Lesson 58 MEASURES

Volume — counting unit cubes in a cuboid

WHAT THIS LESSON TEACHES

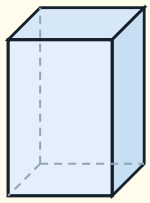
The volume of a cuboid is how many equal unit cubes fill it with no gaps. Find how many cubes fit in the bottom layer, then multiply by the number of layers stacked on top.

→ A box packed with 12 unit cubes has a volume of 12 cubic units.
→ If the bottom layer holds 6 cubes and there are 2 layers, the box holds 12 cubes.

MODEL THIS ON THE BOARD

COUNTING CUBES IN A CUBOID

1. The bottom layer is **2** cubes wide and **2** cubes deep, so it holds **2 × 2 = 4** cubes.
2. The cuboid is **3** cubes high, so there are **3** equal layers.
3. Multiply: **4 × 3 = 12**.



DISCUSSION STARTER

REFLECT How is counting cubes for volume different from counting squares for area?

ANSWER KEY

a) 5, 4, 3

b) 20

c) 60 cubic units

Q1: 21 cubes

Q2: 12 cubes

Q3: 60 cubes

a) Always — Bottom layer 3 imes2=6, times 2 layers gives 12.

b) Always — Bottom layer 2 imes2=4, times 3 layers gives 12.

c) Sometimes — True only when bottom layer is exactly 6; other bottoms give other totals.

d) Always — 6 imes2=12.

EXTENSION SHEET · STRETCH ANSWERS

S1: 30 cm^3

S2: 18 cm^3

S3: 72 cm^3

S4: 108 cm^3

S5: 75 cm^3

Investigation: Pack the box — open-ended; scan pupils' working for valid solution paths rather than a single answer.