

Mixtures, solutions and dissolving

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

Name: _____ Date: _____ Class: _____

Does warm water really dissolve sugar faster? In this lab you time 5 g of sugar dissolving in water at four different temperatures and compare the times. You then turn the times into rates and use the particle picture to explain the pattern you find.

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

Aim

To find out how the temperature of water affects the time taken for 5 g of sugar to dissolve.

Equipment

- 4 beakers of 250 mL
- Granulated sugar, 5 g portions
- Thermometer and stirring rod
- Stopwatch and a balance
- Warm and cold water, a kettle or water bath

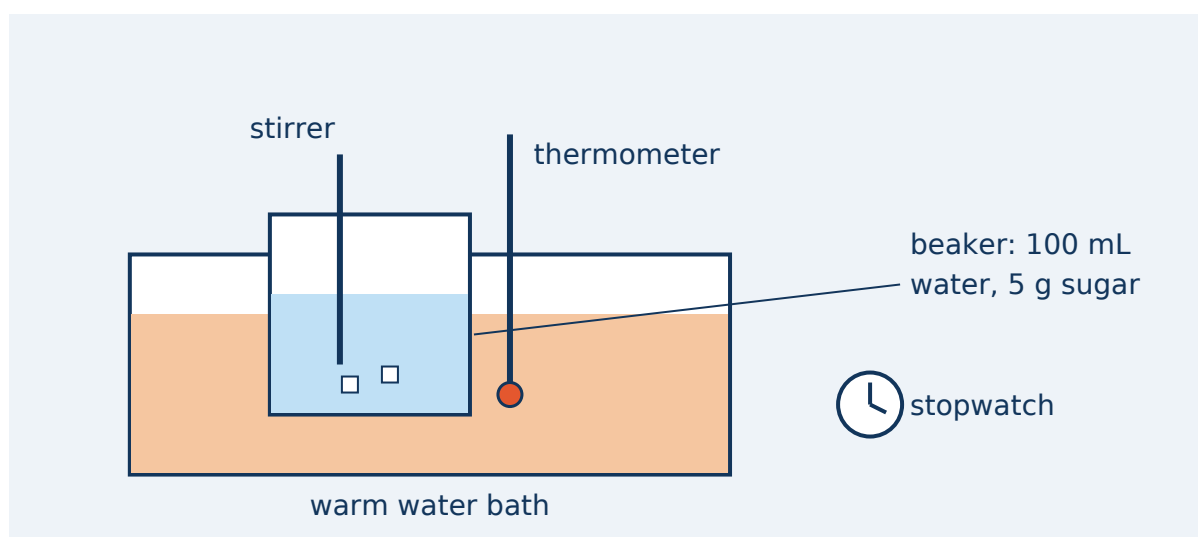
Safety

Safety

Water at 60 °C can scald. Carry hot water with care and keep it away from the table edge. Wear goggles, and do not taste anything in the lab.

Method

1. Put 100 mL of water in a beaker and bring it to 10 °C by adding ice, then remove the ice.
2. Weigh 5.0 g of sugar.
3. Add the sugar, start the stopwatch and stir at a steady rate.
4. Stop the watch when no sugar crystals can be seen.
5. Repeat at 20 °C, 40 °C and 60 °C, and do each temperature twice.



A beaker of water in a warm bath, with thermometer, stirrer and stopwatch.

Results

Sample measurements from one group:

Temperature (°C)	Trial 1 (s)	Trial 2 (s)	Mean time (s)
10	98	92	95
20	60	64	62
40	33	29	31
60	17	19	18

Analysis questions

Question 1 Check a mean

Show that the mean time at 40 °C is correct.

Question 2 Rate of dissolving

Calculate the rate of dissolving, in g/s, at 10 °C and at 60 °C. Give answers to 2 significant figures.

Question 3 Compare the extremes

Calculate how many times faster the sugar dissolves at 60 °C than at 10 °C.

Question 4 Explain the pattern

Explain the pattern in the results using the particle picture.

Question 5 Control variables

Name three conditions that you must hold constant so that each temperature is tested fairly.

Question 6 Reliability

Find the largest difference between two trials, and say whether the results are reliable.

Question 7 Predict at 80 °C

Predict the time at 80 °C and say why your prediction is uncertain.