

Wet wicks, or water at the bench

60 minutes • Practical • The dry lab

What makes a wet surface cool: the wet wicks dry lab (or the bench stations), with repeats, mean, SD and SE

TIMING

0-5	5 min	The question	
5-20	15 min	Liquids compared	
20-35	15 min	The hand starter, measured	
35-45	10 min	Process	
45-60	15 min	Explain	
	60 min	One lesson	

STARTER

5 min **The question**
Name the independent, dependent and controlled variables together. Why a dry wick and an oil wick?

THE LESSON

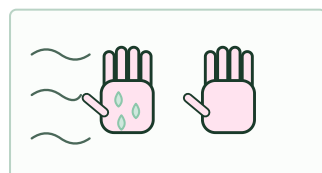
15 min **Liquids compared**
Pairs open [the dry lab](#) and run all four wicks in still air three times, recording each run. Students write their hypothesis for each wick before the first run.

15 min **The hand starter, measured**
In [the dry lab](#), fan on, then humidity at 20% and 80%. Each pair takes a different set-up, runs it three times, and the class pools its results on the board.

10 min **Process**
Work out one standard deviation and standard error by hand, check them against Graph your results in the lab, and draw a graph with error bars.

The same hour can run the bench stations (the activity below) instead, with [the dry lab](#) for homework.

ACTIVITIES

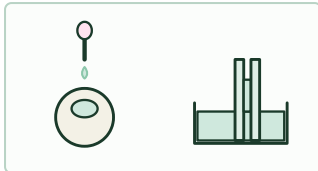


DEMO

Wet hand, dry hand

Students wet the back of one hand, blow on both, and say which is colder and why. Revisit it after [the dry lab](#), when the answer has numbers behind it.

Needs: water, paper towels.



PRACTICAL

Water at the bench

Four stations. Drops on a coin, water and soapy water, three trials each, with mean, SD and SE (cohesion). Capillary rise in tubes or straws of three widths (adhesion). What dissolves: salt, sugar, oil and sand (solvent). Water against dry sand warmed under a lamp, with the temperature taken every 2 minutes (heat capacity).

Needs: coins, droppers, washing-up liquid, capillary tubes or straws, beakers, salt, sugar, oil, sand, a lamp, thermometers.

DRY LAB

Wet wicks

The [dry lab](#), with the tasks and questions under it, and its results table as a CSV for a pooled class graph. Done for real, it needs probes or thermometers, gauze, water, ethanol (flammable: no flames), cooking oil, droppers and a desk fan.

Needs: one device per pair.

PLENARY

15

min

Explain

The three questions under the lab. Link the result to sweating and to leaves, and evaluate the method.

WHAT STUDENTS GET WRONG

Sweat cools because water has a high specific heat capacity. It cools because evaporation takes heat away (latent heat of vaporisation).

STRETCH AND SUPPORT

Stretch: in [the dry lab](#), predict the curve for a liquid that boils at about 97 °C, between ethanol and water, then reason about it.

IN THE GUIDE

Lab [Dry lab: Wet wicks: cooling by evaporation](#)

A11 [The whole guide, with the figures that play](#)

PPTX [This lesson's slides, in the order of this plan](#)

EXAM PRACTICE

Check yourself

Set it for homework: a fresh paper of exam-bank questions on A1.1 at standard level each time, marked as students go and saved to their Exam practice when they are signed in.

biologybybradford.com/exam-maker/sit?topics=A1.1&level=SL&paper=quiz&marks=15&src=ep



PRACTISE AND REVISE

BUILD FOR YOUR CLASS

- [Tarsia puzzle](#), [dominoes](#) and [picture reveal](#) on A1.1, built from its key terms and ready to print
- A [pub quiz](#) with rounds on A1.1, to present or run with no projector
- An [escape room](#) built from the [question bank](#) on A1.1

ALREADY ON THE SITE FOR A1.1

- Lesson: [Water](#)
- Summary doodle: [Water](#)
- Quiz: [Water](#)
- Revision map: [A1.1 Water](#), to fill in
- Exam questions: [A1.1 in the exam maker](#), a paper with its markscheme

CARD SETS ON SPLYCR

Open a set to host it as a class game, or make a copy to edit.

- [A1.1 Water](#)

How this was made. The course structure, the activities and the teaching choices come from my own classroom, my presentations and my years of teaching IB and AP Biology. I use Claude, an AI, to help write and build the interactive guides, lesson plans, slides and practice questions, and to draw the diagrams and code the interactives. I direct the work and review it against the IB and AP specifications before it goes live.