

Topic: Angles

Lesson Objectives

At the end of this lesson, students should be able to:

- Define **angles**
 - Understand the **classification of angles**
 - **Construct and measure angles** using drawing tools
 - Order angles by size and describe them correctly
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1. What is an Angle?

Definition:

An **angle** is formed when **two straight lines meet at a common point** called the **vertex**.

- The **two lines** are called **arms** or **sides** of the angle.
 - The **space between the arms** is called the **angle**.
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Notation of Angles

Angles are usually named with **three capital letters**, e.g., $\angle ABC$, where:

- **B** is the **vertex**
 - **A and C** are points on the arms
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2. Parts of an Angle

Part	Description
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Arms	The two straight lines that meet
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Vertex	The common point where the lines meet
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Angle	The opening between the two arms
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3. Measurement of Angles

Angles are measured in **degrees (°)**.

- A **full circle** is **360°**
 - A **straight line angle** is **180°**
 - A **right angle** is **90°**
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4. Classification of Angles

Type of Angle	Size (in degrees)	Description	Example
Acute Angle	Less than 90°	A small angle	30°, 45°
Right Angle	Exactly 90°	Forms an L-shape	90°
Obtuse Angle	More than 90° but less than 180°	A wide angle	120°
Straight Angle	Exactly 180°	Forms a straight line	180°
Reflex Angle	More than 180° but less than 360°	Larger than a straight angle	250°
Full Angle	Exactly 360°	Forms a complete circle	360°

5. Construction of Angles

Tools Needed:

- **Protractor**
 - **Compass**
 - **Ruler**
 - **Pencil (2H or HB)**
 - **Set Square (optional)**
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a) Using a Protractor

Steps to Construct a 60° Angle:

1. Draw a **base line AB** using a ruler.
 2. Place the **protractor's center point** on point **A**.
 3. Align the **baseline of the protractor** with line AB.
 4. Mark a **point at 60°** on the protractor scale.
 5. Remove the protractor and draw a **line from A through the marked point**.
 6. Label the angle **60°**.
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b) Using a Compass (Without Protractor)

Constructing a 60° Angle:

1. Draw a **line AB**.
 2. Place the **compass point on A** and draw an **arc** cutting AB at point C.
 3. Without changing the compass width, place the compass at C and draw another arc crossing the first arc at point D.
 4. Draw a line from **A through D**.
 5. The angle **CAD is 60°**.
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Constructing a 90° Angle (Right Angle):

1. Draw a **line AB**.
 2. Draw an **arc from A**, cutting AB at C.
 3. From C, draw another arc above the line.
 4. Repeat the same process from the other side of A.
 5. The arcs intersect at D.
 6. Draw a line from **A through D**. This is a **90° angle**.
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6. Ordering Angles

When comparing angles:

Order	Example
Acute	Smallest
Right	Next in size
Obtuse	Larger
Straight	Larger still
Reflex	Largest before full circle
Full Angle	Complete rotation

7. Real-Life Examples of Angles

Angle Type	Real-Life Example
Acute Angle	Arrowhead, roof gables
Right Angle	Corners of a book, walls
Obtuse Angle	Open doors, wall mirrors
Straight Angle	Flat road or ruler
Reflex Angle	Steering wheel turns, fan blades
Full Angle	Clock hands making a full turn

8. Importance of Angles in Technical Drawing

Reason	Explanation
Accurate designs	Machinery, buildings, and furniture require precise angles
Layout of drawings	Angles help create correct perspectives
Geometric construction	For drawing polygons, circles, arcs

9. Summary of Key Points

Concept	Details
Angle	The space between two intersecting lines
Parts	Arms, vertex
Measurement	In degrees ($^{\circ}$)
Classification	Acute, Right, Obtuse, Straight, Reflex, Full
Construction	Using protractor or compass
Uses	In architecture, engineering, art, and design