LESSON 63

Studio: Higher or Lower

40 minutes | Project studios (optional extension sessions) | Built in micro:bit | Outcome 1.7 | Outcome 1.8

WHAT THIS LESSON DOES

Students build a Higher or Lower chance game on the micro:bit using random numbers, button inputs and if decisions, then discuss whether the computer's random feels fair.

CURRICULUM OUTCOMES

Outcome	What the specification asks for
1.7	Discuss and implement core features of a structured programming language: variables, operators, loops, decisions, assignment and modules.
1.8	Test code to find and manage errors.

WHAT STUDENTS SHOULD BE ABLE TO DO

- Build a chance game with random numbers and decisions (LO 1.7)
- Talk about why the computer's random feels fair or unfair (LO 1.8)

BEFORE THE BELL

- Have micro:bits, USB cables and a shared download route ready; students logged in to the class platform and MakeCode micro:bit open in the browser.
- Open a blank MakeCode micro:bit project on the board ready to model the first blocks.
- Check that A and B buttons work on demo devices and that students know how to download to the micro:bit the class way.

WHAT YOU NEED

Item	Qty	Per	If you do not have it
micro:bit (with USB lead)	1	pair	run the lesson on the IWB using the MakeCode simulator

Studio: Higher or Lower

HOW THE LESSON RUNS

4 min	introduction	Start: what we're building
2 min	content	Create a new Microbit project
2 min	content	Create 2 variables
2 min	content	Setup the start of the game
4 min	content	Choosing lower
4 min	content	Scoring a point
4 min	content	Resetting the numbers
5 min	content	Game over
5 min	content	Choosing higher
2 min	content	Download and play
3 min	content	Make sense: what worked, what broke
2 min	content	Reflect
1 min	summary	What you covered

TEACHING MOVES

- Model creating the two variables and the on-start random setup on the board before pairs continue; keep the early steps tight so time goes on the button logic.
- When the A path works, pause and ask what must change for higher before anyone duplicates, so the B edit is deliberate.
- Name debugging when a pair confuses the comparison or forgets to reset numbers: what did you expect, what did you see, what will you try.
- Leave two minutes of play so the fairness talk in reflect has real scores to refer to.

WHAT TO WATCH FOR

- Comparison the wrong way on A or B (higher check still using less-than): ask which button means higher and rewrite the condition together.
- Forgetting to set number to nextnumber before drawing a new nextnumber: the display never moves on; trace the reset order on the board.
- Score or game-over blocks only on one button path after duplicate: compare both handlers side by side and mirror the missing pieces.

DIFFERENTIATION

- Support: provide a checklist of the A-button sequence (pause, check, icon, score, reset, show) and let students finish A fully before duplicating.
- Extension: challenge pairs to track a high score, narrow the random range, or say aloud how they would test if the game is fair over many rounds.
- Extension: ask how they would explain a long losing streak using only the random range 1 to 100.