Vision Empower & XRCVC

Teacher Instruction KIT

Three dimensional figures

Syllabus: Karnataka State Board
Subject: Math
Grade: 5
Textbook Name: Karnataka State Board
Chapter Number & Name: 19. Three dimensional figures

1. OVERVIEW

Objective

- To represent 3 dimensional figures as 2 dimensional figures and draw the elevation, plane and side view of the 3D geometrical figures.
- To draw geometrical sketches of cube, cylinder and cone with definite nets.

Prerequisite Concept

- Tangrams and designs

TIK_MATH_G4 _CH17_Tangrams and Designs

- Solids

TIK_MATH_G4 _CH18_Solids

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*Kindly Note: Activities marked with * are mandatory*

2. LEARN

2.1 KEY POINTS

Three dimensional figures: In geometry, a three-dimensional shape can be defined as a solid figure or an object or shape that has three dimensions – length, width and height. Unlike two-dimensional shapes, three-dimensional shapes have thickness or depth.

2.2 LEARN MORE

3 ENGAGE

3.1 INTEREST GENERATION ACTIVITY

Activity 1: Making Hat

Materials required: One KG cardboard, cotton, glue, and stapler

Prerequisites: To make shapes

Activity Flow

- *Draw and cut out a half-circle with a radius of 9-10 cm on red KG cardboard.*
- *Roll the half-circle and form a cone. Make the base wide enough to fit on your child's head. Stick it with the glue and firmly staple at the bottom.*
- *Glue cotton all around the base of the cone.*
- *Form a small chunk of cotton into a ball. Glue this at the tip of the cone hat.*
- *Once the glue dries, wear your cone hat. If the hat is slightly small for your head, create a chin strap. Simply punch a pair of opposite holes near the bottom edge of the hat. Attach the ends of an elastic string or satin ribbon.*

Activity 2: Tangram shapes

Materials required: Tangrams

Prerequisites: To make shapes, designs

Activity Flow

- *Once they are completely familiar with the tangrams, ask them to sort the tangrams. Let it be based on shapes, structure, length, size etc.*

- *Then once they are done with sorting they will have a few groups and ask them based on what features they sorted or grouped those tangrams. Later ask them to make some designs from each different group of tangrams.*
- *Ask them to use only two kinds of shapes and make anything out of it pattern/design/bigger shapes.*
- *Also, check with the students, if they want try making any 3D shapes using tangrams.*

3.2 CONCEPT INTRODUCTION ACTIVITIES

3 DIMENSIONAL FIGURES

Activity 3: To represent 3 dimensional figures as 2 dimensional figures

Materials required: 3D geometrical objects cube, cuboid, cylinder, cone and sphere such as dice, Taylor frame/match box, pipe, birthday cap and ball, geometry kit, parchment paper.
Prerequisites: To draw 2 dimensional figures

Activity Flow

Put all the materials in a big box and all the students one by one to pick and identify a 3D shape
Ask the students to give examples for 2 dimensional and 3 dimensional figures. Then ask them the difference between 2D and 3D. Later ask them to draw the 2D shapes of cube, cuboid, cone on a parchment paper.
In geometry, a three-dimensional shape can be defined as a solid figure or an object or shape that has three dimensions – length, width and height. Unlike two-dimensional shapes which have only length and breadth, along with these three-dimensional shapes have thickness or depth.

Activity 4: To draw front view, side view and top view of 3 dimensional figures

Materials required: 3D geometrical objects cube, cuboid, cylinder, cone and sphere such as dice, Taylor frame/match box, pipe, Birthday cap and ball, geometry kit, parchment paper.
Prerequisites: Identifying shapes, To draw shapes

Activity Flow

Explain to them about the front view or elevation, side view and plane or top view of 3D geometrical figures by showing any of the 3D figures.

Front view or Elevation: When we see the object from front.
Side view: When we see the object from left or right.
Plane or Top view: When we see the object from the top.

For example: In the cube the side view, front view and top view all are in square shape.

- *Let all the students feel the shape of 3D objects one by one and ask them to draw the 2D figure of the 3D object on parchment paper with the help of a geometry kit.*
- *Next orally ask them to show the elevated or front view, side view and plane or top view of each 3D geometrical figure.*
- *Later ask them to draw it on parchment and show.*
- *Similarly, do these for any 4 3D objects.*
- *Also, they can trace the sides of 3D shapes to see the side view, front view and top view respectively.*

To Draw geometrical sketches

Activity 5: To draw geometrical sketches of cube, cylinder and cone with respective nets

Materials required: 3 D shapes and nets of cube, cuboid, cylinder cone and sphere, geometry kit and parchment paper.
Prerequisites: None

Activity Flow

- *Give them the 3D shapes and ask them to observe it and draw the respective net for each of the solid figures.*
- *Then see if everyone is able to draw the net, if they are finding it difficult then ask them to observe the net of each 3D figure and then redraw the same on parchment paper using a geometry kit.*

3.3 LET'S DISCUSS: RELATE TO DAILY LIFE*

Cones in Real Life

Here are some examples of cones in daily life:

- Ice cream cone
- Funnel
- Christmas tree
- Traffic cone
- Waffle cone
- Megaphone
- Party hat
- Volcano

Cube in Real Life

Here are some examples of cubes in daily life:

- Dice
- Rubik's Cube
- Ice and sugar cube
- Building blocks
- Boxes

Cuboid in Real Life

Here are some examples of cuboids in daily life:

- The lunch box
- Cubicles
- Shoebox
- Book
- Carton boxes
- Bricks
- Mattresses
- Cabinet
- Microwave or Oven
- Fridge
- Mobile Phone
- Washing machine

Sphere in Real Life

Here are some examples of spheres in daily life:

- Ball
- Planets
- Sun
- Moon
- Stars
- Orange
- Marbles
- Eyeball

Cylinder in Real Life

Here are some examples of cylinders in daily life:

- Pipes
- Beaker
- Cold drink cans
- Battery
- Water tanks
- Gas cylinder
- Candle
- Fire extinguisher
- Test tube

4 EXERCISES & REINFORCEMENT

4.1 PRACTICE EXERCISES

Activity 7: Reinforcement activity

Materials required: None

Prerequisites: Concept of three dimensional figures

Activity Flow

Teachers can ask the students to solve the following questions in a class.

1. *What is the shape of the faces of a cube ?*
2. *How many circular faces are there in a cylinder ?*
3. *Mention the number of plane surfaces and curved surfaces in a cone.*
4. *Draw diagrams of cube, cylinder and cone with different measurements in 2D.*
5. *Draw diagrams of different objects in your house to show elevation, side view and plan.*

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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