



# Calculation Progression Policy

“Go down deep enough into anything and you will find mathematics.”

**EYFS – YEAR SIX**

**SEPTEMBER 2022**

Review:

September 2023

# EYFS

Key Vocabulary			
Number	Geometry	Statistics	Measurement
number, subitising, sort, group, digit, one more, one less, matched, fewer, greater than, less than, equal to, most, least, fewest, smallest, greatest, altogether, group, number sentence, take away, add, number bond, part-whole sharing, grouping, doubling, halving half, quarter, parts of a whole.	side, rectangle, square, triangle, circle, 2D shape, 3D shape, cube, cuboid, sphere, pyramid, cylinder, cone, circle, pattern, flat, curved, shape, face, edge, vertex, vertices, position, left, right, forwards, backwards, above, below, top, middle, bottom, up, down, in between, over, under, direction.	count, sort, group, set, list, tally.	long, longer, short, tall, tallest, length, height, compare, measure, full, empty, days of the week, morning, afternoon, evening, night, before, after, next, last, clock, watch, money, pound, pence, coin, note.

# Addition

## SUBJECT TO CHANGE

In EYFS pupils should be developing their concept of the number system through the use of concrete materials and pictorial representations. They should experience practical calculation opportunities using a wide variety of equipment, e.g. role play, outdoor play, counters, cubes, numicon, ten frames etc. They develop ways of recording calculations using pictures, etc.

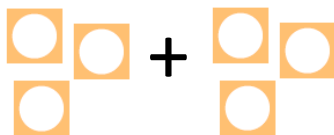
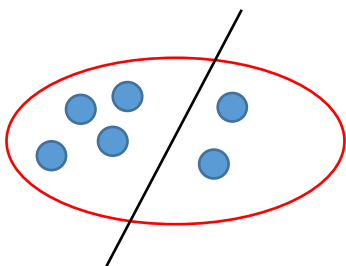
Pupils must be provided with opportunities to develop their skills so that they are able to count reliably, including one to one correspondence and count on from a given number.

Pupils must be provided with many opportunities to **subitise** numbers so they are equipped to calculate rather than count as they progress through their learning. Pupils should be given the opportunity to count out sets of objects and then combine them to make a total.

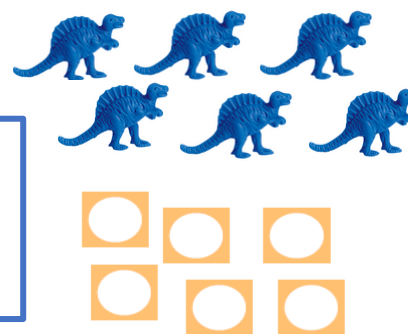
6

6

0



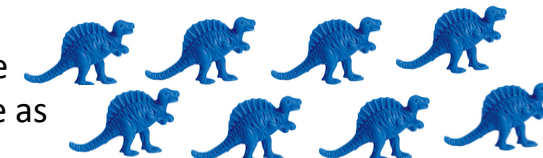
Pupils should recognise different combinations of making single digit numbers.



and



is the same as

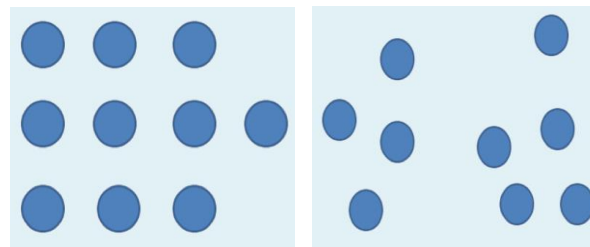


is the same as



### Subitising

Show the dots for 3 seconds.  
How many dots can you see?  
How did you see them?  
Did you calculate? E.g..  $9 + 1$  and  $4 + 5$



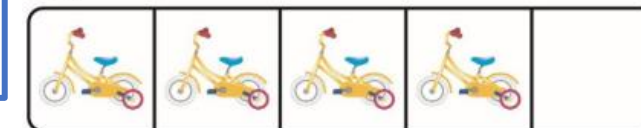
First



Then



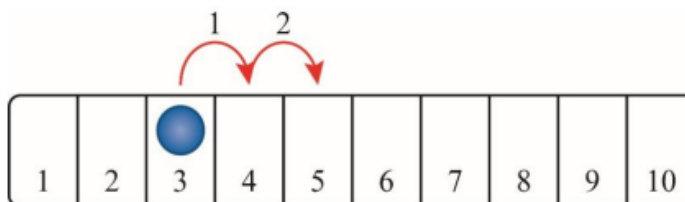
Now



Pupils should use counters or cubes in a part-whole model to find the whole.

Pupils should start at the larger number and count on the smaller number to find the total.

Pupils should represent first, then, now stories on a five frame. They make the first number and then add one more.

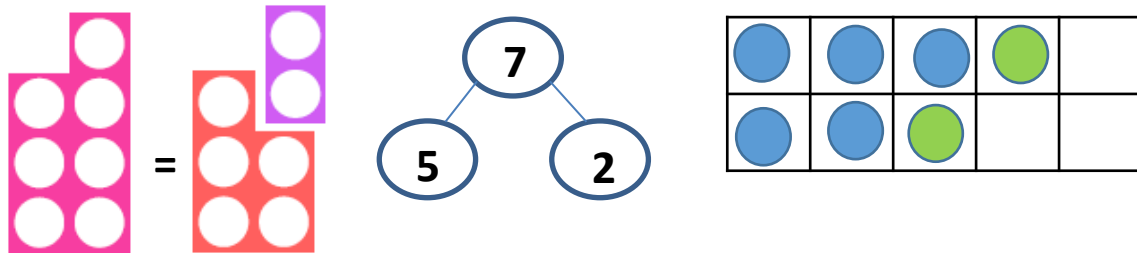


# Subtraction

## SUBJECT TO CHANGE

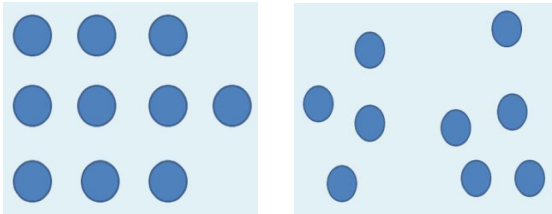
In EYFS pupils should be developing their concept of the number system through the use of concrete materials and pictorial representations. They should experience practical calculation opportunities using a wide variety of equipment, e.g. role play, outdoor play, counters, cubes, numicon, ten frames etc. They develop ways of recording calculations using pictures, etc.

Pupils should recognise different combinations of making single digit numbers using part whole, numicon and tens frame. E.g. 7 can be made as:

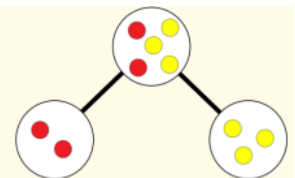


### Subitising

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and  $4 + 5$



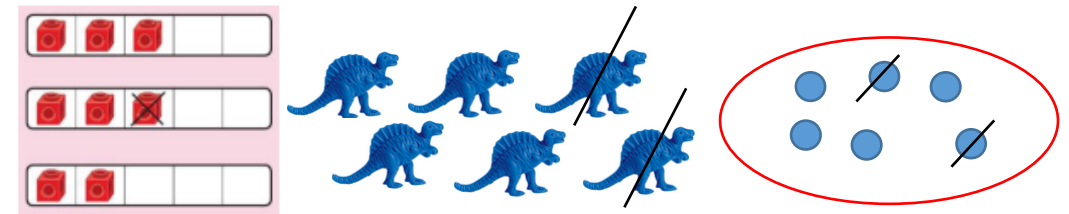
Pupils to use counters or cubes to represent objects in a part-whole model.



Pupils must be provided with opportunities to develop their skills so that they are able to count reliably, including one to one correspondence and count on from a given number.

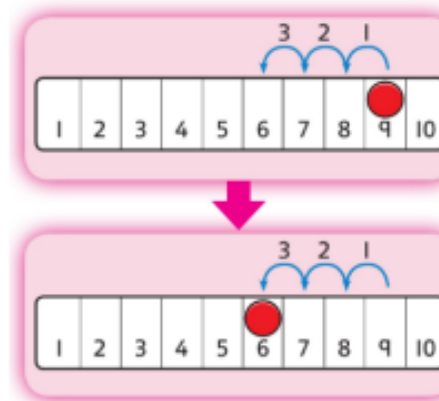
Pupils must be provided with many opportunities to **subitise** numbers so they are equipped to calculate rather than count as they progress through their learning.

Pupils should be given the opportunity to count out sets of objects and then combine them to make a total.



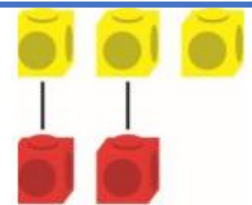
After pupils have recognised different ways of making numbers they should use this number bond knowledge to help with subtraction facts.

Children should use concrete materials to start counting back in order to solve subtraction problems.



Pupils should use a number track and a counter. They start at the larger number and count back the smaller number to find the answer.

Pupils should be able to compare the amount in each group.

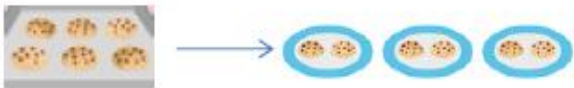


There are more yellow cubes.  
There are fewer red cubes.

# Multiplication

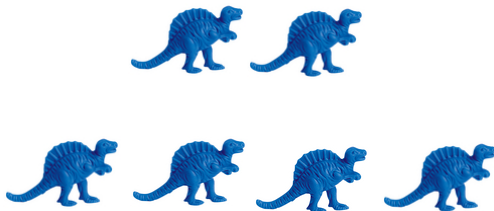
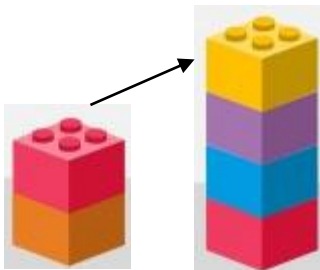
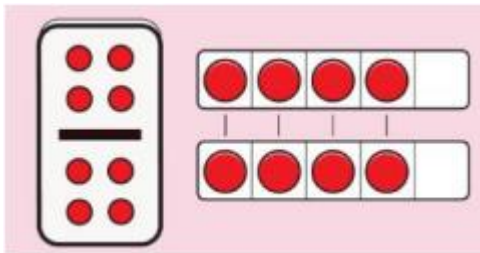
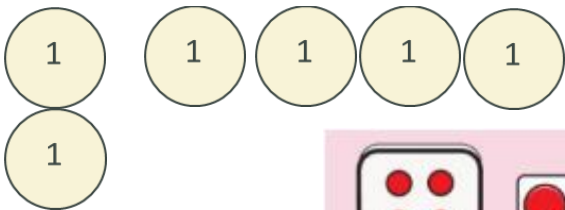
SUBJECT TO CHANGE

Real life contexts

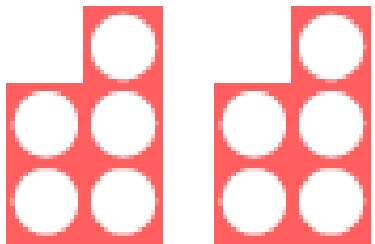


How many fingers on one hand?  
How many fingers on two hands?...

Doubling



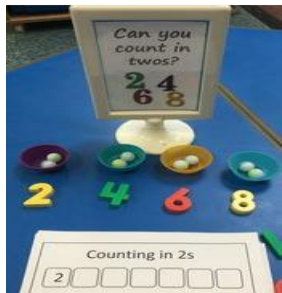
Count in multiples of 5



Count in multiples of 10



Count in multiples of 2





# Division

## SUBJECT TO CHANGE

Real life contexts

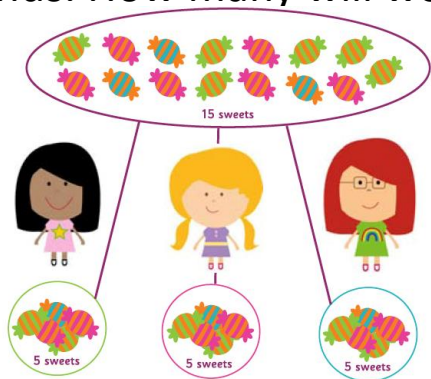
Grouping

Mum has 6 socks. She grouped them into pairs. How many pairs did she make?

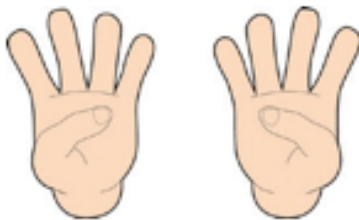


Sharing

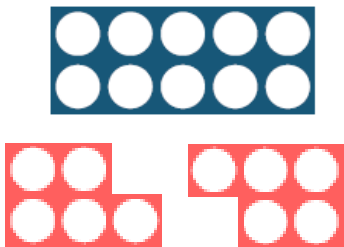
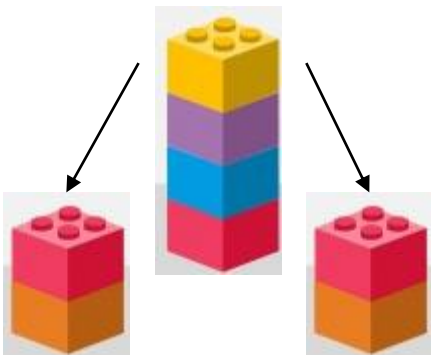
I have 15 sweets. I want to share them with my 3 friends. How many will we have each?



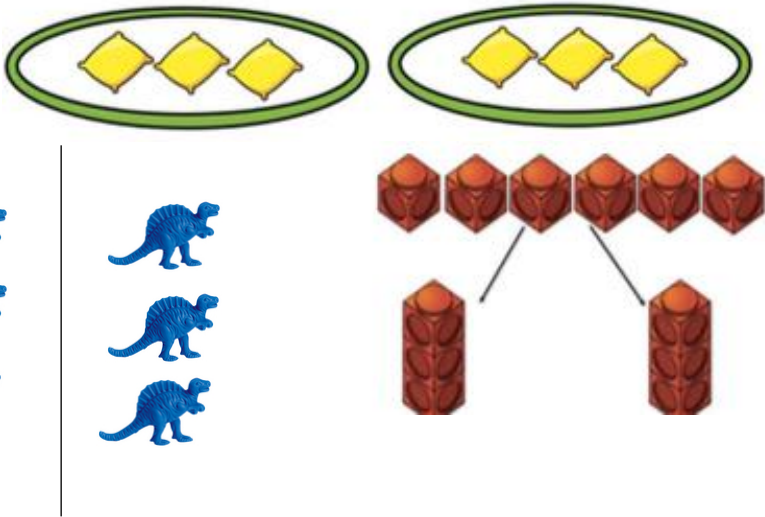
Halving



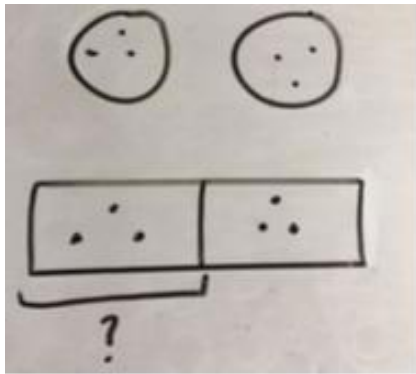
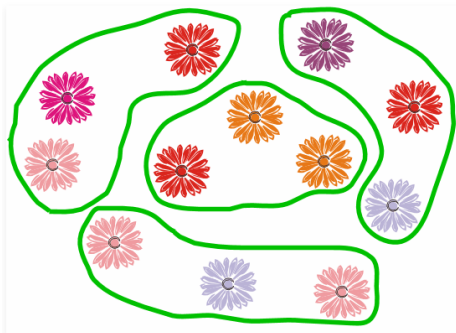
Half of 8 is 4



Concrete



Pictorial

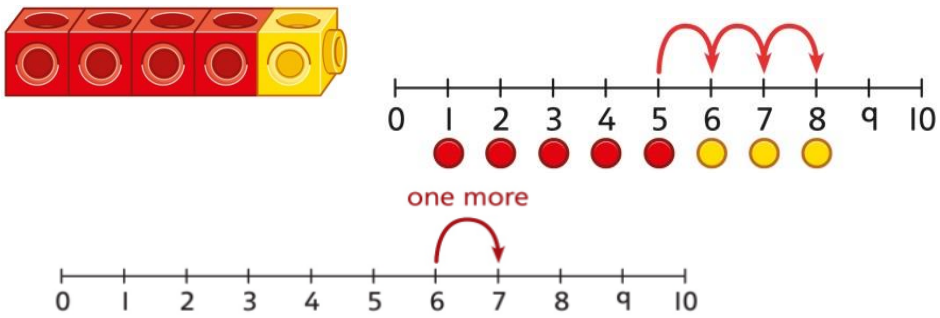


# Year 1

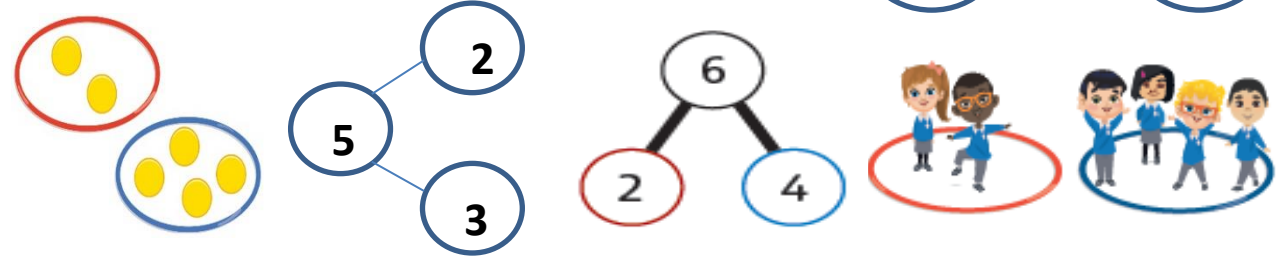
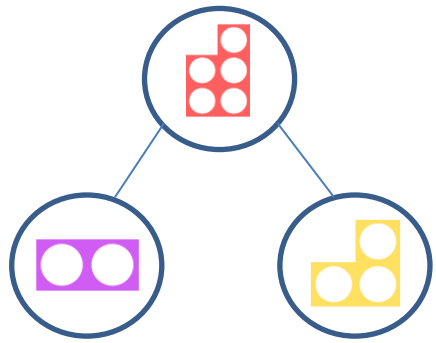
Key Vocabulary			
Number	Geometry	Statistics	Measurement
number, subitising, sort, group, digit, <b>one more, one less</b> , matched, fewer, greater than, less than, equal to, most, least, fewest, smallest, greatest, <b>number line, number track, pattern, order, tens, ones, compare, 100 square, number square, place value grid, numeral, partition, group, part whole, plus, whole, part</b> , number sentence, altogether, <b>in total</b> , add, <b>count on, missing part</b> , take away, <b>subtract, count backwards, difference, in total, addition, subtraction</b> , number bond, part-whole, <b>fact family</b> , tens, ones, <b>equal groups, array, row, column, double, twice, share</b> , sharing, grouping, <b>multiply, fraction</b> , half, <b>halves</b> , quarter, parts of a whole, <b>equal parts</b>	<b>turn, half turn, quarter turn, three quarter turn, whole turn</b> , position, left, right, forwards, backwards, above, below, top, middle, bottom, up, down, in between, 3D shape, cube, cuboid, sphere, pyramid, cylinder, cone, 2D shape, circle, triangle, rectangle, face, edge, vertex, vertices, pattern, <b>repeated</b>	count, sort, group, set, list, tally	<b>before, after, yesterday, today, tomorrow, day, week, lower, faster, month, year, calendar, date, minute hand, hour hand, o'clock, half past, second, minute, hour, heavier, heaviest, lighter, capacity, balance scales</b> , full, empty, <b>weight, weigh, balanced</b> , estimate, pound, pence, coin, note, long, longer, <b>longest</b> , short, <b>shorter, shortest</b> , tall, <b>taller</b> , tallest, length, height, compare, measure, <b>distance, ruler, centimetre</b>

# Addition

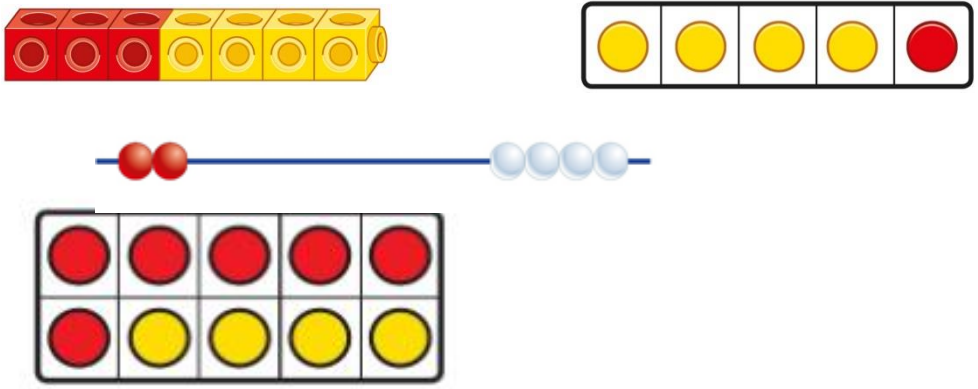
## Counting and adding more



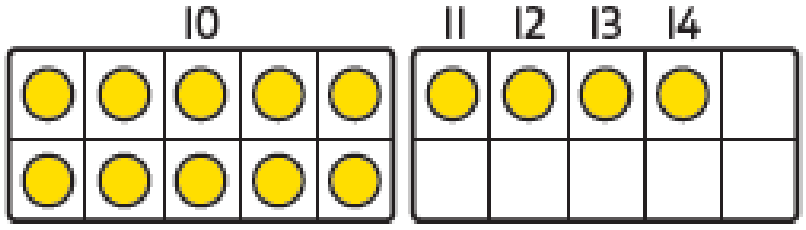
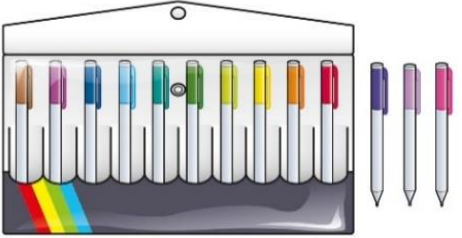
## Understanding part-part-whole relationship



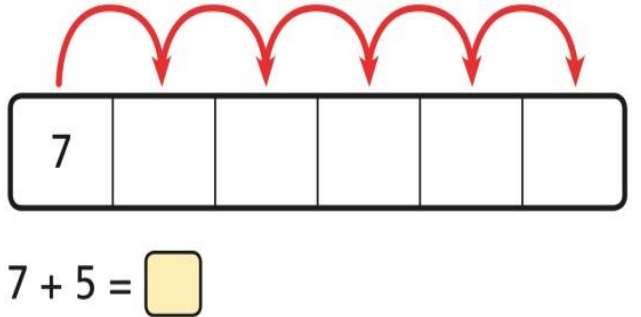
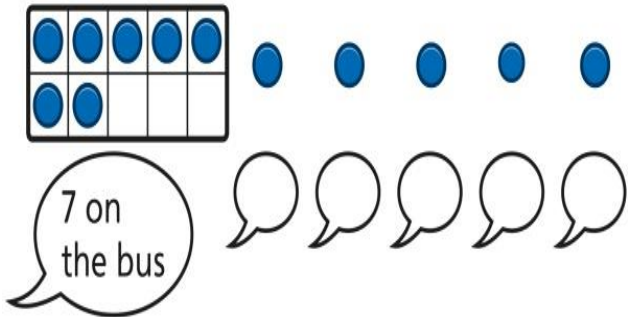
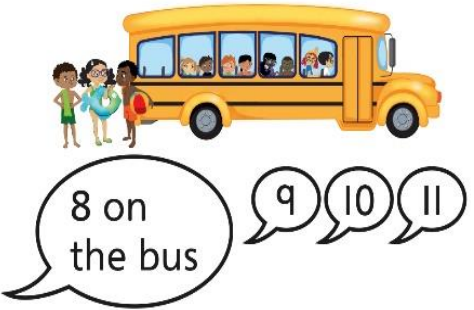
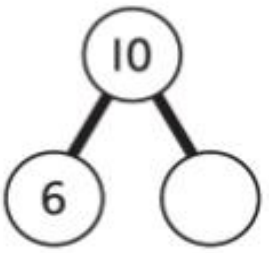
## Knowing and finding number bonds within 10



## Understanding teen numbers as a complete 10 and some more



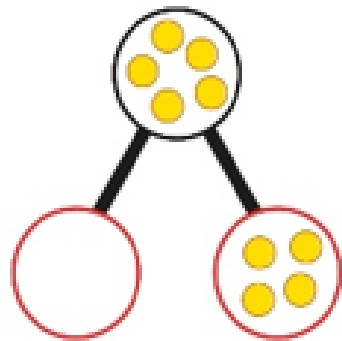
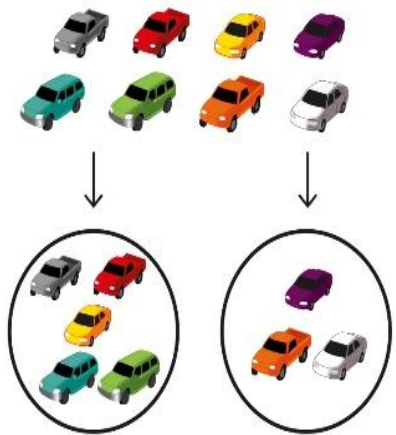
## Adding by counting on



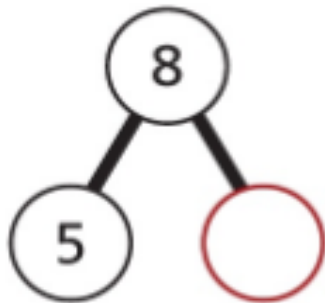


# Subtraction

Finding a missing part, given a whole and a part

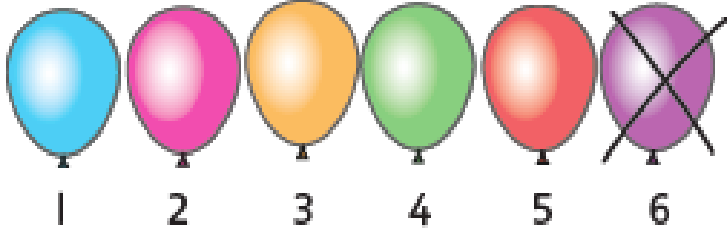
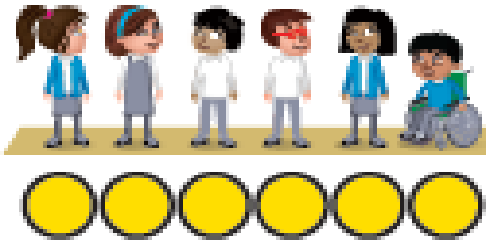


$$5 - 4 = \square$$

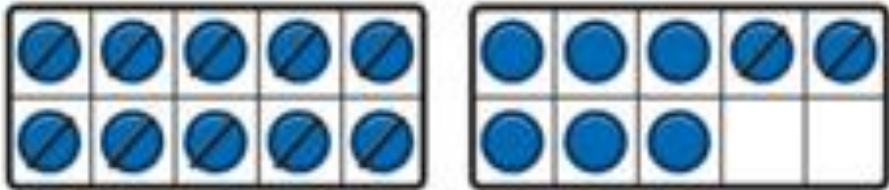
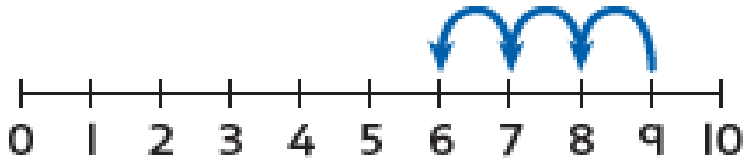


5				
				

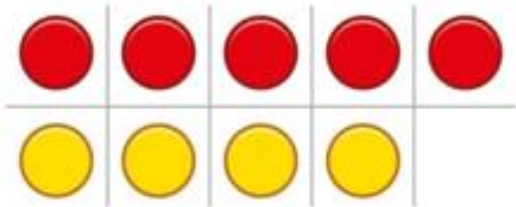
Counting back and taking away



Now there are 6 children.



Find the difference



$5 - 4 = 1$   
The difference between 5 and 4 is 1.

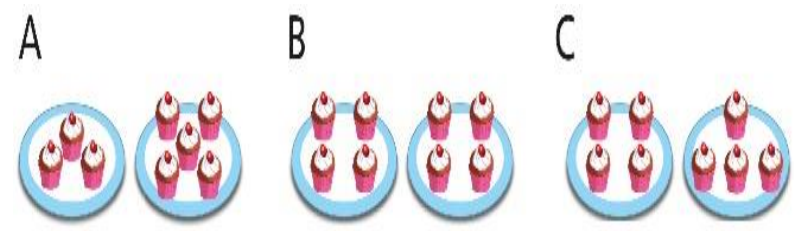
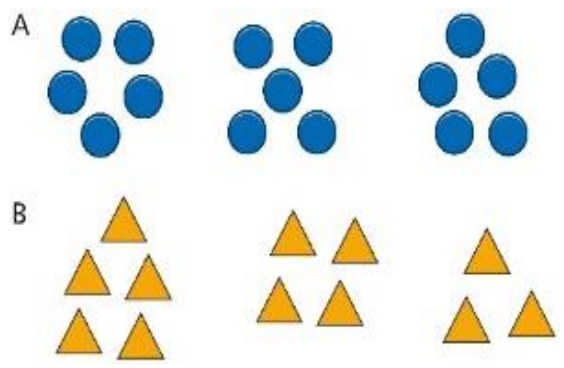


8 is 2 more than 6.  
6 is 2 less than 8.  
The difference between 8 and 6 is 2.

# Multiplication

Recognising and making equal groups

Three equal groups of 4.  
Four equal groups of 3.



$2 + 2 + 2 + 2 + 2 =$



There are \_\_\_\_ groups of \_\_\_\_ pencils.



There are \_\_\_\_ groups of \_\_\_\_ flowers.

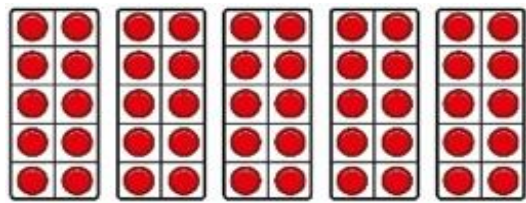
Finding the total of groups by counting in 2s, 5s and 10s



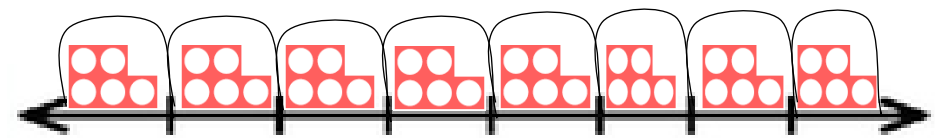
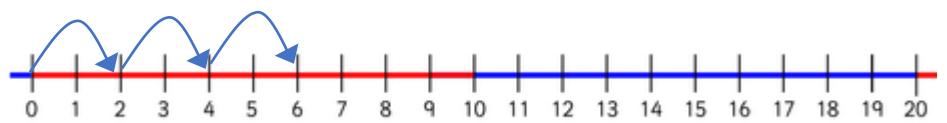
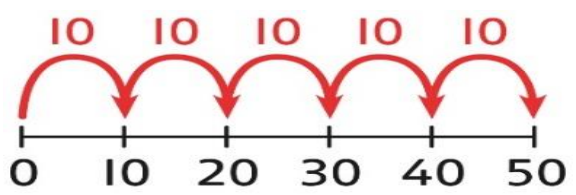
There are 5 pens in each pack ...  
5...10...15...20...25...30...35...40...



There are \_\_\_\_ flowers in each bunch.  
There are \_\_\_\_ bunches.  
There are \_\_\_\_ flowers altogether.



1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50



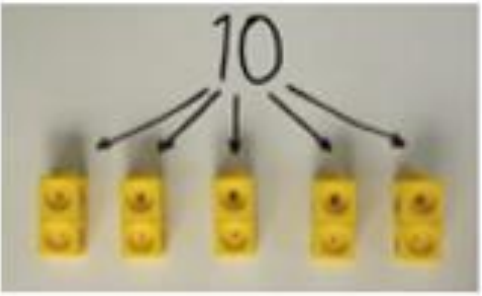
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

# Division

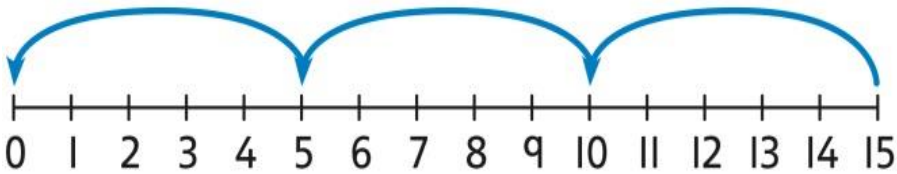
## Grouping



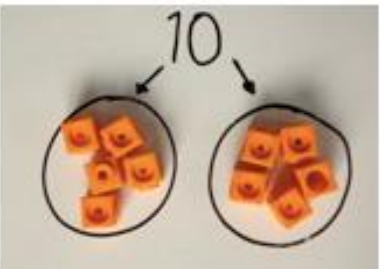
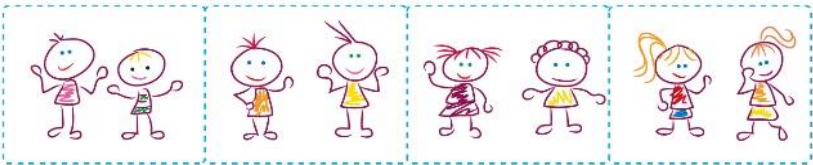
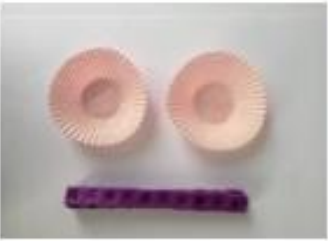
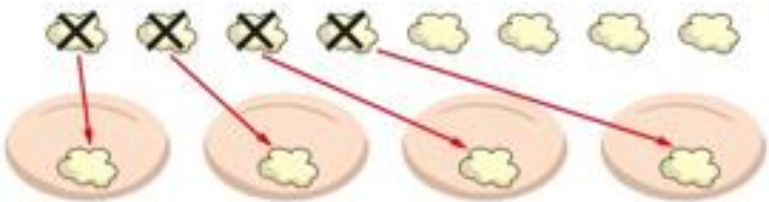
There are 10 in total.  
There are 5 in each group.  
There are 2 groups.



There are \_\_\_\_ altogether.  
There are \_\_\_\_ equal groups of \_\_\_\_



## Sharing



I have 10 cubes, can you share them equally in 2 groups?

$6 \div 2 = 3$

3	3
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# Year 2

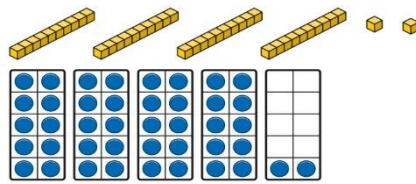
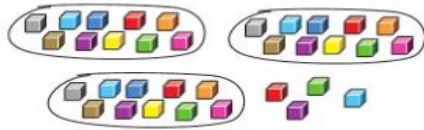
Key Vocabulary			
Number	Geometry	Statistics	Measurement
tens, ones, <b>hundreds</b> , place value grid, partition, numeral, more, fewer, fewest, greatest, smallest, greater than, less than, fact family, number sentence, number bond, column, <b>10 more, 10 less, bar model, represent, exchange</b> , difference, subtract, tens, ones, total, equal groups, share, group, multiply, <b>multiplication, times-table, times, divide, division, odd, even</b> , fraction, half, halves, quarter, parts of a whole, equal parts, <b>whole, third, numerator, denominator, fraction bar, non-unit fraction, unit fraction, equal, three quarters</b>	3D shape, cube, cuboid, sphere, pyramid, cylinder, cone, 2D shape, circle, triangle, rectangle, face, edge, vertex, vertices, pattern, <b>repeated, quadrilateral, polygon, prism, hexagon, octagon, hemisphere, symmetry, line of symmetry, symmetrical, curved surface, anticlockwise, clockwise</b> , turn, half turn, quarter turn, three quarter turn, whole turn, left, right, forwards, backwards, middle, forwards, backwards	<b>table, block diagram, tally chart, pictogram, key</b>	length, centimetre, <b>metre</b> , longer, shorter, <b>metre stick</b> , height, <b>width</b> , compare, distance, pound, pence, coin, note, <b>change, £, mass</b> , balance, weighing scales, capacity, estimate, approximation, <b>gram, kilogram, litre, millilitre, volume, temperature, thermometer, degrees Celsius, heavier than, lighter than, hundreds</b> , o'clock, half past, minute hand, hour hand, <b>duration, quarter past, quarter to</b>

# Addition

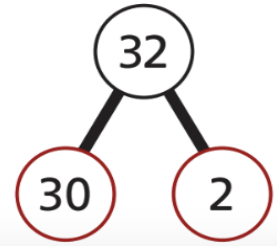
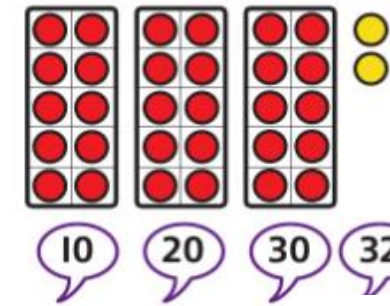
Adding the 1s



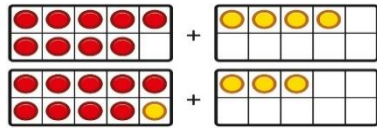
Understanding 10s and 1s



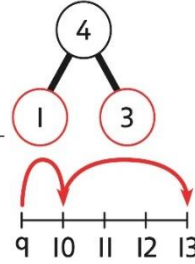
T	O
3	2



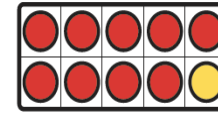
Bridging 10 using number bonds



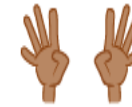
7 add 3 makes 10.  
So, 7 add 5 is 10 and 2 more.



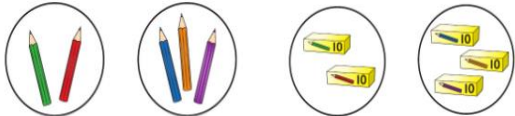
Learn bonds within 10



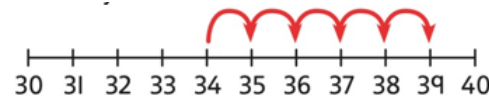
Double 4



Add two multiples of 10



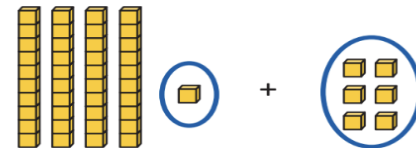
Add a 2-digit number and 1s



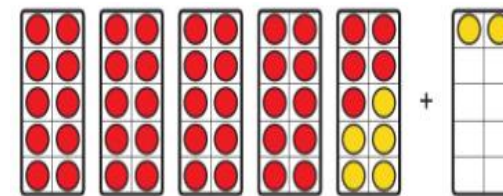
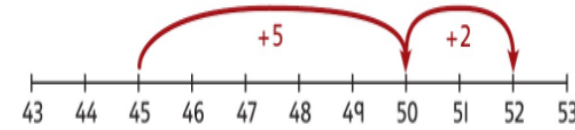
$$4 + 5 = 9$$

So

$$34 + 5 = 39$$

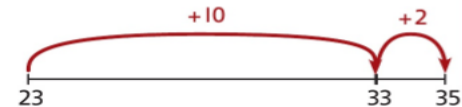
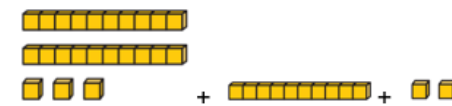


Add across a 10

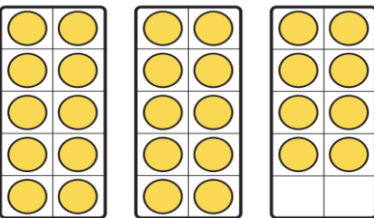


+	0	1	2	3	4	5	6	7	8	9	10
0	0+0	0+1	0+2	0+3	0+4	0+5	0+6	0+7	0+8	0+9	0+10
1	1+0	1+1	1+2	1+3	1+4	1+5	1+6	1+7	1+8	1+9	
2	2+0	2+1	2+2	2+3	2+4	2+5	2+6	2+7	2+8	2+9	
3	3+0	3+1	3+2	3+3	3+4	3+5	3+6	3+7			
4	4+0	4+1	4+2	4+3	4+4	4+5	4+6				
5	5+0	5+1	5+2	5+3	5+4	5+5					
6	6+0	6+1	6+2	6+3	6+4						
7	7+0	7+1	7+2	7+3							
8	8+0	8+1	8+2								
9	9+0	9+1									
10	10+0										

Add more 10s then more 1s



Add to the next 10

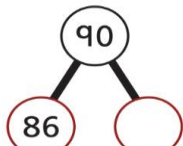
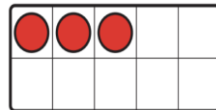


$$3 + \square = 10$$

$$33 + \square = 40$$

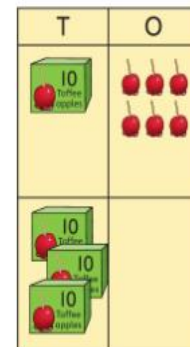
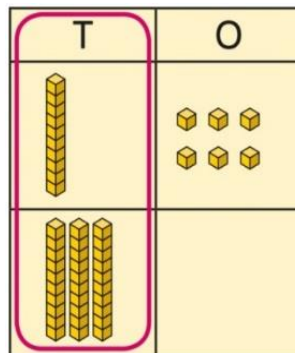
$$43 + \square = 50$$

$$73 + \square = 80$$

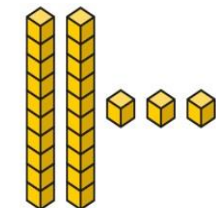
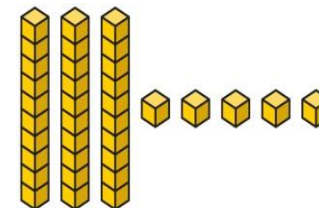


$$86 + \square = 90$$

Add 10s to a 2-digit number



Add the 1s and then 10s separately



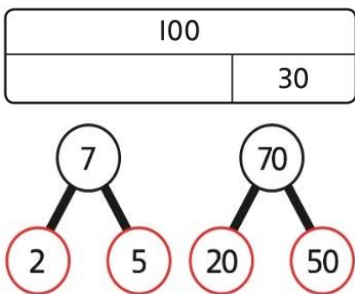
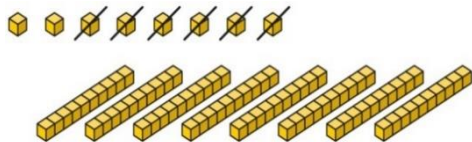
60	
55	?

$$55 + \square = 60$$

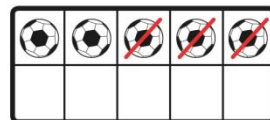
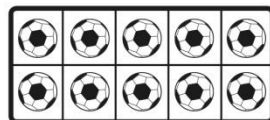


# Subtraction

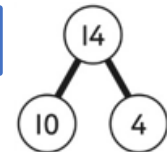
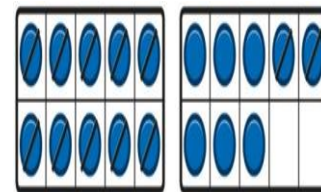
Subtract two multiples of 10



Subtraction within 20

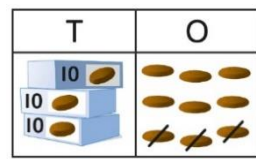
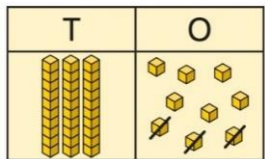
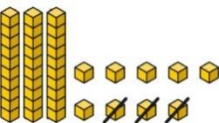


Subtracting 10s and 1s

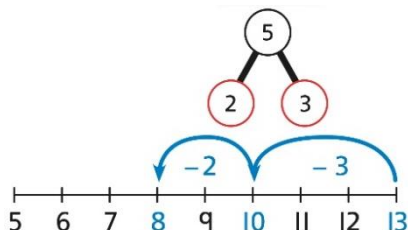
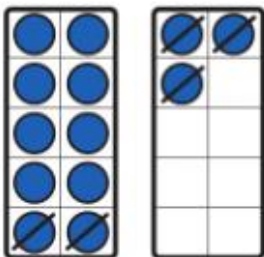


$$\begin{aligned} 19 - 14 \\ 19 - 10 &= 9 \\ 9 - 4 &= 5 \\ \text{So, } 19 - 14 &= 5 \end{aligned}$$

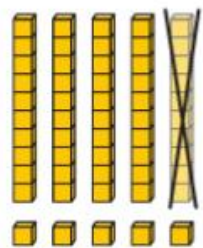
Subtracting a single-digit number



Subtraction bridging 10 using number bonds

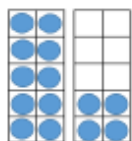


Subtract tens from a 2-digit number



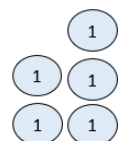
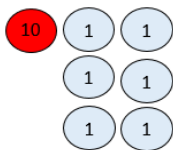
Subtract tens using known bonds

$$43 - 10 = 33$$



$$\begin{array}{r} 24 \\ - 5 \\ \hline 24 - 4 = 20 \\ 20 - 1 = 19 \end{array}$$

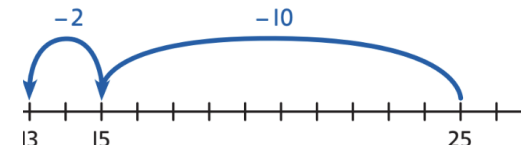
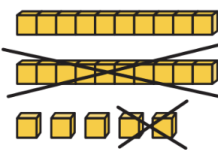
Subtract ones from a 2-digit number



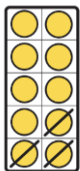
$$25 - 10 - 2 = 13$$

$$25 - 12 = 13$$

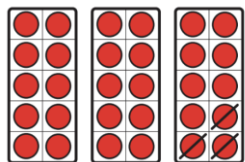
Subtract tens and ones from a 2-digit number



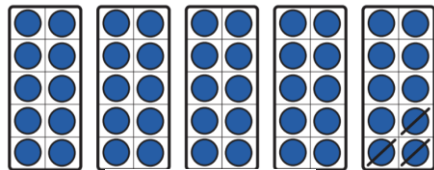
Subtract ones from a multiple of 10



$$10 - 3 = 7$$



$$30 - 3 = 27$$

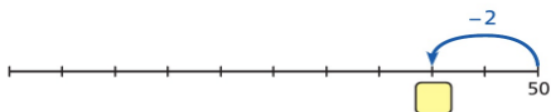


$$50 - 3 = 47$$

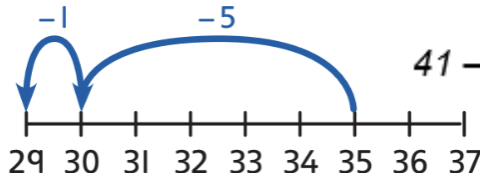
$$30 - 3 = 27$$

$$60 - 3 = 57$$

$$90 - 3 = 87$$



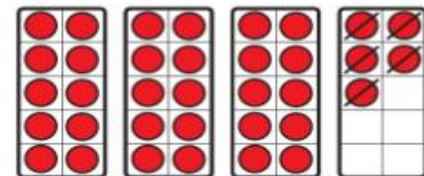
Subtract bridging a ten



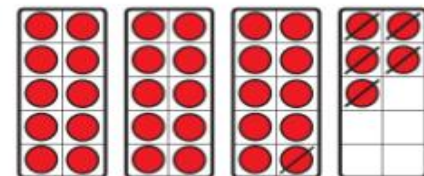
$$41 - 6 = 41 - 1 - 5$$

$$41 - 6 = 35$$

$$35 - 5 - 1 = 29$$



$$35 - 5 = 30$$



# Multiplication

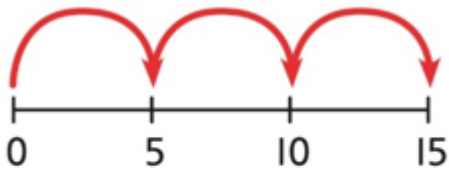


3 groups of 5 chairs  
15 chairs altogether

## Equal groups and repeated edition

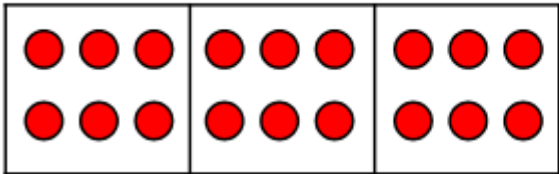
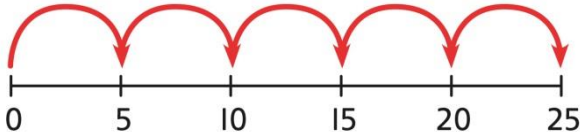
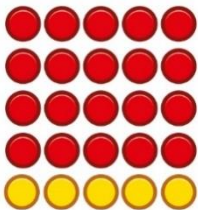


3 groups of 5  
15 in total



$5 + 5 + 5 = 15$   
 $3 \times 5 = 15$

## Using arrays to represent multiplication and support understanding

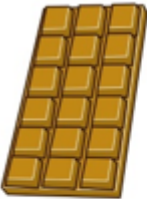


\_\_\_ + \_\_\_ + \_\_\_ = 18  
\_\_\_ × \_\_\_ = 18

## Understanding commutativity



This is 2 groups of 6 and also 6 groups of 2.

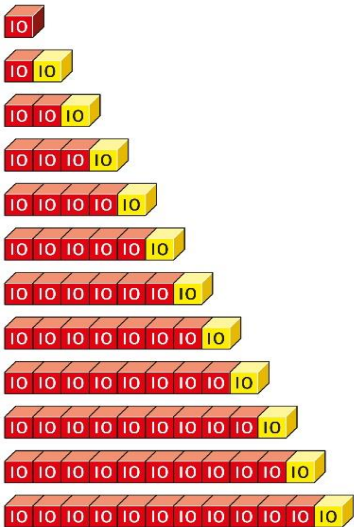
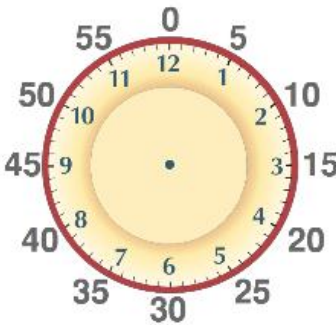
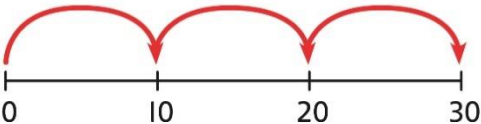
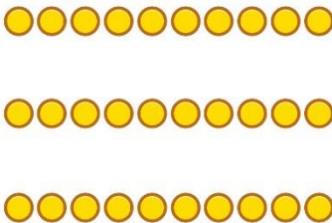


I can see 6 groups of 3.  
I can see 3 groups of 6.



$4 + 4 + 4 + 4 + 4 = 20$   
 $5 + 5 + 5 + 5 = 20$   
 $4 \times 5 = 20$  and  $5 \times 4 = 20$

## Learning x2, x5 and x10 table facts

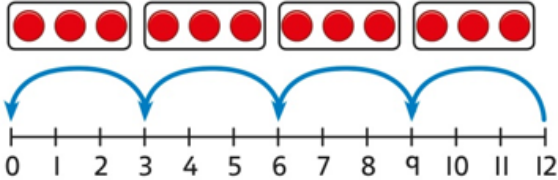


- $1 \times 10 =$
- $2 \times 10 =$
- $3 \times 10 =$
- $4 \times 10 =$
- $5 \times 10 =$
- $6 \times 10 =$
- $7 \times 10 =$
- $8 \times 10 =$
- $9 \times 10 =$
- $10 \times 10 =$
- $11 \times 10 =$
- $12 \times 10 =$



# Division

## Grouping equally



There are 4 groups now.

12 divided into groups of 3.  
 $12 \div 3 = 4$

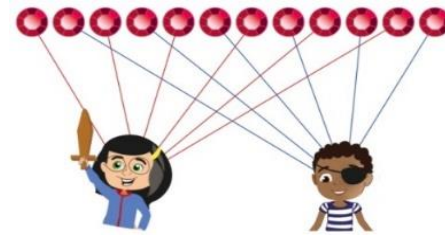
There are 4 groups.

$$12 \div 3 = 4$$

$$12 \div 4 = 3$$

$$12 \div 6 = 2$$

$$12 \div 2 = 6$$

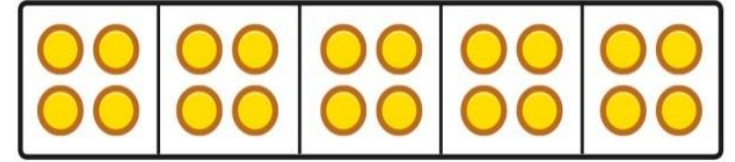


15

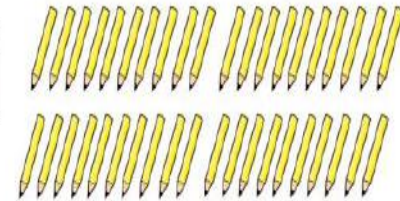
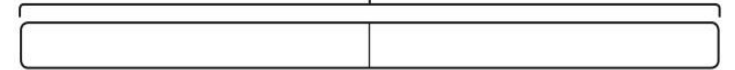


They get 5  each.

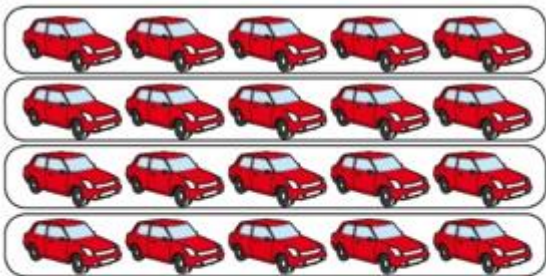
## Sharing equally



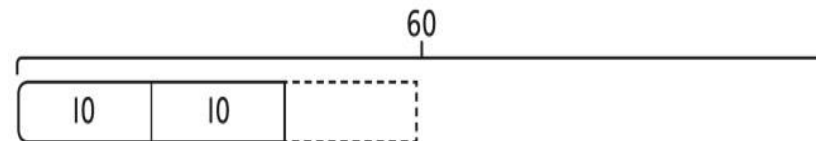
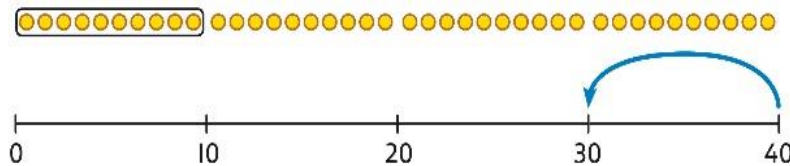
18



## Using known times-tables to solve divisions



4 groups of 5 cars is 20 cars in total.  
 20 divided by 4 is 5.



- $1 \times 10 = 10$
- $2 \times 10 = 20$
- $3 \times 10 = 30$
- $4 \times 10 = 40$
- $5 \times 10 = 50$
- $6 \times 10 = 60$
- $7 \times 10 = 70$
- $8 \times 10 = 80$

I used the 10 times-table to help me.  
 $3 \times 10 = 30$ .

I know that 3 groups of 10 makes 30, so I know that 30 divided by 10 is 3.

$$3 \times 10 = 30 \quad \text{so} \quad 30 \div 10 = 3$$

# Year 3

Key Vocabulary			
Number	Geometry	Statistics	Measurement
<b>thousands</b> , hundreds, tens, ones, place value, more, less, greater than, less than, equal to, order, compare, <b>estimate</b> , <b>exchange</b> , addition, subtraction, mental method, column method, exchange, <b>estimate</b> , <b>approximate</b> , <b>multiple</b> , digit, equal, multiply, divide, times-table, sharing, grouping, array, bar model, <b>remainder</b> , <b>repeated addition</b> , <b>multiplication sentence</b> , <b>division statement</b> , <b>division fact</b> , compare, more than, less than, greater than, equals, equally, least, most, share, partition, multi-step, equal parts, whole, unit fraction, equation, <b>integer</b> , non-unit fraction, numerator, denominator, represent, share, group, <b>mixed number</b> , whole number, divide, set of objects, multiply, <b>tenth</b> , <b>interval</b> , <b>equivalent</b> , <b>equivalent fraction</b> , compare, add, subtract, fraction, whole, greater than, less than, equal to, divide, difference, <b>inequality statement</b>	<b>right angle</b> , <b>obtuse</b> , <b>acute</b> , <b>parallel</b> , <b>perpendicular</b> , <b>vertical</b> , <b>horizontal</b> , triangle, quadrilateral, <b>kite</b> , <b>trapezium</b> , <b>rhombus</b> , <b>parallelogram</b> , cuboid, triangular prism, square-based pyramid, cone cylinder, edge, face, vertices, clockwise, anticlockwise	pictogram, key, <b>bar chart</b> , <b>scale</b> , <b>vertical axis</b> , <b>horizontal axis</b> , table, row, column	length, height, width, <b>perimeter</b> , distance, centimetre, <b>millimetre</b> , metre, <b>unit of measurement</b> , measure, add, subtract, multiply, equivalent, convert, greater than, less than, ruler, metre stick, pound, pence, <b>convert</b> , <b>total</b> , <b>difference</b> , change, mass, weight, measure, scale, <b>interval</b> , gram, kilogram, capacity, litre, millilitre, convert, month, year, <b>midnight</b> , <b>midday</b> , <b>am</b> , <b>pm</b> , duration, estimate, <b>consecutive</b> , hour, minute, second, past, to, start, end, <b>digital clock</b> , <b>analogue clock</b>

# Addition

Adding 100s

3 + 4 = 7

3 hundreds + 4 hundreds = 7 hundreds

300 + 400 = 700

3-digit number + 1s, with exchange

7

5 2

135 140 142

3-digit number + 1s, no exchange or bridging

100 LOLLIES 100 LOLLIES

10 LOLLIES

245 246 247 248 249 250

3-digit number + 10s, with exchange

385 + 50

There are 8 tens and 5 tens.

That is 13 tens.

385 + 50 = 300 + 130 + 5

385 + 50 = 435

3-digit number + 10s, no exchange

753 + 40

I know that 5 + 4 = 9

So, 50 + 40 = 90

753 + 40 = 793

3-digit number + 3-digit number, no exchange

3-digit number + 3-digit number, exchange required

Representing addition problems, and selecting appropriate methods

128 + 105 = 233

374

275 99

316

233 83

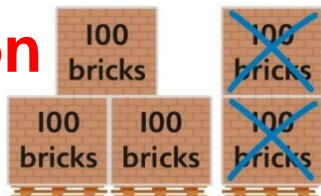
?

275 99

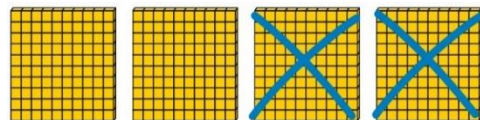
3-digit number + 2-digit number, exchange required



# Subtraction

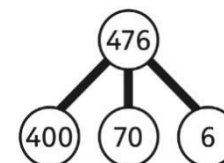


Subtracting 100s



3-digit number – 1s, no exchange

H	T	O
3	1	9



3-digit number – 1s, exchange or bridging required

H	T	O
3	1	9

H	T	O
3	1	8

3-digit number – 10s, no exchange

H	T	O
3	1	9

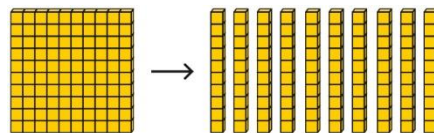


$$372 - 50 = ?$$

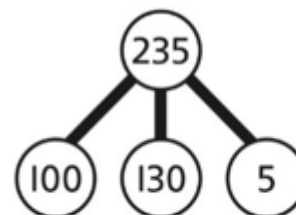
$$70 - 50 = 20$$

$$\text{So, } 372 - 50 = 322$$

3-digit number – 10s, exchange or bridging required



H	T	O
3	1	9

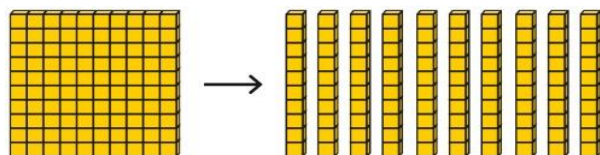


$$235 = 100 + 130 + 5$$

$$235 - 60 = 100 + 70 + 5$$

$$= 175$$

3-digit number – up to 3-digit number, exchange required



H	T	O
3	1	9

H	T	O
3	1	8

H	T	O
3	1	7

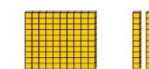
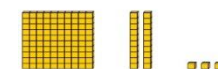
H	T	O
3	1	9
-	1	4
		7

H	T	O
3	1	9
-	1	4
		7

H	T	O
3	1	9
-	1	4
		7

H	T	O
3	1	9
-	1	4
		7

3-digit number – up to 3-digit number



H	T	O
3	1	9

H	T	O
3	1	8

H	T	O
3	1	7

H	T	O
3	1	9
-	1	4
		7

H	T	O
3	1	9
-	1	4
		7

H	T	O
3	1	9
-	1	4
		7

Representing subtraction problems

Team A

454

Team B

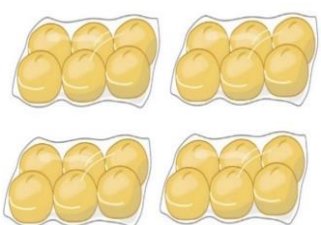
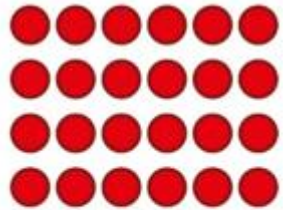
128

H	T	O
2	7	0
+	2	5
	5	2



# Multiplication

## Using commutativity to support understanding of the times-tables

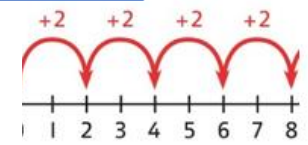
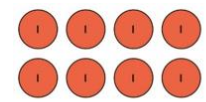


I need to work out 4 groups of 7.  
I know that  $7 \times 4 = 28$   
so, I know that  
4 groups of 7 = 28  
and  
7 groups of 4 = 28.

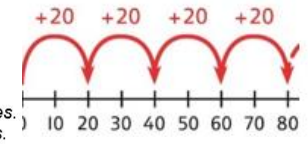
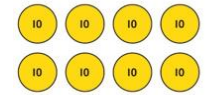
$6 \times 4 = 24$   
 $4 \times 6 = 24$

## Using known facts to multiply 10s

Make 4 groups of 3 ones.



Make 4 groups of 3 tens.



4 groups of 2 ones is 8 ones.  
4 groups of 2 tens is 8 tens.  
 $4 \times 2 = 8$   
 $4 \times 20 = 80$

$4 \times 23 = ?$

T	O
40	12

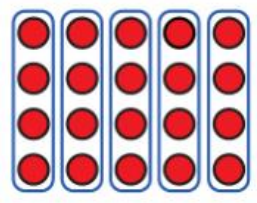
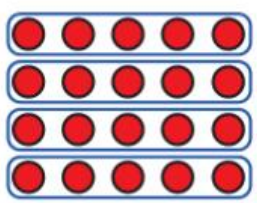
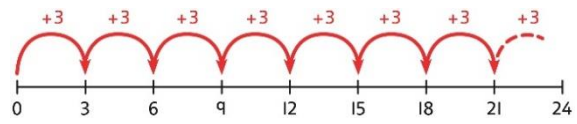
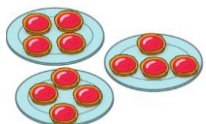
T	O
40	12

$4 \times 23 = 92$

T	O
40	12

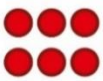
$5 \times 23 = ?$   
 $5 \times 3 = 15$   
 $5 \times 20 = 100$   
 $5 \times 23 = 115$

## Understanding equal grouping and repeated addition

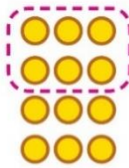


4	4	4	4	4	4
---	---	---	---	---	---

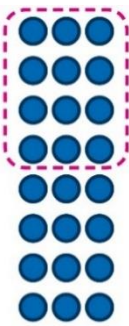
## Understanding and using x3, x2, x4 and x8 tables.



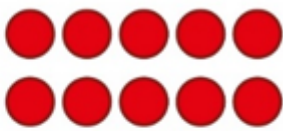
$3 \times 2 = 6$



$3 \times 4 = 12$



$3 \times 8 = 24$



Multiplying a 2-digit number by a 1-digit number

T	O
30	12

$3 \times 24 = ?$

T	O
30	12

$3 \times 4 = 12$

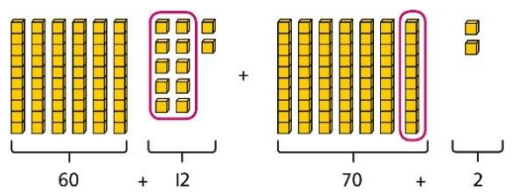
T	O
30	12

$3 \times 20 = 60$

$60 + 12 = 72$

$3 \times 24 = 72$

## Multiplying a 2-digit number by a 1-digit number, expanded column method



T	O
30	12

$$\begin{array}{r} \text{T O} \\ 30 \\ \times 24 \\ \hline \end{array}$$

$6 \times 5$   
 $6 \times 10$

$2 \times 5 = 10$   
 $5 \times 2 = 10$   
 $10 \div 5 = 2$   
 $10 \div 2 = 5$

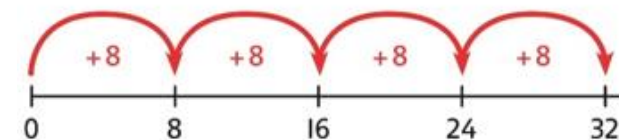


# Division

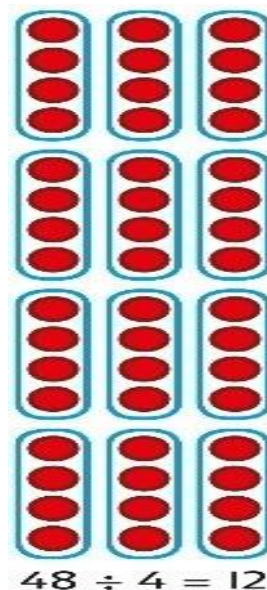
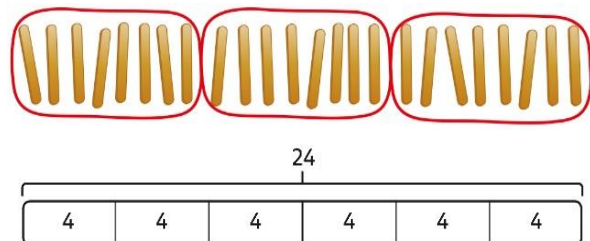
Using times – tables knowledge to divide



$$24 \div 8 = 3$$

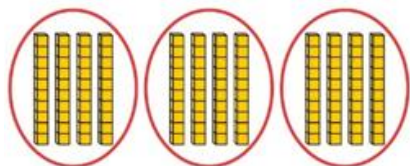


$$32 \div 8 = 4$$



$$48 \div 4 = 12$$

Using known facts to divide multiples of 10

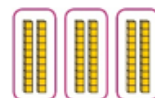


12 tens shared into 3 equal groups.  
4 tens in each group.

Make 6 ones divided by 3.



Now make 6 tens divided by 3.



$$180 \div 3 = ?$$

180 is 18 tens.

18 divided by 3 is 6.  
18 tens divided by 3 is 6 tens.

$$18 \div 3 = 6$$

$$180 \div 3 = 60$$

2-digit number divided by 1-digit number, with remainders

Make 29 from place value equipment.  
Share it into 2 equal groups.



There are two groups of 14 and  
1 remainder.



67 children try to make 5 equal lines.

$$67 = 50 + 17$$

$$50 \div 5 = 10$$

$$17 \div 5 = 3 \text{ remainder } 2$$

$$67 \div 5 = 13 \text{ remainder } 2$$

There are 13 children in each line and  
2 children left out.

Understanding remainders



$$22 \div 5 = ?$$

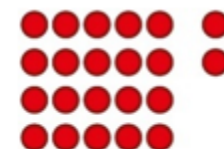
There are 13 sticks in total.

There are 3 groups of 4, with 1 remainder.

$$3 \times 5 = 15$$

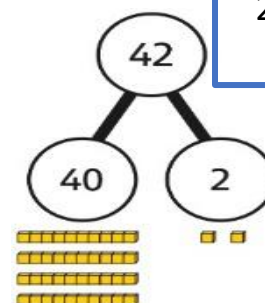
$$4 \times 5 = 20$$

$5 \times 5 = 25$  ... this is larger than 22  
So,  $22 \div 5 = 4$  remainder 2

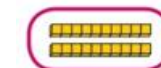
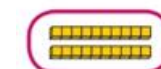


$$22 \div 5 = 4 \text{ remainder } 2$$

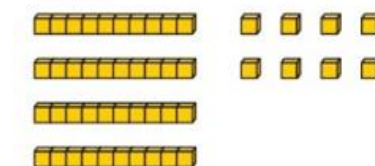
2-digit number divided by 1-digit  
number, no remainders



First divide the 10s.



Then divide the 1s.



$$48 \div 2 = ?$$

I need to partition 42 differently to divide  
by 3.

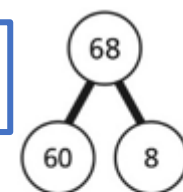
$$42 = 30 + 12$$

$$30 \div 3 = 10$$

$$12 \div 3 = 4$$

$$10 + 4 = 14$$

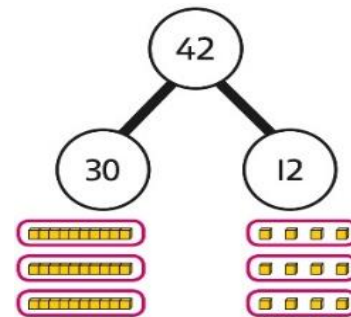
$$42 \div 3 = 14$$



$$60 \div 2 = 30$$

$$8 \div 2 = 4$$

$$68 \div 2 = 34$$



# Year 4

Key Vocabulary			
Number	Geometry	Statistics	Measurement
thousands, hundreds, tens, ones, <b>rounding</b> , order, more than, less than, partition, numeral, <b>nearest</b> , distance, <b>ascending</b> , <b>descending</b> , negative, <b>step</b> , multiple, greater than, less than, addition, total, more than, subtraction, less than, column method, estimate, how much, <b>strategy</b> , <b>efficient</b> , <b>accurate</b> , <b>exact</b> , <b>diagram</b> , fact, multiply, divide, multiplication facts, division facts, lots of, groups of, times-table, array, partition, bar model, part-whole model, remainder, <b>factor</b> , <b>factor pair</b> , <b>commutative</b> , Tenths, <b>hundredths</b> , <b>simplify</b> , equivalent, numerator, denominator, fraction, mixed number, add, subtract, fractions of an amount, <b>improper fraction</b> , <b>simplest fraction</b> , , <b>decimal point</b> , greater than, equivalent, less than, <b>decimal</b> , <b>0.1</b> , <b>0.01</b> , whole number, equal order, compare, convert, <b>decimal place</b> , ascending, descending	quadrilateral, triangle, <b>regular</b> , <b>irregular</b> , <b>interior angle</b> , angle, acute, obtuse, <b>reflect</b> , right angle, symmetrical, <b>isosceles</b> , <b>scalene</b> , <b>equilateral</b> , line of symmetry, <b>reflective symmetry</b> , position, horizontal, vertical, up, down, left, right, <b>coordinates</b> , square, rectangle, <b>plot</b> , <b>vertex</b> , <b>vertices</b> , <b>point</b> , <b>grid</b>	data, <b>line graph</b> , pictogram, bar chart, table, altogether, more than, greatest, smallest, <b>continuous data</b> , compare	length, width, perimeter, distance, rectangle, square, centimetre, metre, <b>around</b> , <b>rectilinear shape</b> , <b>kilometre</b> , <b>area</b> , space, <b>unit</b> , least, greatest, triangle, quadrilateral, <b>reflection</b> , <b>rotation</b> , <b>formula</b> , notes, coins, pounds, pence, add, subtract, change, round to the nearest, order, greater than, less than, <b>cheaper</b> , <b>more expensive</b> , estimate, <b>over estimate</b> , <b>under estimate</b> , <b>notation</b> , total, convert, compare, <b>unit of time</b> , second, minute, hour, day, week, month, year, <b>12-hour</b> , <b>24-hour</b> , analogue, digital, am, pm

# Addition

## Column addition

Th	H	T	O
1,000	500 400 300 200 100		40 30 20 10
	400 300 200 100 100	40 30 20 10 10	40 30 20 10 10
	400 300 200 100 100	40 30 20 10 10	40 30 20 10 10

Th	H	T	O
1,000	500 400 300 200 100	40 30 20 10	40 30 20 10
4,000 3,000 2,000 1,000	400 300	40 30 20 10	40 30 20 10
	400 300	40 30 20 10	40 30 20 10

Th	H	T	O
1,000	500 400 300 200 100	40 30 20 10	40 30 20 10
4,000 3,000 2,000 1,000	400 300	40 30 20 10	40 30 20 10
	400 300	40 30 20 10	40 30 20 10

Th	H	T	O
1,000	500 400 300 200 100	40 30 20 10	40 30 20 10
4,000 3,000 2,000 1,000	400 300	40 30 20 10	40 30 20 10
	400 300	40 30 20 10	40 30 20 10

Th	H	T	O
1,000	500 400 300 200 100	40 30 20 10	40 30 20 10
4,000 3,000 2,000 1,000	400 300	40 30 20 10	40 30 20 10
	400 300	40 30 20 10	40 30 20 10

Th	H	T	O
1	5	5	4
+	4	2	3
			7
			1

Th	H	T	O
1	5	5	4
+	4	2	3
			7
			1

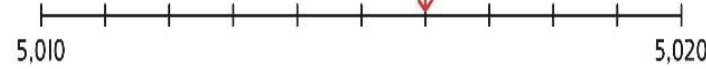
Th	H	T	O
1	5	5	4
+	4	2	3
			7
			1

Th	H	T	O
1	5	5	4
+	4	2	3
			7
			1

## Understanding numbers to 10,000



$$2,000 + 500 + 40 + 2 = 2,542$$



## Choosing mental methods where appropriate

$$4,256 + 300 = ?$$

$$2 + 3 = 5$$

$$200 + 300 = 500$$

$$4,256 + 300 = 4,556$$

Make 1,405 from place value equipment.

Add 2,000.

Now add the 1,000s.

1 thousand + 2 thousands = 3 thousands

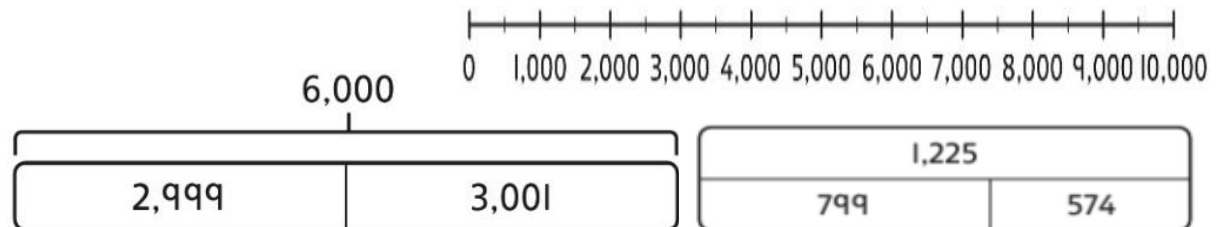
$$1,405 + 2,000 = 3,405$$

I can add the 100s mentally.

$$200 + 300 = 500$$

$$\text{So, } 4,256 + 300 = 4,556$$

## Representing additions and checking strategies

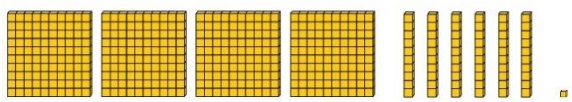
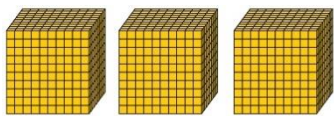


	Th	H	T	O
		7	9	9
+		5	7	4
	1	3	7	3
	1	1	1	



# Subtraction

Choosing mental methods where appropriate



Th	H	T	O
1,000 1,000 1,000 1,000	100 100 100 100 100	10 10 10 10 10	1 1 1 1 1
1,000 1,000	100		1

$3,501 - 2,000$

$3 \text{ thousands} - 2 \text{ thousands} = 1 \text{ thousand}$

$3,501 - 2,000 = 1,501$

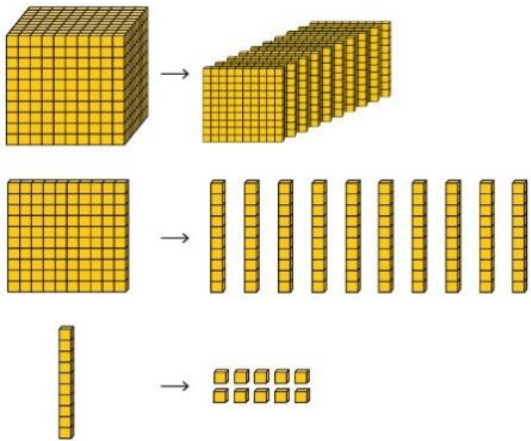
	Th	H	T	O
	1	2	5	0
-		3	2	0
				0

	Th	H	T	O
	1	2	5	0
-		3	2	0
			3	0

	Th	H	T	O
	1	2	5	0
-		3	2	0
		9	3	0

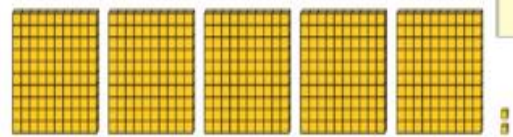
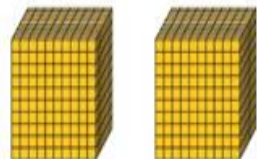
	Th	H	T	O
	1	2	5	0
-		3	2	0
		9	3	0

Column subtraction



Column subtraction with exchange across more than one column

$2,502 - 243 = ?$

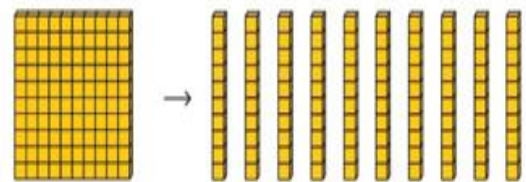


Th	H	T	O
1,000 1,000	100 100 100 100 100	10 10 10 10 10	1 1 1 1 1
	100		

Th	H	T	O
1,000 1,000	100 100 100 100 100	10 10 10 10 10	1 1 1 1 1
	100		

	Th	H	T	O
	2	5	0	2
-		2	4	3

I need to exchange a 10 for some 1s, but there are not any 10s here.



	Th	H	T	O
	2	5	0	2
-		2	4	3

	Th	H	T	O
	2	5	0	2
-		2	4	3
	2	2	5	9

Representing subtractions and checking strategies

Danny  $899 \leftarrow ?$

Luis  $1,005$

$1,225 - 799 = 574$

Total 5,762  
 $? + 2,899 = 5,762$   
Yes votes      No votes

	Th	H	T	O
+		7	9	9
		5	7	4
	1	3	7	3
	1	1	1	

	Th	H	T	O
	1	2	5	0
-		3	2	0

	Th	H	T	O
	1	2	5	0
-		3	2	0

	Th	H	T	O
	1	2	5	0
-		3	2	0

	Th	H	T	O
	1	2	5	0
-		3	2	0

# Multiplication

Multiplying by multiples of 10 and 100

$$4 \times 7 = 28$$

$$4 \times 70 = 280$$

$$40 \times 7 = 280$$

$$4 \times 700 = 2,800$$

$$400 \times 7 = 2,800$$

Understanding times-tables up to  $12 \times 12$



$$5 \times 1 = 5$$



$$5 \times 0 = 0$$



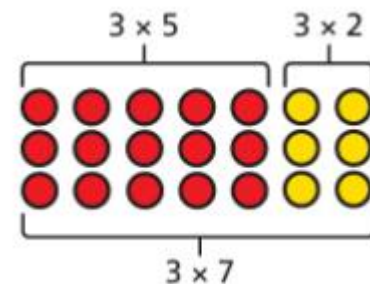
$$2 \times 11 = 20 + 2$$

$$3 \times 11 = 30 + 3$$

$$4 \times 11 = 40 + 4$$



$$4 \times 12 = 40 + 8$$

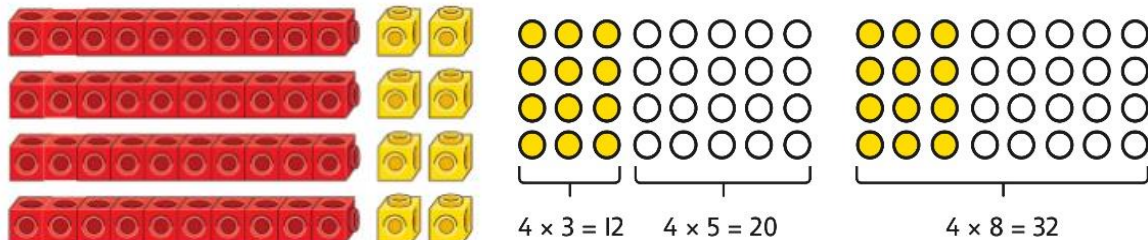


$$3 \times 5$$

$$3 \times 2$$

$$3 \times 7$$

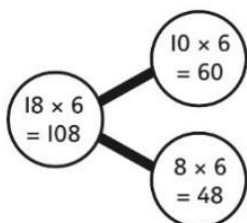
Understanding and using partitioning in multiplication



$$4 \times 3 = 12$$

$$4 \times 5 = 20$$

$$4 \times 8 = 32$$



$$18 \times 6 = 10 \times 6 + 8 \times 6 = 60 + 48 = 108$$

Column multiplication for 2- and 3-digit numbers multiplied by a single digit

Make  $4 \times 136$  using equipment.



$$2 \times 6 \times 10 = 120$$

$$12 \times 10 = 120$$

$$10 \times 6 \times 2 = 120$$

$$60 \times 2 = 120$$

$$\begin{array}{r} 23 \\ \times 5 \\ \hline 115 \end{array}$$

$$\begin{array}{r} 23 \\ \times 5 \\ \hline 115 \end{array}$$

I can work out how many 1s, 10s and 100s.

There are  $4 \times 6$  ones...

24 ones

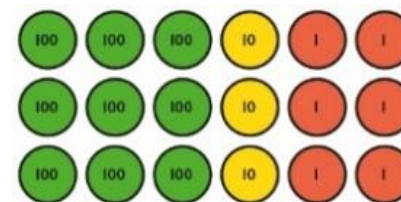
There are  $4 \times 3$  tens...

12 tens

There are  $4 \times 1$  hundreds...

4 hundreds

$$24 + 120 + 400 = 544$$



$$\begin{array}{r} 312 \\ \times 3 \\ \hline 936 \end{array}$$

Multiplying more than two numbers

$$12 \times 2 \times 5 =$$

$$12 \times 10 = 120$$

$$\text{So, } 24 \times 5 = 120$$

$$5 \times 2 \times 3 = 30$$

$$10 \times 3 = 30$$



Each sheet has  $2 \times 5$  stickers.  
There are 3 sheets.

There are  $5 \times 2 \times 3$  stickers in total.



# Division

I know that  $5 \times 7 = 35$

so I know all these facts:

$$5 \times 7 = 35$$

$$7 \times 5 = 35$$

$$35 = 5 \times 7$$

$$35 = 7 \times 5$$

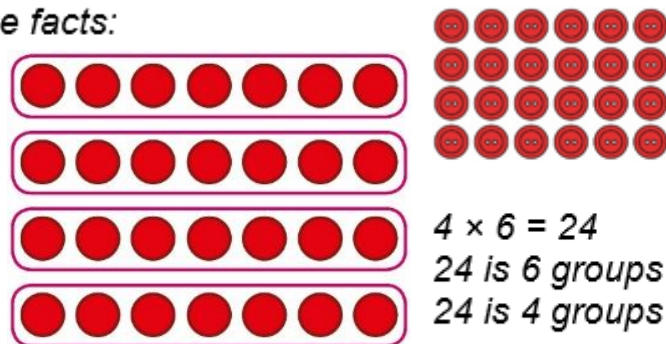
$$35 \div 5 = 7$$

$$35 \div 7 = 5$$

$$7 = 35 \div 5$$

$$5 = 35 \div 7$$

$$28 \div 7 = 4$$



$$4 \times 6 = 24$$

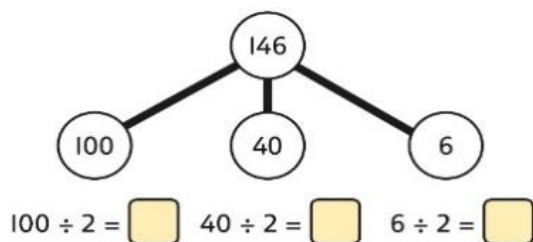
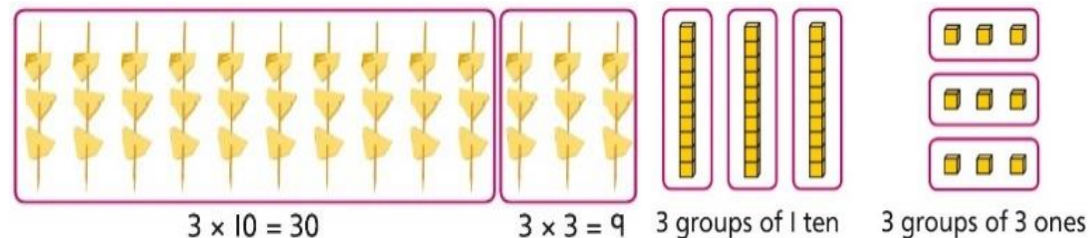
24 is 6 groups of 4.

24 is 4 groups of 6.

24 divided by 6 is 4.

24 divided by 4 is 6.

Dividing 2-digit and 3-digit numbers by a single digit by partitioning into 100s, 10s and 1s



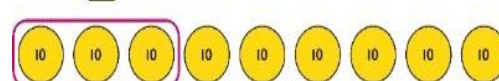
Understanding the relationship between multiplication and division, including times-tables

Dividing multiples of 10 and 100 by a single digit

$$9 \div 3 = \square$$



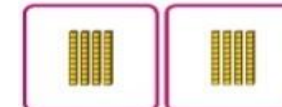
$$90 \div 3 = \square$$



$$900 \div 3 = \square$$



$$15 \div 3 = 5$$

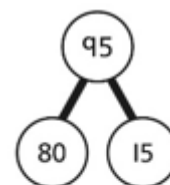
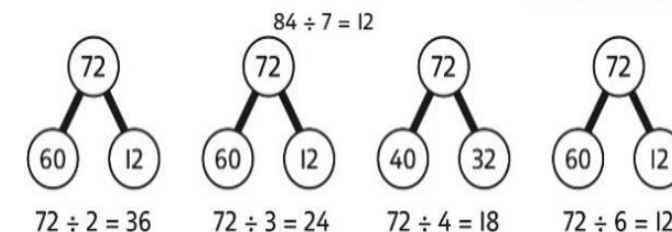
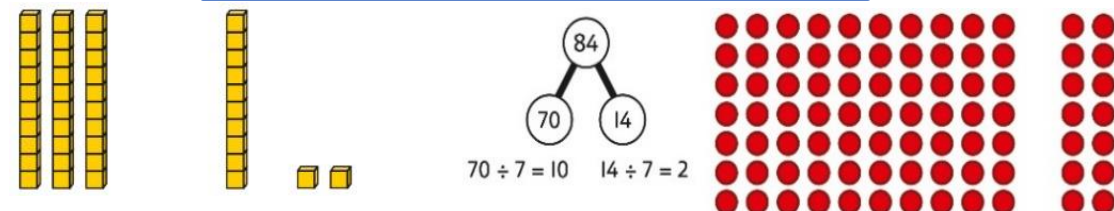


$$150 \div 3 = 50$$



$$1500 \div 3 = 500$$

Dividing 2-digit and 3-digit numbers by a single digit, using flexible partitioning

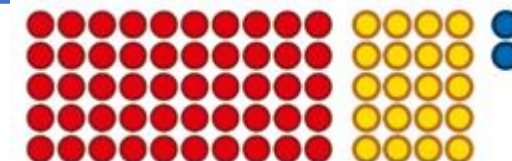
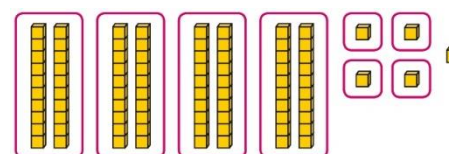


$$80 \div 4 = 20$$

$$12 \div 4 = 3$$

$$95 \div 4 = 23 \text{ remainder } 3$$

Understanding remainders



$$72 \div 5 = 14 \text{ remainder } 2$$

# Year 5

## Key Vocabulary

### Number

ones, tens, hundred, thousands, **ten thousands**, **hundred thousands**, **million**, **sequence**, place value, partition, estimate, round, compare, order, equivalent, greater than, less than, **convert**, add, subtract, ones, tens, hundreds, thousands, ten thousands, **mentally**, inverse, round, estimate, **distance chart**, **prime number**, **composition number**, **square number**, **cube number**, **inverse operation**, **factor prime factor**, multiply, divide, multiple, place value, partition, equal, remainder, total, equivalent, numerator, denominator, whole, fraction, simplify, expand, division, improper, mixed number, convert, sequence, order, greater than, less than, equal to, proper fraction, improper fraction, efficient, **common denominator**, equal parts, divide, multiply, fractions of an amount, operator, decimal, decimal place, tenth, hundredths, **thousandths**, decimal point, place value, digit, fraction, add, subtract, multiply, divide, whole, column, exchange, **per cent**, **percentages**

### Geometry

angle, whole turn, right angle, acute angle, obtuse angle, **reflex angle**, **degree**, **interior angle**, **orientation**, clockwise, anticlockwise, parallel, perpendicular, angle, quadrilateral, view, regular, irregular, 3D shape, pyramid, sphere, cone, hexagon, pentagon, triangle, **top view**, **plan view**, **side view**, **reflection**, **translation**, vertex, vertices, coordinates, **mirror line**, horizontal axis, vertical axis

### Statistics

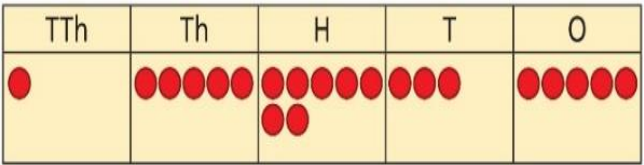
graph, line graph, table, **dual line graph**, horizontal, vertical, **two-way table**, scale, axis/axes, data, **plot/plotted**, tallies/tally, digit

### Measurement

perimeter, distance, area, space, length, width, centimetre, **square centimetre**, metre, **square metre**, scale, compare, estimate, formula, 2d shape, **brackets**, convert, **metric unit**, **imperial unit**, **kilo**, kilogram, gram, millimetre, centimetre, metre, kilometre, litre, millilitre, **pound**, **ounce**, **inch**, **foot**, **yard**, **pint**, **gallon**, **stone**, approximately, **volume**, cube, cuboid, 3D shape, solid, capacity, calculate, estimate, **unit cube**, least, greatest

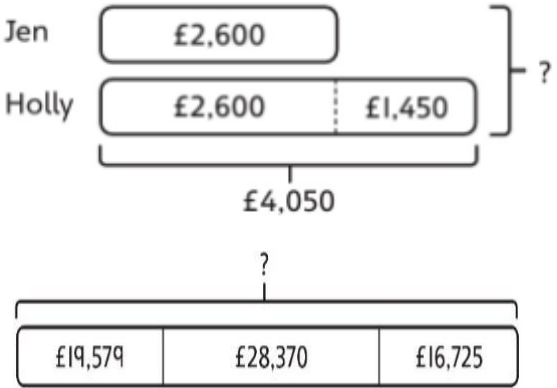
# Addition

Column addition with whole numbers



	TTh	Th	H	T	O
	1	9	1	7	5
+	1	8	4	1	7
	3	7	5	9	2
	1			1	

	TTh	Th	H	T	O
	2	0	1	5	3
+	1	9	1	7	5
	3	9	3	2	8
			1		



Representing additions

	Th	H	T	O
	2	6	0	0
+	1	4	5	0
	4	0	5	0
	1			

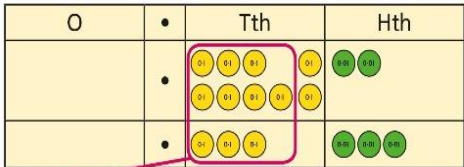
	Th	H	T	O
	2	6	0	0
+	4	0	5	0
	6	6	5	0

	TTh	Th	H	T	O
	2	3	4	0	5
+		7	8	9	2
	2	0	2	9	7

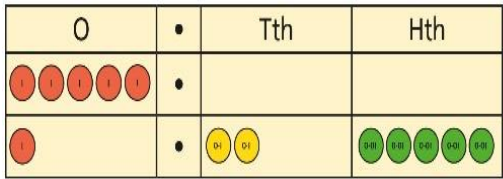
	TTh	Th	H	T	O
	2	3	4	0	5
+		7	8	9	2
	3	1	2	9	7

Adding tenths

Adding decimals using column addition



O	Tth	Hth
0	9	2
+	0	3
	1	2
		5

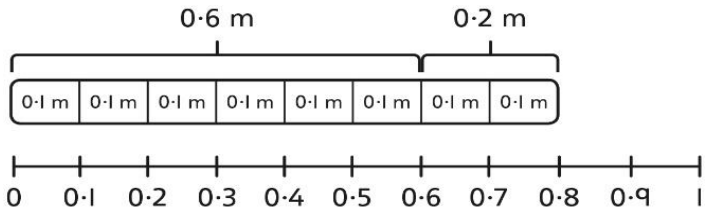


O	Tth	Hth
3	4	0
+	0	6
	4	5

O	Tth	Hth
0	9	2
+	0	3
	1	2
		5

O	Tth	Hth
3	4	0
+	0	6
	4	5

O	Tth	Hth
0	2	3
+	0	4
	0	6
		8



$$\frac{6}{10} + \frac{2}{10} = \frac{8}{10}$$

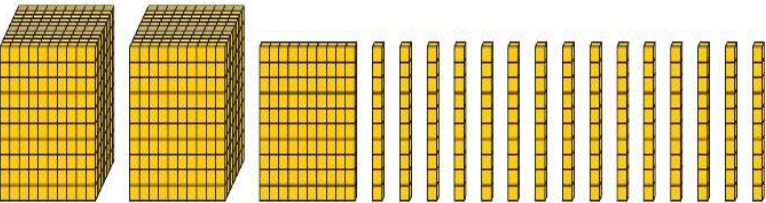
6 tenths + 2 tenths = 8 tenths

$$0.6 + 0.2 = 0.8$$



# Subtraction

## Column subtraction with whole numbers



	TTh	Th	H	T	O
	1	5	7	3	5
-		2	5	8	2
					3

	TTh	Th	H	T	O
	1	5	<del>7</del> <sup>6</sup>	<del>3</del> <sup>1</sup>	5
-		2	5	8	2
				5	3

	TTh	Th	H	T	O
	1	5	<del>7</del> <sup>6</sup>	<del>3</del> <sup>1</sup>	5
-		2	5	8	2
	1	3	1	5	3

TTh	Th	H	T	O
●	●●●●●	●●●●●	●●●	●●●●

Now subtract the 10s.  
Exchange 1 hundred for 10 tens.

TTh	Th	H	T	O
●	●●●●●	●●●●●	●●●●●	●●●●

Subtract the 100s, 1,000s and 10,000s.

TTh	Th	H	T	O
●	●●●●	●●●●	●●●●	●●●●

	TTh	Th	H	T	O
	<del>1</del> <sup>5</sup>	<del>5</del> <sup>1</sup>	2	5	9
-	1	8	0	3	4
	4	4	5	6	3

## Subtracting decimals

O	•	Tth	Hth
●●●●●	•	●●●●●	●●●●●

Exchange 1 tenth for 10 hundredths.

O	•	Tth	Hth
●●●●●	•	●●●●●	●●●●●

Now subtract the 5 hundredths.

O	•	Tth	Hth
●●●●●	•	●●●●●	●●●●●

Now subtract the 2 tenths, then the 2 ones.

O	•	Tth	Hth
●●●●●	•	●●●●●	●●●●●

O	•	Tth	Hth
5	•	7	4
-		2	2
			5

O	•	Tth	Hth
5	•	<del>7</del> <sup>6</sup>	<del>4</del> <sup>14</sup>
-		2	2
			5

O	•	Tth	Hth
5	•	<del>7</del> <sup>6</sup>	<del>4</del> <sup>14</sup>
-		2	2
			9

O	•	Tth	Hth
5	•	<del>7</del> <sup>6</sup>	<del>4</del> <sup>14</sup>
-		2	2
		3	4

## Checking strategies and representing subtractions

Athletics Stadium	75,450
Hockey Centre	42,300
Velodrome	15,735

### Bella's working

	TTh	Th	H	T	O
	1	7	8	7	7
+	4	0	1	2	
	5	7	9	9	7

### Correct method

	TTh	Th	H	T	O
	1	7	8	7	7
+		4	0	1	2
	2	1	8	8	9

0.49 m

1 m - 0 m = 0 m

O	•	Tth	Hth	Thth
3	•	9	2	1
-		3	7	5
				0

# Multiplication

## Multiplying by 10, 100 and 1,000



$$7 \times 10 = 70$$

$$7 \times 100 = 7,000$$

$$7 \times 1,000 = 70,000$$

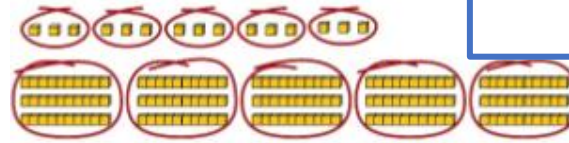
$4 \times 1 = 4 \text{ ones} = 4$	
$4 \times 10 = 4 \text{ tens} = 40$	
$4 \times 100 = 4 \text{ hundreds} = 400$	

H	T	O
	1	7

$$17 \times 10 = 170$$

$$17 \times 100 = 17 \times 10 \times 10 = 1,700$$

$$17 \times 1,000 = 17 \times 10 \times 10 \times 10 = 17,000$$



$$5 \times 4 = 20$$

$$5 \times 40 = 200$$

$$5 \times 400 = 2,000$$

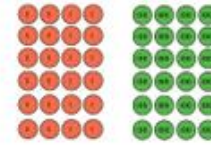
$$5 \times 4,000 = 20,000$$

$$5,000 \times 4 = 20,000$$



$$4 \times 3 = 12$$

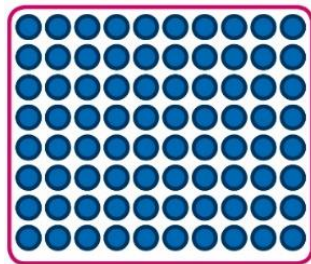
$$4 \times 300 = 1,200$$



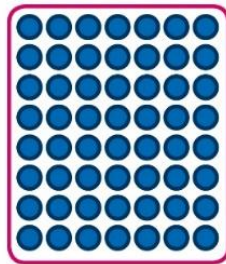
$$6 \times 4 = 24$$

$$6 \times 400 = 2,400$$

## Multiplying up to 4-digit numbers by a single digit



$$8 \times 10 = 80$$



$$8 \times 7 = 56$$

$$80 + 56 = 136$$

$$100 \quad 60 \quad 3$$

5	$100 \times 5 = 500$	$60 \times 5 = 300$	$3 \times 5 = 15$
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$$\begin{array}{r} 136 \\ \times 5 \\ \hline 680 \\ 500 \\ \hline 680 \end{array}$$

H	T	O
100	10 10 10 10 10	1 1 1
100	10 10 10 10 10	1 1 1
100	10 10 10 10 10	1 1 1
100	10 10 10 10 10	1 1 1
100	10 10 10 10 10	1 1 1

## Multiplying 2-digit numbers by a 2-digit numbers



$$10 \times 15 = 150$$



$$10 \times 15 = 150$$



$$3 \times 15 = 45$$

There are 345 bottles of milk in total.

	20 m	8 m
10 m	$20 \times 10 = 200 \text{ m}^2$	$8 \times 10 = 80 \text{ m}^2$
5 m	$20 \times 5 = 100 \text{ m}^2$	$8 \times 5 = 40 \text{ m}^2$

$$\begin{array}{r} 34 \\ \times 27 \\ \hline 238 \\ 680 \\ \hline 918 \end{array}$$

## Multiplying a 4-digit by 2-digits

	100	40	3
10			
2			

$$143 \times 12 = 1,716$$

There are 1,716 boxes of cereal in total.

Th	H	T	O
1	0	0	0
4	0	0	0
2	0	0	0
8	0	0	0
3	0	0	0
6	0	0	0
1	7	1	6

1	4	3
1	2	
2	8	6
1	4	3
1	7	1

$$143 \times 2$$

$$143 \times 10$$

$$143 \times 12$$

1	2	7	4
3	2		
2	5	4	8
3	8	2	0
4	0	7	6

$$1,274 \times 2$$

$$1,274 \times 30$$

$$1,274 \times 32$$

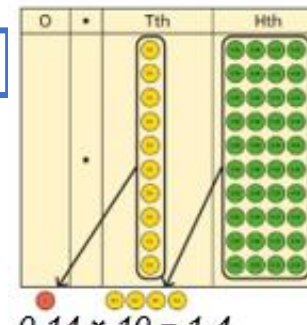
## Multiplying decimals by 10, 100 and 1,000

$$2.5 \times 10 = 25$$

$$2.5 \times 100 = 250$$

$$2.5 \times 1,000 = 2,500$$

Th	H	T	O	•	Tth
			2	•	5
		2	5	•	
	2	5	0	•	
2	5	0	0	•	



$$0.14 \times 10 = 1.4$$



# Division

Divide whole numbers by 10, 100 and 1,000

4,000  
1,000 ×

380 ÷ 10 = 38

Th	H	T	O
3	2	0	0

3,200 ÷ 100 = ?

380 is 38 tens.  
38 × 10 = 380  
10 × 38 = 380  
So, 380 ÷ 10 = 38

3,200 is 3 thousands and 2 hundreds.

$$200 \div 100 = 2$$

$$3,000 \div 100 = 30$$

$$3,200 \div 100 = 32$$

Dividing up to four digits by a single digit using short division

4 | 9 2

First, lay out the problem.

4 | 2 | 9 2

How many groups of 4 go into 9 tens? 2 groups of 4 tens with 1 ten left over.

4 | 2 | 9 2

Exchange the 1 ten left over for 10 ones. We now have 12 ones.

4 | 2 | 9 2

How many groups of 4 go into 12 ones? 3 groups of 4 ones.

136	136	136	136	136	3
-----	-----	-----	-----	-----	---

$$683 = 136 \times 5 + 3$$

$$683 \div 5 = 136 r 3$$

Dividing decimals by 10, 100 and 1,000

O	•	Tth	Hth
8	•	5	
0	•	0	8

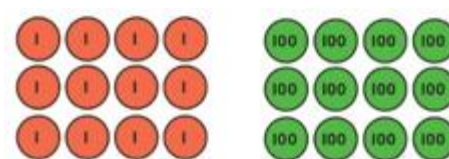
  

O	•	Tth	Hth
0	•	8	5
0	•	0	8

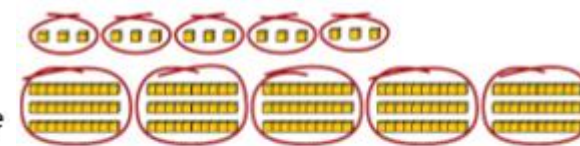
O	•	Tth	Hth
0	•	8	5
0	•	0	8

Dividing by multiples of 10, 100 and 1,000



12 ones divided into groups of 4. There are 3 groups.

12 hundreds divided into groups of 4 hundreds. There are 3 groups.



15 ones put into groups of 3 ones. There are 5 groups.  
15 ÷ 3 = 5

$$3,000 \div 5 = 600$$

$$3,000 \div 50 = 60$$

$$3,000 \div 500 = 6$$

$$5 \times 600 = 3,000$$

$$50 \times 60 = 3,000$$

$$500 \times 6 = 3,000$$

Understanding remainders

T	O
10 10 10 10 10	
10 10 10	

Lay out the problem as short division.

T	O
10 10 10 10 10	
10 10 10	

How many groups of 6 go into 8 tens? There is 1 group of 6 tens.

There are 2 tens remaining.

T	O
10 10 10	1 1 1 1 1 1 1 1 1 1
10 10 10	1 1 1 1 1 1 1 1 1 1

How many groups of 6 go into 20 ones? There are 3 groups of 6 ones.

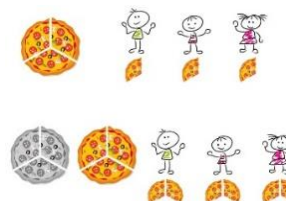
There are 2 ones remaining.

80 cakes divided into trays of 6.



80 cakes in total. They make 13 groups of 6, with 2 remaining.

Understanding the relationship between fractions and divisions



$$1 \div 3 = \frac{1}{3}$$

$$5 \div 4 = \frac{5}{4} = 1 \frac{1}{4}$$

$$11 \div 4 = \frac{11}{4} = 2 \frac{3}{4}$$



# Year 6

## Key Vocabulary

Number	Geometry	Statistics	Measurement	Algebra	Ratio and proportion
ten thousands, hundred thousand, millions, ten million, place value, partition, interval, estimate, compare, order, equal to, rounding, negative, positive, column addition, column subtraction, <b>order of operations, brackets</b> , inverse operation, column multiplication, short division, long division, remainder, factor, common factor, common multiple, prime, composite, squared, cubed, multiple, estimate, <b>long division, order of operations</b> , numerator, denominator, common denominator, <b>common factor</b> , equivalent, simplify, simplest form, factor, whole number, mixed number, <b>highest common factor, lowest common multiple</b> , compare, order, ascending, descending, proper fraction, improper fraction, mixed number, convert, <b>lowest common denominator</b> , Per cent, percentages, part, whole, decimal, fraction, divide, share, multiply, convert, equivalent fraction, simplify, less than, more than, multiply, divide, decimal, decimal place, <b>recurring decimal</b> , placeholder, place value, tenth, hundredth, thousandth, product, fraction	degree, angle, obtuse, acute, reflex, right angle, protractor, triangle, isosceles, scalene, regular, polygon, quadrilateral, parallelogram, kite, rhombus, trapezium, <b>diameter, radius, circumference, concentric</b> , perimeter, <b>net</b> , pyramid, <b>tetrahedron</b> , cylinder, prism, cuboid, cube, <b>vertically opposite angles, quadrant</b> , four quadrants, <b>translate</b> , translation, x-axis, y-axis, axis, axes, horizontal, vertical, vertex, <b>reflect</b> , reflection.	<b>mean, average, pie chart, segment</b> , line graph, bar chart, percentage, fraction, data	metric, imperial, unit of measurement, gram, kilogram, pound, ounce, mass, millilitre, litre, pint, capacity, millimetre, centimetre, metre, millimetre, inch, foot, yard, mile, length, convert, <b>conversion table, conversion graph</b> , area, volume, perimeter, parallelogram, height, enclosed, width, length, square centimetre, square metre, base, estimate, formula, <b>compound shape, cubic centimetre, cubic metre</b>	algebra, <b>formula, formulae, equation</b> , unknown, variable, sequence, <b>rule</b> , term, <b>substitute, expression</b> , calculation, operation, generalise, inverse, solution	<b>ratio, proportion</b> , part, whole, scale, <b>scale factor</b> , notation, <b>similar</b>

# Addition

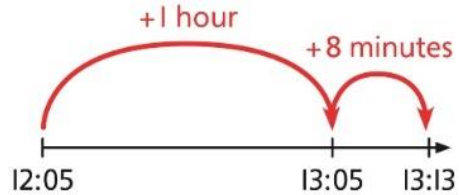
## Comparing and selecting efficient methods

M	HTh	TTh	Th	H	T	O
●●	●●●●	●	●	●●●		●

TTh	Th	H	T	O
3	2	1	4	5
+	4	3	0	2
3	6	4	4	7

TTh	Th	H	T	O
3	2	1	4	5
+	4	3	0	2
7	5	1	6	5

H	T	O	Tth	Hth
1	4	0	0	9
+	4	9	8	9
1	8	9	9	8



40,365	3,572

	TTh	Th	H	T	O
	4	0	3	6	5
+		3	5	7	2

## Selecting mental methods for larger numbers where appropriate

M	HTh	TTh	Th	H	T	O
●●	●●●●	●	●	●●●		●

$$2,411,301 + 500,000 = ?$$

This would be 5 more counters in the HTh place.

So, the total is 2,911,301.

$$2,411,301 + 500,000 = 2,911,301$$

$$257,000 + 99,000 = ?$$

£257,000	£100,000

I added 100 thousands then subtracted 1 thousand.

257 thousands + 100 thousands = 357 thousands

$$257,000 + 100,000 = 357,000$$

$$357,000 - 1,000 = 356,000$$

$$\text{So, } 257,000 + 99,000 = 356,000$$

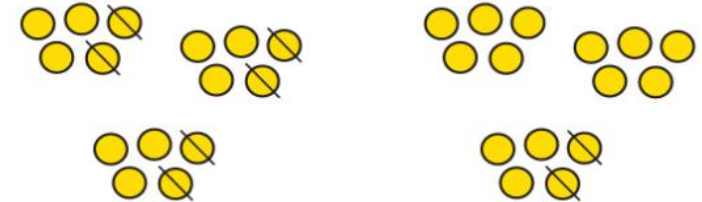
$$195,000 + 6,000 = ?$$

$$195 + 5 + 1 = 201$$

195 thousands + 6 thousands = 201 thousands

$$\text{So, } 195,000 + 6,000 = 201,000$$

## Understanding order of operations in calculations



$$3 \times (5 - 2)$$

$$\downarrow \quad \downarrow$$

$$3 \times 3 = 9$$

$$(3 \times 5) - 2$$

$$\downarrow \quad \downarrow$$

$$15 - 2 = 13$$

cab	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	16 × 4
trailer	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	16 × 6
		?

This can be written as:

$$16 \times 4 + 16 \times 6$$

$$64 + 96 = 160$$

$$4 + 6 \times 16$$

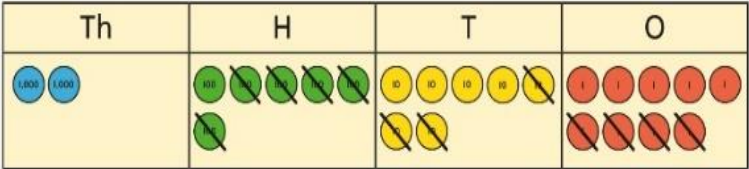
$$4 + 96 = 100$$

$$(4 + 6) \times 16$$

$$10 \times 16 = 160$$

# Subtraction

Comparing and selecting efficient methods

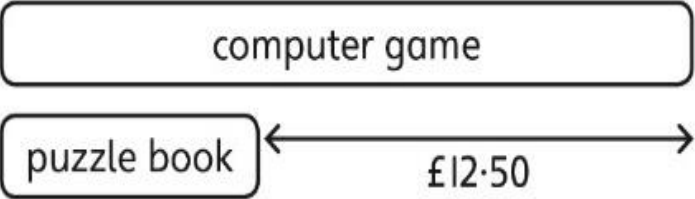
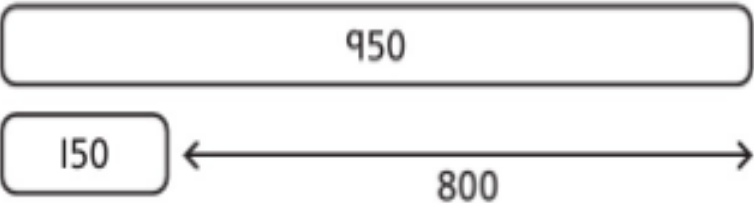
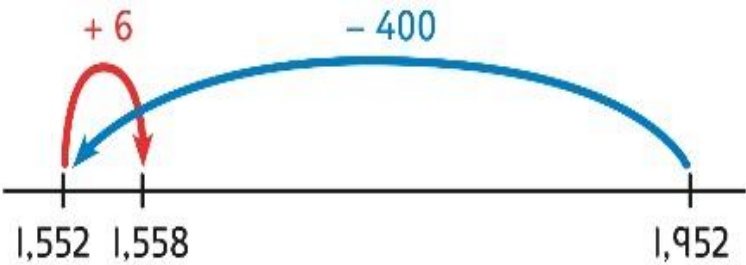


H	T	O	·	Tth	Hth
3	0	9	·	6	0
<hr/>					
2	0	6	·	4	0
<hr/>					
1	0	3	·	2	0



	Th	H	T	O
	2	6	7	9
-		5	3	4
	2	1	4	5

Th	H	T	O
1	<del>8</del>	<del>14</del>	2
<hr/>			
-	1	5	8
<hr/>			
	3	9	4







# Division

## Dividing by a single digit

How many groups of 6 are in 1 hundred?

How many groups of 6 are in 13 tens?

How many groups of 6 are in 12 ones?

$$6 \times ? = 132$$

$$132 = 120 + 12$$

$$132 \div 6 = 20 + 2 = 22$$

	0		
6	1	3	2

## Dividing by a 2-digit number using factors

$$1,260 \div 14 = ?$$

$$1,260 \div 2 = 630$$

$$630 \div 7 = 90$$

$$1,260 \div 14 = 90$$

$$2,100 \rightarrow \div 2 \rightarrow \div 6 \rightarrow$$

$$2,100 \rightarrow \div 6 \rightarrow \div 2 \rightarrow$$

$$2,100 \rightarrow \div 3 \rightarrow \div 4 \rightarrow$$

$$2,100 \rightarrow \div 4 \rightarrow \div 3 \rightarrow$$

$$2,100 \rightarrow \div 3 \rightarrow \div 2 \rightarrow \div 2 \rightarrow$$

## Dividing by a 2-digit number using long division

Use equipment to build numbers from groups.

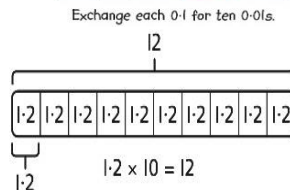
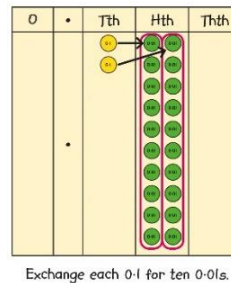


182 divided into groups of 13.  
There are 14 groups.

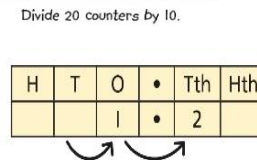
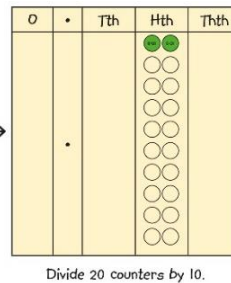
	?		
13	377		
	10	?	
13	130	247	
	10	10	?
13	130	130	117
	29		
	10	10	9
13	130	130	117

		2	9
13	3	7	7
-	1	3	0
	2	4	7
-	1	3	0
	1	7	7
-	1	7	7
			0

$$21 \overline{) 798} \\ - 630 \\ \hline 168$$



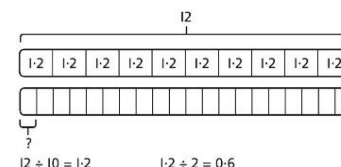
## Dividing by 10, 100 and 1,000



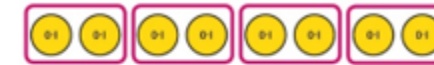
$$40 \div 50 = \square$$

$$40 \rightarrow \div 10 \rightarrow \div 5 \rightarrow ?$$

$$40 \rightarrow \div 5 \rightarrow \div 10 \rightarrow ?$$



## Dividing decimals



8 tenths divided into 4 groups. 2 tenths in each group.

0.8			
?	?	?	?

$$4 \times 2 = 8$$

$$8 \div 4 = 2$$

$$\text{So, } 4 \times 0.2 = 0.8$$

$$0.8 \div 4 = 0.2$$

$$8 \overline{) 4.24}$$

$$8 \overline{) 4.24}$$

$$8 \overline{) 4.24}$$

$$8 \overline{) 4.24}$$