

LESSON 16

Sound level

40 minutes

Microbit Adventures

WHAT THIS LESSON DOES

In this step-by-step lesson, you'll create a new Microbit project and learn how to display the sound level as a graph using the built-in microphone. Then, you'll be challenged to turn your Microbit into a warning device that sounds an alarm when the noise level exceeds a certain limit.

WHAT STUDENTS SHOULD BE ABLE TO DO

- Develop skills in creating a new Microbit project using makecode.com.
- Understand and apply the concept of sound level detection using the built-in microphone in Microbits.
- Learn to display the detected sound level as a graph on the Microbit.
- Apply coding skills to manipulate the sound level block and the plot bar graph block.
- Engage in a challenge to utilise learned skills in a practical scenario, turning the Microbit into a warning device.

BEFORE THE LESSON

- Open makecode.com on the board and confirm it is not blocked by the school filter.
- Check pupils have a device each or in pairs, logged in and able to reach MakeCode.
- This uses the microphone and speaker on micro:bit version 2, so check your micro:bits are v2 before starting.

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HOW THE LESSON RUNS

Create a new Microbit project

Show the sound level as a graph

Challenge!

TEACHING MOVES

- 1. Create a new Microbit project. Model creating a new project on the board once, then let pupils repeat it themselves so the setup is theirs, not copied blindly.
- 2. Show the sound level as a graph. Before typing code, ask pupils what number they think a whisper versus a shout would give. Then run the bar graph and have them clap to watch it climb toward 255.
- 3. Challenge! Do not give the answer first. Ask what block decides 'too loud' and let pupils try an if-statement themselves. Reveal the sample only after they have attempted a threshold.

WHAT TO WATCH FOR

- Pupils think the sound level is fixed rather than a live reading that changes moment to moment. Put the bar graph in a forever loop and have them make sounds while watching the graph respond in real time.
- Pupils place the if-statement outside the forever loop, so the alarm is only ever checked once. Show that the check must sit inside forever so it repeats and keeps monitoring the sound.

DIFFERENTIATION

- Emerging: Give them the completed bar graph code to type and run first, so they get the microphone working before attempting any logic.
- Developing: Prompt them with a single question: what number counts as too loud? Let them pick the threshold and test it by clapping.
- Proficient: Ask them to change the alarm sound, or make the threshold adjustable so the device is more or less sensitive, then explain their choice back to you.