

LESSON 5

Lists and Working with Data in Python

40 minutes

Python from the Start

WHAT THIS LESSON DOES

Students use PRIMM to create and manipulate lists in MicroPython on the micro:bit, then loop over list data to build and combine LED light patterns.

WHAT STUDENTS SHOULD BE ABLE TO DO

- Students create and modify lists, retrieve and update elements by index, add and remove items, and use a for loop to process a small dataset of LED images.

BEFORE THE BELL

- Have micro:bits (or the simulator) ready and students logged in to the class Python setup
- Open the micro:bit Python editor at python.microbit.org and check that a new project loads cleanly
- If using physical boards, confirm USB cables or Bluetooth pairing works before the lesson
- Plan to model the first create-and-retrieve steps on the board before pairs work independently

Lists and Working with Data in Python

HOW THE LESSON RUNS

4 min	introduction	Start: What We're Building
2 min	content	Introduction
2 min	content	What Is an Array?
2 min	content	Create a List
2 min	content	Retrieve List Elements
3 min	content	Change List Elements
4 min	content	Add Elements to a List
4 min	content	Remove Elements from a List
2 min	content	Project: LED Light Patterns
2 min	content	Display Pattern1
2 min	content	Modify the Patterns
3 min	content	Merge and Show
2 min	content	Wrap up
3 min	content	Make Sense: What Worked, What Broke
2 min	content	Reflect
1 min	summary	What You Covered

TEACHING MOVES

- Stress that list indexes start at 0; write a short labelled list on the board so students can point to index 0, 1, 2
- When students reach the for loop, model reading it aloud: for each image in the list, show it, wait one second
- Keep the early steps tight so there is real time for the patterns project, where lists become a small dataset
- Treat debugging as a named skill: when a display shows the wrong item, ask which index they meant before editing the code

WHAT TO WATCH FOR

- Off-by-one index (wanting the third item but using [3]): point at the board list and count from 0
- Calling append or pop but then showing an old index that no longer matches: have them display the length or the last item after the change
- Forgetting sleep after display.show so images flash too fast to see: add the one-second pause and run again

DIFFERENTIATION

- Support: provide a written index strip (0 to 4) beside the starter list and stay with pairs on retrieve and change before they move on
- Extension: challenge students to design a third pattern list or change the merge order and timings
- Extension: ask stronger pairs to remove by value and by index in one run and explain the difference