

Measuring tap water temperature using sugar



What is your tap water temperature?

- ❖ Can you use dissolving sugar to measure tap water temperature?
- ❖ Why is tap water the temperature it is?
- ❖ Why do people's results disagree? (Clue: control variables)

Estimated time: 30 minutes, no experience needed

Instructions

Watch the video ([YouTube video jFw-1tE4vZ0](https://www.youtube.com/watch?v=jFw-1tE4vZ0))

1. Let the jug of water stand in room temperature for about an hour.
2. Measure some white granulated sugar – at point scale reading ***just*** changes from 4 g to 5 g onto a teaspoon.
3. Pour 200 g of water from the jug into a glass.
4. If you have a thermometer, measure and note down the water temperature. If you don't, you can still proceed.
5. Start the timer when you add the sugar to the water.
6. Stir with the spoon in time with the video ticking (100 stirs per minute).
7. When all the sugar has dissolved, record the time on the timer.
8. Repeat using the hottest tap water possible - take care not to scald yourself.
9. Repeat using water from a cold tap that's been running for at least a minute, so it's as cold as it will get.
10. Enter the results on the table below or on our web page.

#MeasurementAtHome
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Equipment required

- Kitchen scales
- Water taps
- White granulated sugar
- 2 teaspoons
- Drinking glass
- Jug of water
- Timer (use the one on the video)
- Thermometer (optional)
- Paper and pencil

Risks

- ❖ Hot tap water can scald – handle with care.

SI measurement units

- ❖ kilogram (kg) for mass
- kelvin (K) for temperature
- second (s) for timing

Challenge Topics

Measurement Science, Maths, Health

Thoughts, tips and information

- ❖ Which factors (control variables) cause people to get different results? (glass size, sugar amount and type, stirring speed and spoon shape...)
- ❖ Hot water is heated to >60 °C to kill bacteria in the boiler. Water >42 °C may scald you.

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Water temperature	Dissolve time (in seconds)	Temperature (in °C)
Room temperature		
Hot tap		
Cold tap		
Notes (you could list variables that affect the result)		

Adult direction or supervision is required. All experiments are carried out at your own risk. For more experiments, visit [NPL Measurement at Home](https://npl.co.uk/measurement-at-home).