

technology

micro:bit: logging data over time

Lesson at a glance

Open by contrasting a single live temperature glance with readings that vanish the moment pupils look away. Pupils build a Temperature Logger in MakeCode: add the datalogger extension, name the temperature column, log Input temperature every 30000 ms inside forever, and clear the log on start. Download to the micro:bit on its battery pack, leave devices in a warm windowsill or cool corner for about nine minutes, then open MY_DATA and copy the set onto the Investigation Journal. Close by naming highest, lowest and trend, and saying what one start-of-lesson reading would have missed.

Learning objectives

- Program a micro:bit to log repeated readings over a period of time
- Read a logged dataset for a trend: what rose, fell or changed and when
- Explain why logging over time shows more than a single reading

Before the bell – prep

Charge or fit battery packs to every micro:bit — USB alone drops the log the moment it unplugs. Spot one warm place (sunny windowsill) and one cool shaded corner before the bell. One front laptop ready to open a MICROBIT drive if devices are locked down.

Safety watch-point

Use battery packs only while logging; keep USB leads tidy when reading back. Low-voltage micro:bit only — no mains packs or damaged leads.



Teaching moves

- **What we're building:** Keep it short. Ask: if I read the temperature once now, what does that tell me about the next half hour? Land on 'nothing' — that is why logging exists. Agree the warm and cool spots now so groups know where devices will go.
- **Create a new project:** Direct the class to makecode.microbit.org → New Project → name it Temperature Logger. Dismiss any sign-in prompt; no account is needed. Confirm every screen shows empty on start and forever blocks.
- **Add the data logger:** Do Extensions together on the board before anyone races ahead. Search datalogger with no space. If a pupil cannot find Extensions, they have scrolled the workspace instead of the block list — redirect them.
- **Say what you are recording:** Have them drag set columns into on start and type temperature. Predict first: nothing will show on the micro:bit, and that is correct. Stress spelling — the box text becomes the results heading.
- **Take a reading every half minute:** Watch two slips: pause must sit inside forever under log data, or the device floods thousands of readings a second; 30000 is easy to type as 3000 (three seconds). Say out loud that forever keeps going after they stop watching — that is the point.
- **Start with an empty log:** Check every screen for order: delete the log first, then set columns. The other way round wipes the headings they just typed.
- **Leave it running while nobody watches:** Download, switch to battery pack, confirm each micro:bit is on, then place in the agreed warm or cool spot. Pupils note place and start time on the Investigation Journal. Protect a full nine minutes — no picking up, breathing on, or checking devices. Use the wait for a Maths link or quick review.
- **Read your readings back:** Plug in via USB, open the MICROBIT drive and MY_DATA. If a pupil has only headings and no numbers, power was lost — pair them with a group that has data rather than restarting. Show one log on the front board if locked-down laptops block the drive.
- **What does the pattern show?:** Pupils finish highest, lowest and mostly up/down/steady on the Journal, then compare with the other spot. Let several voices answer what a single start reading would have missed — do not supply the line. Affirm a flat cool-corner set as a real, useful result.

What it should show

Expect roughly eighteen readings over nine minutes. The warm windowsill set usually runs higher and may drift as sun or room air shifts; the cool corner often stays flatter. A group with empty MY_DATA almost always lost battery power or never left forever running. Wild spikes usually mean someone handled or breathed on the board — treat as interference, not climate.



Misconceptions & interventions

- Pupils put pause outside forever, or type 3000 instead of 30000, so the log fills in seconds or races uselessly. — Point at their forever stack on screen: log data, then pause 30000 must both sit inside it. Count ‘thirty seconds’ aloud and have them fix the number before re-downloading.
- ‘Nothing appeared when I set the columns — it’s broken.’ — Remind them set columns only names the heading; the numbers appear later in MY_DATA after the timed run. Have them predict ‘blank now, table later’ before download.
- ‘A flat list means our logger failed.’ — Hold a steady cool-corner table beside a drifting warm one. A stable set is real data and the comparison the lesson needs — ask what a single reading would still have missed.

Differentiation

Emerging	Developing	Proficient
• Pair at the teacher laptop and build the forever stack together: log temperature, then pause 30000 already placed; pupil adds set columns and the delete-on-start block. • If MY_DATA is empty, share a neighbouring group’s table and still complete highest, lowest and trend on the Journal.	• After copying the table, mark the half-minute where the biggest jump sits and note what was happening in the room then. • Prompt: why does leaving the micro:bit untouched matter for trusting the pattern?	• Critique the setup: name one thing that could still unfairly nudge readings (draught, hand heat, moving the board) and how to tighten it next time. • Compare warm vs cool spreads and argue which spot changed more and why, ready for charting the same dataset next.

Cross-curricular hook

Tie to Maths Data — the Journal table is the raw set pupils will later organise into a chart, mode and range.