

**GRADE 3: LESSON 1**

**REFERNCE MATERIAL :- Notes: Shapes Around Us**

**I. Overall Learning Objectives (Overview)**

The module aims for students to be able to:

• **Identify plane shapes** based on their properties.

• **Describe solid shapes** based on their properties.

• **Create patterns with tessellation**.

**II. Key Concepts and Vocabulary**

• **Plane Shapes:** Two-dimensional shapes.

    ◦ **Properties:** Straight sides, corners (vertices), diagonals.

    ◦ **Examples:** Square, Rectangle, Triangle, Circle, Hexagon, Pentagon.

    ◦ **Diagonals:** A line segment joining two opposite corners of a shape.

• **Solid Shapes:** Three-dimensional shapes.

    ◦ **Properties:** Faces (flat surfaces), edges (where faces meet), corners/vertices (where edges meet).

    ◦ **Examples:** Cube, Cuboid, Cylinder, Sphere, Cone.

• **Views of Objects:** Top view, front view, side view.

• **Tessellation (Tiling):** An arrangement of shapes that fit together **without any gaps or overlaps**.

• **Tangrams:** A puzzle made from **seven flat shapes (tans)** that can be rearranged to create different designs.

**III. Teaching Strategies and Activities**

**A. Introducing Plane Shapes and Their Properties**

• **Recall and Identify:** Begin by asking students to name different shapes they know and identify them in a given image (e.g., shapes in a school building, garden, and road).

• **Hands-on Exploration of Diagonals:**

    ◦ Provide students with cut-outs of squares, rectangles, triangles, and pentagons.

    ◦ Instruct them to **draw diagonals** by joining opposite corners.

    ◦ Guide them to **observe and count the number of diagonals** for each shape (e.g., a square has two diagonals, a triangle has no diagonals).

    ◦ Discuss why a circle cannot have diagonals (no straight sides or corners).

• **Property Matching Activity:** Use a table to list shapes (Square, Rectangle, Triangle, Circle) and have students fill in the number of straight sides and corners for each.

• **Creative Drawing:** Challenge students to create their own designs using small squares and their diagonals.

• **Riddle Creation:** Encourage students to create riddles about plane shapes based on their properties.

**B. Exploring Solid Shapes and Views**

• **Constructing Solid Shapes:**

    ◦ Provide materials for students to construct a **cuboid** (e.g., from a net).

    ◦ Guide them through steps to construct a **cylinder** from paper.

• **Identifying Properties:**

    ◦ Introduce terms like **face, edge, and corner** using physical solid objects or visual aids.

    ◦ Have students observe various solid shapes (Cube, Cuboid, Cylinder, Cone, Sphere) and **count their number of faces, edges, and corners**, filling in a table.

        ▪ *Example properties:* A cube has 6 faces, 12 edges, and 8 corners. A sphere has 1 face, 0 edges, and 0 corners.

• **Drawing Different Views:**

    ◦ Present images of common objects (e.g., refrigerator, car, chair, bicycle).

    ◦ Guide students to draw the **top view, front view, and side view** of these objects. This helps develop spatial reasoning.

    ◦ Use a refrigerator as a detailed example, asking students to describe its features and draw its views.

• **Solid Shape Riddles:** Ask students to create riddles for solid shapes, like the example for a cone.

**C. Understanding Tessellations and Patterns**

• **Concept Introduction:** Explain that a **tessellation** is a pattern of shapes that fit together **perfectly without any gaps or overlaps**.

• **Hands-on Tessellation:**

    ◦ Provide various shapes (e.g., triangle, square, hexagon, circle) and have students try to arrange them to form tessellations.

    ◦ Discuss which shapes tessellate (e.g., triangles, rectangles, hexagons) and which do not (e.g., circles).

• **Pattern Analysis:** Present various tessellation patterns and ask students to identify the different shapes used within them.

• **Creative Tessellation:** Challenge students to create their own tessellations using one or more shapes.

**D. Working with Tangrams**

• **Introduction to Tangrams:** Explain that a tangram is a set of seven specific flat shapes called 'tans'.

• **Hands-on Creation:** Provide tangram sets and challenge students to rearrange the tans to create different figures, such as animals, birds, or buildings.

**IV. Assessment Opportunities**

• **Direct Questions:** Ask questions like "How many different shapes can you name?".

• **Table Completion:** Assess understanding of shape properties by having students complete tables for plane shapes (sides, corners) and solid shapes (faces, edges, corners).

• **Drawing Tasks:** Evaluate comprehension of diagonals by asking students to draw them in given shapes. Assess spatial reasoning by having students draw different views of objects.

• **Problem-Solving:** Present scenarios like "Is it possible to draw diagonals for a triangle? Why or why not?".

• **Application Questions:** Ask "Which shape is being repeated to form the tessellation?".

• **Creative Tasks:** Assess deeper understanding through riddle creation for shapes and creating tessellation patterns or tangram figures.

**V. Real-World Connections**

• Encourage students to identify **plane shapes in their surroundings** (e.g., in buildings, roads, gardens).

• Point out examples of **solid shapes in everyday objects** (e.g., a refrigerator as a cuboid).

• Highlight **tessellations found in real life**, such as on carpets, quilts, and honeycombs. This helps students see the relevance of geometry in their daily lives.

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