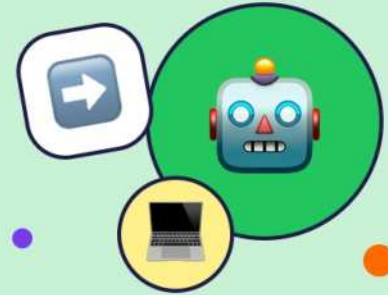


Science

Grade 4

Coding for kids: program the robot

No computer needed. Write step-by-step code, spot the bugs and fix them.



I can write an algorithm and debug a wrong set of steps.

1



Coding words

Draw a line from each word to its meaning.

☐

Algorithm

☐

Bug

☐

Debug

☐

Loop

☐

Input



● A. Find and fix a mistake in code.

● B. A set of step-by-step instructions.

● C. Information a robot takes in, like a button press.

● D. A mistake in code.

● E. Repeating the same steps again.

2



Robot sandwich

A robot needs exact steps. Write 1 to 5 in the boxes.

☐

Put the second slice of bread on top.

☐

Take out two slices of bread.

☐

Put a slice of cheese on one slice of bread.

☐

Add a lettuce leaf on top of the cheese.

☐

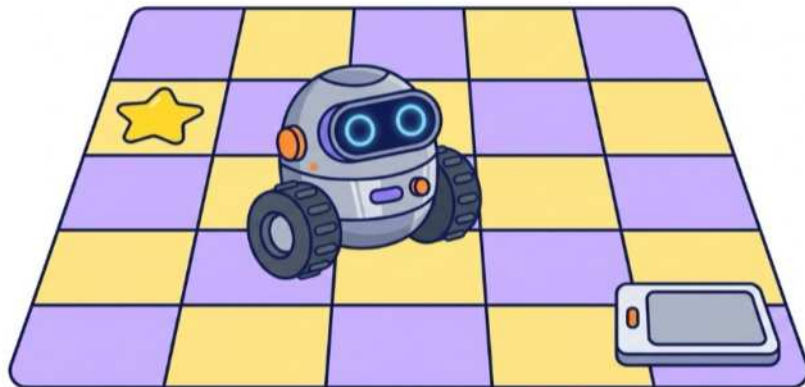
Cut the sandwich in half.

3



Read the code

Each arrow moves the robot 1 square. Circle the right answer.



1. The star is 3 squares to the right of the robot. Which code gets the robot there?

A → →

B → → →

C → → → →

2. Code: → → ↑ ↑ ↑. How many squares does the robot move in all?

A 3

B 5

C 6

3. Code: repeat 4 times [→ ↑]. How many arrows does the robot follow?

A 4

B 6

C 8

4. The robot should move 3 squares right. The code is → → ↓. Which step is the bug?

A Step 1

B Step 2

C Step 3

4



True or false

Circle the right answer.

1. A robot can guess what you mean if your code has a mistake.

True

False

2. A loop can make code shorter.

True

False

3. A robot follows its instructions in order, one step at a time.

True

False

4. An algorithm can only run on a computer.

True

False

5 Count the moves

Each arrow moves the robot 1 square. Write the missing numbers.

1. Code: → → → ↑. The robot moves _____ squares.

2. Code: repeat 3 times [→ →]. That is _____ arrows.

3. Code: repeat 5 times [↑]. The robot moves _____ squares up.

4. Code: → → ↓ ↓ ↓. The robot moves _____ squares right and _____ squares down.

5. Code: ↑ ↑ ↑ ↓. The robot ends _____ squares above where it started.

6. Code: repeat 2 times [→ ↑ ↑]. That is _____ arrows.

6 Input or output?

An input goes into the robot. An output comes out of it. Write each one in the right column.

pressing a button

a light turns on

a sensor feels a wall

the robot beeps

typing on a keyboard

a screen shows words

a microphone hears a clap

the wheels turn

Input

Output

7

**Loop counter**

Each arrow moves the robot 1 square. Fill in the table for each loop.

Loop code	Arrows in one loop	Times repeated	Total squares
repeat 3 times [→ →]			
repeat 4 times [↑ →]			
repeat 5 times [→ ↑ ↑]			
repeat 6 times [↓]			

8

**Robot challenges**

Circle the right answer.

1. Which code does the same thing as → → → →?

A repeat 4 times [→]

B repeat 2 times [→]

C repeat 4 times [↑]

2. Code: repeat 3 times [→ ↓]. Where does the robot end?

A 6 squares right

B 3 squares right and 1 square down

C 3 squares right and 3 squares down

3. The goal is 2 squares up and 4 squares right. Which code works?

A ↑ → → → →

B ↑ ↑ → → → →

C → → ↑ ↑

4. Tia's code makes the robot bump into a wall. What should she do first?

A Debug the code

B Add more arrows at random

C Turn the robot off for good

9



Debug it

The robot must go 2 squares up and then 3 squares right to reach its charger. The code is ↑ ↑ → →. What is the bug? Write the fixed code.

How did it go?



Made with 

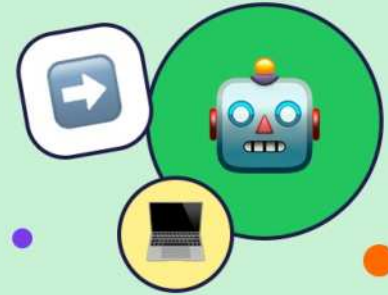
Science

Grade 4

Answer key

Coding for kids: program the robot

No computer needed. Write step-by-step code, spot the bugs and fix them.



I can write an algorithm and debug a wrong set of steps.

1



Coding words

Draw a line from each word to its meaning.

B

Algorithm



D

Bug



A

Debug



E

Loop



C

Input



● A. Find and fix a mistake in code.

● B. A set of step-by-step instructions.

● C. Information a robot takes in, like a button press.

● D. A mistake in code.

● E. Repeating the same steps again.

2



Robot sandwich

A robot needs exact steps. Write 1 to 5 in the boxes.

4

Put the second slice of bread on top.

1

Take out two slices of bread.

2

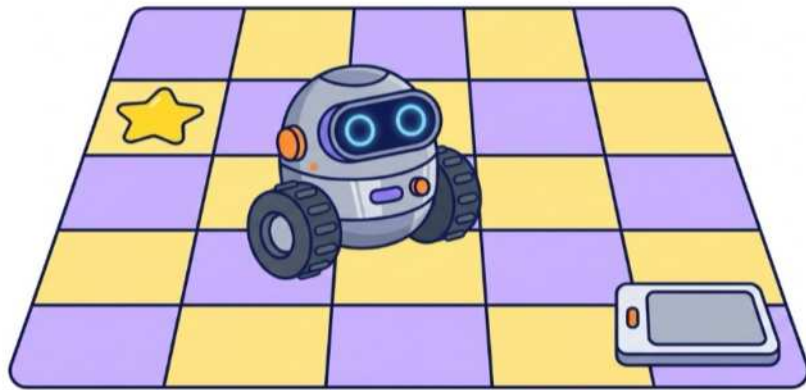
Put a slice of cheese on one slice of bread.

3 Add a lettuce leaf on top of the cheese.

5 Cut the sandwich in half.

3 Read the code

Each arrow moves the robot 1 square. Circle the right answer.



1. The star is 3 squares to the right of the robot. Which code gets the robot there?

A → →

B → → →

C → → → →

2. Code: → → ↑ ↑ ↑. How many squares does the robot move in all?

A 3

B 5

C 6

3. Code: repeat 4 times [→ ↑]. How many arrows does the robot follow?

A 4

B 6

C 8

4. The robot should move 3 squares right. The code is → → ↓. Which step is the bug?

A Step 1

B Step 2

C Step 3

4 True or false

Circle the right answer.

1. A robot can guess what you mean if your code has a mistake.

True

False

2. A loop can make code shorter.

True

False

3. A robot follows its instructions in order, one step at a time.

True

False

4. An algorithm can only run on a computer.

True

False

5 Count the moves

Each arrow moves the robot 1 square. Write the missing numbers.

1. Code: → → → ↑. The robot moves 4 squares.

2. Code: repeat 3 times [→ →]. That is 6 arrows.

3. Code: repeat 5 times [↑]. The robot moves 5 squares up.

4. Code: → → ↓ ↓ ↓. The robot moves 2 squares right and 3 squares down.

5. Code: ↑ ↑ ↑ ↓. The robot ends 2 squares above where it started.

6. Code: repeat 2 times [→ ↑ ↑]. That is 6 arrows.

6 Input or output?

An input goes into the robot. An output comes out of it. Write each one in the right column.

pressing a button

a light turns on

a sensor feels a wall

the robot beeps

typing on a keyboard

a screen shows words

a microphone hears a clap

the wheels turn

Input

pressing a button, a sensor feels a wall, typing on a keyboard, a microphone hears a clap

Output

a light turns on, the robot beeps, a screen shows words, the wheels turn

7

**Loop counter**

Each arrow moves the robot 1 square. Fill in the table for each loop.

Loop code	Arrows in one loop	Times repeated	Total squares
repeat 3 times [→ →]	2	3	6
repeat 4 times [↑ →]	2	4	8
repeat 5 times [→ ↑ → ↑]	3	5	15
repeat 6 times [↓]	1	6	6

8

**Robot challenges**

Circle the right answer.

1. Which code does the same thing as → → → →?

A repeat 4 times [→]

B repeat 2 times [→]

C repeat 4 times [↑]

2. Code: repeat 3 times [→ ↓]. Where does the robot end?

A 6 squares right

B 3 squares right and 1 square down

C 3 squares right and 3 squares down

3. The goal is 2 squares up and 4 squares right. Which code works?

A ↑ → → → →

B ↑ ↑ → → → →

C → → ↑ ↑

4. Tia's code makes the robot bump into a wall. What should she do first?

A Debug the code

B Add more arrows at random

C Turn the robot off for good

9



Debug it

The robot must go 2 squares up and then 3 squares right to reach its charger. The code is ↑ ↑ → →. What is the bug? Write the fixed code.

The code has only 2 right arrows, so the robot stops 1 square short. Fixed code: ↑ ↑ → → →.

How did it go?



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