

## LESSON 2

# Microbit Step Counter

60 minutes (2 periods)

Introduction to Micro:bit Basics

### WHAT THIS LESSON DOES

Follow this guide to build a step counter using your Microbit. Start by creating a new project, set up a steps variable, detect shakes with the accelerometer, display step counts, and test it while walking.

### WHAT STUDENTS SHOULD BE ABLE TO DO

- Develop a basic understanding of Microbit programming and project creation.
- Learn to create and set up variables in Microbit.
- Understand the use of accelerometer sensor in Microbit for step detection.
- Gain skills to display data on Microbit using LEDs.
- Learn to modify and resend code to Microbit for improved functionality.

### BEFORE THE BELL

- Count out one micro:bit and USB cable per student or pair the day before. Check each board powers on and is recognised when plugged in.
- Open [makecode.microbit.org](https://makecode.microbit.org) on the school network and confirm students can create a project from classroom devices.
- If you want them walking with the counter, have small USB power banks ready (about €4 each) so boards are not tethered to laptops.

## Microbit Step Counter

### HOW THE LESSON RUNS

- Create a new Microbit project
- Create the 'steps' variable
- Setup the 'steps' variable
- Detect a step
- Display the number of steps
- Send the code to your Microbit
- Connect a power source
- Get walking!
- Every second step
- Resend the code to your Microbit

### TEACHING MOVES

- 1. Create a new Microbit project. Project the MakeCode home screen. Have everyone create a new project and name it clearly, for example StepCounter, before any blocks are added.
- 2. Create the 'steps' variable. Ask why the board must remember a running total. Guide them to Variables, make a variable named steps, and check spellings match across the room.
- 3. Setup the 'steps' variable. Show set steps to 0 on start. Stress that without this, the count can begin from an unknown value when the board powers up.
- 4. Detect a step. Name the accelerometer as the sensor that feels a shake. Add on shake and change steps by 1. Students should not expect the board to know a footstep on its own.
- 5. Display the number of steps. Place show number steps inside forever. Say aloud: forever keeps the display updating so the latest count stays visible while they walk.
- 6. Send the code to your Microbit. Download and flash together. Do a quick desk shake test first so faults show up before anyone leaves their seat.
- 7. Connect a power source. Only then unplug from the laptop and connect a power bank with the USB cable. Check the board is still running on battery before they move.
- 8. Get walking! Pocket or sock placement only, board secure. Remind them micro:bits break if dropped or stepped on. Keep the walk short and indoors unless space is calm.
- 9. Every second step. Ask what the count missed. One board on one leg feels every other step. Change the increment from 1 to 2 and have them say why that corrects it.
- 10. Resend the code to your Microbit. Flash the updated program, reconnect power, and retest the same short walk so they can compare counts before and after.

### WHAT TO WATCH FOR

- Students treat any program that downloads as a working step counter, without checking that shake actually increases the display. Before walking, have each pair shake the board at the desk and watch steps rise on the LEDs. No rise means fix the on-shake or variable link first.
- Students think the micro:bit knows left and right steps or true distance, not just motion strong enough to trigger shake. Say it only feels a jolt. Placement and stride matter. Compare pocket versus gentle desk taps so they see sensitivity, not magic.
- After changing the increment to 2, students forget to download again and keep testing the old program on the board. Make resend a visible checkpoint: new file on the micro:bit, then a fresh walk. Ask one student to explain what is now on the hardware.

### DIFFERENTIATION

- Emerging: Pair them with someone whose project already shows a rising number on shake, and have them rebuild set steps, on shake, and forever show number in order. Stay on desk shake tests with USB power from the laptop until the display updates reliably before adding a power bank.
- Developing: Ask them to talk through each block in order: start at 0, shake adds, forever shows, before they walk. If the count looks wild, have them reseal the board in a tighter pocket and retest the same corridor length.
- Proficient: Have them explain to another pair why incrementing by 2 is a rough fix and what still makes the count inaccurate. Challenge them to reset steps on button A and re-flash, using only blocks already in this project pattern.