

3 DIMENSIONAL SHAPES

3.20.2019

Subject

Mathematics

Prepared By

[Instructor Name]

Grade Level

4

Overview

This lesson plan covers teaching content for;

- 1. Understanding 3 Dimensional shapes
- 2. Understand properties of different 3D shapes
- 3. Drawing different kinds of 3D shapes
- 4. confidently make nets for models of 3-D shapes

Objectives

Students should be able to;

- State the properties of three-dimensional shapes such as cuboid, pyramids, cubes and so on
- Draw additional shapes on the board for pupils to identify.
- confidently make nets for models of 3-D shapes and also identify the correct 3-D shape from a given net.
- They should be able to design a net for a given 3-D shape.
- Solve quantitative problems on the three dimensional shapes.

Activity Starter/Instruction

- Prior to the lesson, invite pupils to collect and bring in a wide range of packaging which can be deconstructed.
- 2. Start the lesson by asking the children how many pieces of card were used to make a cereal box packaging, for example.
- 3. Ask them to 'prove it' by taking the relevant packaging apart.
- 4. Continue to disassemble a wide range of packaging into a shape net
- 5. Discuss findings: how many different nets did you find for even simple cuboidal packaging? Which shape nets are most common? Why do you think this is? Can you make any links between complexity of the package and complexity of the net? (If time allows, discussion around how this is reflected in the product value can be useful).
- 6. Engage their reasoning skills: what's the same, what's different? e.g. what is the same and what is different about the nets of a triangular prism and a square based pyramid?

Teacher Guide

Day 1/ Lesson 1: 15 Mins

- Emphasize the difference between 2-D and 3-D shapes.
- 2. Discuss the properties of the 3-D shapes that the pupils learnt about in the previous grade.
- 3. Create a drawing showing the various shapes.
- 4. Cover up the names of the shapes and ask the pupils to identify them.
- 5. Allow volunteers to describe a particular 3-D shape.
- 6. The rest of the class has to identify the shape using the pupil's description.
- Go through all the technical terms (mathematical vocabulary) necessary for this unit.
- 8. Try and have a model of each of the shapes covered in this unit available for the pupils to work with viz. Cube, triangular prism, rectangular prism, pyramid, cone, cylinder and sphere

Materials Required

- Cube
- Cuboid
- 3 Dimensional shapes
- Box or prism
- Nets
- Cardboard
- Whiteboard
- Protractor
- Blank sheet
- Set square

Additional Resources

- https://www.bristol.gov.uk/documents/1090275/236 730a-40ae-1f7b-679549709875
- https://study.com/academy/lesson/what-is-a-trianguexamples.html?src=ppc bing nonbrand&AdGroupId=
- www.math-only-math.com/worksheet-on-volume-of-
- https://za.pearson.com/content/dam/region-growth africa/TeacherResourceMaterial/9781447978428 mC

Additional Notes

Guided Practice

Day 2/ Lesson 2: 15 Mins

Definition of Triangular Prism

- 1. Picture a box sitting on the floor. In math language, a common everyday box is a prism.
- 2.A prism is a three-dimensional solid shape with two identical ends connected by equal parallel lines.
- 3. Most boxes have rectangles or squares for their tops and bottoms.
- 4. Let's imagine once again your box no longer has a rectangle for its top and bottom but triangles for both.
- 5. This new box is called a triangular prism, or a prism with a triangle on either side.
- 6. This lesson is concerned with what the parts of the triangular prism are called, and how to name them.
- 7. Notice how your three dimensional triangular prism is made up two dimensional shapes, like rectangles and triangles. There are three rectangles and two triangles.
- 8. The two-dimensional shapes that form a three-dimensional shape are called faces.
- 9.The top and bottom, which are triangles, are bases. The three rectangles are called lateral faces.
- 10.A triangular prism has five faces consisting of two triangular bases and three rectangular lateral faces, and a base is also a face.

Guided Practice

Day 3/ Lesson 3: 15 Mins

- This is a straightforward task in which the students make a cuboid-shaped container that meets certain specifications.
- 2. Encourage them to do the most professional job possible.
- 3. The quality of the end product will depend on their:
 - using pencil rather than pen for construction lines
 - using a set square (or anything known to be square) when forming the right angles
 - measuring accurately
 - scoring lines before folding
 - using suitable glue tabs using small quantities of PVA glue instead of sticky tape.
- 4. Like most nets, the net for the container can be drawn in more than one way.
- 5. It is important that the pupils make all the models as this will help them understand the properties of the shapes better.
- Therefore, for additional practical exercise, it would be useful to bring boxes of different shapes and dimensions e.g.
 Tobelarone chocolate box, cereal boxes, etc., and to ask pupils to open them up and to sketch the nets for these shapes.

Assessment Activity	Assessment Activity
	1. Ask pupils to make paper/cardboard models
	of one of the following 3-D shapes: Cube,
	cuboid, Cylinder, Triangular based pyramid,
	rectangular based pyramid, Cone.
	2.A cuboid is 9cm long, 5cm broad, 4cm high
	and a cube has an edge of 5cm. Which one
	has greater volume?
	3.A pond is 50m long, 30m wide and 2m deep.
	4. A brick measures 15cm in length, 8cm in
	breadth and 5cm in height. How many bricks
	will be used to make a wall of length 15m,
	breadth 10m and height 8m?
Summary	Review and Closing
	1. Ask the pupils to draw any four of the 3-D
	shapes.
	2. They could also bring an example of an
	object that is the same as each of their
	drawings to class.
	3. Pupils should be able to identify different
	shapes and draw their nets. Make sure that
	pupils understand what is meant by edges
	and faces
	4. Pupils should be able to identify a three
	dimensional shape and understand how a net
	can be folded to create a specific three
	dimensional shape.