

Mixtures, solutions and dissolving

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

Use these answers to check your calculations from the sample table. Show the formula, write the substitution and give units. When asked to explain, link the particle movement to how often and how hard particles collide.

Level: Grade 6 science (Year 7 · Class 6) · **Curriculum:** MS-PS1-2

Question 1 Check a mean

$$(33 + 29) \div 2 = 62 \div 2 = \mathbf{31\ s}.$$

Question 2 Rate of dissolving

$$10\ ^\circ\text{C}: 5.0 \div 95 = \mathbf{0.053\ g/s}. \quad 60\ ^\circ\text{C}: 5.0 \div 18 = \mathbf{0.28\ g/s}.$$

Question 3 Compare the extremes

$$95 \div 18 = \mathbf{5.3\ times\ faster}.$$

Question 4 Explain the pattern

In warmer water the particles move faster, so they hit the sugar more often and with more energy. **The sugar breaks up and spreads out sooner.**

Question 5 Control variables

Mass of sugar, volume of water, stirring rate and the size of the sugar crystals; **any three.**

Question 6 Reliability

The largest difference is $98 - 92 = 6\ \text{s}$ (at $10\ ^\circ\text{C}$), small compared with the means. **The results are fairly reliable**, as the pairs are close.

Question 7 Predict at $80\ ^\circ\text{C}$

The time should be shorter, perhaps about $10\ \text{s}$, since the times fall as temperature rises. **This is uncertain** because it goes beyond the measured range, so the trend may not continue.