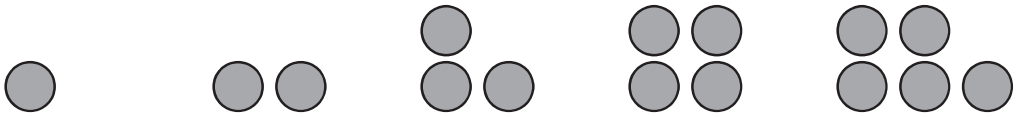
Patterns and rules – growing patterns

Some patterns repeat. ♡♡♥♥♡♡♥♥

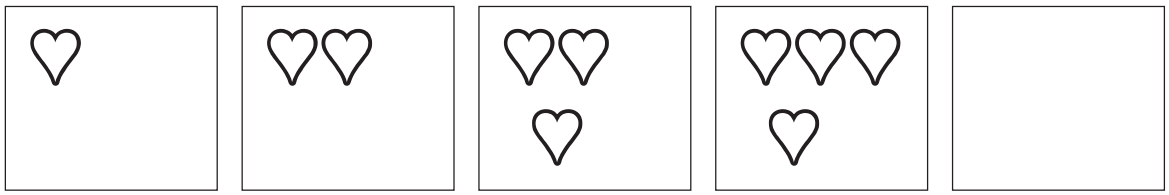
Some patterns grow. When they grow, they must still follow a rule.

The rule for this pattern is '+ 1 ●'



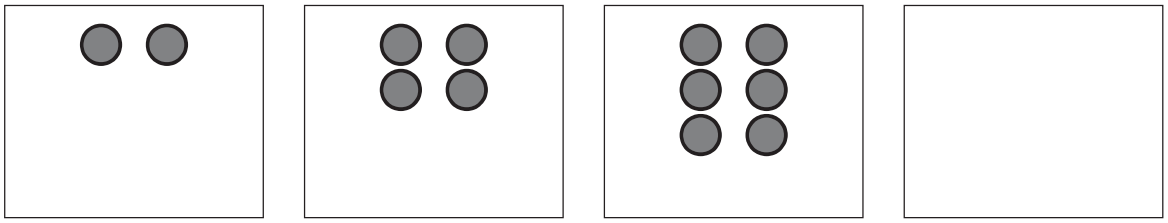
1 Work out the rule and draw the next part of each pattern.

a



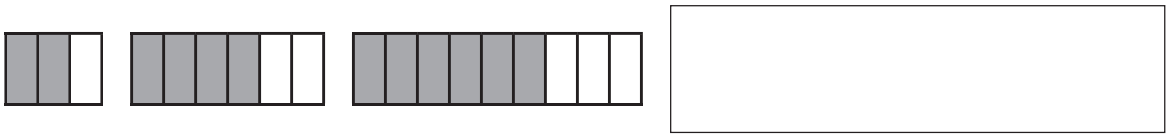
The rule is + _____

b



The rule is + _____

c

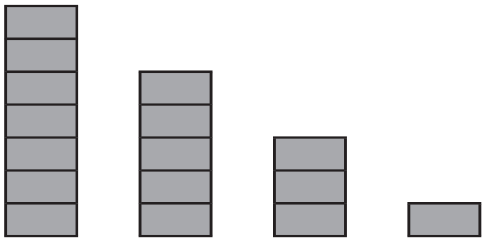


The rule is + ____ ▮ and + ____ ▯

2 Make your own growing pattern with blocks. Record the rule and the first few parts of the pattern here.

Patterns and rules – growing patterns

Patterns can also shrink. Look at this pattern.



It follows a –2 rule.
In each stage we have
2 fewer blocks.

You will need: a partner counters

What to do:

Start with 10 counters. ●●●●●●●●●●

Take some away so there are only **7 left**. ●●●●●●●

Then take some more away so there are only **4 left**. ●●●●

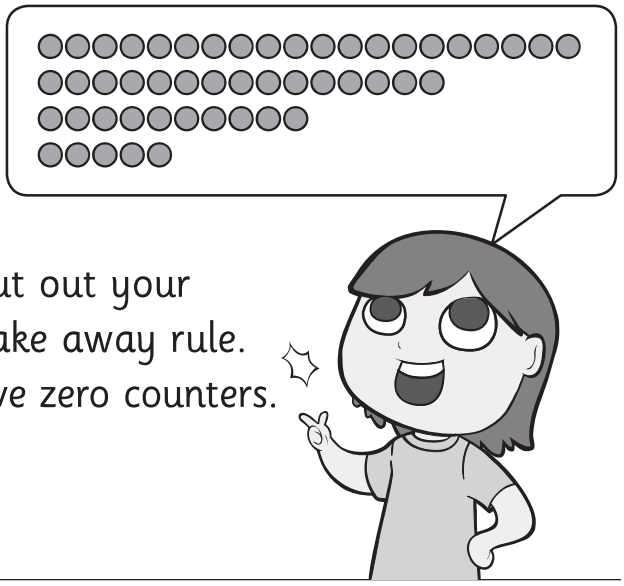
Now take some away so there is only **1 left**. ●

a How many counters are you taking away each time? _____

b What is the rule? _____

What to do next:

Think of a different take away rule. Write it somewhere secret. Don't let your partner see!



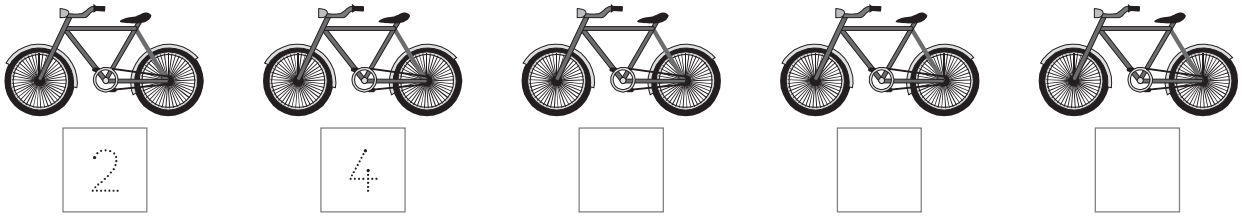
Put out 20 counters in a row. Then put out your next row of counters following your take away rule. Continue until your last row would have zero counters.

Guess each other's secret rule!

Patterns and rules – skip counting

When we skip count, we follow number patterns.

1 Count by 2s to find how many wheels.



2	4			

2 Count by 5s to find how many toes.

3 Count by 2s to fill in the gaps. Watch out! Your starting point is not 2. You can use a hundred grid to help.

5	7			13			19		

4 Count by 5s to fill in the gaps. Watch out! Your starting point is not 5.

3	8	13		23	28				

What pattern do you notice?

Patterns and rules – skip counting

1 Finish the grid. Try going **down** the columns, not **across** the rows. Can you find and follow the patterns?

1	2	3	4	5		7		9	
11	12	13	14	15	16	17	18	19	
21		23	24	25				29	
31	32	33		35		37		39	
41		43		45				49	
	52		54		56		58		60
	62	63			66	67			
71			74				78		80
			84		86				
	92			95		97		99	100

2 Now colour the chart above like this.

a If you say the number when you count by 2s, give it a yellow stripe.

b If you say the number when you count by 5s, give it a green stripe.

c If you say the number when you count by 10s, give it a red stripe.

3 What do you notice:

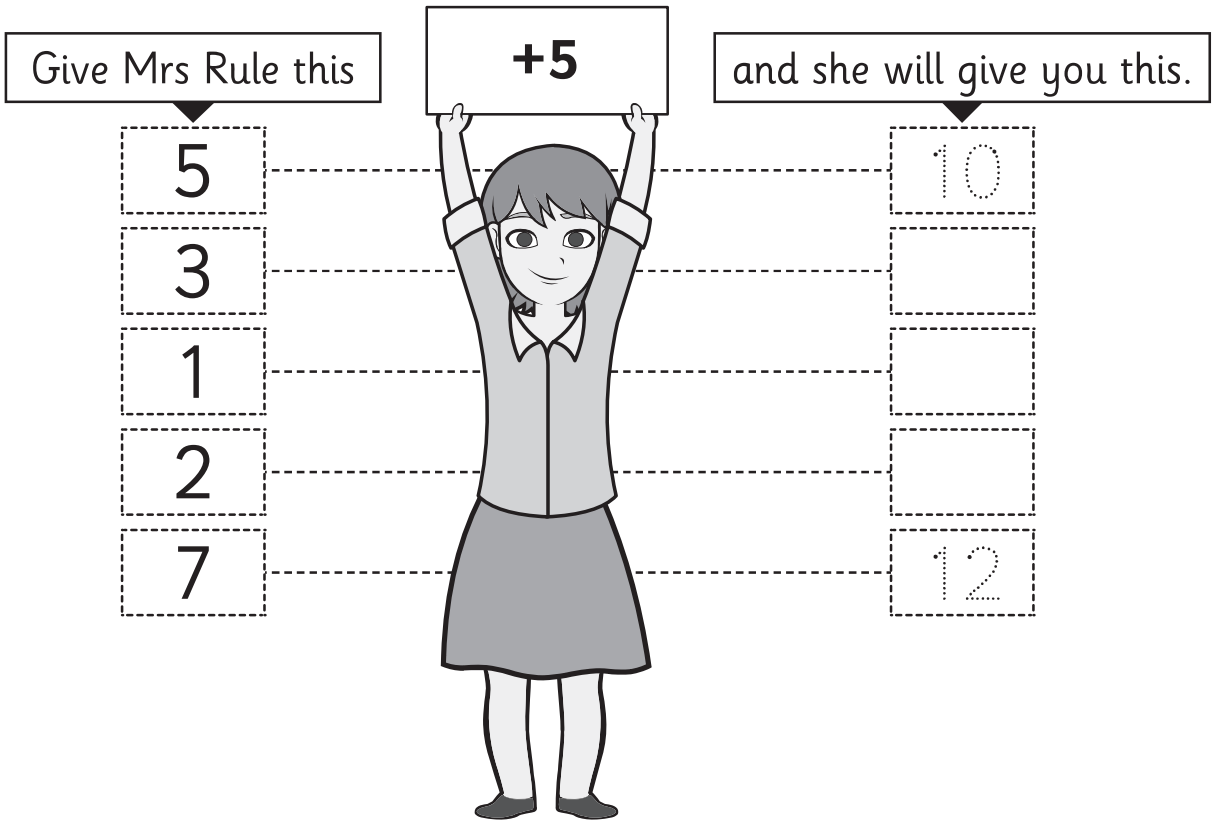
a about the numbers that have 3 stripes?

b about the numbers that only have a green stripe?

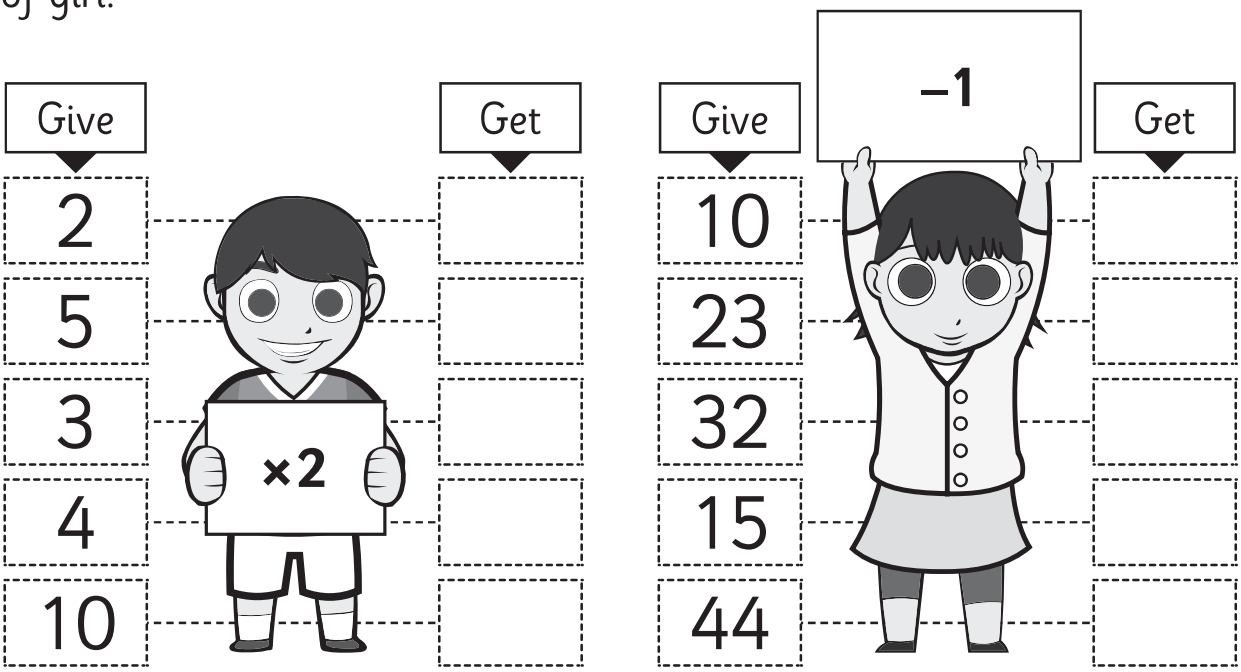
c about the numbers that have a yellow stripe?

Patterns and rules – function rules (continued)

2 Now let's give Mrs Rule some numbers. She is a **+5** woman.

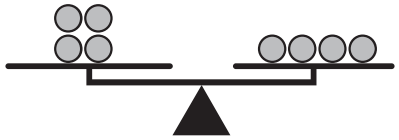


3 What about the kids? Freddy likes to **×2** and Fonnie is a **–1** kind of girl.



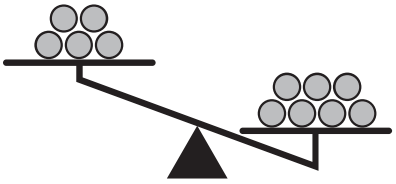
Number relationships – equivalence

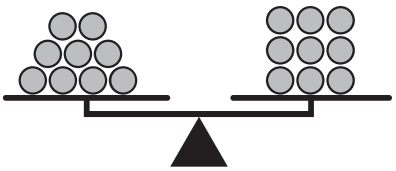
In Maths we often use = when we are talking about the **same amount** of things. To help us decide if amounts are equal, we can think about balancing them on a scale.

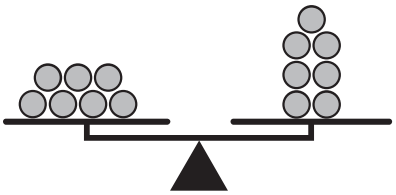


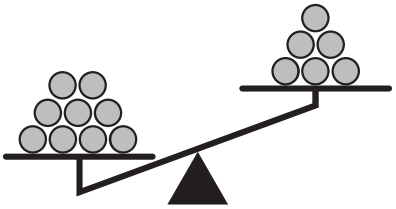
Are these the same amount? Yes, there are 4 on each side.

1 Is each scale balanced? This means it has the same amount on both sides. If it is, write =. If it isn't balanced, write ≠.

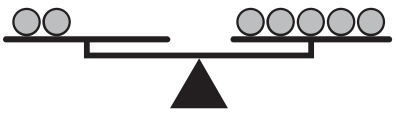
a  ☐

b  ☐

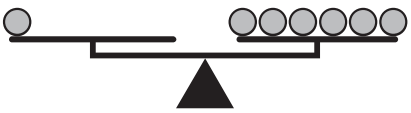
c  ☐

d  ☐

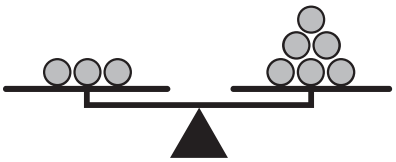
2 Draw more counters on the left of each scale to make the sides equal. How many did you draw each time? Write it in the box.

a 

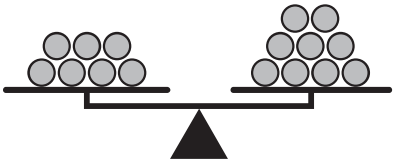
I drew ☐

b 

I drew ☐

c 

I drew ☐

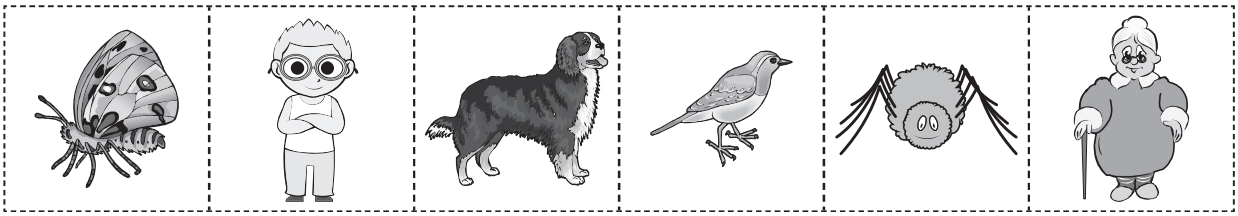
d 

I drew ☐

Number relationships – combinations

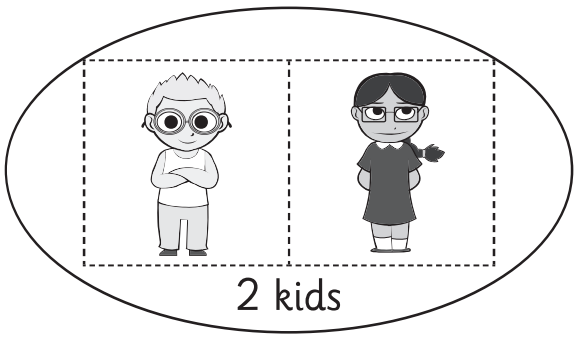
You will need: a partner scissors pages 31 and 32

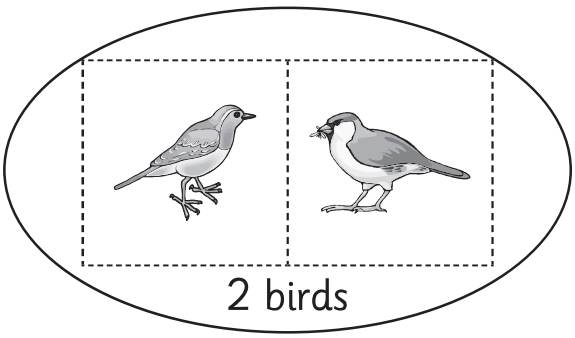
1 In a park we might find

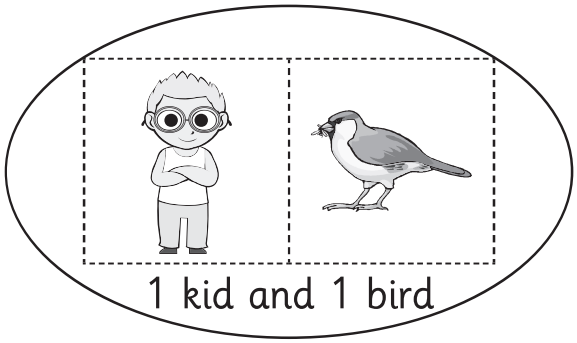


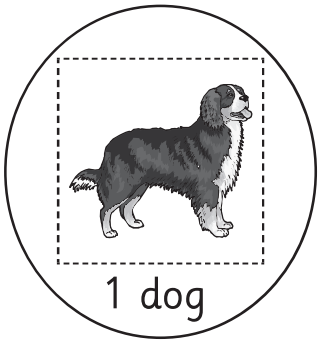
a How many legs does each creature have? Write the numbers in the boxes above.

b If there are **4 legs** in the park one day, who could be there? There could be:









There couldn't be a butterfly as it has 6 legs.

There couldn't be a spider as it has 8 legs.

There couldn't be an old lady as she has 3 legs (if we include her walking stick)!

What to do:

Work with your partner to work out who could be in the park if there are **10 legs**. You can cut out the people and animals on page 32 to help you.

Record your findings here.

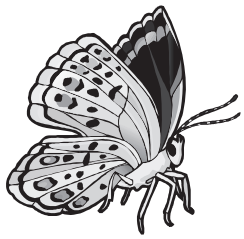
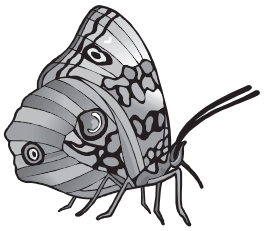
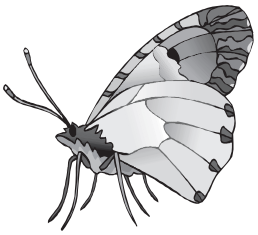
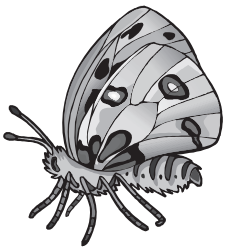
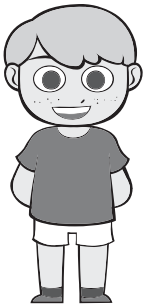
What to do next:

Compare your findings with those of another group. Have they found any different ones? How will you know when you have found all the options?

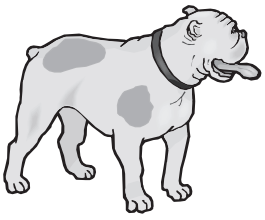
Ready for a challenge? What if there were 24 legs in the park? You will need another piece of paper to record your findings on.

Number relationships – combinations
(continued)

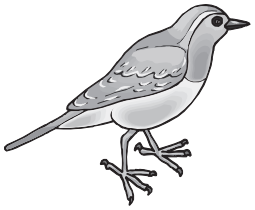
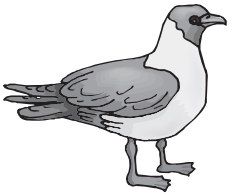
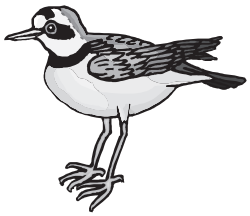
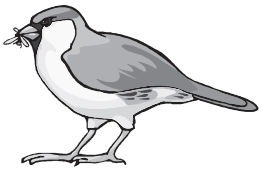
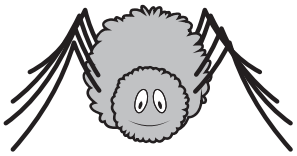
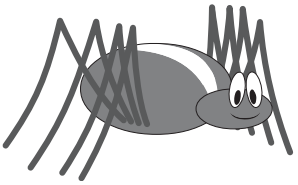
copy







Number relationships – equivalent statements

You will need:  a partner  a copy of this page

 10 counters in 4 different colours, 40 in all

What to do:

Divide up the coloured counters so you have 2 different colours each. You should have 20 counters. Mix up your own counters. Decide who will go first.

Player 1: take a handful of your own counters. Count how many counters you have altogether and how they are made up. For example, you might have 12 counters: 4 red and 8 blue. Write 12 in the small box and the addition statement you have made.

	_____ + _____ = _____ + _____

Player 2: make an equivalent statement with your own counters. Fill in your statement on the other side of the equals sign.

What to do next:

Swap jobs and make 3 more sets of equivalent statements. If you want to add some excitement, you could add a time limit or a penalty for an incorrect answer. How about 5 push ups for an incorrect statement?

	_____ + _____ = _____ + _____

	_____ + _____ = _____ + _____

	_____ + _____ = _____ + _____

Number relationships – turnarounds

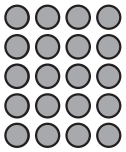
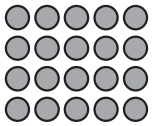
We know we can make turnarounds when we **add**.

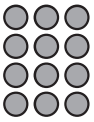
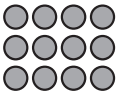
We know we can't make turnarounds when we **subtract**.

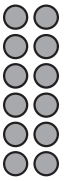
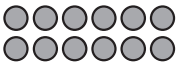
What about when we **multiply**?

1 Use the dots to help you solve these pairs of multiplication problems. If you think they are turnarounds, tick them.

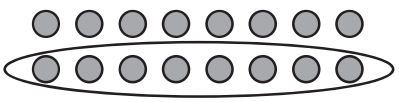
a  3 rows of 5 = 15  5 rows of 3 = ___

b  5 rows of ___ = ___  ___ rows of ___ = ___

c  4 × 3 = ___  ___ × ___ = ___

d  6 × ___ = ___  ___ × ___ = ___

e Can we make turnarounds when we multiply?

This is a row. 

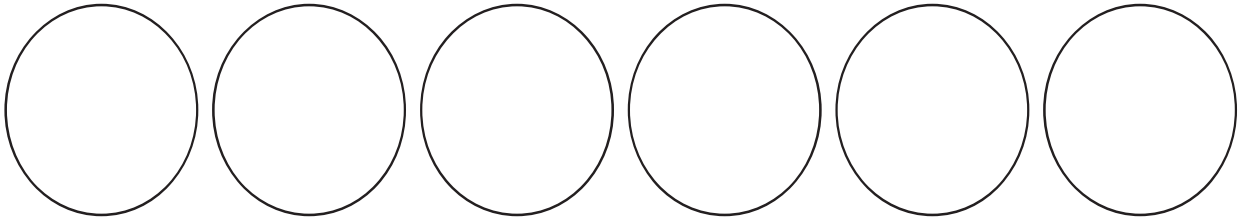
Number relationships – zero

What happens when we use zero in multiplication problems?

Think about 6 × 0 = ● or 0 × 6 = ▲

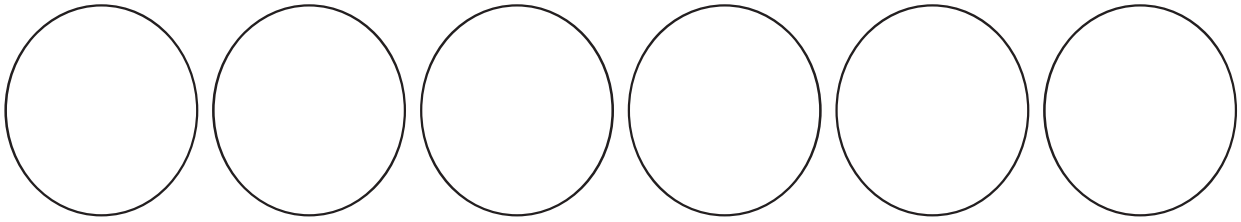
Let's explore.

1 You are at a cake shop. There are 6 plates, and on each plate there are 2 cakes. Draw the cakes on the plates.



How many cakes do you have? 6 × ___ = ___

2 Now draw 0 cakes on each of the plates.



How many cakes do you have now? 6 × ___ = ___ Sad, but true.

3 The cake shop lady says you can have as many cakes as you like but only if you put them on plates. You look **everywhere** but can't find any plates. How many cakes can you have?

0 × ___ = ___ It's OK to cry a little.

4 What happens when you multiply by zero?

Number relationships – turnarounds

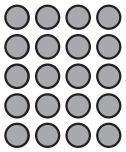
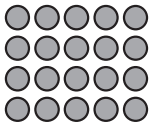
We know we can make turnarounds when we **add**.

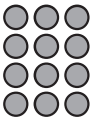
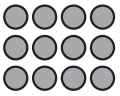
We know we can't make turnarounds when we **subtract**.

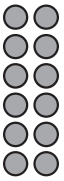
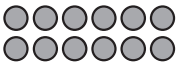
What about when we **multiply**?

1 Use the dots to help you solve these pairs of multiplication problems. If you think they are turnarounds, tick them.

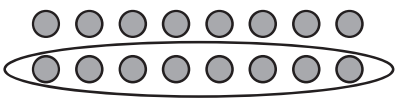
a  3 rows of 5 = 15  5 rows of 3 = ___

b  5 rows of ___ = ___  ___ rows of ___ = ___

c  4 × 3 = ___  ___ × ___ = ___

d  6 × ___ = ___  ___ × ___ = ___

e Can we make turnarounds when we multiply?

This is a row. 

2D space – 4-sided shapes

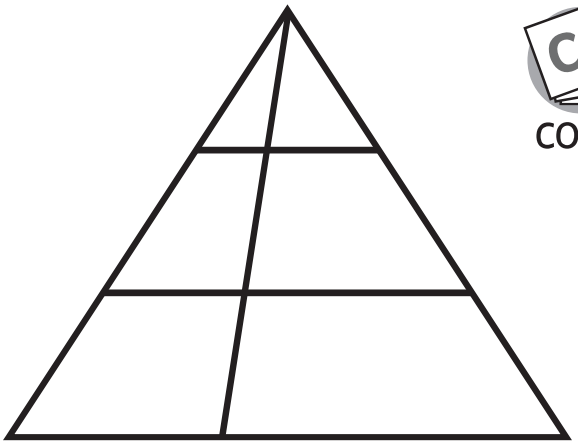
1 Draw a square, a rectangle, a trapezium and a rhombus. Label them.

2 Now draw them again, but turn them around and make them a different size. Label them.

2D space – explore

1 How many triangles can you find?

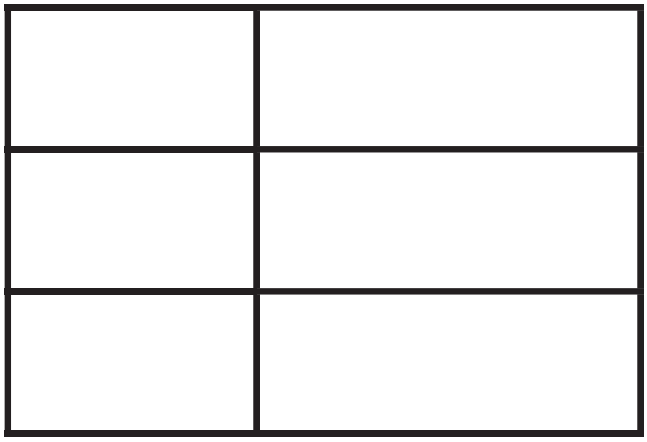
Compare your answer with that of a partner. Do you both agree?



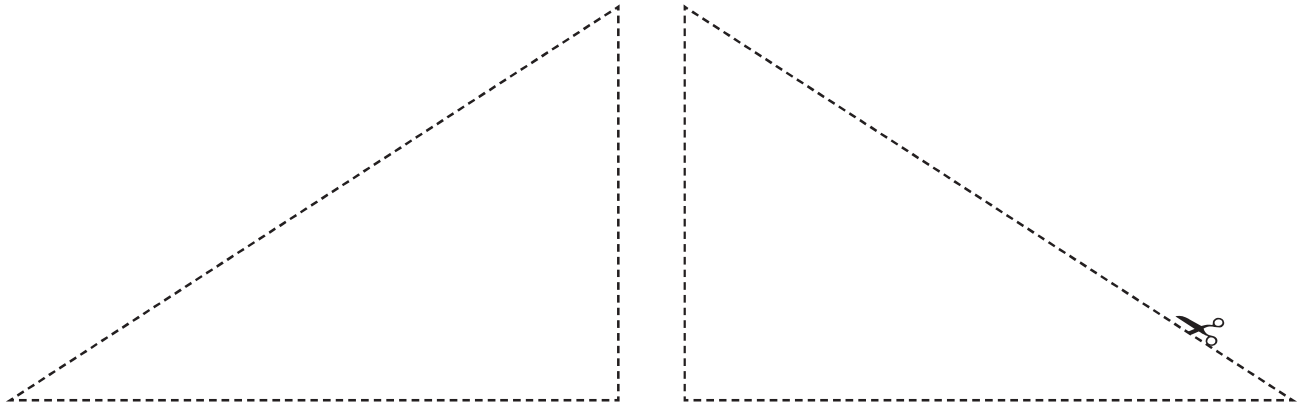
C copy

2 How many rectangles can you find?

Compare your answer with that of a partner. Do you both agree?

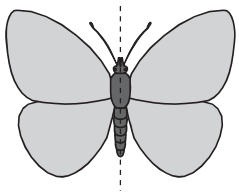


3 Cut out the triangles below. What different shapes can you make by joining them in different ways? Remember you can make irregular shapes. Record the different shapes you make in your maths book.



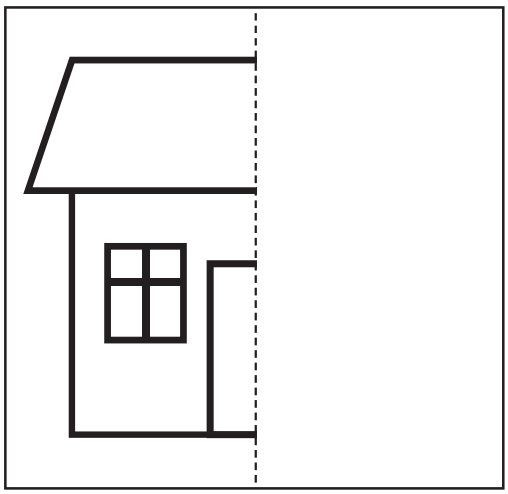
2D space – symmetry

This picture of a butterfly is symmetrical. If we fold it along the dotted line, both sides match exactly. We have 'flipped' the half.

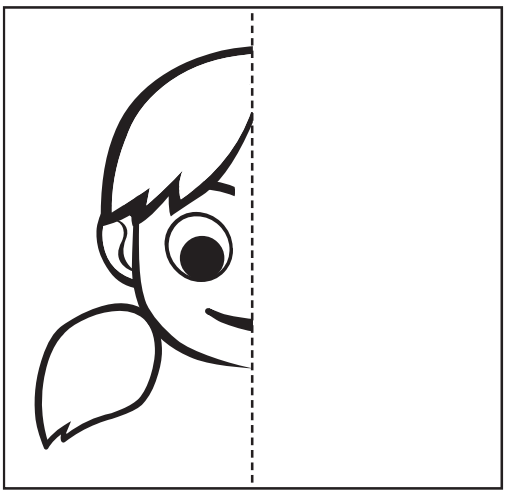


1 Draw the other side of the pictures to make them symmetrical. Colour them symmetrically.

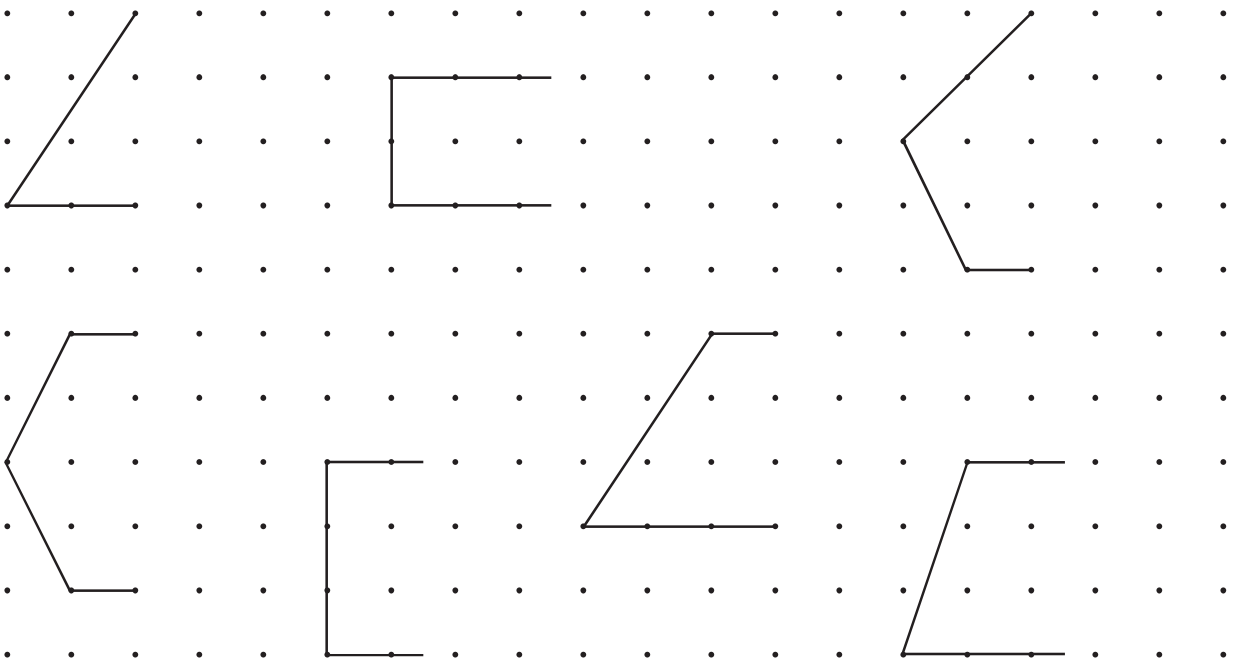
a



b

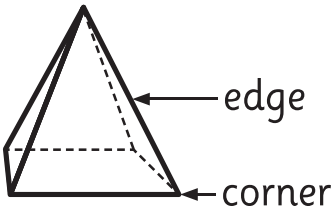


2 Draw the other side of the shape. Label each shape.



3D space – faces, edges and corners

Edges are formed when 2 **faces** meet.
Corners are formed when 2 or more edges meet.
This square pyramid has 5 **faces**.
It has 8 **edges** and 5 **corners**.

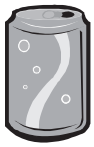


You will need: a partner classroom objects

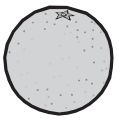
What to do:

Your task is to investigate the faces, edges and corners of some common classroom or household objects. Record the number of each to finish the fact files.

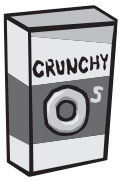
_____ faces
_____ edges
_____ corners



_____ faces
_____ edges
_____ corners



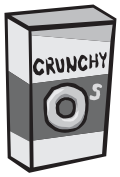
_____ face
_____ edges
_____ corners

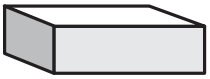


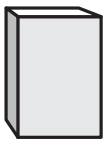
_____ faces
_____ edges
_____ corners

What to do next:

Draw lines to join the objects with their matching solids below.







Numbers to 999 – counting by 1s (continued)

4 Use the grid on page 4 to help you fill in the puzzle pieces.

a

111	112	
121		

b

121		

c

163		

d

128		

e

151		

f

	182	

5 Use what you know about number patterns to fill in these puzzle pieces.

a

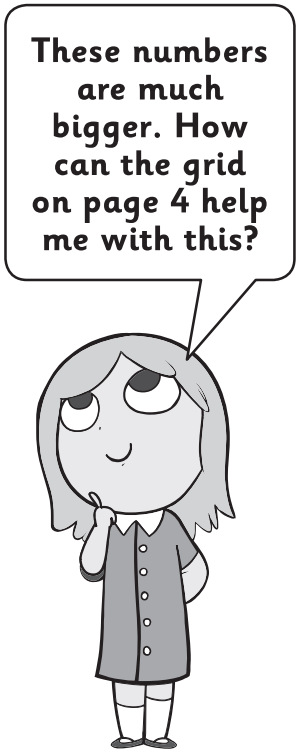
212	213	

b

325		
335		

c

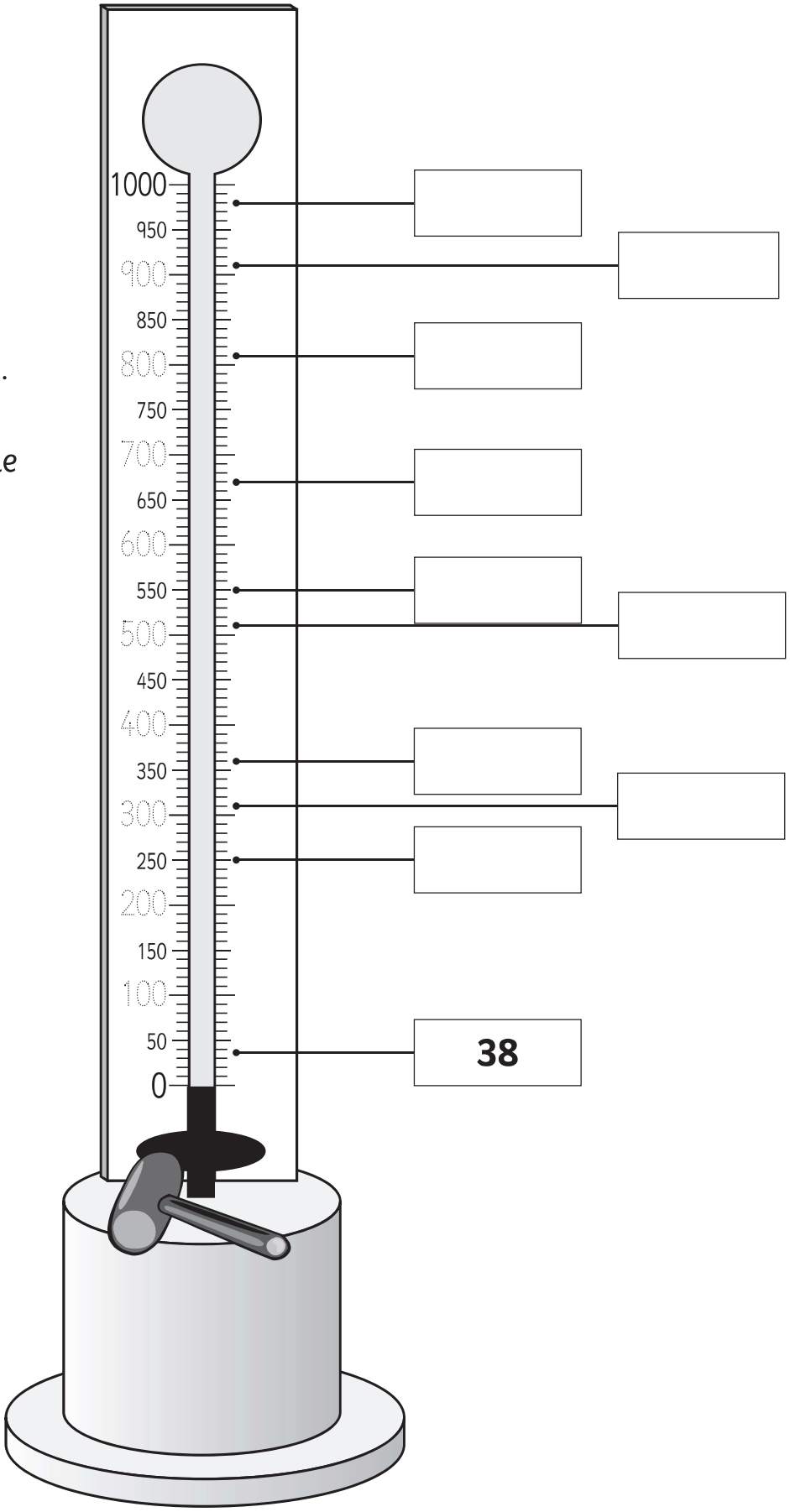
	507	508



Numbers to 999 – counting by 1s

1 **a** Trace over the dotted numbers on this Strong Kid Striker.

b In the boxes write a score that might fit. The first one has been done for you.



Numbers to 999 – matching numbers to amounts

You will need: a partner base-10 blocks

What to do:

Decide who will go first. Player 2, write a number between 1 and 999 for Player 1 in their first box. Player 1, make the number with blocks. If it's right, Player 1, tick the number. Swap jobs. Can you both get 5 ticks?

Player 1 ✓	Player 2 ✓
_____ ☐	_____ ☐
_____ ☐	_____ ☐
_____ ☐	_____ ☐
_____ ☐	_____ ☐
_____ ☐	_____ ☐

What to do next:

Join up with another pair. 1 player writes a number, the other 3 make it with blocks. One person puts out the hundreds blocks, one does the tens blocks and one does the ones blocks. For each correct answer the team scores 2 points. Can your team score 10 points?

Numbers to 999 – matching numerals to words

You will need:  a partner

1 Look, cover, write and check these number words. Write the matching numerals.

ten		
twenty		
thirty		
forty		
fifty		
sixty		
seventy		
eighty		
ninety		
one hundred		

Numbers to 999 – counting from different starting points

1 Find a partner. Face each other. Choose one of the starting numbers from the list on the right and take turns saying the numbers until you reach the next hundred.

Say it like you are having an argument with each other OR you are having a conversation. Try it again using a different number and different expression.

134
241
331
423
750
838
922

2 Complete the number lines.

a

94	95	96					

b

344	345			348			

c

496	497				501		

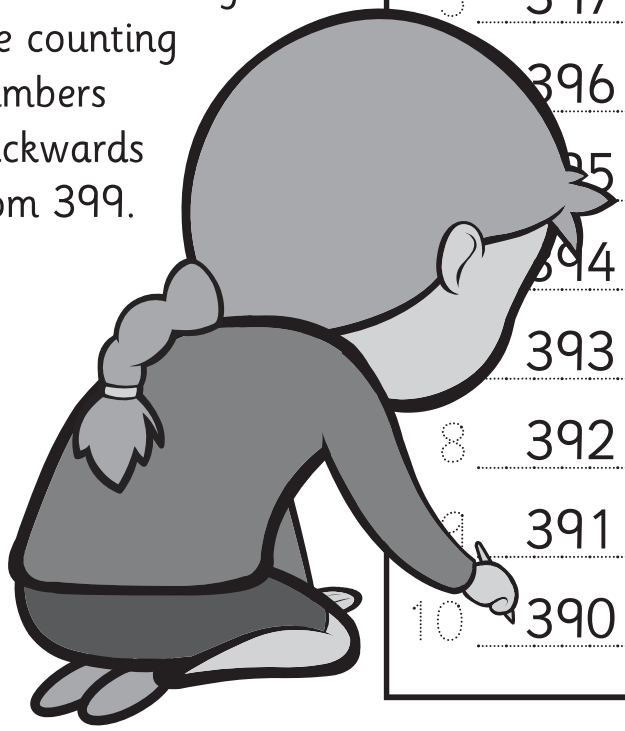
Numbers to 999 – counting backwards

You will need: a partner

What to do:

Work with your partner to solve this problem.

Qin was writing all the counting numbers backwards from 399.



1	399		11		
2	398		12		
3	397				
	396				
	95				
	94				
	393			27	
8	392				
	391				
10	390				

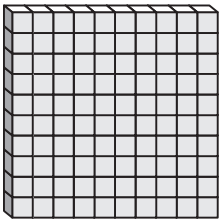
She took a break after writing 27 digits. What was the last number she wrote?

What to do next:

Can you work out what the 57th number would be? You may need to use another piece of paper to record the numbers as you count.

Place value to 999 – matching numbers to amounts

We can use base-10 blocks like these to make and show amounts.



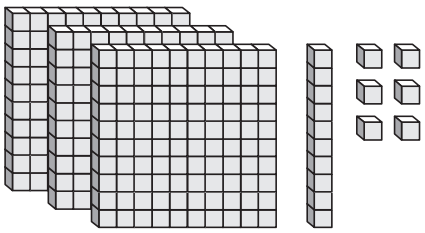
hundred

ten

one

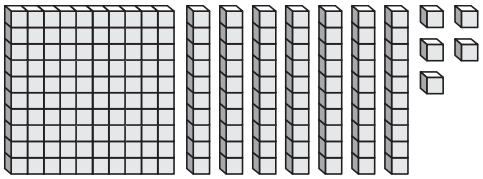
1 How many? Write the number to match the amount.

a

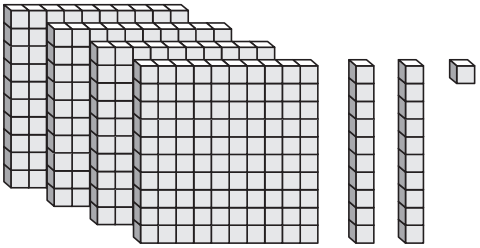


316

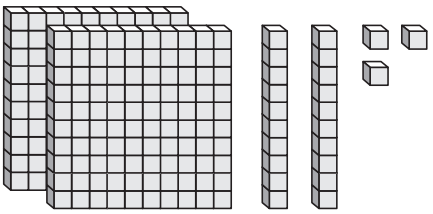
b



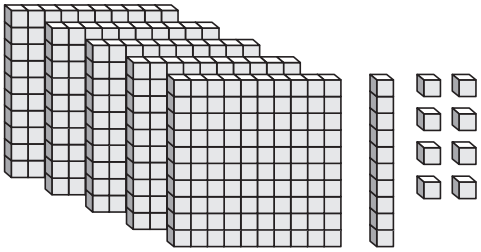
c



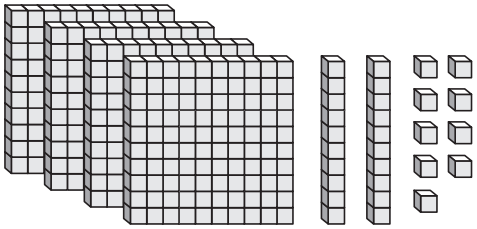
d



e



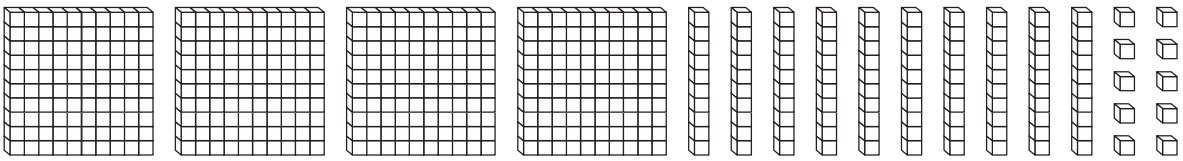
f



Place value to 999 – matching numbers to amounts

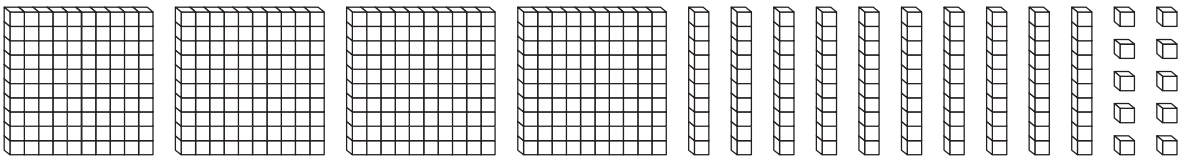
1 Colour the right number of blocks to match the number.

a



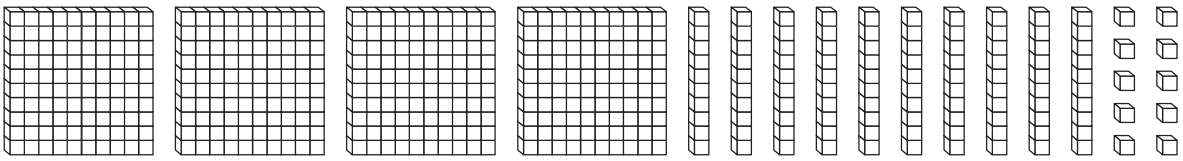
286

b



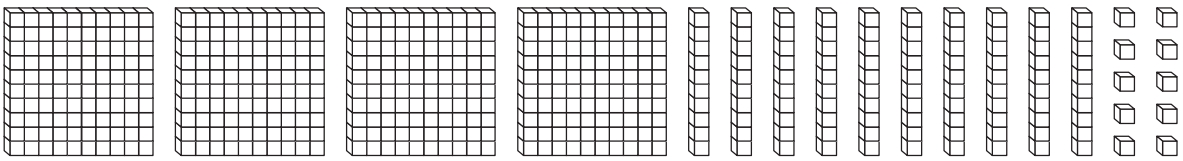
425

c



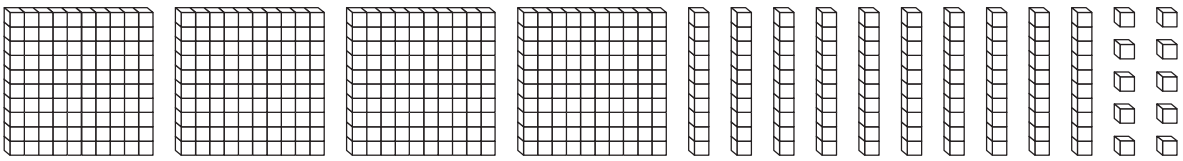
198

d



295

e



331

Place value to 999 – matching numbers to amounts

You will need: a partner, base-10 blocks

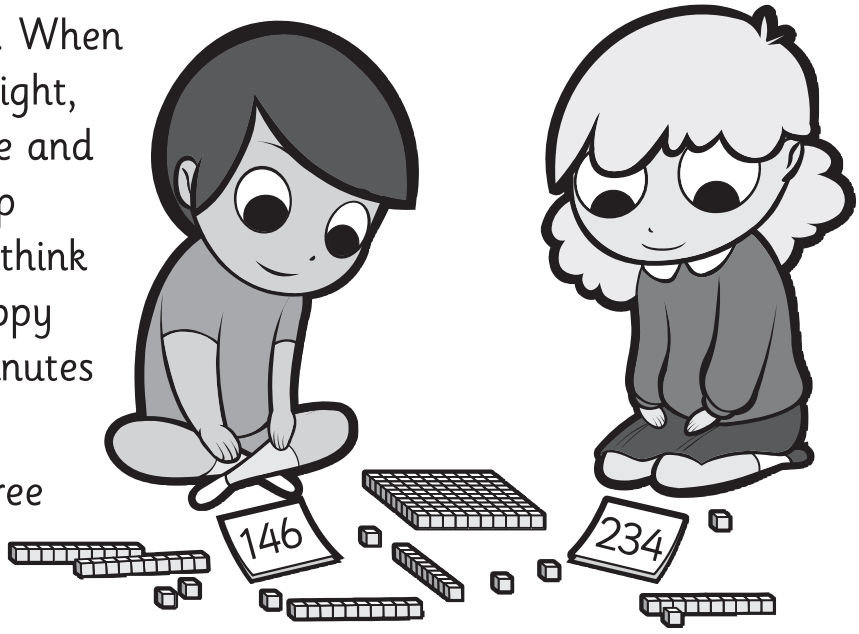
C copy

What to do:

Write a number with hundreds, tens and ones in each box and then cut out the boxes. Give your boxes to your partner. Make each other's numbers using the base-10 blocks.

Check each other's work. When you think you are both right, ask your teacher to come and check. If your partnership scores 10 out of 10, we think your teacher may be happy to give you at least 3 minutes of free time.

If you need to, use the free point card to help you score an extra point!



___ ___ ___	___ ___ ___	___ ___ ___
___ ___ ___	___ ___ ___	Free point

Place value to 999 – exploring further

You will need:  a partner

What to do:

Work with your partner to solve these problems.

a Which numbers are less than 100 and have a 6 in them?

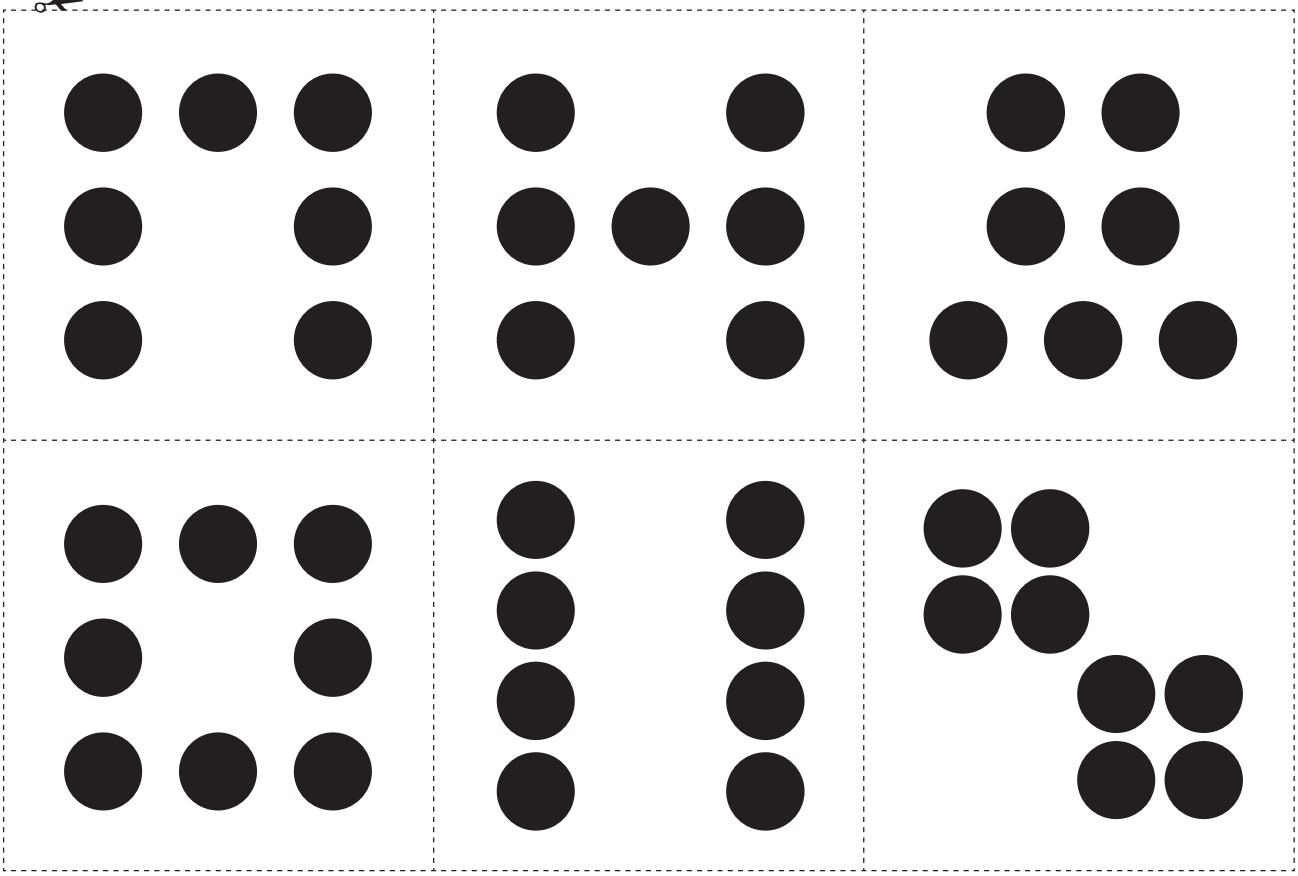
b I am thinking of a number between 20 and 50. Its tens digit is more than its ones digit. What number could it be?

c A 2 digit number contains only one 7. How many different numbers could it be?

d I have a 7, a 4 and a 3. What is the largest number I could make with them? What is the smallest?

Number sense – estimate (continued)

copy



Skip counting – by 2s

You will need: a partner, lots of counters or blocks, sticky notes

What to do:

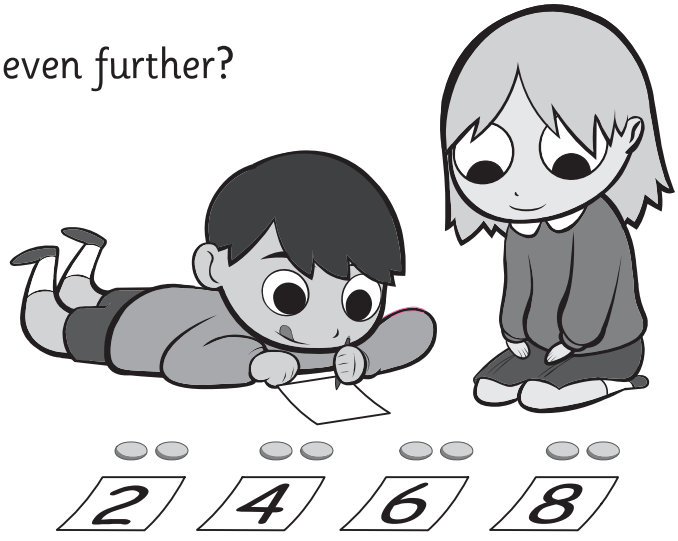
Work with your partner to make a 2s pattern with your counters all the way across the classroom floor.

What to do next:

a Look at your pattern. How many counters do you think you have used? Write your predictions here.

b Use sticky notes or paper squares to label each pair of counters. How many counters have you used?

c Can you continue your pattern even further? How far can you go?



Skip counting – by 5s

1 Finish the counting by 5s pattern.

5	10	15							

2 Help! These ladybirds have lost their spots.

a Give each ladybird 5 spots.

b Count by 5s to find how many spots altogether. ☐

c If 5 ladybirds fly away, how many spots will go? ☐

d How many spots will be left? ☐

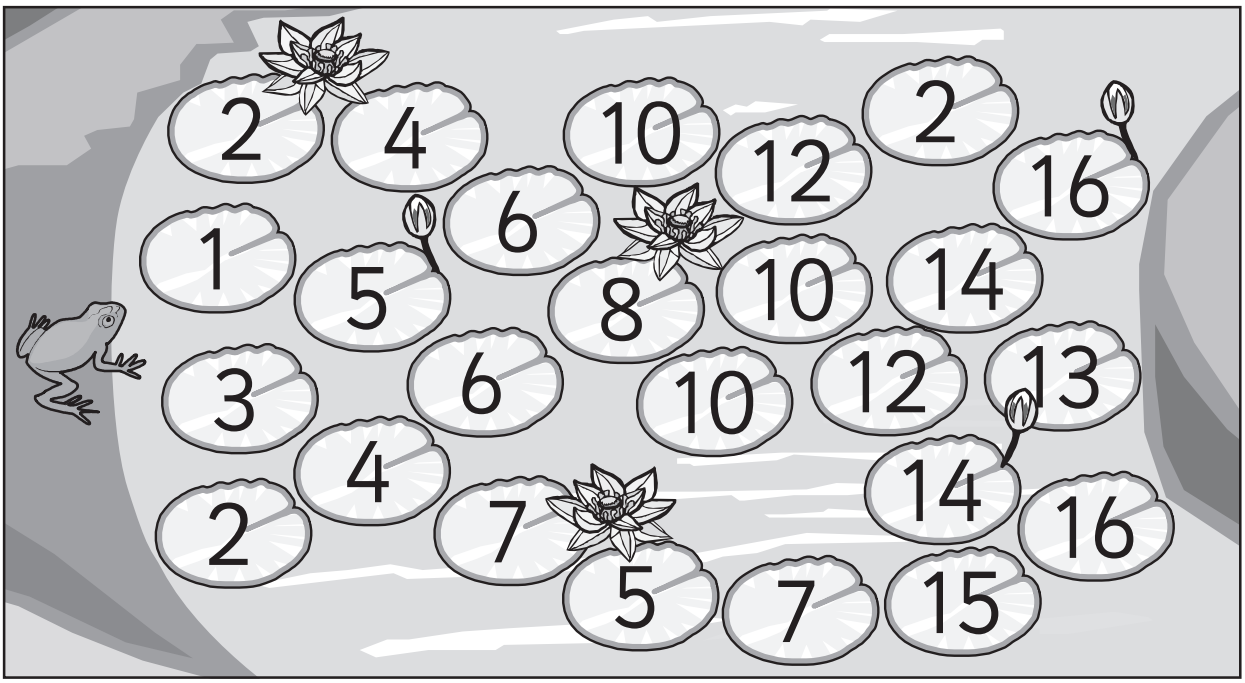
Skip counting – odd and even numbers

Even numbers can be put into pairs.

Odd numbers can't.

We say even numbers when we count the 2s pattern.

1 Froggo can only jump on lily pads with even numbers.
Colour a path he could take to get across the river.



2 Is there only one path? How many paths can you find?

3 What are the odd numbers less than 20? Write them. Can you keep going past 20?

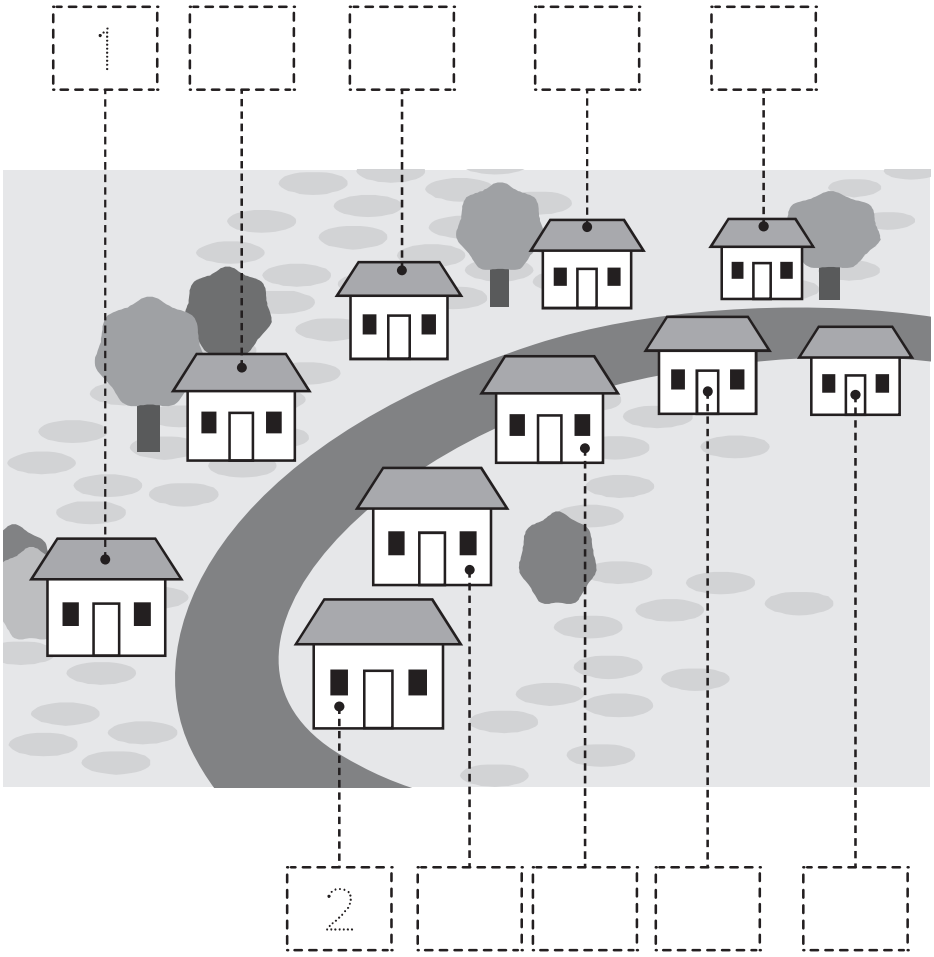
Skip counting – odd and even numbers

You will need: a partner

What to do:

Work with your partner to solve this problem.

On Main Street there are 10 houses. The even numbered houses are on one side of the street. The odd numbered houses are on the other side of the street. Put numbers above or below each house to show this.



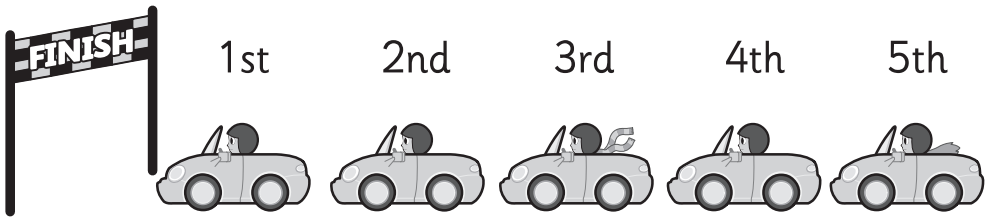
What to do next:

The even numbered houses have 3 bedrooms. The odd numbered houses have 2 bedrooms. How many bedrooms are there on Main Street?

There are ☐ bedrooms on Main Street.

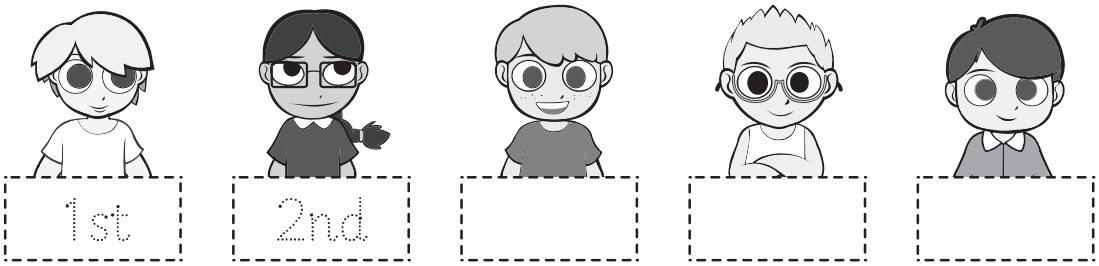
Ordinal numbers – 1st to 5th

Ordinal numbers tell us the order of things or events.



1st, 2nd and 3rd are the trickiest to remember as they don't sound like 1, 2, 3. Once we get to 4th, we mainly just say the counting number and add 'th'.

1 A terrible crime has happened – someone has stolen all the stickers from the principal's desk. Here are the chief suspects.



a Finish labelling the order of the students in the lineup.

Eliminate the suspects clue by clue till 1 is left.

b This student in the middle of the line up was away. The _____ student is not the thief.

c The last student hates stickers. The _____ student is not the thief.

d The student with a 2 in the label never left their classroom.

The _____ student is not the thief.

e The 2nd to last student had basketball training all day.

The _____ student is not the thief.

f The _____ student is the thief. What should happen to them?

_____

Ordinal numbers – 1st to 20th

You will need: a partner, scissors, pencils

copy

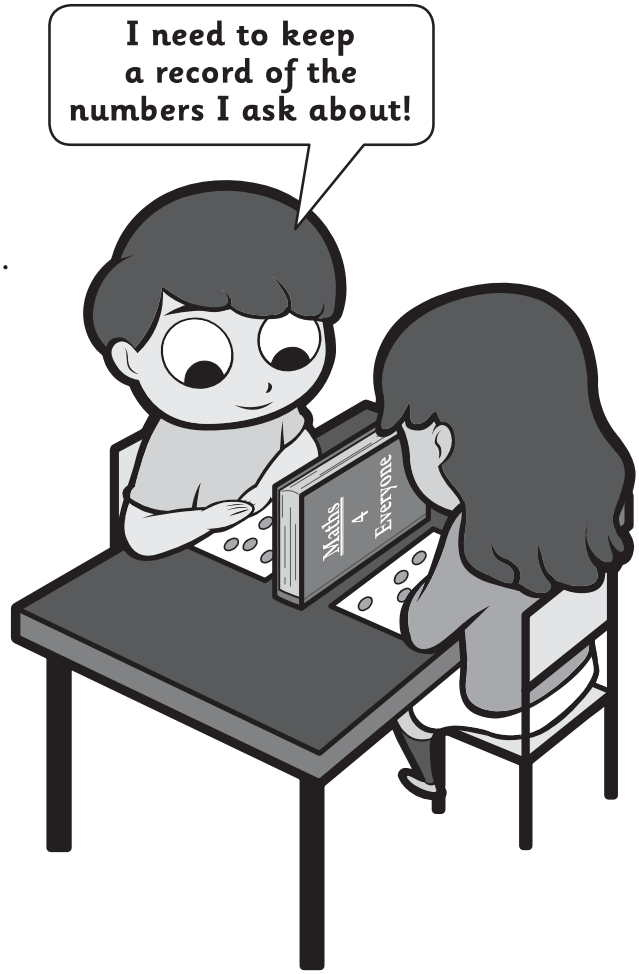
What to do:

Some gold has fallen out of a treasure chest and it's yours for the taking! Just follow these steps.

You and your partner each need a copy of this page and the next page. Finish labelling the stepping stones. Cut out and colour your gold coins and decide which stepping stones you will place them on. Don't let your partner see!

Take turns asking each other where the coins are with questions like, "Is a coin on the 19th stone?" If you are right, you take the coin.

Play until all the coins are gone. Who is the richest person at the end of the game?

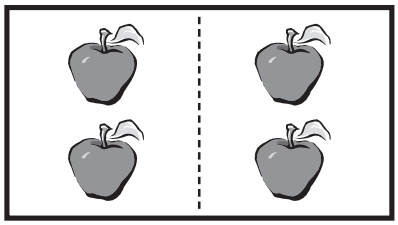


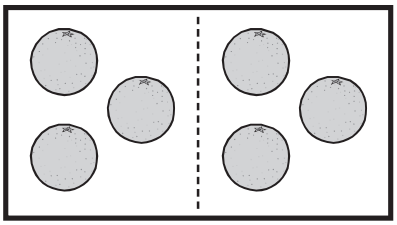
Fractions – half of a group

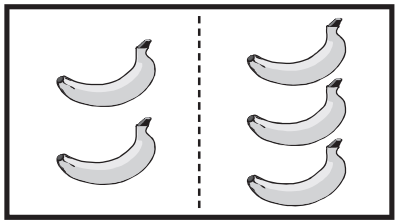
When we divide a group into 2 equal parts, we call each share or part a half. When they are equal, each share is fair.

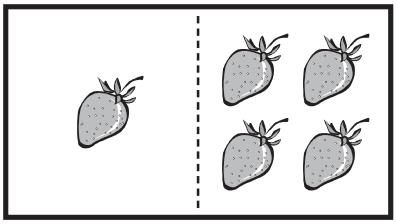
$\frac{1}{2}$ ♥♥♥♥ | ♥♥♥♥ $\frac{1}{2}$

1 Tick all the groups that have been divided into 2 equal parts. Cross them if the parts are not equal.

a  ☐

b  ☐

c  ☐

d  ☐

2 Draw a group of hats in the box. Put half on one side of the line and half on the other. Are the parts equal? If so, tick the box.

☐

3 Draw a group of stars in the box. Make the two parts unequal. Do you tick or cross the box?

☐

Fractions – half of a group

You will need:  a partner  counters

What to do:

a Start with 2 counters. Divide the 2 counters into 2 equal groups. How many counters are in each group? Draw them.

$\frac{1}{2}$ of 2 is ☐

b Now take 4 counters. Divide the counters into 2 equal groups. How many counters are in each group? Draw them.

$\frac{1}{2}$ of 4 is ☐

c Now take 6 counters. Divide the counters into 2 equal groups. How many counters are in each group? Draw them.

$\frac{1}{2}$ of 6 is ☐

d Now take 8 counters. Divide the counters into 2 equal groups. How many counters are in each group? Draw them.

$\frac{1}{2}$ of 8 is ☐

e Can you see the pattern? Continue it on another piece of paper. How high can you and your partner go?

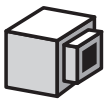
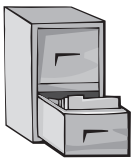
What to do next:

Can you make 2 equal groups out of 3, 5, or 7 counters? What happens?

Length – measure with informal units

1 Estimate and measure the length of each object using pop sticks and cubes.

2 Find 2 more classroom objects and measure their length. Add them to the table.

				
	Estimate	**Measure**	**Estimate**	**Measure**
				
				
				

3 Did you need more cubes or more pop sticks to measure the objects? Why?

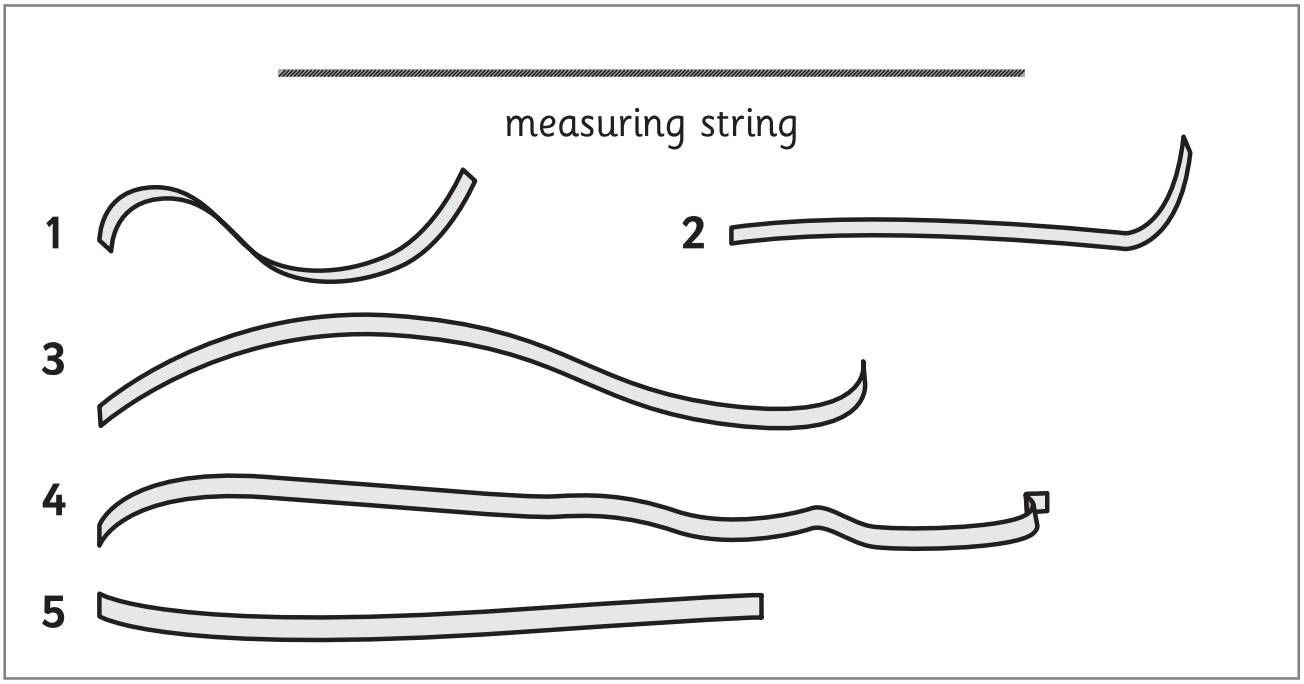
Length – compare and order lengths

You will need: string scissors

What to do:

Look at the measuring string below. Now look at streamer 1. Write 1 in the box where you think it belongs. Do the same for the other pieces of streamer.

Longer than the string.	Shorter than the string.	Same length as the string.



What to do next:

Now cut a piece of string the same length as the measuring string and use it to measure the streamers. Are there any surprises?

Length – language of length

You will need: a partner

1 What are some words we use when we measure and talk about length? Brainstorm with a neighbour and record.

longer than

shorter than

2 How many pencils long is this page?
Was your answer a whole number or was it between 2 numbers?
What are some different ways we can deal with this when it happens?