

Microbit Step Counter

60 minutes

Microbit Adventures

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 LESSON

- Open makecode.microbit.org yourself and check the school filter does not block it. Log in or set up how pupils will save their projects.
- One device per pupil or pair, plus a physical Microbit and USB cable each so they can flash and test.
- Have small power banks ready (about €4 each) so pupils can walk with the Microbit; without them they can only test on-screen.
- Clear a safe space for walking and check underfoot: dropped Microbits break.

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

- 2. Create the 'steps' variable. Explain a variable as a labelled box that remembers a number. Have every pupil name theirs exactly 'steps' so their code matches the blocks that follow.
- 3. Setup the 'steps' variable. Stress that setting steps to 0 must sit inside 'on start', so the count resets each time. Check nobody has left it floating loose in the workspace.
- 4. Detect a step. Show that the accelerometer reads the jolt of a step as a shake. Model dragging 'change steps by 1' inside the shake gesture block.
- 5. Display the number of steps. Point out that forever repeats endlessly, which is why the number keeps updating. Contrast it with 'on start', which runs once.
- 6. Send the code to your Microbit. Walk them through flashing: connect by USB, download, drag the file to the Microbit drive. Wait for the light to stop flashing before unplugging.
- 7. Connect a power source. Once flashed, have pupils swap the computer USB for the power bank so the Microbit runs untethered.
- 8. Get walking! Before anyone moves, remind them to secure the Microbit in a pocket or sock and to mind it does not fall or get stepped on. Hold the yard trip until step 9 is done.
- 9. Every second step. Let pupils discover it counts every second step first, then ask why. Guide them to reason that one foot only shakes once per two paces, so change 1 to 2.
- 10. Resend the code to your Microbit. Remind pupils that editing code changes nothing on the Microbit until they download and flash again. Have them re-test after resending.

WHAT TO WATCH FOR

- Pupils think editing the code in MakeCode changes the Microbit automatically, and are puzzled the count still behaves the old way. Make the flash step visible each time: no download and drag, no change on the device. Have them resend after every edit.
- Pupils place the 'set steps to 0' inside forever, so the count resets constantly and never climbs. Check placement early. Show that reset belongs in 'on start' and the display belongs in forever, and explain what each block does.
- Pupils assume the counter is broken when it only counts every second step, rather than seeing it as expected behaviour to fix. Reframe it as a bug to reason about, not a fault. Ask which foot the Microbit is on and how often that foot lands.

DIFFERENTIATION

- Emerging: Pre-name the 'steps' variable on their screen so they start from block placement rather than setup. Pair them with a partner for the flashing step, which is the fiddliest part.
- Developing: Have them explain back what the forever block does and why the reset sits in 'on start' before moving on.
- Proficient: Once working, challenge them to add a shortcut, for example pressing button A to reset the count to zero, or showing an icon each time a step is added.