

LESSON 2

Variables and input in Scratch

40 minutes

Strand 1: Introducing computer science

Built in Scratch

Outcome 1.7

WHAT THIS LESSON DOES

Students build a Paddle Ball game in Scratch, using a speed variable with assignment and arithmetic, and mouse input to control the paddle.

CURRICULUM OUTCOMES

Outcome	What the specification asks for
1.7	discuss and implement core features of structured programming languages, including variables, operators, loops, decisions, assignment and modules

WHAT STUDENTS SHOULD BE ABLE TO DO

- Store and change a value in a variable using assignment and arithmetic operators (LO 1.7)
- Use input to change what a program does (LO 1.7)

BEFORE THE BELL

- Students logged in to the Coding Ireland platform on their devices, with Scratch ready to open in the browser
- Data projector or board ready so you can model the first blocks before pairs work independently
- Check that students can create a new Scratch project and find the sprite library
- Decide which way you want students to save at the end, signed in to Scratch or saved to a folder on the device, so you can tell them which of the two options on the last step applies

WHAT YOU NEED

Item	Qty	Per	If you do not have it
tablet or laptop with Scratch	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
2 min	content	The plan: four parts to build
2 min	content	Create a new Scratch project
2 min	content	Add the paddle sprite
2 min	content	Add the ball sprite
3 min	content	Position the ball
3 min	content	Make the ball bounce around
3 min	content	Create a speed variable
3 min	content	Control the paddle
3 min	content	Make the ball bounce off the paddle
2 min	content	Add a backdrop
2 min	content	Add the game over line
3 min	content	Program game over
3 min	content	Make sense: what worked, what broke
2 min	content	Reflect
1 min	summary	What you covered

TEACHING MOVES

- Model creating the speed variable and dropping the round speed reporter into the move block's number slot on the board before students try it
- Ask pairs to predict what happens if they change the set speed value from 10 to 20 before they run it
- When the ball first moves, expect questions about it passing through the paddle; park that until the bounce step
- For independent practice, invite students who finish early to add a second variable, for example a score that increases on each paddle hit
- If you are running short: drop the backdrop step and, if you must, the game over line and its code as well. A paddle that bounces a speeding ball is a complete, working game. Keep the full time for Create a speed variable, because storing and changing that value is what the rest of the lesson and the closing discussion rest on.

WHAT TO WATCH FOR

- Speed reporter dropped beside the move block instead of into its number slot: show the white highlight on the slot and have them drag again
- Code added to the wrong sprite (paddle blocks on the ball or the reverse): check the sprite list highlight before adding blocks
- Touching-colour sensor not matching the red line: use the eyedropper so the block samples the exact line colour on the backdrop

DIFFERENTIATION

- Support: Pair students and model the variable create-and-insert steps once more on the board; leave a working set-speed example visible
- Extension: Add a second variable such as score that increases when the ball hits the paddle, or make speed increase by a different amount
- Extension: Change the starting direction or add a second ball that also uses the speed variable