Vision Empower & XRCVC Teacher Instruction KIT Circles

Syllabus: Karnataka State Board Subject: Math Grade: 5 Textbook Name: Karnataka State Board Chapter Number & Name: 7.Circles

1. OVERVIEW

1.1 OBJECTIVE & PREREQUISITES

Objective

- To get familiar with geometrical instruments, and when and where to use those instruments.
- To understand the meaning/concept of a circle and construct circles of different measurements.

Prerequisite Concept

• Shapes *TIK_MATH_G4_CH18_Solids*

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Kindly Note: Activities marked with * are mandatory

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name : Circles

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2. LEARN

2.1 KEY POINTS

- Circle: A circle is the locus of all points equidistant from a central point.
- Radius: Distance from center of circle to any point on it.

2.2 LEARN MORE

3. ENGAGE

3.1 INTEREST GENERATION ACTIVITY

CIRCULAR OBJECTS

Activity 1: To collect circular objects Materials required: Bangles, plates, coin, geometry kit, parchment paper. Prerequisites: To know circular shape

Activity Flow

Ask the students to collect all circular objects from their surroundings.

Then discuss the following questions,

1. Why are all wheels of circular shape?

Answer: The circular shape of wheels and tires ensure that the vehicle can move fast. Wheels help the car move by rolling smoothly and without much drag. Their circular shape is the most appropriate one as they maintain a uniform and smooth contact with the surface. This constant contact with the road surface provides the wheels and tires with grip and traction that other shapes just can't.

Any other shape other than round, such as triangular, square, or rectangular, has edges that would dig into the road. This would make the vehicle rather slow; not to mention they would increase the rolling resistance.

2. If there are circular objects of different sizes, what is it that makes a difference in size of circular shape?

Answer: Let the students think and ask them to answer at the end of this chapter.

3. Use Circular objects like bangles, plate, and coin and draw circles. Identify the centre of these circles. Can you exactly locate the centres of these circles?

Answer: No.

3.2 CONCEPT INTRODUCTION ACTIVITIES

GEOMETRICAL INSTRUMENTS

Activity 2: Introducing geometrical instruments

Materials required: Geometry kit (tactile ruler, divider, compasses, protractor, set squares), stylus, rubber board, parchment paper and push pins. Prerequisites: None

Activity Flow

Explain to the students the purpose of the geometrical instrument box consisting of different instruments which help us to construct different geometrical figures.

Tactile ruler:

- 1. To draw straight lines and line segments.
- 2. To measure the length of the line segment.

Dividers: To measure the length of the line segment accurately.

Compasses: To construct the circle of given radius.

Protractor: To measure the angle.

Set squares:

- 1. To draw and measure the right angle.
- 2. To draw parallel lines and perpendicular lines.

Let children first touch and then use it to know how each of them works.

INTRODUCTION TO A CIRCLE

Activity 3: Introducing a circle

Materials required: Tactile diagram of a circle with radius, centre and 3 points marked on the circumference.

Prerequisites: Circular/round objects

Activity Flow

A circle is a closed plane figure. All the points on the circle are equidistant from a fixed point. This fixed point is called the centre of the circle. In the tactile diagram, O is called the centre of the circle. A is a point on the circle. In the same way B, C and D are also points on the circle. We can mark any number of points on the circle.

OA is a line segment which joins the centre O and the point A on the circle. OA is the radius of the circle.

Activity:

- Ask the students to join B, C and D to the centre of the circle. OB, OC and OD are radii of the circle.
- Then ask them to measure their length using a scale and write them.
 OA = ____ cm, OB = ___ cm, OC= ___ cm, OD= ___ cm.

Ask them, what do they observe from the measurements? Are all the radii of a circle equal? Yes, they are equal. Radius is denoted by the letter r.

Observe:

- 1. Every circle will have a centre and a definite measurement of the radius.
- 2. Centre and radius are not part of a circle. They specify the existence of the circle.

MAKING CIRCLES

Activity 4: Making circles

Materials required: Stylus, rubber board, parchment paper, thread, tactile ruler and push pins.

Prerequisites: To construct circle

Activity Flow

- First tie one side of the thread to a push pin and other side to the stylus, keep thread distance around 5 to 6 cm.
- Fix the pin in the middle of the transparent sheet, stretch the thread to its maximum length and then try making a circle by moving it round with the help of a stylus.
- After completing, ask the students where the centre of their circle is.
- Then tell them that where the pin is fixed is the centre. And thread distance between the centre of the circle and a point on the circle is radius which is always the same from centre to any point on the circle.
- Mark 2to 3 points on the circle and then ask them to measure the radius with the help of a tactile ruler.

CONSTRUCTION OF A CIRCLE USING COMPASSES

Activity 5: Construction of a circle using compasses

Materials required: Compasses, rubber board, parchment paper. Prerequisites: To construct circle

Activity Flow

- Fix the pencil on one side of the compass.
- Adjust the distance by using scale, keep one side/pointed side on scale, measure the distance.

Example: to measure radius 3 cm, put one end of the compasses at one edge of the scale and the other end at 3 cm on the ruler.

- Keep and fix the pointed end on the sheet which would be the centre of the circle and move the other end to draw the circle.
- Draw a line joining the centre and any point on the circle with the help of a tactile ruler and this line is the radius of that circle which would be of the same measurement 3 cm.
- After this, give them different radii and ask them to draw circles on the parchment paper.

3.3 LET'S DISCUSS: RELATE TO DAILY LIFE*

- We commonly use circles in wheels of vehicles, bangles, rings, architecture, art, design, toys, and vessels.
- Circle is a cross section of cylinder and sphere.

4. EXERCISES & REINFORCEMENT

4.1 PRACTICE EXERCISES

HOMEWORK PROBLEMS

Activity 6: Cutting spherical or cylindrical fruits

Materials required: Banana/apple/tomato, knife Prerequisites: To cut fruits

Activity Flow

Ask the students to slice a banana or apple or tomato cross sectionally and ask them to observe the shape they get. Then discuss in the class.

Note: The cross section of the cylinder or sphere will be a circle.

Activity 7: Homework problems

Materials required: Geometry kit, parchment paper Prerequisites: To construct circle Activity Flow

- 1. Construct circles with the following radii,
 - a) 2 cm
 - b) 2.5 cm
 - c) 3.2 cm
 - d) 3.7 cm.
- 2. Write true and false for the following statements.
 - a. Only one radius can be drawn to a circle.
 - b. All radii of a circle are equal.
 - c. There is only one centre for a circle.

4.2 IMPORTANT GUIDELINES*

Exercise Reading

It is very important that the children practice their learnings as well as their reading. Hence have the children read out the newly learned concepts from their textbooks or other available resources.

Perform Textbook Activity

It is good practice to have the children perform the textbook activities. Your textbook activities might not be accessible hence go through this resource to learn how to make textbook content accessible

Provide Homework

To evaluate their understanding and to help the student revise and implement the new learnt concept ensure to provide them with homework. Students should perform one or two of the questions mentioned above or from the textbook exercises with the teacher in Class and the remaining may be given for homework. Also, ensure that the student knows their special skills linked to independently using their accessible books as it will be critical to doing homework independently

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