

LESSON 17

Microbit Fruit and Veg Piano

60 minutes

Microbit Adventures

WHAT THIS LESSON DOES

Get ready to turn fruit and vegetables into a musical instrument with your Microbit! Follow simple steps to create a circuit using your body and fresh produce, programming your Microbit to play unique notes and display icons.

WHAT STUDENTS SHOULD BE ABLE TO DO

- Understand and apply the concept of electrical conductivity using the human body and various fruits and vegetables.
- Identify and utilise the components of a Microbit, including its pins and GND.
- Create and modify a Microbit project using the makecode.microbit.org platform.
- Program Microbit pins to play different musical notes and display different icons.
- Test and troubleshoot a simple electrical circuit using a Microbit, crocodile clips, and conductive materials.

BEFORE THE LESSON

- Open makecode.microbit.org and check it is not blocked by the school filter. Test flashing code to one Microbit yourself first.
- Per group: a Microbit with a power source (USB to computer, power bank or battery pack), 4 crocodile clips, and 4 pieces of fruit or veg such as bananas, apples or carrots.
- Sound on and audible, or headphones, so pupils can hear the notes.
- Set the safety line before you start: this circuit is safe because the current is tiny, and never experiment with plugs or power outlets.

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HOW THE LESSON RUNS

Introduction
What you need
Create a new Microbit project
Program Pin 0
Program Pin 1
Program Pin 2
Send the code to your Microbit
Connect the crocodile clips
Test that the circuits work
Connect the fruit and veg

TEACHING MOVES

- 1. Introduction. Make the safety point out loud and firmly: this works because the current is very, very low. Stress that pupils must never try this with mains electricity, plugs or sockets.
- 2. What you need. Hand out kit per group and have them check they have all four crocodile clips before coding starts, so testing is not held up later.
- 3. Create a new Microbit project. Walk the room to confirm everyone is on makecode.microbit.org with a fresh project open before anyone starts dragging blocks.
- 4. Program Pin 0. Show that the code lives inside a forever loop and an if pin-is-pressed block. Let pupils pick their own note and icon for P0 so it feels like theirs.
- 5. Program Pin 1. Point out P1 is added below P0 in the same forever loop, not in a new one. Insist P1's note and icon differ from P0.
- 6. Program Pin 2. Confirm all three if-blocks now sit inside one forever loop, each pin with its own note and icon. Check the block order before flashing.
- 7. Send the code to your Microbit. Demonstrate the flash step once on the board. Watch for pupils confusing saving the file with sending it to the physical Microbit.
- 8. Connect the crocodile clips. Check each group clips one lead to each of P0, P1, P2 and GND. A clip on the wrong pin is the commonest reason a note will not play.
- 9. Test that the circuits work. Make sure the Microbit is powered first. Model holding the GND lead in one hand and touching the metal of a pin lead with the other, then releasing to trigger the note.
- 10. Connect the fruit and veg. Tell pupils to hold the GND wire in one hand and touch each fruit to play its note. Tip: touching the bottom of the fruit conducts best.

WHAT TO WATCH FOR

- Pupils think nothing happened because the note only plays when they release their finger, not while touching. Show that touch completes the circuit and release triggers the sound. Have them touch, pause, then let go and listen.
- Pupils give all three pins the same note and icon, so they cannot tell which fruit does what. Before testing, ask each pupil to name their three notes and icons back to you and confirm all three are different.
- Pupils assume flashing failed when it is actually the crocodile clip on the wrong pin or a dead power source. Troubleshoot in order: is it powered, is each clip on the right pin, is metal touching skin. Check these before re-flashing.

DIFFERENTIATION

- Emerging: Pair them with a partner and give them just P0 to program and test working before adding P1 and P2. Sit beside them for the flash step, the one point most likely to stall a slower start.
- Developing: Let them build P1 and P2 by copying the shape of the P0 block themselves, rather than being shown each one. Ask them to predict which fruit will play before touching it, then check.
- Proficient: Challenge them to choose notes that form a short recognisable tune and play it on the fruit. Have them explain to another group why the body and fruit conduct but the plastic clip handle does not.