

LESSON 3

Mastering the Maze: Navigating the 4x4

30 minutes

Pattern Play Without Devices

WHAT THIS LESSON DOES

Embark on a journey to understand the importance of sequence and direction in coding. You'll guide a bird to its fruit on a 5x5 grid, take turns giving directions, and work independently on a worksheet. Remember, careful planning of your sequence is key to success. Let's get started!

WHAT STUDENTS SHOULD BE ABLE TO DO

- Develop an understanding of sequence and direction in the context of coding.
- Apply navigational skills in a practical, hands-on activity.
- Enhance problem-solving abilities through grid navigation tasks.
- Work independently to plan and execute a sequence of directions.
- Reflect on learning experiences and share strategies for planning and problem-solving.

BEFORE THE LESSON

- This is an unplugged lesson: no pupil devices are needed.
- Print a 4x4 grid worksheet for every pupil, and a few blank grids for the extension. If using the cut-and-stick option, have scissors and glue ready.
- Open the 4x4 grid interactive on the whiteboard and check it displays before the class comes in.
- Clear enough floor space for pairs to walk a route safely during the Navigator game.

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HOW THE LESSON RUNS

Introduction

Classroom Navigator

The 4x4 Challenge

4x4 Worksheet

Extension Challenge: Design Your Own Grid Game

Wrap Up

TEACHING MOVES

- 1. Introduction. Set the mission clearly: we guide the bird to the fruit using directions. Stress that the order of the steps matters, and that planning the whole path before moving is the point.
- 2. Classroom Navigator. Model one round yourself first as the Robot, following a pupil's commands literally, so pairs see that only the exact instructions given get carried out. Set clear turn-taking before they start moving.
- 3. The 4x4 Challenge. Before accepting each command, ask the class to say the next one or two steps aloud. Use your prompts about turning to get them planning ahead rather than reacting square by square.
- 4. 4x4 Worksheet. Offer both options plainly: draw the arrows, or cut and stick. Ask pupils to trace their finished path with a finger to check it actually reaches the fruit before they call it done.
- 5. Extension Challenge: Design Your Own Grid Game. Give early finishers a blank grid to design a start, a destination and obstacles, then swap with another finisher to solve. Point out that spotting and fixing a wrong step is debugging.
- 6. Wrap Up. Ask pupils to describe out loud how they planned the bird's path and what they found tricky. Keep this spoken, drawing out different strategies pupils used.

WHAT TO WATCH FOR

- Pupils count squares instead of moves, so they add an extra step at the start and land one square short or long. Have them place a finger on the starting square and only count each arrow as they move off it, checking the finish square matches the fruit.
- During the Navigator game, pupils assume the Robot 'knows' where they mean and skip commands. Insist the Robot does only exactly what is said. When it goes wrong, ask the Navigator which command was missing rather than fixing it for them.
- Pupils treat left and right from their own view rather than the bird's when it faces a different way. Ask the pupil to turn their body to face the same way as the bird before deciding, then give the direction.

DIFFERENTIATION

- Emerging: Pair them with a partner and let them give one command at a time out loud before writing anything. Reduce the distance by starting the bird closer to the fruit on their worksheet.
- Developing: Ask them to plan and say the full sequence before they draw or stick a single arrow. Have them check a finished path by tracing it with a finger back to the start.
- Proficient: Move them to the extension: design a grid with obstacles for a partner to solve. Challenge them to find a second, longer path to the same fruit and explain which is more efficient.