2 DIMENSIONAL SHAPES

Subject

Mathematics

Prepared By

[Instructor Name]

Grade Level

5

Overview

This lesson plan covers teaching content for;

1. Definition of 2D shapes.
2. Examples of 2D shapes.
3. Properties of 2D shapes.

Objectives

Students should be able to;

1. Define 2D shapes.
2. Give examples of 2D shapes
3. State the properties of 2D shapes.

Activity Starter/Instruction

1. '2D' stands for 2-dimensional. A 2D shape is any shape that has two dimensions. It's also known as a Polygon.
2. Tell students to think about what it means to have two dimensions for a moment. If we had only one dimension to work with, we could only move backwards or forwards in a line.
3. A line is one-dimensional. If we had two dimensions, on the other hand, we could go forwards and backwards in a line and turn in any direction to start a new line.
4. We are essentially able to travel anywhere on a flat surface. In mathematics, a flat surface is called a plane.
5. A plane is one example of a two-dimensional shape. A plane is essentially the largest sheet of paper you will ever find. In fact, it is a sheet of paper so large that it never ends.

Teacher Guide

Day 1/ Lesson 1: 20mins

1. Properties of shapes: Knowing the properties of 2D shapes is basic but important skill. Depending on if the shapes are equilateral, their properties may vary.
2. Square:
   - 4 equal side
   - 4 equal angles (90⁰)
   - 4 axes of symmetry
3. Rectangles:
   - 2 sets of 2 equal sides
   - 4 equal angles (90⁰)
   - 2 axes of symmetry
4. Circle:
   - Constant diameter and radius
   - Almost infinite axes of symmetry going through the center.
5. Pentagon:
   - 5 sides (can be equal)
   - 5 angles (can be equal)
   - Can have up to 5 axes of symmetry
6. Hexagon:
   - 6 sides (can be equal)
   - 6 angles (can be equal)
   - Can have up to 6 axes of symmetry

Materials Required

- Cube
- Soda Can
- White Board
- Marker
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Additional Resources

- https://www.splashmath.com/math-vocabulary/geometry/shape
- https://www.mathsisfun.com/geometry/polygons.htm
- https://www.xceleratemaths.com/geometry/two-dimensional-shapes
- https://www.mathsisfun.com/shape.html
- https://www.onlinemathlearning.com/types-polygons.html
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Additional Notes

Guided Practice

Day 2/ Lesson 2: 15 Mins

1. A shape can be folded to see if it has a line of symmetry.
2. A shape has a line of symmetry when the folded part sits perfectly on top with all edges matching.
3. Line symmetry in regular polygon:
4. A square is a regular polygon. It has four lines of symmetry and four sides.
5. A regular pentagon has 5 sides and 5 lines of symmetry.
6. Rotational Symmetry: A shape has rotational symmetry when it can be rotated and it still looks the same.
7. If a triangle is rotated at 360°, it never looks the same except when it arrives back to its original starting position.
8. It has only one order of rotational symmetry, the starting position.
9. Symmetry of quadrilaterals: There are 6 special quadrilaterals with different symmetrical properties: Square, rectangle, parallelogram, rhombus, trapezium and kite.

6. One way of thinking about 2D shapes is anything that lays flat on a piece of paper.
7. Students should take out a piece of paper, and place it on their desk. Ask if they notice how flat it is.
8. They should take any nearby object, place it on their piece of paper, and trace around it.
9. Tell them to look at their shape. What does it look like? Congratulations, you have just drawn a 2D shape! This is another way you can think of 2D shapes
10. 2D shapes are any shape you can trace from an object on a flat piece of paper.
11. They should take a cube and trace it on a piece of paper and they will get a square shape.
12. Give them a soda can to trace on a piece of paper. Depending on how they lay the soda can down, they will get either a circle or a rectangle.

7. Octagon:
- 8 sides (can be equal)
- 8 angles (can be equal)
- Can have up to 8 axes of symmetry
8. Parallelogram:
- 2 sets of equal sides
- 2 sets of equal angles
- Usually no axes of symmetry
9. Rhombus:
- All sides the same length
- 2 sets of 2 equal angles
- 2 lines of symmetry
10. Trapezium:
- At least 2 parallel sides
- Can have pairs of equal angles
- Can have a line of symmetry

Guided Practice

Day 3/ Lesson 3: 20mins

1. Cut out polygons and post them. Make sure that they are large enough for the entire class to see. Use different colors for each polygon and write the name of each in the center of the cut-out.
2. Ask: (While pointing at the triangle) what shape is this? (triangle) Can anyone tell me what makes a triangle different from other shapes?
3. Students should identify that a triangle has three sides. Some may also say that it has three angles. Write these properties below the shape on the board.
4. Below the properties of the triangle, write "Tri means 3."
5. Ask: (While pointing at the quadrilateral) this shape is called a quadrilateral. What can you tell me about it?

6. Students should identify that a quadrilateral has four sides. Some may also say that it has four angles. Write these properties below the shape on the board.
7. Continue by explaining that quad- means four. Then write "quad means 4" below the quadrilateral.
8. Ask: (While pointing at the pentagon) this is a pentagon. What can you tell me about it?
9. Again, students should identify the number of sides and possibly angles for a pentagon.
10. Ask: Who knows what prefix means five in the word pentagon?
11. Some students may also beat you to the punch line by informing you that pent- means five before you ask this question.
12. Continue for the hexagon and octagon. Some students will be thinking ahead and already have the prefixes for 6 and 8.

Summary

1. Volunteers should be asked questions about 2D shapes.
2. Teacher reviews the whole lesson with the entire class.

Assessment Activity

Assess if students can;

1. Explain 2D shapes and the properties correctly.