

WA7MMGTH2

Three-dimensional space

Core + Challenge

# Volume of Rectangular Prisms — Marking Key

I can find the volume of rectangular prisms, connect volume to capacity, and solve problems with cubic units.

*For tutors and parents. Award method marks for correct working even if the final answer is wrong.*

## Marks summary

Section A Fluency: 16   Section B Core: 22   Section C Reasoning: 9   Section D Challenge: 11   **Total: 58**

Fluency: 1 mark each; accept an equivalent unsimplified answer for half credit at tutor's discretion.

## A Fluency *answers and working*

/ 16 marks

| Q  | Answer               | Working                             |
|----|----------------------|-------------------------------------|
| 1  | 30 cm <sup>3</sup>   | $5 \times 3 \times 2 = 30$          |
| 2  | 240 cm <sup>3</sup>  | $10 \times 4 \times 6 = 240$        |
| 3  | 64 cm <sup>3</sup>   | $4 \times 4 \times 4 = 64$          |
| 4  | 60 cm <sup>3</sup>   | $8 \times 2.5 \times 3 = 60$        |
| 5  | 600 cm <sup>3</sup>  | $12 \times 5 \times 10 = 600$       |
| 6  | 1000 cm <sup>3</sup> | $10 \times 10 \times 10 = 1000$     |
| 7  | 12 m <sup>3</sup>    | $1.5 \times 2 \times 4 = 12$        |
| 8  | 120 cm <sup>3</sup>  | $24 \times 5$                       |
| 9  | 3 cm                 | $96 \div 32$                        |
| 10 | 5 cm                 | $5 \times 5 \times 5 = 125$         |
| 11 | 2 L                  | $1000 \text{ cm}^3 = 1 \text{ L}$   |
| 12 | 3500 cm <sup>3</sup> | $3.5 \times 1000$                   |
| 13 | 750 cm <sup>3</sup>  | $1 \text{ mL} = 1 \text{ cm}^3$     |
| 14 | 2000 L               | $1 \text{ m}^3 = 1000 \text{ L}$    |
| 15 | 120 mL               | $120 \text{ cm}^3 = 120 \text{ mL}$ |
| 16 | 0.06 m <sup>3</sup>  | $0.5 \times 0.4 \times 0.3$         |

## Volume of Rectangular Prisms · WA7MMGTH2

B

Core answers, working and marks

/ 22 marks

| Q  | Answer                        | Working / sample response                                                                                                                               | Marks |
|----|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1  | 120 cm <sup>3</sup>           | $8 \times 3 \times 5 = 120$<br>1 mark: working<br>1 mark: 120 cm <sup>3</sup>                                                                           | 2     |
| 2  | 72 000 cm <sup>3</sup> = 72 L | $60 \times 30 \times 40 = 72\ 000$<br>$\div 1000 = 72\text{ L}$<br>1 mark each                                                                          | 2     |
| 3  | 72 cubes; 72 cm <sup>3</sup>  | $6 \times 4 = 24$ per layer; $24 \times 3 = 72$<br>1 mark each                                                                                          | 2     |
| 4  | 74.88 m <sup>3</sup>          | $12 \times 2.4 \times 2.6 = 74.88$<br>1 mark: working<br>1 mark: answer                                                                                 | 2     |
| 5  | 48 000 L                      | $8 \times 4 \times 1.5 = 48\text{ m}^3$<br>$48 \times 1000 = 48\ 000\text{ L}$<br>1 mark each                                                           | 2     |
| 6  | No – 980 mL                   | $7 \times 7 \times 20 = 980\text{ cm}^3 = 980\text{ mL} < 1000\text{ mL}$<br>1 mark: 980<br>1 mark: conclusion                                          | 2     |
| 7  | 18 bags                       | $2 \times 1.5 \times 0.3 = 0.9\text{ m}^3$<br>$0.9 \div 0.05 = 18$<br>1 mark: 0.9<br>1 mark: divide<br>1 mark: 18                                       | 3     |
| 8  | 30                            | $5 \times 3 \times 2 = 30$<br>1 mark: 5, 3, 2<br>1 mark: 30                                                                                             | 2     |
| 9  | 5 cm                          | base area 72; $360 \div 72 = 5$<br>1 mark each                                                                                                          | 2     |
| 10 | 2000 L                        | 25 mm = 0.025 m<br>$80 \times 0.025 = 2\text{ m}^3$<br>$2 \times 1000 = 2000\text{ L}$<br>1 mark: convert<br>1 mark: 2 m <sup>3</sup><br>1 mark: 2000 L | 3     |

Volume of Rectangular Prisms · WA7MMGTH2

C

Reasoning *sample answers and marking criteria*

/ 9 marks

| Q | Answer                                             | Working / sample response                                                                                                                                                         | Marks |
|---|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1 | Counts cubes                                       | Volume counts how many unit cubes fill the space; each cube is $1\text{ cm} \times 1\text{ cm} \times 1\text{ cm} = 1\text{ cm}^3$ .<br><i>2 marks</i>                            | 2     |
| 2 | False – $\times 8$                                 | $2 \times 3 \times 4 = 24$ ; $4 \times 6 \times 8 = 192$<br>$192 = 8 \times 24$<br><i>1 mark: 24 and 192</i><br><i>1 mark: <math>\times 8</math></i><br><i>1 mark: conclusion</i> | 3     |
| 3 | The cube ( $96\text{ cm}^2$ vs $112\text{ cm}^2$ ) | Cube: $6 \times 16 = 96$<br>Other: $2 \times (32 + 16 + 8) = 112$<br><i>1 mark: both</i><br><i>1 mark: cube</i>                                                                   | 2     |
| 4 | $100 \times 100 \times 100$                        | A 1 m cube is 100 cm on each edge, so $100 \times 100 \times 100 = 1\,000\,000\text{ cm}^3$ .<br><i>1 mark each</i>                                                               | 2     |

D

Challenge *solutions and marking criteria*

/ 11 marks

| Q | Answer             | Working / sample response                                                                                                                               | Marks |
|---|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1 | 72 cm              | $6 \times 6 \times 6 = 216$ , so side = 6<br>12 edges $\times 6 = 72$<br><i>1 mark: side 6</i><br><i>1 mark: 12 edges</i><br><i>1 mark: 72</i>          | 3     |
| 2 | $4000\text{ cm}^3$ | Rise = 2 cm<br>$50 \times 40 \times 2 = 4000$<br><i>1 mark: rise</i><br><i>1 mark: working</i><br><i>1 mark: <math>4000\text{ cm}^3</math></i>          | 3     |
| 3 | $378\text{ cm}^3$  | Base: $(20 - 6) \times (15 - 6) = 14 \times 9$<br>Height 3: $14 \times 9 \times 3 = 378$<br><i>1 mark: 14</i><br><i>1 mark: 9</i><br><i>1 mark: 378</i> | 3     |
| 4 | 36                 | $3 \times 4 \times 3 = 36$<br><i>1 mark: 3, 4, 3</i><br><i>1 mark: 36</i>                                                                               | 2     |