

LESSON 13

Rainbow Paintbrush

40 minutes

Exploring Coding

WHAT THIS LESSON DOES

In this lesson, students will learn how to create a rainbow paintbrush using Scratch's pen blocks, colour changing, and mouse movement features. They will create a drawing tool that changes colours as it moves, following their mouse pointer.

WHAT STUDENTS SHOULD BE ABLE TO DO

- Understand and apply the use of Scratch's pen blocks to create a drawing tool.
- Learn how to manipulate sprites to follow mouse movements on the Scratch platform.
- Develop skills in adding and utilizing extensions in Scratch, specifically the Pen extension.
- Apply coding concepts to create interactive features, such as clearing the drawing with the space bar.
- Understand and implement the use of colour changing blocks to create a rainbow effect in drawings.
- Develop an attitude of exploration and creativity in using coding to create interactive tools and features.

BEFORE THE LESSON

- Confirm scratch.mit.edu opens on class devices and is not blocked by the school filter.
- One device per pupil (or per pair). A mouse is easier than a trackpad for drawing control.

Rainbow Paintbrush

HOW THE LESSON RUNS

Introduction

Create a new project

Add the Ball sprite

Follow our mouse pointer

Add the Pen Extension

Pen Down and Draw

Clear the Drawing

Rainbow Drawing

Wrap Up

TEACHING MOVES

- 1. Introduction. Keep the intro short: they will build a brush that follows the mouse and paints rainbow lines. Get them onto Scratch quickly.
- 2. Create a new project. Direct everyone to scratch.mit.edu, create a new project, and delete the cat sprite so the stage is empty.
- 3. Add the Ball sprite. Help them add the Ball from the library. Run the green flag and check size is 30 percent before moving on.
- 4. Follow our mouse pointer. Run the forever go-to mouse-pointer code. Confirm the ball tracks the pointer before any pen blocks are added.
- 5. Add the Pen Extension. Show the Extensions button at the bottom left. Wait until every pupil can see Pen blocks in the palette.
- 6. Pen Down and Draw. Place pen down above the forever loop, not inside it. Run and have them move the mouse so lines appear.
- 7. Clear the Drawing. Add a separate when space key pressed script with erase all. Have the class press space to prove the clear works.
- 8. Rainbow Drawing. Put change pen color by (10) inside the forever loop, under go to mouse-pointer. Run it to show the rainbow trail.
- 9. Wrap Up. Invite free drawing, then clear with space. Ask a few pupils what the forever loop and colour change do together.

WHAT TO WATCH FOR

- Students may think: Pupils place change pen color outside the forever loop, so the colour only shifts once. What to do: Show the block must sit inside forever, under go to mouse-pointer, so it runs on every move.
- Students may think: Pupils expect a trail without pen down, or snap pen down in the wrong place in the script. What to do: Check pen down sits above forever. Run with and without it so they see when drawing starts.
- Students may think: Pupils try to clear the stage with the green flag instead of the space key. What to do: Point to the separate space-key script and have them press space to erase all on purpose.

DIFFERENTIATION

- Emerging: Stay with them until the Pen extension is added and the ball follows the mouse, before any draw blocks. Pair them with a partner who can point to where each new block should snap.
- Developing: After each step, have them run the green flag and say what changed before adding the next block. If lines fail, ask them to read their script aloud against the order in the step.
- Proficient: Ask them to try different values in change pen color by (10) and describe how the rainbow shifts. Have them explain to a partner why pen down sits outside forever and colour change sits inside.