

Solid shapes: the cube and the cuboid

CURRICULUM ALIGNMENT

SHA.SHP.2 examine, categorise and model 3-D and 2-D shapes.

INTERACTIVES Drag Sort · challenge, display, explore

WHAT THIS LESSON TEACHES

A cube is a solid box shape whose six faces are all the same square. A cuboid is a solid box shape with six rectangular faces that are not all the same square.

→ A dice and a sugar cube are cubes.

→ A cereal box and a shoe box are cuboids.

MODEL THIS ON THE BOARD

SORT THE SUGAR CUBE

- 1 Take the sugar cube from the shopping bag and look at every face.
- 2 Each face is a square and all six squares match in size.
- 3 Because every face is the same square, the shape is a **cube**.

LESSON ARC

Open with a real dice and cereal box from a shopping bag; three hands-up answers on what is the same and different, steered to flat faces not size or colour. On the IWB, sort dice and sugar cube as cubes, cereal box as cuboid, then turn the gift box so the side view busts the front-only trick. Pupils take turns sorting at the board with thumbs signals, copy cube/cuboid with a square and a long rectangle plus 'check every face', then brisk Class Challenge sorts. Student Activity Book follows.

TEACHING MOVES

1. **Getting Started.** Hold up a real dice and cereal box if you have them. Take three hands-up answers. Steer talk to the flat sides — 'what do you notice about the faces?' — not size or colour. The board picture is backup only.
2. **Watch and Notice.** Pass or turn the dice and cereal box so more than one face is clear before the first sort. Reveal board cards one at a time and ask: 'are all the faces the same square, or are some long and some short?' For the gift box, turn a real one if you have it — one view can fool you. Leave the finished sort up and say both names aloud. Head off 'squares are rectangles so a cube is a cuboid' by pointing back to the long-and-short rule.
3. **Try It Together.** Several pupils take turns at the board; the class agrees or corrects out loud before each drop. Before each drop, thumbs-up for cube or thumbs-sideways for cuboid. When a real solid matches the next card, hold and turn it first. Revoice size-only sorting: 'it is the faces that decide, not how big it is.'
4. **Write cube and cuboid in your copy.** Model on the board first: cube with one plain square, cuboid with one long plain rectangle, plus the line 'check every face'. Walk the rows — one careful square and one careful long rectangle are enough; do not wait for shaded 3D drawings.
5. **Class Challenge.** Keep board turns brisk. Warm start with four clear boxes. Pause on the tissue box before the answer locks: 'looks square from the front — what about the side?' Name the pencil box's long faces out loud so cuboid stays long-and-short. Fast finishers watch and mouth the next name.

6. What Did We Notice?. Ask: 'How do you tell a cube from a cuboid for sure?' Listen for all-faces-the-same-square versus long-and-short faces. Revoice: 'so we check every face, not just the front.' Point back to the sugar cube and the big gift box if size-only talk creeps in.

COMMON MISCONCEPTIONS

⚠ Pupils sort by size only — 'big ones go in cuboid, small ones are cubes' — and ignore the faces. Hold the sugar cube beside a large gift box. 'Tiny and cube; big and still need to check faces.' Revoice: it is the faces that decide, not how big it is.

⚠ Pupils name from the front view only: the gift box or tissue box 'looks square' so they call it a cube. Stop before the sort locks. Turn the real box so the side shows a long face. 'Check every face — turning does not change the name, but one view can fool you.'

⚠ Pupils say 'squares are rectangles, so a cube is a cuboid' and collapse the two names. Point back to the long-and-short rule on the finished sort: cube faces are all the same square; cuboid mixes long faces and short faces. Keep both names; do not merge them.

DIFFERENTIATION

EMERGING

- Stay with the dice and cereal box only at first — one clear cube, one clear cuboid — while you turn each solid and the pupil points to faces before naming.
- On the copybook moment, supply the two words already written; pupils only draw the square and the long rectangle and copy 'check every face'.

DEVELOPING

- After a correct sort, ask: 'which face told you — and what would you have thought from the front alone?'
- On the tissue-box pause, have them predict cube or cuboid before you turn the side, then confirm from the faces.

PROFICIENT

- During Class Challenge, ask a fast finisher to justify out loud before the drop: 'all same square' or 'long and short' — no size words allowed.
- After the copybook line, pose: 'could a very tall thin box still be a cube? Draw why or why not' — still faces, not a new solid.

✂ **Cross-curricular:** Link to SPHE/home: sort lunchbox, pencil case and tissue box by faces before packing the school bag.

ANSWER KEY

Q1: cube

Q2: cuboid

Q3: cube

Q4: cuboid

Q5: Check all faces: cube = all squares; cuboid = rectangles

Q6: cuboid

a) Always : That matching-square rule is the definition of a cube.

b) Never : Cereal boxes are cuboids because their faces are not all the same square.

c) Always : Every cuboid is a box shape with exactly six faces.

d) Sometimes : It is a cube only if every face is the same square; some cuboids look square from one side only.

EXTENSION SHEET · STRETCH ANSWERS

S1: cube

S2: cuboid

S3: 6

S4: cube

Investigation: Box or dice? — open-ended; scan pupils' working for valid solution paths rather than a single answer.