

Train The Robot

Write efficient algorithms with sequences and loops, predict where the robot ends, and debug programs on a 6 × 5 grid.

Name _____ Date _____ Class _____

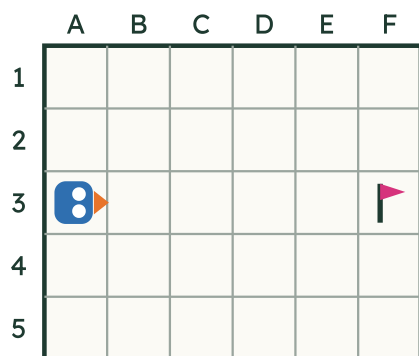
Learning objective: I can write, predict and improve algorithms using sequence and repetition.

✓ I can write a sequence of commands ✓ I can predict the outcome of a program ✓ I can use a loop to shorten a program

Commands: **F** = forward one square · **L** = turn left 90° · **R** = turn right 90° · **REPEAT n [...]** = do the commands in brackets n times. The robot cannot move onto a block (tree) or off the grid. Its orange nose shows which way it faces.

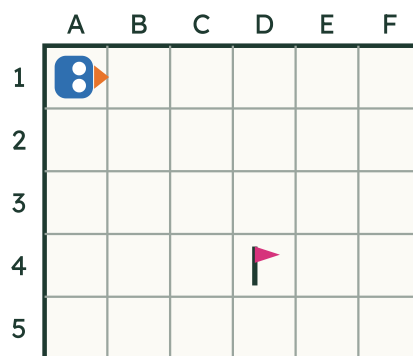
1 Write the algorithm Write the shortest program you can to reach the flag.

Level 1



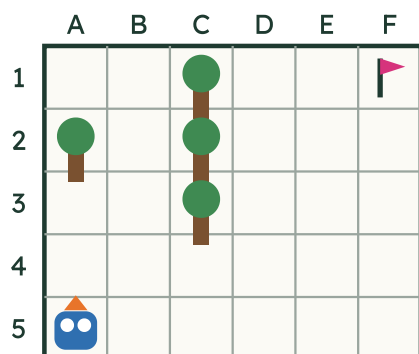
Program:

Level 2



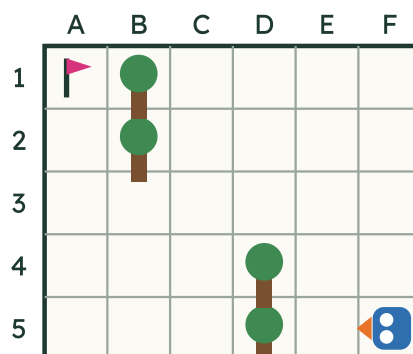
Program:

Level 3



Program:

Level 4

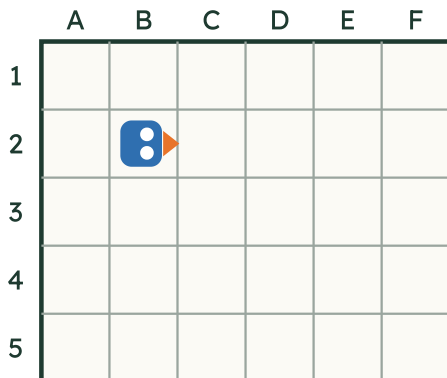


Program:

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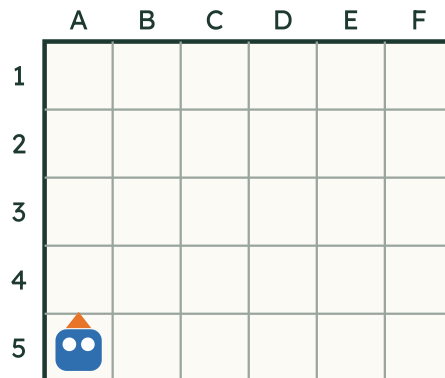
2 Predict Where does the robot finish, and which way is it facing? Give the square (e.g. C4) and direction.

Program A



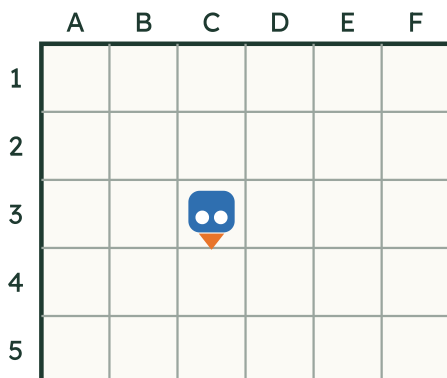
forward forward turn right forward forward
turn left forward

Program B



repeat 2 × [forward, forward, turn right]

Program C



repeat 4 × [forward, turn left]

3 Use a loop

1 Rewrite this program using REPEAT: F R F L F R F L F R F L F R F L

2 Why are loops useful in programming?

Answer Key

Train The Robot

Question	Answers
1 Write the algorithm	1. e.g. forward ×5 (5 blocks). Any working program is correct. 2. e.g. forward ×3, turn right, forward ×3 (7 blocks). Any working program is correct. 3. e.g. forward, turn right, forward ×5, turn left, forward ×3 (11 blocks). Any working program is correct. 4. e.g. forward, turn right, forward ×2, turn left, forward ×4, turn right, forward ×2 (12 blocks). Any working program is correct.
2 Predict	1. E4, facing East 2. C3, facing South 3. C3, facing South
3 Use a loop	1. REPEAT 4 [F R F L] – 16 commands become one loop of 4. 2. They make programs shorter, quicker to write and easier to check and change.

Teaching note: Every level and prediction was checked with a simulation that follows the same rules as the app (grid 6 × 5, columns A–F, rows 1–5).