

3D shapes: naming and sorting

CURRICULUM ALIGNMENT

SHA.SHP.3a

investigate and analyse the properties of 3-D and 2-D shapes and identify classes of shapes based on these properties.

INTERACTIVES Drag Sort · challenge, display

WHAT THIS LESSON TEACHES

A 3D shape you can hold takes up space and is not flat. We name solids like cube, cuboid, sphere, cylinder and cone by looking at their faces and how they roll or slide.

→ A dice is a cube with flat square faces.

→ A football is a sphere that rolls every way.

MODEL THIS ON THE BOARD

NAMING A SOLID

- 1 Look at the solid and count its faces.
- 2 A dice has six flat square faces so it is a **cube**.
- 3 A tin has two flat circles and a curved side so it is a **cylinder**.

DISCUSSION STARTER

REFLECT Which 3D shapes roll and which slide — how can you tell before you try?

LESSON ARC

Open by holding up a ball, a tin and a dice and asking which will roll or slide when pushed — take the wondering, don't resolve it. On the board, sort five solids into named cards, pulling one telling feature and one everyday object per solid. Pupils list the five names with objects in their copy. Then the interactive sorts pictures by name, and the Class Challenge sorts the real tray by roll-or-slide and by feature. The maths-talk loops back to why a ball rolls every way.

TEACHING MOVES

1. **Getting Started.** Hold up a ball, a tin and a dice. Give five seconds of silent think-time, then take three hands-up (no call-outs) on which rolls and which slides. Don't confirm — let the wondering hang; you'll return to it in the wrap.
2. **Watch and Notice.** As each named card lands, point and say the one telling feature — 'a cube: every face a flat square'; 'a sphere: fully round, no flat face at all'. Take one everyday object per solid from the class, but hold out for the sphere being the ONLY fully-round one — that's what catches pupils later.
3. **Name the Solids in Your Copy.** Pupils write the five names down the page with one everyday object beside each. Walk the room glancing for spellings and sensible objects — if someone stalls on cone, nudge toward an ice-cream cone or party hat. This is practice, not marking.
4. **Try It Together.** Pupils take turns at the board; before each drop ask 'which telling feature tells you its name?' so the class agrees or corrects aloud. Save the globe for the end and hold out for the idea that a sphere is fully round even with a map drawn on it.

5. **Class Challenge.** Brisk practice: the class confirms each solid aloud before the next drops. Cylinder and cone go in Rolls for the binary board sort. Then hand out the real tray for the harder rules one at a time — this is where you revoice 'a cylinder rolls AND has flat ends, so it fits the flat-faces group too.'
6. **What Did We Notice?.** Ask why a ball rolls every way but a tin only rolls forwards and back. Revoice a strong answer connecting the sphere's fully-round surface to the tin's flat round ends, then tie it straight back to the Getting Started push.

COMMON MISCONCEPTIONS

⚠ A pupil calls the tin (cylinder) a sphere because 'it's round' — they hear round and stop looking for the flat ends.

Put the real tin and the ball side by side in pupils' hands. Ask them to find a flat part on each. The tin has two flat round ends; the ball has none. 'Round on the side isn't the same as round all over.'

⚠ Pupils insist the globe can't be a sphere 'because it has bumps and countries drawn on it' — they treat the surface picture as part of the shape.

During Try It Together, spin the globe and ask if the drawing changes how it rolls. It rolls every way just like a plain ball. The picture is on the sphere, not part of its shape.

⚠ In the roll-or-slide sort, pupils put the cone under 'slides' because it has a flat circular base.

Push the real cone on its side across the desk — it rolls (in a curve). A curved surface means it rolls, even though it also has one flat face. Let a pupil push it themselves to see.

DIFFERENTIATION

EMERGING

- Give these pupils the real tray solids to hold while the board sort runs — they match the object in their hand to the card rather than working from the picture alone.
- In the copybook step, pre-write the five shape names so pupils only add the everyday object beside each.

DEVELOPING

- After the roll-or-slide sort, ask them to find a solid that both rolls and slides and say why (cylinder — curved side rolls, flat ends slide).
- Ask them to sort the tray a third way of their own choosing and name the rule they used.

PROFICIENT

- Narrate a harder Class Challenge variant: 'find the solids that roll only one way, not every way' — pupils must separate the cylinder and cone from the sphere and justify it aloud.
- Pull them ahead into the Student Activity Book page on faces, edges and corners, previewing the next lesson's closer look inside the solids.

✂ **Cross-curricular:** Tie to Geography — pass the classroom globe around and confirm it's a sphere even with all the countries drawn on its surface.

ANSWER KEY

- a) All flat faces / Cannot roll
b) All flat faces / Cannot roll
c) Curved surface / Can roll

Q1: cube

Q2: cuboid

Q3: tin rolls; cone slides

- a) Always : Every cube has six square faces.
b) Never : A sphere can roll every way, not just one direction.
c) Always : A cylinder has two flat circular ends.
d) Sometimes : True for a ball; false for a cylinder, which can roll too.

EXTENSION SHEET · STRETCH ANSWERS

- S1: a square-based pyramid
S2: a tetrahedron
S3: a cuboid

Investigation: Build and count — open-ended; scan pupils' working for valid solution paths rather than a single answer.