliage. It assists in practising symbol recognition and placement.

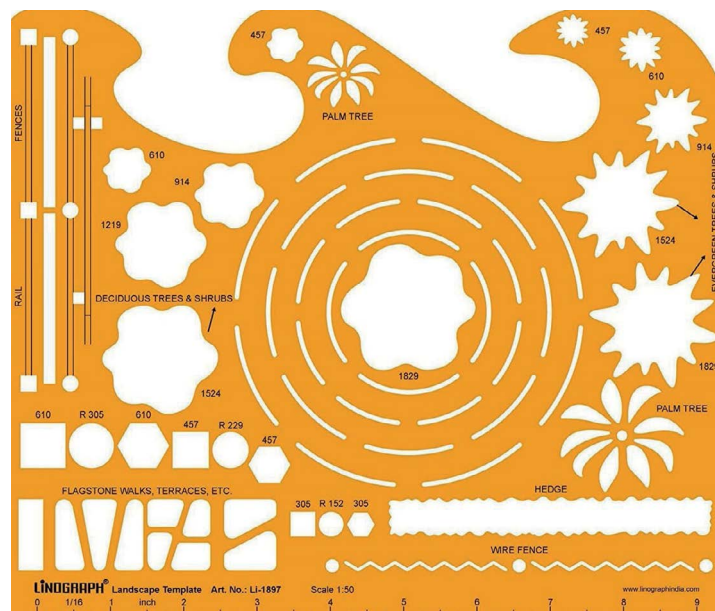


Fig. 1.3.7 Symbol Template

7. **Dimensioning template:** Dimensioning templates include pre-marked lines and arrows for indicating dimensions such as length, width, and height in technical drawings. They help beginners learn how to dimension accurately and consistently.



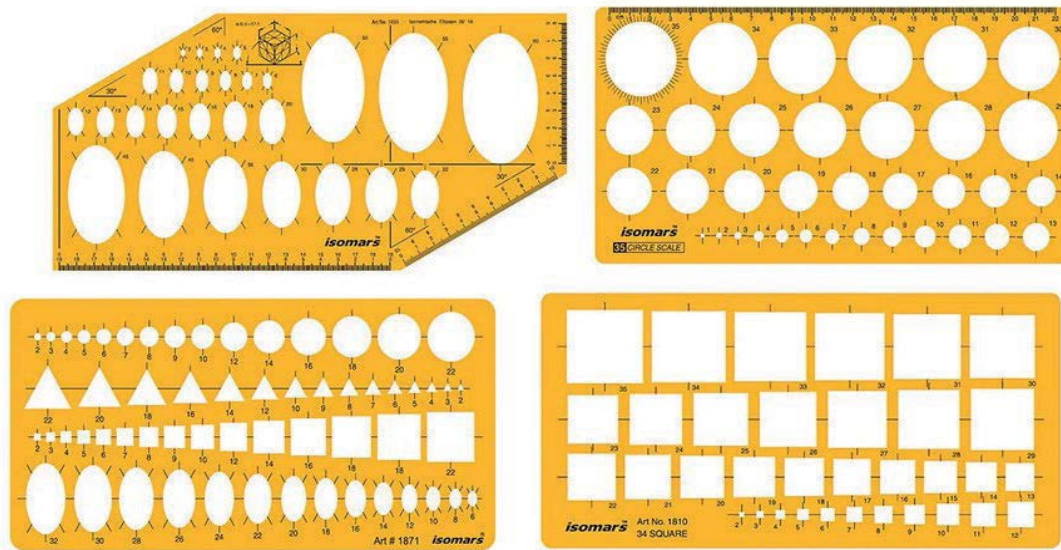


Fig. 1.3.8: Dimensioning Template

### Freehand Templates/ Fundamental Templates

Freehand drawing prioritises expression over technical accuracy, allowing for more fluid and open-to-interpretation templates. These designs offer designers inspiration for unique, expressive work that allows for a variety of styles and interpretations. Freehand design templates include:

1. **Abstract shapes template:** The abstract shapes template offers a range of abstract shapes and forms, promoting creativity and experimentation in design and composition.

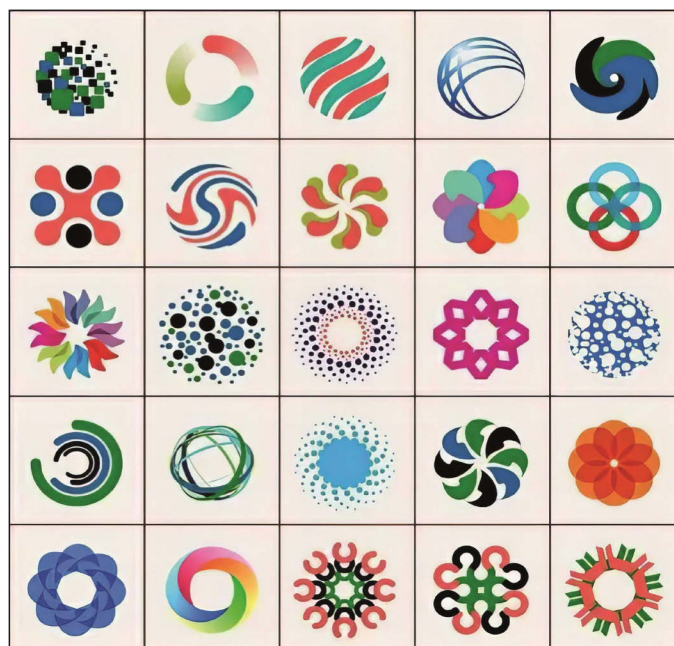


Fig. 1.3.9: Abstract shape template collections

2. **Nature-inspired template:** A nature-inspired template incorporates elements from the natural world such as leaves, flowers, shells, and branches, enabling artists to include organic motifs and textures in their designs.



Fig. 1.3.10: Nature-inspired template for continuous design

3. **Fantasy creatures' template:** This template is a creative tool that inspires artists to create fantastical worlds and characters, featuring outlines of mythical creatures like dragons, unicorns, mermaids, and fairies.

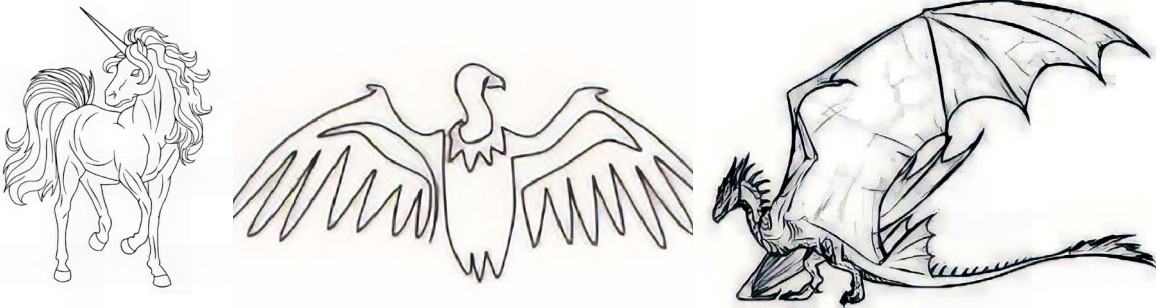


Fig. 1.3.11: Fantasy creatures' template

4. **Graffiti style template:** A graffiti-style template is a design that incorporates graffiti-inspired elements like bold lettering, urban symbols, and spray paint effects, allowing artists to explore street art aesthetics.



Fig. 1.3.12: Graffiti style template



- Tribal pattern template:** Tribal pattern templates, derived from traditional indigenous art, offer artists a framework for intricate, culturally rich designs, incorporating freehand geometric shapes, lines, and motifs.



Fig. 1.3.13: Ghanaian Template Pattern

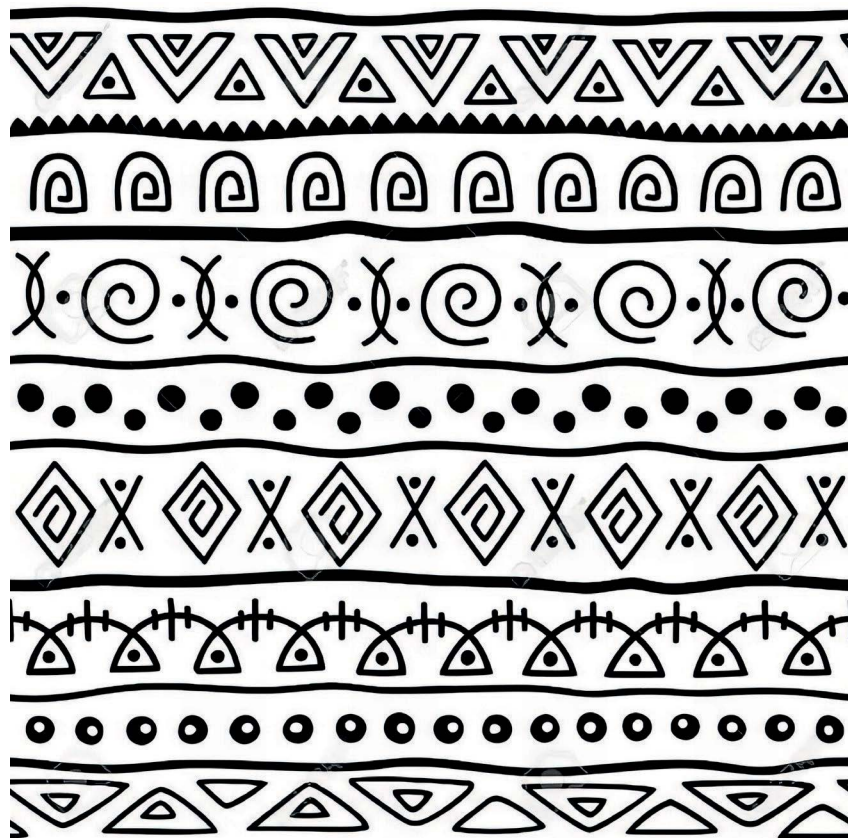


Fig. 1.3.14: Ethnic template pattern



Fig. 1.3.15: Adinkra template pattern in Ghana

- 6. Zentangle template:** Zentangle templates are intricate designs featuring repetitive patterns and shapes. They are used to create calming and meditative designs that focus on complex and visually appealing compositions.

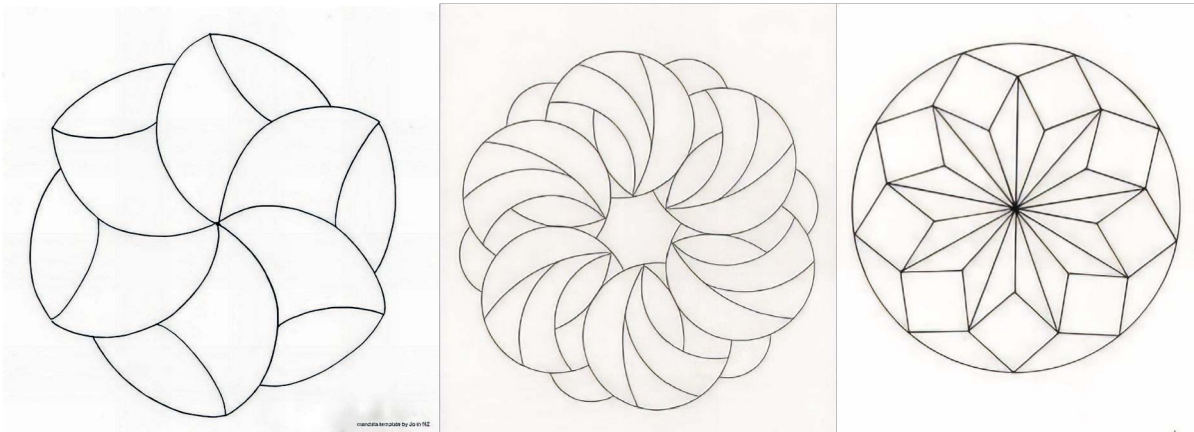


Fig. 1.3.16: Zentangle templates

- 7. Futuristic design template:** Futuristic design templates incorporate futuristic elements like robots, spaceships, and technological symbols, allowing artists to explore imaginative future visions and science fiction themes.

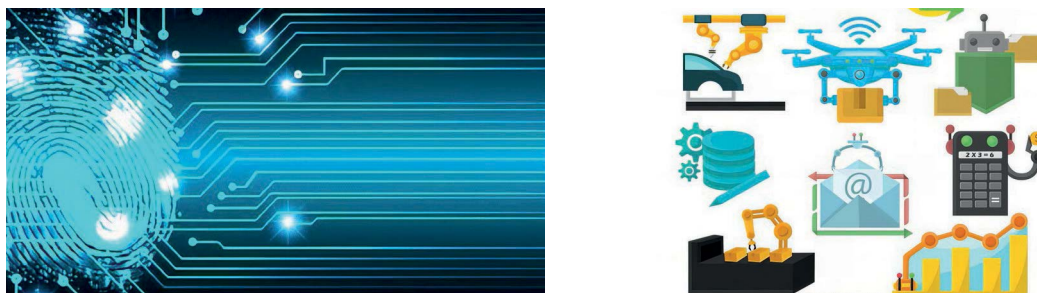
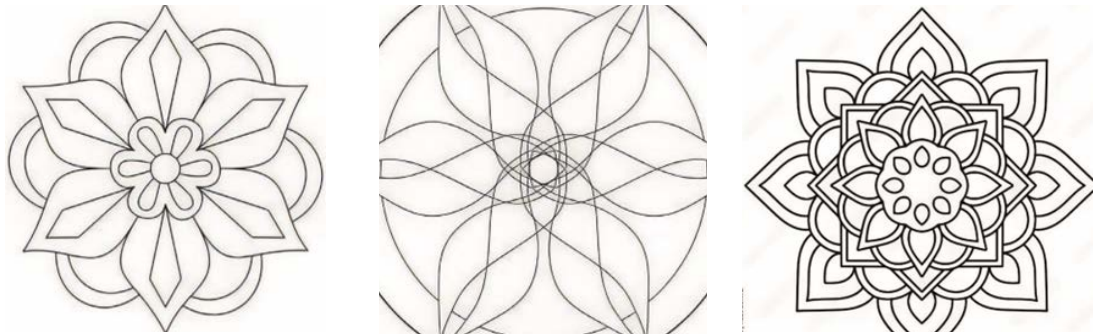


Fig. 1.3.17: Futuristic design templates



- 8. Mandala template:** Mandala templates are circular designs with intricate patterns, used for creating symmetrical and decorative artwork with spiritual or meditative significance.



**Fig. 1.3.18:** Mandala templates

## What is a Pattern?

Patterns in technical drawing are repetitive arrangements of shapes, symbols, or elements that create recognisable designs or patterns. They enhance aesthetic appeal, indicate materials or surface textures, and convey structured information. They are commonly used in fields like architecture, engineering, and graphic design to add visual interest, provide visual cues, or represent recurring features. Patterns can be geometric, organic, or symbolic and are crucial in conveying information and facilitating comprehension in technical drawings.



**Fig. 1.3.19:** Repeated templates in Adinkra cloth in Ghana

## Sources of Templates and Patterns

Templates and patterns are integral to African cultures, showcasing the continent's rich history, cultural diversity, and artistic creativity. They are derived from various sources, including ethnic groups, nature, historical legacy and trade and exchange with other countries. Each ethnic group has unique customs, rituals, and beliefs that are passed down through generations and reflected in their intricate designs in textiles,

pottery, and architecture. Nature also inspires African artists and artisans with patterns resembling rhythmic patterns of savannah grasslands, tribal animal markings, and geometric shapes. Historical legacies such as the pyramids of Egypt and rock-hewn churches of Ethiopia showcase the enduring legacy of African templates and patterns. Trade and exchange with the Arab world, Europe, and Asia have a fusion of styles and motifs in African art and design, resulting in a rich tapestry of cross-cultural patterns.

## Sources of Templates and Patterns in Ghana

Templates and patterns are integral to Ghanaian culture and artistic traditions, serving both practical and symbolic purposes. They are central to Ghanaian art, culture, and daily life, promoting artistic expression, cultural preservation, and communication. These symbols and motifs, from textile design to architectural ornamentation, showcase Ghana's rich cultural heritage and artistic ingenuity. The following are some sources and uses of templates and patterns in Ghana:

### Sources

Ghana's indigenous art, including Adinkra, Ewe Desi, Ga Samai symbols, Kente and Batakari weaving, as well as wood carvings, serves as a significant source of templates and patterns that reflect cultural practices and beliefs. The diverse ethnic groups and rich cultural heritage inspire creative patterns and templates, while the natural environment, including flora, fauna, and landscapes, provides further inspiration. These traditional crafts often carry symbolic meanings related to fertility, abundance, and spirituality.

### Uses

Templates and patterns are prevalent in Ghanaian textile design, particularly in traditional fabrics like Kente, Batakari, and Adinkra cloth, which are adorned with intricate geometric patterns and symbolic motifs.

These patterns are also used in architectural ornamentation and decorative arts such as the Sirigu architecture in the Kasina Nankana District.

Ceremonial objects such as masks, drums, and ceremonial garments often incorporate symbolic motifs to convey spiritual beliefs and cultural heritage.

Templates and patterns also serve as visual communication, conveying messages, stories, and cultural values through symbols and motifs. Adinkra symbols, for example, are used to convey proverbs and philosophical concepts in Ghanaian culture.

Everyday objects, such as pottery, utensils, jewellery, and clothing, also feature templates and patterns to enhance their aesthetic appeal and cultural significance.

### Activity 1.3.1

An NGO plans to set up several firms in your community to provide unemployed youth with valuable skills to help them secure meaningful employment. These firms will focus on various trades, including carpentry, tailoring, farming, and technology. To support this initiative, students in the community have been asked to create a series of templates and patterns that can be used as logos for each of these firms.

Your task is to investigate the local community to identify the sources of templates and patterns that can inspire the students' designs. These patterns should reflect the cultural, natural, and artistic heritage of the community while representing the trades the firms will focus on.

Imagine you are part of a team tasked with researching sources and uses of traditional templates and patterns in your local community. Your findings will assist the students in creating logos for the various firms the NGO plans to establish.

1. Write a report (250-350 words) on the sources of templates and patterns within your community, focusing on the following:
  - How do traditional symbols (e.g., Adinkra, Kente patterns, or local motifs) serve as templates for design in everyday life?
  - How do natural elements such as animals, plants, and landscapes inspire patterns and motifs in the community's crafts, arts, and designs?
  - What role do local craftspeople and artisans play in the creation of templates and patterns, and how can their work be incorporated into the logo designs for the firms?
  - How do the patterns and templates used in traditional crafts (such as pottery, textiles, etc.) carry symbolic meanings that reflect the identity and values of the community?
2. In your report, include examples of patterns and their symbolic meanings, as well as suggestions on how they can be adapted for use in the students' logo designs. Be creative in suggesting how different trades could be represented through specific symbols or patterns.
3. Complete the report by making recommendations for how students can combine traditional and modern design techniques to create impactful logos that capture the essence of the firms.

### Activity 1.3.2

A new textile manufacturing company is set to open in your district, and students have been invited to participate in a design competition. The challenge is to create unique textile print designs that reflect cultural, natural, and modern influences.



As one of the students in this competition, your task is to present an album featuring three distinct templates and patterns that could be used for the new textile prints. Your designs should draw from a variety of sources to showcase originality, creativity, and a connection to both traditional and contemporary themes.

Your task is to create an album containing three unique designs, each with its own template and pattern. To do this, you will need to research available sources of inspiration in your community and beyond.

### **Step 1: Gather Inspiration**

- Look at traditional cloth patterns (e.g., Kente, Adinkra), architecture, local artwork, books, magazines, and online resources for ideas.
- Visit local artisans and observe their designs, paying attention to the symbols and patterns they use.

### **Step 2: Create Your Patterns**

- Using the inspiration you gathered, design three (3) different patterns, each with its own theme (e.g., culture, nature, etc.).
- Make sure each design is clear and can be used in textile printing.

### **Step 3: Write a Report**

- Write a short report (about 300 words) explaining where you got your ideas from and how you developed each pattern.
- Mention any symbols or stories behind your designs and explain how the textile company could use them.

### **Step 4: Share your findings**

- Present your report/findings to your class for review.

## **Activity 1.3.3**

You and a friend have decided to start a small-scale enterprise after school. While your friend is passionate about fitness and entertainment, your focus is on personal grooming and catering. To create a strong identity for your business, you need to develop a unique template that reflects the range of services you offer.

### **Step 1: Create Your Template**

- Think about symbols and patterns that represent both fitness, entertainment, and personal grooming, as well as catering.
- Design a template that creatively combines these elements.

### **Step 2: Design the Fabric**

- Use your template to design a fabric print for your team's Friday wear.
- Choose colours that reflect the energy of fitness and entertainment, as well as the elegance of grooming and catering.

**Step 3: Write an Explanation**

- Write a short explanation (150-200 words) about why you chose your template and colours.
- Describe how your design represents your business and what you want it to convey to customers.

Submit your design and explanation to your classmates and teacher to showcase your new business identity.

**Activity 1.3.4**

**Project work:** Learn about templates and patterns from different sources and how they are used in Ghana, Africa, and worldwide. Prepare a summary to share with your classmates.

**Step 1: Do Your Research**

- Look up information about templates and patterns in books, journals, magazines, and online.
- Focus on their use in Ghanaian culture, across Africa, and globally.

**Step 2: Write Your Report**

- Write a brief report (150-200 words) of your findings.
- Include key details about how templates and patterns are used in different cultures and examples from various regions.

**Step 3: Share Your Findings**

- Present your summary to your classmates, highlighting interesting facts and examples.

**Extended Reading**

- Jump to key moments of underwood, J.L. and Okeke-Agulu, C. (2021). African Artists: from 1882 to Now, Phaidon Press
- <https://refactoring.guru/design-patterns>
- Go to google and search for “Textile Designs”

**DESIGN AND CREATION PROCESSES OF TEMPLATES AND PATTERNS**

Designing and creating freehand-drawn templates and patterns involves several crucial steps in realising an artist’s or designer’s vision. Templates and patterns are essential in our daily activities and can enhance the beauty of designs. This can be achieved through various techniques, using basic hand tools and materials for creating these templates and patterns.

## Creating Freehand-Drawn Templates and Patterns Involves the Following Steps

These steps will guide you to acquire the skills of creating templates and patterns.

### 1. Inspiration and conceptualisation

- Begin by gathering inspiration from various sources, such as nature, art, architecture, and cultural motifs.
- Develop a concept or theme for the template based on the inspiration gathered.

### 2. Sketching and exploration

- Use pencil and paper to sketch out rough ideas and concepts for the template.
- Experiment with different shapes, lines, and motifs, exploring different compositions and arrangements.

### 3. Refinement and detailing

- Refine the initial sketches, paying attention to details such as line weight, symmetry, and proportion.
- Add intricate details and embellishments to enhance the appearance of the design.

### 4. Inking or finalisation

- Once satisfied with the pencil sketches, trace over the lines with ink to create a clean and definitive outline.
- Alternatively, finalise the design directly with ink, using confident strokes to create a bold and expressive design.

### 5. Erasing and cleaning up

- Erase any remaining pencil marks and smudges to ensure a clean and polished final drawing.
- Use an eraser shield or precision eraser to selectively remove unwanted lines and imperfections.

### 6. Testing and adjustments

- Test the design by applying it to various surfaces or projects to evaluate its visual impact and usability. The design can also be repeated to develop a **pattern** to see the impact.
- Make any necessary adjustments or refinements based on feedback and observations.

### 7. Digitalisation (optional)

- If desired, scan the hand-drawn design into a digital format using a scanner or smartphone camera.
- Use graphic design software such as Adobe Illustrator or Photoshop to further refine, edit, or digitise the design.

## 8. Documentation and specification

- Document the design process, including inspiration, sketches, and refinements, to keep track of the creative journey.
- Specify details such as dimensions, colours, and materials if the design will be applied to a specific project, like stencilling or stamping for PATTERNS.

## 9. Application and use

- Apply the finalised template to its intended use, whether it is for illustration, decoration, or functional purposes, into a pattern.
- Share the design with others or incorporate it into projects like wood, crafts, textiles, or graphic design.

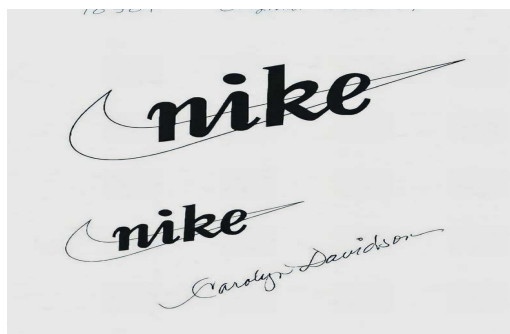
## Popular Brands Created with Freehand Drawn Templates and Patterns

The use of freehand-drawn templates and patterns in the design process has proven to be a popular and creative approach, transforming hand-drawn concepts into iconic symbols and successful products in the global marketplace. This list includes popular brands, products, and objects. These brands include:

1. **Nike's** famous “Swoosh” logo was hand-drawn by Carolyn Davidson in 1971. This simple yet powerful logo has become a symbol of the brand's athletic products.



**Fig.1.3.21:** Nike's advertisement illustrating the action of writing



**Fig. 1.3.22:** Nike's 1973 logo

2. **Apple's** early products, such as the Macintosh computer and iPod, began with freehand sketches by Steve Jobs and the design team. These sketches shaped Apple's sleek global brand and style.

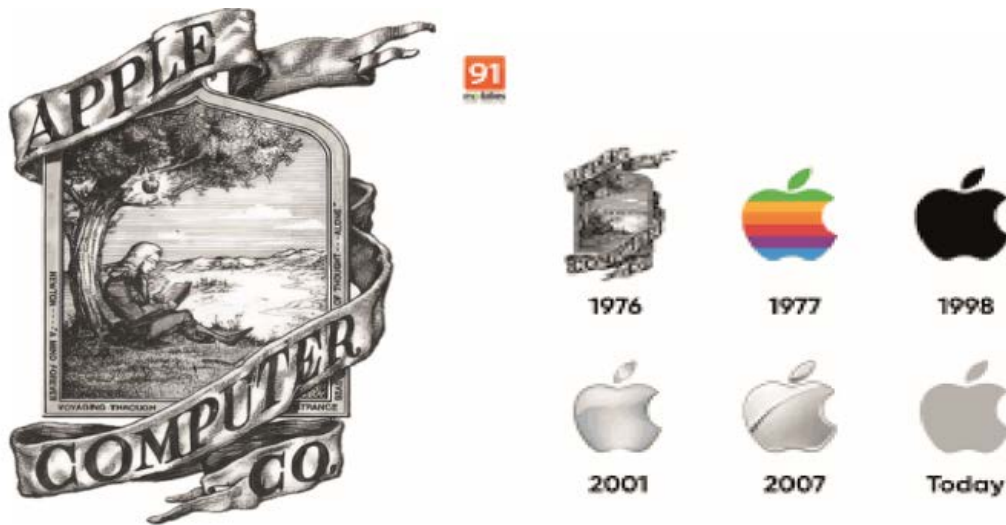


Fig. 1.3.23: Evolution of the Apple Logo

3. The **Coca-Cola** logo, created in 1885 by designer Frank Mason Robinson, features a hand-lettered script font. This timeless design remains unchanged and is known worldwide.



Fig. 1.3.24: Coca Cola logo design ca.1885

4. The **famous Adinkra cloth** is made from freehand-drawn templates that are later developed and carved into stamps and used to create patterns of Adinkra symbol rows and columns in the cloth.



Fig. 1.3.25 Samples of Adinkra cloth





Fig. 1.3.26 a Adinkra symbol, template, stamp and pattern process



Aya

Funtumfunafu denkyemfunafu



Akofena

Adinkrahene

Fig. 1.1.26 b Various Adinkra symbols designed on calabash stamps



Fig. 1.3.27: Adinkra Symbol and patterns on building

## The Process for Creating Adinkra Template and Pattern

1. Adinkra symbols are carved onto pieces of calabash (hard fruit of the calabash tree) to make a stamp and attached to a handle.
2. The cloth or fabric is laid on solid surfaces.
3. First, the fabric is divided into sections using a hard comb carved from local hardwood with two to eight prongs.
4. The calabash stamps are then used to apply the adinkra symbols to the sections between the comb marks.
5. Arrange the strips to be hand- or machine-sewn to make adinkra cloth.
6. The strips of stamped fabric are then sewn together to form fabric of various sizes depending on the intended use.

### Activity 1.3.5 – Case Study

#### Scenario

Imagine a renowned Ghanaian fashion designer has recently introduced a new line of textiles featuring distinctive patterns. As part of a research project, you are required to investigate the process behind the creation of these textiles. Your objective is to understand and document how the designer used various tools, materials, and techniques to develop these unique patterns.

In groups of five, perform the following tasks to complete the activity.

#### Tasks:

1. **Research:** Begin by gathering information about the designer's creative process. Use available resources such as the designer's website, interviews, fashion magazines, and online articles. Look for details on how the designer conceptualised and produced the patterns, including the tools and materials used.
2. **Analyse the Process:** In your small group, review the collected information. Focus on understanding each stage of the design process, from initial sketches to final production. Take note of the techniques and materials highlighted in your research.
3. **Create a Report:** Prepare a detailed report on the designer's process. Your report should include:
  - a. **Steps in the Design Process:** Outline each stage of the pattern creation process, from initial inspiration to final design.
  - b. **Tools and Materials:** List and describe the tools and materials used, including any specific software or hardware.
  - c. **Illustrations:** Include images or freehand drawings of the tools and materials mentioned. Ensure these visuals help to clarify your report.

- 4. Submit Your Report:** Present your report and visual illustrations to the class. Highlight how understanding the design process enhances the appreciation of the final textile products. Discuss any unique techniques or materials that contributed to the distinctive features of the designer's patterns.

### Activity 1.3.6

In your groups, prepare pattern blocks and templates. Use the materials and the instructions below:

#### Materials:

- Pattern blocks (square, triangle, rectangle, etc.)
- Templates (geometric shapes, animals, etc.)
- Paper
- Pencils

#### Instructions:

- Choose a template and place it on the paper.
- Select a pattern block and place it on the template to start a pattern.
- Continue the pattern by adding more blocks, following the same shape and colour sequence.
- When complete, draw the pattern on the paper using pencils.
- Repeat with different templates and patterns.

#### Examples:

**Template:** Square

- **Pattern:** Red square, blue square, red square, blue square...

**Template:** Triangle

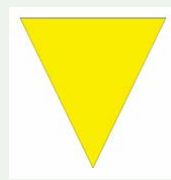
- **Pattern:** Yellow triangle, green triangle, yellow triangle, green triangle...



Red square



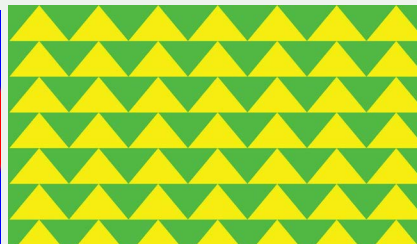
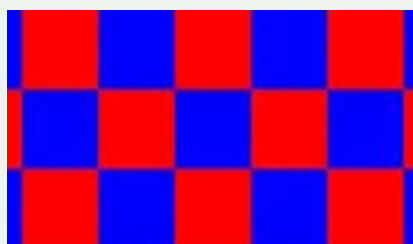
blue square



Yellow triangle



green triangle



Continue with the instructions below:

**Extension:**

- Create a new template and design a pattern to go with it.
- Use different colours and shapes to create a unique pattern.
- Challenge a friend to continue your pattern.

### Activity 1.3.7

**Scenario:** In your community, traditional artisans are known for their weaving and beadwork. For your school project, you need to find out how these artisans use tools and techniques to create their designs.

**Tasks:**

**Research:** Look up information about local traditional crafting. You can visit workshops, talk to artisans, or find articles about their methods.

1. **Examine the Process:** Work in your group to review how artisans use different tools and techniques. Understand each step from starting a design to finishing the product.
2. **Create a Report:** Prepare a report that includes:
  - a. **Crafting Steps:** Describe how the artisans make their designs.
  - b. **Tools and Techniques:** List the tools (e.g., looms, beads, etc.) and techniques (e.g., weaving, bead arrangement, etc.) used.
  - c. **Visuals:** Add images or drawings of the tools and techniques.
3. **Present:** Share your report with the class. Explain how the tools and techniques help create unique patterns and designs, highlighting any special practices.

### Activity 1.3.8

In your groups, explore how to use various tools, materials, and techniques to design the following templates and patterns. Your task is to describe the process you will follow for each design.

S/No	Symbol (Template or Pattern)	Process
1		
2		
3		
4		

**Tips:**

- 1. Select Your Tools and Materials:** Choose the appropriate tools (such as pencils, markers, or digital software) and materials (like paper, fabric, or digital canvases) you will need for your designs.
- 2. Plan Your Techniques:** Decide on the techniques you will use to create your templates and patterns. Consider methods like drawing, shading, layering, or digital manipulation.
- 3. Describe Your Process:** For each template and pattern you design, explain:
  - **How you will use the chosen tools:** Describe the role of each tool in your design process.
  - **How you will use the materials:** Explain how different materials will contribute to the final look of your template or pattern.



- **The techniques you will apply:** Detail the specific techniques you will use and why they are suitable for your designs.
- 4. Document Your Approach:** Create a visual and written record of your process. Include sketches, diagrams, or digital mock-ups, and provide a clear explanation of your choices.

## DESIGNING AND CREATING 2-DIMENSIONAL TEMPLATES AND PATTERNS AS INTERVENTION

Designing and creating 2-dimensional templates and patterns plays a crucial role in various fields, from art and design to problem-solving and communication. These templates and patterns provide a structured approach to visualising and implementing ideas, allowing for consistency, efficiency, and creativity in design processes. By understanding and mastering the techniques for creating effective 2D templates and patterns, individuals can address specific challenges, streamline production, and enhance aesthetic appeal. This intervention focuses on exploring the methodologies and applications of 2-dimensional design, offering practical insights into how these tools can be used to achieve desired outcomes in various contexts.

You will agree that communities around the world face various challenges daily. Many interventions, including the use of visual tools, can be implemented to help address these issues. As designers, you have the opportunity to identify community challenges and needs and then utilise appropriate materials and tools. By employing freehand drawing techniques, you can either replicate existing 2-dimensional templates and patterns or create your own to serve as interventions for these community challenges. This approach allows you to contribute meaningful solutions through innovative and practical design.

### Activity 1.3.9

Your school is organising a small durbar to raise funds for building a local museum. As the project leader in your group, your task is to create a display of at least four existing template and pattern designs to showcase at the event. Follow these steps to complete your task:

- 1. Select Your Designs:** Choose four existing templates and patterns that are visually appealing and relevant. These could be sourced from books, magazines, or online resources.
- 2. Gather Materials:** Collect the necessary tools and materials for your task, such as pencils, markers, drawing paper, and any digital tools if applicable.
- 3. Create Your Templates:** Using the selected tools and materials, carefully recreate each template and pattern. Pay close attention to the details and techniques used in the original designs.

4. **Write Brief Explanations:** For each template and pattern, write a brief description explaining its meaning and significance. Include any cultural, historical, or symbolic aspects related to the design.
5. **Prepare Your Display:** Arrange your completed templates and patterns neatly on display boards or digital slides, with the accompanying explanations clearly visible.
6. **Present Your Work:** Ensure your display is ready for the durbar and be prepared to explain the significance of each template and pattern to attendees.

## Extended Reading

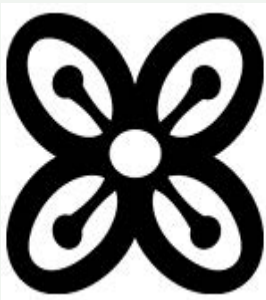

- Armstrong, J. H. (2013). *Patternmaking for Fashion Design: Pearson New International Edition*. Pearson Education.
- Surf the internet for a video (on the internet) on designing adinkra symbols to help design adinkra symbols on your own.
- Irish, L. (2007). *Great Book of Celtic Patterns: The Ultimate Design Sourcebook for Artists and Crafters*. Fox Chapel Publishing.
- James, D. (2003). *Draw Your Own Celtic Designs*. David & Charles.

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- Paricio, J. (2015). *Perspective Sketching: Freehand and Digital Drawing Techniques for Artists & Designers*. Rockport Publishers.
- Parks, C. S., & Parks, R. (2009). *The Big Book of Realistic Drawing Secrets: Easy Techniques for Drawing People, Animals, Flowers, and Nature*. North Light Books.
- Velasquez, D. (2016). *Drawing in Black & White: Creative Exercises, Art Techniques, and Explorations in Positive and Negative Design*. Quarry Books.
- Willenbrink, M. (2013). *Drawing Nature for the Absolute Beginner*. Cincinnati, Ohio: North Light Books.

# Review Questions, Unit 3

1. Name five (5) sources in the community where one can find inspirations for templates and patterns.
2. a. What is a popular source of templates and patterns in Ghana that designers get inspiration from?  
b. Give three examples of such textile designs.  
c. Name three uses of templates and patterns.
3. Give three differences between templates and patterns. Support your answer with a freehand drawing of a template and the pattern created from it.
4. Templates and patterns are created for so many reasons. Identify three such reasons for creating existing templates and patterns in a particular community.
5. The table below shows adinkra symbols; name them and show the material(s) and tool(s) used in making them.

S/N	Adinkra symbol Name of Adinkra symbol	Tool(s)	Material(s) used	Technique
1	<b>Gye Nyame</b>			
2	<b>Sankofa</b>			
3	 <p><b>BESE SAKA (Sack of cola nuts)</b></p>			
4	 <p><b>Akofena</b></p>			

- 6.** Identify two (2) challenges each under the following areas in the community that can be addressed using templates and patterns:
  - a. Environmental Conservation
  - b. Accessibility
  - c. Education
- 7.** Create a 2-dimensional pattern to address a challenge in the community with the appropriate materials, tools, and techniques under any one of the answers given in Question 6 above.

# Answers to Review Questions, Unit 3

1. Traditional textiles, crafts, artworks, nature, ethnic groups, markets, etc.
2. a. From traditional textile designs  
b. Kente, Batakari, Adinkra cloths, Batik, tie and dye, etc.  
c. Ghanaian textile designs, architecture designs, ceremonial objects, everyday objects—pottery, jewellery, sculpture, basketry, etc.
- 3.

Templates	Patterns
For efficiency and consistency.	For creating visual language and style.
Pre-designed document.	Repeating design elements.
Can be heavily customised.	Often used as they are.
Used for specific design.	Used to create an entire visual identity.
Used as a starting point for patterns.	A combination of templates.
Can be used for print and digital designs only.	Can be used to create both physical and digital designs.

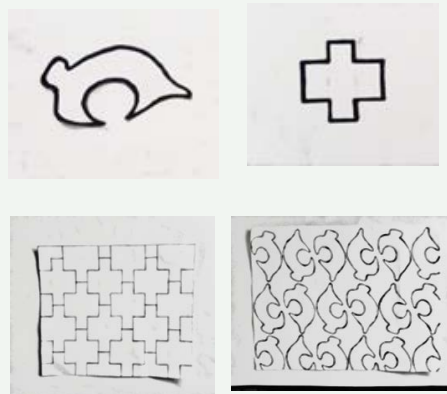

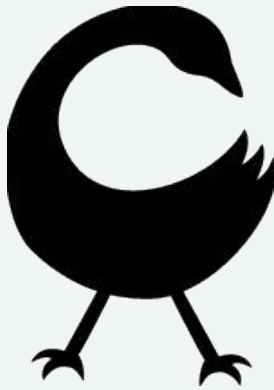
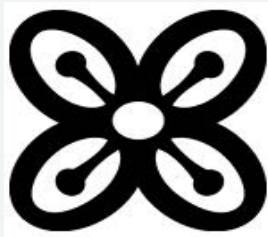



Fig. 1.3.20: Templates and related patterns

4.
  - i. To preserve historical designs for the community.
  - ii. To reflect the community's values, traditions, and beliefs.
  - iii. To share common design elements.
  - iv. To strengthen community ties.
  - v. To express creativity and skills in the community, etc.



5.

S/N	Name of Adinkra and symbol	Tool(s)	Material(s) used to create	Technique
1	 <p>Gye Nyame</p>	Knife, gorges file, mallet and chisel	<p><b>calabash shell:</b> a type of gourd or hard-shelled fruit.</p> <p>Wood, cotton, ink and hessian.</p>	<p>Stamping, Printing.</p> <p>Spraying, etc.</p>
2	 <p>Sankofa</p>	Knife, gorges, mallet, and chisel	<p>Calabash</p> <p>Wood, ink, Paint.</p>	<p>Stamping, Printing.</p> <p>Spraying, etc.</p>
3	 <p>BESE SAKA (sack of cola nuts)</p>	Knife, gorges, mallet, and chisel	<p>Calabash, wood, ink, paint</p>	<p>Stamping, Printing.</p> <p>Spraying, etc.</p>
4	 <p>Akofena</p>	Knife, gorges, mallet, and chisel	<p>Calabash, wood, ink, and paint</p>	<p>Stamping, Printing.</p> <p>Spraying, etc.</p>

## 6. a) Environmental Conservation

- i. Recycling: Templates can educate people on proper recycling practices.
- ii. Reforestation: Patterns can be used to educate people on the need to plant more trees.

## b) Accessibility

- i. Language barriers: Patterns can help translate important information into multiple languages.
- ii. Visual impairments: Templates can be used to create tactile graphics or braille materials.

## c) Education

- i. Learning difficulties: Templates can help students with reading, maths, or spelling problems.
- ii. Learner engagement: Patterns can be used to create interactive and fun learning materials.

## 7. Sample Multiplication Table Template

X	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

**NB:** Students can create their own grid using the appropriate tools and materials. This can be used to help learners having problems with multiplication in maths.

## UNIT 4: DESIGN AND REALISATION

# CONCEPTUAL DRAWING

## Design and Realisation

### INTRODUCTION

---

In this unit, you will learn about the design thinking process. This will help you identify and solve problems in your environment, such as in your school environment (dining hall, dormitory, and washrooms) or home (kitchen, bedroom and hall). Every day, we use products and services created through the design thinking process. This involves a systematic and interactive approach through several key steps that designers use across various fields to create effective and efficient solutions.

#### At the end of this section, you should be able to:

- Describe the processes in designing
- Problem identification and brief writing
- Generate solutions to solve identified problems

#### Key Ideas

- The design process involves the steps and stages you will follow to create a design from conception to a final product.
- Empathies, that is, understanding the user's needs and experiences by observing and engaging with them.
- Define means, clearly identifying and articulate the problem
- Ideate/Research means generating a wide range of ideas and gathering information to explore possible solutions.
- Prototype implies creating simple models or versions of your ideas to see how they might work in real life.
- Test/Evaluation refers to trying out your prototypes with users, gathering feedback, and refining your solutions until they effectively meet users' needs.
- Identification refers to the process of recognizing or establishing the identity of something or someone.
- Problem implies a matter or situation that is difficult to deal with or understand and needs to be resolved.
- Situation is the set of circumstances or context at a particular time and place.
- Brief refers to a concise statement or summary of the main points.

- Innovative is introducing or using new ideas, methods, or inventions, creative and original in thinking.
- This involves clearly defining the problem where you will identify the problem and make a statement on how to find a solution.
- Brainstorming is a wide range of potential solutions to gather enough information to enhance the problem-solving process
- Evaluating and selecting the most feasible options is when you will put on a scale the suitable and best solution you have derived.
- Implementing these solutions effectively refers to using the found and satisfactory solution by the user.

## DESIGN THINKING PROCESS

The design thinking process, also known as the engineering method, is a common series of steps that engineers use in creating functional products and processes.

Let's take a closer look at these steps and how you can put the design process into practice for your own projects.

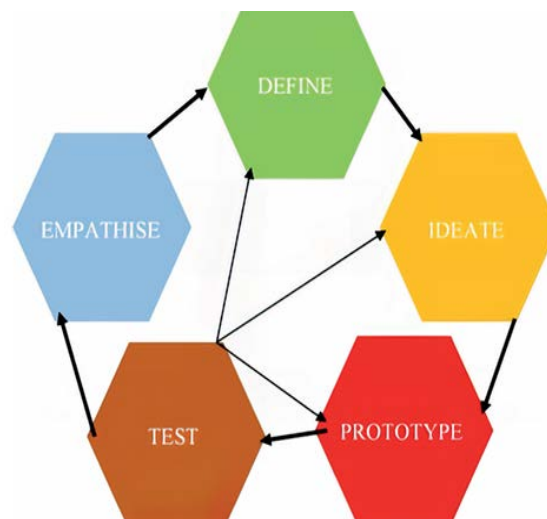


Fig. 1.4.1: Flowchart of Design Thinking Process

Interpretation of the chart (Fig 1.4.1) above.

### Empathise (Research your Users' Needs and Problems)

The first stage of the design thinking process is all about getting to know your users deeply. To do this, you need to observe and interact with them to truly understand their experiences and challenges. By putting yourself in their shoes, you will gain a personal and meaningful perspective on the issues they face.

Empathy is key to solving problems and creating human-centered designs. It helps you move beyond your assumptions and see the world through your users' eyes. This deeper understanding is essential for developing solutions that genuinely meet their needs.

The main goal of the Empathise stage is to thoroughly understand your users, their needs, and the problems they face. This insight will guide the development of your product or service, ensuring it is truly user-centered.

## **Define (State your Users' Needs and Problems Clearly and Concisely)**

In the Define stage, you will organise the information gathered during the Empathise stage. You will analyse your observations to define the core problems identified up to this point. Defining the problem and creating a problem statement must be done in a human-centred manner.

The Define stage will help the design team collect great ideas to establish features, functions and other elements to solve the problem at hand.

## **Ideate/Research (Generate and Explore Possible Solutions)**

At this stage you have a better understanding of your users and their needs (Empathise stage), and you have analysed your observations (Define stage) to create a user-centric problem statement. With this solid background, you and your team members can start to look at the problem from different perspectives and ideate innovative solutions to your problem statement. Brainstorm and Worst Possible Idea are examples of ideate techniques the design team can use.

## **Prototype (Create and Test Low-Fidelity Versions of your Solutions)**

This is an experimental phase aimed at finding the best solutions for the problems identified in the first three stages. During this phase, you create prototypes to test these solutions. Each prototype is evaluated based on user feedback and experiences, and then accepted, improved, or rejected accordingly.

The design team will create several inexpensive, scaled-down versions of the product to test the key solutions generated in the ideation phase. These prototypes can be shared and tested within the team, other departments, or a small group of external users.

By the end of the Prototype stage, the design team will have a better understanding of the product's limitations and challenges. They will also gain insights into how real users interact with the product, which will inform further development and refinement.

## **Test (Evaluate and Refine your Solutions Based on Feedback)**

During this stage, Designers test the complete product using the best solutions identified in the Prototype stage.

This is the final stage. Based on how the users feel about the product can lead you to loop back to a previous stage in the design process. You can then proceed with further iterations and make alterations and refinements to rule out alternative solutions. The ultimate goal is to get a deeper understanding of the product and its users.



### Activity 1.4.1

In your groups, explore what the design thinking process involves and why it is so important for innovation and problem-solving.

Consider this:

Many students feel overwhelmed by the amount of homework they receive, which can lead to stress and burnout. This stress affects their mental health, academic performance, and overall well-being.

As a designer, use the following activity steps to come up with creative solutions to help reduce stress and make school a more enjoyable place for everyone.

#### Step 1

- Who are the users?
- What are their needs and challenges?
- How do they feel about the current situation?

#### Step 2

- What is the core problem?
- How can you frame this problem in a human-centered way?
- What are the key insights from the empathy stage?

#### Step 3

- What are all the possible solutions?
- How can you think outside the box?
- Which ideas are the most promising?

#### Step 4

- How can you bring your ideas to life quickly and affordably?
- What does a basic version of the solution look like?
- How can you test your ideas with real users?

#### Step 5

- What do users think about your prototype?
- What works well, and what needs improvement?
- How can you make your solution better?

Present your solution to the class for further discussion.

## Activity 1.4.2

"In groups, describe the processes involved in design. Discuss how to apply the principles and stages of design thinking (Empathize, Define, Ideate, Prototype, and Test) to a given project."

## EXTENDED READING

- Brown. (2017), Change by Design, Skillsoft Publishers. Pages 4-8.

## DESIGN BRIEF

In this area of study, you will learn more about problem identification and design brief writing which are the foundational pillars of the design and making process. They set the stage for the entire design journey, guiding the creation of innovative solutions that address real-world problems. You will also learn how to identify a need (situation) within your environment such as the home, the school, church or marketplace. In this section, we will delve into the art of problem identification and design brief writing, equipping you with the skills to tackle complex design challenges and create solutions that truly make a difference.

### Problem Identification (Situation)

Before a design brief can be written a problem needs to be identified (situation) within the learner's environment such as the home, the school, church or marketplace. It provides essential context and sets the stage for the design work ahead. The entire designing process hinges on problem identification by effectively identifying the problem half of the solution is achieved.

The format for writing a problem statement uses your answers to the questions and the following structure: **who** needs **what** because **why**. \_\_\_\_\_ needs \_\_\_\_\_ because \_\_\_\_\_

### Design Brief

A design brief is a document that outlines the objectives, scope and requirements of a design project. It provides a clear understanding of what is expected and what needs to be delivered to ensure the end product meets the client's expectations and delivers the desired outcomes.

The design brief should provide a clear and concise description of a design project. It should cover the **who**, **what** and **why** behind the project. For example: 'a new entrance for a school needs to be designed, and why it should be designed'

A design brief typically includes:

1. Clearly defining the problem you're aiming to solve.
2. Identify and describe your target audience.
3. Determining the scope of the project.
4. Establishing the project budget and timeline.
5. Setting the project goals and objectives.
6. Outline the client's brand identity.
7. Providing sample designs.

## Examples of how to Write a Design Brief Statement:

- a. Design and make .....
- b. Design and construct .....
- c. Design and manufacture .....
- d. Design and fabricate .....
- e. Design and realise.....

### Activity 1.4.3

#### Work in groups

Go out of your classroom and walk around your school environment. You will identify needs, wants and lacks in the school environment which can lead to future problems when not solved.

- a. Identify problem situations within your school environment.
- b. How can it be solved?
- c. Discuss your ideas in your group.
- d. State the main issues and challenges you have identified.
- e. Write the situation (need) you have identified.
- f. Write a design brief statement to the problems identified.
- g. Share your written statement with other groups and compare.

### Activity 1.4.4

#### Individual work

Identify a need in your community

- a. Write down the problem that has been identified that needs a design solution.

- b. Describe the people who face the problem (note these could also be animals etc.)
- c. Describe what goes on at the spot where the problem occurs.
- d. Describe the consequences of the problem. (State what the affected people/persons cannot achieve because of the lack of a solution).

## Extended Reading

- Kimbell, R. and Stables, K. (2008). Researching Design Learning, Springer Publishing Ltd, UK. (Chapter 3, Page 219-230)
- <https://thedieline.com/category/interviews/>

## GENERATE SOLUTIONS TO SOLVE IDENTIFIED PROBLEMS

This lesson will teach you how to generate and apply solutions to problems, equipping you with the tools to handle challenges confidently.

We all face problems daily, some simple and others more complex. To solve problems effectively, it's helpful to follow a plan: identify the problem, brainstorm solutions, choose the best one, and implement it. By using a step-by-step approach, we can find effective and lasting solutions

Watch these pictures, what is happening here?



**Fig. 1.4.2.** Undisciplined student.



**Fig. 1.4.3.** A Walking-challenged man wants to go up a stair



**Fig. 1.4.4.** Dustbin overflow



**Fig. 1.4.5.** Sand-winning

We all spend a lot of time-solving problems, both at school and in our personal lives. Some problems are small and easy to solve, while others are more complex and require collaboration, creativity, and effort.

At school, the problems we face can be different for each person. For example, a student in a wheelchair might struggle to go up the stairs to a classroom, there might be too many flies in the dining hall, or a teacher might look for ways to handle student indiscipline.

No matter what the issue is, there are common ways to tackle problems effectively. We generate solutions to problems every day, often without even realising it. Problem-solving is part of our daily routine and using a systematic approach can help us tackle problems more effectively.

## Procedures for Generating Solutions to Solve Identified Problems

1. **Identify and Define the Problem:** Clearly state the problem you are facing. For instance, consider the issue of ‘indiscriminate littering in our school environment.’ Be specific about the behaviour, situation, timing, and circumstances that make it a problem.
2. **Generate Possible Solutions:** Brainstorm all potential solutions without worrying about their feasibility at this stage. Aim to list at least 3 creative ideas. Allow your creativity to flow—you might discover innovative solutions you had not considered before.
3. **Evaluate Alternatives:** Review and eliminate less desirable or impractical solutions. Rank the remaining solutions in order of preference. Assess the advantages and disadvantages of each option.
4. **Decide on a Solution:** Choose the best solution and outline how and when it will be implemented.
5. **Implement the Solution:** Put the chosen solution into action according to your plan.



**6. Evaluate the Outcome:**

Assess the effectiveness of the implemented solution. Determine if the current plan needs revision or if a new approach is necessary to better address the problem.

**7. Not Sure of the Outcome?**

If the solution does not work as expected, revisit the 'Generate Possible Solutions' step. Select a new solution or revise the existing one, then repeat the remaining steps.

**Activity 1.4.5**

Consider a scene where your school is facing a significant littering problem. Trash is frequently found around the schoolyard, hallways, and classrooms. This creates an unappealing and unhealthy environment. Your challenge is to develop effective and practical solutions to address this issue and enhance the overall cleanliness of the school.

With your understanding of the above stages, complete the following to solve the problem at hand:

STAGES	DESCRIPTION OF PROCESS
<b>Define the Problem</b>	
<b>Generate Possible Solutions</b>	
<b>Evaluate Alternatives</b>	
<b>Decide on a Solution</b>	
<b>Implement the Solution</b>	

**Extended Reading**

- Tufnell, R. (1987), *Introducing Design and Communication*, Hutchinson Education Ltd, London. (Pages 6 & 7).

## Review Questions, Unit 4

1. Feedback that students are dissatisfied with the cafeteria experience, citing issues such as long wait times, limited healthy options, and an unappealing dining environment. Explain how the design process can effectively address these issues and improve the overall cafeteria experience."
2. The school library needs improvement. Common issues include a lack of quiet study spaces, outdated resources, and a layout that doesn't support collaborative work. Using a flowchart explain all the stages involved in the design thinking process for redesigning the library.
3. In the Senior Housemistress's office, the official files are scattered on the floor due to the place for keeping them. As a result, he finds it difficult to look for a specific file on time. Due to this, attending to important issues delays which the headteacher takes the Senior Housemistress to be incompetent.

Write a design brief statement of the problem statement above.

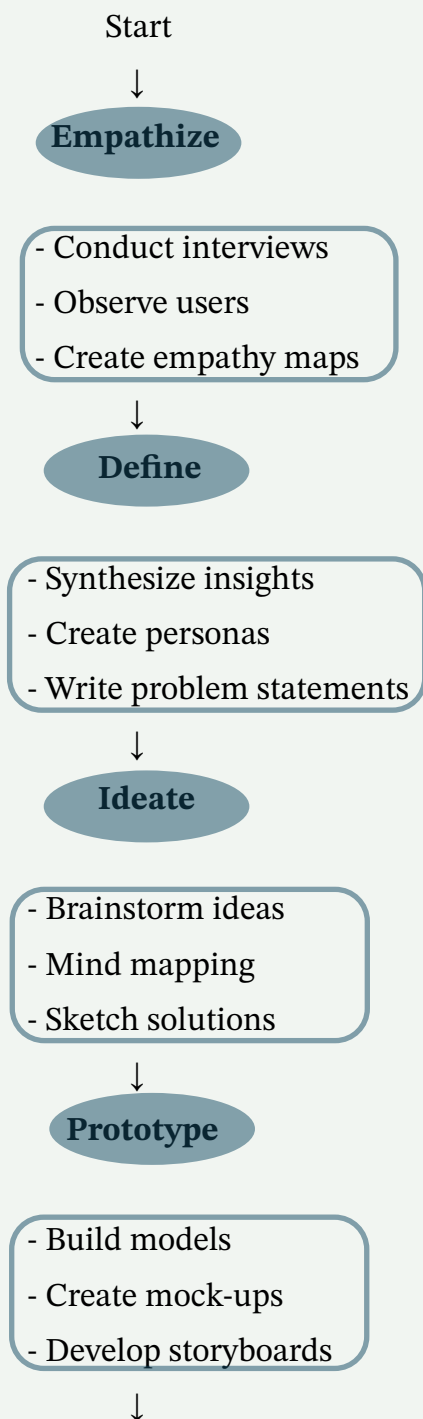
4. When you go home look around the compound, bedroom, kitchen, and outside house. Identify a need that poses a challenge which needs to be addressed to avoid future problems.
  - a. Write the statement of the situation
  - b. Write the design brief statement to the situation identified in (i) above.
5. As a boarding student, take a walk after class and go around your school compound, the headmaster's office, dormitory, dining hall, library, etc. Identify a need which will need immediate attention in one of the areas above mentioned.
  - a. Write the statement of the situation
  - b. Write the design brief statement to the situation identified in (i) above
6. Be in your group and do this project work.

Problem: The washrooms in your school have several issues affecting cleanliness, due to inadequate cleaning supplies, water leakage, and broken doors. These problems create an uncomfortable and unhygienic environment for students and staff. Generate solutions to address these issues to make your school washrooms cleaner, safer, and more user-friendly for everyone.

  - a. Write a design brief for the situation.
  - b. Finding report.
7. Generate workable possible solutions for the problem.

# Answer to Review Questions, Unit 4

1. The design process is a structured approach to solving problems and creating solutions that meet users' needs. It is essential for creating innovative, user-centered solutions. It reduces risks, improves quality, fosters collaboration, and ensures that the final product or service truly meets the needs and expectations of its users.
2. Flowchart:



## Test

- Conduct user testing
- Gather feedback
- Iterate and improve

3. Design and make an artefact that could be used to keep files and other important documents.

4.

- a. Stating suitable situation.
- b. Writing suitable design brief statement.

5.

- a. Stating suitable situation.
- b. Writing suitable design brief statement.

6.

a. **Design Brief:**

Design and make a device to renovate the School Washrooms to enhance Cleanliness and Safety.

### Investigation Plan

- We will do the following:
- Conduct a thorough inspection of all school washrooms.
- Document the current state of cleanliness, water leakage points, and the condition of doors.
- Conduct interviews with janitorial staff to understand current cleaning routines and challenges.
- Engage a plumber to identify and diagnose sources of water leakage.
- Consult a carpenter or maintenance team to evaluate door damage and provide a repair or replacement estimate
- Research best practices in school washroom maintenance and design.
- Visit other schools with well-maintained washrooms for ideas and insights.

### Problem Analysis

- Will there be sufficient cleaning supplies?
- Will leaky faucets and pipes normalise?

- Will the drainage systems be free from blockage?
- Will the doors be locked and closed properly?
- Will the damaged hinges and frames be fixed?
- Will the user's privacy and security be guaranteed?
- Will the environment be potentially healthy?

**b. Findings Report:**

This report presents the findings from the investigation into the current state of school washrooms, focusing on cleanliness, water leakage, and broken doors. The aim is to outline the problems and propose actionable solutions to improve the washroom environment.

**Findings:**

From the investigation and analysis, the following were revealed:

- Janitorial staff reported a lack of adequate cleaning supplies and clear guidelines.
- Multiple sources of leakage were identified, including faulty faucets and pipes.
- Poor drainage in several washrooms causing standing water issues.
- Mold and mildew are present in areas with persistent dampness.
- Several doors do not lock or close properly, compromising privacy.
- Damaged hinges and frames need immediate attention.
- Students and staff feel unsafe using washrooms with broken doors.

**7. Recommendations made are:**

- There should be a consistent cleaning schedule with checklists for janitorial staff.
- Management should ensure a steady supply of cleaning materials.
- A permanent plumber should be employed to repair all identified leaks and improve drainage systems to prevent future leaks.
- There should be repair or replacement of all broken doors to ensure proper locking and privacy.
- Regular checks should be made to ensure the condition of doors and perform maintenance as needed.
- Installing more durable and robust door materials should be considered.

**Conclusion:** Addressing these issues will significantly enhance the cleanliness, safety, and user experience of the school washrooms. Implementing the recommended solutions will create a more comfortable and hygienic environment for all users.



## References

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- Chapman C. and Mel P. (1998) Design and Realisation for Collins GCSE Design and Technology.
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# Acknowledgements



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