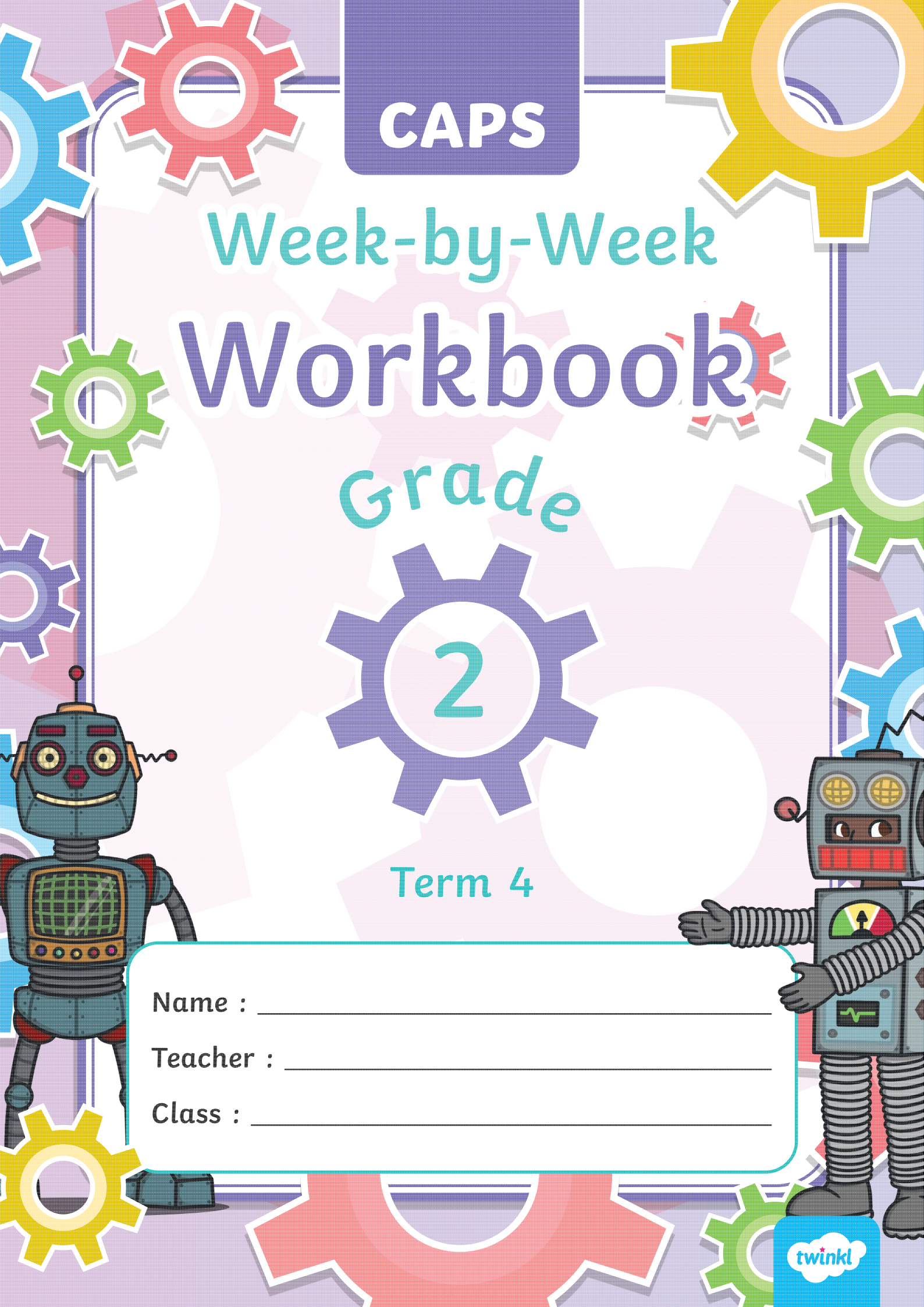




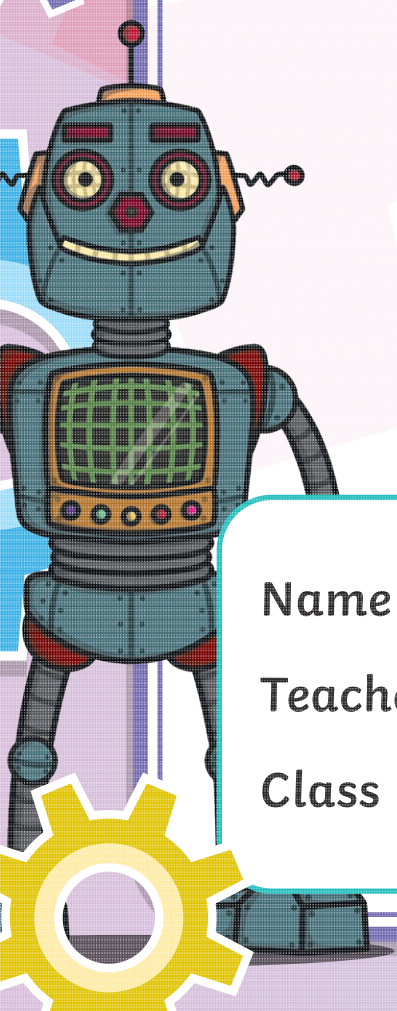
CAPS

Week-by-Week
Workbook

Grade

2

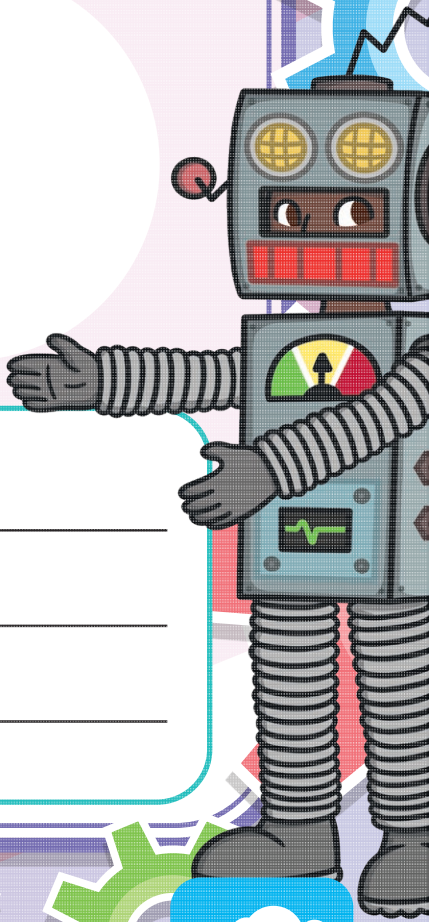
Term 4



Name : _____

Teacher : _____

Class : _____



Notes about the Robotics and Coding Curriculum

The curriculum is divided into three topical areas.

Coding,

Robotics,

Digital skills.

Each of these has its own competencies which must be achieved at appropriate levels.

Coding

- C.1** Apply computational thinking skills to develop a set of logical instructions to solve a problem.
- C.2** Present a simple coding solution using symbolic or written statements representing sequences of commands, single repetition, and conditional constructs.
- C.3** Interpret and execute a given symbolic or written set of instructions.
- C.4** Debug a symbolic or written set of instructions.
- C.5** Evaluate a given solution towards potential improvement.
- C.6** Recognise and interpret patterns and symbolic sets of data or visualisations.
- C.7** Create or complete a pattern to represent a particular data set.

Robotics

- R.1** Explain what a robot is in simple terms.
- R.2** Identify different types of robots.
- R.3** Outline the different components of a robot.
- R.4** Present an understanding of how robots affect the world.
- R.5** Design a simple product (artefact) based on a set of design specifications.
- R.6** Mimic the operations of a robot.
- R.7.** Create, test, and execute a set of robotic instructions.



Digital Skills

- D.1** Outline the concept of technology and the purpose of Information Technology (IT).
- D.2** Recognise that he or she is living as a citizen in a digital world.
- D.3** Demonstrate an understanding of the concept of a computing device.
- D.4** Identify the common uses of ICT (Information and Communications Technology) in the real world.
- D.5** Differentiate between the components of an ICT system.
- D.6** Explain how the adaptation of technology impacted the world we work and live in.
- D.7** Present a basic understanding of the concept of input, processing, and output.
- D.8** Interpret a pattern to represent or communicate a message or image.
- D.9** Create a pattern to represent or communicate a message or image.
- D.10** Demonstrate a basic proficiency in the use of digital skills.

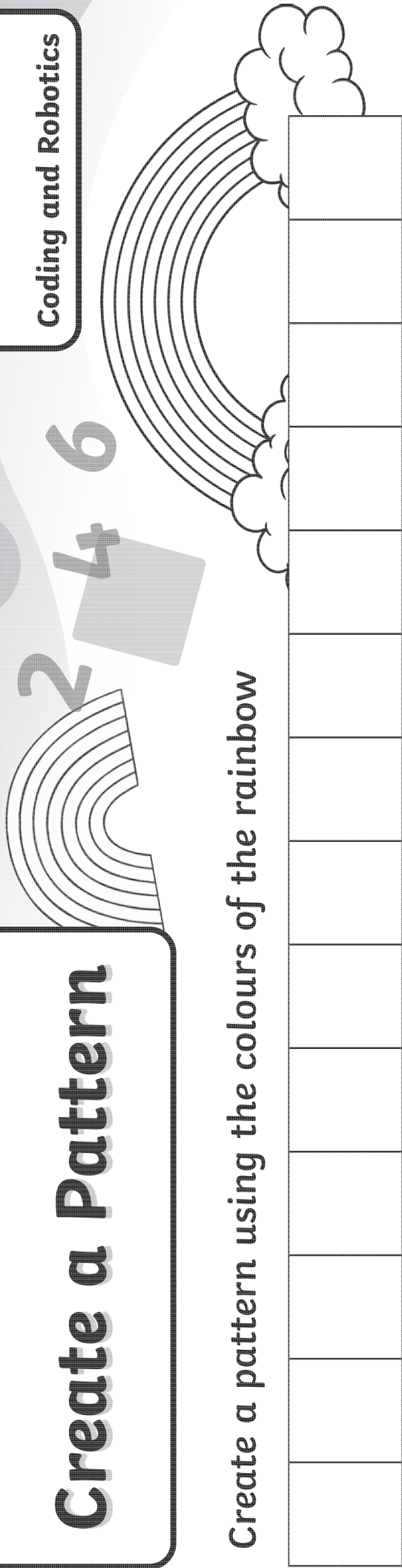
Once you have an understanding of what these competencies cover it becomes easy to use our other Robotics and Coding resources to supplement and enhance your learners' understanding of Robotics and Coding.

You will need:

- a set of action cards;
- a set of directional arrow cards;
- a demarcated 4x4 grid (made from paving blocks outside or inside from floor tiles) on which the learners can move according to a set of instructions.
- a copy of the Grade 2 Week-By-Week Planning for Term 4.

The worksheets in this workbook are arranged following the Week-by-Week Planning.

Create a Pattern



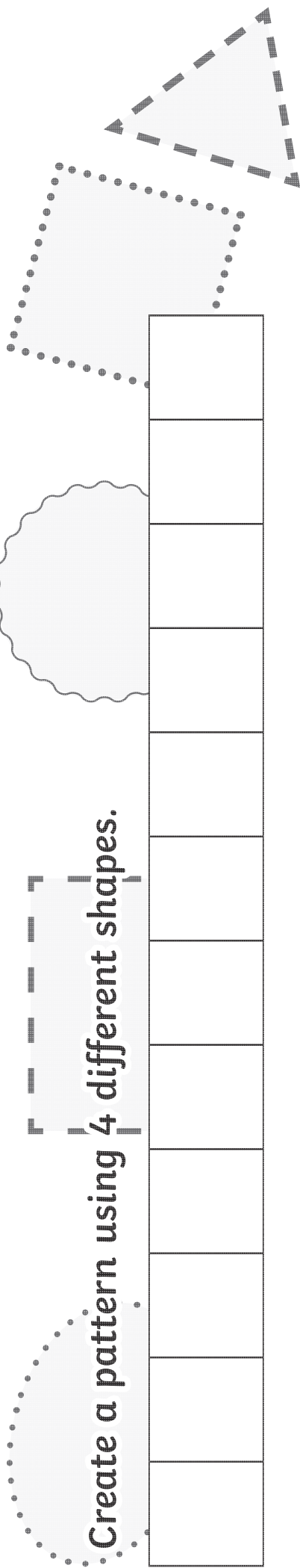
Create a pattern using the colours of the rainbow

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

2 4 6 8 0 2 4 6 8 0

Create a pattern using even numbers. You must use at least 5 different numbers.

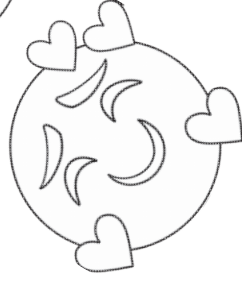
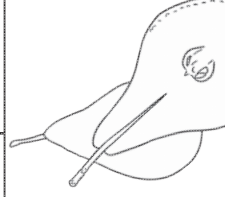
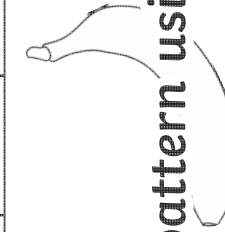
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Create a pattern using 4 different shapes.

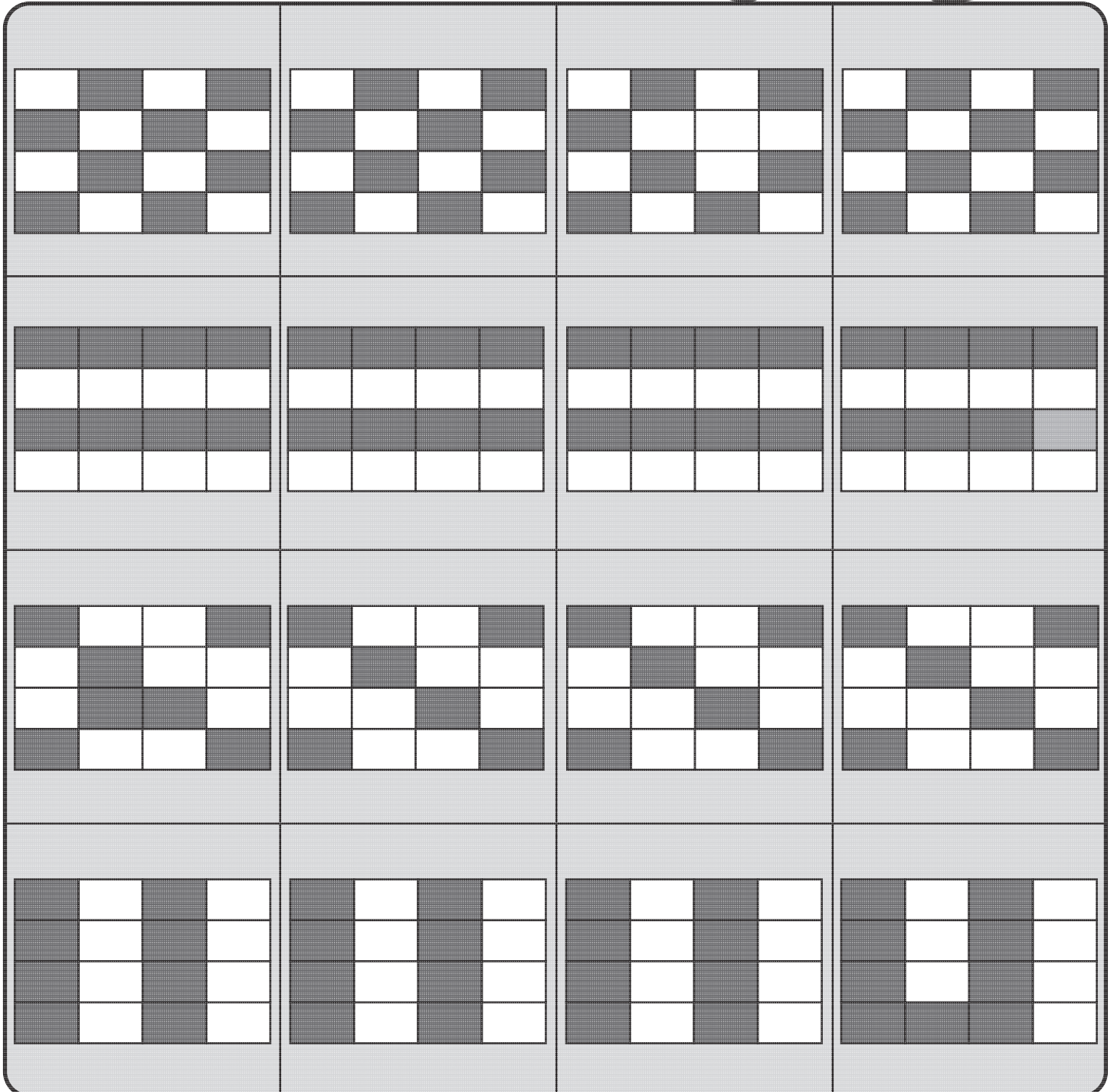
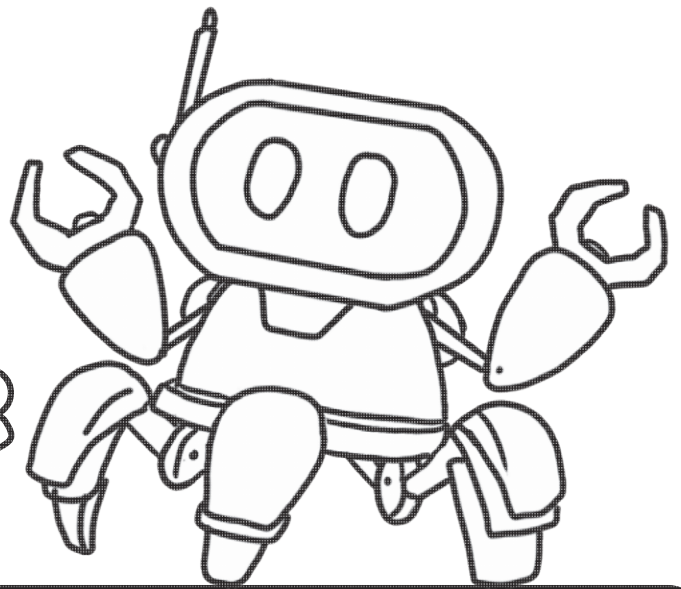
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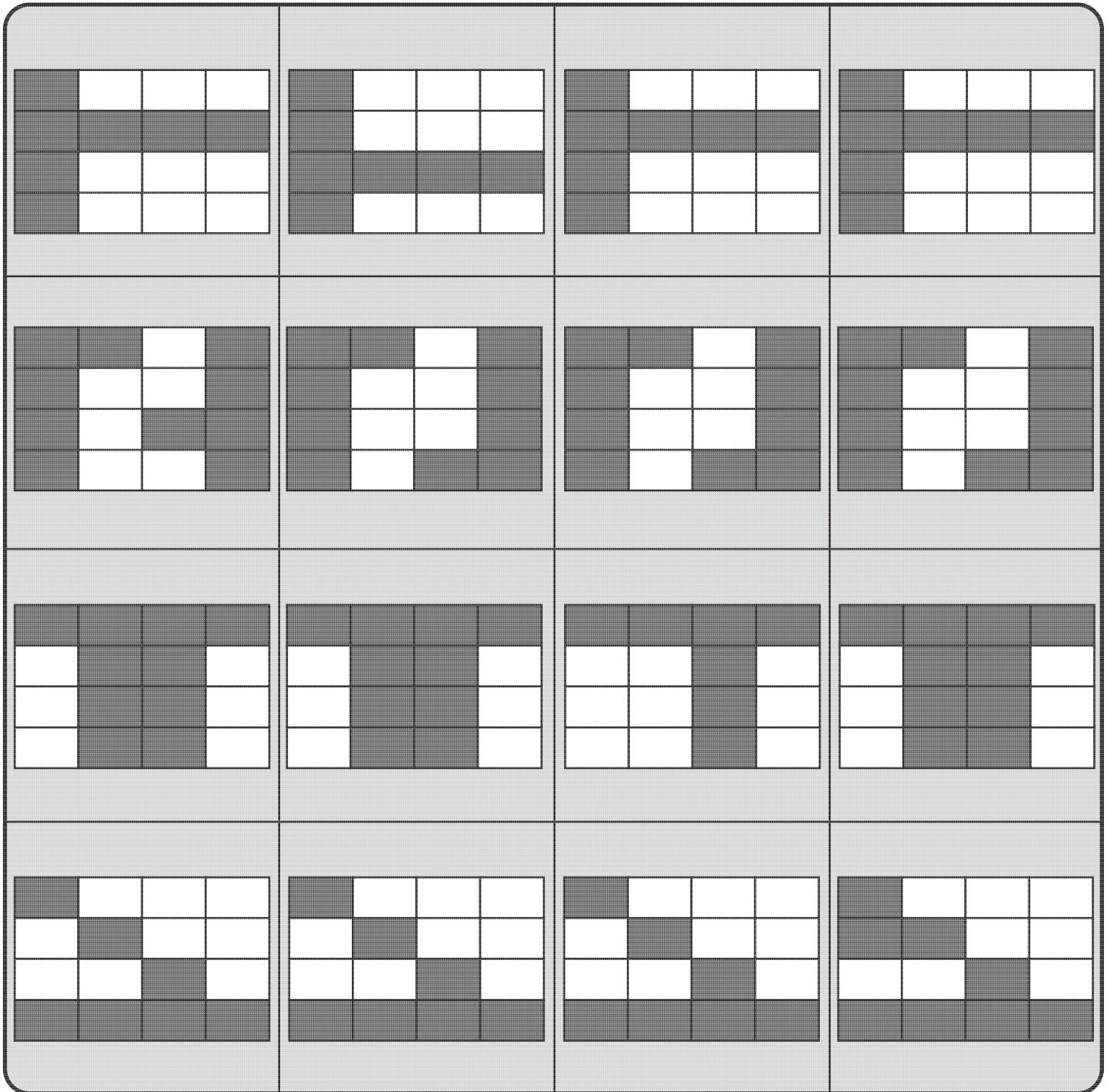
Coding and Robotics

[illegible][illegible][illegible]

Spot the difference

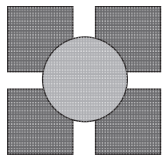
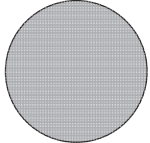
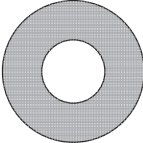
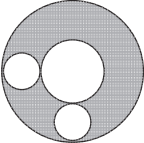
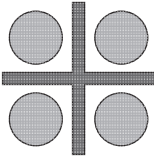
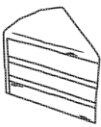
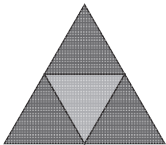
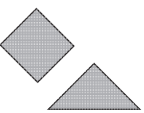
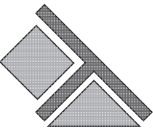
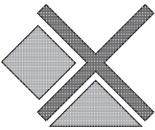
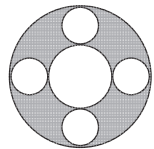
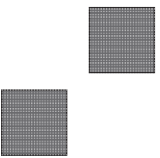
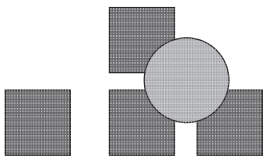
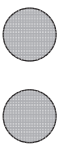
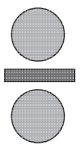
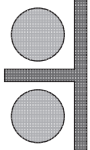
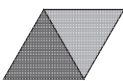
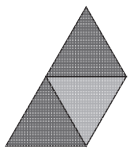
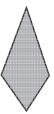
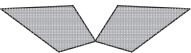
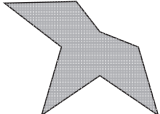
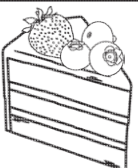
Circle the one that is different.



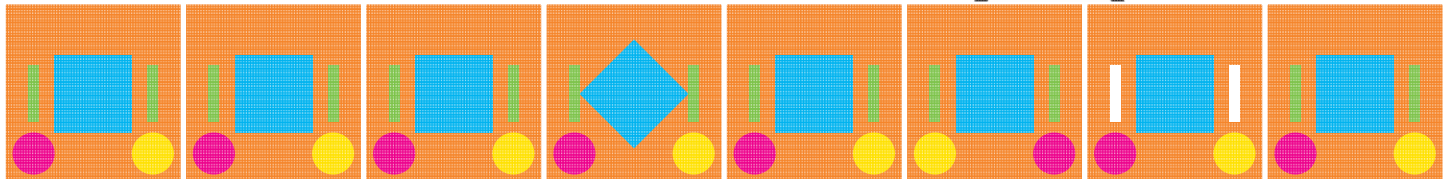
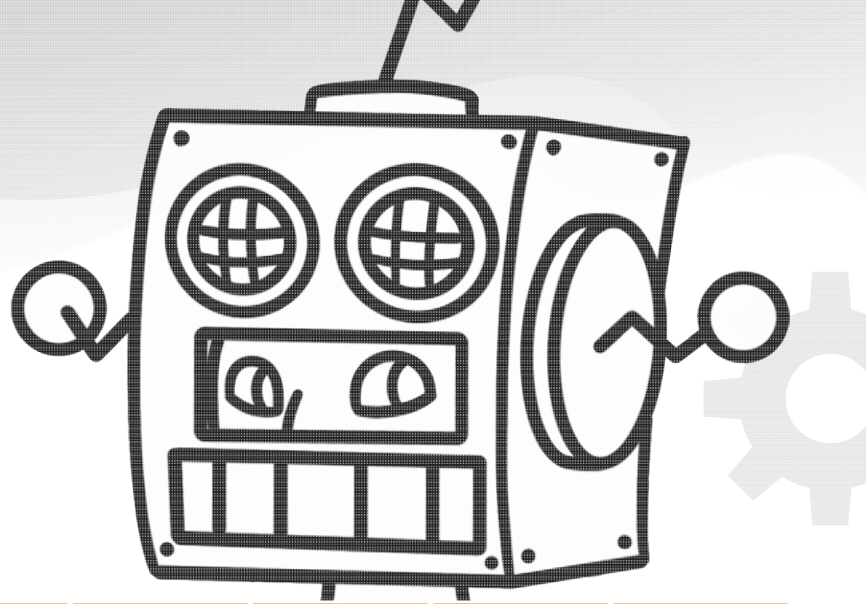


Pattern Recognition: Pattern Matching

Draw a line to match the pattern to what will come next.
Use a different colour for each one.

Debugging a Complex Pattern



Look closely at this pattern and **analyse** the elements and repetitions.

How many different shapes are there?

How many different colours are there?

How many repetitions are there?

How many elements are there altogether?

Write a description of this pattern. Begin like this -

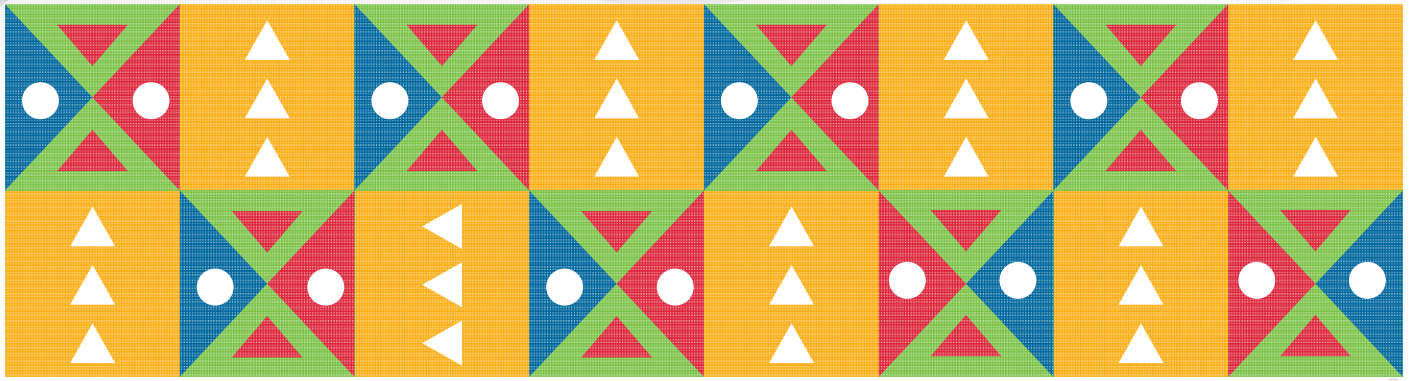
This pattern consists of:

Does this pattern have any bugs? Yes/no

Put a circle around the bugs.

Draw the correct pattern here.

--	--	--	--	--	--	--	--



Look closely at this pattern and **analyse** the elements and repetitions.

How many different shapes are there?

How many different colours are there?

How many repetitions are there?

How many elements are there altogether?

Write a description of this pattern. Begin like this -

This pattern consists of:

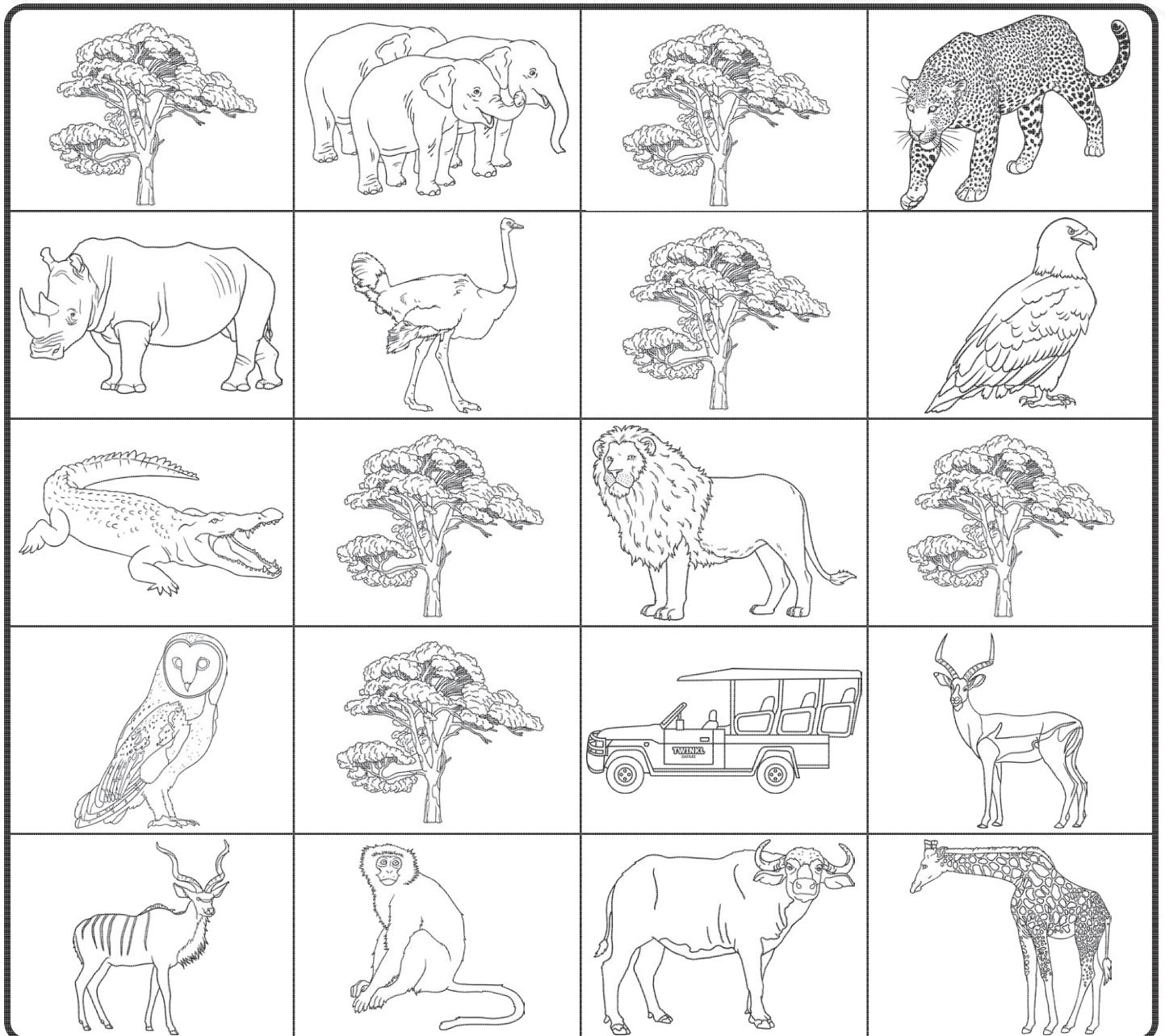
Does this pattern have any bugs? Yes/no

Put a circle around the bugs.

Draw the correct pattern here.

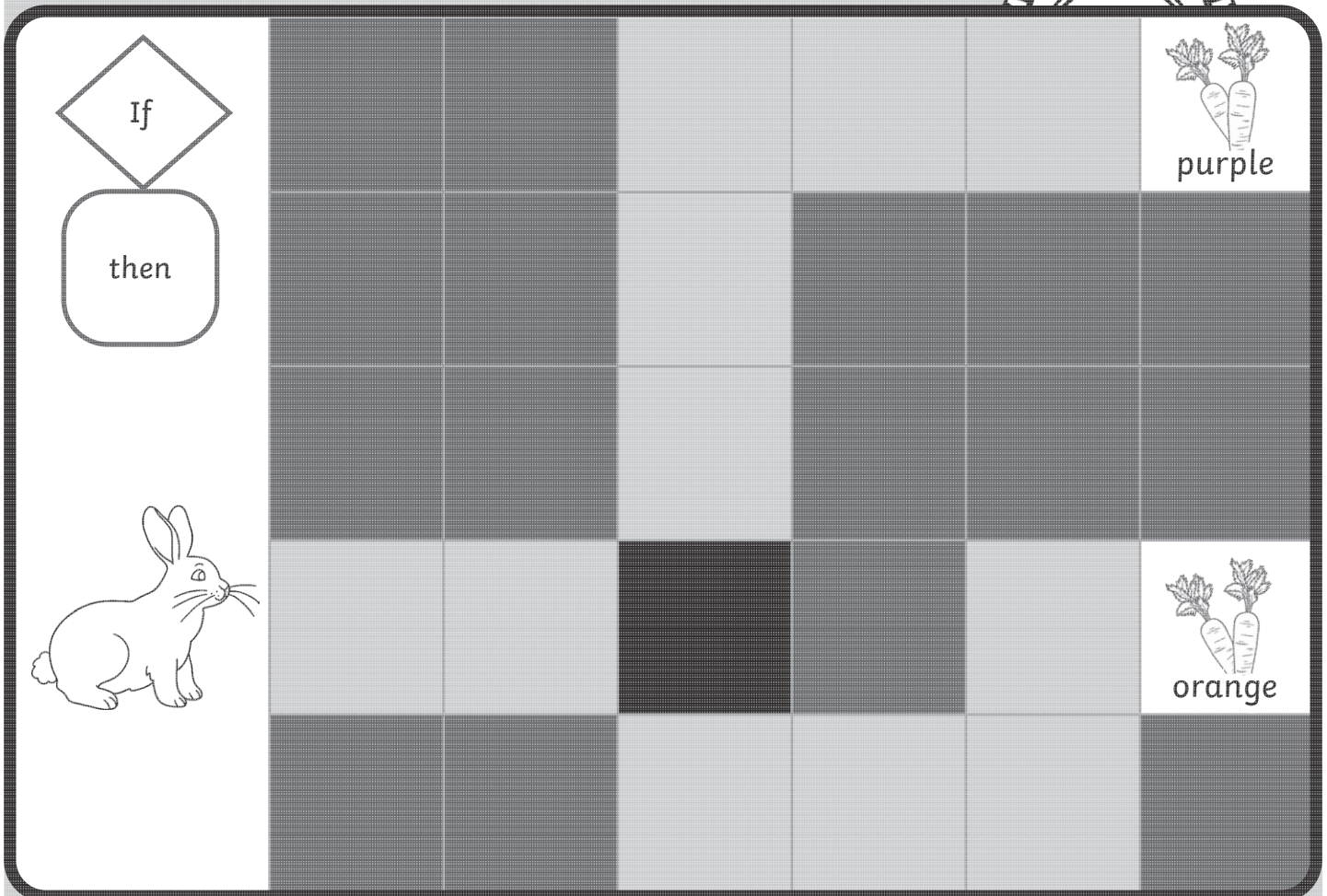
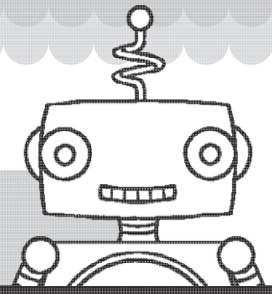
The Game Reserve

Draw arrows in the grid below to show how to get to the elephants.
Colour in the animals as you go. You must go around the trees.

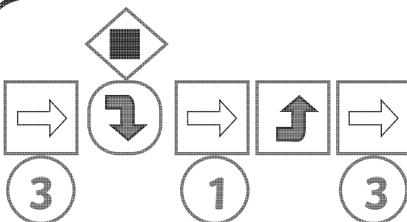


Making Decisions

The bunny does not like purple carrots, when he reaches the red decision block he has to decide which way to go.

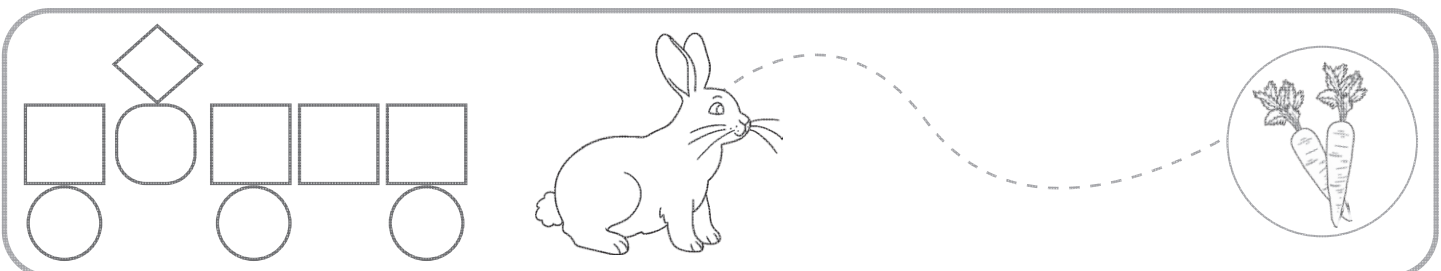


■ If you reach the decision block then decide which way to go. He decided to
 ↻ turn right

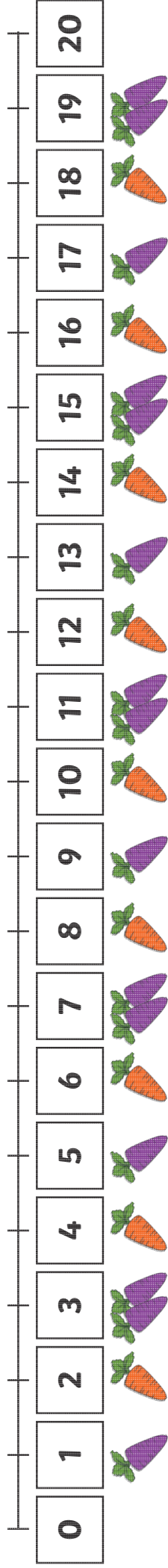
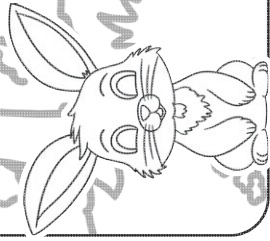


This is the code that the bunny followed. Will he reach the orange carrots?

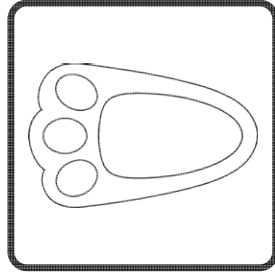
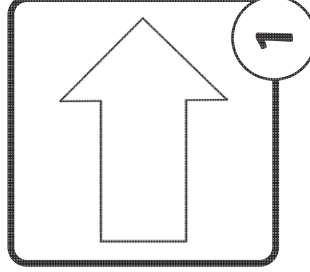
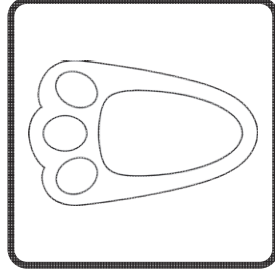
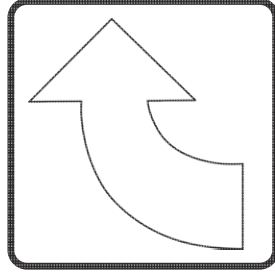
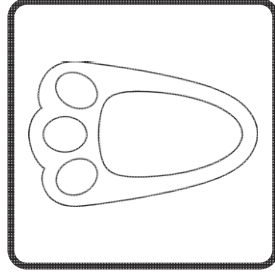
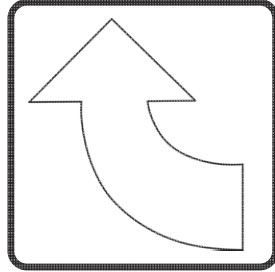
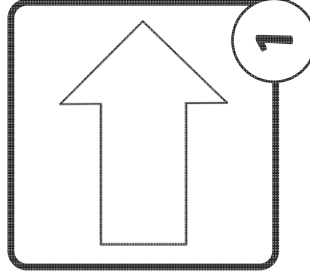
Write the correct code here.



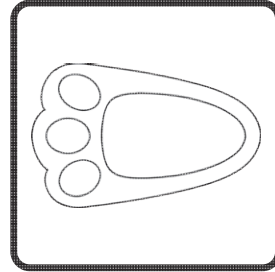
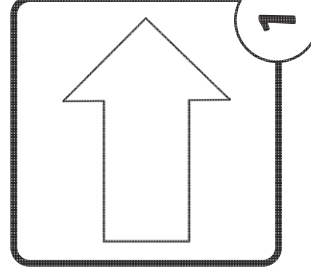
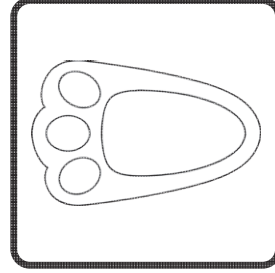
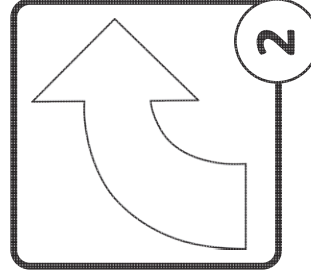
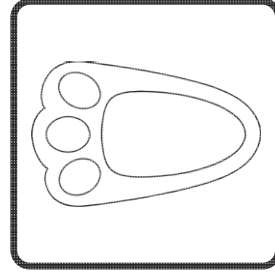
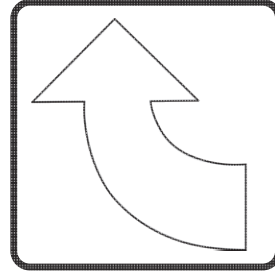
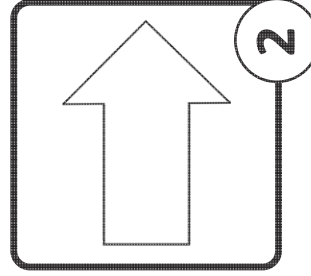
Numberline Pick-up



A



B



Examine the code for set A

- After the code has been executed what number will the bunny end up on?
- After the code has been executed how many purple carrots will the bunny have collected?
- After the code has been executed how many orange carrots will the bunny have collected?

Answers for A

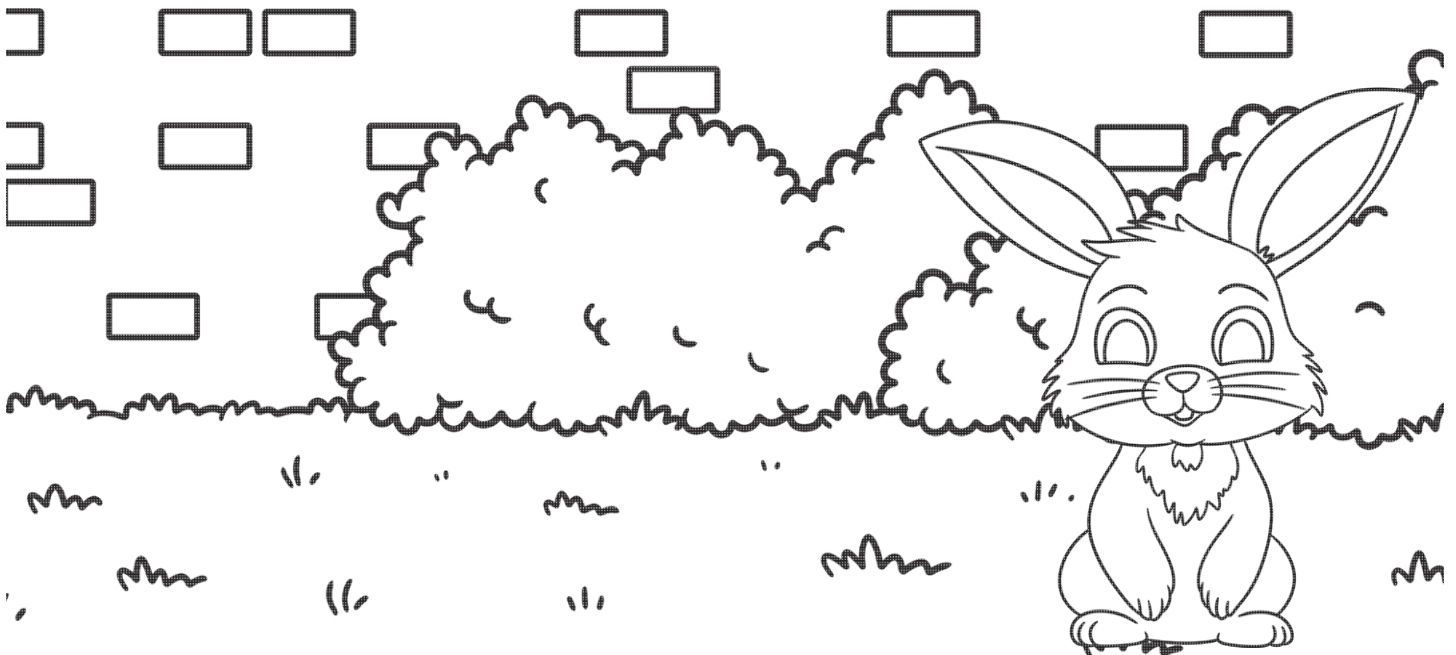
- _____
- _____
- _____

Examine the code for set B

- After the code has been executed what number will the bunny end up on?
- After the code has been executed how many purple carrots will the bunny have collected?
- After the code has been executed how many orange carrots will the bunny have collected?

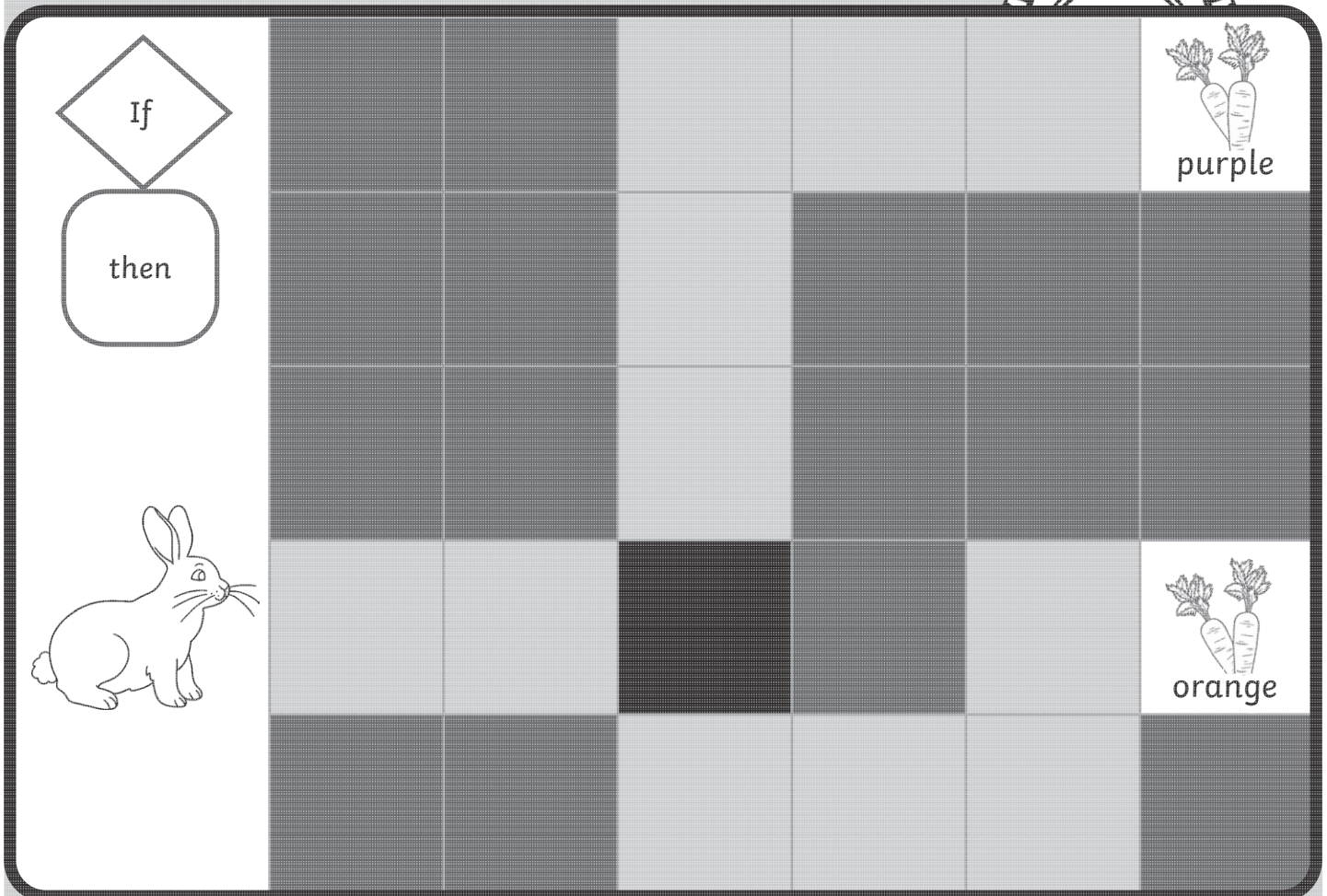
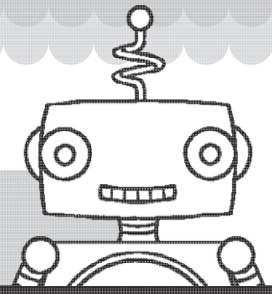
Answers for B

- _____
- _____
- _____

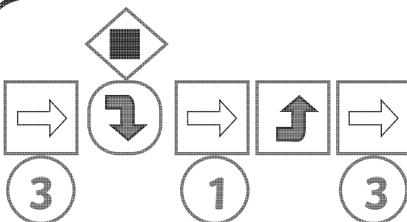


Making Decisions

The bunny does not like purple carrots, when he reaches the red decision block he has to decide which way to go.

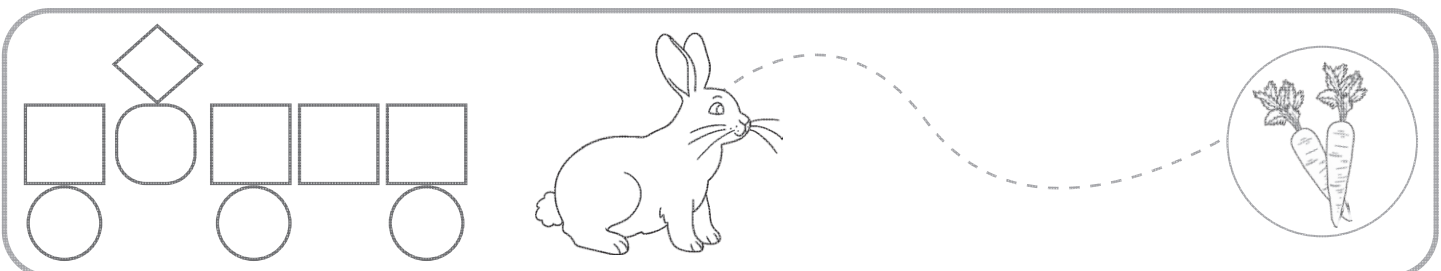


■ If you reach the decision block then decide which way to go. He decided to
 ↱ turn right

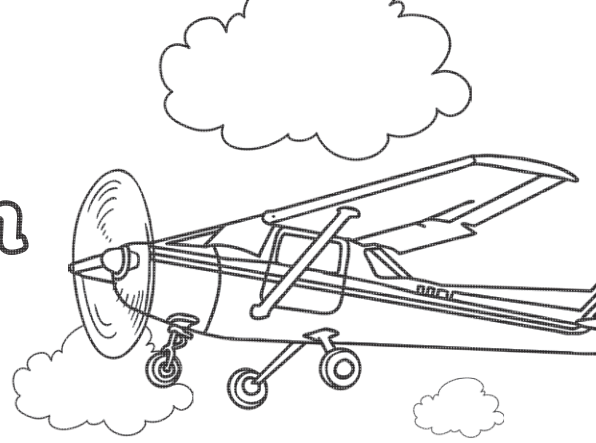


This is the code that the bunny followed. Will he reach the orange carrots?

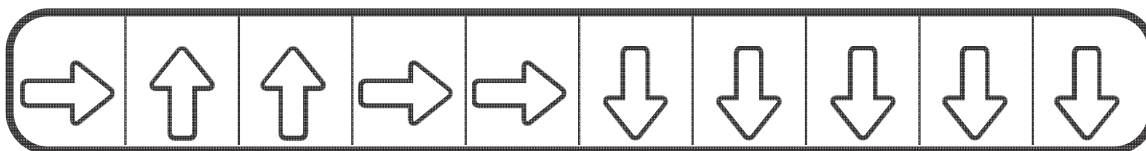
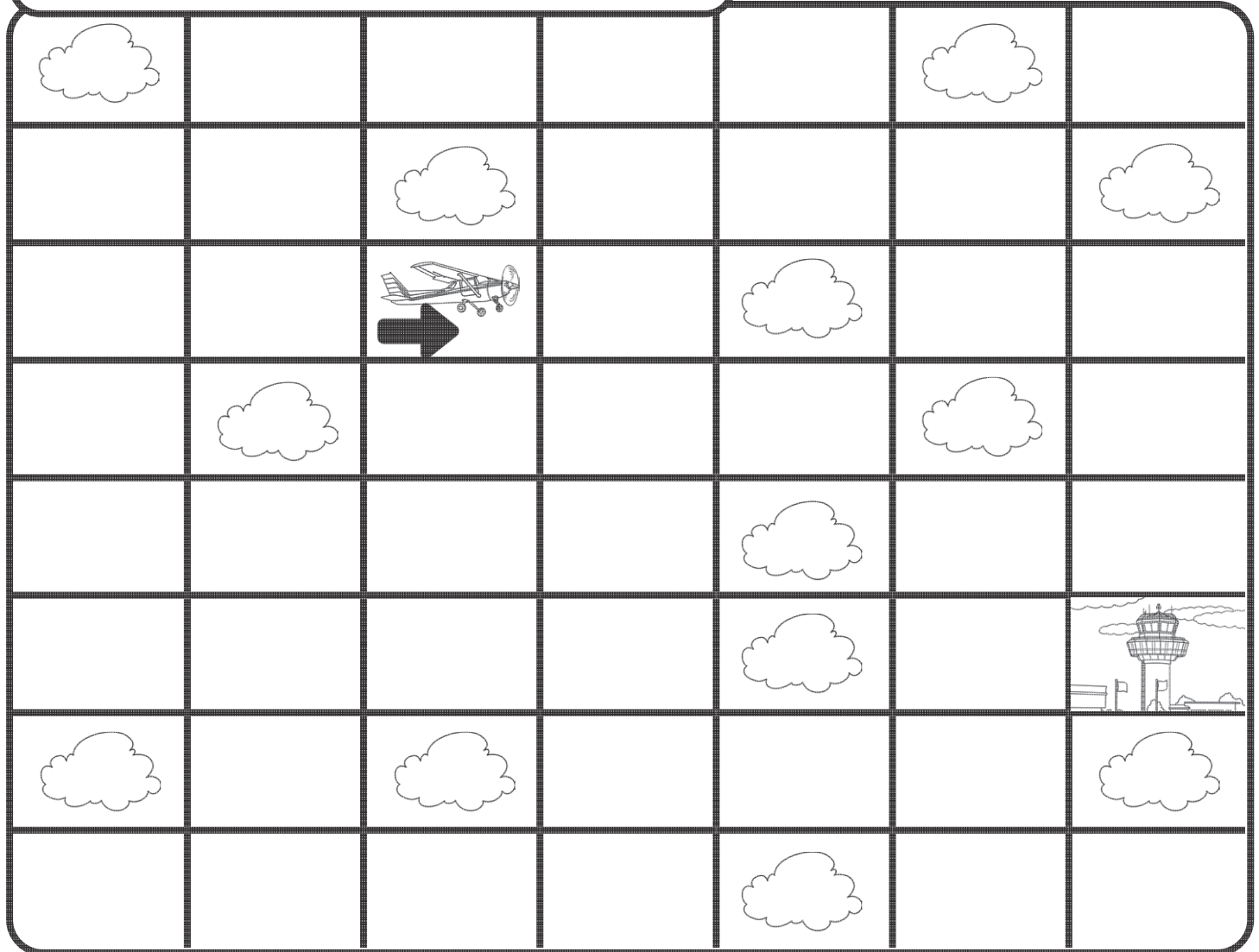
Write the correct code here.



Algorithmic Thinking - Find the Bug in the Algorithm



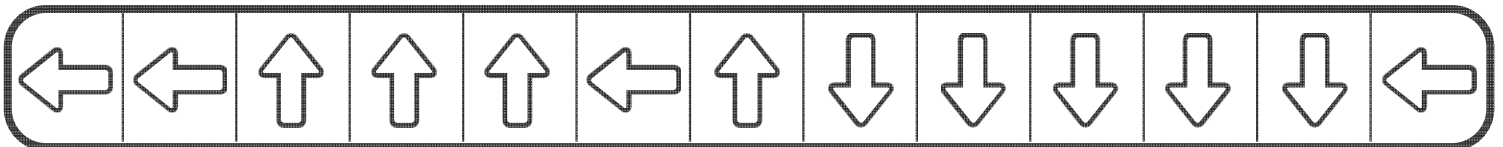
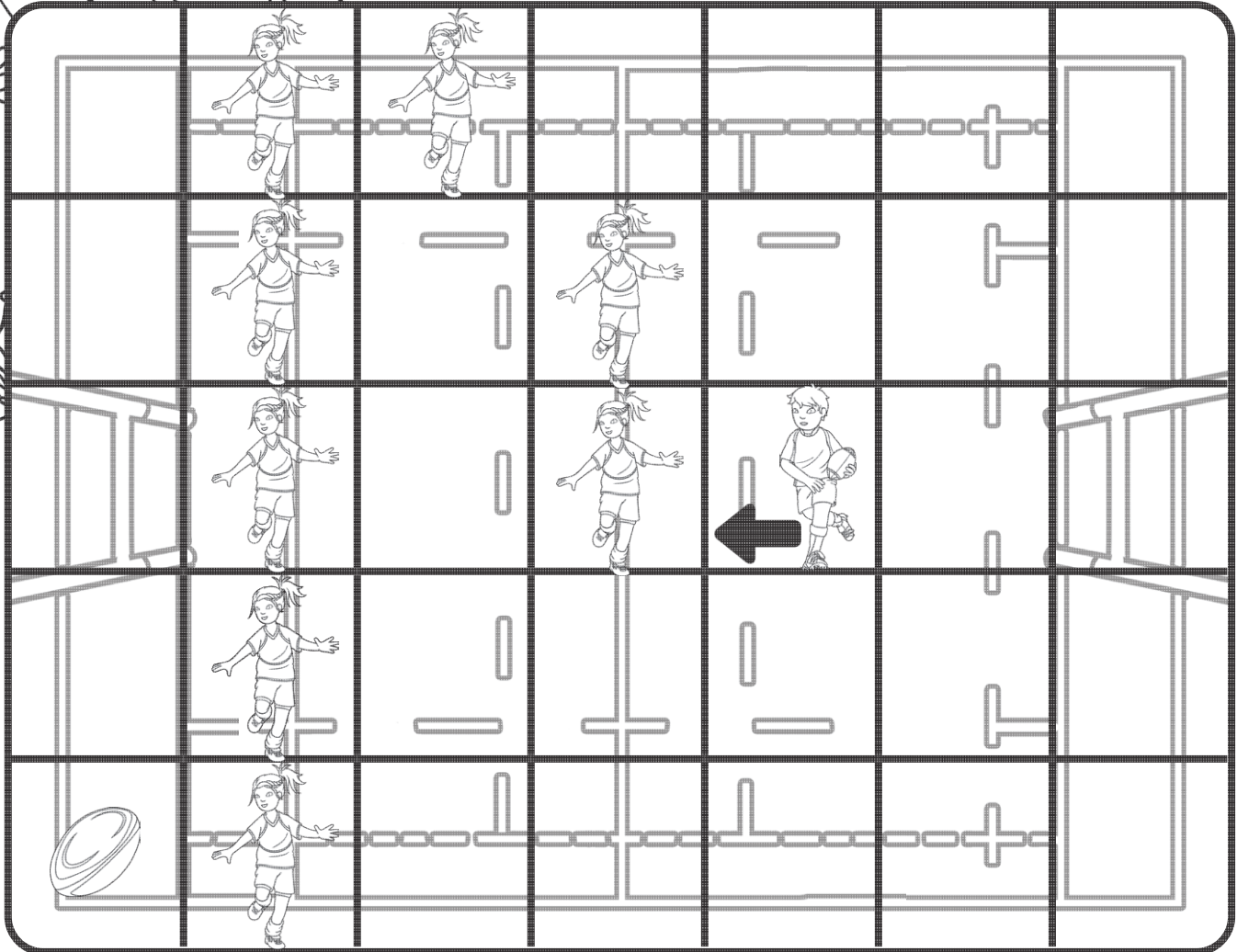
Help the plane land safely at the airport.



Draw the correct algorithm below.

--	--	--	--	--	--	--	--	--	--

Pass the ball from player to player to help the Bokke score.



Draw the correct algorithm below.

--	--	--	--	--	--	--	--	--	--	--	--	--	--

Components of a Robot

1. Sensors Robots have sensors to “see” and “hear” the world around them. Their sensors can include cameras, microphones, and other devices that can detect light, sounds, and movement.

2. Tools and attachments

Some robots are fitted with tools and attachments designed to allow them to perform the tasks which they were designed for.

3. Control System

is what allows the robot to “think” and make decisions. It's made up of a computer or microcontroller that is programmed by a human, with instructions for how the robot should behave.

4. Arms and hands

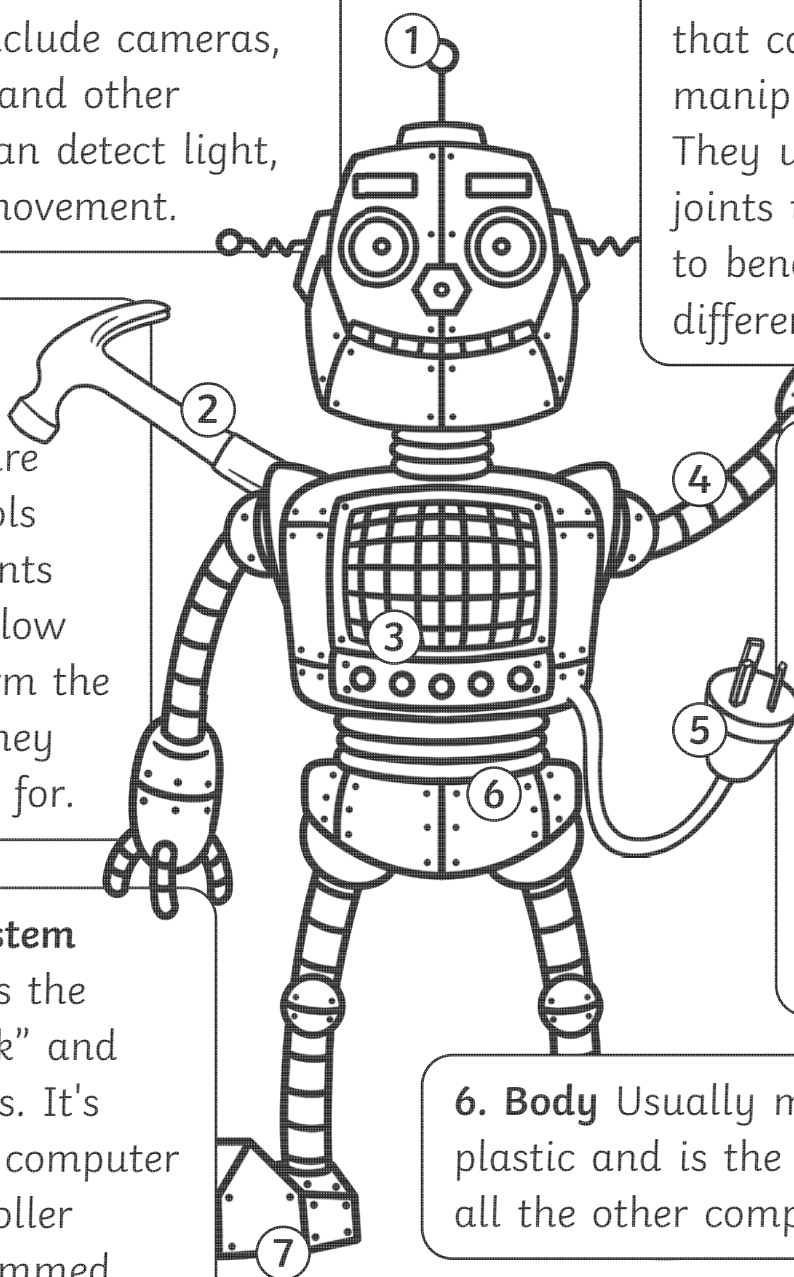
Many robots have arms and hands that can move and manipulate objects. They usually have joints that allow them to bend and move in different directions.

5. Power Source

Robots need a source of power to be able to work. This could be a battery, solar power, or a cable connected to electricity.

6. Body Usually made of metal or plastic and is the part that holds all the other components together.

7. Wheels or legs Some robots have wheels or legs so that they can move around.



Questions

1. Why does a robot need a body?

2. What component allows the robot to “think”?

3. Why do you think a battery would be better than a cable on a robot with wheels?

4. What enables robots to “see” and “hear”? _____

5. What component do you think controls the robot's legs?

6. Would a robot designed to weld car parts together need legs? Why?

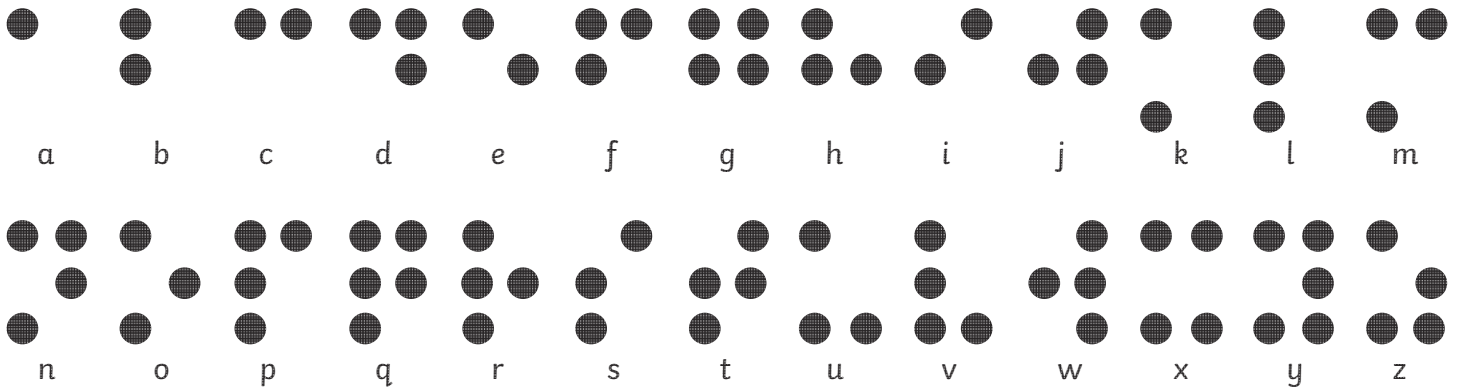
7. If you were designing a robot to cut the grass what special attachment would you give it?

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Braille Matching Activity

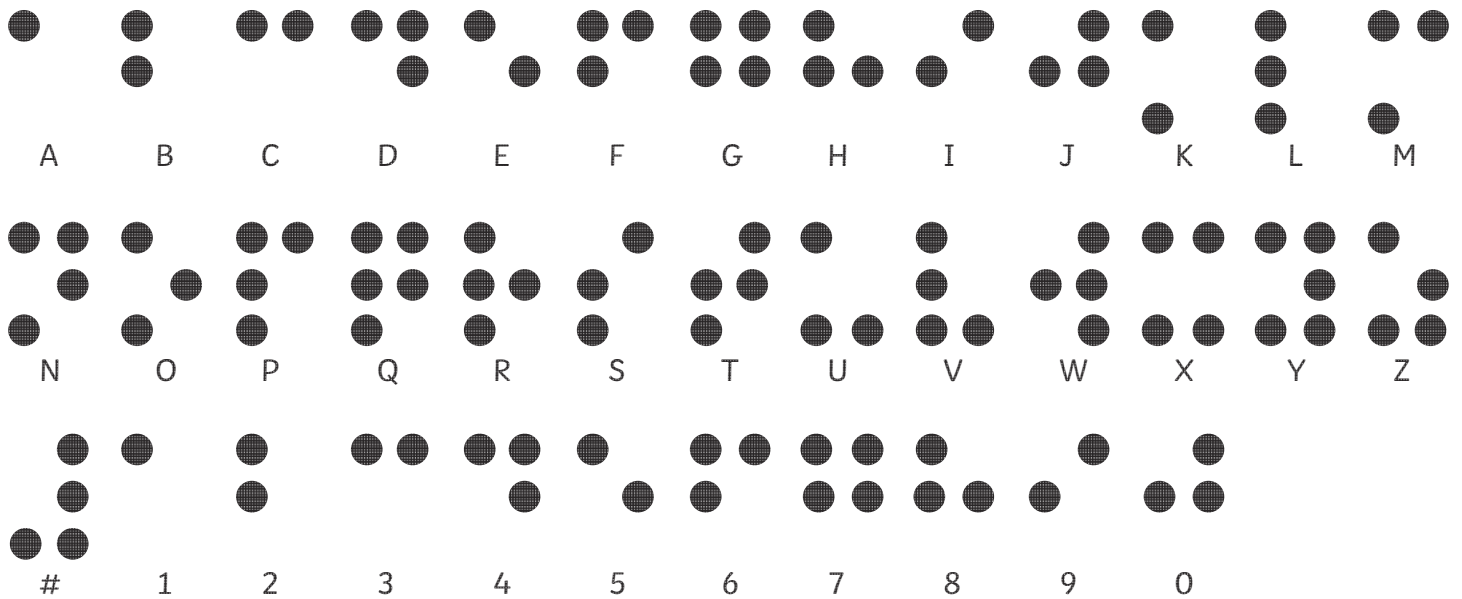
Draw lines from the letters to match the braille alphabet. The braille alphabet is written below to help you.



		b
		s
		t
		u
		z
		r
		o
		c

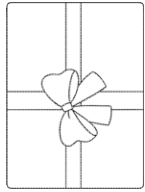
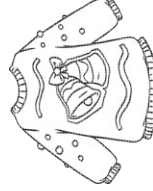
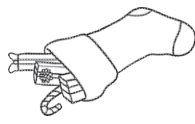
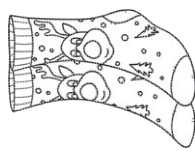
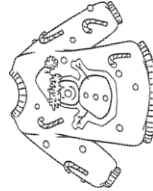
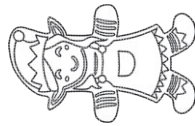
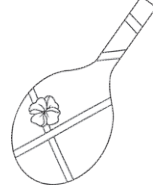
Braille Secret Code Writing

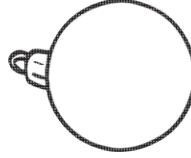
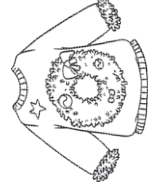
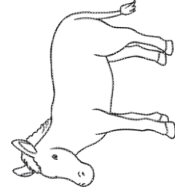
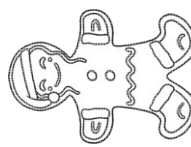
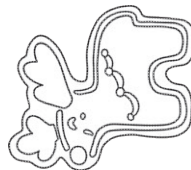
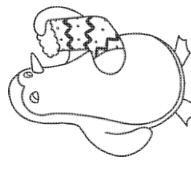
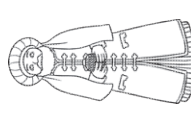
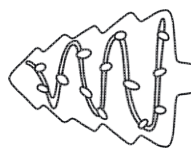
Can you write a secret code using braille?

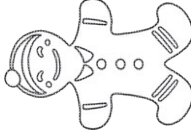
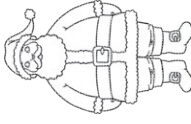
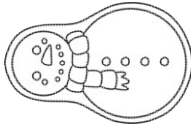
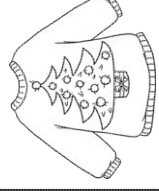
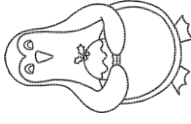
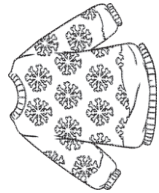
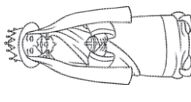
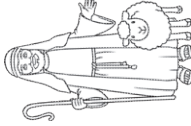
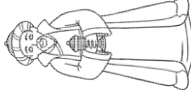


Christmas Joke Code Breaker

Use the code below to find the answers to the Christmas jokes.

a		b		c		d		e		f		g		h		i		j	
---	---	---	---	---	---	---	---	---	---	---	--	---	---	---	---	---	---	---	--

k		l		m		n		o		p		q		r		s		t	
---	---	---	---	---	---	---	---	---	---	---	--	---	---	---	---	---	---	---	---

u		v		w		x		y		z		!		?		"		-	
---	---	---	---	---	---	---	---	---	---	---	--	---	---	---	---	---	---	---	---

1. What happens if you eat Christmas decorations?



2. What do you call Santa when he stops moving?



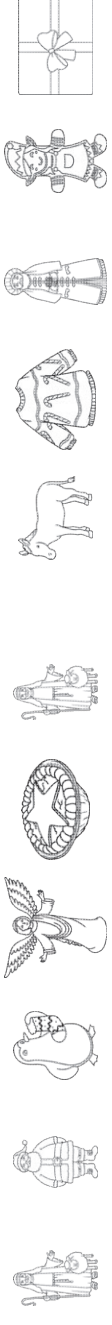
3. What does an elf study in school?



4. What is every parent's favourite Christmas carol?



5. What kind of music do elves like?

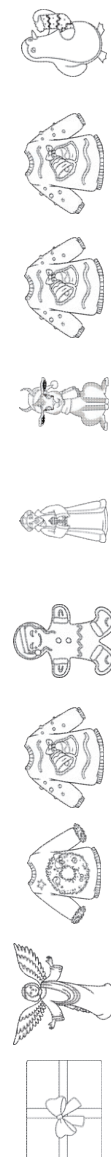


6. What do you get when you cross an iPhone with a Christmas tree?

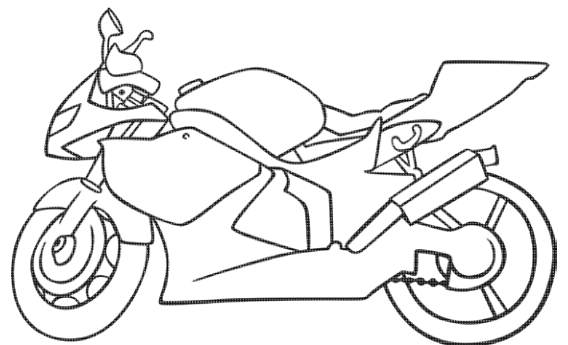
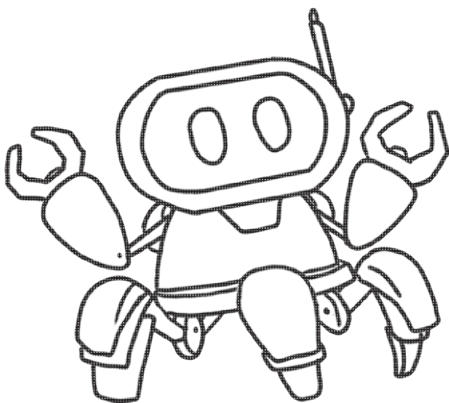
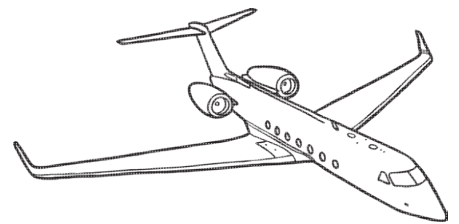
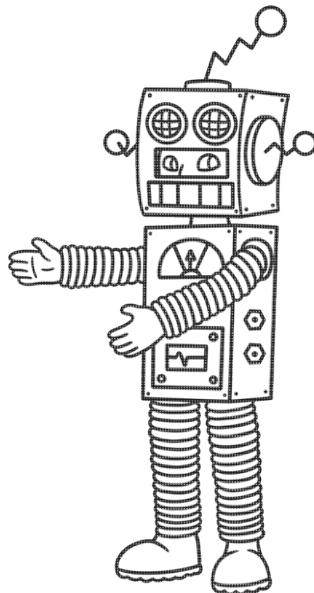
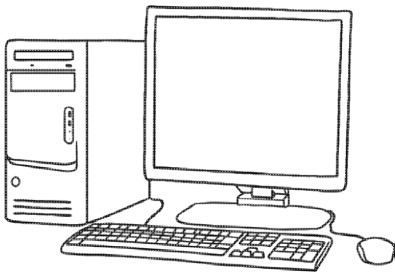
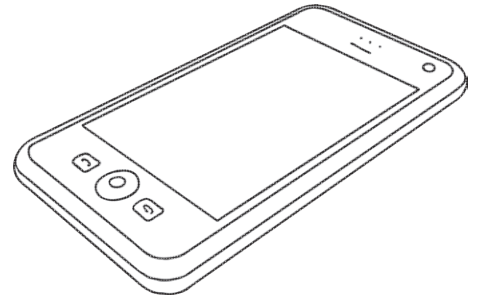
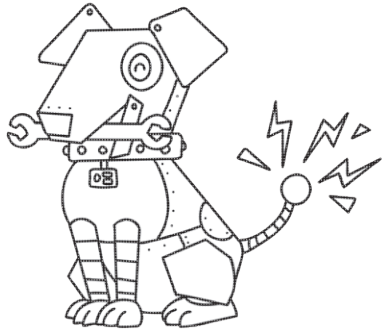


7. How do reindeers know when it's Christmas?





Look at these pictures and circle the robots



Spot the difference

Answer Sheet

1. 3rd Block
2. 4th Block
3. 1st Block
4. 4th Block
5. 2nd Block
6. 1st Block
7. 3rd Block
8. 4th Block



Numberline Pick-up Answers

Answers for A

a. 6

b. 3

c. 1

Answers for B

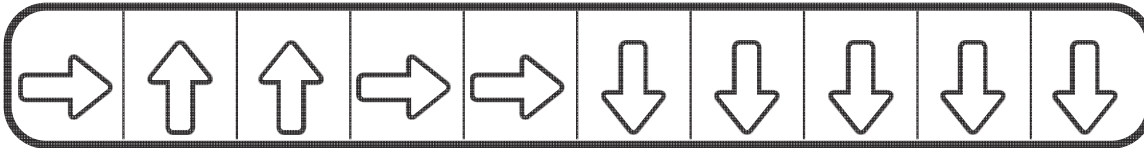
a. 9

b. 1

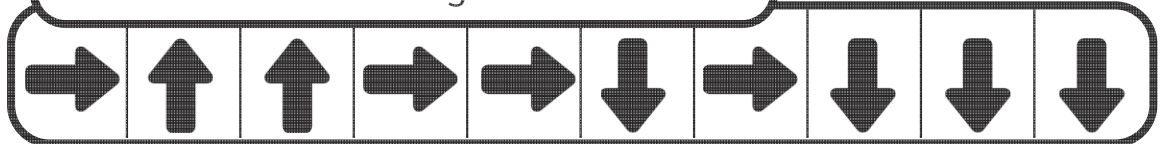
c. 2

Find the Bug in the Algorithm Answers

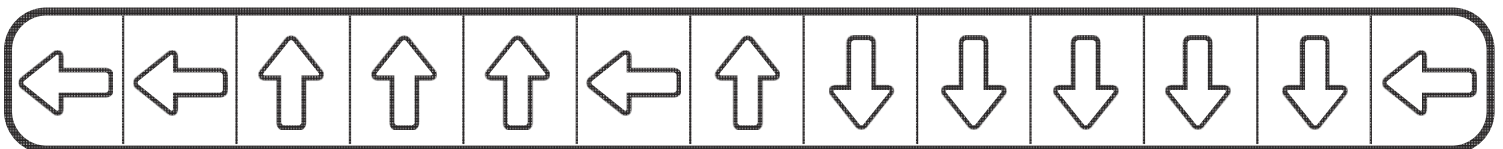
Help the plane land safely at the airport.



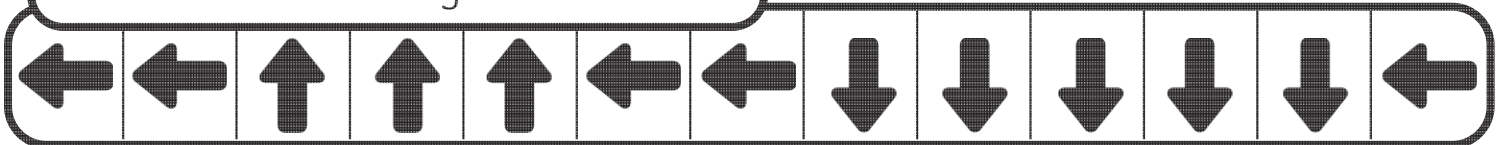
Draw the correct algorithm below.



Pass the ball from player to player to help the Bokke score.



Draw the correct algorithm below.



Christmas Joke Code Breaker Answers

1. What happens if you eat Christmas decorations?

You get tinselitus

2. What do you call Santa when he stops moving?

Santa Pause

3. What does an elf study in school?

The elfabet

4. What is every parent's favourite Christmas carol?

Silent Night

5. What kind of music do elves like?

"Wrap" music

6. What do you get when you cross an iPhone with a Christmas tree?

A pine-apple

7. How do reindeers know when it's Christmas?

They look at a calen-deer