

Class	Subject	Time Slot	Lesson	Topic P1
IX	Maths	35 Mins 1 Pd	Circles	Introduction & Recall of Circle and related terms <i>Angle Subtended by a Chord at a Point</i>

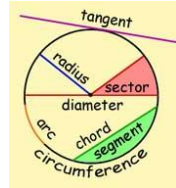
Expected Learning Outcome : The learners will be able to :

- Identify circular objects present in the surroundings.
- Define circle and all the basic terms of circles and apply in real life situations.
- Prove that equal chords of a circle subtend equal angles at the centre and vice versa and apply the concept in practical situations.

Expected skill development:

- Identification skills while identifying different parts of circles
- Logical thinking, Mathematical Skills.
- Computational Skills and Thinking skills while proving different statements.
- Representation skill while drawing the figure as per the requirement of the question.

FLOW OF LESSON WITH RESPECT TO TIME (Introduction/warm-up, Content, Think Line, Closure)

Pedagogy	Content
(15 Mins) Warm Up Facilitator will ask: - Identify circular shapes from surroundings and define circle. - Identify different parts of circle and define them Facilitator will draw a circle on the board.	Circle is the set of all points in a plane that are equidistant from a given point in the plane known as the centre of the circle. Learners will make the diagram in their notebooks.  The terms related to the circle will be discussed by interactive method. Learner will be asked to write the information in copy. (i) Centre The <i>center</i> of a circle is a fixed point within the circle from which all the points of the closing curve are equidistant.

Facilitator will check the understanding of the learners through the following questions:

EXERCISE 10.1

1. Fill in the blanks:

- (i) The centre of a circle lies in _____ of the circle. (exterior/ interior)
- (ii) A point, whose distance from the centre of a circle is greater than its radius lies in _____ of the circle. (exterior/ interior)
- (iii) The longest chord of a circle is a _____ of the circle.
- (iv) An arc is a _____ when its ends are the ends of a diameter.
- (v) Segment of a circle is the region between an arc and _____ of the circle.
- (vi) A circle divides the plane, on which it lies, in _____ parts.

2. Write True or False: Give reasons for your answers.

- (i) Line segment joining the centre to any point on the circle is a radius of the circle.
- (ii) A circle has only finite number of equal chords.
- (iii) If a circle is divided into three equal arcs, each is a major arc.
- (iv) A chord of a circle, which is twice as long as its radius, is a diameter of the circle.
- (v) Sector is the region between the chord and its corresponding arc.
- (vi) A circle is a plane figure.

(ii) Circumference:

The curve which closes a circle is called its circumference. The length of the *circumference* is called the length of the circle.

(iii) Radius:

The distance from the centre to any point on the circumference of a circle is called the *radius* of the circle. The symbol of the radius is *r*.

(iv) Diameter:

The line segment passing through the centre and meeting the points on circumference is called the diameter of the circle. It is denoted by 'D'.

(v) Chord:

The line segment joining the two ends of an arc known as chord. A diameter is the longest chord.

(vi) Arc:

Any part of the circumference is called an arc of the circle.

(vii) Sector:

The part of a circle enclosed by two radii of a circle and an arc.

(viii) Segment:

Part of a circle bounded by a chord and corresponding arc.

(ix) Semi – Circle:

It is an arc whose end points are endpoints of a diameter.

(20 mins) demonstration by Facilitator on board

Thinkline:

Facilitator will ask:

- What is the relationship between the size of the chord and the angles subtended by it at the centre?
- What will happen if you take two equal chords of a circle? Will the angles subtended at the centre be the same or not?

Facilitator will give proof of this fact on Black Board

Thinkline :

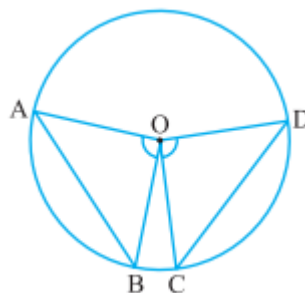
Can you show equal parts of two congruent circle subtend equal angles at the center.

Response by Learners:

- The longer is the chord, the bigger will be the angle subtended by it at the center.
- The angles subtended by them at the centre are equal.

Theorem 10.1 : *Equal chords of a circle subtend equal angles at the centre*

In triangles AOB and COD



$OA = OC$ (Radii of a circle)

$OB = OD$ (Radii of a circle)

$AB = CD$ (Given)

$\Delta AOB \cong \Delta COD$ (SSS rule)

$\angle AOB = \angle COD$ (cpct)

Proposed Questions (must include the questions asked in the classroom and the ones given as class-work in the notebook)

Prove that – If the angles subtended by the chords of a circle at centre are equal, then the chords are equal and vice versa.

Evaluation/Assessment: Peer discussion will be done. Teacher will assess the children randomly and also through student teacher interaction.

Learners on the way Identify different parts of the circle.	Advanced Learners Prove that – If the angles subtended by the chords of a circle at the centre are equal, then the chords are equal.
Materials needed/Resources: Chalk, blackboard, duster, NCERT Text Book.	
Common Misconceptions: Difficulty in identifying the angles subtended by the chord and angle subtended by some part of chord.	Addressing the Misconceptions: By drawing different chords of a circle and angles subtended by them at the centre and on circumference.

Home Assignment:

1. Recall that two circles are congruent if they have the same radii. Prove that equal chords of congruent circles subtend equal angles at their centres.
2. Prove that if chords of congruent circles subtend equal angles at their centres, then the chords are equal.