

Measuring mass and volume accurately

Grade 6 science (Year 7 · Class 6) · Lab answers

Model answers use the sample readings in the results table. If you collected your own data, your numbers will differ, but the same methods apply and the same conclusions about mass and volume should follow.

Level: Grade 6 science (Year 7 · Class 6) · **Curriculum:** SEP measurement

Question 1 Volumes of the stones

Volume = final – start. A: $58 - 50 = 8$; B: $64 - 50 = 14$; C: $55 - 50 = 5$; D: $65 - 50 = 15$.
So **A 8 cm³, B 14 cm³, C 5 cm³, D 15 cm³**.

Question 2 Two orders

By mass: C (12.6 g), D (18.0 g), A (21.4 g), B (37.9 g). By volume: C (5), A (8), B (14), D (15).
The lists are different: stone D takes up the most space but is not the heaviest.

Question 3 All four together

Mass: $12.6 + 18.0 + 21.4 + 37.9 = \mathbf{89.9\text{ g}}$. Volume: $5 + 15 + 8 + 14 = 42\text{ cm}^3$, so the level would be $50 + 42 = \mathbf{92\text{ mL}}$.

Question 4 Repeat readings

$(8 + 9 + 8) \div 3 = 25 \div 3 = \mathbf{8.3\text{ cm}^3}$.

Question 5 Uncertainty

Stone C: $1 \div 5 \times 100 = \mathbf{20\%}$. Stone B: $1 \div 14 \times 100 = \mathbf{7.1\%}$. The smaller volume is less certain.

Question 6 Sources of error

Air bubbles stuck to the stone or splashing when it enters would change the level. Reading from above or below eye level also gives a wrong value. **Any two** sensible sources are accepted.

Question 7 Improvement

Use a 25 mL cylinder with 0.5 mL divisions and start with 15 mL of water, so the rise is a larger fraction of the scale. **A narrower cylinder with finer divisions** gives a better

result.