

Science investigation report

Keep observations, explanations and evaluation distinct.



MAKE THESE CHOICES VISIBLE

A focused question and named variables • Measurements with units and repeats • A trend supported by numerical evidence • A conclusion limited to what was measured • A specific limitation and useful improvement

An original model - and why it works

State the question and variables

Question: How does water temperature affect the time taken for 5.0 g of sugar to dissolve?

The independent variable was water temperature. The dependent variable was dissolving time. The water volume, sugar mass and stirring procedure were kept the same.

Naming what changes, what is measured and what is controlled makes the comparison interpretable.

Report the evidence

At 20 °C, the mean dissolving time was 121 s. At 40 °C, it was 77 s, and at 60 °C, it was 42 s. In this dataset, mean dissolving time decreased as water temperature increased.

Report the trend with values and units. This describes the measurements; it does not yet explain them.

Explain and conclude

These results support the conclusion that higher water temperature reduced dissolving time under these conditions. Faster particle motion at higher temperatures can help explain the quicker dissolving. The results do not show that more sugar can dissolve overall, because this investigation measured time rather than maximum solubility.

Connect the claim to evidence and a scientific explanation. Distinguish dissolving rate from solubility.

Evaluate the evidence

The three repeats at each temperature were close together, which suggests the timing was reasonably consistent in this dataset. However, deciding when the final sugar crystal disappeared involved judgement. A more consistent endpoint and a controlled stirring procedure would improve the comparison.

Evaluate a specific source of uncertainty and link it to an improvement. Close repeats do not prove accuracy.

CHECK: Variables are named correctly / Means and units are accurate / Evidence supports the trend / Explanation uses a relevant scientific idea / Evaluation links a limitation to an improvement

Original classroom material. Use the task and applicable course guidance to make choices; this is not an official assessed exemplar.