Maths at Round Hill

An overview of the methods we use to teach key concepts in each year group

September 2020

Maths at Round Hill

Since the Primary Curriculum changed in 2014, the way Maths is taught across the country has changed. We now follow a mastery approach to Maths. This works on the basis that all children can master Maths. "Mastering maths" means that children understand the Maths they are doing, rather than simply learning how to do it. All children are given the opportunity to explore different Maths topics and some will work at a deeper level, developing their understanding of concepts and how to apply these. This is a very different way of learning maths, however by teaching children to understand what they are doing, they are much more likely to remember it and be able to apply what they have learnt to a range of questions.

Teachers and practitioners in the Early Years support children in developing their understanding of Mathematics in a broad range of contexts in which they can explore, enjoy, learn, practise and talk about their developing understanding. Children in the EYFS learn by playing and exploring, being active, and through creative and critical thinking which takes place both indoors and outside. We recognise that children learn through routine, continuous provision and incidental learning opportunities, as well as planned sessions and activities. This includes being given opportunities to seek patterns, make connections, recognise relationships, work with numbers, shapes and measures, and counting, sorting and matching. Children use their knowledge and skills in these areas to solve problems, generate new questions and make connections across other areas of learning and development.

In Years 1-6, we use the Maths No Problem series to support our teaching. This has been developed by experts and teaches concepts using a mastery approach. Children will be shown different methods for solving problems, using physical apparatus, drawings and more traditional methods. Each topic will start with children using physical apparatus and/or drawings, and move on to written methods. This is done to help children understand why written methods "work".

Some children may decide to stick with using cubes or other objects to help them answer a problem. They will be asked to have a go at other methods, but they may choose to go back to using equipment when working on their own. Many children will be able to use all or most of the methods they are shown, but will have one preferred method. Some children will choose to use different methods for different questions. By teaching in this way, all children will have at least one method for solving a problem.

Some of the methods your child is learning will be similar to those you learnt at school. Many methods may seem very different . This is because these methods are a way of helping children to understand the concept, whether that be addition, subtraction, multiplication or division. Children will work through these methods as their understanding develops. The aim is for children to eventually be using the most efficient method, however they will reach this point at their own pace.

Here we will show you the main methods your child will be taught for addition, subtraction, multiplication and division in their current year group. This will hopefully help you to understand what they have been shown in their lessons. If you are unsure about a particular method, see if your child can explain it to you, or speak to your child's class teacher who will be happy to help.

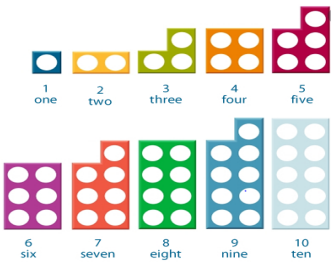
EYFS

Reception- Place Value

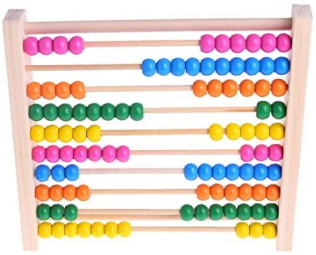
Recognising numbers and amounts

We use **dice patterns, counting frames, tens frames** and **Numicon** to support the children in recognising numbers in small groups without the need for counting.

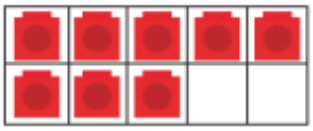
Dice Patterns



Numicon


Counting Frame

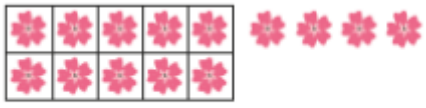
We can use **cubes** and place these in the boxes on the **tens frame**, or we can **draw** a shape in the box.


Tens Frame

8
eight

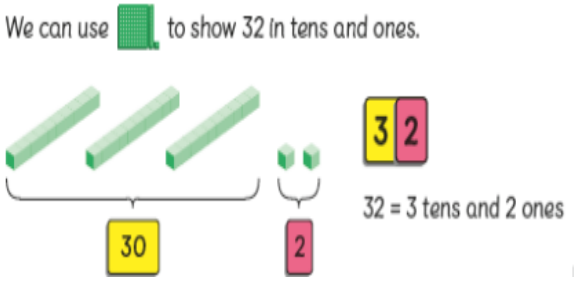
Numbers bigger than 10

When we look at numbers bigger than 10, we use a **tens frame** then count on.

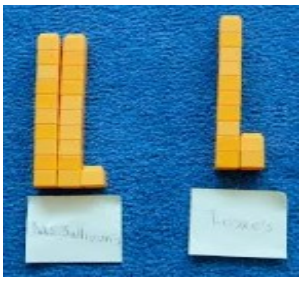


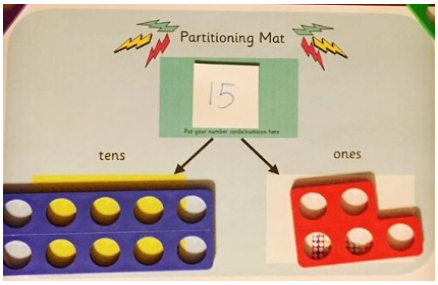
14 fourteen

We then move on to representing numbers using **base ten**, **unifix cubes** and **Numicon.**



Base Ten

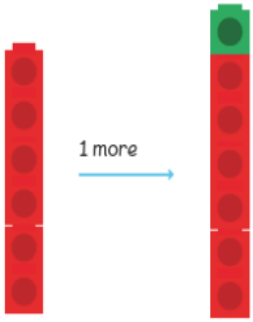

Unifix Cubes

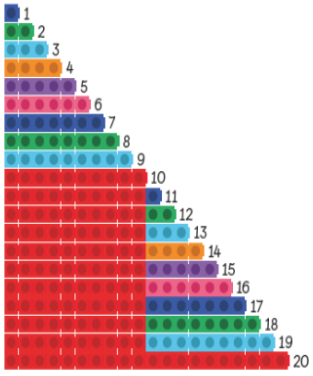


Numicon

Comparing numbers

We use **cubes, counters, Numicon** and **other objects** to help us compare amounts.





We can also look at **pictures** and use **number lines** to help us compare numbers

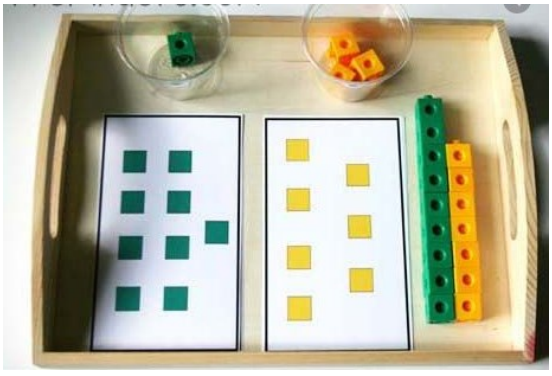
There are 3 cupcakes.

There are 5 cookies.

5 is more than 3.

1	2	3	4	5	6	7	8	9	10

Children will also compare numbers that are far apart, near to and next to each other. For example, 8 is a lot bigger than 2 but 3 is only a little bit bigger than 2. The children will use **cubes, counters, Numicon** and **other resources** to help them with this.



"9 is a bit bigger than 7"

"10 is a lot bigger than 1"

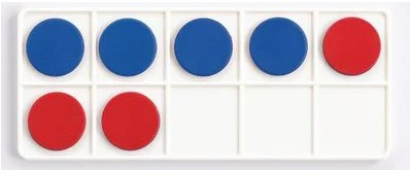
EYFS - Addition

Adding two single digit numbers

We use **objects**, **cubes, tens frames, Numicon** and **pictures** to help us compose and decompose different numbers.

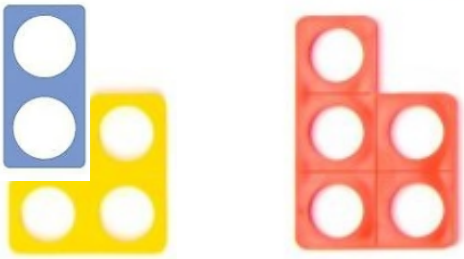
Objects

Cubes



Tens Frames

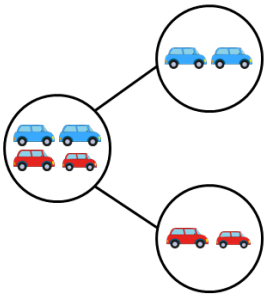
We also use **Numicon** to explore number bonds.

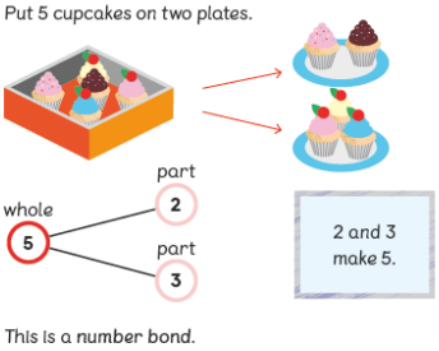


"The 2 and the 3 together is the same as 5"

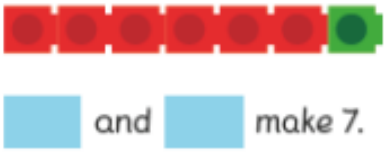
Part-Whole Models

We can then use **part-whole models** to show these number bonds. This helps us to understand addition. We begin with concrete, moveable objects and move to abstract symbols when the children are ready.

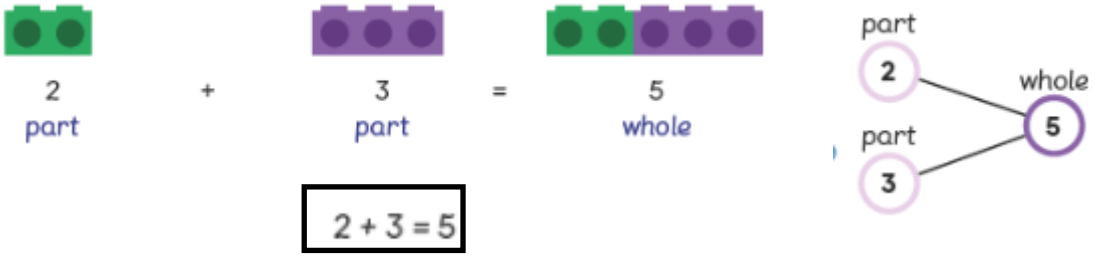




The parts can be added to make the whole.

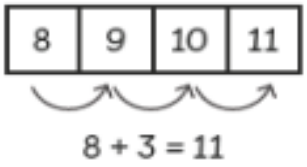


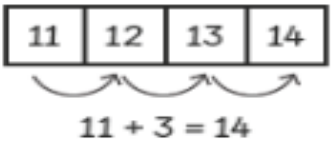
When the children are ready, we can also complete number sentences. We can use our **part-whole model** to help us by splitting numbers in different ways.



Counting on

We can also use **counting on** to help us practice counting numbers in a sequence and to add small numbers on. We start with **physical objects** and **practical resources** to help us count on. We then move on to using a **number track** or a **number line**.





EYFS- Subtraction

Physical objects

Children are introduced to the concept of subtraction through practical games and activities. We use **physical objects**, including **counting bears**, **counters** and **pegs** to demonstrate how something can be taken away.

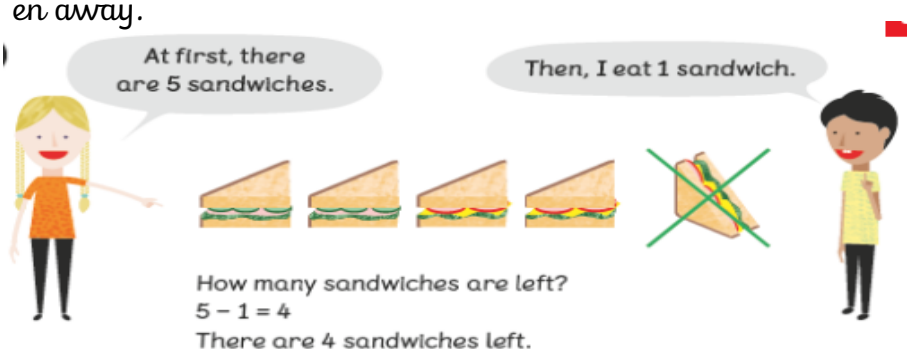


Difference

The children will also use physical objects such as **Numicon** and **cubes** to explore subtraction as the 'difference between' two numbers.

Crossing out

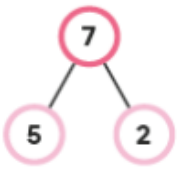
We then use **pictures** and **crossing out**, so we can see what is happening when something is taken away.

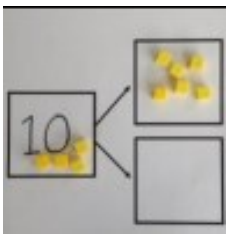


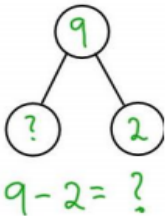
Number bonds

We can also use **number bonds** to help us subtract. Our **part-whole model** helps us see what is left when something is taken from the whole.

7 – 5 = 2
2 boats are not red.

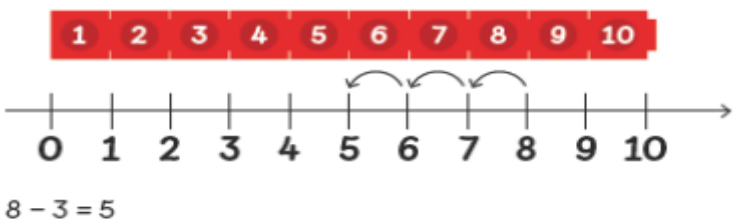






Number lines

We then move onto using **number lines** and **counting back**.



8 – 3 = 5

EYFS- Multiplication

Doubling using practical objects

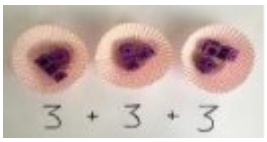
Children are introduced to the concept of multiplication through doubling. They use practical games and activities including **everyday objects** and act out 'doubling' by physically adding two equal groups together to find out the 'doubles' answer. They will also practice this with **Numicon**.

Equal groups

We use **objects** and **pictures** to make sure we understand what **equal groups** are. Then we count the equal groups.

Repeated Addition

We also use **Numicon**, **cubes** and **other objects** to create repeated addition sums.



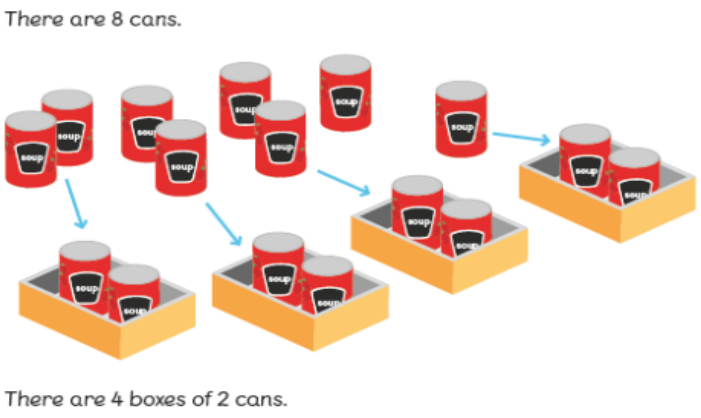
EYFS- Division

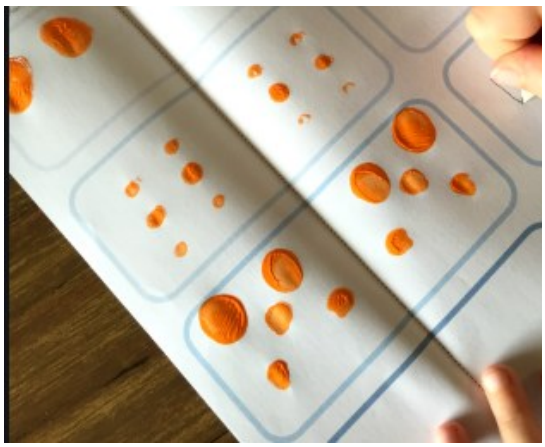
Division using practical objects

Children are introduced to the concept of halving and sharing through practical games and activities, using **everyday objects**. They act out 'halving and sharing' through activities such as sharing food for their Teddy Bear's Picnic or sharing resources equally to play a game. This is reinforced by opportunities provided in the outdoor area for the children to halve and share out **objects** such as building blocks, twigs etc.

Sharing and Equal Groups– Division

We use **objects** including **cubes** and **pictures** to show how we can **share** things into groups.



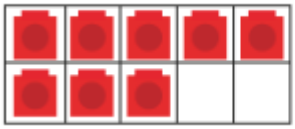



Year 1


Year 1 - Place Value

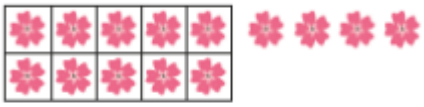
Recognising numbers and amounts

We use **ten frames** to help us picture numbers. We can use **cubes** and place these in the boxes, or we can **draw** a shape in the box.



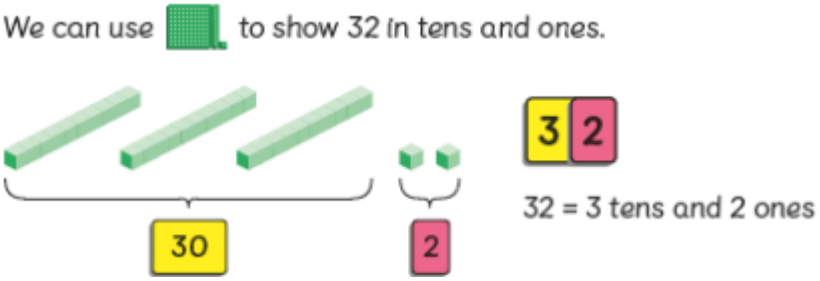
8
eight

When we look at numbers bigger than 10, we use a **ten frame** then count on.



14 fourteen

For bigger numbers, we will practice counting in 10s, 5s and 2s. We then move on to representing numbers using **base ten** and showing numbers in **place value charts**.

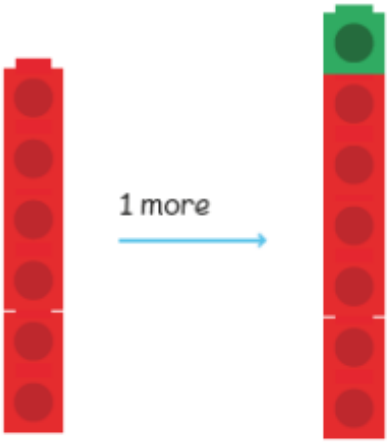


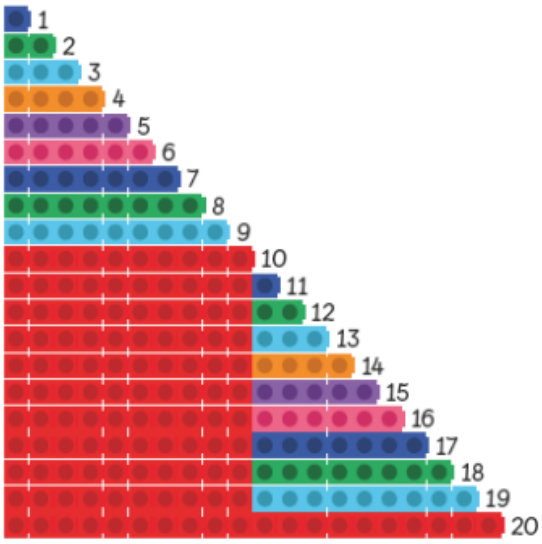
tens	ones
3	2

This is a place-value chart.

Comparing numbers

We use **cubes, counters** and **other objects** to help us compare amounts.



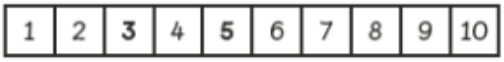


We can also look at **pictures** and use **number lines** to help us compare numbers.

There are 3 cupcakes.

There are 5 cookies.

5 is more than 3.



Then we use **place value charts** to look at each part of the number and compare first the tens, then the ones.

tens	ones
3	6

3 tens and 6 ones = 36

tens	ones
2	7

2 tens and 7 ones = 27

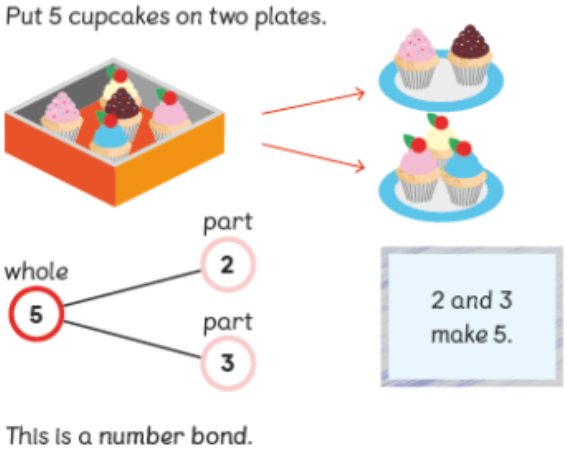
3 tens is more than 2 tens.

36 is more than 27.

Year 1 - Addition

Number bonds

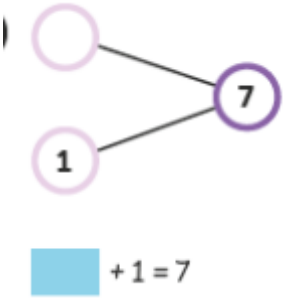
We use **cubes** and **other objects**, and **pictures**, to help us see different number bonds. We can then use **part-whole models** to show these number bonds. This helps us to understand addition.



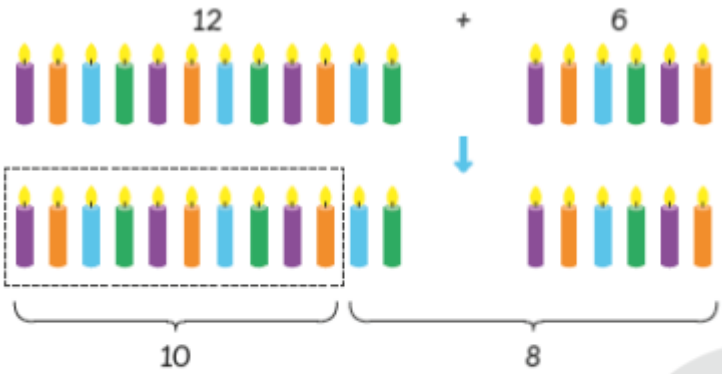
This is a number bond.

The parts can be added to make the whole.

We can also complete **number sentences**.

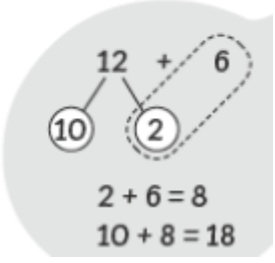


When we add larger numbers, we can use our **part-whole model** to help us by splitting numbers in different ways.



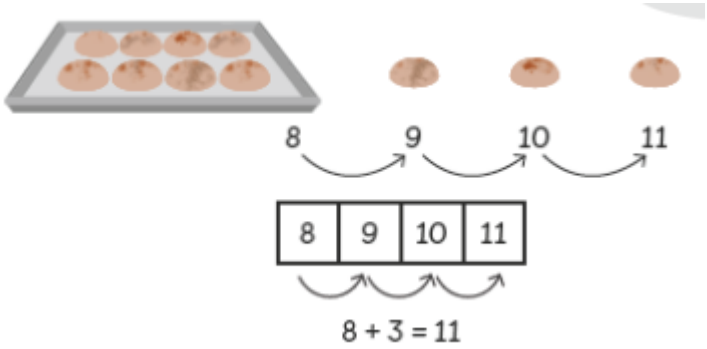
12 + 6 = 18

There are 18 candles altogether.



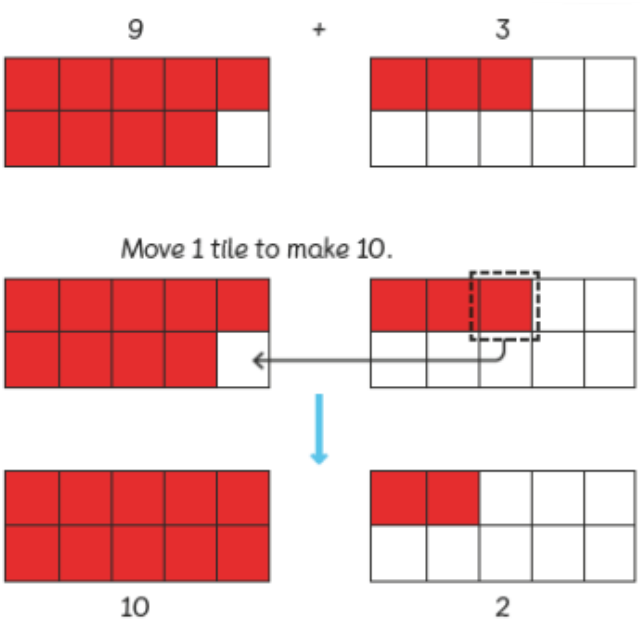
Number lines

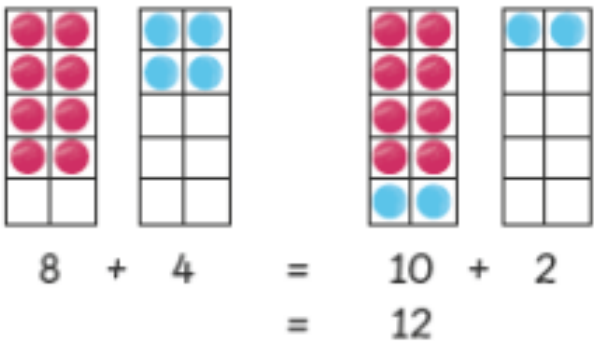
We also use **number lines** and counting on.



Making 10

When we add bigger numbers, we try to make 10. We use **tens frames** with either **objects** or **drawings** to help us.

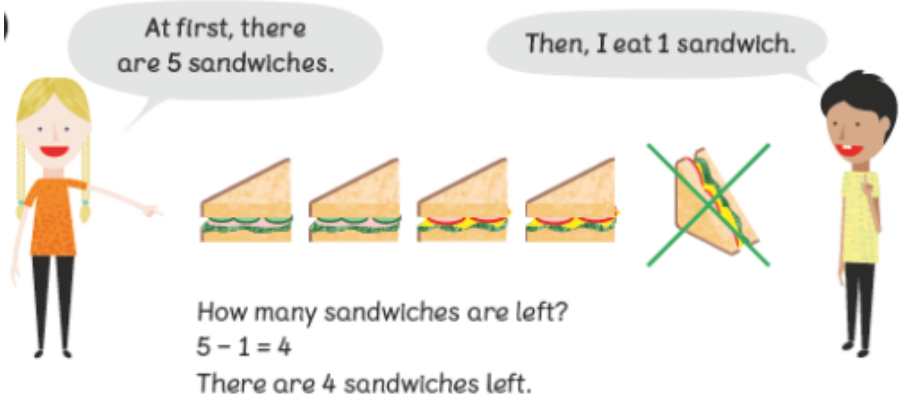




Year 1 - Subtraction

Crossing out

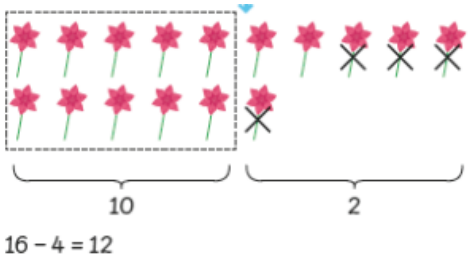
We start by using **pictures** and **crossing out**, so we can see what is happening when something is taken away.

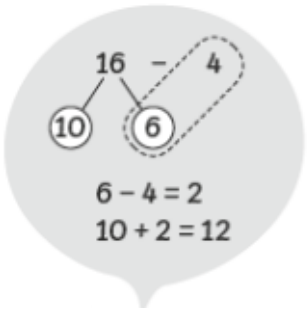


Number bonds

We can also use number bonds to help us subtract. Our **part-whole model** helps us see what is left when something is taken from the whole.

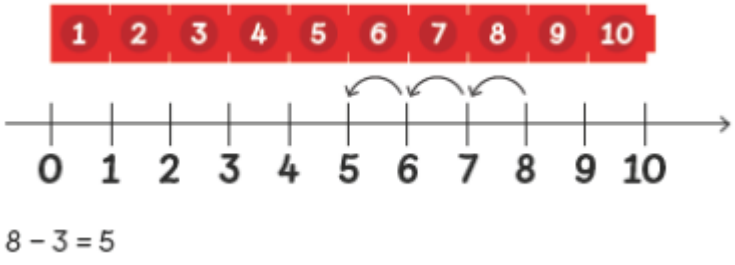
When we subtract from larger numbers, we look to see if there is a 10 in the number.





Number lines

We move onto using **number lines** and **counting back**.



Year 1 - Multiplication and Division

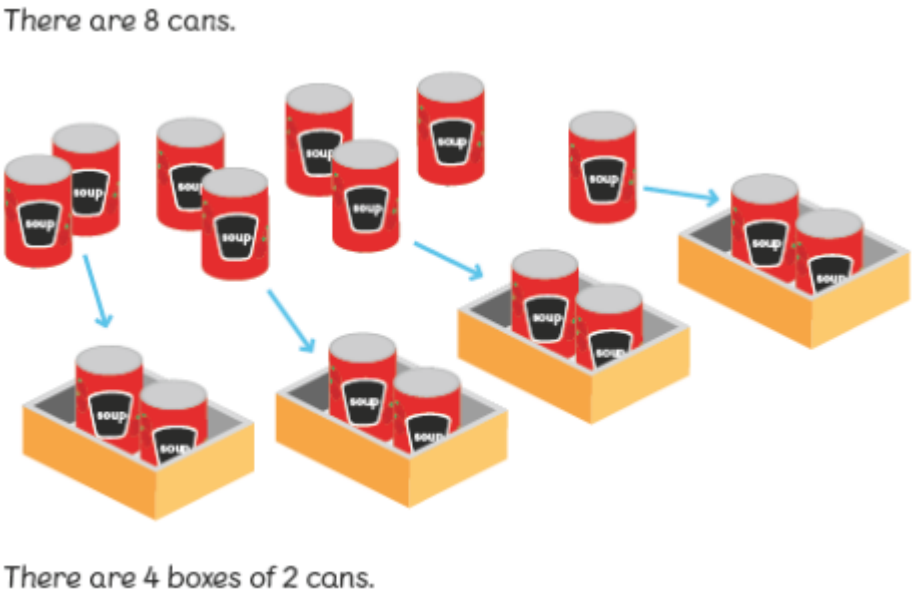
Equal groups– Multiplication

We use **objects** and **pictures** to make sure we understand what **equal groups** are. Then we count the equal groups.

We will arrange the equal groups in different ways, for example in rows.

Equal groups– Division

We use **objects** and **pictures** to show how we can split things into equal groups.



We talk about **sharing things equally**.


Year 2


Year 2 - Place Value

Recognising numbers and amounts

We continue counting in 10s, 5s and 2s, and using **base ten** and **place value charts** as we did in Year 1. We will also continue to use **part-whole models** to help us break numbers down into smaller parts.

tens	ones
6	5

Comparing numbers

As we did in Year 1, we use **place value charts** to look at each part of the number and compare first the tens, then the ones.

tens	ones
3	6

3 tens and 6 ones = 36

tens	ones
2	7

2 tens and 7 ones = 27

3 tens is more than 2 tens.

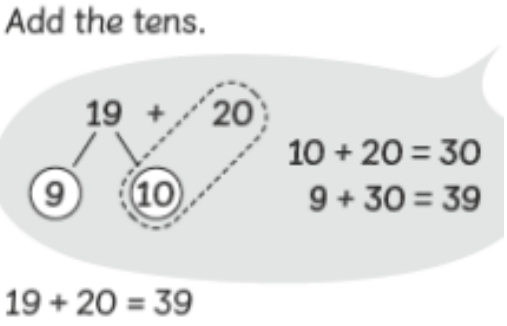
36 is more than 27.

Year 2 - Addition

We start by using the same methods as we did in Year 1. We might count on in 10s rather than in ones. We also learn some new methods.

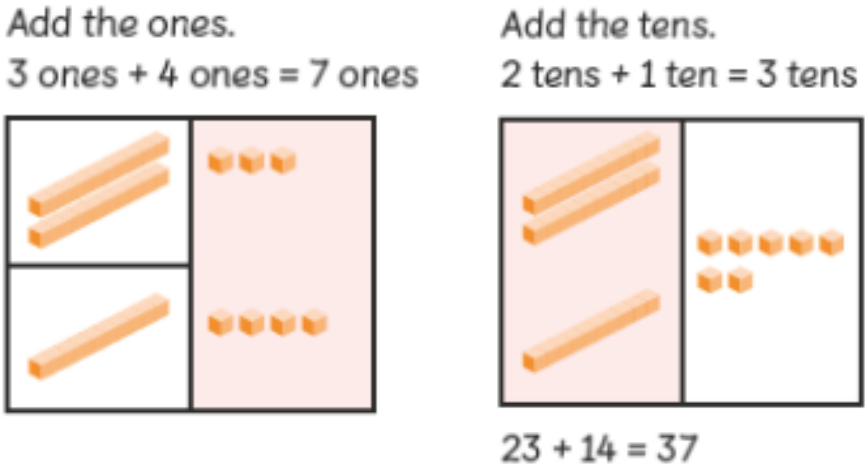
Number bonds

When we use **number bonds**, we might add tens rather than ones.

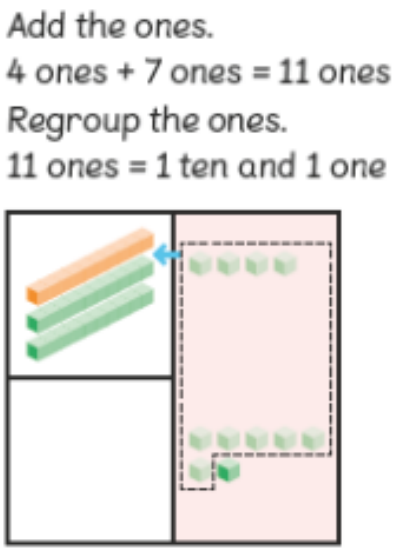


Place value charts

We use **base ten** and **place value charts** to help us add larger numbers. We always start by adding the ones.



Using **base ten** helps us see when we need to rename a number. Here, we rename 10 ones as a ten.



Column method

Using **base ten** and **place value charts** helps us to understand the **column method**. Again we start with the ones.

	tens	ones
	2	3
+	1	4
		7

	tens	ones
	2	3
+	1	4
	3	7

When we start **renaming** using the column method, we add the ones and write the answer underneath. Then we add the tens and write this underneath. Finally, we add the two answers together.

	tens	ones
	2	4
+		7
	1	1
+	2	0
	3	1

Year 2 - Subtraction

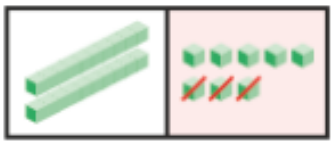
We start by using the same methods as we did in Year 1, using **number lines** and **number bonds**.

Place value charts

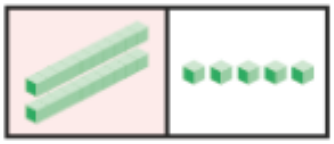
We will use **base ten** to help us see what has been subtracted. We might also draw a number in a **place value chart** and cross things out. We always start by subtracting the ones, then the tens.

When we do not have enough ones to subtract from, we **rename** 1 ten as 10 ones. We do this with base 10 so we can see what happens.

Subtract the ones.
8 ones − 3 ones = 5 ones

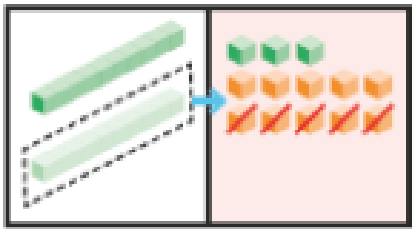


Subtract the tens.



28 − 3 = 25

Regroup 1 ten into 10 ones.
Subtract the ones.
13 ones − 5 ones = 8 ones



Column method

Using **base ten** and **place value charts** helps us to understand the **column method**. Again we start with the ones.

	tens	ones
	2	8
−		3
		5

	tens	ones
	2	8
−		3
	2	5

When renaming using the column method, we cross out the original numbers and replace them with our new representation.

	tens	ones
	1 ~~2~~	13 ~~3~~
−		5
	1	8

Year 2 - Multiplication

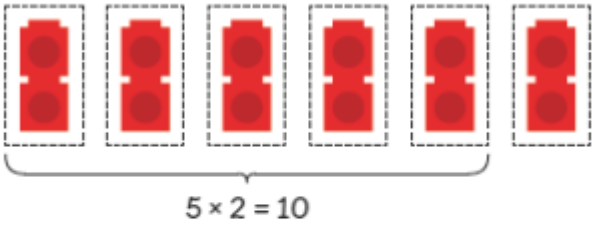
In Year 2, we practice the 2, 5 and 10 times table. We always think of times tables as being a way to describe **equal groups**.

3 x 2 is 3 equal groups of 2. We use **objects** and **pictures** to help us see the equal groups and count them. We will also look at knowing that 3x2 is the same as 2x3.

3 groups of 2
3 × 2 = 6

Patterns

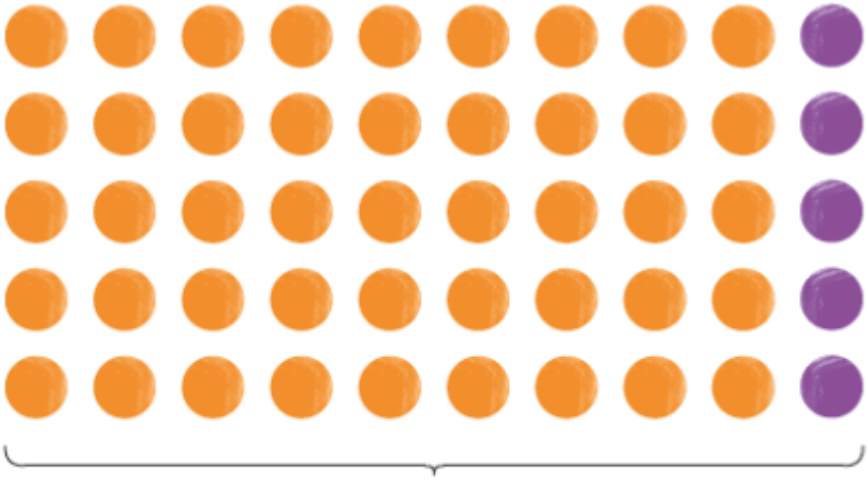
We will also look at **patterns** like even numbers, and the 10 times table ending in 0. We will also use patterns to help us use a fact we know to work out ones we don't.



5 × 2 = 10

6 × 2 = 10 + 2
= 12

6 × 2 is 2 more than 10.



10 × 5 = 50

9 × 5 = 50 − 5
= 45

Year 2 - Division

In Year 2 we continue to think about **equal groups** and **sharing**, using **objects** and **pictures**. We link this to the word divide. We concentrate on dividing by 2, 5 or 10.

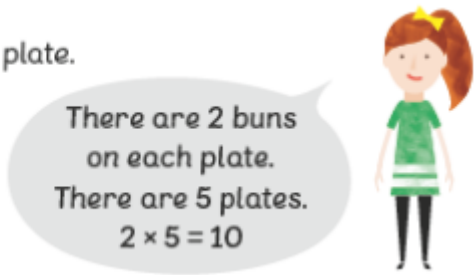
Inverse operations

We start to make more links between multiplication and division.

Put 10 buns equally on 5 plates.
How many buns are there on each plate?

$10 \div 2 = 5$

There are 2 buns on each plate.

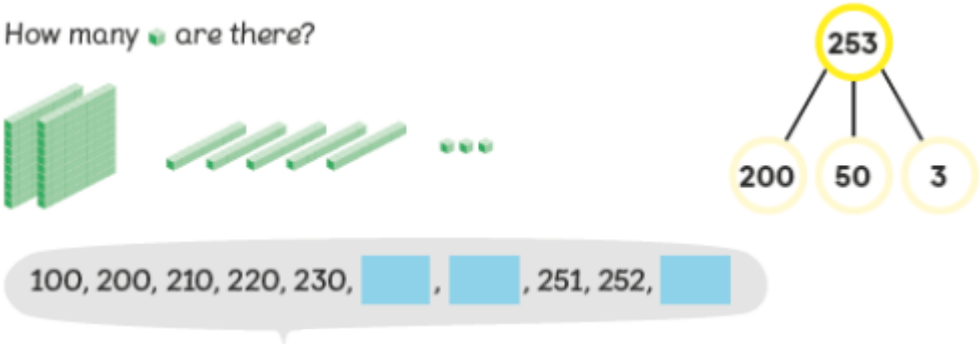



Year 3


Year 3 - Place Value

Recognising numbers and amounts

We continue counting in 10s and 100s and using **base ten** and **place value charts** as we did in Year 2. We will also continue to use **part-whole models** to help us break numbers down into smaller parts (**partitioning**). We now also count in 50s.

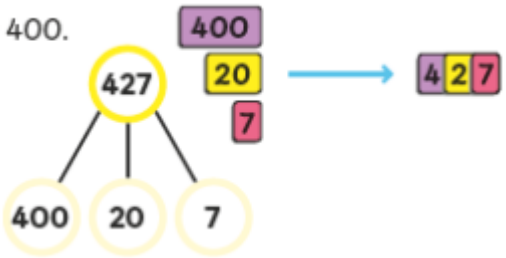


hundreds	tens	ones
4	2	7

427 = 4 hundreds + 2 tens + 7 ones
427 = 400 + 20 + 7

The digit 4 stands for 4 hundreds or 400.
The digit 2 stands for 2 tens or 20.
The digit 7 stands for 7 ones or 7.

We write 427 as four hundred and twenty-seven.

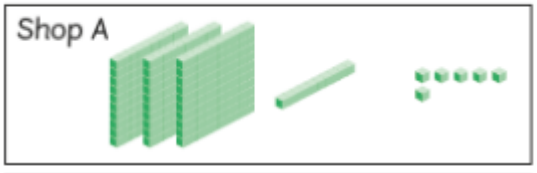


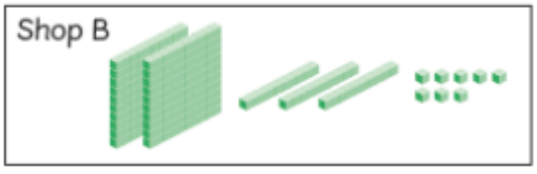
Comparing numbers

As we did in Year 2, we use **place value charts** and **base ten** to look at each part of the number. We compare the hundreds, then the tens and finally the ones.

We also use this to help us find 10 and 100 more and less than a number.

Which number is greater, 316 or 238?





hundreds	tens	ones
3	1	6

hundreds	tens	ones
2	3	8

Year 3 - Addition

We continue using **number lines**, **base ten** and **part-whole models** to help us add simple numbers.

Column method

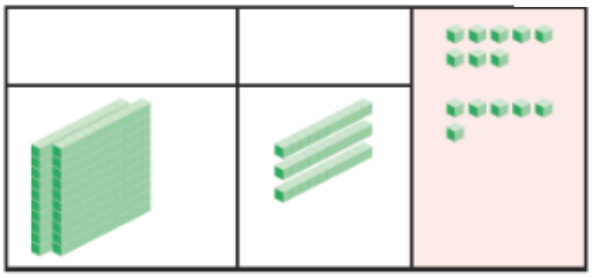
We continue to develop our understanding of using the **column method**. We use **base ten** to help us. When renaming, we start by using the same method as we did in Year 2. We add the ones and write the answer underneath. Then we add the tens and write this underneath. Then we add the hundreds, and write this underneath. Finally, we add the two answers together.

	h	t	o
			8
+	2	3	6
		1	4
		3	0
+	2	0	0
	2	4	4

We then move on to writing this using a more efficient method.

Step 1 Add the ones.

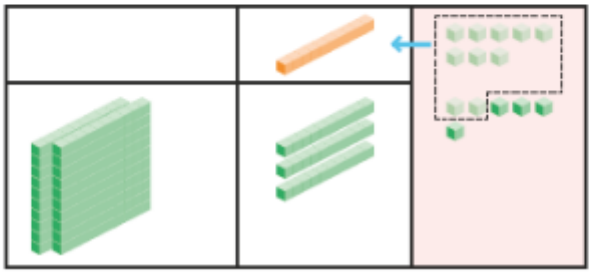
8 ones + 6 ones = 14 ones



	h	t	o
			8
+	2	3	6
			4

Step 2 Regroup the ones.

14 ones = 1 ten + 4 ones



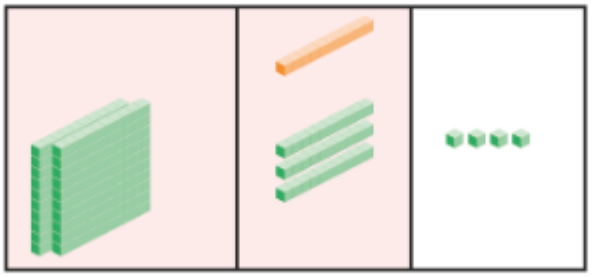
	h	t	o
		1	8
+	2	3	6
			4

When an answer makes more than 10 ones, we rename those 10 ones and 1 ten. We write this in the tens column above the number that is already in that column.

Step 3 Add the tens.

1 ten + 3 tens = 4 tens

Add the hundreds.



8 + 236 = 244

There are 244 children altogether.

	h	t	o
		1	8
+	2	3	6
	2	4	4

When we then add the tens, we add this renamed ten.

We no longer need to do an extra addition at the end of the calculation.

We may also need to rename 10 tens as 1 hundred.

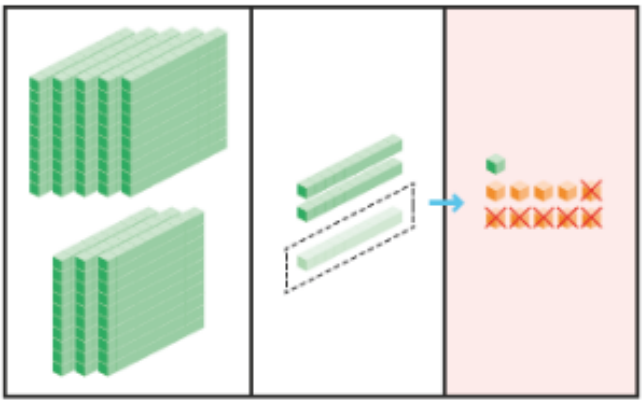
Year 3 - Subtraction

We continue using the **number lines** and **number bonds**, **part-whole models**, **base ten** and **place value** charts to help us with simple subtraction.

Column method

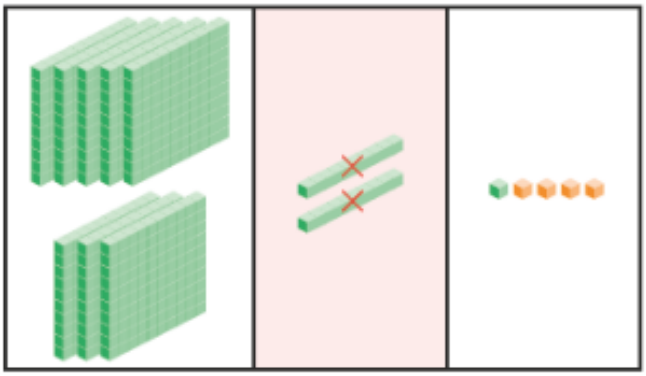
We also continue to develop our understanding of the **column method** with renaming. We now subtract up to 3-digit numbers. We use **base ten** to help us understand what is happening in the calculation. When renaming, we cross out the original numbers and replace them with our new representation. We may need to rename more than once in a calculation.

Step 1 Regroup 1 ten into 10 ones.
Subtract the ones.
11 ones – 6 ones = 5 ones



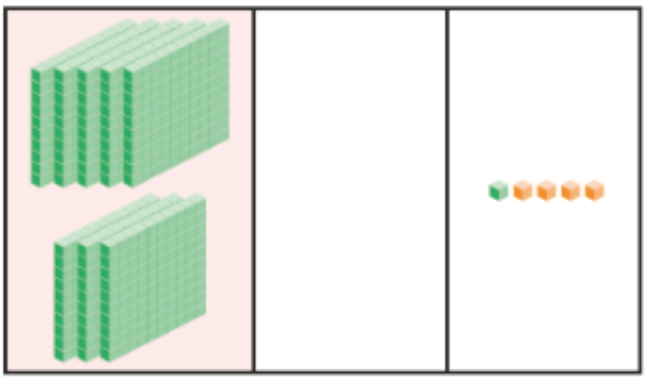
	h	t	o
	8	~~2~~ 3	~~11~~ 1
–		2	6
			5

Step 2 Subtract the tens.
2 tens – 2 tens = 0 tens



	h	t	o
	8	~~2~~ 3	~~11~~ 1
–		2	6
		0	5

Step 3 Subtract the hundreds.

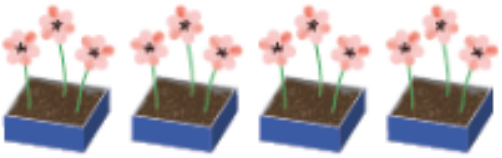


	h	t	o
	8	~~2~~ 3	~~11~~ 1
–		2	6
	8	0	5

Year 3 - Multiplication

In Year 3, we concentrate on the 3, 4 and 8 times tables. We always think of times tables as being a way to describe **equal groups**.

We use **objects** and **pictures** to help us see the equal groups and count them. We will also look at knowing that 3x2 is the same as 2x3. We continue to look for patterns to help us work out facts we don't know.



4 groups of 3
4 × 3 = 12

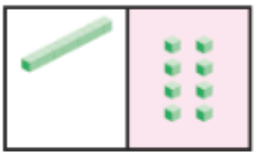
2 × 3 = 6
3 × 3 = 6 + 3

Partitioning

We split number up (partition) and use **base ten** to help us multiply 2-digit numbers. We multiply the ones first, then the tens, and then put our answers together. This helps us to understand the column method.

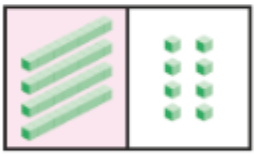
12 × 4 = ☐

Multiply 12 by 4.



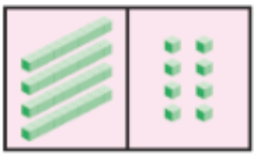
Step 1 Multiply the ones by 4.

2 ones × 4 = 8 ones



Step 2 Multiply the tens by 4.

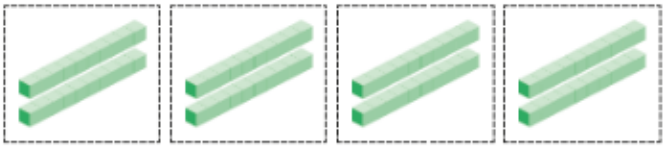
1 ten × 4 = 4 tens



Step 3 2 ones × 4 = 8
1 ten × 4 = 40
12 × 4 = 8 + 40 = 48

Column method

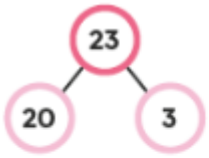
In Year 3, we start to use the **column method** to multiply 2-digit numbers by 1-digit numbers. We use **base ten** to help us understand the column method.



	t	o
	2	0
×		4
	8	0

Multiply 2 tens by 4
20 × 4 = 80

When using the column method, we start by multiplying the ones. We write this answer underneath. Then we multiply the tens and write the answer underneath our first answer. Finally, we add our answers (the products) together. We may use **part-whole models** to help us partition the number.



Step 1 Multiply the ones by 2.

3 ones × 2 = 6 ones

	t	o
	2	3
×		2
		6

Step 2 Multiply the tens by 2.

2 tens × 2 = 4 tens

	t	o
	2	3
×		2
		6
	4	0

Step 3 Add the products.

6 + 40 = 46

	t	o
	2	3
×		2
		6
+	4	0
	4	6

23 × 2 = 46

There are 46 children in the 2 classes.

We then move on to a more efficient method of writing the products. We might need to rename ones when writing the answers. We do this by writing the renamed digit above the correct column.

Step 1

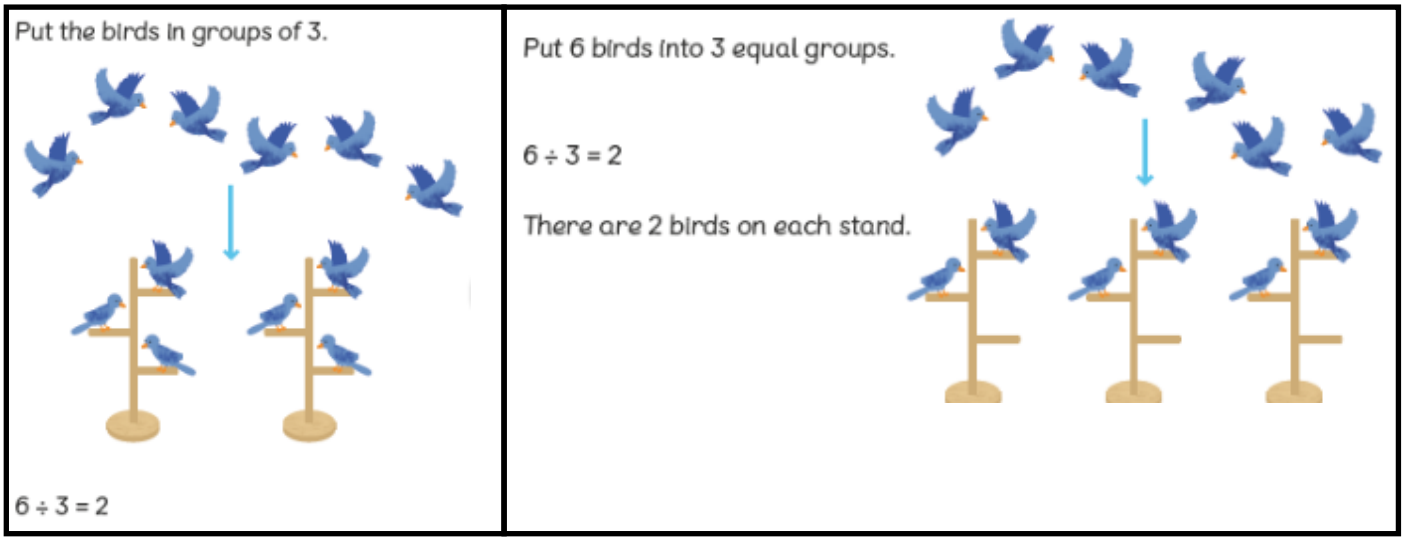
	t	o
	2	
	2	3
×		8
		4

Step 2

	h	t	o
		2	
		2	3
×			8
	1	8	4

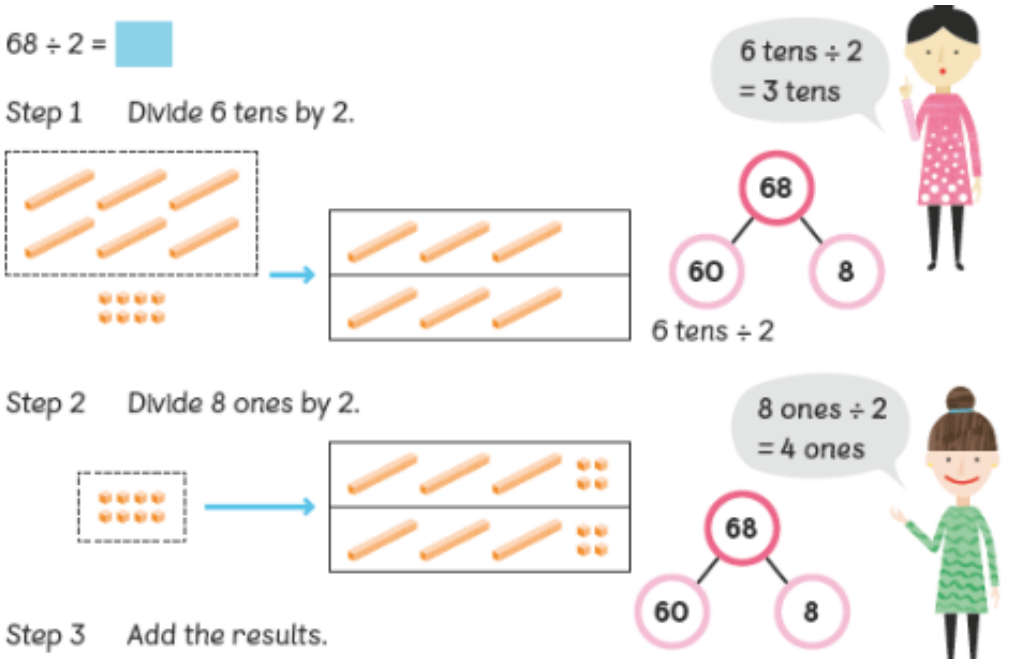
Year 3 - Division

In Year 3 we continue to think about **equal groups** and **sharing**, using **objects** and **pictures**. We link this to the word divide. We concentrate on dividing by 3, 4 and 8. When talking about dividing, we think about putting things into equal groups or into groups of a certain number.

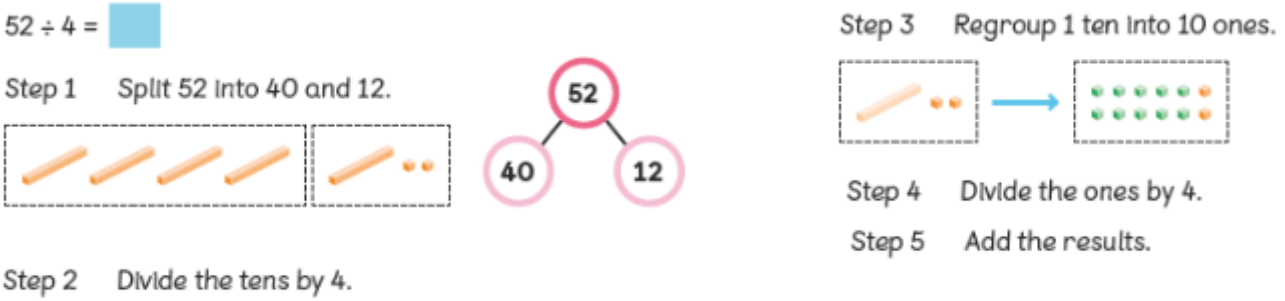


Base ten

We use **base ten** and **part-whole models** to help us divide 2-digit numbers. We divide the tens then the ones separately, then add the answers.



If we cannot divide the tens exactly, we regroup them with the ones to make numbers that are more easy to divide.

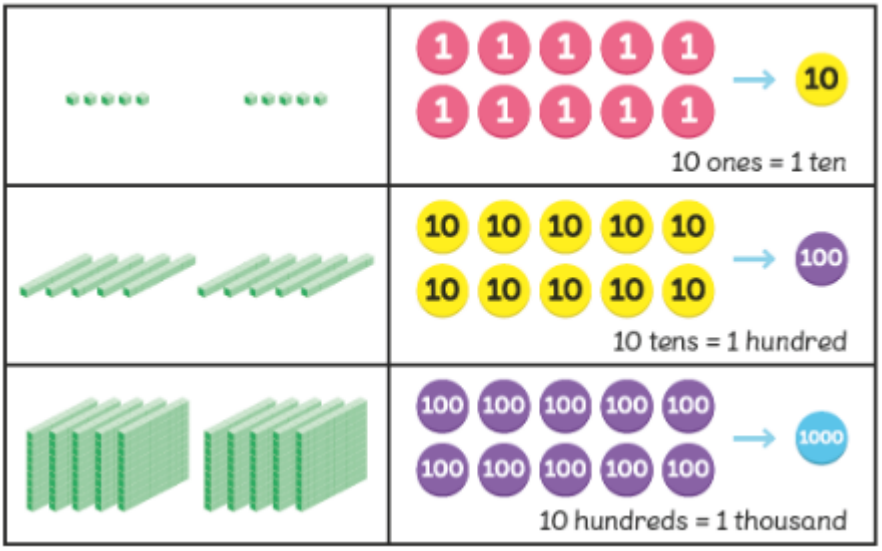



Year 4


Year 4 - Place Value

Recognising numbers and amounts

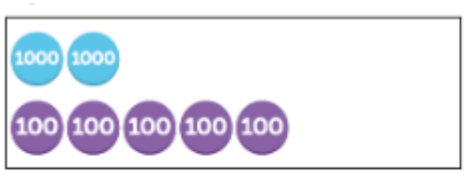
We continue counting in 50s and 100s and using **base ten, place value charts** and **part-whole models** to help us partition numbers as we did in Year 3. We now also count in 25s and 1000s. In Year 4, we also use **number discs** or **place value counters** to help us visualise larger numbers.



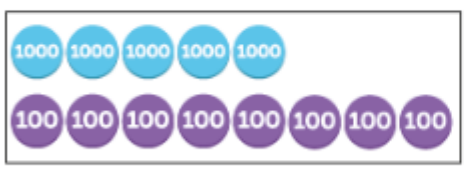
Comparing numbers

We continue using **place value charts** and **base ten** to look at each part of the number. We compare the thousands, then the hundreds, then the tens and finally the ones. We also use **place value counters** to help us with this.

We also use these to help us find 1000 more and less than a number.



thousands	hundreds	tens	ones
2	5	0	0



thousands	hundreds	tens	ones
5	8	0	0

2500 is less than 5800.
2500 < 5800

5 thousands is greater than 2 thousands and 5 hundreds.

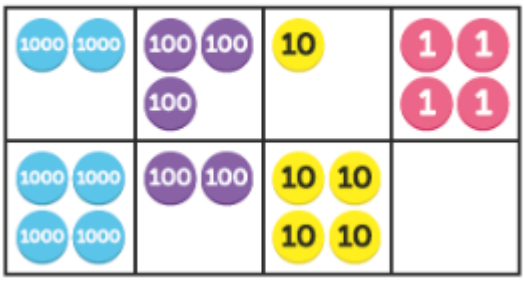
Year 4 - Addition

We continue using **base ten** and **part-whole models** to help us add numbers.

Column method

We continue to develop use the **column method** for addition, with 4-digit numbers. Again we use **base ten** to help us. We also now use **place value counters** to help us see what is happening in the calculation.

Find the sum of 2314 and 4240.



2	3	1	4
4	2	4	0
6	5	5	4

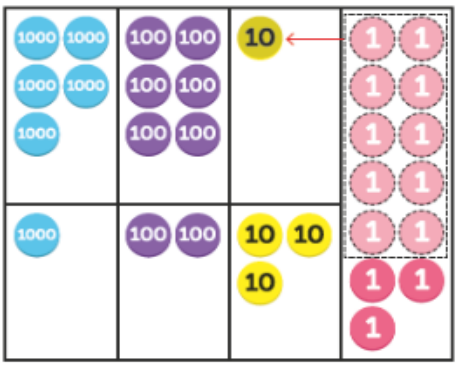
Step 1 — Add the ones.
4 ones + 0 ones = 4 ones

Step 2 — Add the tens.
1 tens + 4 tens = 5 tens

Step 3 — Add the hundreds.
3 hundreds + 2 hundreds = 5 hundreds

Step 4 — Add the thousands.
2 thousands + 4 thousands = 6 thousands

2314 + 4240 = 6554



			1	
	5	6	0	8
+	1	2	3	5
	6	8	4	3

Mental methods

To support our **mental arithmetic**, we look at how we can add small parts to make a number up to the nearest 10 or 100, to make an addition easier. We also use "tricks" like adding 10 then subtracting 1 to reach the overall aim of adding 9.

98 + 4142 = ☐

make 100

98 + 4142 = 100 + 4140

= 4240

2034 + 10 = 2044

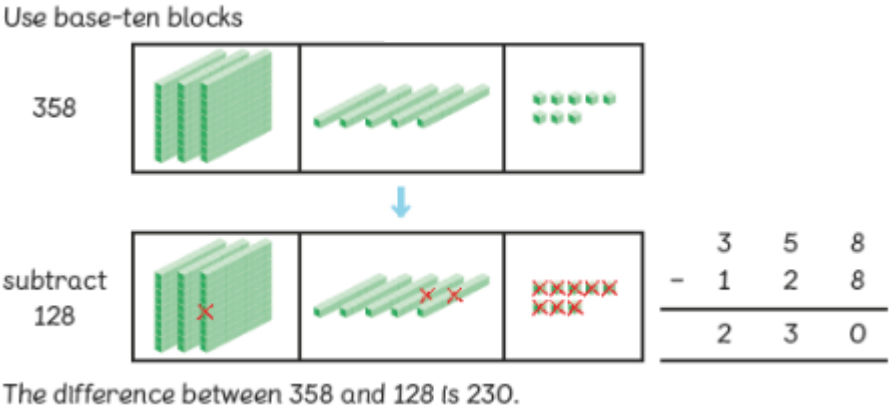
2034 + 9 = 2043 — 1 less

Year 4 - Subtraction

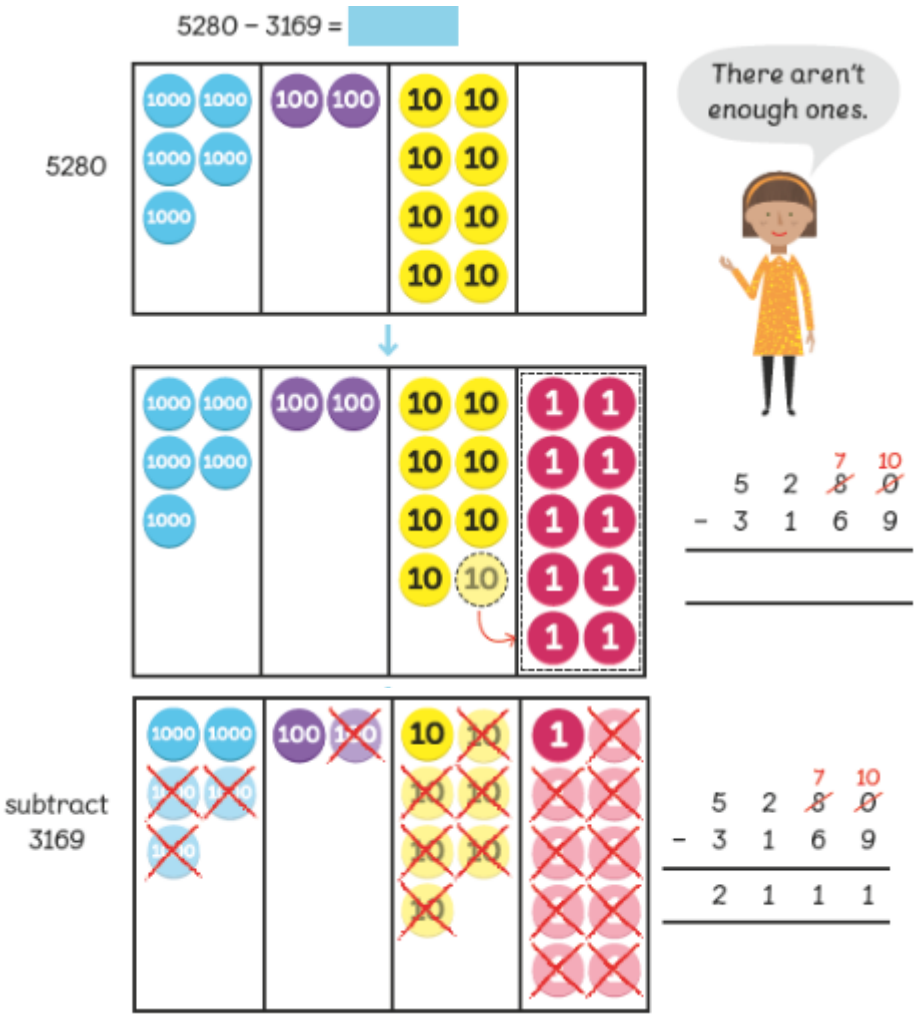
We continue to use **base ten** and **place value charts** to support us when doing subtraction calculations.

Column method

We also continue to develop our understanding of the **column method** with renaming. We now subtract up to 4-digit numbers. We use **base ten** to help us understand what is happening in the calculation.



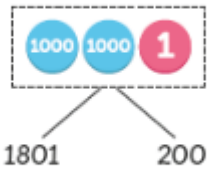
We also use **place value counters** to help us, either using physical counters or drawing these. When renaming, we cross out the original numbers and replace them with our new representation. We made need to rename more than once in a calculation.



Mental methods

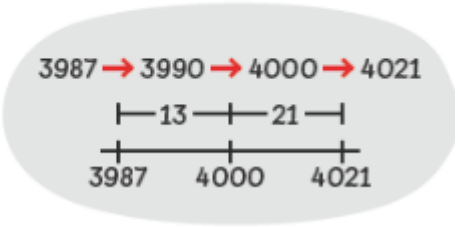
To support our **mental arithmetic**, we break numbers apart to make a subtraction easier. We can use **part-whole models** to help us with this. We also look at counting on in small chunks to find the answer to a subtraction.

2001 – 189



2001 – 189 = 1801 + 11 = 1812

4021 – 3987 = ☐

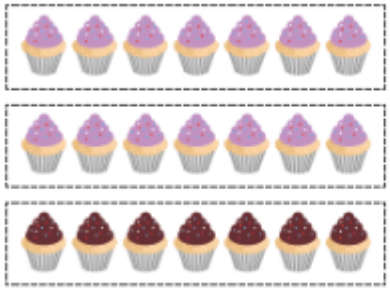


Year 4 - Multiplication

In Year 4, we concentrate on the 6,7,9,11 and 12 times tables. We always think of times tables as being a way to describe **equal groups**.

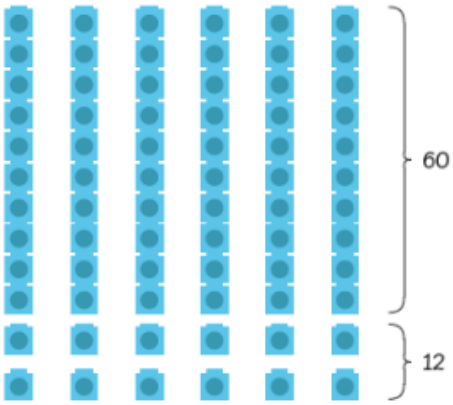
We use **objects** and **pictures** to help us see the equal groups and count them. We continue to look for patterns to help us work out facts we don't know.

4 groups of 6
4 × 6 = 24



2 × 7 = 14
3 × 7 = 14 + 7

6 × 12 = 72



Multiples of 10 and 100

In Year 4, we focus on multiplying multiples of ten and one hundred. This helps us to do more complicated multiplications. We use **place value counters** and our knowledge of place value to help us. We also use our knowledge that multiplication is repeated addition to help us.

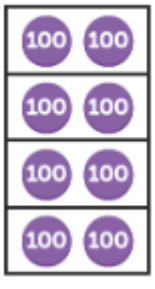
We know that 6 × 2 = 12.
So 6 × 2 tens = 12 tens.
6 × 20 = 120

12 tens = 120

40 × 7 = 7 × 40
= 7 × 4 tens
= 28 tens
= 280

40 × 7 = 4 × 10 × 7
= 4 × 70
= 70 + 70 + 70 + 70
= 280

4 × 2 = 8
4 × 2 hundreds = 8 hundreds
4 × 200 = 800

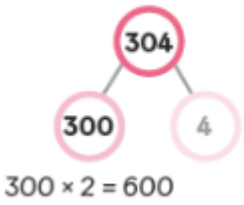


7 × 3 = 21
7 × 3 hundreds = 21 hundreds
7 × 300 = 2100

7 × 300 = 7 × 3 × 100
= 7 × 3 × 100
= 21 × 100
= 21 hundreds
= 2100

Column method

In Year 4, we continue to use **base ten** and **place value counters** to help us partition numbers to help us multiply, and to help us understand the **column method**. When using the column method, we recap using the longer method, building up to multiplying 3-digit numbers. We start by multiplying the ones. We write this answer underneath. Then we multiply the tens and write the answer underneath our first answer. Next, we multiply the hundreds, and write the answer underneath. Finally, we add our answers (the products) together.

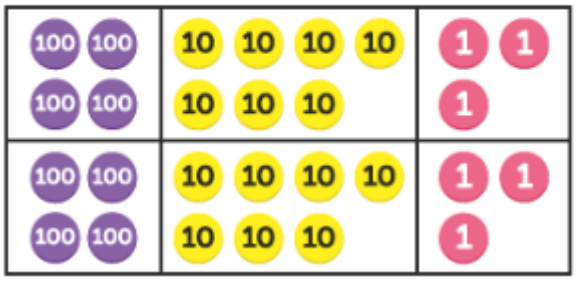


300 × 2 = 600

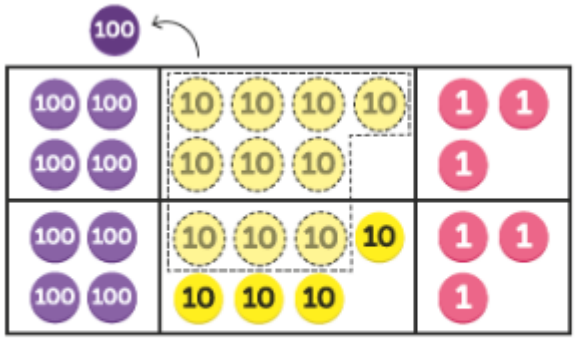
	3	0	4
×			2
			8
+	6	0	0
	6	0	8

We then again move on to a more efficient method of writing the products. We might need to rename ones when writing the answers. We do this by writing the renamed digit above the correct column.

473 × 2 = ☐



	4	7	3
×			2

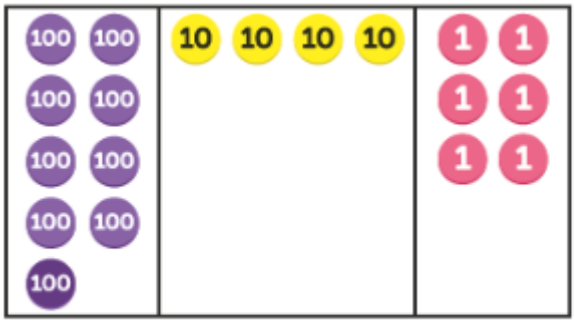


Multiply the ones.

	4	7	3
×			2
			6

Multiply the tens.

	1		
	4	7	3
×			2
		4	6



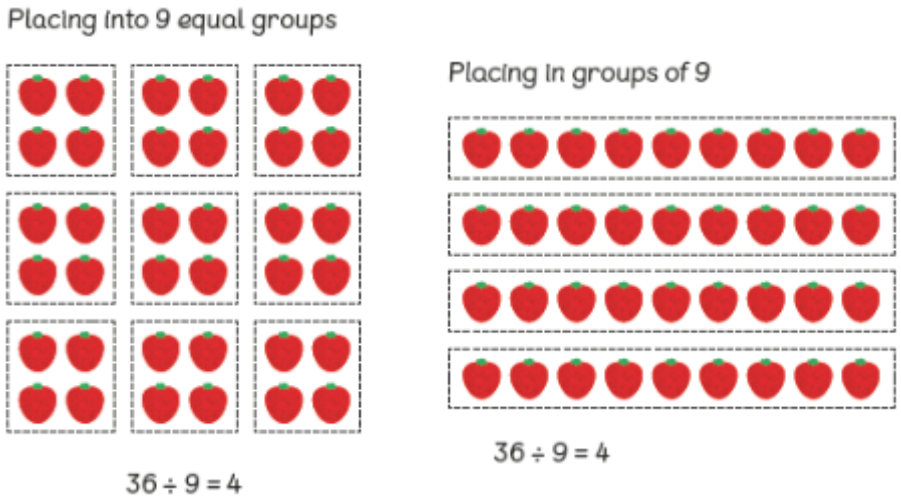
Multiply the hundreds.
Add the 1 hundred.

	1		
	4	7	3
×			2
	9	4	6

473 × 2 = 946

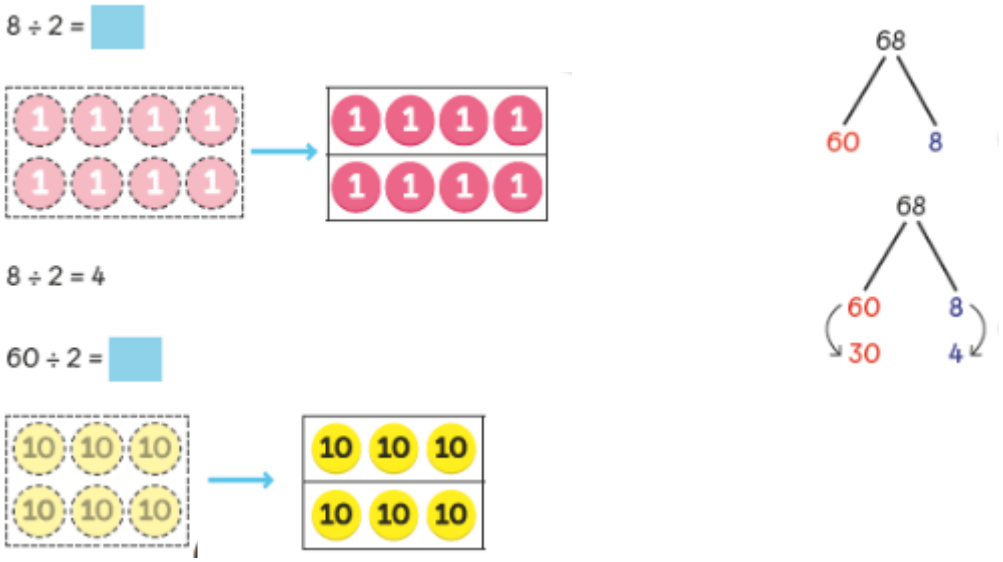
Year 4 - Division

In Year 4 we continue to think about **equal groups** and **sharing**, using **objects** and **pictures**. We link this to the word divide. We concentrate on dividing by 6,7,9,11 and 12. When talking about dividing, we think about putting things into equal groups or into groups of a certain number.



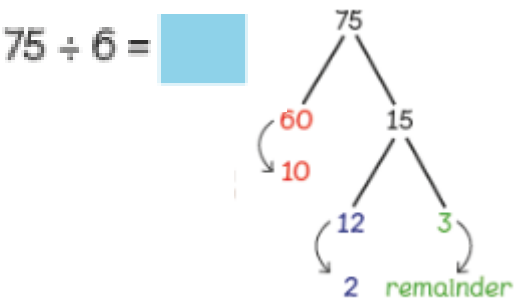
Place value counters

We use **place value counters** to help us divide larger numbers and **part-whole models** to help us partition larger numbers to divide them.



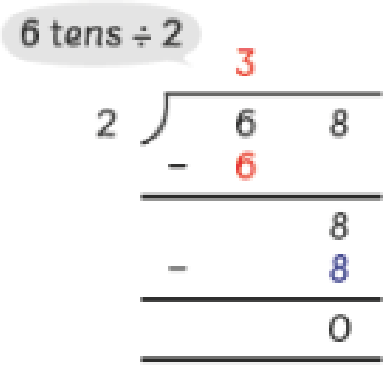
Part-whole models

Part-whole models particularly help us when we divide larger numbers where some parts of the number do not divide exactly. They help us to see how we can split a number in different ways, and find any remainders.



Formal method (bus stop)

In Year 4We use a long division method as this helps us to understand what we are doing and why. It also means we don't need to hold as much information in our heads.



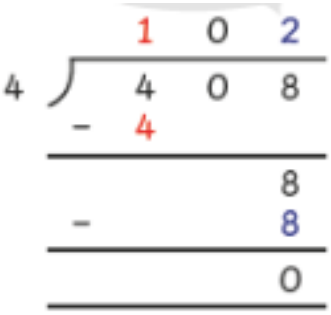
We start with the tens. 6 ÷ 2 = 3. We write 3 at the top of our calculation, above the 6.

2 x 3 = 6. We started with 6 tens. 2 groups of 3 tens is 6 tens. We subtract 6 tens to see if we have anything left over. We might describe this using objects:

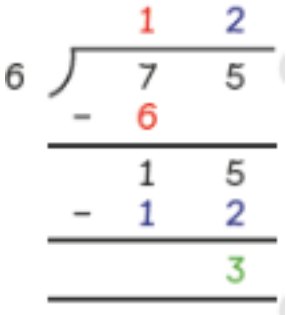
I started with 68 sweets and I shared them between my 2 friends. So far, I have given each friend 30 sweets. How many sweets have I given away? (60) How many sweets do I still have left to share? (8)

We then repeat this process with the ones, until we have nothing left over.

We also use this method to divide 3-digit numbers.



Using this method helps us when a number doesn't divide exactly, and we have a remainder.



1. Divide 7 tens by 6: 7 ÷ 6 = 1, so 7 tens ÷ 6 = 1 ten. We place a 1 in the tens column, above the 7.
2. We had 75 buttons. We have given 6 people, 10 buttons each.

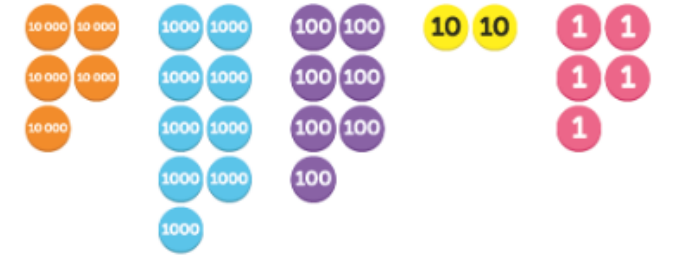
   Altogether, we have given away 60 buttons. We subtract 60 from 75 to see what is left. We have 15 buttons left.
3. Divide 1 ten by 6: we cannot do this.
4. Divide 15 ones by 6: 15 ÷ 6 = 2. We place 2 in the ones column, above the 5.
5. We had 15 buttons. We have given 6 people, 2 buttons each. Altogether, we have given away 12 buttons. We subtract 12 from 15 to see what is left. We have 3 buttons remaining. This cannot be divided by 6, so is our remainder.

Year 5

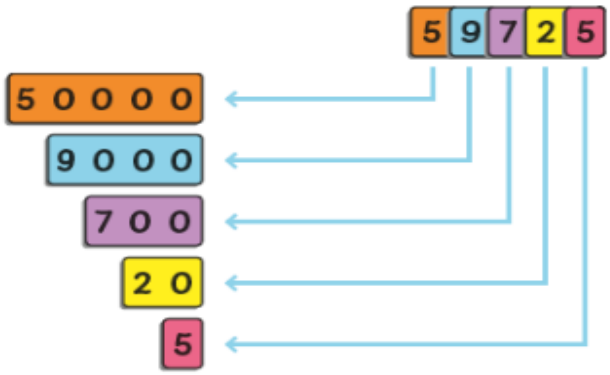
Year 5 - Place Value

Recognising numbers and amounts

We continue using **base ten, place value charts, place value counters** and **part-whole models** to help us partition numbers. We also use **arrow cards** to look at the different parts of a number and what each digit represents. We now look at numbers up to 1,000,000.



ten thousands	thousands	hundreds	tens	ones
5	9	7	2	5



The digit 5 is in the ten thousands place.
It stands for 50 thousands or 50 000.

The digit 9 is in the thousands place.
It stands for 9 thousands or 9000.

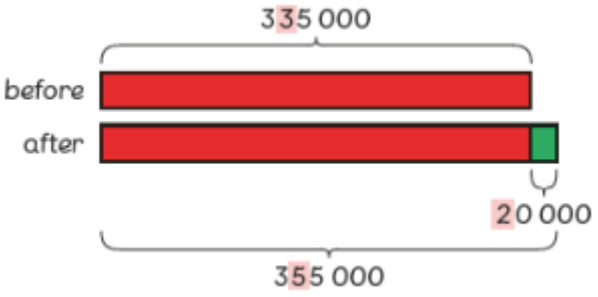
The digit 7 is in the hundreds place.
It stands for 7 hundreds or 700.

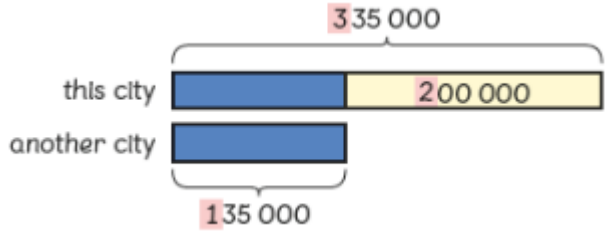
The digit 2 is in the tens place.
It stands for 2 tens or 20.

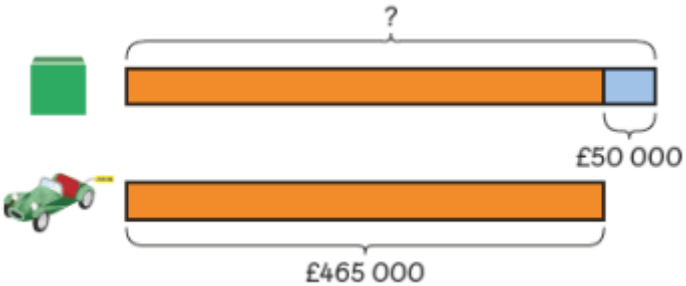
59 725 = 50 000 + 9000 + 700 + 20 + 5

Comparing numbers

We use **bar models** to help us compare numbers and decide what calculation to do to work out the difference between two numbers. We then use our place value knowledge rather than a formal method. We also look at patterns in the place value of different numbers.



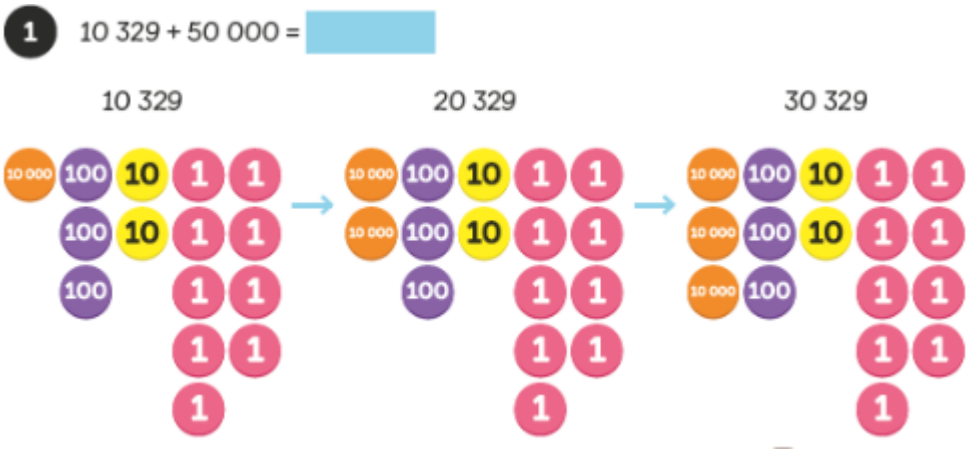




Year 5 - Addition

Counting on

We use our place value knowledge to help us count on in multiples of 10,000 and 100,000. We sometimes use **place value counters** to help us with this. We might also use a **number line**.



Column method

We continue to develop use the **column method** for addition, with 5-digit numbers. We use **place value counters** to help us see what is happening in the calculation.

$$\begin{array}{r} {\scriptstyle 1} \\ 16\,000 \\ +\ 17\,000 \\ \hline 33\,000 \end{array}$$

Place value

We also use our place value knowledge to help make some addition calculations easier. When adding two larger numbers, which are multiples of 10, we can add as though these are smaller numbers, as long as we remember their original value.

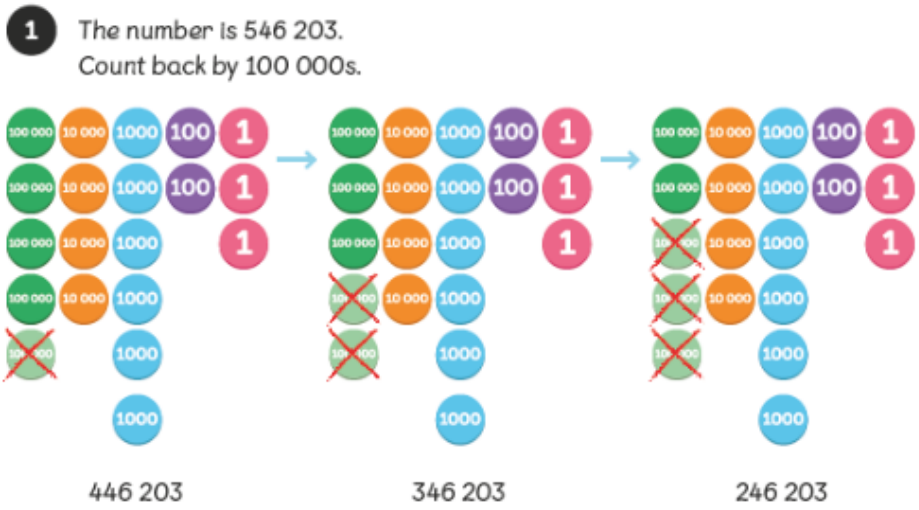
$$\begin{array}{r} 225\,000 \\ +\ 30\,000 \\ \hline 255\,000 \end{array}$$

$$\begin{array}{r} 225 \text{ thousands} \\ +\ 30 \text{ thousands} \\ \hline 255 \text{ thousands} \end{array}$$

Year 5 - Subtraction

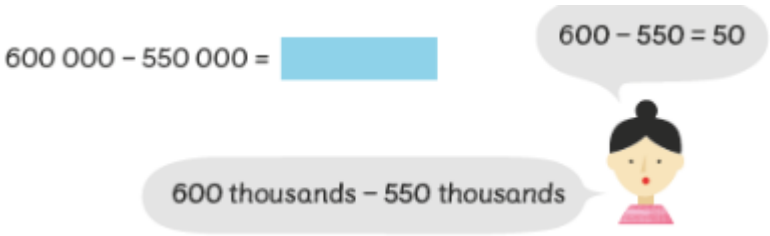
Counting back

When we need to subtract a multiple of 10, we can count back. We may count back in larger "jumps" of 100,000. We can use **place value counters** to help us.



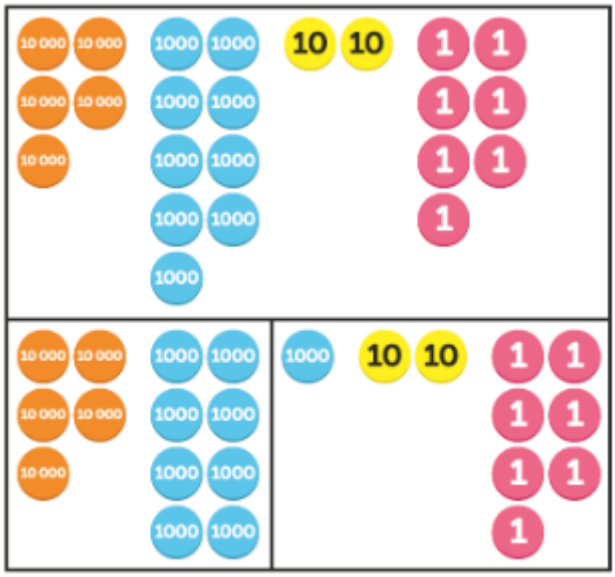
Place value

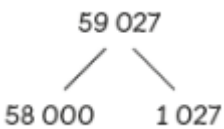
When subtracting multiples of 10, we can also imagine that the numbers are smaller to make the subtraction easier. We must then remember the value of each digit at the end.



Partitioning with the column method

When we start subtracting with larger numbers, we break the numbers down into smaller parts (partition) to make it easier. We use **place value counters** and **part-whole models** to help us. We look to see how we can easily split the numbers into 2 parts and subtract each part separately, then combine the answers. We must make sure our totals stay the same.





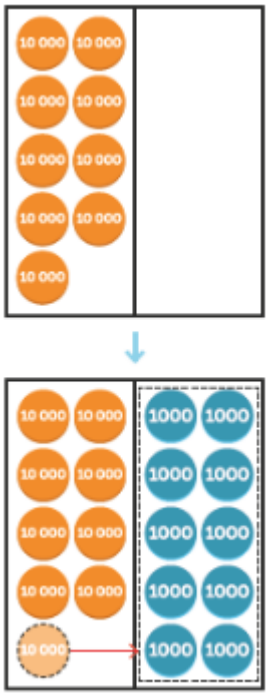
	5 8	thousands
–	2 3	thousands
	3 5	thousands

11
9 12 17
1 0 2 7
– 3 5 9
6 6 8

59 027 – 23 359 = 35 668

Column method

We continue to use **place value counters** to help us understand the **column method** for subtraction with larger numbers, particularly when renaming. When we rename a number, we write it above the original digit, and cross out the original.



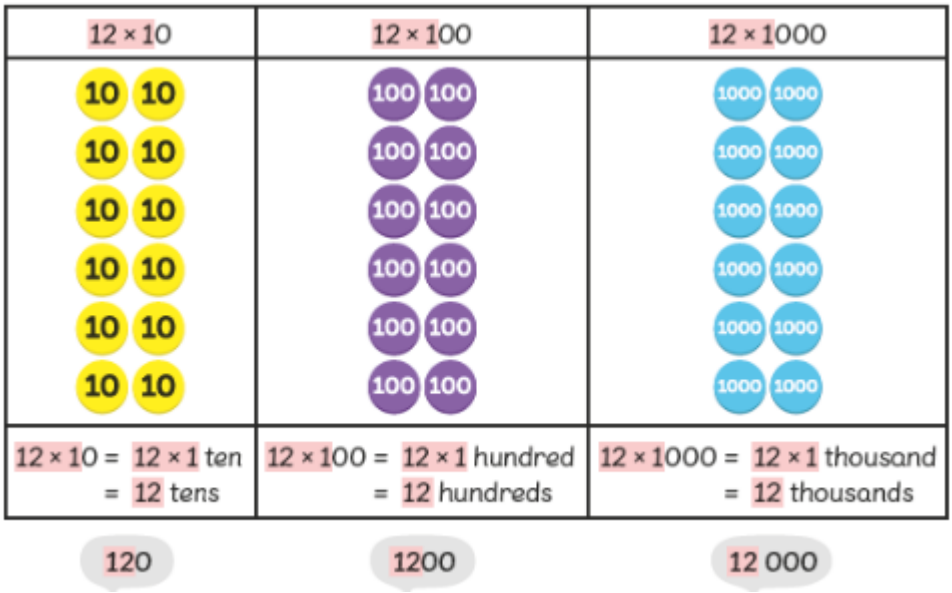
$$\begin{array}{rr} & \overset{8}{\cancel{9}}\,\overset{10}{\cancel{0}}\,000 \\ - & 54\,000 \\ \hline & 36\,000 \end{array}$$

$$\begin{array}{rr} & \overset{8}{\cancel{9}}\,\overset{9}{\cancel{0}}\,\overset{10}{\cancel{1}}\,\overset{11}{\cancel{2}}\,\overset{12}{\cancel{3}}\,\overset{13}{\cancel{4}} \\ - & 87\,654 \\ \hline & 2\,469 \end{array}$$

Year 5 - Multiplication

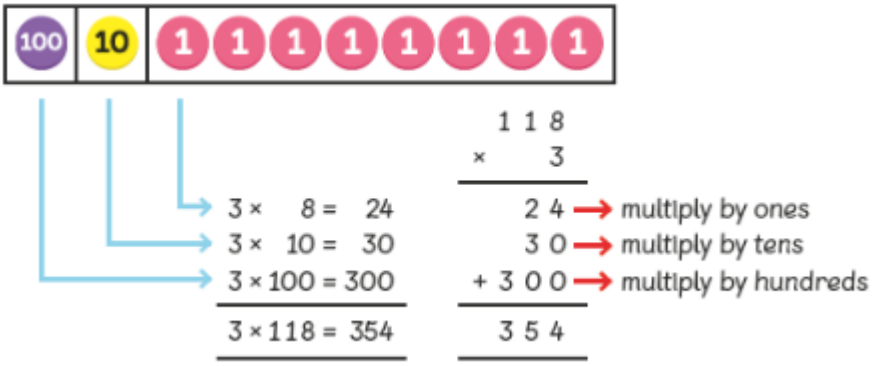
Multiples of 10, 100 and 1000

In Year 5, we continue to focus on multiplying multiples of ten, one hundred and now one thousand. This helps us to do more complicated multiplications. We use **place value counters** and our knowledge of place value to help us. We also use our knowledge that multiplication is repeated addition to help us.

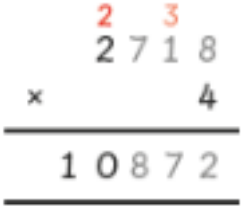


Column method

In Year 5, we use **place value counters** when recapping using the column method for multiplication. We start by revising the longer method to help us understand the more efficient **column method**. We now use this method to multiply 4-digit numbers.



We then move on to a more efficient method of writing the products. We might need to rename numbers when writing the answers. We do this by writing the renamed digit above the correct column.



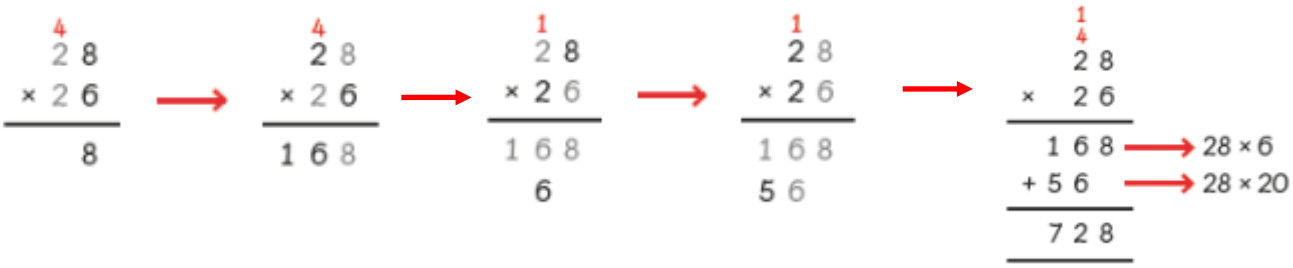
Then we move on to multiplying 2-digit numbers by other 2-digit numbers. We continue to use **place value counters** to help us, as well as our knowledge of multiplying by multiples of 10. We partition numbers to help us see the calculation in steps. We can partition the numbers in different ways to make the calculation easier.

$14 \times 10 = 140$
$14 \times 2 = 28$
$14 \times 12 = 168$

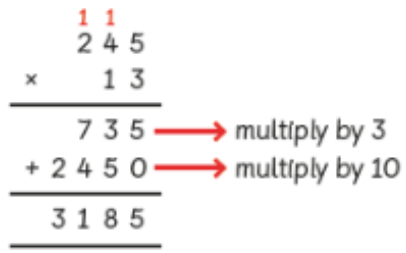
$14 \times 20 = 280$
$14 \times 2 = 28$
$14 \times 22 = 308$

$10 \times 26 = 260$
$10 \times 26 = 260$
$8 \times 26 = 208$
$28 \times 26 = 728$

We again move on to writing this in a more efficient way. We always start by multiplying the ones.



We use this same method to multiply a 3-digit number by a 2-digit number.



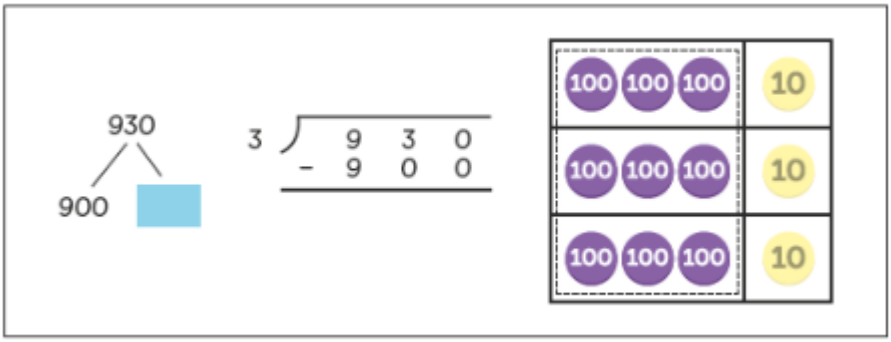
Year 5 - Division

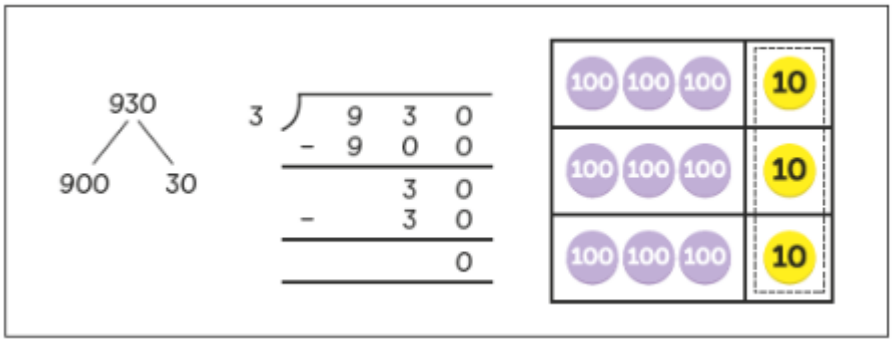
Multiples of 10, 100 and 1000

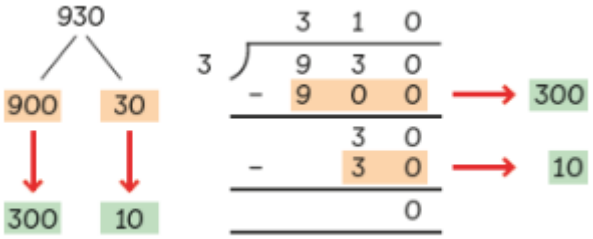
In Year 5, we focus on dividing by multiples of ten, one hundred and one thousand. This helps us to do more complicated divisions. We use **place value counters** and **base ten**, as well as our knowledge of place value to help us. We also use our knowledge that multiplication is repeated subtraction to help us.

Formal method

We start using the **formal method** for dividing 3-digit and 4-digit numbers. This is sometimes called the "**bus stop**" method. We use a long division method as this helps us to understand what we are doing and why. It also means we don't need to hold as much information in our heads. We use **place value counters** and **part-whole models** to help us understand then formal method. We also use this method when working with numbers which will give a remainder.







Year 6

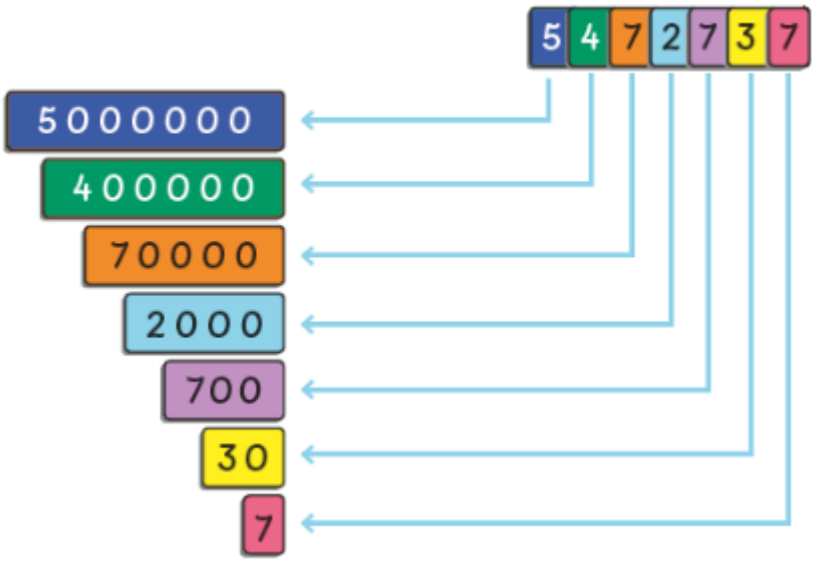
Year 6 - Place Value

Recognising numbers and amounts

We continue using **base ten, place value charts, place value counters, part-whole models** and **arrow cards** to help us partition numbers. We now look at numbers up to 10 million. We will practice counting in 10,000s.

Show 5 472 737 on a place-value chart.

millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones
●●●●●	●●●●	●●●●●	●●	●●●●●	●●●	●●●●●

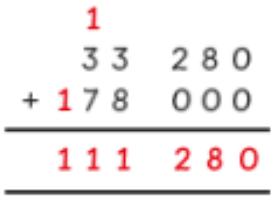


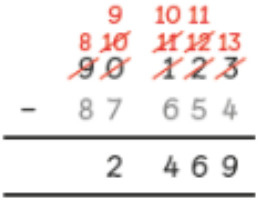
10 one hundred thousands make 1 million.

100 ten thousands make 1 million.

Year 6 - Addition and Subtraction

We do not use any new methods for addition and subtraction in Year 6. We now apply the methods we have learnt to help us solve more complex problems with larger numbers. We aim to use the column methods generally, as these are usually the most efficient methods, but other methods may suit certain questions better.





We will practice using these methods with different units of measurement and with decimals.

Year 6 - Multiplication

Multiples of 10, 100 and 1000

In Year 6, we recap multiplying by multiples of 10, 100 and 1000. This helps us to answer and understand more complex multiplications. We use different strategies to help us , breaking up numbers in different ways. It is important that we understand how numbers can be built up using multiplication.

$1414 \times 10 = 14\,140$

$1414 \times 20 = 14\,140 \times 2$

$= 28\,280$

$1414 \times 20 = 1414 \times 2 \times 10$

$= 2828 \times 10$

$= 28\,280$

Place value counters

We use **place value counters** to help us understand what happens when we multiply a decimal by a whole number. We can partition the decimal or use our place value knowledge to help us. We also use **part-whole models** to help us partition numbers.

$0.23 \times 3 =$ ▭

Method 1

$0.2 \times 3 = 0.6$

$0.03 \times 3 = 0.09$

$0.23 \times 3 = 0.6 + 0.09 = 0.69$

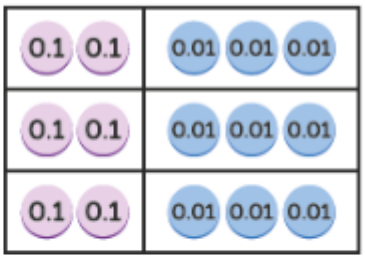
Method 2

0.23 = 23 hundredths

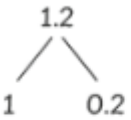
0.23×3 = 23 hundredths $\times 3$

= 69 hundredths

= 0.69



$1.2 \times 8 =$ ▭

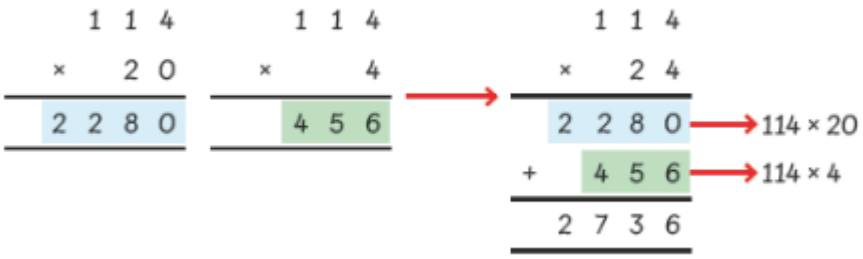


$1.2 \times 8 = 8 + 1.6$

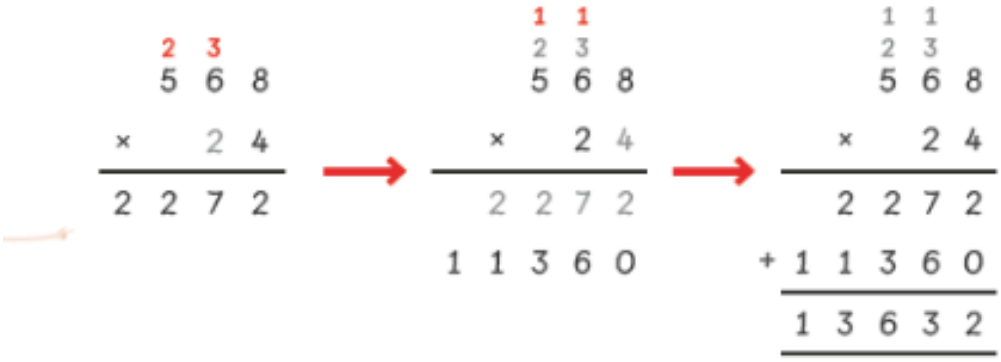
$= 9.6$

Column method

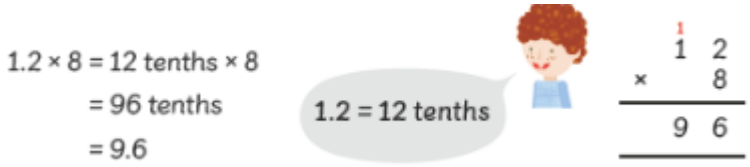
In Year 6, we use **place value counters** when recapping using the column method for multiplication. We start by breaking down the calculation into steps, multiplying by a 2-digit number. This helps us to see how we can use our skills in multiplying by multiples of 10 to help us when completing the more efficient method.



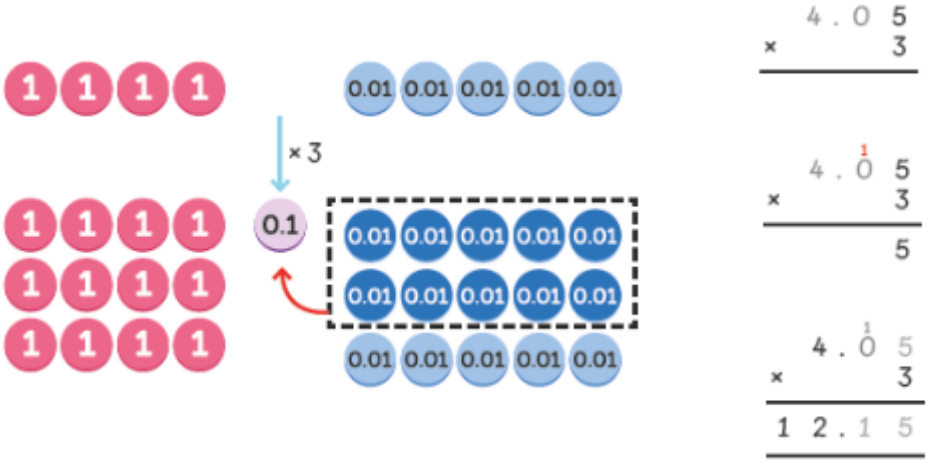
We then again move on to a more efficient method of writing the products. We might need to rename numbers when writing the answers. We do this by writing the renamed digit above the correct column.



We also use the column method to multiply decimals. At first, we use our place value knowledge to help with this.



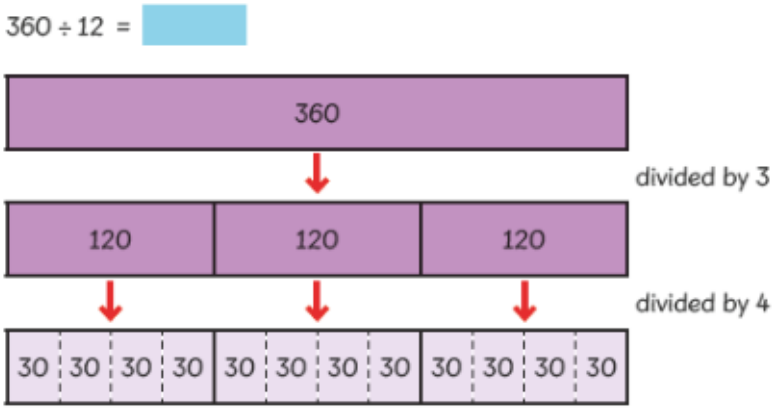
Then we move on to a more efficient method. We apply what we have learnt so that we are still thinking about the size of the number and our place value knowledge to check that the decimal point is positioned correctly.



Year 6 - Division

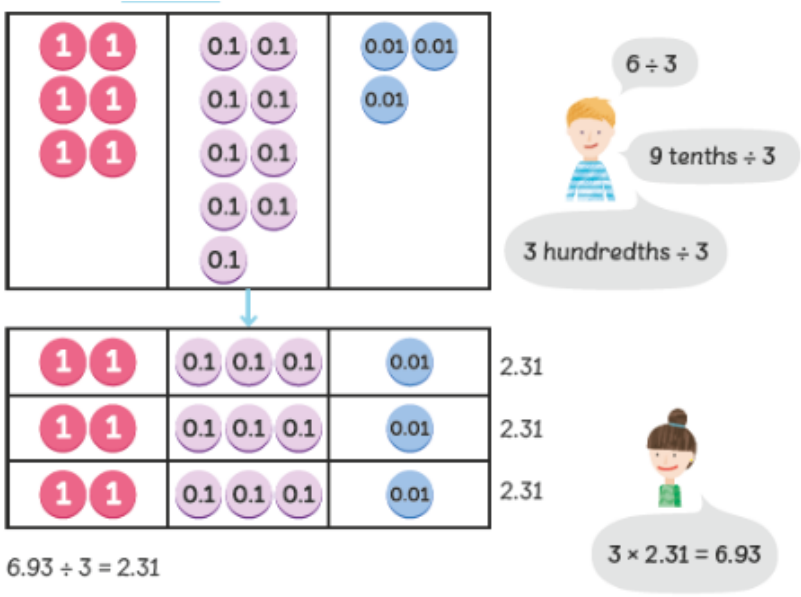
Bar models

We use **bar models** to help us picture division in different ways. If we find dividing by a 2-digit number tricky, this helps us to see how we can break down the calculation into small steps.



Place value counters

We use **place value counters** to help us understand what happens when we divide a decimal by a whole number. We can partition the decimal or use our place value knowledge to help us. We also use **part-whole models** to help us partition numbers.



Formal method

We continue using the **formal method** for dividing 3-digit and 4-digit numbers. We now divide by 2-digit numbers. We use **place value counters** and **part-whole models** to help us understand then formal method. Our place value knowledge is also important as it helps us check that our answer is the right size. We also use this method when working with numbers which will give a remainder.

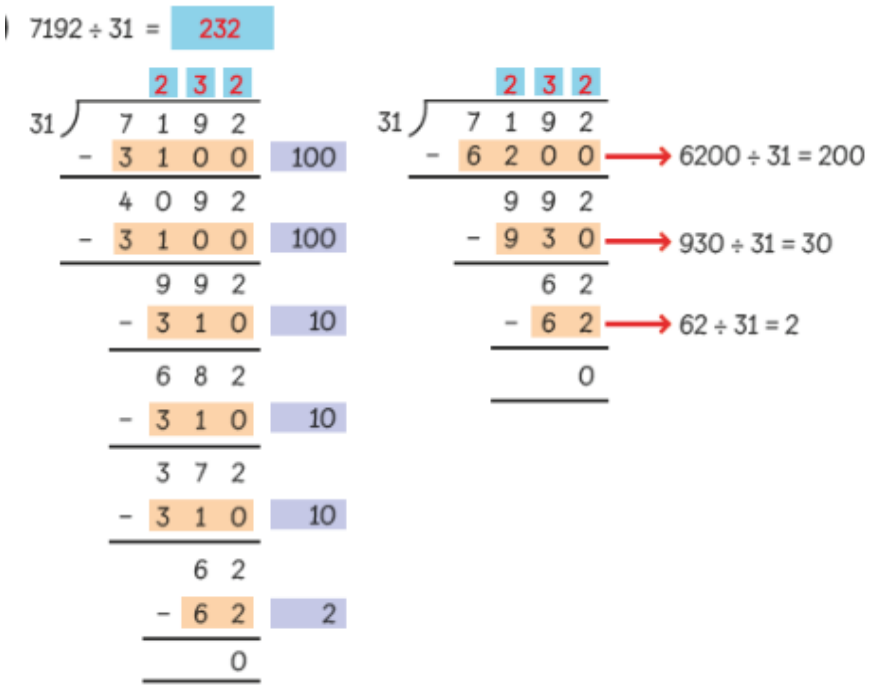
360 = 36 tens

$$\begin{array}{r} 30 \\ 12\overline{)360} \\ -\,36 \\ \hline 0 \end{array}$$

36 tens ÷ 12 = 3 tens

360 ÷ 12 = 30

When dividing larger numbers, we will start by looking at sharing out "chunks" of the number, then seeing how many "chunks" we have shared in total. We will then move to a more efficient method where we always find the greatest amount which can be shared equally for each digit in turn.



We also use this method to divide decimals, or to divide a whole number with a decimal answer. We again use **place value counters** to help us.