

Diver Game

60 minutes

Dynamic Digital Projects

WHAT THIS LESSON DOES

In this lesson, students will create an interactive game using Scratch. They will learn to control a diver sprite with their mouse, collect starfish appearing at random positions, and evade a shark that follows them. The lesson covers creating and programming sprites, implementing game logic, and using conditionals to trigger game events.

WHAT STUDENTS SHOULD BE ABLE TO DO

- Understand and apply the basic principles of game design using Scratch.
- Develop skills in programming sprites to interact with mouse movements.
- Master the use of 'clones' in Scratch for dynamic sprite generation.
- Gain proficiency in using conditional statements to control game outcomes.
- Enhance problem-solving and debugging skills in a coding environment.

BEFORE THE LESSON

- Open Scratch and check the school filter allows it, and confirm each pupil or pair can log in and start a new project.
- One device per pupil or pair, mice attached if possible since the game is mouse-controlled and trackpads make it harder.
- Build the game yourself once beforehand so you know where the Diver1, Starfish and Shark 2 sprites sit in the library.

Diver Game

HOW THE LESSON RUNS

Welcome to the Diver Game
Create a new Scratch project
Add the Underwater 1 backdrop
Add and program the Diver1 sprite
Make the diver swim
Add the Starfish sprite
Hide the Starfish and create a clone
Program the Starfish
Introducing the Shark
Game Over
Wrap up

TEACHING MOVES

- 1. Welcome to the Diver Game. Show pupils what the finished game looks like before any code, so they know the target: diver follows the mouse, collect starfish, dodge the shark.
- 2. Create a new Scratch project. Remind pupils to delete the cat sprite before adding anything, otherwise it sits on the stage and confuses their later testing.
- 4. Add and program the Diver1 sprite. Stress the test-as-you-go habit here: click the green flag straight after adding the blocks and check the diver jumps to the top middle and shrinks.
- 5. Make the diver swim. Point out that the forever loop is what makes the diver keep following the mouse. Ask pupils to predict what happens without it, then add it.
- 7. Hide the Starfish and create a clone. Warn pupils the starfish will vanish now and that is correct, not a bug. The clone does the visible work in the next step.
- 8. Program the Starfish. Walk the class through the 'when I start as a clone' logic slowly: the original hides, the clone shows and checks for the diver. This is the hardest idea in the lesson.
- 9. Introducing the Shark. Draw attention to move 2 steps versus the diver's 4 steps. Ask why the shark is deliberately slower, so the game is winnable.
- 10. Game Over. Make sure the 'if touching Diver1' block sits inside the shark's forever loop, not below it, or the game will never check for a catch.
- 11. Wrap up. Ask pupils to name the three ideas they used: mouse control, clones and conditionals. Invite them to say one thing they would add next.

WHAT TO WATCH FOR

- Pupils drop the sensing block (if touching) below the forever loop instead of inside it, so it only checks once and the game never ends or the starfish never respawns. Show them the difference on the board: a block outside the loop runs once, a block inside runs constantly. Have them count the loop's mouth to check placement.
- Pupils think the starfish disappearing at step 7 means they made a mistake and start deleting blocks. Reassure them the hide is deliberate. The original stays hidden and its clone is what they will see once step 8 is added.
- Pupils confuse the original sprite with its clone and try to add clone code to the wrong script. Explain that 'when I start as a clone' only runs for copies, while 'when green flag clicked' runs for the original. Both live on the same sprite.

DIFFERENTIATION

- Emerging: Pair them with a partner and let one drive the mouse while the other reads the block sequence aloud. Have them build and test just the diver first before moving on, so one working sprite builds confidence.
- Developing: Ask them to explain their shark script back to you and say why it uses move 2 steps rather than 4.
- Proficient: Challenge them to add a score that goes up each time a starfish is caught, using a variable. Ask them to change the shark's speed or add a second shark and predict how it changes the difficulty.