

CLASS – IX
LESSON PLAN
CHAPTER-7: TRIANGLES

Unit	Geometry (Chapter 6: Triangles)
Class Transaction	Total: 15 periods (approx. 40 min each)
Pre-requisite for the course	This lesson requires 1. Basic knowledge of congruency and congruent figures. 2. Knowledge of various parts of a triangle. 3. Knowledge of types of triangles. 4. Knowledge of relation between exterior and interior of a triangle.
Assessment of qualifying knowledge	1. Written test 2. Lab activity 3. Group Discussion 4. HW notebook
Objective	Students will know in detail about the congruence of triangles, would be able to identify the rules of congruence while proving the 2 triangles to be congruent, will learn more properties of triangles and inequalities in a triangle. , thereby inculcating competencies like collaboration, critical thinking and creativity
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will develop the ability to understand</i> 1. Congruence of triangles. 2. Criteria for congruence of triangles. 3. Some properties of triangles. 4. Inequalities in a triangle. <u>SKILLS and COMPETENCIES</u>-<i>Students would be able to</i> 1. Locate and identify the various criteria for the congruency. 2. Prove the A-S-A criteria of congruency of triangles. 3. Analyze the various criteria to check whether the given pair of triangles is congruent or not. 4. Use the rules of congruency in combination figures involving triangles. 5. Use the property of inequalities of triangles to solve geometrical problems thus, develop critical thinking and collaboration in the process
Transaction Methodology (The teacher can	Strategies Used : Inductive Deductive Reasoning, Graphic Organizers, Think, pair and share, muddiest point discussion Dimensions of Learning : D1, D2, D3

use the mentioned techniques, wherever applicable, and can use any other too.)	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 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	- In ΔPQR, $\angle Q = 40^\circ$ and $PQ = PR$. Find $\angle P$ and $\angle R$. - In triangle QSR sides SQ and RS are produced to points T and P resp. $\angle TQR = 125^\circ$ & $\angle PSQ = 100^\circ$ find $\angle SRQ$ - Prove that sides opposite to equal angles of triangle are equal. - Prove that the angles opposite to equal sides of triangle are equal. - PQR is a triangle in which $PQ = PR$ and S is any point on the side PQ. Through S, a line is drawn parallel to QR and intersecting PR at T. Prove that $PS = PT$.

DAY	ONE
Objective	Enhance ability to accurately recognize and use appropriate terminology related to triangles and developing the art of communication and critical thinking.
Assessment of qualifying knowledge	Quiz and knowledge testing on triangles and its properties.
Learning Outcomes	<u>KNOWLEDGE</u>- Students will know and identify triangles, and its properties. <u>SKILLS and COMPETENCIES</u> Students would be able to Reason effectively and critically examine about the congruence of triangles, rules of congruence, some more properties of triangles.
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- Anticipatory Set: 10 min Facilitator will ask few questions to introduce the topic • What is a triangle? • What is congruence? • Find numerous examples where congruence of objects is applied in daily life situations.? Discussion of topic through Collaborative Learning: 15 min <u>Inquiry based learning</u> (Critical Thinking and Problem Solving) Students would be asked to draw two plane figures of the same dimensions and place one on the other, then they shall critically examine congruence of plane figures. 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 7.1 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 7.1 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 identify the SAS and ASA Criteria for Congruence of Triangles, incollaborative manner .
Assessment of qualifying knowledge	Written questions on Congruence of Triangles using SAS and ASA congruence rule.
Learning Outcomes	<u>KNOWLEDGE</u>- Students will know and Demonstrate the ability to find correct Criteria for Congruence of Triangles, incollaborative manner. <u>SKILLS and COMPETENCIES</u>- Students will be able to differentiate and classify various types of correct Criteria for Congruence of Triangles, 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, Think, pair and share 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 various equality of relations between corresponding parts of triangles and will be able to realize the fact that in congruent triangles corresponding parts are equal and we write in short 'CPCT' for corresponding parts of congruent triangles. Guided practice: 15 min The students, with the help of the facilitator, will solve the questions from NCERT book of Exercise – 7.1 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 7.1 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 1. 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 solve the questions of Ex- 7.1 based on Congruence of Triangles
Assessment of qualifying knowledge	Written questions on inserting rational numbers between two rational numbers and other operations on rational numbers.
Learning Outcomes	<u>KNOWLEDGE</u>- Students will develop the ability to understand the relationship between corresponding parts of congruent triangles. <u>SKILLS and COMPETENCIES</u> - Students would be able to critically apply the concepts in given situations and collaboratively realize the fact that triangle can be proved to be congruent using ASA and SAS congruence rule. 2. Comprehend that not every pair of triangles can be congruent.
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) Exercise 7.1 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 – 7.1 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 7.1 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	MCQ (5 minutes)
DAY	FOUR
Objective	To understand and apply the studied results to study some properties related to a triangle whose two sides are equal.
Assessment of qualifying knowledge	Written test on identifying whether the given triangle is isosceles or equilateral.
Learning Outcomes	<u>KNOWLEDGE</u> - Students will develop the ability to understand the

	angles opposite to the equal sides of isosceles triangles are equal.. SKILLS and COMPETENCIES - <i>Students would be able to</i> 1. Critically apply the concepts in given situations and collaboratively realize the fact Angles opposite to equal sides of an isosceles triangle are equal and The sides opposite to equal angles of a triangle are equal.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Strategies Used : Inductive Deductive Reasoning, Graphic Organizers, Think, pair and share Dimensions of Learning : D1, D3 Transaction would proceed in the following manner- Recapitulation: 5 min Quick revision on the previous concept would be taken up. Discussion of topic through Collaborative Learning: 15 min (Creativity, Collaboration) properties related to a triangle whose two sides are equal would be introduced to students. They will know how Angles opposite to equal sides of an isosceles triangle are equal and The sides opposite to equal angles of a triangle are equal. This would be discussed in detail with vivid examples. Guided Practice: 15 min The students will solve the questions from NCERT book, solved examples before Ex 7.2 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 find various activities related to isosceles triangle in view of its definition. Closure: 5 min Discussion of muddiest point. .
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	FIVE
Objective	To solve the questions of Ex- 7.2 based on Properties of a Triangle
Assessment of qualifying knowledge	Written questions on Properties of an isosceles Triangle.
Learning Outcomes	KNOWLEDGE- <i>Students will develop the ability to understand that in each isosceles triangle, the angles opposite to the equal sides are equal and the converse also stands true.</i> SKILLS and COMPETENCIES - <i>Students would be able to Comprehend the various results related to isosceles triangle, through collaborative learning</i>

	process.
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) Exercise 7.2 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 – 7.2 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 7.2 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	MCQ (5 minutes)
DAY	SIX
Objective	To study some More Criteria for Congruence of Triangles
Assessment of qualifying knowledge	Written test on drawing congruent triangle and assessing the correct congruence rule.
Learning Outcomes	<u>KNOWLEDGE-</u> <i>Students will know and understand</i> 1. equality of three sides of one triangle to three sides of another triangle is enough for congruence of the two triangles. <u>SKILLS and COMPETENCIES</u> - <i>Students would be able to</i> 1. Apply the given knowledge with 100 % accuracy 2. Creatively construct two triangles with equal corresponding sides.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can	Strategies Used : Inductive Deductive Reasoning, Think, pair and share Dimensions of Learning : D1, D3 Transaction would proceed in the following manner- Recapitulation: 5 min Oral test would be taken.

use any other too.)	Discussion of topic through Collaborative Learning: <u>15 min</u> (Critical Thinking) Construct two triangles with equal corresponding sides The two triangles cover each other completely and so they are congruent. Repeat this activity with other pairs of right triangles. Guided Practice: <u>15 min</u> The students will solve the questions from NCERT book of Exercise – 7.3 in their notebook in the class with the help of their facilitator. Independent Practice: Students will complete the remaining HW parts given in the monthly planner of Exercise 7.3 in their Math HW notebook. Closure: <u>5 min</u> Summarization, preferably by a student, 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	SEVEN
Objective	To study some More Criteria for Congruence of Triangles
Assessment of qualifying knowledge	Written test on drawing congruent triangle and assessing the correct congruence rule.
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and understand</i> 1. right triangles are congruent if one pair of sides and the hypotenuse are equal. <u>SKILLS and COMPETENCIES</u> - <i>Students would be able to</i> 1. Use appropriate congruence rule to show the triangles are congruent.
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: <u>5 min</u> Warming session would be taken. Discussion of topic through Collaborative Learning: <u>15 min</u> (Critical thinking, communication) Solved examples from the book would be taken up. Brainstorming on classification of congruence rules would be done. Guided Practice: <u>20 min</u> The students will solve the questions from NCERT book of Exercise – 7.3 in their notebook in the class with the help of their facilitator. The facilitator would explain the questions from Ex 7.3 with a collaborative approach towards them. Independent Practice: Students will complete the remaining HW parts

	given in the monthly planner of Exercise 7.3 in their Math HW notebook. Closure: 5 min Summarization, preferably by a student, 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	EIGHT
Objective	To solve the questions of Ex- 7.3 based on more Criteria for Congruence of Triangles
Assessment of qualifying knowledge	Written test on SSS and RHS congruence rule.
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and understand</i> - Angles opposite to equal sides of a triangle are equal. - Sides opposite to equal angles of a triangle are equal. - Each angle of an equilateral triangle is of 60°.. <u>SKILLS and COMPETENCIES</u> - <i>Students would be able to</i> Critically visualize the representation of congruence of triangles using different congruence rules.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Strategies Used : Inductive Deductive Reasoning, Graphic Organizers, Think, pair and share Dimensions of Learning : D1, D3 Transaction would proceed in the following manner- Recapitulation: 5 min Warming session would be taken. Discussion of topic through Collaborative Learning: 15 min (Critical thinking, communication) Solved examples from the book would be taken up. Brainstorming on classification of congruence rules would be done. Guided Practice: 20 min The students will solve the questions from NCERT book of Exercise – 7.3 in their notebook in the class with the help of their facilitator. The facilitator would explain the questions from Ex 7.3 with a collaborative approach towards them. Independent Practice: Students will complete the remaining HW parts given in the monthly planner of Exercise 7.3 in their Math HW notebook. Closure: 5 min Summarization, preferably by a student, 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	NINE
Objective	To study about Inequalities in a Triangle
Assessment of qualifying knowledge	Oral test on congruence of triangles using different congruence rules..
Learning Outcomes	<u>KNOWLEDGE</u>- Students will know and criticallyexamine whether there is any relation between unequal sides and unequal angles of a triangle. <u>SKILLS and COMPETENCIES</u> - Students would be able to 2. Apply critically the knowledge meaningfully and creatively. 3. Develop various techniques to prove results related to Inequalities in a 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, Think, pair and share Dimensions of Learning : D1, D2 Transaction would proceed in the following manner- Recapitulation: 5 min Oral test would be taken. Discussion of topic through Collaborative Learning: 10 min (Communication and critical thinking) Solved examples from the book would be taken up. Mind mapping would be used and would discuss different questions Guided Practice: 20 min The teacher, as a facilitator, would explain examples from Ex 7.4 would be taken up and collaborative approach towards them so that the facilitator would help them with their doubts. Independent Practice: Students will complete the remaining HW parts given in the monthly planner of Exercise 7.4 in their Math HW notebook. Closure: 5 min Summarization, preferably by a student, 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	TEN
Objective	To solve the questions from NCERT book of Exercise – 7.4
Assessment of qualifying knowledge	MCQ test on Inequalities in a Triangle. Apply the knowledge meaningfully and creatively

Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and understand</i> 1. Inequalities in a Triangle. <u>SKILLS and COMPETENCIES</u> - <i>Students would be able to</i> 4. Develop various techniques to produce more and more different proves of the results creatively
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 Warming session would be taken. Discussion of topic through Collaborative Learning: 15 min (Critical thinking, communication) Solved examples from the book would be taken up. Brainstorming on classification of congruence rules would be done. Guided Practice: 20 min The students will solve the questions from NCERT book of Exercise – 7.4 in their notebook in the class with the help of their facilitator. The facilitator would explain the questions from Ex 7.4 with a collaborative approach towards them. Independent Practice: Students will complete the remaining HW parts given in the monthly planner of Exercise 7.4 in their Math HW notebook. Closure: 5 min Summarization, preferably by a student, 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 test (5 minutes)