

LESSON 22

Microbit Sensor Graphs

60 minutes

Microbit Innovators

WHAT THIS LESSON DOES

Follow this guide to explore Microbit sensors by creating a new project on the MakeCode website. Learn to display and graph light levels, then experiment with temperature, compass, and other sensors, testing each on the simulator and your device.

WHAT STUDENTS SHOULD BE ABLE TO DO

- Understand how to create a new project on makecode.microbit.org.
- Learn to display the light level on the Microbit.
- Develop skills to graph the light level and observe changes.
- Gain knowledge on graphing other sensors such as temperature, compass heading, acceleration, magnetic forces and sound level.
- Apply creativity to graph other possible values and incorporate sensor usage in different projects.

BEFORE THE LESSON

- Confirm makecode.microbit.org loads on the school network and that a new project can be created.
- Have Microbits and USB cables ready, one set per pupil or pair, for download and real light or heat tests.
- On your own simulator, find the yellow light control circle and the Show data button under the Microbit.

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HOW THE LESSON RUNS

- Create a new project
- Show light level
- Graph light level
- Graph other sensors
- Get creative

TEACHING MOVES

- 1. Create a new project. Open makecode.microbit.org on the class screen and create a new project together so every pupil starts from the same blank workspace.
- 2. Show light level. Build the forever showNumber lightLevel blocks as a class. Demo the simulator light circle, then have them download and shine real light on the board.
- 3. Graph light level. Switch to plotBarGraph with light level and max 255. Click Show data on the simulator so they see the live graph before downloading.
- 4. Graph other sensors. Start with temperature and max 50 for Celsius. Point to the Input drawer for other sensors and use 1023 only when the true maximum is unknown.
- 5. Get creative. Give a short creative window: graph one new value or note how a sensor could drive a game. Ask each pair what their graph measures.

WHAT TO WATCH FOR

- Pupils treat the light reading as a percentage out of 100 rather than a scale from 0 (black) to 255 (white). Restate the 0 to 255 range and match it to the second value in the plotBarGraph block.
- The bar stays flat or always full because the graph maximum is far too high or too low for that sensor. Ask what peak reading they expect. Try 255 for light, 50 for Celsius temperature, or 1023 only as a safe default.
- Pupils edit the code when they only need to change the light or heat on the simulator or the real board. Demo once with code unchanged: move the yellow circle or cup the Microbit and watch the graph respond.

DIFFERENTIATION

- Emerging: Pair them with a partner and let them use the simulator light control before any download. Stay with them to get the forever and lightLevel blocks snapped in the right order.
- Developing: Prompt them to name the next Input block and a sensible maximum for that sensor. Have them explain what the graph does when they cover or warm the Microbit.
- Proficient: Challenge them to graph two sensors and compare the scales they chose. Ask them to sketch how one sensor reading could control a game or another project.