

CLASS – IX
LESSON PLAN
CHAPTER-8 : QUADRILATERAL

Unit	Geometry (Chapter 8:Quadrilateral)
Class Transaction	Total: 15 periods (approx. 40 min each)
Pre-requisite for the course	This lesson requires 1. Basic knowledge of polygon 2. Knowledge of various types of quadrilaterals 3. Congruence criteria of triangles 4. Knowledge of properties of different types of quadrilaterals.
Assessment of qualifying knowledge	1. Written test 2. Lab activity 3. HW notebook
Objective	Students will know in detail about the properties of quadrilaterals, will know how to prove a given parallelogram a rectangle ,rhombus or square. Students will verify midpoint theorem through lab activity thereby incorporating competencies like collaboration ,critical thinking .
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and understand</i> 1. Properties of quadrilaterals 2. Criteria for proving parallelogram to a rectangle, square and rhombus. 3. Midpoint theorem and its applications. <u>SKILLS and COMPETENCIES</u> - <i>Students would be able to</i> 1. Identify the criteria needed to prove a given quadrilateral a parallelogram, square ,rectangle and rhombus. 2. Prove the mid point theorem 3. Use the midpoint theorem to prove parallelogram 4. Verify midpoint theorem through paper cutting and pasting method.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Strategies used :Inductive Deductive reasoning and graphic organizers,circle the sage, jigsaw,four corners Dimensions of learning : D1, D2, D3 Transaction would proceed in the following manner- <i>Brain Storming</i>-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

	<i>Guided practice followed by Independent Practice-</i> 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 ma 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. In a parallelogram ABCD, if $\angle A = (4x+20)$, $\angle C = (110-5x)$, then find x. 2. In a parallelogram ABCD, bisectors of angles A and B intersect each other at E which lies on DC. Find $\angle AEB$. 3. In a parallelogram, the bisectors of any two consecutive angles intersect at right angle. Prove it. 4. E and F are points on diagonal AC of a parallelogram ABCD such that $AE = CF$. Show that BFDE is a parallelogram. 5. ABCD is a parallelogram. AB produced to E so that $BE = AB$. Prove that the ED bisects BC.

DAY	ONE
Objective	Enhance ability to accurately recognize and use appropriate terminology related to quadrilaterals and developing the art of communication and critical thinking.
Assessment of qualifying knowledge	Quiz and knowledge testing on how to identify the type of quadrilateral.
Learning Outcomes	<u>KNOWLEDGE</u>- Students will know and identify the criteria needed to prove a quadrilateral a parallelogram, square, rectangle and rhombus. <u>SKILLS and COMPETENCIES</u> Students would be able to Reason effectively and critically describe different types of parallelograms.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	<u>Dimensions used : (D1, D2)</u> <u>Strategy used : Muddiest point discussion, jigsaw</u> Transaction would proceed in the following manner- Anticipatory Set: 10 min Facilitator will ask few questions to introduce the topic • What is a quadrilateral? • What is the sum of four angles of a quadrilateral? • What is parallelogram? • What is congruence of triangles? 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 different types of parallelograms, define different types of parallelogram. 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 8.1 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 8.1 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 • CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks.
Assessments	MCQ (5 minutes)
DAY	TWO
Objective	Enhance ability to accurately recognize and use appropriate terminology related to quadrilaterals and developing the art of communication and critical thinking.
Assessment of	Quiz and knowledge testing on how to prove a quadrilateral a parallelogram.

qualifying knowledge	
Learning Outcomes	<u>KNOWLEDGE</u>- Students will know and identify the types of parallelogram and criteria's needed to prove a parallelogram a rectangle, square and rhombus. <u>SKILLS and COMPETENCIES</u> Students would be able to Reason effectively and critically describe positions of different points.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	<u>Dimensions used : (D1, D2)</u> <u>Strategy used : Muddiest point discussion, circle the sage.</u> Transaction would proceed in the following manner- Anticipatory Set: <u>10 min</u> Facilitator will ask few questions to introduce the topic •What is the difference between a rectangle and square? •What is the difference between a rhombus and a square? Discussion of topic through Collaborative Learning: <u>15 min</u> <u>Inquiry based learning</u> (Critical Thinking and Problem Solving) Students would be asked to write difference between different types of parallelogram on the basis of diagonals.. The facilitator would take rounds and ensure that each learner is engaged. Guided practice: <u>10 min</u> The students will solve the questions from NCERT book, solved examples before Ex 8.1 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 8.1 of NCERT text book. Closure: <u>5 min</u> 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	MCQ (5 minutes)
DAY	THREE
Objective	Develop ability to accurately identify the properties to prove a quadrilateral a parallelogram, square, rectangle or a rhombus and developing the art of communication and critical thinking.
Assessment of qualifying knowledge	Quiz and knowledge testing on how to prove a quadrilateral a parallelogram.
Learning Outcomes	<u>KNOWLEDGE</u>- Students will know and identify the types of parallelogram and criteria's needed to prove a parallelogram a rectangle, square and rhombus.

	<u>SKILLS and COMPETENCIES</u> Students would be able to Reason effectively and critically prove a quadrilateral parallelogram.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	<u>Dimensions used : (D3, D1)</u> <u>Strategy used : Round the table</u> Transaction would proceed in the following manner- Anticipatory Set: 10 min Facilitator will ask few questions to introduce the topic • What is the difference between a rectangle and square? • What is the difference between a rhombus and a square? Discussion of topic through Collaborative Learning: 15 min <u>Inquiry based learning</u> (Critical Thinking and Problem Solving) Students would be asked to write difference between different types of parallelogram on the basis of diagonals.. 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 8.1 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 8.1 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 • CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks.
Assessments	MCQ (5 minutes)
DAY	FOUR
Objective	Develop ability to accurately verify Midpoint theorem and developing the art of communication and critical thinking.
Assessment of qualifying knowledge	Quiz and knowledge testing on how to prove triangles congruent.
Learning Outcomes	<u>KNOWLEDGE</u>- Students will know and verify midpoint theorem. <u>SKILLS and COMPETENCIES</u> Students would be able to Reason effectively and critically verify midpoint theorem and its converse.
Transaction Methodology	<u>Dimensions used : (D2, D3)</u> <u>Strategy used : Inductive reasoning</u>

(The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Anticipatory Set: <u>10 min</u> Facilitator will ask few questions to introduce the topic • State mid point theorem. • State the converse of midpoint theorem. Discussion of topic through Collaborative Learning: <u>15 min</u> <u>Inquiry based learning</u> (Critical Thinking and Problem Solving) Students would be asked to verify midpoint theorem by paper cutting and pasting method. The facilitator would take rounds and ensure that each learner is engaged. Guided practice: <u>10 min</u> The students will solve the questions from NCERT book, solved examples before Ex 8.2 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. Independent Practice: Students will go through the solved examples before Ex 8.2 of NCERT text book. Closure: <u>5 min</u> 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	MCQ (5 minutes)
DAY	FIVE
Objective	Enhance ability to accurately prove Midpoint theorem and its converse and developing the art of communication and critical thinking.
Assessment of qualifying knowledge	Quiz and knowledge testing on how to prove triangles congruent.
Learning Outcomes	<u>KNOWLEDGE</u>- Students will know and verify midpoint theorem. <u>SKILLS and COMPETENCIES</u> Students would be able to Reason effectively and critically verify midpoint theorem and its converse.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	<u>Dimensions used : (D3, D1)</u> <u>Strategy used : Muddiest point discussion,</u> Transaction would proceed in the following manner- Anticipatory Set: <u>10 min</u> Facilitator will ask few questions to introduce the topic • State mid point theorem. • State the converse of midpoint theorem. Discussion of topic through Collaborative Learning: <u>15 min</u>

	<u>Inquiry based learning</u> (Critical Thinking and Problem Solving) Students would be asked to prove midpoint theorem. 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 8.2 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. Independent Practice: Students will go through the solved examples before Ex 8.2 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 • CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks.
Assessments	MCQ (5 minutes)
DAY	SIX
Objective	Enhance ability to accurately prove that the quadrilateral joining the midpoints of the sides of a quadrilateral is parallelogram and developing the art of communication and critical thinking.
Assessment of qualifying knowledge	Quiz and knowledge testing on how to use mid point theorem.
Learning Outcomes	<u>KNOWLEDGE</u>- Students will know and apply midpoint theorem. <u>SKILLS and COMPETENCIES</u> Students would be able to Reason effectively and critically verify midpoint theorem and its converse.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	<u>Dimensions used : (D1, D3)</u> <u>Strategy used : creative thinking</u> Transaction would proceed in the following manner- Anticipatory Set: 10 min Facilitator will ask few questions to introduce the topic • State mid point theorem. • State the converse of midpoint theorem. Discussion of topic through Collaborative Learning: 15 min <u>Inquiry based learning</u> (Critical Thinking and Problem Solving) Students would be asked to prove midpoint theorem. 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 8.2 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. Independent Practice: Students will go through the solved examples before Ex

	8.2of 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 • CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks.
Assessments	MCQ (5 minutes)
DAY	SEVEN
Objective	Enhance ability to accurately prove that the quadrilateral joining the midpoints of the sides of a RECTANGLE is rhombus .and developing the art of communication and critical thinking.
Assessment of qualifying knowledge	Quiz and knowledge testing on how to use mid point theorem.
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and apply midpoint theorem.</i> <u>SKILLS and COMPETENCIES</u><i>Students would be able to Reason effectively and critically verify midpoint theorem and its converse.</i>
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Dimensions used : (D3, D1) Strategy used : Deductive reasoning Transaction would proceed in the following manner- Anticipatory Set: 10 min Facilitator will ask few questions to introduce the topic • State mid point theorem. • State the converse of midpoint theorem. Discussion of topic through Collaborative Learning: 15 min <u>Inquiry based learning</u> (Critical Thinking and Problem Solving) Students would be asked to prove midpoint theorem. 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 8.2 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. Independent Practice: Students will go through the solved examples before Ex 8.2of 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 • CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks.
Assessments	MCQ (5 minutes)
DAY	EIGHT
Objective	Enhance ability to accurately prove that the quadrilateral joining the midpoints of the sides of rhombus is a rectangle .and developing the art of communication and critical thinking.
Assessment of qualifying knowledge	Quiz and knowledge testing on how to use mid point theorem.
Learning Outcomes	<u>KNOWLEDGE</u> - Students will know and apply midpoint theorem. <u>SKILLS and COMPETENCIES</u> Students would be able to Reason effectively and critically verify midpoint theorem and its converse.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	<u>Dimensions used : (D1, D2)</u> <u>Strategy used : Muddiest point discussion, jigsaw</u> Transaction would proceed in the following manner- <u>Anticipatory Set: 10 min</u> Facilitator will ask few questions to introduce the topic • State properties of rectangle. • What are the properties of a rhombus? <u>Discussion of topic through Collaborative Learning: 15 min</u> <u>Inquiry based learning</u> (Critical Thinking and Problem Solving) Students would be asked to prove that the quadrilateral joining the midpoints of a rectangle is rhombus. The facilitator would take rounds and ensure that each learner is engaged. <u>Guided practice: 10 min</u> The students will solve the questions from NCERT book, solved examples before Ex 8.2 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. <u>Independent Practice:</u> Students will go through the solved examples before Ex 8.2 of NCERT text book. <u>Closure: 5 min</u> 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	MCQ (5 minutes)
DAY	NINE
Objective	Enhance ability to accurately apply converse of midpoint theorem .and developing the art of communication and critical thinking.
Assessment of qualifying knowledge	Quiz and knowledge testing on how to use converse midpoint theorem.
Learning Outcomes	<u>KNOWLEDGE</u>- Students will know and apply midpoint theorem. <u>SKILLS and COMPETENCIES</u> Students would be able to Reason effectively and critically apply converse of midpoint theorem.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	<u>Dimensions used : (D1, D2)</u> <u>Strategy used : one minute test</u> Transaction would proceed in the following manner- Anticipatory Set: 10 min Facilitator will ask few questions to introduce the topic • What does converse of midpoint theorem state? • What is the meaning of trisect? <u>Discussion of topic through Collaborative Learning: 15 min</u> <u>Inquiry based learning</u> (Critical Thinking and Problem Solving) Students would be asked to apply converse of midpoint theorem. The facilitator would take rounds and ensure that each learner is engaged. <u>Guided practice: 10 min</u> The students will solve the questions from NCERT book, solved examples before Ex 8.2 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. <u>Independent Practice:</u> Students will go through the solved examples before Ex 8.2 of NCERT text book. <u>Closure: 5 min</u> 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	<u>Independent Practice:</u> Students would do the given questions in their H.W. notebooks.
Assessments	MCQ (5 minutes)
DAY	TEN
Objective	Enhance ability to accurately prove various questions based on midpoint theorem and developing the art of communication and critical thinking.
Assessment of qualifying	Quiz and knowledge testing on how to use converse midpoint theorem.

knowledge	
Learning Outcomes	<u>KNOWLEDGE</u>- Students will know and apply midpoint theorem. <u>SKILLS and COMPETENCIES</u> Students would be able to Reason effectively and critically apply converse of midpoint theorem.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	<u>Dimensions used : (D1, D2)</u> <u>Strategy used : Muddiest point discussion, jigsaw</u> Transaction would proceed in the following manner- <u>Anticipatory Set: 10 min</u> Facilitator will ask few questions to introduce the topic • What does converse of midpoint theorem state? • What is the meaning of trisect? <u>Discussion of topic through Collaborative Learning: 15 min</u> <u>Inquiry based learning</u> (Critical Thinking and Problem Solving) Students would be asked to apply converse of midpoint theorem. The facilitator would take rounds and ensure that each learner is engaged. <u>Guided practice: 10 min</u> The students will solve the questions from NCERT book, solved examples before Ex 8.2 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. <u>Independent Practice:</u> Students will go through the solved examples before Ex 8.2 of NCERT text book. <u>Closure: 5 min</u> A short oral test would be taken to check proper assimilation of the topic discussed.