Unit 2 · Solid Objects

STUDY NOTES

Key terms

Solid object: takes up space; you can hold it; not flat like a drawing (a brick, a die, a ball).

Face (surface): a flat surface of a solid; on a box, a rectangle or a square.

Edge: a straight line where two faces meet.

Vertex (plural **vertices**): a corner, where edges meet.

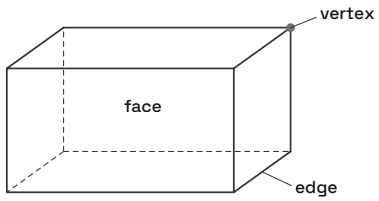
Cuboid: a box shape; all 6 faces are rectangles.

Cube: a special cuboid; all 6 faces equal squares, all 12 edges the same length.

Hollow model (खोक्रो नमुना): only the edges, nothing between them.

Net: the flat shape of card that folds up into a box.

The parts of a box



Faces, edges, vertices. Dashed lines: the edges at the back, which you can't see.

Solid	Faces	Edges	Vertices
Cuboid	6 rectangles	12	8
Cube	6 equal squares	12 equal	8
Ball (sphere)	none, curved all over	none	none

- hollow straw cube: **12 straws** = 12 edges; **8 joints** = 8 vertices
- paper on the faces: edge where 2 colors meet; vertex where 3 colors meet
- from one place you see at most **3 faces**; the other 3 hide at the back
- a square, triangle or circle drawn on paper: a **flat shape**, no thickness → not a solid

Counting without missing one

Count in **layers**:

- **edges:** 4 round the top + 4 round the bottom + 4 upright = **12**
- **vertices:** 4 on top + 4 at the bottom = **8**
- **faces:** 3 pairs; 2 + 2 + 2 = **6**
  - top–bottom
  - front–back
  - left–right
- each edge belongs to **two** faces: 4 edges × 6 faces = 24 counts every edge twice; 24 ÷ 2 = **12**
- turn the box, or think about its back

Cube or cuboid?

- **every cube is a cuboid** (faces all equal squares)
- **not every cuboid is a cube**: a brick's faces aren't all squares
- both: 6 faces, 12 edges, 8 vertices
- cuboids: a cupboard, a book, a box of chalk; cube: a langur burja die
- **opposite faces of a cuboid are equal**: the face a brick lies on has a twin on top
- name the faces of cuboid ABCD–EFGH by their four corners: front ABFE, back DCGH

Three cubes in a row make a cuboid:

- still 6 faces, 12 edges, 8 vertices
- the lines between the cubes are joins, not edges
- faces not the same: 2 squares (the ends), 4 long rectangles, each as big as 3 squares

Nets

- shop boxes (noodles, medicine)
  - flat card
  - cut
  - folded
  - glued along the edges
- cube's net: **6 squares**; cuboid's net: **6 rectangles**; one piece per face
- folded up, the cuts and folds become the 12 edges

A die

- opposite faces add up to **7**
  - 1–6
  - 2–5
  - 3–4
- a cube, so each of its 6 faces has the same chance to land on top
- **langur burja**: dice are cubes, with pictures (a heart, a spade) instead of dots

COMMON MISTAKES

✗ 24 edges, 4 counted on each face
✓ each edge is on two faces: 12.

✗ only the parts you can see counted (3 faces)
✓ count the back too: 6 faces, 12 edges, 8 vertices.

✗ a cube and a cuboid are the same
✓ every cube is a cuboid, not every cuboid a cube.

✗ the joins between cubes counted as edges
✓ a row of cubes is one cuboid, 12 edges.