

CLASS – IX
LESSON PLAN
CHAPTER-6: LINES AND ANGLES

Unit	Geometry (Chapter 6: Lines and Angles)
Class Transaction	Total: 10 periods (approx. 40 min each)
Pre-requisite for the course	This lesson requires 1. Basic knowledge of angles and types of angles. 2. Knowledge of linear pair of angles and parallel lines. 3. Knowledge of angle sum property in a triangle.
Assessment of qualifying knowledge	1. Written test 2. Lab activity 3. Group Discussion 4. HW notebook
Objective	Students would be able to identify the properties of the angles formed when 2 lines intersect each other and when a line intersects 2 or more parallel lines at distinct points. Students will also be able to use these properties to prove some statements, thereby inculcating competencies like collaboration, critical thinking and creativity
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will develop the ability to understand</i> 1. Intersecting lines and non-intersecting lines. 2. Pairs of angles. 3. Parallel lines and a transversal. 4. Lines parallel to the same line. 5. Angle sum property of a triangle. <u>SKILLS and COMPETENCIES</u>-<i>Students would be able to</i> 1. Solve and analyze geometrical problems 2. Solve problems related to adjacent angles and linear pair. 3. Critically think and use the concept of various angles formed when a transversal intersects 2 parallel lines and their properties. 4. Apply angle sum property of a triangle to solve various problems. 5. Solve complex questions based on the topics 6. Use analytical skills to visualize the given scenario and use the concepts learnt in everyday problems.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Strategies Used : Inductive Deductive Reasoning, Graphic Organizers, muddiest point discussion Dimensions of Learning : D1, D2, D3 Transaction would proceed in the following manner- Brain Storming-The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. <i>Introduction of the topic</i>- ppt and Digital Content would be shared

	Guided practice followed by Independent Practice- NCERT questions to be discussed in the classroom. Techniques to be used: Quiz Daily Practice Problem MCQ Peer Assessment Case Studies Lab Activities Any Other
Resources	Text Book: NCERT text book for Mathematics Reference Book 1. CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W notebooks. HW notebooks to be marked as per the given plan: <i>Assessment Parameters:</i> The total marks for the activity is 5 marks On time submission.....1 mark Presentation/ Neatness.....1 mark Content.....3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
Assessments	Through Pen Paper Test Students will be assessed creatively and critically 4 UNIT TESTS 20 Marks each HALF YEARLY EXAMINATION 80 Marks ANNUAL BOARD EXAMINATION 80 Marks INTERNAL ASSESSMENT 10 Marks - Note Book Submission 05 Marks - Lab Practical (Subject Enrichment) 05 Marks Through lab Practical Students are assessed for Collaboration, Character building
Addressing Classroom Diversity	Due to various social backgrounds and multiple intelligences, the classroom might be a diverse arena. The following techniques can be used for various groups: <i>For gifted students:</i> - Spiral Level 3 questions to be done - Encouragement for referring other resources <i>For weak students:</i> - Spiral Level 1 to be completed

	• Buddy help to be provided • Provide grade-up classes <i>For differently abled students:</i> • Ignore spelling mistakes and formulae, if not written • Call parents at regular intervals • Provide grade-up classes
Marks	The weightage would be given by CBSE.
Assessment Questions	1. Two lines AB and CD intersect at O if $\angle AOC = 115^\circ$, Find $\angle AOD$ 2. The sum of two angles of a triangle is 70° and their difference is 30°. Find all the angles of the triangle. 3. The supplement of an angle is one third of itself. Determine the angle and its supplement. 4. In a $\triangle ABC$, the bisectors of $\angle ABC$ and $\angle BCA$ intersect each other at O. Prove that $\angle BOC = 90^\circ + \frac{1}{2} \angle A$ 5. Prove Exterior angle property of a triangle.

DAY	ONE
Objective	Enhance ability to accurately recognize and use appropriate terminology related to lines and angles and developing the art of communication and critical thinking.
Assessment of qualifying knowledge	Quiz and knowledge testing on how to identify vertically opposite angles and adjacent angles.
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will identify and find unknown angles.</i> <u>SKILLS and COMPETENCIES</u>–<i>Students would be able to Reason effectively</i> for finding unknown angles using concept of adjacent angles.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Strategies Used : Inductive Deductive Reasoning, Graphic Organizers, muddiest point discussion Dimensions of Learning : D1, D3 Transaction would proceed in the following manner- Anticipatory Set: 10 min Facilitator will ask few questions to introduce the topic •How many types of angles? •What is the sum of linear angles? •How to use axioms in finding unknown angles? • What independent information we need for finding the unknown angle? Discussion of topic through Collaborative Learning: 15 min <u>Inquiry based learning</u> (Critical Thinking and Problem Solving) Students would be asked to write different real life situations in which they see vertically opposite angles. The facilitator would take rounds and ensure that each learner is engaged. Guided practice: 10 min The students will solve the questions from NCERT book, solved examples before Ex 6.1 in their notebook in the class with the help of their facilitator. The facilitator would take rounds and help the students in solving the questions. Independent Practice: Students will go through the solved examples before Ex 6.1 of NCERT text book. Closure: 5 min A short oral test would be taken to check proper assimilation of the topic discussed.
Resources	Text Book: NCERT text book for Mathematics Reference Book 1. CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks.
Assessments	Oral Test (5 minutes)
DAY	TWO
Objective	Students will be able to verify that vertically opposite angles are equal by paper cutting and pasting activity in collaborative manner .

Assessment of qualifying knowledge	Written questions on finding angles using vertically opposite angle and adjacent angle property.
Learning Outcomes	<u>KNOWLEDGE</u>- Students will know and Demonstrate the ability to prove relation between angles. <u>SKILLS and COMPETENCIES</u>- Students will be able to differentiate and classify the different angles, in collaboration with each other.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Strategies Used : Inductive Deductive Reasoning, Graphic Organizers, muddiest point discussion Dimensions of Learning : D1, D3 Transaction would proceed in the following manner- Recapitulation: 5 min Brainstorming on the previously taught concept would be done. Discussion of topic through Collaborative Learning: 15 min (Critical Thinking, Collaboration) A small blackboard test would be taken and students will be asked to identify and find unknown angles. Guided practice: 15 min The students, with the help of the facilitator, will solve the questions from NCERT book of Exercise – 6.1 in their notebook in the class with the help of their teacher. The teacher would ensure that each student tries to be independent at the work as well as be under the teacher's guidance. Independent Practice: Students will complete the remaining HW parts given in the monthly planner of Exercise 6.1 in their Math HW notebook. Students who would difficulty in solving the problem would solve with the help of their buddies. Closure: 5 min A short oral test would be taken to check proper assimilation of the topic discussed.
Resources	Text Book: NCERT text book for Mathematics Reference Book • CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks.
Assessments	Oral quiz (5 minutes)
DAY	THREE
Objective	To understand the angles made by the transversal and parallel lines.
Assessment of qualifying knowledge	Written questions on how to identify corresponding alternate and co-interior angles.
Learning Outcomes	<u>KNOWLEDGE</u>- Students will develop the ability to understand the Identification of angles made by the transversal. <u>SKILLS and COMPETENCIES</u> - Students would be able to critically apply the concepts in given situations and collaboratively find the unknown angles using facts about angles

	made by the transversal
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Strategies Used : Inductive Deductive Reasoning, muddiest point discussion Dimensions of Learning : D1, D3 Transaction would proceed in the following manner- Recapitulation: 5 min Oral test on the previous concept would be taken up. Discussion of topic through Collaborative Learning: 15 min (Critical thinking) The students will solve the questions from NCERT book, solved examples before Ex 6.2 in their notebook in the class with the help of their facilitator. The facilitator would take rounds and help the students in solving the questions. and then the questions would be crosschecked. Digital content would be used. The facilitator would take rounds and help students with their doubts. Guided Practice: 15 min The students will solve the examples before Ex 6.2 from NCERT book in their notebook in the class with the help of their teacher. The teacher would ensure that each student tries to be independent at the work as well as be under the teacher's guidance. Independent Practice: Students will complete the remaining HW parts given in the monthly planner of Exercise 6.2 in their Math HW notebook. Closure: 5 min A short oral test would be taken to check proper assimilation of the topic discussed.
Resources	Text Book: NCERT text book for Mathematics Reference Book • CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks.
Assessments	Written test (5 minutes)

DAY	FOUR
Objective	To solve the questions of Ex- 6.2 based on Parallel Lines and a Transversal.
Assessment of qualifying knowledge	Quiz and knowledge testing on how to identify corresponding alternate and co-interior angles.
Learning Outcomes	<u>KNOWLEDGE</u>- Students will know and identify the angles by analyzing Parallel Lines and a Transversal <u>SKILLS and COMPETENCIES</u> Students would be able to Reason effectively and critically describe various pairs of angles.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Strategies Used : Inductive Deductive Reasoning, Graphic Organizers, Dimensions of Learning : D1, D3 Transaction would proceed in the following manner- Recapitulation: 5 min Oral test on the previous concept would be taken up. Discussion of topic through Collaborative Learning: 15 min (Critical thinking) The students will solve the questions from Ex 6.2 in their notebook in the class with the help of their facilitator. The facilitator would take rounds and help the students in solving

	the questions. and then the questions would be crosschecked. Digital content would be used. The facilitator would take rounds and help students with their doubts. Guided Practice: 15 min The students will solve the remaining questions of Ex 6.2 from NCERT book in their notebook in the class with the help of their teacher. The teacher would ensure that each student tries to be independent at the work as well as be under the teacher's guidance. Independent Practice: Students will complete the remaining HW parts given in the monthly planner of Exercise 6.2 in their Math HW notebook. Closure: 5 min A short oral test would be taken to check proper assimilation of the topic discussed.
Resources	Text Book: NCERT text book for Mathematics Reference Book • CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks.
Assessments	Oral Test (5 minutes)
DAY	FIVE
Objective	Students will be able to understand Angle Sum Property of a Triangle in collaborative manner .
Assessment of qualifying knowledge	Written questions on angle sum property of closed polygons.
Learning Outcomes	<u>KNOWLEDGE</u>- Students will know and Demonstrate the ability to find The sum of the angles of a triangle is 180° <u>SKILLS and COMPETENCIES</u>- Students will be able to differentiate and classify the interior and exterior angles of a triangle, in collaboration with each other.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Strategies Used : Inductive Deductive Reasoning, Graphic Organizers, muddiest point discussion Dimensions of Learning : D1, D3 Transaction would proceed in the following manner- Recapitulation: 5 min Brainstorming on the previously taught concept would be done. Discussion of topic through Collaborative Learning: 15 min (Critical Thinking, Collaboration) An oral quiz will be taken and students will be asked to identify and locate various steps towards the proof of the result and will be able to realize the fact that an exterior angle of a triangle is greater than either of its interior opposite angles.. Guided practice: 15 min The students, with the help of the facilitator, will solve the examples from NCERT book before Exercise – 6.3 in their notebook in the class with the help of their teacher. The teacher would ensure that each student tries to be independent at the work as well as be under the teacher's guidance. Independent Practice: Students will complete the remaining HW parts given in the monthly planner of Exercise 3.2 in their Math HW notebook. Students who would face difficulty in solving the problem would solve with the help of their buddies.

	Closure: 5 min A short oral test would be taken to check proper assimilation of the topic discussed.
Resources	Text Book: NCERT text book for Mathematics Reference Book CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks.
Assessments	Oral quiz (5 minutes)
DAY	SIX
Objective	To solve the questions of Ex- 6.3 based on Angle Sum Property of a Triangle
Assessment of qualifying knowledge	Written questions on how to find the interior angles of a triangle using certain information related to the triangle.
Learning Outcomes	<u>KNOWLEDGE</u>- Students will develop the ability to understand the Angle Sum Property of a Triangle. <u>SKILLS and COMPETENCIES</u> - Students would be able to critically apply the concepts in given situations and collaboratively realize the fact that the interior and exterior angles of a triangle have a relationship using angle sum property of triangle.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Strategies Used : Inductive Deductive Reasoning, Graphic Organizers, muddiest point discussion Dimensions of Learning : D1, D2, D3 Transaction would proceed in the following manner- Recapitulation: 5 min Oral test on the previous concept would be taken up. Discussion of topic through Collaborative Learning: 15 min (Critical thinking) Exercise 6.3 would be discussed and students would solve different questions per group and then the questions would be crosschecked. Digital content would be used. The facilitator would take rounds and help students with their doubts. Guided Practice: 15 min The students will solve the questions from NCERT book of Exercise – 6.3 in their notebook in the class with the help of their teacher. The teacher would ensure that each student tries to be independent at the work as well as be under the teacher’s guidance. Independent Practice: Students will complete the remaining HW parts given in the monthly planner of Exercise 6.3 in their Math HW notebook. Closure: 5 min A short oral test would be taken to check proper assimilation of the topic discussed.
Resources	Text Book: NCERT text book for Mathematics Reference Book CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks.
Assessments	Written test (5 minutes)

