

Vision Empower & XRCVC
Teacher Instruction KIT
Mensuration

Syllabus: Karnataka State Board
Subject: Mathematics
Grade: 6
Textbook Name: Math Text cum workbook
Chapter Number & Name: 10. Mensuration

1. OVERVIEW

1.1 OBJECTIVE AND PREREQUISITES

Objective

Students will be able to:

- find the perimeter and area of a square.
- find the perimeter and area of a rectangle
- find the perimeter and area of a triangle.

Prerequisite Concept

- Concept

TIK_MATH_G5_CH9_Perimeter and Area

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*Kindly Note: Activities marked with * are mandatory*

LEARN

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2. LEARN

2.1 KEY POINTS

Perimeter: The perimeter is the distance around the outer edge of a two-dimensional figure. To find the perimeter, you need to know the length of one or more sides, depending on the shape of the figure.

(a) Perimeter of a rectangle = $2 \times (\text{length} + \text{breadth})$

(b) Perimeter of a square = $4 \times \text{length of its side}$

(c) Perimeter of an equilateral triangle = $3 \times \text{length of a side}$

Area: Area is a measure of how much space there is on a flat surface. For example, in a rectangle we find the area by multiplying the length times the width.

(a) Area of a rectangle = $\text{length} \times \text{breadth}$

(b) Area of a square = $\text{side} \times \text{side}$

2.2 LEARN MORE

3. ENGAGE

3.1 INTEREST GENERATION ACTIVITY

Activity 1: Discussion

Materials Required: None

Prerequisites: None

Activity Flow

- *Tell the following scenario to the students.*
- *The custodians are considering painting our classroom next summer. In order to know how much paint they must buy, the custodians need to know the total surface area of the walls. Why do you think they need to know this, and how can we find the information?*
 - *Painting the wall means the custodians will paint the whole wall.*

- *All classroom walls are different. Taking overall measurements and then subtracting windows, doors, or other areas will give a good approximation. Based on that we can buy paint for the wall.*
- *Ask the students if anyone has known about fenced yards and ask them to think about how you might figure out how much fencing was required.*
- *What kind of measurement is needed for fencing a yard and to paint the whole wall?*

3.2 CONCEPT INTRODUCTION ACTIVITIES

Perimeter

Activity 2: Concept of Perimeter

Materials Required: Tactile ruler

Prerequisites: None

Activity Flow

- *Ask the students to measure the border or boundary of a book, Taylor frame and table.*
- *The total length of a book and Taylor frame is the perimeter. This distance is known as the perimeter of the closed figure.*
- *Give the examples, to understand the usage of finding perimeter.*
- *The idea of perimeter used in our daily life.*
 - *To fence a land to plot a crop.*
 - *To fence the garden.*
 - *To construct compounds for the school, house etc.*
 - *To construct a boundary for the lake.*
- *Similarly, ask them to give a few more examples of situations where they need to know the perimeter.*
- *Hence, in general Perimeter is the distance covered along the boundary forming a closed figure.*

Activity 3: Perimeter of Rectangle

Materials Required: Tactile ruler

Prerequisites: None

Activity Flow

- *Ask them to give examples for rectangular shapes which they can find in their surroundings.*
For example: Desk
- *Ask them if they want to know the perimeter of a desk, how will they find it?*

- Explain to the students that they can measure the perimeter of a rectangle by measuring the length of all sides and adding up all the length of four sides or measuring the length and breadth of the desk then add those values then multiplying the answer by 2, after which get the final answer which is the perimeter of the desk.
- Students know the property of the rectangle, it has two lengths and 2 breadths where opposite sides are equal.

$$\text{Perimeter of rectangle} = 2(\text{length} + \text{breadth}) = 2lb$$

Ask them which method they would find it easier and simple.

- Explain them the following practical applications of perimeter.
 - Dinesh's rectangular shaped field is 10 m long and 6 m wide. He wants to put a fence around the field to protect his field from animals. What is the total length of wire required to complete the boundary of the field?
 - Answer:
Total length = perimeter = $2(10 + 6) = 2 \times 16 = 32$ meter
The perimeter of a rectangular rug is 32 m. If the width of the rug is 8 m, what is the length of the rug?
 - Answer:
Length of the rug = $2(32 + 8) = 2(40) = 80$ m

Activity 4: Perimeter of Regular shapes

Materials Required: Geometry kit, parchment paper

Prerequisites: Perimeter of square and rectangle

Activity Flow

- Ask them to construct a regular polygon whose lengths of the sides are equal. Such as square, triangle, pentagon and hexagon. Then ask them to find the perimeter of all the shapes.

Examples:

a) The length of a side of a hexagon is 2 inches. What is the perimeter?
Hexagon. It means 6 equal sides.
 $\text{Perimeter} = 2 + 2 + 2 + 2 + 2 + 2 = 4 + 4 + 4 = 8 + 4 = 12$ inches

b) The perimeter of an equilateral triangle is 6 inches. What is the length of a side?
Equilateral. It means 3 equal sides.
 $\text{Perimeter} = 6 + 6 + 6 = 18$ inches

Area

Activity 5: Concept of an Area

Materials Required: Geometry kit, parchment paper

Prerequisites: None

Activity Flow

- *Ask them to keep 3 different belongings from their school bag on the desk and ask them which is the object that covers more space on the desk and well as the object which covers less space.*
- OR*
- *They can even trace those 3 different objects on parchment paper and know how much space each object covers.*
- *Through which explain the concept of an area which is defined as the amount of surface enclosed by a closed figure.*

Activity 6: Area of a Rectangle and Square

Materials Required: Tactile graph sheet, Bindi, Geometry kit and parchment paper.

Prerequisites: Concept of area

Activity Flow

- *Ask them to form a square, rectangle on a tactile graph sheet using bindis and if each square measures an area of 1 unit square then if square has 4 bindis then the area of a square is 4 unit square. And if we arrange two rows of three bindis will get a rectangle having 6 squares with bindis altogether and the area will be 6 square units.*
- *Similarly, ask the students to form different lengths of squares and rectangles and find the area.*
- *Ask the students to draw three different squares and rectangles of different lengths and let them find the area of those shapes.*
 - *Area of a square = side \times side*
 - *Area of rectangle = length \times breadth*
- *Example:*
 - *If a square is constructed having length of 5 cm in all the sides, then the area of square = $5 \times 5 = 25$ square centimetres.*
 - *If a rectangle is constructed having length of 6 cm and breadth of 4cm then the area of rectangle = $6 \times 4 = 24$ square centimetres.*
- *Ask them to solve the following problems.*
- *Find the areas of rectangles whose sides are:*
 - *3 cm and 4 cm*
 - *8 km and 5 km*

- *The area of rectangular carpet is 300 square metre and whose lengths are 30 metres. Find the width of the carpet.*

Area of the rectangular carpet is 300 square meter.

$$l \times b = \text{Area of the rectangular carpet}$$

$$l \times b = 300 \text{ square meter}$$

$$30 \text{ meter} \times b = 300 \text{ square meter}$$

$$b = 300 / 30 = 10 \text{ meter}$$

The length of the square handkerchief is 7 cm. Find the area of the kerchief.

- *Area of the square = side \times side*
- *Area of the square = 7 cm \times 7 cm = 49 square centimeter .*

3.3 LET'S DISCUSS: RELATE TO DAILY LIFE*

Need of perimeter in real life:

1. We often find the perimeter when putting up Christmas lights around the house.
2. Fencing off an area to plot a crop.
3. Area needs to be considered when covering an area with paint, carpet, tile, or wallpaper; wrapping a present.

4 EXERCISES & REINFORCEMENT

4.1 PRACTICE PROBLEMS

Activity 7: Practise and Recall

Materials Required: None

Prerequisites: Perimeter and Area of Square and Rectangle.

Activity Flow

1. *The lid of a rectangular box of sides 40 cm by 10 cm is sealed all round with tape. What is the length of the tape required?*
2. *What is the length of the wooden strip required to frame a photograph of length and breadth 32 cm and 21 cm respectively?*
3. *Find the perimeter of each of the following shapes :*
 - (a) *A triangle of sides 3 cm, 4 cm and 5 cm.*
 - (b) *An equilateral triangle of side 9 cm.*
 - (c) *An isosceles triangle with equal sides 8 cm each and third side 6 cm*
4. *Find the perimeter of a triangle with sides measuring 10 cm, 14 cm and 15 cm.*
5. *Find the perimeter of a regular hexagon with each side measuring 8 m.*
6. *Find the areas of the rectangles whose sides are :*
 - (a) *3 cm and 4 cm*

(b) 12 m and 21 m

(c) 2 km and 3 km

(d) 2 m and 70 cm

7. Find the areas of the squares whose sides are :

(a) 10 cm

(b) 14 cm

(c) 5 m

8. The length and breadth of three rectangles are as given below :

(a) 9 m and 6 m

(b) 17 m and 3 m

(c) 4 m and 14 m

Which one has the largest area and which one has the smallest?

9. The area of a rectangular garden 50 m long is 300 sq m. Find the width of the garden.

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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