LESSON 68

Studio: Digital Dice Roller

40 minutes | Project studios (optional extension sessions) | Built in Python | Outcome 3.1 | Outcome 3.9

WHAT THIS LESSON DOES

Students build a shake-to-roll digital dice in Python on the micro:bit, using lists, random selection and a function, then test that all six faces come up fairly.

CURRICULUM OUTCOMES

Outcome	What the specification asks for
3.1	creatively design and write code for short programming tasks to demonstrate the use of operators for assignment, arithmetic, comparison, and Boolean combinations
3.9	analyse code to determine its function and identify errors or potential errors

WHAT STUDENTS SHOULD BE ABLE TO DO

- Build a shake-to-roll dice in Python (LO 3.1)
- Test that all faces come up fairly (LO 3.9)

BEFORE THE BELL

- Students logged in to the platform with the Python micro:bit editor open
- Physical micro:bits and USB cables available if you plan to download; otherwise use the on-screen simulator shake control
- Check that the simulator runs and the shake button is visible before the class starts

WHAT YOU NEED

Item	Qty	Per	If you do not have it
tablet or laptop with Python	1	pair	run the lesson on the IWB with students taking turns

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HOW THE LESSON RUNS

4 min	introduction	Start: what we're building
3 min	content	The plan: four parts to build
2 min	content	Import Modules
5 min	content	Define Dice Faces
3 min	content	Detect Shake Event
4 min	content	Animate Rolling Dots
4 min	content	Select and Display Random Face
4 min	content	Wrap in a Function
3 min	content	Download your Code
2 min	content	Wrap Up and Extensions
3 min	content	Make sense: what worked, what broke
2 min	content	Reflect
1 min	summary	What you covered

TEACHING MOVES

- Model the first two build steps on the board, then let pairs continue while you circulate
- Use the simulator shake button early so every student can test without waiting for hardware
- When the random face is in place, pause for a short fairness check: roll several times and tally which faces appear
- Keep the wrap-in-a-function step focused on why the roll logic sits in one named block, not on extra features

WHAT TO WATCH FOR

- Spelling errors in import names or Image patterns stop the program before anything runs; fix spelling on the spot and re-run
- Shake not detected because the check sits outside the loop or the gesture name is mistyped; confirm the continuous check and the exact gesture spelling
- Random index out of range if the list length and the random bounds do not match; count the six faces and align the random range with the list

DIFFERENTIATION

- Support: Provide a printed face map (1 to 6) so students can match each Image pattern without decoding dots under pressure
- Extension: Ask confident pairs to tally twenty rolls and say whether the dice still looks fair
- Extension: Invite a short extra animation frame or a text number after the face once the core roller works