

Scratch Platformer

60 minutes

Digital Creation Lab

WHAT THIS LESSON DOES

In this lesson, you'll learn to build a platformer game in Scratch. Follow step-by-step instructions to design characters, create platforms, and code movements. Start crafting your game and explore endless creative possibilities with each step!

WHAT STUDENTS SHOULD BE ABLE TO DO

- Develop skills in creating and manipulating sprites in Scratch.
- Understand and apply the concept of variables in game development.
- Implement control mechanisms for character movement, including gravity and jumping.
- Utilise broadcasting messages to manage game states and transitions.
- Enhance game aesthetics through effects like character trailing.

BEFORE THE LESSON

- Open and test the Scratch website on pupil devices; check the school filter allows it and that projects can be created and saved.
- One device per pupil or per pair, charged and logged in so work is not lost.
- Sound is optional; a projector helps if you demo the first few blocks together.

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HOW THE LESSON RUNS

Introduction

Create a new Scratch project

Create your sprite

Create the 'platform' sprite

Resize your character

Create 3 variables

Apply gravity

Move left and right

Make it jump

Add a trailing effect

Add more costumes to the ground sprite

Detect screen edge

Receive the message

Wrap up

TEACHING MOVES

- 1. Introduction. Show a quick finished platformer if you have one. Name the goal: own character, platforms, gravity, jump, and more than one screen.
- 2. Create a new Scratch project. Get everyone to a blank project with the cat deleted before anyone starts painting. Confirm they know where the sprite and costume editors are.
- 3. Create your sprite. Keep designs simple: a box with eyes is enough. Stress two costumes named exactly right and left so later switch blocks work.
- 4. Create the 'platform' sprite. Name the sprite platform. First costume should be a full-width floor along the bottom so gravity has something to land on.
- 5. Resize your character. Have them set size on green flag and tweak until the character sits neatly on the floor, not taller than a platform gap.
- 6. Create 3 variables. Create gravity, speed, and jump as variables for all sprites. Check starting values match the lesson before anyone adds movement code.
- 7. Apply gravity. Build the forever loop together: fall only when not touching platform. Green-flag test until the sprite drops and rests on the floor.
- 8. Move left and right. Add arrow-key checks in a forever loop. Costume must switch with direction. Test both ways without falling through the floor.
- 9. Make it jump. Emphasise the and touching platform condition so jump only works on the ground. Repeat-change y by jump, then let gravity bring them down.
- 10. Add a trailing effect. Add clone creation on the character, then clone script with ghost effect and delete. If the project slows, lengthen the wait slightly.
- 11. Add more costumes to the ground sprite. Duplicate costume1 and redraw platforms with gaps and ledges. Keep a continuous floor path so the character can still land.
- 12. Detect screen edge. On touching edge, use x position to choose next or previous screen broadcast, then reposition the character onto the new side.
- 13. Receive the message. On the platform sprite, start at costume1. Next and previous messages should add or subtract one from the costume number.
- 14. Wrap up. Play-test full runs across screens. Invite one extra feature only if time: another costume, a hazard idea, or tuning jump and gravity.

WHAT TO WATCH FOR

- Pupils set gravity to a positive number and the character floats up instead of falling. Remind them y increases upward in Scratch, so gravity should be negative. Reset to -15 and retest the fall.
- The character can jump again in mid-air because the up-arrow check ignores whether it is touching the platform. Show the and block: up arrow pressed and touching platform. Test from the floor and from mid-air.
- Screen changes fail because the broadcast name does not match the receive blocks, or costume names are not numbered in order. Check next screen and previous screen are identical strings on both sprites, and costumes run in order from costume1.

DIFFERENTIATION

- Emerging: Pair them with a partner and complete sprite setup plus gravity before attempting jump or clones. Provide the variable names and starting values to copy so they can focus on snapping the forever loops.
- Developing: Have them explain why jump needs touching platform before they add the trail or edge broadcasts. If stuck on screens, freeze new art and only debug the broadcast and go-to x reposition.
- Proficient: Challenge them to design extra platform costumes with tighter jumps, retuning jump and gravity. Ask them to add a simple extra using only Scratch blocks they already know, such as a score variable or a hazard costume idea from the wrap-up.