

Attack of the Dots

60 minutes

Digital Creation Lab

WHAT THIS LESSON DOES

Get ready to create an exciting game in Scratch! You'll control a spinning disc to match colours with attacking dots. Learn to program the disc's movement, clone dots, and detect colours as you build this interactive project.

WHAT STUDENTS SHOULD BE ABLE TO DO

- Develop skills in using Scratch to create an interactive game.
- Understand how to control a coloured disc using keyboard inputs.
- Learn to clone game elements and set their behaviour.
- Master the technique of colour detection for game mechanics.
- Apply problem-solving skills to prevent game elements from spawning too close to the player.

BEFORE THE LESSON

- Open and test the starter project <https://scratch.mit.edu/projects/281652790/editor/> on a pupil device; confirm Scratch is not blocked and pupils can Remix and save.
- For beginners, use the alternate starter <https://scratch.mit.edu/projects/307852358/editor/> noted in the lesson.
- One device per pupil or pair, charged, with keyboard access for left and right arrow keys. Sound on if you want hit and miss audio heard.

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HOW THE LESSON RUNS

Introduction

Remix the starter project

Make the disc spin

Clone the ball

Not too close!

Make them move

Detect the colour

Create purple and orange balls

Change the code for the purple and orange balls

Wrap up

TEACHING MOVES

- 1. Introduction. Show the finished idea in one sentence: spin the wheel so its colour matches each incoming ball before it hits. Keep demo short so they reach Remix quickly.
- 2. Remix the starter project. Direct everyone to the starter link and the Remix button. Check each project is their own copy before any code is added. Offer the beginners link if the main starter feels heavy.
- 3. Make the disc spin. Build the wheel script together: go to centre, size 30%, forever with left arrow turn ccw 3 and right arrow turn cw 3. Have them press the arrows to confirm spin before moving on.
- 4. Clone the ball. On Sprite1, hide on green flag, then forever wait random 4 to 8 seconds and create clone. On clone start: random position, point towards wheel, show. Run the flag so clones appear.
- 5. Not too close! Under the clone start blocks, add if distance to wheel under 100 then delete this clone. Stress why: no reaction time if a ball spawns on top of the wheel.
- 6. Make them move. Still on clone start, after the distance check, add forever move 2 steps. Play-test that balls drift in from safe distances only.
- 7. Detect the colour. Place the touching-wheel and colour checks inside the forever, above move 2 steps. Pause and check block order on a few screens before they chase sounds and scores.
- 8. Create purple and orange balls. Duplicate Sprite1 twice. In the costume editor, eyedropper the wheel's exact purple and orange onto the new balls so colour detection can match.
- 9. Change the code for the purple and orange balls. On Sprite2 and Sprite3, change only the touching-colour hex to the wheel purple and orange given. Then full play-test all three colours.
- 10. Wrap up. Name the three skills they used: keyboard spin, cloning with a distance filter, and colour touch. Invite one pair to show a tricky bug they fixed.

WHAT TO WATCH FOR

- Pupils duplicate sprites before the green-ball code is finished, so purple and orange copies miss key blocks. Hold duplication until Sprite1 fully works: spin match, spawn, distance delete, move, and colour detect.
- Colour detection fails because the ball fill is a near-miss shade, not the wheel's exact purple or orange. Have them eyedropper from the wheel costume and retest touching colour with the sampled hex only.
- The touching checks sit outside or below the forever move, so balls pass through the wheel with no hit logic. Show the stack order on the board: inside forever, detect first, then move 2 steps.

DIFFERENTIATION

- Emerging: Pair them with a peer and complete wheel spin plus a single working green clone before any duplication. Sit with them to place the distance-to-wheel delete block and confirm no spawns inside the safe gap.
- Developing: Prompt them to read their clone stack aloud and find whether wait, create clone, and point towards wheel are in order. If green works but other colours fail, send them back only to the touching-colour blocks on Sprite2 and Sprite3.
- Proficient: Ask them to tune spawn timing or move steps and explain how that changes difficulty. Challenge them to explain why deleting clones closer than 100 is needed, using a live demo.