MAGNOLIA LESSON PLAN MATHS

A – Curriculum to Learning Objectives: Geometry

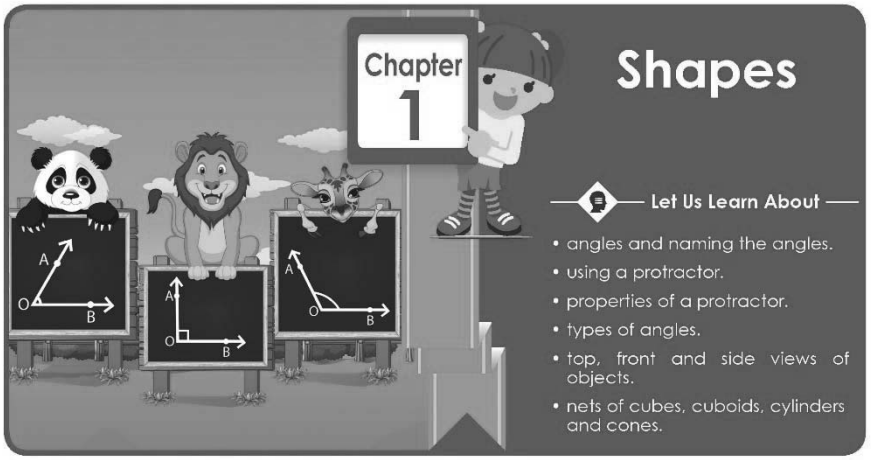
Prior Knowledge		• *basic shapes and figures, vertices*				
Class	**Ch. No.**	**Chapter Name**	**C. No.**	**Concept Name**	**L. Obj. No.**	**Learning Objectives**
1	1	Shapes	1.1	Understand Spatial Words	1.1.a	• basic flat and solid figures
					1.1.b	• corners and sides of objects/figures
					1.1.c	• outlines of the bases of the objects
2	1	Shapes	1.1	Identify the Geometrical Features of Objects	1.1.a	• lines, open figures and closed figures
					1.1.b	• drawing figures using lines
					1.1.c	• basic flat and solid figures
					1.1.d	• flat figures as outlines of the surfaces of solid figures
3	1	Shapes	1.1	Vertices and Diagonals of Two-dimensional Shapes	1.1.a	• identifying 2D shapes with straight and curved lines
					1.1.b	• identifying sides, corners and diagonals
					1.1.c	• making a tangram
					1.1.d	• recognising 3D shapes and their faces and edges
4	1	Shapes	1.1	Circle and its Parts	1.1.a	• circle and its parts
					1.1.b	• drawing a circle
			1.2	Reflection and Symmetry	1.2.a	• reflection and symmetry in figures
					1.2.b	• tessellation and tiling
5	1	Shapes	1.1	Identify and Classify Angles	1.1.a	• angles and naming the angles
					1.1.b	• using a protractor
					1.1.c	• properties of a protractor
					1.1.d	• types of angles

B – Vision-to-Action Plan: 1.1 Identify and Classify Angles

Period and Planned Date	TB Page No. and Key Competency	L. Obj. No.	Learning Outcome(s)	Teaching Strategies	Resources	Practice		Areas to Focus
						CW	HW	
1 DD/MM/YYYY	1, 2 – THK, RCL	1.1.a	• Recall the terms – point, line, line segment and ray. • Make a geoboard to show various 2-dimensional figures.	• Activity Method	• geoboard	–	–	
2 DD/MM/YYYY	2, 3 – REM/UND	1.1.a	• Show different angles made by intersecting lines using geoboard. • Identify an angle and name different angles.	• Activity Method • Guided Learning	• geoboard • rubber bands	WB: Pg. 2 (Q. 7-9)	WB: Pg. 1 (Q. 1-3)	
3 DD/MM/YYYY	3-6 – REM/UND	1.1.b, 1.1.c, 1.1.d	• Measure angles using a protractor. • Identify different types of angles.	• Peer Learning • Guided Learning	• protractor • Chart of Angles	TB: Pg. 4 (Example 2) WB: Pg. 2 (Q. 10- 12, 14)	WB: Pg. 1 (Q. 4-6)	
4 DD/MM/YYYY	6, 7 – APP	1.1.d	• Identify and measure angles in real-life objects. • Measure different angles made by letters of the alphabet series and hands of a clock.	• Using Concrete Material • Activity Method	• Protractor	TB: Pgs. 6, 7 (Examples 4, 5) WB: Pg. 2 (Q. 13)	WB: Pgs. 3, 4 (Q. 15-17) WB: Pgs. 5, 6 (Q. 18-20)	

Period and Planned Date	TB Page No. and Key Competency	L. Obj. No.	Learning Outcome(s)	Teaching Strategies	Resources	Practice		Areas to Focus
						CW	**HW**	
5 DD/MM/YYYY	7, 8 – HOTS, Drill Time	1.1.d	• Calculate the sum of the angles of a triangle.	• Using Concrete Material • Questioning	• cut-outs of different types of triangles	TB: Pgs. 7, 8 (Examples 6, 7) TB: Pg. 15, (Drill Time, Q. 1, 2)	WB: Pg. 7 (Q. 21, 22)	

Annual Day:	Day:	Actual Date:	Page(s):
1/61	1/5	_____	1, 2



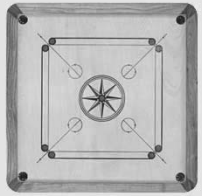
Concept 1.1: Identify and Classify Angles

Think

Pooja was playing carrom with her friends. Each time she struck a coin, Pooja observed that the striker followed a straight path.

She wondered if there is any way she could use her knowledge of mathematics to master the game.

Do you also want to know?



Recall

Let us recall what we have learnt in the previous class.

Important Words **Duration: 1 min**

- Today: point, line segment, ray, line, one-dimensional figure

Transactional Tip(s) **Duration: 27 min**

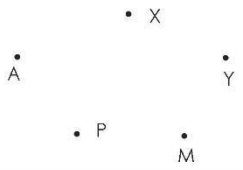
Activity Method:

- Instruct learners to use the geoboards. Otherwise, arrange for materials for making a geoboard.
- Explain the steps involved in making a geoboard. Demonstrate each step to the class.
- Ask learners to show the 2-dimensional figures from TB: Pg. 2 on the geoboard. E.g., 1 pin is a point. Rays and lines extend to the edge to show infinite length.
- Discuss the terms – 'point', 'line', 'ray', 'line segment' and 'one-dimensional'.

Class Pulse Check **Duration: 2 min**

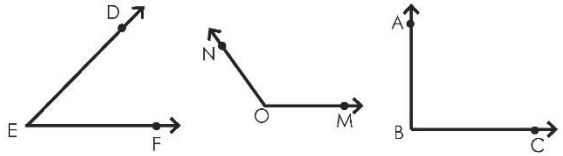
1) What is the difference between a line and a line segment?
2) What is the difference between a line segment and a ray?

Annual Day:	Day:	Actual Date:	Page(s):
2/61	2/5	_____	2, 3

Object	Features	Representation
Point	A point is an exact location in space. It has no length, width or thickness. A point is denoted by a capital letter of the English alphabet. For example, A, X, Y, P and M are points.	
Line	Many points, placed close to each other in a straight path, form a line. It has no thickness or breadth. It has only length. So, it is called a **one-dimensional figure**. A line has no end points. It can be extended on both the sides.	 We mark two points E and F on a line and write it as $\overleftrightarrow{FE}$ or $\overleftrightarrow{EF}$. It is read as line EF.
Line segment	A line segment is a part of a line. It has two end points. A line segment has a definite length.	 We write a line segment AB as $\overline{AB}$. It is read as segment AB, or BA.
Ray	A ray is a part of a straight line which has a starting point called the initial point but no end point. It can be extended only in one direction.	 We write ray AB as $\overrightarrow{AB}$. It is read as ray AB. We cannot read it as ray BA.

Remembering and Understanding

Consider the following figures.



These figures are formed by two rays with the same initial point. Such figures are called **angles**.

Important Words **Duration: 1 min**

- Last class: point, line segment, ray, line, one-dimensional figure
- Today: angle

Transactional Tip(s) **Duration: 15 min**

Activity Method:

- Use an geoboard and rubber bands to make figures as shown in TB: Pg. 2, 3,
- 'Remembering and Understanding'. Show how angles are formed by two rays.
- Now draw the same figures on the blackboard and show how to name an angle.
- Draw several intersecting line segments on the blackboard as given in TB: Pg. 2. Show the different angles made by the lines at the intersection. Ask learners to name and denote the angles verbally and also note down in their notebooks.
- Solve and discuss WB: Pg. 2, Q. 7-9.

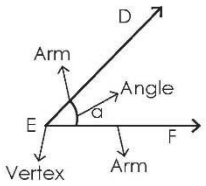
Class Pulse Check **Duration: 2 min**

1) When two line segments meet each other at a point what is formed between the line segments?
2) The common initial point of the two rays is called _____.

Annual Day:	Day:	Actual Date:	Page(s):
2/61	2/5	_____	3

Angle: The figure form by two rays sharing common initial point is called an **angle**. Angles are also formed when two line segments cut each other.

The common initial point of the two rays is called its **vertex**. The two rays are called the **arms** of the angle.



Naming an angle

Consider the angle shown.

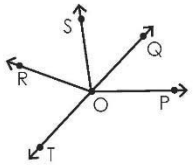
The symbol of an angle is ∠. In the given angle, the common point is E.

So, the angle is denoted as ∠DEF, ∠FED or ∠a.

Example 1: Name any nine angles in the figure.

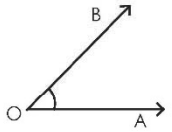
Solution: In the given figure, any nine angles are:

∠POQ, ∠QOS, ∠SOR, ∠ROT, ∠TOP, ∠POS, ∠POR, ∠SOT, ∠QOR



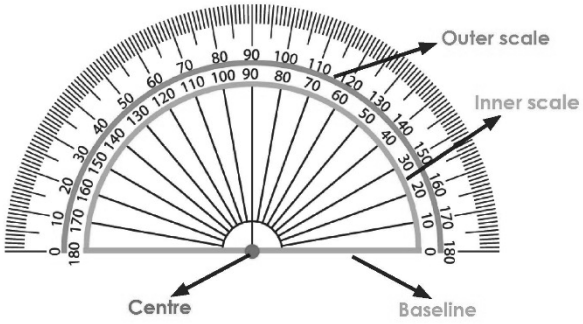
The unit used to represent the measure of an angle is the **degree**. It is denoted using the symbol '°'.

We can also consider an angle as the movement of a ray (called the **initial ray**, OA) through some distance to another position (called the **final ray**, OB).



In other words, the distance through which a ray moves from an initial position to the final position is called an **angle**.

Protractor



We use a protractor to measure angles. Let us first observe the protractor and understand how to measure angles.

The protractor has markings from 0 to 180 from the left and the right. The distance between 0 and 180 is divided into 180 small divisions. Each division is called a **degree**.

Important Words **Duration: 1 min**

- Today: degree, initial ray, final ray, measure of angle, vertex, arms

Transactional Tip(s) **Duration: 10 min**

Guided Learning:

- Explain the different parts of an angle. Point out the vertex and the arms of an angle.
- Explain angles and naming of angles using TB: Pg. 2, 3.
- Ask learners to name different angles drawn on the blackboard via random calling.
- Show how to write the angle name using the correct symbol as shown in TB: Pg. 3, Example 1.

Class Pulse Check **Duration: 1 min**

1) Name the unit used to represent the measure of an angle.

Annual Day:	Day:	Actual Date:	Page(s):
3/61	3/5	_____	3, 4

So, we can measure angles from 0° to 180° using a protractor.

The horizontal line on the protractor joining 0° and 180° is called the **baseline**. The mid-point of the base line is called the **centre** of the protractor.

The **outer scale** has 0° to 180° marked in clockwise direction.

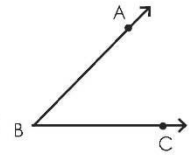
The **inner scale** has 0° to 180° marked in anticlockwise direction.

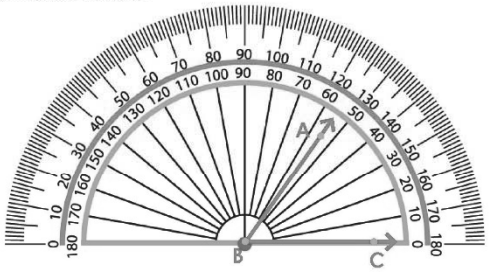
Let us understand how to measure an angle using a protractor, with the help of an example.

Example 2: Measure ∠ABC using a protractor.

Solution: To measure the given angle, follow these steps.

Step 1: Place the protractor on the given angle such that its centre lies on the vertex B and the baseline lies exactly on the arm BC of ∠ABC.





Step 2: Observe where the arm BC points to 0. In this angle, it is on the inner scale.

Step 3: Note the reading on the outer scale through which the other arm BA of ∠ABC passes. In this case, it is the 5th mark after 50.

Thus, the measure of the given angle is 55°.

Note: Always remember to measure on the scale where the arm coinciding with the baseline points to 0°.

Types of angles

The measure of an angle lies between 0° and 360°.

These angles of different measures are given different names. Let us learn about them in detail.

Important Words **Duration: 1 min**

- Last class: angle, degree, initial ray, final ray, measure of angle, vertex, arms
- Today: baseline, centre, inner scale, outer scale

Transactional Tip(s) **Duration: 11 min**

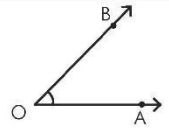
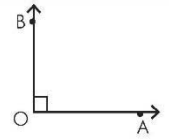
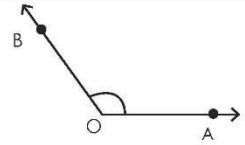
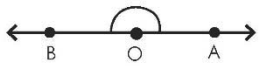
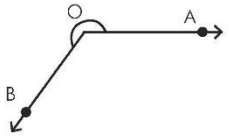
Peer Learning:

- Show learners how a protractor looks and explain all its characteristics – inner scale, outer scale, baseline and centre.
- With the help of examples on TB: Pgs. 3, 4, show how to measure angles using a protractor.
- Ask learners to draw different angles. They will exchange their books with their partners who will measure the angles, using a protractor.
- Use TB: Pg. 4, Example 2 to show how we choose which scale (inner or outer) to use. As the angle is less than 90°, we use the scale that gives us measures less than 90°.

Class Pulse Check **Duration: 1 min**

1) Explain and show the following features of a protractor: inner scale, outer scale, baseline and centre.

Annual Day:	Day:	Actual Date:	Page(s):
3/61	3/5	_____	5, 6

Angles	Representation
1) **Zero angle:** If the initial ray does not move to any distance, no angle is formed. It is called a **zero angle**. It has a measure of 0°.	
2) **Acute angle:** If the initial ray moves to a distance such that the final ray lies between 0° and 90°, the angle formed is called an **acute angle**.	
3) **Right angle:** If the final ray lies on 90°, the angle formed between the initial ray and the final ray is called a **right angle**. It has a measure of 90°.	
4) **Obtuse angle:** If the final ray lies between 90° and 180°, the angle formed between the initial ray and the final ray is called an **obtuse angle**.	
5) **Straight angle:** If the final ray lies on 180°, the angle formed between the initial ray and the final ray is called a **straight angle**.	
6) **Reflex angle:** If the measure of angle between the initial ray and the final ray is greater than 180°, then the angle is called a **reflex angle**.	
7) **Complete angle:** If the initial ray moves to a distance and comes back to its original position, the angle formed is called a **complete angle**. It has a measure of 360°.	

Example 3: Identify the following angles as acute, obtuse, right, zero or straight.

65°	120°	40°	90°	135°	45°
0°	150°	50°	180°	75°	60°

Important Words **Duration: 1 min**

- Today: zero angle, acute angle, right angle, obtuse angle, straight angle, reflex angle, complete angle

Transactional Tip(s) **Duration: 14 min**

Guided Learning:

- Use your arm to define and demonstrate the different types of angles as given in TB: Pg. 5 – acute, right, obtuse and straight angles. Keep one arm constant and increase the distance from the other to show acute angle, right angle, obtuse angle, straight angle, reflex angle and complete angle.
- To explain reflex and complete angles, show the Chart of Angles.
- Ask learners to name the different angles made by the minute and hour hands of a clock at different times. E.g., 4:00 a.m., 12:00 a.m., 9:25 a.m., etc.
- Ask learners to look around and find objects that make certain angles and try measuring them using protractor. E.g., corners of the desk make a right angle, an open door can make an acute, right or zero angle.
- Solve and discuss :
  - TB: Pgs.5, 6, Example 3,
  - WB: Pg. 2, Q. 11, 12, 14.

Class Pulse Check **Duration: 2 min**

1) What is the maximum degree of an angle that can be measured using a protractor?
2) Name the different types of angles.

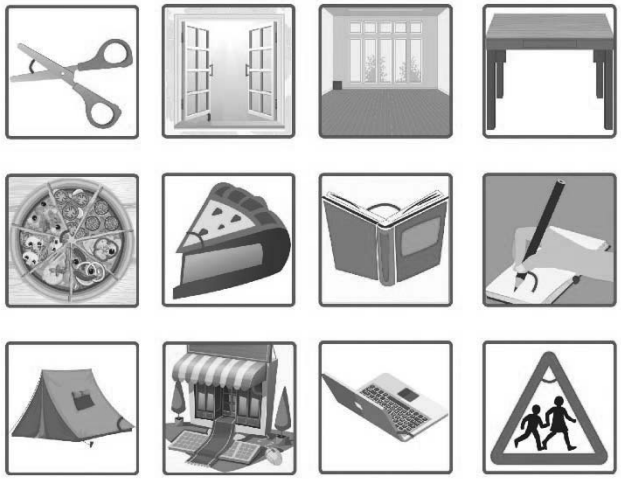
Annual Day:	Day:	Actual Date:	Page(s):
4/61	4/5	_____	6

Solution:

65°	120°	40°	90°	135°	45°
Acute angle	Obtuse angle	Acute angle	Right angle	Obtuse angle	Acute angle
0°	150°	50°	180°	75°	60°
Zero angle	Obtuse angle	Acute angle	Straight angle	Acute angle	Acute angle

Application

Now that we have learnt about different types of angles, let us try to identify them in real-life objects. Here are a few pictures in which angles are marked. Identify the types of angles in these items.



Example 4: Identify the types of angles formed by the hands of each clock.

Important Words **Duration: 1 min**

- Last class: protractor, baseline, centre, inner scale, outer scale, zero angle, acute angle, right angle, obtuse angle, straight angle, reflex angle, complete angle

Transactional Tip(s) **Duration: 15 min**

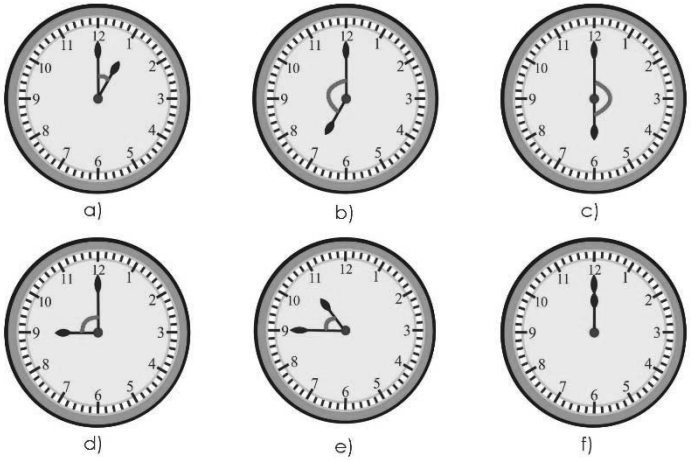
Using Concrete Material:

- Before the class begins, prepare a set of everyday objects which have measurable angles. These will be used as props for the lesson. E.g., compass, scissors, tiffin box, etc.
- Ask learners to identify the angles given in TB: Pg. 6, 'Application'.
- Ask learners to measure and record the different angles made by different objects.
- Categorise each of the angles measured into zero angle/acute angle/straight angle/straight angle.
- Solve and discuss WB: Pg. 2, Q. 13.

Class Pulse Check **Duration: 1 min**

1) If two rays make an acute angle on one side, what type of an angle is made on the other side of the acute angle?

Annual Day:	Day:	Actual Date:	Page(s):
4/61	4/5	_____	6, 7



Solution: a) Acute angle b) Obtuse angle c) Straight angle
d) Right angle e) Acute angle f) Zero angle

Example 5: Identify the different types of angles marked in these letters of the English alphabet.

Solution: a) Acute angle b) Right angles c) Acute angle and right angle
d) Straight angle e) Acute angle and obtuse angle

Higher Order Thinking Skills (H.O.T.S.)

Let us see a few more examples of measuring angles.

Example 6: What is the angle covered by an hour hand from 2 p.m. to 4 p.m.?

Important Words **Duration: –**

–

Transactional Tip(s) **Duration: 11 min**

Activity Method:

- Before the class begins, arrange for chart paper and markers. Learners will need protractors.
- Use TB: Pgs. 6, 7, Examples 4, 5 (different angles marked on letters of the alphabet) as the basis for a class activity.
- Learners will make charts showing different letters of the alphabet.
- They will show the angles made by the vertices in each letter, marking the measurement and noting the type.

Class Pulse Check **Duration: 2 min**

1) Which letter makes no angle?
2) What angle is formed by the hands of a clock at 9:00 p.m.?

Annual Day:	Day:	Actual Date:	Page(s):
5/61	5/5	_____	7, 8

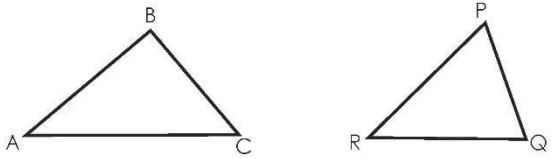
Solution: In 12 hours, the hour hand goes around the clock and so completes 360°.

In one hour, the angle covered by the hour hand = $\frac{360^\circ}{12} = 30^\circ$

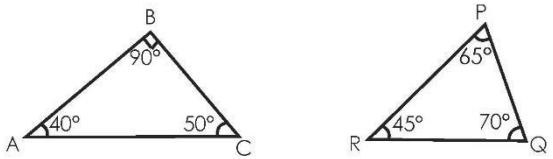
So, in two hours, the angle covered by the hour hand is $30^\circ \times 2 = 60^\circ$.

Therefore, the angle covered by the hour hand from 2 p.m. to 4 p.m. is 60°.

Example 7: In ΔABC and ΔPQR given, find the measures of all the angles. Find the sum of the angles in each triangle and compare them.



Solution: Measure the angles using a protractor and mark them as shown in the figures.



In triangle ABC, ∠A = 40°, ∠B = 90°, ∠C = 50°.

Sum of the angles = 40° + 90° + 50° = 180°

In triangle PQR, ∠P = 65°, ∠Q = 70°, ∠R = 45°.

Sum of the angles = 65° + 70° + 45° = 180°

Comparing the sum of angles in the two triangles, we see that they are equal.

Concept 1.2: Nets and Views of Solids

Think

Pooja saw a figure in a pamphlet. It looked like the one shown here. She was curious to know how a house was drawn on a sheet of paper. Do you also want to know?

Important Words **Duration: –**

–

Transactional Tip(s) **Duration: 29 min**

Using Concrete Material (15 min):

- Before the class begins, cut triangles out of paper, one for every learner. Include different types (acute, obtuse and right triangles).
- Give two cut-outs of different types of triangles to each pair of learners.
- Ask each learner to measure all the angles of one triangle using a protractor, then find the sum of all the three angles.
- Have learners trade triangles and repeat the process.
- Learners will share and discuss their results in pairs.
- Use TB: Pg. 8, Example 7 to discuss and explain how the sum of all the interior angles of a triangle is 180 degrees.

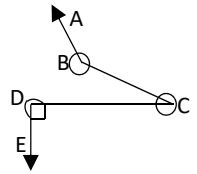
Questioning (14 min):

- Discuss TB: Pg. 7, 8 Example 6 by drawing a clock.
- Learners answer the first few questions by drawing the hands accordingly and measuring the results, using the blank clock faces on their chart paper.
- Discuss and solve TB: Pg. 15, Drill Time, Q. 1, 2.

Class Pulse Check **Duration: 1 min**

1) Can a triangle have more than one right angle?

C – Exit Assessment

	Suggested questions to test the learning objective(s)	Learning objective(s)	Number of learners who answered correctly
1	Identify an obtuse angle and a reflex angle.  (Ans. Angle ABC and reflex angle ABC)	Period 1 - angles and naming the angles Period 4 - types of angles	
2	Identify the type of an angle between the blades of a ceiling fan. (Ans. Learner's response, e.g. Obtuse angle)	Period 2 - types of angles	
3	The hour hand is on 12 and the minute hand is on 6. Identify the measure of angle formed by the two hands. (Ans. 180°)	Period 3 - properties of a protractor	
4	The sum of the measures of the three angles in a triangle is 180°. If the measure of two angles of a triangle are 90° and 45°, find the measure of the third angle. (Ans. 45°)	Period 3 - properties of a protractor	

Post-lesson Reflection						
TB completed	Yes ☐	No ☐	WB completed	Yes ☐	No ☐	
Enthusiastic participation	😀 ☐	🙂 ☐	😐 ☐			
Concept clarity in the classroom	😀 ☐	🙂 ☐	😐 ☐			
Concept clarity through the workbook	😀 ☐	🙂 ☐	😐 ☐			

	Handhold Learners	Challenge Learners
Names		
Exam Revision Strategy	**Reteach** ☐ **Revise** ☐ **Practise** ☐	
App Report	**Number** _____	**Signature** _____