technology

Data with a micro:bit

Lesson at a glance

Open by holding up a micro:bit and asking what a sensor could measure in this classroom, then agree the class measure is light. Pairs predict highest and lowest of three spots on the Investigation Journal, copy the three-block MakeCode program (button A → show light level), and collect readings. Spot types (window / middle / shade) feed the IWB data-recorder chart. Close with a talk on what the bars show versus the predictions.

Learning objectives

- Program a micro:bit to read a temperature or light sensor
- Gather a small dataset of sensor readings
- Read a simple pattern from the data and say what it shows

Before the bell — prep

Charge or battery-fit one micro:bit per pair. Bookmark a shared MakeCode project (or hex/QR/LMS link) with the light program already built so pairs open it in one tap. Print Investigation Journal pages. Simulator-only path ready on the IWB if hardware is short.

Materials

Item	Qty	Per	Source	Low-cost substitute
micro:bit (with USB lead)	1	pair	school devices	run the lesson on the IWB using the MakeCode simulator

Safety watch-point

Manage classroom traffic so pairs are not crowding one window or desk. Unplug leads carefully and return micro:bits to the kit at pack-away.

Lesson 26

Teaching moves

- **Getting Started:** Hold up a micro:bit or show the simulator. Keep it to curiosity: what is a sensor, and where might light change in this room? Before moving on, lock the class measure as light so every group's data can be pooled.
- **Sensors, data and patterns:** Project only the short board text. Stress sensor, dataset and pattern with the window–middle–desk example. Head off the idea that one reading is 'the answer' — several readings let us compare.
- **Question and predict:** Form pairs first, then set the shared question: how does light change in different classroom spots? Pairs choose three spots and jot highest/lowest plus a short why on the Investigation Journal before any coding.
- **Model the micro:bit program:** On the IWB, snap only: on button A pressed → show number (light level). Download or click A on the simulator, then take one contrast pair (window vs shade) so the number changes. Say once that the scale is about 0–255, not lux or percent. Leave the project open for pairs.
- **Program and collect readings:** Name each pair's path aloud (shared link, rebuild three blocks, or board turns). Protect measuring time: stop when a number shows. Batch spots so pairs are not all at the window; circulate asking what the 0–255 number means and whether a second trial matched.
- **Record and organise the data:** Journal first: each row is spot name plus reading. Require every pair to tag spots window / middle / shade before any IWB entry. Drive the data-recorder with a few typed rows by type; chart button makes one bar per row on the 0–255 light scale.
- **What does the data show?:** Point at the bars: which spot type was highest and lowest, and did most groups match? Separate observation ('reading was 25') from inference ('so it is dimmer under the desk'), and float why one odd reading might happen.

What it should show

Expect window-type spots highest on the 0–255 light scale and shade/under-desk lowest, with middle in between. A pair whose shade reading is oddly high often covered the LED face with a hand or stood at a different height — re-run still, sensor facing out.

Misconceptions & interventions

- **One reading is 'the answer' — no need for more than a single number.** — Point back at the dataset idea: three spots side by side. Ask which pattern would be invisible if they only measured once.
- **Pupils treat the light number as percent or lux, or think brighter always means 100.** — Say the scale once while circulating: about 0 dark to 255 very bright, unitless. Compare two live readings so they see relative change, not a percentage.
- **If temperature is used, pupils expect the onboard sensor to show air temperature the instant they move.** — Put the board down, hands off, wait a few seconds, and only compare clearly different spots (radiator vs away). Prefer light indoors when you need an obvious pattern.

Differentiation

Emerging	Developing	Proficient
• Pair works from the IWB simulator with teacher support and records two spots only, still tagging type on the journal. • Rebuild is optional — open the shared three-block project and stop once a number shows on A.	• Optional second trial at each spot; note whether the two readings matched and what might have changed.	• Add a fourth spot or critique an odd class bar: was it sensor error, height, or a real difference? • Stretch prompt: how would you log light over time so nobody has to stand and press A?

Cross-curricular hook

Tie to Maths Data — bars of light readings by spot type; read highest, lowest and the shared class pattern.