Steady Steps Maths

FREE UNIT TEST · TOPIC 9

FREE SAMPLE · UNIT TEST A

# Volume

Unit Test A · 40 marks · about 40 minutes

GRADE 5




Common Core 5.MD.C.3–5

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Name _____ Date _____

UNIT TEST A

# Volume

40 marks · about 40 minutes · Common Core 5.MD.C.3–5

**Name** _____ **Date** _____

## Instructions

- Answer **every** question in the space given.
- Show your working: in Sections B and C you get marks for your method, even if the final answer is wrong.
- The number in brackets, like [2], shows how many marks a question is worth.
- You have about 40 minutes. A calculator is **not** needed.
- Check your answers if you finish early.

## Your score

| Section | Questions | Marks | Your score |
|---|---|---|---|
| A · Quick questions | 1–10 | 10 | |
| B · Show your working | 11–16 | 17 | |
| C · Problem solving | 17–18 | 13 | |
| **Total** | | **40** | |

Percentage: _____ %  85%+ excellent · 65–84% good · 45–64% keep practising · below 45% revise the packs first


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## SECTION A Quick questions

1 mark each · write your answer in the box

1. A box holds 6 layers of 12 unit cubes. What is its volume? [1]

   Answer

2. Better unit for the volume of a matchbox: cubic centimetres or cubic metres? [1]

   Answer

3. Find the volume of a box 3 cm long, 4 cm wide and 4 cm high. [1]

   Answer

4. A prism has a base area of 30 $cm^2$ and a height of 4 cm. What is its volume? [1]

   Answer

5. Find the volume of a cube with edges of 4 cm. [1]

   Answer

6. A box has a volume of 20 $cm^3$. It is 5 cm long and 2 cm wide. How high is it? [1]

   Answer

7. Box A is 5 × 3 × 4 cubes; Box B is 4 × 3 × 2 cubes. Which is bigger? [1]

   Answer

8. Find the total volume of two boxes: 4 × 3 × 2 cm and 6 × 4 × 3 cm. [1]

   Answer

9. A cereal box is 12 cm wide, 6 cm deep and 30 cm tall. What is its volume? [1]

   Answer

10. How many 1 cm cubes fit exactly into a box 6 cm by 4 cm by 4 cm? [1]

    Answer

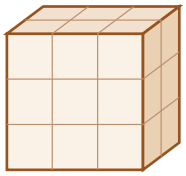

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## SECTION B Show your working

Marks are given for your method

**11** The box is made of unit cubes. How many cubes are in one layer? How many layers are there? What is the volume? [2]

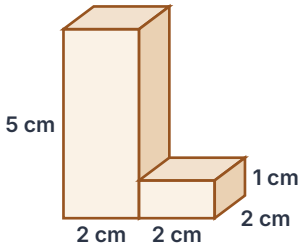


Answer

**12** A box is 7 cm long, 5 cm wide and 6 cm high. [3]
(a) Find the area of its base. (b) Use V = b × h to find the volume. (c) Check with V = l × w × h.

Answer

**13** The solid is made of two boxes with the same depth. Find its total volume. [3]
Show how you split it.




Answer


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**14** Sam says the volume of a box 5 cm by 4 cm by 4 cm is 5 + 4 + 4 = 13 cm³. [3]
(a) What is wrong? (b) Find the correct volume.

Answer

**15** A prism has a volume of 80 cm³ and a base area of 16 cm². How tall is it? [2]

Answer

**16** A fish tank is 40 cm long, 30 cm wide and 35 cm high. [4]
(a) What is the volume of the tank? (b) It is filled with water to a height of 25 cm. What is the volume of the water?

Answer


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## SECTION C Problem solving

Longer questions with several steps

**17** Box A is 8 cm long, 4 cm wide and 2 cm high. [7]

(a) Find the volume of Box A.

(b) Box B has the same base as Box A but is 4 cm high. Find its volume.

(c) How much greater is the volume of Box B?

(d) How many cubes with 2 cm edges would fit exactly in Box A? (Hint: how many fit along each edge?)

Answer

**18** A stage is made from two boxes, both 4 m wide. The bottom box is 9 m long and 2 m high. The top box sits on it and is 3 m long and 3 m high. [6]

(a) Find the volume of each box. (b) Find the total volume of the stage.

(c) A builder says the stage is 9 × 4 × 5 = 180 m³. Explain why this is wrong.

Answer


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# Mark scheme

For parents · give the marks shown; method marks can be given even if the final answer is wrong

**Tip:** Give method marks generously when the working shows the right idea. If a mistake early on is carried through correctly, give the later marks.

| Q | Answer | Marks | How to award the marks |
|---|---|---|---|
| 1 | 72 cubic units | 1 | |
| 2 | cubic centimetres | 1 | |
| 3 | 48 cm³ | 1 | |
| 4 | 120 cm³ | 1 | |
| 5 | 64 cm³ | 1 | |
| 6 | 2 cm | 1 | |
| 7 | Box A (60 cubes) | 1 | |
| 8 | 96 cm³ | 1 | |
| 9 | 2,160 cm³ | 1 | |
| 10 | 96 | 1 | |
| 11 | 6 per layer, 3 layers, 18 cubic units | 2 | 1 mark for the layer and number of layers; 1 mark for the volume. |
| 12 | (a) 35 cm² (b) 35 × 6 = 210 cm³ (c) 7 × 5 × 6 = 210 cm³ | 3 | 1 mark each part. |
| 13 | 20 + 4 = 24 cm³ | 3 | 1 mark for each box (2 × 2 × 5 and 2 × 2 × 1); 1 mark for the total. |
| 14 | (a) He added the edges; he should multiply them. (b) 80 cm³ | 3 | (a) 1 mark. (b) 2 marks: 1 for multiplying. |
| 15 | 5 cm | 2 | 1 mark for 80 ÷ 16; 1 mark for the answer. |
| 16 | (a) 42,000 cm³ (b) 30,000 cm³ | 4 | (a) 2 marks: 1 for a correct method. (b) 2 marks: 1 for using the height 25 cm. |
| 17 | (a) 64 cm³ (b) 128 cm³ (c) 64 cm³ (d) 4 × 2 × 1 = 8 | 7 | (a) 2 marks. (b) 2 marks: 1 for using the same base. (c) 1 mark. (d) 2 marks: 1 for finding how many fit along each edge. |
| 18 | (a) 72 m³ and 36 m³ (b) 108 m³ (c) The top box is only 3 m long, not 9 m, so that box would include space that is empty. | 6 | (a) 2 marks: 1 each. (b) 2 marks. (c) 2 marks: 1 for noticing the top box is shorter. |


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# What to revise

Circle the questions your child lost marks on, then go back to the matching part of the pack

| Questions | Skill | Revise in | ✓ / × |
|---|---|---|---|
| 1, 11 | Layers | Pack 1 · Understanding Volume, Part 2 | |
| 2 | Units of volume | Pack 1 · Understanding Volume, Part 3 | |
| 3, 5, 14 | V = l × w × h | Pack 2 · Volume Formulas, Part 1 | |
| 4 | V = b × h | Pack 2 · Volume Formulas, Part 2 | |
| 6, 15 | Finding a missing edge | Pack 2 · Volume Formulas, Part 3 | |
| 7 | Comparing volumes | Pack 1 · Understanding Volume, Part 4 | |
| 8 | Two boxes described | Pack 3 · Composite Volume, Part 2 | |
| 9, 16 | Real-life volume | Pack 2 · Volume Formulas, Part 4 | |
| 10 | Counting unit cubes | Pack 1 · Understanding Volume, Part 1 | |
| 12 | V = b × h and V = l × w × h | Pack 2 · Volume Formulas, Parts 1 and 2 | |
| 13 | Two boxes in a picture | Pack 3 · Composite Volume, Part 1 | |
| 17 | Volume formulas and comparing volumes | Pack 2 · Volume Formulas, Parts 1 and 2 and Pack 1 · Understanding Volume, Part 4 | |
| 18 | Composite volume | Pack 3 · Composite Volume, Parts 2 and 4 | |


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