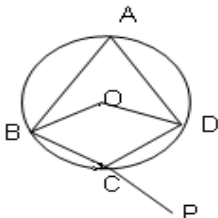


CLASS – IX
LESSON PLAN
CHAPTER-10 ; CIRCLES

Unit	Circles (Chapter 10: CIRCLES)
Class Transaction	Total: 8 periods (approx. 40 min each)
Pre-requisite for the course	This lesson requires 1. Basic knowledge of terms related to circles. 2. Knowledge of congruent figures. 3. Knowledge of basic geometrical terms like perpendicular.
Assessment of qualifying knowledge	1. Written test 2. Lab activity 3. HW notebook
Objective	Students would be able to recall terms related to circles, to understand the properties of circles. To understand different properties of circles with proofs and verification through hands on activities thereby inculcating competencies like collaboration, critical thinking and creativity
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will develop the ability to understand</i> 1. The method of finding unknown angles in the circle using properties. 2. The strategy to prove a given quadrilateral cyclic. <u>SKILLS and COMPETENCIES</u>-<i>Students would be able to</i> 1. Develop the ability to find unknown angles using different properties of circles. 2. Solve real life situation base questions such question on David, syed and Ankur and develop critical thinking and collaboration in the process.
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, learning by doing, circle the sage 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 given questions in their H.W. notebooks. H.W. 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, 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 - Encourage and motivate them at every level.

Marks	The weightage would be given by CBSE.
Assessment Questions	1. AC and BD are chords of a circle which bisect each other. Prove that AC and BD are diameters of the circle and ABCD is a rectangle. 2. Distance of chord AB from the centre is 12 cm and length of the chord is 10 cm. Then find the diameter. 3. AB and CD are parallel chords of a circle whose centre is O and radius 20cm. If AB = 24cm and CD = 32cm, find the distance between AB and CD when it is given that they lie on the opposite sides of the centre O. 4. In the given figure, O is the centre of the circle. The angle subtended by the arc BCD at the centre is 140°. Find $\angle BAD$ and $\angle DCP$  5. If two circles intersect at two points, prove that the line through the centre is perpendicular bisector of the common chord.

DAY	ONE
Objective	Enhance ability to accurately recognize and use appropriate terminology related to circles and developing the art of communication and critical thinking.
Assessment of qualifying knowledge	Quiz and knowledge testing on terms related to circles.
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and define terms related to circles.</i> <u>SKILLS and COMPETENCIES</u> <i>Students would be able to Reason effectively and critically prove that congruent circles have equal angles at the centre made by the equal chords.</i>
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 Dimensions of learning : D1, D3 Transaction would proceed in the following manner- Anticipatory Set: <u>10 min</u> Facilitator will ask few questions to introduce the topic • What is a circle? • What is a sector? • What are segments? • What is the circumference of a circle? • What is the Difference between an chord and a tangent? • How many maximum points are in common between any two intersecting circles? • What is the name of the chord passing through the centre? 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 define and draw different terms related to circles. 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 10.1 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 10.1 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

	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 difference between various types of numbers and would also be able to plot natural and decimal numbers on the number line in collaborative manner .
Assessment of qualifying knowledge	Draw a figure of circle with all parts such as sector , segment, arc, chord ,radius and diameter asked them to draw in their notebooks and label them.
Learning Outcomes	<u>KNOWLEDGE</u>- Students will know and Demonstrate the ability to define terms related to circles. <u>SKILLS and COMPETENCIES</u>- Students will be able to define and explain with examples related to circles, 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 and graphic organizers 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 define and show various terms related to circles. Guided practice: 15 min The students, with the help of the facilitator, will solve the questions from NCERT book of Exercise – 10.2 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 10.2in 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 understand theorems based on perpendicular from the centre of a circle to

	the chord .
Assessment of qualifying knowledge	Writing questions to find the length of chord and distance between the chord and the centre.
Learning Outcomes	<u>KNOWLEDGE</u>- Students will develop the ability to understand the Property of the perpendicular from the centre of the circle to the chord. <u>SKILLS and COMPETENCIES</u> - Students would be able to critically apply the concepts in given situations and collaboratively realize the fact that if two circles intersect at two points , prove that their centres lie on the perpendicular bisector of the common chord.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Strategies used :Inductive Deductive reasoning and Four corners 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 10.3 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 – 10.3 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 10.3 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 1. 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 that equal chords are equidistant from the centre and chords equidistant from the centre are equal.
Assessment of qualifying knowledge	Written test on finding the length of the chord if the length of another chord is given and distance of the two chords from the centre is same.
Learning Outcomes	<u>KNOWLEDGE</u> - Students will develop the ability to understand the

	Relationship between the length of the chord and the distance of the chord from the centre. <u>SKILLS and COMPETENCIES</u> - <i>Students would be able to</i> 1. Critically apply the concepts in given situations and collaboratively realize the fact that equal chords are equidistant from the centre and chords equidistant from the centre are equal.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Strategies used :Circle the sage Dimensions of learning : D1, D2, 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) Students will understand the relation between the length of the chord and its distance from the centre. Guided Practice: 15 min The students will solve the questions from NCERT book, solved examples before Ex 10.4 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 irrational numbers in view of its definition. Closure: 5 min Discussion of muddiest point. .
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	Written test (5 minutes)
DAY	FIVE
Objective	To understand the use of equal chord theorem in solving questions related to real-life examples.
Assessment of qualifying knowledge	Fill in the blank type question on above mentioned theorem.
Learning Outcomes	<u>KNOWLEDGE- s</u> <u>SKILLS and COMPETENCIES</u> - <i>Students would be able to</i>Comprehend that equal chords are equidistant from the centre and chords equidistant from the centre are equal. , through collaborative leaning process.
Transaction Methodology	Strategies used :Brain storming Dimensions of learning : D1, D2

(The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	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 (Critical Thinking, Collaboration) Irrational numbers would be introduced to students. They will know how rational numbers and irrational numbers are entirely different and collection of all rational numbers and irrational numbers is called Real numbers. 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 10.4 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 irrational numbers in view of its definition. Closure: 5 min Discussion of muddiest point. .
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	MCQ (5 minutes)
DAY	SEVEN
Objective	To understand that the angle made by an arc at centre is double the angle made by it on any other part of the remaining circle.
Assessment of qualifying knowledge	Written test on finding angle on any part of the circle if central angle is given.
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and understand</i> 1. Angle made by an arc at centre is double the angle made by it on any other part of the remaining circle. 2. Angles in the same segment are equal. 3. Angle in a semicircle is a right angle. <u>SKILLS and COMPETENCIES</u> - <i>Students would be able to</i> 1. Apply the given knowledge with 100 % accuracy 2. Critically find the unknown angles using above stated theorems of circle.
Transaction Methodology (The teacher can use the mentioned	Strategies used :Inductive Deductive reasoning and circle the sage Dimensions of learning : D1, D2 Transaction would proceed in the following manner- Recapitulation: 5 min

techniques, wherever applicable, and can use any other too.)	Oral test would be taken. Discussion of topic through Collaborative Learning: <u>15 min</u> (Critical Thinking) How to use properties of circles in finding unknown angles of the circles would be discussed in detail. Guided Practice: <u>15 min</u> The students will solve the questions from NCERT book of Exercise – 10.5 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 10.5 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 1. 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 from NCERT book of Exercise – 10.5
Assessment of qualifying knowledge	Written some simple questions to find unknown angles in a circle.
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and understand</i> 1. Definition of a cyclic quadrilateral 2. Opposite angles of cyclic quadrilateral are supplementary. <u>SKILLS and COMPETENCIES</u> - <i>Students would be able to</i> 1. Use property of cyclic quadrilateral to prove that the given figure is cyclic.
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 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 real number as rational and irrational would be done. Guided Practice: <u>20 min</u> The students will solve the questions from NCERT book of Exercise – 10.5 in their notebook in the class with the help of their facilitator. The facilitator would explain the questions from Ex 10.5 with a collaborative approach towards them.

	Independent Practice: Students will complete the remaining HW parts given in the monthly planner of Exercise 10.5 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 1. 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	SIX
Objective	To verify that the angle made by an arc at the centre is double the angle made by it on any other part of the circle by paper cutting and pasting method.
Assessment of qualifying knowledge	Written some simple questions to find unknown angles in a circle.
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and understand</i> 1. Degree measure theorem <u>SKILLS and COMPETENCIES</u> - <i>Students would be able to</i> 1. Use creativity to show angle made by an arc at the centre is double the angle made by it on any other part of the circle
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Strategies used :learning by doing Dimensions of learning : D1, D2, 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 finding unknown angles of the circle. Guided Practice: 20 min The students will verify by hands on activity that central angle is double the angle made on any other part. The facilitator would explain the activity by adopting collaborative approach towards them. Independent Practice: Students will complete the written part 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 1. 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)