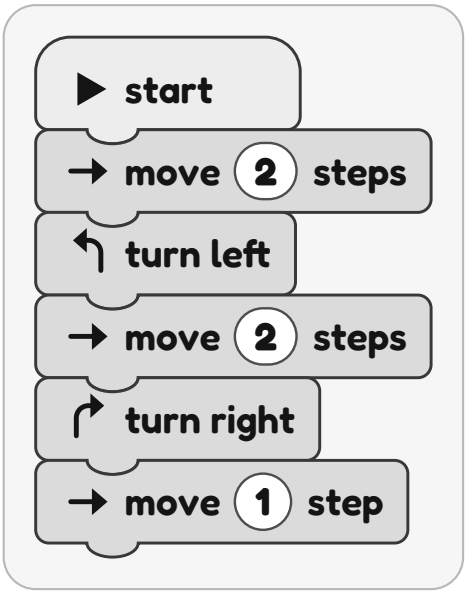
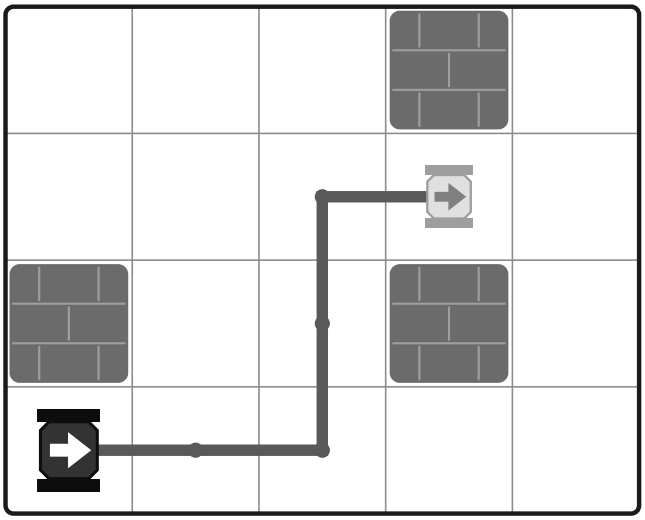
SCREEN-FREE CODING WORKBOOK • AGES 7-10

The Big Book of Block Coding Puzzles

150 Screen-Free Coding Puzzles for Kids Ages 7-10, Sequences to Functions, with Answers





Harper Lane

Sample pages

The Big Book of Block Coding Puzzles

150 Screen-Free Coding Puzzles for Kids Ages 7–10, Sequences to Functions, with Answers

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All 150 puzzles in this book are original. Every program was run by computer twice, by two separately written interpreters, and every puzzle with a gap, a bug or cut-up cards was checked to have exactly one right answer.

First edition, 2026

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Sample pages

A Note for Grown-Ups

This workbook teaches **how programs are built**, with no screen at all. Children read short programs made of blocks, the same kind of blocks used by the free block coding apps many schools use, and work out what a little robot will do. Along the way they learn the big ideas of coding: sequences, loops, events, if and else, variables and functions (making your own blocks).

How the book works

There are **6 chapters**, one big idea each, in the order elementary computer science standards introduce them (sequences and loops first, then events, conditionals and variables). Each chapter opens with a worked example and the new blocks, then **21 to 27 puzzles** that climb from one star to three. There are 9 kinds of puzzles: trace the code, press the buttons, find the missing block, the missing button, fix the bug, put the blocks in order, what does it say, the missing number and count the stars. Every page explains its task in one or two short sentences.

Every answer is checked

Every program in this book was run by computer **twice, by two interpreters written separately**, and the printed blocks were read back from the finished file and run again. Every puzzle with a gap, a bug or cut-up cards was checked against **every** block it could hold, so there is **exactly one** right answer. The difficulty of each puzzle was measured by counting the steps a child traces.

Tips for helping

- ★ Trace with a finger: one block at a time, top to bottom. Say each step out loud ("move 2 steps: one, two").
- ★ Turns are the tricky part. Turn the book, or stand up and turn your own body, so "left" matches the robot.
- ★ A repeat block runs everything inside it, then starts again from the top of the loop.
- ★ Use a pencil. The answers start on page 168; the cut-out block cards on page 195 let you play the same puzzles on the floor.

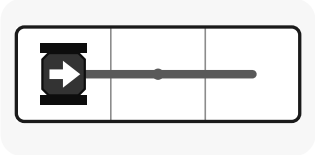
Sample pages

Meet Your Robot

The robot lives on a board of squares. It can only do what the code tells it, one block at a time.



The robot. The white arrow shows which way it faces. Here it faces **right**.



move 2 steps rolls it forward 2 squares, the way its arrow points.



turn left and **turn right** spin it a quarter turn on its square. It does not move to a new square.



A wall. The robot can never go into a wall or off the edge of the board.



A star. Some code asks "on a star?" or counts the stars the robot rolls over.



The flag. In some puzzles the robot must stop right on the flag.



Letters. When you trace a program, circle the letter where the robot stops.

Sample pages

Meet the Blocks

Blocks snap together like puzzle pieces to make a program. The shade and the little picture on each block tell you what kind it is.



Every program begins here. Run the blocks under it from the top down.



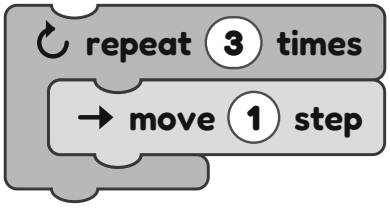
Roll forward, one square for each step, the way the arrow points.



A quarter turn to the robot's own left. It stays on its square.



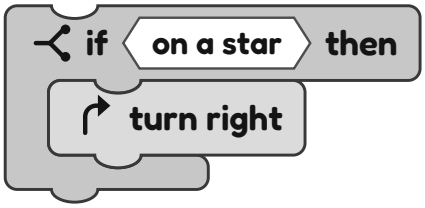
A quarter turn to the robot's own right. It stays on its square.



Runs the blocks inside it 3 times, then goes on to the block below it.

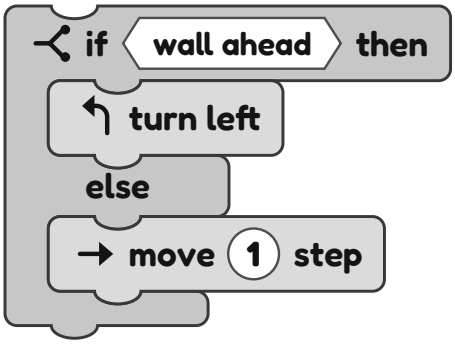


Runs its blocks every time button A is pressed.



Is the robot on a star? If yes, the blocks inside run. If no, they are skipped.

Sample pages



Is a wall (or the edge) right in front? Yes: run the top blocks. No: run the blocks under else.



Puts a number in the variable "score".



Adds 2 to "score". A minus number takes away.



Tells you the number that is in "score" right now.



Makes a new block called "hop" from the blocks under it.

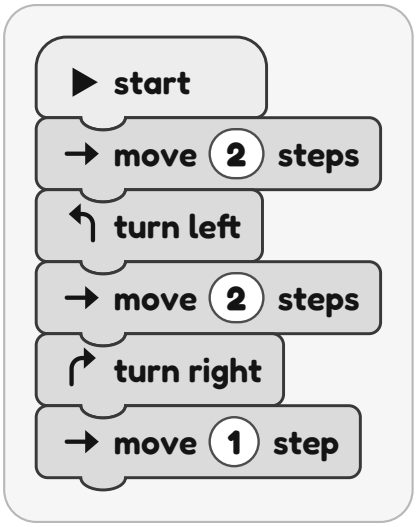


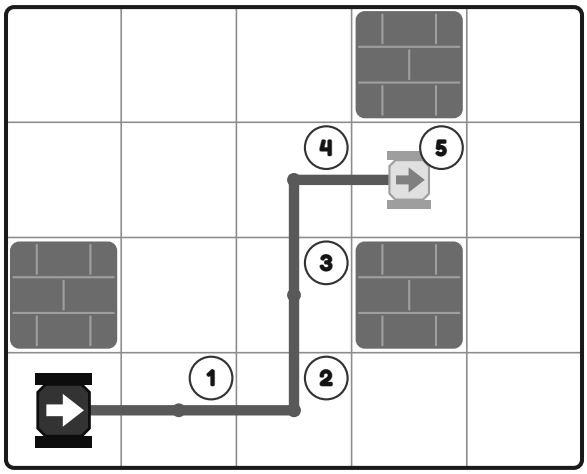
Runs every block under "define hop", then comes back.

Sample pages

How to Trace a Program

To trace a program, you become the computer. Put your finger on the robot and run each block in order, from the top block down.





- The robot starts facing **right**.
- **move 2 steps**: it rolls right 2 squares (squares 1 and 2 on the board).
- **turn left**: it stays on its square and now faces **up**.
- **move 2 steps**: it rolls up 2 squares (squares 3 and 4 on the board).
- **turn right**: it stays on its square and now faces **right**.
- **move 1 step**: it rolls right one square (square 5 on the board).
- No blocks are left, so the program is done. The robot stops here.

The rules of tracing

1. **Top to bottom.** Run one block at a time, in order. Never skip a block.
2. **Move goes forward**, the way the arrow points: one square for each step.
3. **Turn spins on the spot.** The robot faces a new way but stays on its square.
4. **Turns are tricky!** Turn the book, or turn your own body, so you face the same way as the robot. Then its left is your left.

Sample pages

Kinds of Puzzles



Trace the Code

Run the code with your finger, draw the robot's path and circle the letter where it stops.



Press the Buttons

Each button runs its own script. Press them in order and follow the robot.



Find the Missing Block

A block, a number or a sensor is missing. Pick the one from the bank that gets the robot to the flag.



The Missing Button

A button press is missing. Which button gets the robot to the flag?



Fix the Bug

One block is wrong. Find the bug, circle it and write the block that fixes it. Programmers call this debugging.



Put the Blocks in Order

The code was cut up. Put the lettered cards back in the right order.



What Does It Say?

The code keeps a number in a variable. Run it and write what it says.



The Missing Number

A number is missing. Which number makes the code say what it should?



Count the Stars

The robot counts stars as it rolls. Trace it and write the number it says.

Sample pages

My Coding Progress

Color a star each time you finish a puzzle. Can you fill every row?

1 Sequences



2 Loops



3 Events



4 If and Else



5 Variables



6 Make Your Own Block



10

CHAPTER 1

Sequences

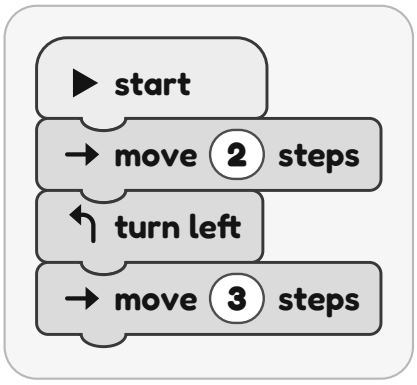
Step by Step

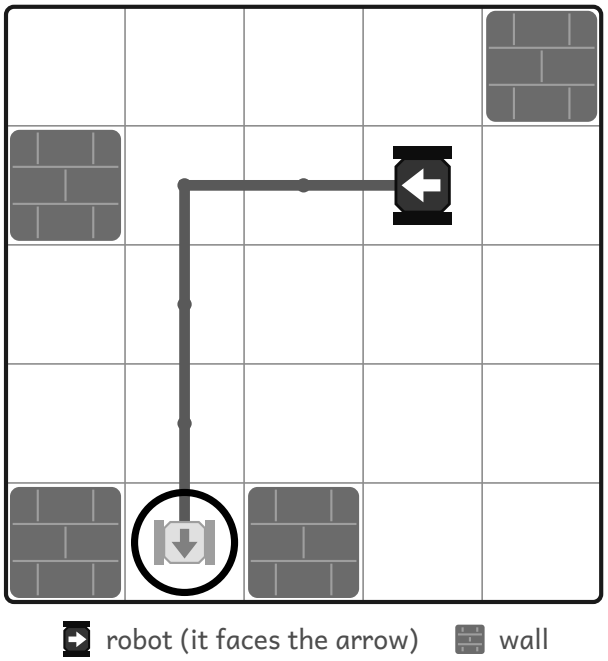
A program is a list of steps. The robot does them one at a time, from the top block down to the bottom block.

New blocks



Example





robot (it faces the arrow) wall

The gray line shows the robot's path: 5 squares. It ends where the faded robot is, facing **down**. Trace it with your finger to check.

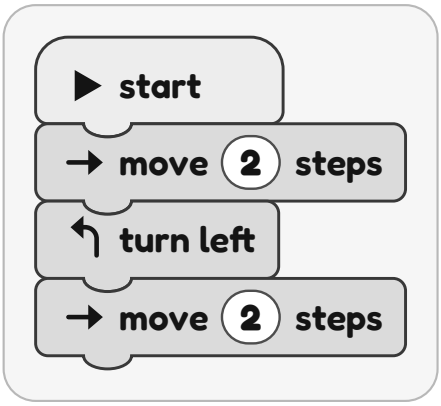
Sample pages

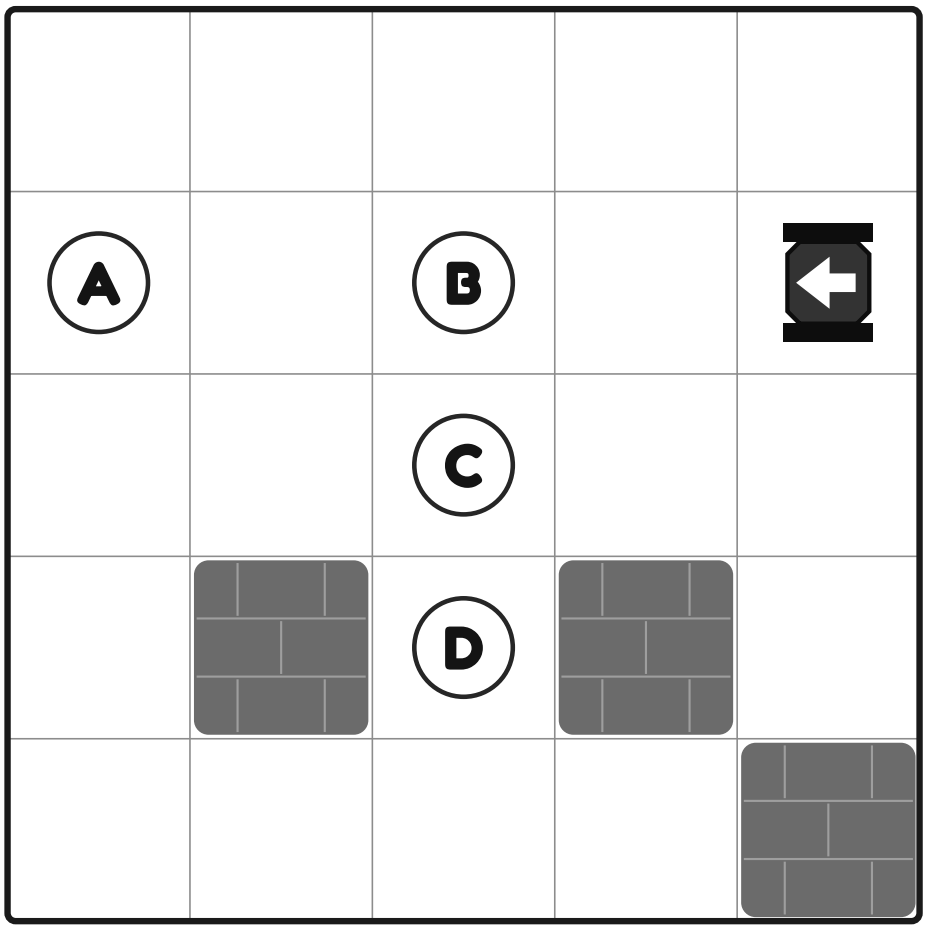
SEQUENCES

Trace the Code

★☆☆ **No. 1**

Start at the robot. Run the code from the top, one block at a time. **Draw the path**, then circle the **letter** where the robot stops.





robot (it faces the arrow) wall

It stops on letter: ☐ **Squares it rolled:** ☐

☆ Color the star when you finish!

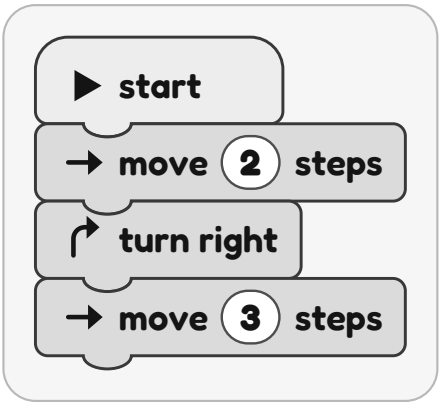
Sample pages

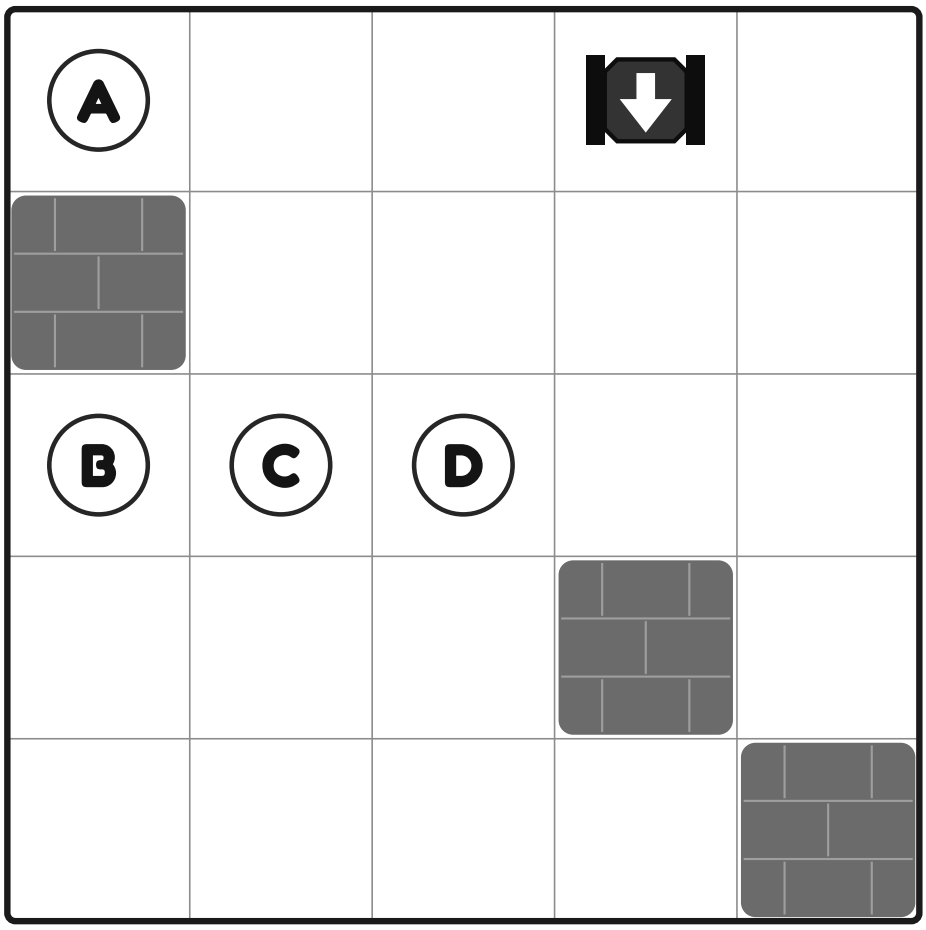
SEQUENCES

Trace the Code

★☆☆ **No. 2**

Start at the robot. Run the code from the top, one block at a time. **Draw the path**, then circle the **letter** where the robot stops.





robot (it faces the arrow) wall

It stops on letter: ☐ **Squares it rolled:** ☐

☆ Color the star when you finish!

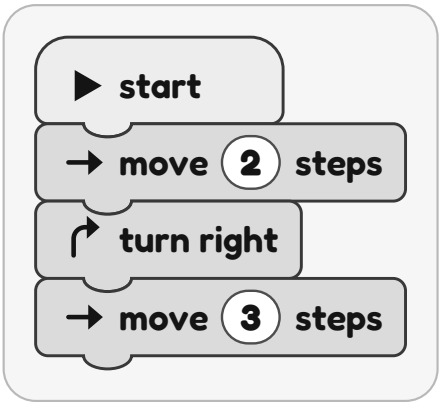
Sample pages

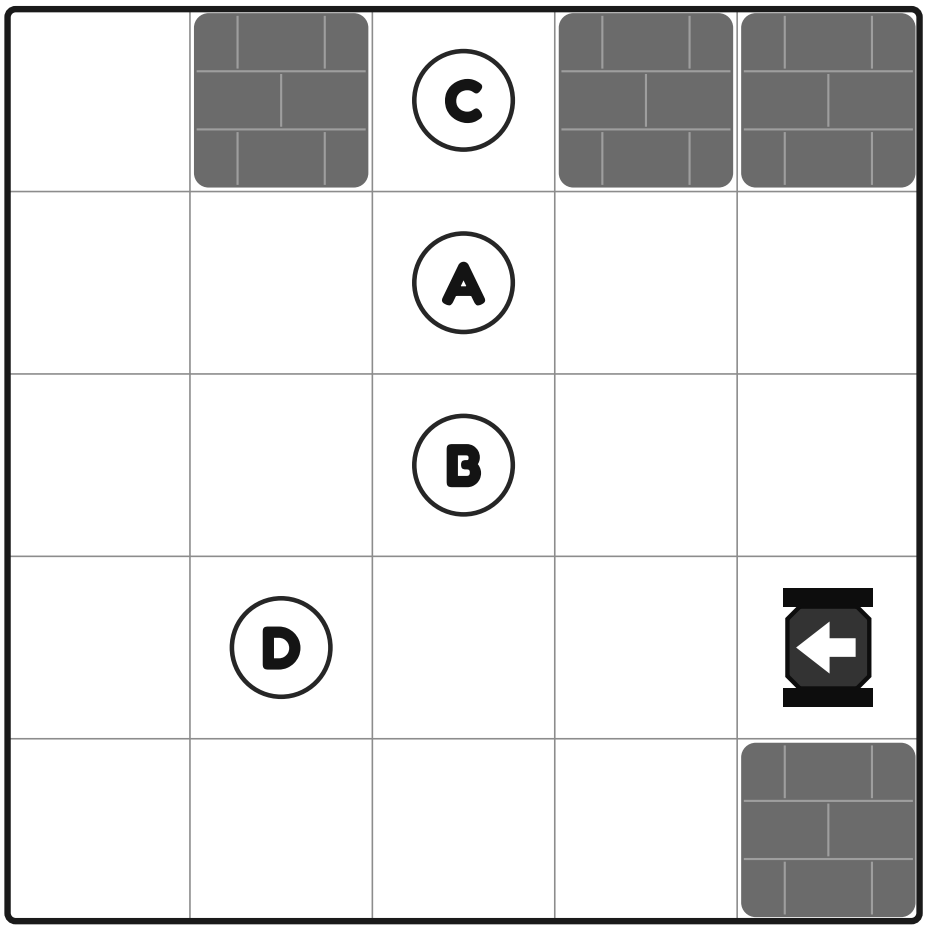
SEQUENCES

Trace the Code

★☆☆ **No. 3**

Start at the robot. Run the code from the top, one block at a time. **Draw the path**, then circle the **letter** where the robot stops.





robot (it faces the arrow) wall

It stops on letter: ☐ **Squares it rolled:** ☐

☆ Color the star when you finish!

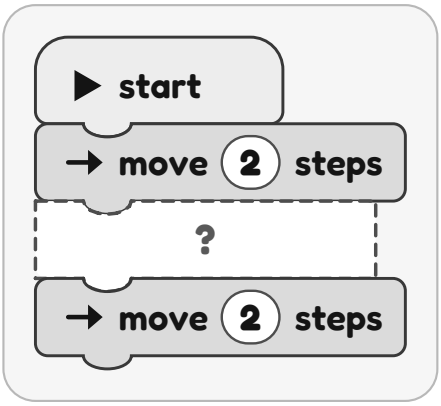
Sample pages

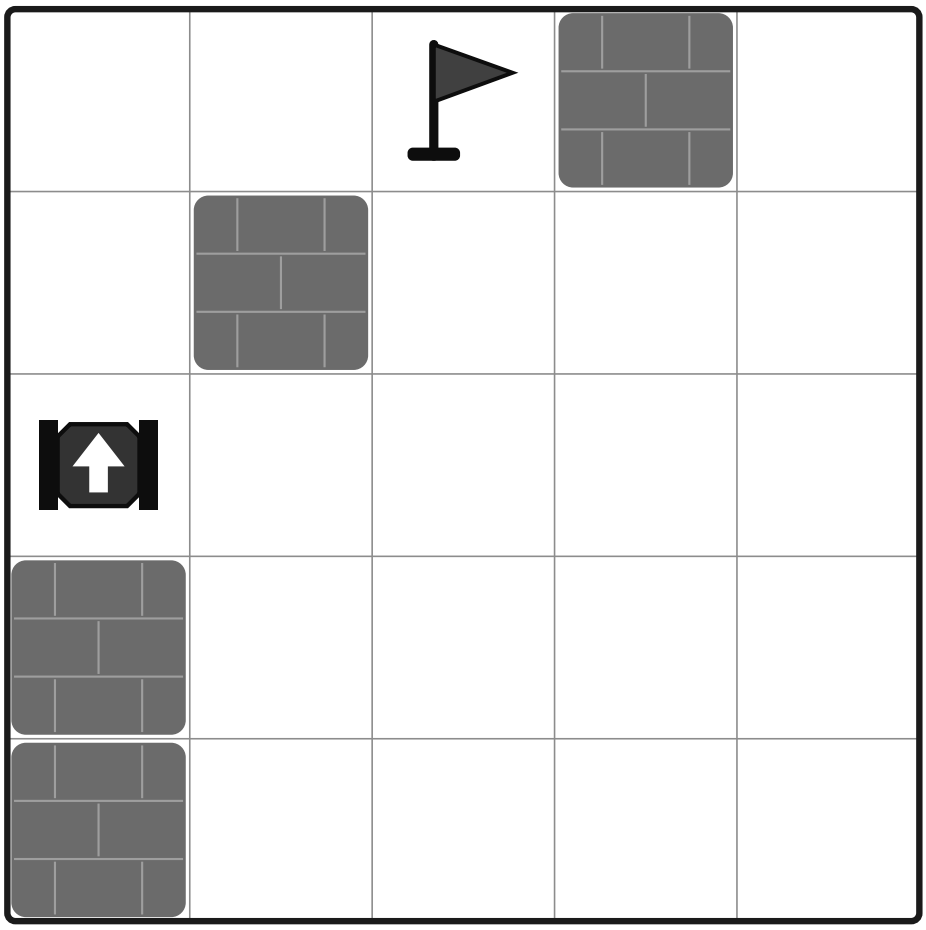
SEQUENCES

Find the Missing Block

★☆☆ **No. 4**

One block is missing. Which block from the bank takes the robot to the **flag**? Write it in the gap.





robot (it faces the arrow) flag wall

Block bank:



☆ Color the star when you finish!

Sample pages