Plane and Solid Shapes

Lesson plan and teacher's notes · Grade 1 Mathematics · 1 period of 40 minutes

School	(write school name)	**Teacher**	(write name)
Date	(date)	**Class**	Grade 1
Subject	Mathematics	**Enrolment**	Boys ___ Girls ___ Total ___
Time	40 minutes	**Topic**	Plane and Solid Shapes

Learners name the plane shapes (circle, square, rectangle, triangle) and some solid shapes (cube, cuboid, sphere, cylinder, pyramid), find them in things around them, and use them to trace, draw and build. This is a hands-on lesson that uses real objects and cut-outs from the first minute.

Specific outcomes

By the end of the lesson, learners should be able to:

1. Name the circle, square, rectangle and triangle when shown a cut-out or a drawing
2. Name at least three solid shapes when shown a real object
3. Say whether an object is flat (plane) or takes up space (solid)
4. Trace around objects or cut-outs to draw plane shapes and colour them
5. Draw a simple picture using plane shapes and tell the class which shapes were used

Prior knowledge

- Learners can say the words big, small, round and flat
- Learners can hold, point to and sort things into groups
- Learners can hold a crayon or pencil and draw lines

Teaching and learning materials

- Chalk and board
- Bottle tops, a small box, a ball, a round tin, a book
- Cut-outs of a square, a rectangle and a triangle made from cardboard or old paper
- Old boxes, tins, bottle caps and other things people would throw away
- Crayons or pencils and paper for each learner or pair

References

Ministry of Education (CDC) Grade 1 Mathematics syllabus and module; 25Schools learners' note: Plane and Solid Shapes.

Lesson development

Stage and time	Teacher activities	Learner activities
Introduction: shape basket 5 min	Show a bottle top, a box, a ball and a book. Ask: What do you see when you look at each one. Let three learners hold them. Say the name of each shape slowly and let the class repeat after you.	Look, touch and say the shape names with the teacher.
Plane shapes 8 min	Hold up the cut-outs one by one and name the circle, square, rectangle and triangle. Say that plane shapes are flat and lie flat on paper. Ask learners to point to a flat shape in the classroom, such as a page of a book. Ask how a square and a rectangle are the same and how they are different.	Repeat the names, point to flat shapes in the room and tell the class how two shapes are the same and different.
Solid shapes 8 min	Pass around the box, the ball and the round tin. Say that solid shapes are not flat, they take up space and can be held in the hand. Name the cube, cuboid, sphere, cylinder and pyramid. Press the round tin on paper, draw around it and show that the flat shape on the tin is a circle.	Hold the solid objects, say their names and say which are solid and which are flat.
Practice: shape hunt and tracing 14 min	Send pairs to find one thing that looks like each plane shape. Give out paper. Show how to trace around a bottle top and the cut-outs. Let learners colour the shapes and repeat them to make a pattern. Walk around and ask each pair to name its shapes.	Hunt for shapes, trace them, colour them, make a pattern and name each shape to the teacher.
Conclusion 5 min	Ask three learners to show a drawing and name the shapes in it. Repeat the summary: plane shapes are flat, solid shapes take up space. Give the homework.	Show their work, say the names again and listen to the homework.

Teacher's content notes

Read these before the lesson. They are what you need to know, not what to copy onto the board.

Plane shapes

Plane shapes are flat. The Grade 1 plane shapes are the circle, square, rectangle and triangle. A drawing on paper is a plane shape. Learners trace and name them.

Solid shapes

Solid shapes have depth, so they take up space and can be held. The Grade 1 solid shapes are the cube, cuboid, sphere, cylinder and pyramid. Use real objects such as boxes, tins and balls.

Plane shapes found on solid shapes

Many solid shapes have a plane shape on them. When you press a round tin on paper and draw around it you get a circle. This helps learners link the two groups.

Comparing shapes

Ask learners to say how two shapes are the same and how they are different, for example a square and a rectangle. The language of comparing is part of the Ministry lesson.

Questions to ask during the lesson

Question	Expected answer
A boy goes to the market with his mother. He sees a round tin of cooking oil, a bottle top on the ground and a flat piece of cardboard shaped like a triangle. (a) Which one can you trace to draw a circle. (b) Which one is a solid shape. (c) Which one is a plane shape with three sides.	(a) The bottle top. (b) The round tin. (c) The cardboard triangle.
A girl is playing with blocks at home. She builds a tower with a box shaped like a cuboid and puts a ball shaped like a sphere next to it. Her brother says the ball is flat. (a) Is the ball flat or solid. (b) Name the shape of the ball. (c) Name the shape of the box.	(a) Solid. (b) Sphere. (c) Cuboid.
Your teacher puts a book, a bottle top and a small box on the desk. She asks you to sort them into flat things and things that take up space. (a) Which two are solid. (b) Which one can you trace to make a circle. (c) Which one is shaped like a rectangle when it lies flat.	(a) The box and the bottle top both take up space. (b) The bottle top. (c) The cover of the book.

Worked examples for the board

Tracing a circle

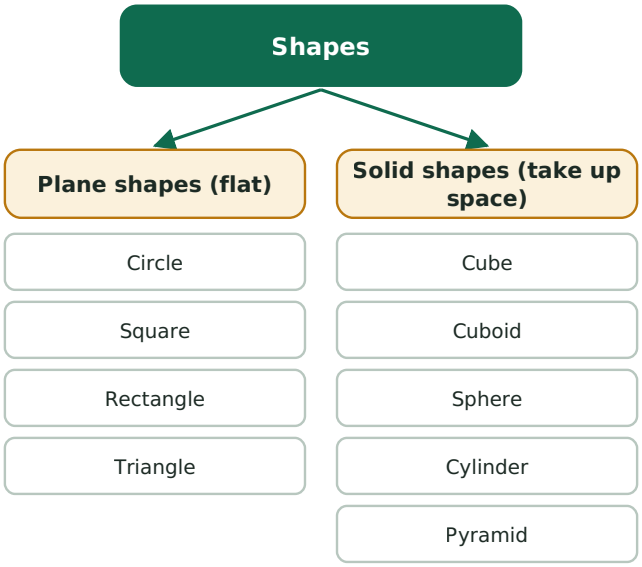
Step 1: Take a bottle top and put it on paper. Step 2: Hold it still with one hand. Step 3: Draw around the edge with a crayon. Step 4: Lift the bottle top. The flat shape on the paper is a circle. Say its name and colour it.

Sorting flat and solid

Step 1: Put a book, a ball and a tin on the desk. Step 2: Ask: can I hold it and does it take up space. The ball and the tin do, so they are solid. Step 3: Open the book flat and show that a page is flat, so it is a plane shape.

Board plan

Write the title. Draw a circle, a square, a rectangle and a triangle in a row and write each name under it. Draw a line down the middle. On the other side write the names cube, cuboid, sphere, cylinder and pyramid. Write FLAT above the plane shapes and TAKE UP SPACE above the solid shapes.



The finished board: two groups of shapes

Mistakes to expect

Learners often think	Put it right
A square and a rectangle are the same.	Both are plane shapes, but put a square cut-out next to a rectangle cut-out and let learners see that the rectangle is longer on two sides. Name each one every time.
A ball is a circle.	A ball is a solid shape, a sphere, because you can hold it. Trace a round tin and show that the flat shape you draw is the circle.
Shapes only exist in books.	Take the learners on a shape hunt so they see shapes in bottle tops, boxes, tins and paper.

Differentiation

Learners who struggle

Work with a small group at the front with real objects. Let them touch each object and say its name before you ask for the picture. Use only two shapes at first, the circle and the square, then add the others.

Learners who finish early

Ask learners to draw a house, a bicycle or a car using plane shapes only, then say how many of each shape they used. They may then build it with blocks, boxes and bottle caps.

Hearing or visual impairment

For learners with a visual impairment, give real objects and cut-outs with thick edges to feel, and describe each shape in words as they touch it. For learners with a hearing impairment, stand facing them in good light, write each shape name on the board, and show the object while you name it.

No projector, no printing

Cut shapes from old cardboard or paper with scissors. Use bottle tops, tins, boxes, stones and balls made from rolled paper as solid shapes. Learners trace on the back of old paper or on the ground with a stick.

If time is short

Keep the plane shapes and solid shapes stages and the tracing. Move the pattern making and the picture drawing to the next lesson, and give the shape hunt as homework.

Evaluation

Question or task	A correct answer shows
A mother is packing items into a bag at the market. She has a round tin, a flat piece of paper shaped like a rectangle and a ball. This is what she asks her child to tell her. (a) Which one is a solid shape that is round like a tin. (b) Which one is a plane shape. (c) Which one will roll away if she puts it on a slope.	(a) The tin or the ball, a solid shape. (b) The paper, a plane shape. (c) The ball. Learners use the words plane and solid correctly.
Your friend is making a picture of a house on paper. She traces around a bottle top for the sun and a cardboard cut-out for the roof. The cut-out has three sides. (a) Which shape is the sun. (b) Which shape is the roof. (c) Say what shape you would trace for a flat door that is long.	(a) Circle. (b) Triangle. (c) Rectangle. Learners name the shapes and link them to the tracing.

Homework

At home you see a cooking pot lid, a matchbox and a piece of paper on the table. (a) Find and name one thing at home that looks like a circle. (b) Find one solid thing and say its name. (c) Trace one flat shape on paper and colour it. Bring your drawing to school.

Extra practice with answers

Question	Answer
1. A boy has a small cardboard box, a round tin and a cut-out square. He wants to draw a circle on paper. (a) Which object helps him draw a circle. (b) Which one is the cuboid. (c) Which one is a plane shape.	(a) The round tin, by tracing around its flat end. (b) The cardboard box. (c) The cut-out square.
2. At school your friend finds a ball, a bottle top and a flat paper triangle. He says all three are flat. (a) Which one is not flat. (b) Which one is a plane shape with three sides. (c) Which one can you trace to draw a circle.	(a) The ball, it is a sphere. (b) The paper triangle. (c) The bottle top.

3. A girl wants to draw a car using plane shapes. She uses a rectangle for the body and two circles for the wheels. (a) How many circles did she use. (b) Name the shape of the body. (c) Which things at home could she trace to make the wheels.	(a) Two. (b) Rectangle. (c) Bottle tops or the lids of small tins.
4. Two learners build with boxes and tins at school. One builds a tower using three cubes. The other uses a cylinder and a pyramid. (a) Which learner used a cube. (b) Name the two shapes the second learner used. (c) Say what these shapes are called as a group.	(a) The first learner. (b) Cylinder and pyramid. (c) Solid shapes.

Answers to the learners' check-yourself questions

1. Name the four plane shapes in this note.
   Circle, square, rectangle and triangle.
2. What is the difference between a plane shape and a solid shape?
   A plane shape is flat. A solid shape has depth and takes up space.
3. Which plane shape do you get when you trace around a bottle top?
   A circle.
4. Name two solid shapes.
   Any two of: cube, cuboid, sphere, cylinder, pyramid.
5. You want to wrap a gift. You can use a box shaped like a cube or a flat piece of paper shaped like a rectangle. (a) Which one is a solid shape? (b) Which one is a plane shape? (c) Which one will you use to wrap the box?
   (a) The box. (b) The piece of paper. (c) The piece of paper, because it can wrap around the box.
6. You go home after school and look for shapes in the kitchen. You see a round tin, a bottle top and a flat tray shaped like a rectangle. (a) Which one is a circle? (b) Which one is a solid shape? (c) Say how you can draw a flat circle on paper using one of them.
   (a) The bottle top. (b) The round tin. (c) Trace around the bottle top.

Teacher's reflection

What went well:

What I will change next time:

Learners who need follow-up: