

Summer Block 3

Statistics

Small steps

Step 1

Make tally charts

Step 2

Tables

Step 3

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Step 4

Draw pictograms (1–1)

Step 5

Interpret pictograms (1–1)

Step 6

Draw pictograms (2, 5 and 10)

Step 7

Interpret pictograms (2, 5 and 10)

Make tally charts

Notes and guidance

In this block, children are introduced to statistics and different representations of data for the first time. In this small step, they use tally charts to systematically record data.

It is important that children understand how different numbers are represented and when to use a “gate” to represent a group of 5. They should already be confident counting in 5s, and should use this skill when finding the totals represented by tallies. When they are confident in working out totals from tallies, they move on to drawing tallies for themselves to record numbers of objects.

Tallies are used throughout this block, so children must be confident using them before moving on to the next step.

Things to look out for

- Children may draw five individual lines rather than using a “gate”.
- Children may count the groups of 5s as 10s or 1s.
- If looking at pictures, children may need efficient strategies to avoid counting an object more than once.
- Children may think that they need to draw something to represent zero.

Key questions

- What is a tally chart?
- How do you show 1, 2, 3, 4 in a tally?
What happens when you show 5?
How do you show 15? How do you show 17?
- What number does the tally show? How do you know?
- How do you show zero as a tally?
- Why are tally charts useful? When would you use a tally chart?
- How can you avoid counting an object more than once?

Possible sentence stems

- To show _____ as a tally, I need to draw _____ groups of 5 and _____ single lines.
- The tally chart shows _____ groups of 5 and _____ single lines.
The total is _____

National Curriculum links

- Interpret and construct simple pictograms, tally charts, block diagrams and simple tables
- Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity

Make tally charts

Key learning

- What do you notice about the tallies?



Why do you think we group 5 together?

- Draw tallies for the numbers.



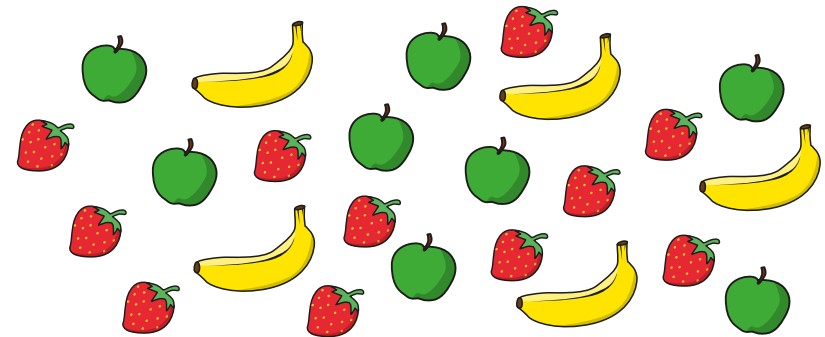
- Complete the tally chart.

Favourite colour	Tally	Total
blue		
red		
yellow		

- Complete the tally chart.

Year group	Tally	Total
Year 1		15
Year 2		19
Year 3		

- Complete the tally chart for the fruit.



Fruit	Tally	Total
apple		
strawberry		
banana		



Ask children to collect their own data and create a tally chart. Possible topics include:

- favourite colour
- favourite sport
- how children travel to school

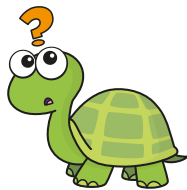
Make tally charts

Reasoning and problem solving

Tiny draws a tally chart to show how children in Class 2 get to school.



Journey to school	Tally	Total
walk		7
cycle		2
bus	###	4
car	###	6



What mistakes has Tiny made?

Correct Tiny's mistakes.

How many children are there in Class 2?

Tiny has missed the gate from 7

|
4 should not have a gate
||||

19

Here is a tally chart showing some children's favourite colours.



Favourite colour	Tally
red	###
green	
blue	### ### ### ###
yellow	

yellow: any number less than 9
green: any number between 9 and 21

- Yellow is the least popular colour.
- The number of children who like green is greater than the number who like red, but less than the number who like blue.

Complete the tally chart.

Is there more than one answer?



Tables

Notes and guidance

In this small step, children explore the use of simple tables. Some of these include tallies, but others just show the totals.

Children can compare tally charts and tables and think about when it is more efficient to use each one. They may come to understand that a table is easier to read, but a tally chart is more efficient when collecting data.

Children think about what the data represents and draw pictures to match the information shown in a table, or use a picture to create a table. They should also begin to compare and answer questions about the data shown. This is built upon in the next steps, where they interpret block diagrams and pictograms.

Things to look out for

- Children may use tallies when they are not needed.
- Children may find it difficult to represent data from a table.
- Children may miscount when collecting data to put in a table.
- Children may need support to identify key information when answering comparative questions.

Key questions

- How are tally charts and tables similar? How are they different?
- When is it better to use a tally chart?
- When is it better to use a table?
- Which _____ is the most/least popular? How can you tell?
- How can you use tallies to complete a table?

Possible sentence stems

- The tally shows _____ groups of 5 and _____ single lines. The total is _____
- _____ people chose _____

National Curriculum links

- Interpret and construct simple pictograms, tally charts, block diagrams and simple tables
- Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
- Ask and answer questions about totalling and comparing categorical data

Tables

Key learning

- Look at the tally chart and table.

Item	Tally
pencil	
rubber	
ruler	

Item	Total
pencil	30
rubber	15
ruler	21

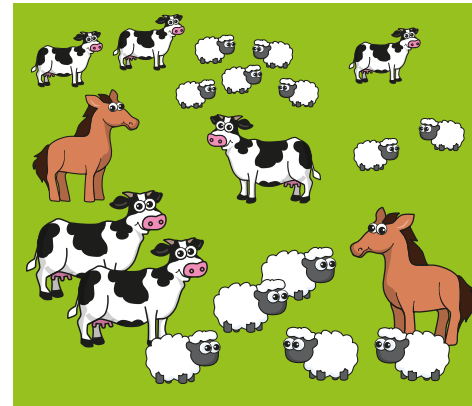
What is the same? What is different?

Which do you find easier to understand?

- Draw a picture to show the information in the table.

Shape	Total
square	4
triangle	8
circle	2

- Use the picture to complete the table.



Animal	Total
cow	
horse	
sheep	

- Here is a table showing the pets owned by children in Class 2

Pet	Total
cat	11
dog	14
hamster	7

- ▶ Which pet is most common? Which pet is least common?
- ▶ How many cats and hamsters do children in Class 2 have?
- ▶ How many pets do children in Class 2 have altogether?
- ▶ How many more dogs than hamsters are there?

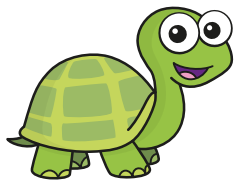
Tables

Reasoning and problem solving

Tiny wants to record the colours of cars that pass by.



I think that tables are easier to understand than tally charts, so I will use a table to collect my data.



Do you think that this is a good idea? Why?

No
A tally chart is better for collecting data when all the data cannot be seen at the same time.

The table shows the number of pieces of fruit in a box.



Some of the information is missing.

Fruit	Total
bananas	
apples	12
oranges	
pears	10

- There are 5 fewer bananas than apples.
- The number of oranges is greater than the number of pears but less than the number of apples.

Complete the table.

How many pieces of fruit are there altogether?

7 bananas,
11 oranges

40

Block diagrams

Notes and guidance

In this small step, children are introduced to block diagrams as a way of representing data. This is a new concept and it may be beneficial to explore the similarities/differences between this and previous representations of data.

Children explore block diagrams that use one-to-one correspondence, where each block represents one item. They will develop this idea when looking at bar charts with scales in later years.

Children identify simple information from a block diagram, for example using the heights/lengths of the bars to identify the most/least popular items. Stem sentences can be used to support interpretation of diagrams. Children can then create their own block diagrams, firstly using concrete resources such as cubes or sticky notes, and then by drawing on paper. Explain that block diagrams can be shown vertically or horizontally.

Things to look out for

- Children may not use/draw blocks of equal size.
- Children may not use the size of the bars to compare totals.
- Children may need support to label their block diagrams.

Key questions

- How is a block diagram similar to a tally chart/table? How is it different?
- What does each block represent?
- What information can you find out from the block diagram?
- How do you know which item is the most popular? How can you tell without counting?
- How could you show this data in a block diagram?

Possible sentence stems

- There are _____ blocks shaded.
This means that _____ people chose _____
- The most/least popular item is _____ because ...

National Curriculum links

- Interpret and construct simple pictograms, tally charts, block diagrams and simple tables
- Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
- Ask and answer questions about totalling and comparing categorical data

Block diagrams

Key learning

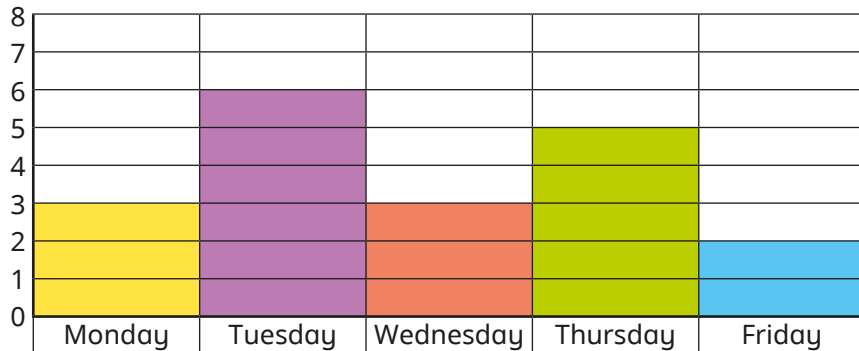


Give every child a sticky note and ask them to write their name on it.

Use the sticky notes to create block diagrams showing:

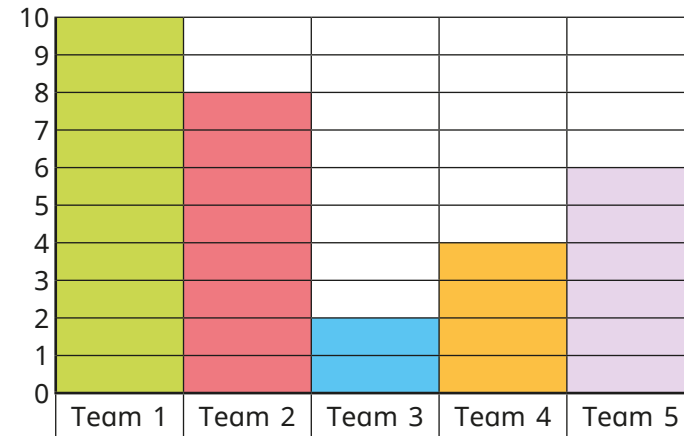
- the month with the most birthdays
- children’s favourite sports

- The block diagram shows how many children went to after-school club each day.



- ▶ On Monday, _____ children went to after-school club.
- ▶ The day with the most children was _____
- ▶ The day with the fewest children was _____
- ▶ On _____ and _____, the same number of children went to after-school club.

- The block diagram shows the number of house points each team got.



- ▶ How many more points did team 2 get than team 4?
- ▶ How many fewer points did team 3 get than team 5?
- ▶ How many points did team 2 and team 3 get altogether?
- Year 2 are collecting data about their favourite colours.

Colour	Total
red	5
green	8
blue	7
yellow	2

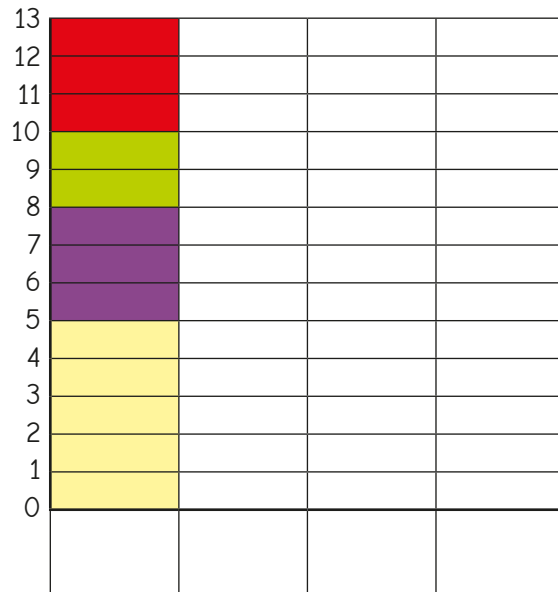
Make a block diagram, using cubes to show the data.

Now draw the block diagram.

Block diagrams

Reasoning and problem solving

Tiny makes a block diagram to show children's favourite colours.



Tiny has not made a separate column for each colour.

What mistake has Tiny made?

Why is Tiny's block diagram difficult to understand?



Match the tables to the block diagrams.

A

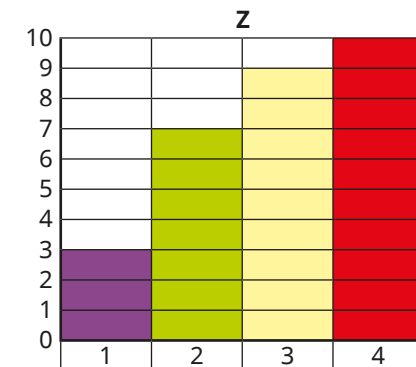
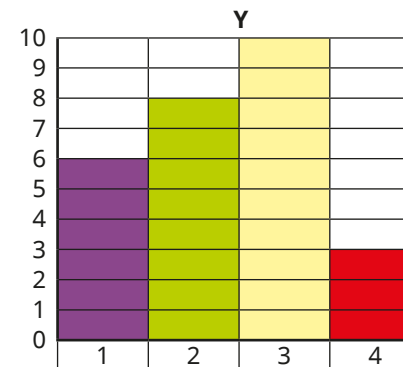
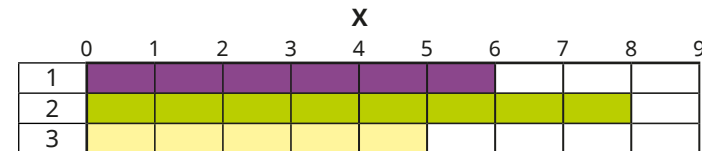
	Total
1	6
2	8
3	10
4	3

B

	Total
1	6
2	8
3	5

C

	Total
1	3
2	7
3	9
4	10



A – Y

B – X

C – Z

Draw pictograms (1–1)

Notes and guidance

In this small step, children are introduced to pictograms as a way of representing data. The first pictograms they draw use one-to-one correspondence, where each symbol represents one item.

Children could use physical objects to create 3-D pictograms before drawing them. Ensure that they encounter both horizontal and vertical pictograms. Emphasise the need to use the same symbol for every category, and that symbols need to be easy to draw.

Keys are introduced to aid understanding and to avoid potential misconceptions later in the block when one symbol can represent 2, 5 or 10

Things to look out for

- Children may draw different symbols to represent the different categories and may draw symbols inconsistently, for example using different sizes.
- Children may pick symbols that are difficult to replicate consistently.
- Children may think pictograms can only be shown horizontally/vertically.

Key questions

- What does each symbol represent?
- How many symbols do you need to draw in the row/column for _____?
- How can you tell which is the most popular without counting?
- What is a key? Why is it important?
- What would/would not be a sensible symbol to use? Why?
- Why do you use the same symbol for each category?

Possible sentence stems

- The key shows that 1 _____ = 1 _____
_____ children chose _____, so I need to draw _____ symbols.

National Curriculum links

- Interpret and construct simple pictograms, tally charts, block diagrams and simple tables
- Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
- Ask and answer questions about totalling and comparing categorical data

Draw pictograms (1–1)

Key learning

- Here is a pictogram showing the number of goals each person scored in a football match.

Key = 1 goal

Player	Goals scored
Ann	
Jo	
Mo	
Ron	
Dan	

How are pictograms different from block diagrams?
How are they similar?

Complete the pictogram to show that Dan scored 5 goals.

- Use the tally chart to complete the pictogram.

Key = 1 piece of fruit

Fruit	Tally
banana	
grape	
pear	
apple	

Fruit	Number
banana	
grape	
pear	
apple	

- Use the key to complete the pictogram.

Key = 1 ice cream

Flavour	Total
vanilla	8
chocolate	12
mint	7
strawberry	3

vanilla	chocolate	mint	strawberry

- Complete the pictogram.

Key = 1 person

Eye colour	Number	Total
green		5
blue		
brown		9
grey		



Ask children to collect their own data and to draw a pictogram for it.

Remind them to include a key.

Draw pictograms (1–1)

Reasoning and problem solving

Tiny goes on a shape hunt and uses the data to make a pictogram.

Shape	Number of shapes
circle	
rectangle	
square	
triangle	



I saw the same number of squares and rectangles.

Do you agree with Tiny?
Explain your reasons.



No

Use the clues to help you complete the pictogram.



Flavour	Number sold
strawberry	
vanilla	
chocolate	
mint	
caramel	
bubblegum	

Key

= 1 ice cream

- The number of caramel ice creams sold was more than the number of bubblegum, but less than the number of strawberry.
- There were half as many mint ice creams sold as there were chocolate.
- Fewer vanilla ice creams were sold than mint ice creams.

Is there more than one way to complete the pictogram?



vanilla 1 or 0

mint 2

caramel 5, 6 or 7

Interpret pictograms (1–1)

Notes and guidance

In this small step, children interpret data from pictograms. Both vertical and horizontal pictograms should be explored.

Children will be aware of the key features of a pictogram and how to interpret a key from the previous step. Each symbol in the pictogram still represents one item.

Children start by identifying totals for different categories before comparing totals. As the numbers used are often small, this offers a good opportunity to revisit number bonds and mental methods of calculation. Children should be encouraged to look for multiple ways to make comparisons that can sometimes be done just by looking, counting the difference and also subtraction. They could think about the “story” the data tells them and infer information that is not directly shown. In the next steps, children use these skills to draw and interpret pictograms with different keys.

Things to look out for

- Children may need to have strategies modelled for them, particularly when answering multi-step problems.
- Children may think that if there is nothing drawn for a category, then it is unfinished rather than representing zero.

Key questions

- What is a pictogram?
- What do you know? What can you find out?
- Which category was the most/least popular?
- What is a key? Why is it important?
- How many more people chose _____ than _____?
- How many _____ are there in total?

Possible sentence stems

- There are _____ symbols. This stands for _____ people.
- I can find the total by adding together _____ and _____
- _____ more/fewer people chose _____ than _____

National Curriculum links

- Interpret and construct simple pictograms, tally charts, block diagrams and simple tables
- Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
- Ask and answer questions about totalling and comparing categorical data

Interpret pictograms (1-1)

Key learning

- The pictogram shows the favourite fruit of children in Year 2

apple	
banana	
pear	
strawberry	

Key
 = 1 child

What do you know? What can you find out?

- The pictogram shows the number of children in each class who ride a bicycle to school.

Class	Number of children
Class 1	
Class 2	
Class 3	
Class 4	
Class 5	

Key
 = 1 child

Complete the sentences.

- ▶ In Class 1, _____ children cycle to school.
- ▶ In Class 2, _____ children cycle to school.
- ▶ In Class 4, _____ child cycles to school.
- ▶ In total, _____ children cycle to school.

- The pictogram shows the number of minibeasts that Class 2 see on a bug hunt.

Minibeast	Number of minibeasts
spider	
ladybird	
centipede	
worm	

Key
 = 1 minibeast

Complete the sentences.

- ▶ There are _____ centipedes and worms altogether.
- ▶ There are _____ more spiders than ladybirds.

What else does the pictogram tell you?

- The pictogram shows Class 2's favourite colours of T-shirt.

Colour	Number of children
blue	
green	
red	
purple	

Key
 = 1 child

- ▶ What is the most popular colour of T-shirt?
- ▶ How many more children voted for blue than for red?
- ▶ How many children are there in Class 2?

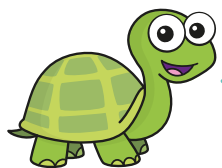
Interpret pictograms (1–1)

Reasoning and problem solving

The children of Class 2 vote for their favourite colour.

Tiny draws a pictogram to show the results.

Colour	Number of children
blue	● ● ● ●
red	● ● ●
yellow	● ● ● ● ●
green	● ● ● ● ● ● ●



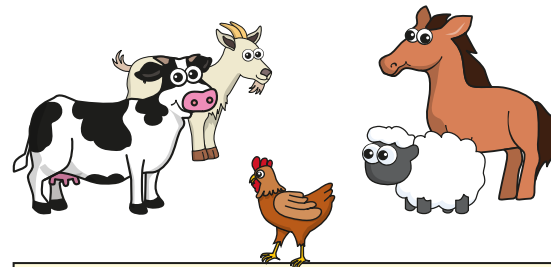
The most popular colour is blue.

Do you agree with Tiny?
Why?



No

Tom writes these statements about a pictogram.



- There are more cows than sheep.
- There are the same number of sheep and horses.
- There are more chickens than any other animal.
- There are fewer cows than goats.
- There are 8 goats.

Draw the pictogram.

Compare answers with a partner.



multiple possible answers, e.g.
chickens 12
cows 6
sheep 3
goats 8
horses 3

Draw pictograms (2, 5 and 10)

Notes and guidance

In this small step, children draw pictograms where the symbols represent 2, 5 or 10 items. From the previous steps, children should have a secure understanding of how to draw pictograms and what the key represents. They also need to be confident counting in 2s, 5s and 10s.

Children start this step by considering examples of data where symbols representing one item are not appropriate, as they would take a long time to draw and take up too much space. Initially, children are given keys to use, but they then move on to choosing the most appropriate key depending on the data. They also need to interpret what number is represented by half a symbol.

Things to look out for

- Children may be reluctant to use either 2s, 5s or 10s and prefer to stick to a count they are confident with, even if it is not the most appropriate.
- Children may need support to understand the use of part-symbols, for example if 1 symbol = 10, then half a symbol = 5
- Children may choose symbols that are not easily halved.

Key questions

- What is a key? Why is it important? What does the key show?
- What does each symbol represent? How do you know?
- Why should you use the same symbol for each category?
- Will each symbol in your key represent 1, 2, 5 or 10 items? How will you decide?
- If the key shows that 1 symbol stands for 2/10 people, how will you show 1 person/5 people?

Possible sentence stems

- The key shows that 1 symbol = _____ people.
To show _____ people, I need to draw _____ symbols.
- The greatest number of items is _____, so I will choose 1 symbol = _____ items.

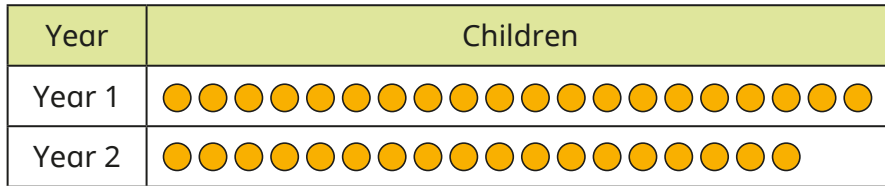
National Curriculum links

- Interpret and construct simple pictograms, tally charts, block diagrams and simple tables
- Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
- Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers

Draw pictograms (2, 5 and 10)

Key learning

- The pictogram shows the number of children in Year 1 and Year 2
- Key** ● = 1 child



What do you notice?
Is there a better way to show the data?

- Complete the pictograms for the flowers in the garden.



Flower	Flowers in garden
tulip	■ ■ ■ ■ ■ ■
crocus	
daffodil	

Key ■ = 1 flower

Flower	Flowers in garden
tulip	■ ■ ■
crocus	
daffodil	

Key ■ = 2 flowers

Which pictogram do you prefer? Why?

- Use the tally chart to complete the pictogram showing the number of books read in each class.
- Key** 📖 = 5 books

Class	Books read
Class 1	
Class 2	
Class 3	
Class 4	

Class	Books read
Class 1	📖 📖
Class 2	
Class 3	
Class 4	

- Use the table to complete the pictogram.

Key ● = 10 points

Child	Points
Jo	15
Ron	30
Ann	35
Kay	25

Child	Points
Jo	● ●
Ron	
Ann	
Kay	

- The table shows the different types of cake sold in a week.

Draw a pictogram to show the data.

Cake	chocolate	lemon	fruit	carrot	banana
Total	65	35	20	25	15

Draw pictograms (2, 5 and 10)

Reasoning and problem solving

Here is the start of a pictogram showing when some children were born.



Key ● = 10 children

● ●		
January	February	March

February: 30
March: 15

Use the clues to complete the pictogram.

- 5 fewer children were born in March than in January.
- Twice as many children were born in February as in March.

Mo and Sam draw pictograms to show how many cars they see.

Mo

Key ● = 5 cars

● ● ● ●	● ● ● ● ● ●	● ●	● ● ● ● ●	● ● ●
blue	red	silver	black	green

Sam

Key ● = 10 cars

Colour	Number of cars
blue	● ●
red	● ● ●
silver	●
black	● ● ●
green	● ●

What is the same? What is different?
Whose pictogram do you prefer?



multiple possible answers, e.g.

same: same information; circle symbols; colours in the same order

different: counting in 5s and 10s; vertical and horizontal

Interpret pictograms (2, 5 and 10)

Notes and guidance

In this small step, children interpret pictograms where the symbols represent 2, 5 or 10 items. Again, the pictograms may be presented either vertically or horizontally and children should now be familiar with both.

Children encountered how to interpret part symbols in the previous step, but this is challenging and may need some reinforcement. Questions include reading from a single row/ column of a pictogram, making comparative statements and solving simple multi-step problems.

At this point, children may start to make inferences and consider more contextual questions such as “Why do you think that the data shows this?”

Things to look out for

- Children may not use or may misread the key.
- Children may calculate the totals of items rather than using the pictogram to make comparisons.
- Children may need support to interpret part of a symbol.
- Children may think that if there is nothing in a column/ row, then it is unfinished rather than representing zero.

Key questions

- What do you know? What can you find out?
- What is a key? Why is it important? What does the key show?
- Which category is the most popular? Which is the least popular?
- How many more people chose _____ than _____?
- How many _____ are there in total?
- What would change if the key changed?

Possible sentence stems

- The key shows 1 symbol = _____ people.
So _____ symbols represent _____ people.
- The key shows 1 symbol = _____ people.
So half of a symbol represents _____ people.

National Curriculum links

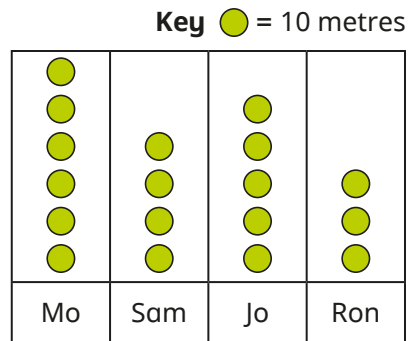
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- Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
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Interpret pictograms (2, 5 and 10)

Key learning

- The pictogram shows how far children run in a game.

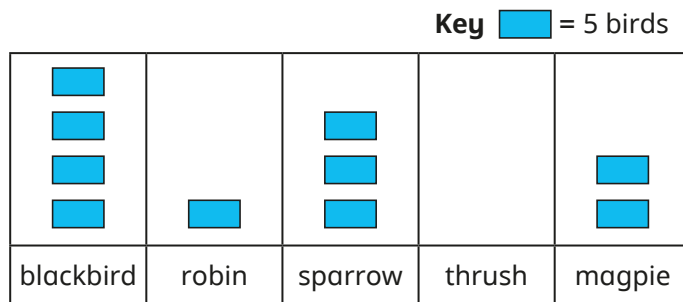
Complete the sentences.



Sam runs _____ metres.
 _____ runs the furthest distance.
 _____ runs the shortest distance.
 Altogether they run _____ metres.

What else can you find out?

- The pictogram shows how many birds Ben sees on a walk.



- ▶ How many more sparrows does he see than robins?
- ▶ How many more blackbirds than magpies does he see?

How did you work these out?

- Here is a pictogram showing children's favourite sports.

Key ▲ = 2 children

Sport	Number of children
football	▲▲▲▲▲
tennis	▲▲
basketball	▲▲▲
hockey	▲▲▲▲
swimming	▲

- ▶ How many children voted for either football or swimming?
- ▶ How many fewer children voted for tennis than for hockey?

- Use the pictogram to decide if the statements are true or false.

Key ★ = 10 animals

Animal	Number on farm
sheep	★ ★ ★ ★ ★
horse	★
chicken	★ ★ ★ ★
cow	★ ★ ★ ★ ★ ★ ★ ★

There are 8 cows on the farm.

There are 55 sheep and horses in total.

The number of chickens is half the number of cows.

Interpret pictograms (2, 5 and 10)

Reasoning and problem solving

Max and Kim count the traffic they see.
They draw a pictogram.

Key = 10 vehicles

van	
bus	
bike	
lorry	
car	



Max

The total number of lorries and bikes is equal to the number of cars.

There are 16 and a half vehicles.



Kim

Do you agree with Max and Kim?
Explain your answer.



Max – yes

Kim – no

The pictogram shows the number of ice creams sold in one week.

Key = 2 ice creams

Mon	
Tue	
Wed	
Thur	
Fri	
Sat	
Sun	

Is the statement true or false?

More ice creams were sold at the weekend than during the rest of the week.

Explain your answer.



True

Summer Block 4

Position and direction

Small steps

Step 1

Language of position

Step 2

Describe movement

Step 3

Describe turns

Step 4

Describe movement and turns

Step 5

Shape patterns with turns

Language of position

Notes and guidance

In this small step, children use the language of position, recapping and building upon learning from Year 1

Children start by describing the position of objects using left and right. Discuss methods for remembering which way is left and which way is right. They then think about other language to describe position, such as above, below and between.

Children use their understanding of this language to complete multi-step and more sophisticated problems. This learning will be built upon as they begin to think about describing movement and turns in the next steps.

Things to look out for

- Children may confuse left and right.
- Children may think that there is only one way to describe position.
- Children may not use mathematical language to describe position.
- Children may find it more difficult to describe position using images than they do in practical contexts.

Key questions

- How do you know which way is left/right?
- How would you describe the position of this object?
- Which object is to the left/right of the _____?
- Which object is above/below the _____?
- What does “between” mean?

Possible sentence stems

- The _____ is above/below the _____
- The _____ is to the right/left of the _____
- The _____ is between the _____ and the _____

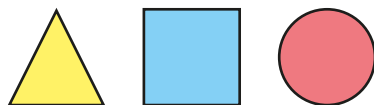
National Curriculum links

- Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise)

Language of position

Key learning

- Here are some shapes.



- ▶ Which shape is to the left of the square?
- ▶ Which shape is to the right of the square?
- ▶ How can you remember which way is left and which is right?
- ▶ Which shape is between the triangle and the circle?

- Look at the people and things around you in the classroom.

Complete the table.

In front of me	Behind me	To the left of me	To the right of me



Ask children to walk around school or the playground and complete the sentences.

The _____ is above/below the _____

The _____ is to the left/right of the _____

The _____ is in between the _____ and the _____

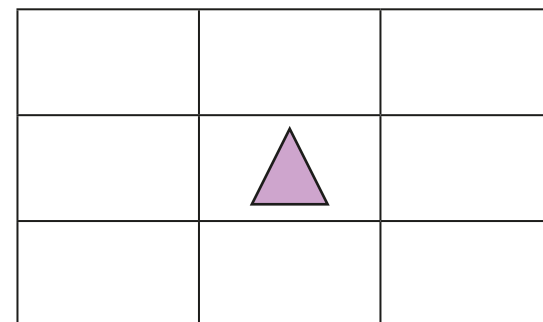
- Use five cubes. Follow the instructions to make a tower.

- Start with a yellow cube.
- Put a blue cube on top of the yellow cube.
- Put a white cube below the yellow cube.
- Put a red cube on the top of the tower.
- Put the green cube in between the yellow and white cube.

Write your own instructions for a partner.

- Follow the instructions.

- Draw a square above the triangle.
- Draw a circle below the triangle.
- Draw a rectangle to the left of the triangle.
- Draw another triangle to the right of the square.






Language of position

Reasoning and problem solving

Use the clues to write Max, Sam and Jo's names on the grid.



 Kim	 Mo	
		 Ron

- Mo is directly above Max.
- Sam is directly below Max.
- Jo is to the right of Max.

Complete the sentence.

Sam is to the left of _____

2nd row: empty,
Max, Jo

3rd row: empty,
Sam

Ron

How many ways can you describe the position of the 2p coin?



- below the 50p
- above the 10p
- in between the 50p and the 10p
- in between the 20p and the 5p
- to the left of the 5p
- to the right of the 20p

Think of a set of clues to describe the positions of some coins.

Tell a partner your clues. Can they work out the position of each coin?



Describe movement

Notes and guidance

In this small step, children use their understanding of position to describe movement. This could be explored, in the first instance, by following instructions outside to move from one area to another. Children then begin to record and describe movement more formally, in terms of both direction and number of squares. They should first describe movement of an object as up, down, left and right as they look at it on a page. Once they are confident with this, they can begin to think about describing movement using forwards and backwards. This is often difficult for children and will need careful modelling as the direction of forwards or left, for example, changes, depending on which way a person or object is facing. This learning is key and needs to be fully understood as it is used throughout the remainder of this block.

Things to look out for

- Children may confuse left and right.
- Children need to think about which way an object is facing to work out both forwards/backwards and left/right, which can be challenging.
- Children may count the starting square, so miscount the number of squares an object has moved.

Key questions

- Which direction is left/right?
- How many squares has the object moved?
- Do you need to count the square that the object starts in?
- Which direction is forwards/backwards?
- If you move forwards, do you always move in the same direction?
- Which way would left/right be in this question?
How do you know?

Possible sentence stems

- The _____ has moved _____ squares up/down/left/right.
- The _____ has moved _____ squares forwards/backwards and _____ squares left/right.

National Curriculum links

- Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise)

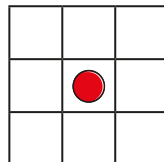
Describe movement

Key learning



Take the children into the playground. In pairs, they take turns to give instructions for their partner to get from one place to another. Tell them that they need to use the words forwards, backwards, left and right, together with the number of steps.

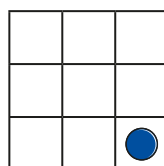
- There is a counter in the middle square of the grid.



- ▶ Draw a triangle to show where the counter will be if it moves 1 square up.
- ▶ Draw a circle to show where the counter will be if it moves 1 square left.

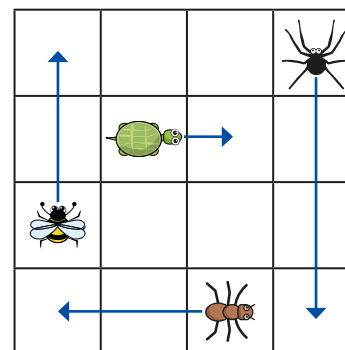
- Ben moves the counter 2 squares left and 2 squares up.

Where is the counter now?



Make up instructions for a partner to move the counter.

- Use the words **forwards** and **backwards** to help you complete the sentences.



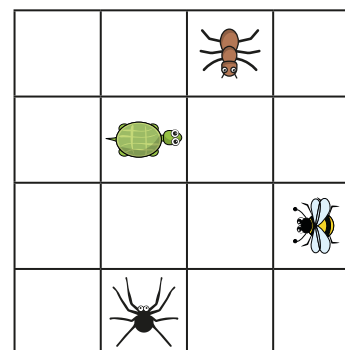
Tiny moves 1 square _____

The bee moves _____ squares _____

The _____ moves 2 squares backwards.

The spider moves _____ squares _____

- Use arrows to show the movement on the grid.



- Tiny moves 1 square backwards.

- The ant moves 2 squares forwards.

- The bee moves 3 squares forwards and then 1 square backwards.

- The spider moves 2 squares right.

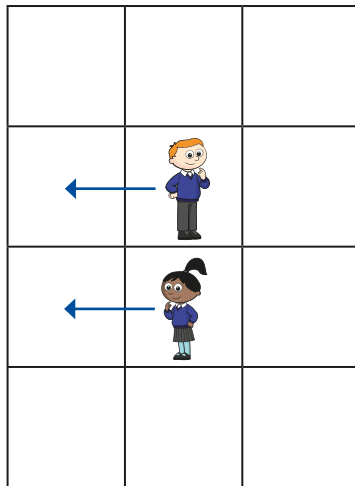
Describe movement

Reasoning and problem solving

Ron and Sam both move 1 square to their left.



Tiny draws arrows to show where they move to.



Do you agree with Tiny?

Explain your answer.

Draw arrows to show where Ron and Sam move to.



No
Both Ron and Sam move in the opposite direction to that shown, into the right-hand column.

Use the words to help the bee get to the beehive.

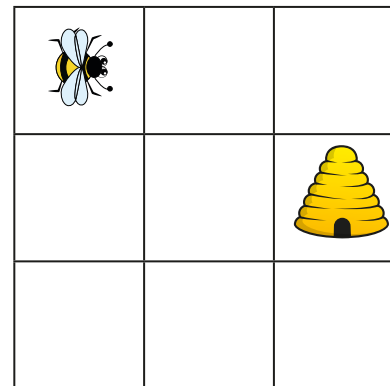


forwards

backwards

left

right



How many ways can you find?



multiple possible answers, e.g.
2 squares forwards,
1 square right

Describe turns

Notes and guidance

In this small step, children start to describe turns.

Children learn about quarter, half, three-quarter and full turns, as well as using clockwise and anticlockwise. Links could be made to other areas of the curriculum (time, fractions) to help conceptualise the learning. Children may find it beneficial to complete quarter, half, three-quarter and full turns before they are introduced to clockwise and anticlockwise.

Children should be able to draw what an object would look like after a turn and describe the turn that an object has performed. As with previous steps, there will be plenty of opportunity to explore this step practically, both in the classroom and outside.

Things to look out for

- Children may need a reminder about the fractions used in this step.
- Children may confuse clockwise and anticlockwise.
- Children may find it more difficult to describe a turn than to make it.
- Children may think that an object must change if it completes a full turn.

Key questions

- Where have you heard “half” and “quarter” before? What do they mean?
- Which direction will you be facing if you make a _____ turn?
- Which way do the hands go round a clock?
- What do you think clockwise/anticlockwise means?
- What happens to the way you are facing when you make a half/full turn?
- What type of turn has this object made?

Possible sentence stems

- The _____ has turned a _____ turn _____
- When I make a half turn, I will be facing _____
- When I make a full turn, I will be facing _____

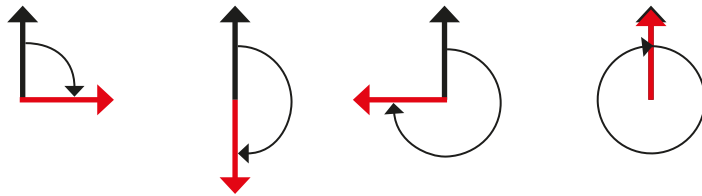
National Curriculum links

- Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise)

Describe turns

Key learning

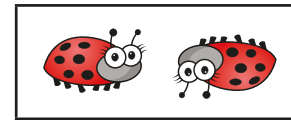
- The pictures show a quarter turn, a half turn, a three-quarter turn and a full turn.



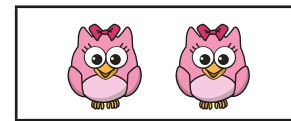
How is this similar to fractions?

How is this similar to time?

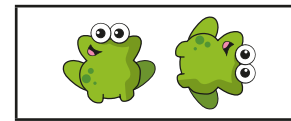
- Match the pictures to the turns.



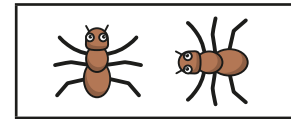
full turn



quarter turn clockwise



half turn anticlockwise



quarter turn anticlockwise

- Complete the sentence to describe the turn each triangle has made.



The triangle has turned a _____ turn _____



Ask children to pick an object and take it in turns with a partner to turn the object.

Children should describe the turns using the language full turn, half turn, quarter turn, three-quarter turn.



Discuss the terms clockwise and anticlockwise. Use a clock to show children the difference.

Play *Simon says* using quarter, half and three-quarter turns together with clockwise and anticlockwise.

Describe turns

Reasoning and problem solving

Jo is describing turns.



It does not matter which way I turn for a half turn.

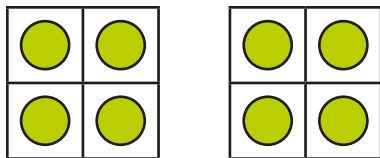
Do you agree with Jo?

Explain your answer.



Yes

Look at the shapes.

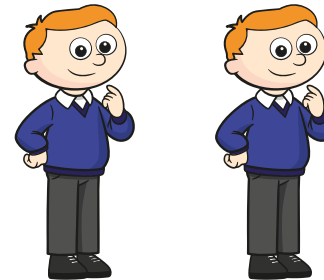


Describe the turns the shape could have made.

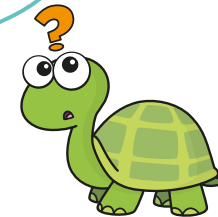


quarter, half, three-quarter or full turn, either clockwise or anticlockwise

Ron has made a turn.



I do not think this is correct, because Ron is facing the same direction.



Do you agree with Tiny?

Explain your answer.

No

Ron could have completed a full turn.

Describe movement and turns

Notes and guidance

In this small step, children combine their learning from previous steps to describe movement and turns.

There are many misconceptions that can occur within this step, so it is important to practically complete tasks and discuss any misunderstandings as a class. Children could play games, such as giving each other instructions through a maze. They need to visualise which way an object is facing and which way it will be facing if it turns left or right. Once this is secure, they can then think about describing movement and giving instructions to move an object from one place to another.

The use of small, programmable robots could also be used to consolidate this learning.

Things to look out for

- Children may confuse left and right, and clockwise and anticlockwise.
- Taking into account the original direction that an object is facing may need support and modelling.
- When describing movement involving more than one step, especially when a turn is needed, children may leave out some steps or confuse the order.

Key questions

- Which direction is left/right?
Does it matter which way the object is facing?
- How do you know which direction the object has moved?
- Which direction is clockwise/anticlockwise?
- Which direction does the object need to move after the turn?
- How can you show the movement using arrows on the grid?

Possible sentence stems

- First I move _____ squares forwards.
Then I turn _____
Then I move _____ squares forwards.

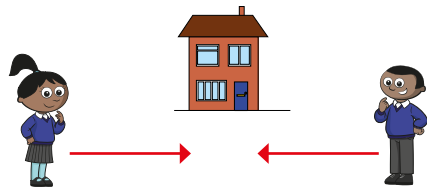
National Curriculum links

- Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise)

Describe movement and turns

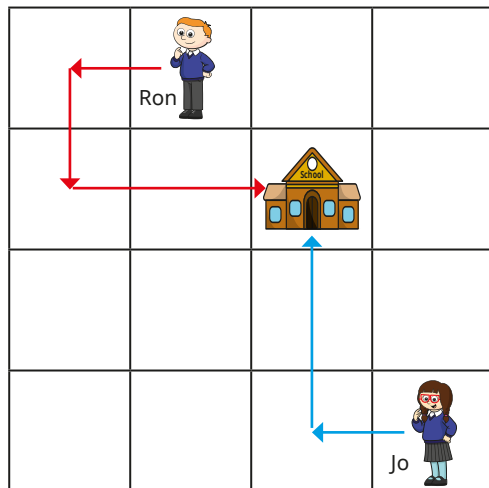
Key learning

- Sam and Mo are walking home.



Which way should Sam turn?
Which way should Mo turn?
What do you notice?

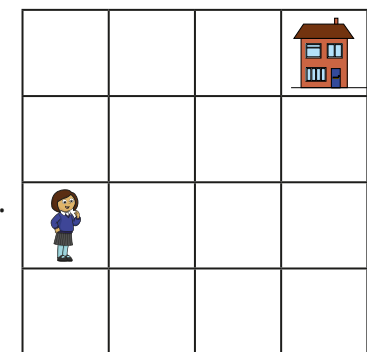
- Ron and Jo are walking to school.



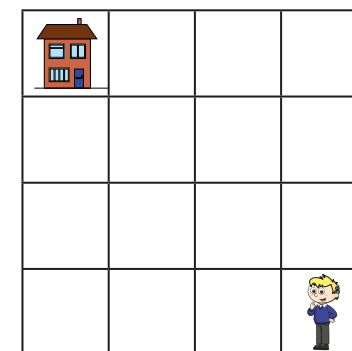
- ▶ Complete the sentences to describe how Jo gets to school.
First she moves _____ square forwards.
Then she turns _____
Then she moves _____ squares forwards.
- ▶ Describe Ron's journey to school.

- Follow the instructions to draw Kim's way home.

- Go forwards 1 square.
- Turn left.
- Go forwards 2 squares.
- Make a quarter turn clockwise.
- Go forwards 2 squares.



- Draw arrows to show how Max could walk home.
Describe Max's journey.



Is there more than one answer?

Describe movement and turns

Reasoning and problem solving



Tell children to go on a walk around the school or the playground, recording their journey.

They then describe their journey to a partner and see if they can recreate the route.

They must include the words clockwise and anticlockwise.



If I make a quarter turn clockwise I will be facing the same direction as if I make a three-quarter turn anticlockwise.

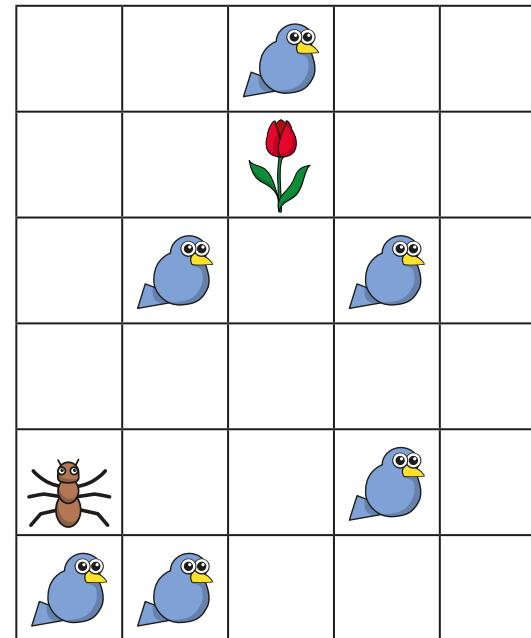
Yes

Is Tiny correct?

Explain your answer.



On this grid, the ant is not allowed to be on the same square as a bird.



How can the ant get to the flower?

How many ways can you find?



multiple possible answers, e.g.

forwards 3 squares,
turn right, forwards
2 squares

Shape patterns with turns

Notes and guidance

In this small step, children explore patterns that involve turns.

Time could be spent recapping patterns that just use different shapes first, including different ways to form patterns, before introducing them to patterns with one or two shapes that include a turn. They should be able to identify what the next shapes in the pattern are and what direction they face. Encourage children to use the language of quarter, half, three-quarter turns as well as clockwise and anticlockwise.

Discuss what happens when a shape completes a full turn and why this may not be useful when creating patterns.

Children can cut out shapes and complete some of these tasks practically before describing their patterns.

Things to look out for

- Children may confuse clockwise and anticlockwise.
- Children may struggle to identify the series of shapes that are repeating when a pattern is made up of more than one shape.
- Children may not be able to identify the turn in each pattern.

Key questions

- What are patterns?
- Which shape(s) is/are repeating?
- How can you describe this pattern?
- How can you make a pattern with one shape?
- How can you describe the turn in each pattern?
- What is the next shape?

Possible sentence stems

- In this pattern, the shape turns a _____ turn _____
- The next shape is _____ because ...

National Curriculum links

- Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise)

Shape patterns with turns

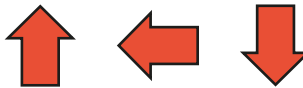
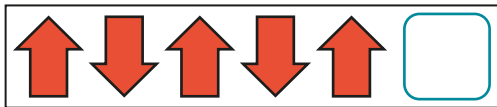
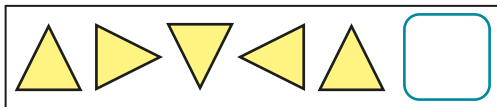
Key learning



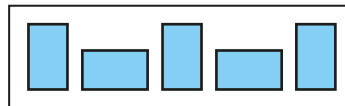
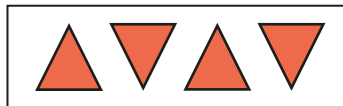
Show children a range of patterns that do not involve turns and ask what they notice. Then ask them to make patterns with different cubes/shapes.

- The patterns are made by turning the shape each time.

Choose the missing shapes.



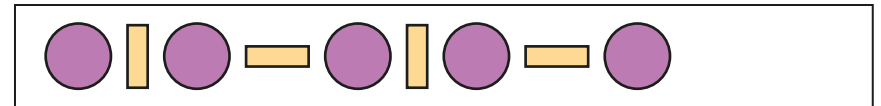
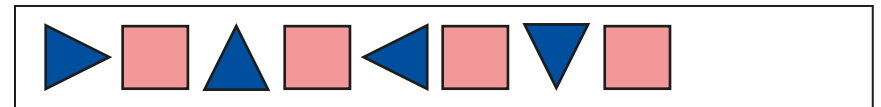
- Complete the sentence to describe the turns between the shapes.



The shape makes a _____ turn _____

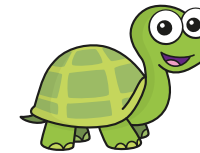
Is there more than one answer?

- Draw the next two shapes in each pattern.



How can you describe the patterns?

- Tiny is describing a pattern.



My 1st shape is a triangle. It makes a half turn each time.

- Draw the first five shapes in Tiny's pattern. Have you drawn the same pattern as your partner?
- Describe a pattern for your partner to draw.

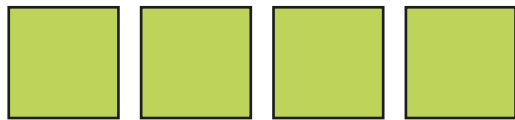
- How many different patterns can you make with this shape?



Shape patterns with turns

Reasoning and problem solving

The pattern is made by turning the square each time.



Describe the turns in the pattern.

Compare answers with a partner.



quarter, half, three-quarter or full turn clockwise or anticlockwise

Spot the mistake in the pattern.

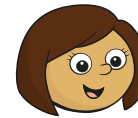
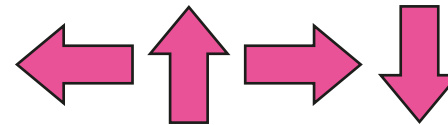


Draw the correct shape.

The 5th shape is incorrect.



Kim and Mo are describing the pattern.



Kim

The arrow makes a quarter turn each time.

The arrow makes a three-quarter turn each time.



Mo

Both children are correct.

Who is correct?

Explain your answer.

