KS2 Mathematical Methods

including arithmetic strategies

Working with parents to support children’s learning

Thank you for continuing to support your child’s learning

Please take a pack from the table, find a place to sit and get comfortable!

ALARM BELL
120VAC

In case of a fire alarm, please exit the building via your nearest door and gather on the junior playground

I will be taking photos throughout the session, I will try and take these of your backs but if you don't want to be in the photo, please let me know

Schoolgateway
Latest News
Welcome to Ladbrooke JMI School Website

I will be attaching all relevant paper work, including the PowerPoint for this workshop on the school website. Go to 'Curriculum' and 'Maths'.

Aims

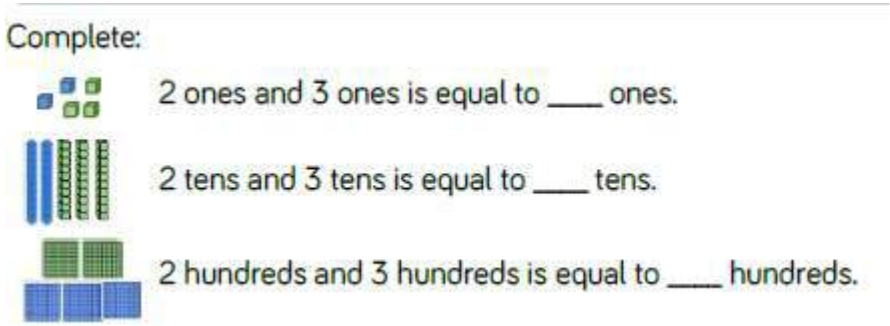
- Understand the expectations for the use of different strategies to solve problems.
- Consider the different methods your child would have been taught at Ladbrooke to solve a given problem.
- Use mental strategies to quickly work through problems.
- Use written methods practised in school to solve problems.

Year 3 programme of study (statutory requirements)

Number and place value	**Addition and subtraction**	**Multiplication and division**	**Fractions**	**Measurement**	**Geometry: properties of shapes**	**Statistics**
Pupils should be taught to: ▪ count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number ▪ recognise the place value of each digit in a three-digit number (hundreds, tens, ones) ▪ compare and order numbers up to 1000 ▪ identify, represent and estimate numbers using different representations ▪ read and write numbers up to 1000 in numerals and in words ▪ solve number problems and practical problems involving these ideas	Pupils should be taught to: ▪ add and subtract numbers mentally, including: - a three-digit number and ones - a three-digit number and tens - a three-digit number and hundreds ▪ add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction ▪ estimate the answer to a calculation and use inverse operations to check answers ▪ Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	Pupils should be taught to: ▪ recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables ▪ write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods ▪ solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects	Pupils should be taught to: ▪ count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 ▪ recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators ▪ recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators ▪ recognise and show, using diagrams, equivalent fractions with small denominators ▪ add and subtract fractions with the same denominator within one whole (for example, $^{5}/_{7} + ^{1}/_{7} = ^{6}/_{7}$) ▪ compare and order unit fractions, and fractions with the same denominators ▪ solve problems that involve all of the above	Pupils should be taught to: ▪ measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) ▪ measure the perimeter of simple 2-D shapes ▪ add and subtract amounts of money to give change, using both £ and p in practical contexts ▪ tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks ▪ estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight ▪ know the number of seconds in a minute and the number of days in each month, year and leap year ▪ compare durations of events [for example to calculate the time taken by particular events or tasks]	Pupils should be taught to: ▪ draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them ▪ recognise that angles are a property of shape or a description of a turn ▪ identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle ▪ identify horizontal and vertical lines and pairs of perpendicular and parallel lines	Pupils should be taught to: ▪ interpret and present data using bar charts, pictograms and tables ▪ solve one-step and two-step questions[for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables

Methods taught:

In year 3

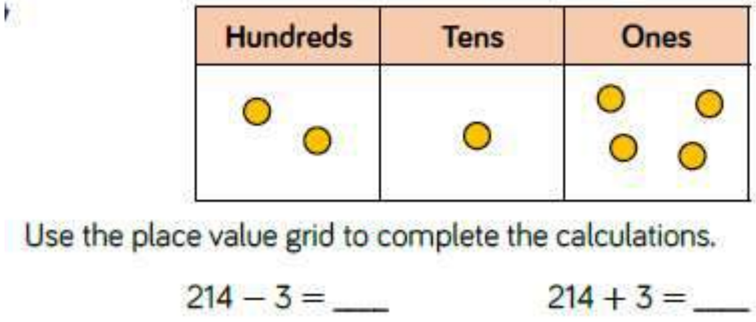


Complete:

2 ones and 3 ones is equal to ___ ones.

2 tens and 3 tens is equal to ___ tens.

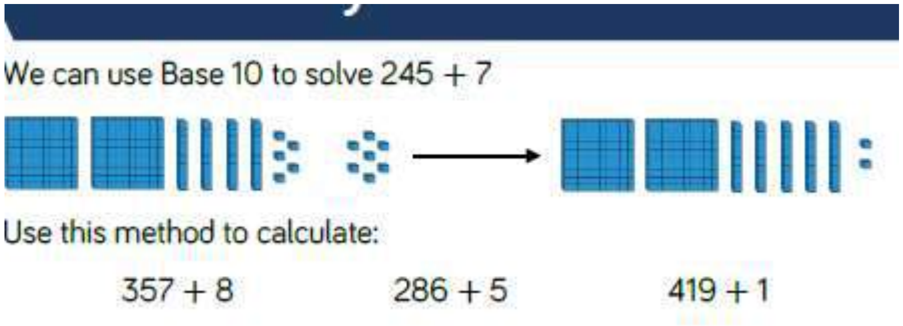
2 hundreds and 3 hundreds is equal to ___ hundreds.



Hundreds	Tens	Ones
● ●	●	● ● ● ●

Use the place value grid to complete the calculations.

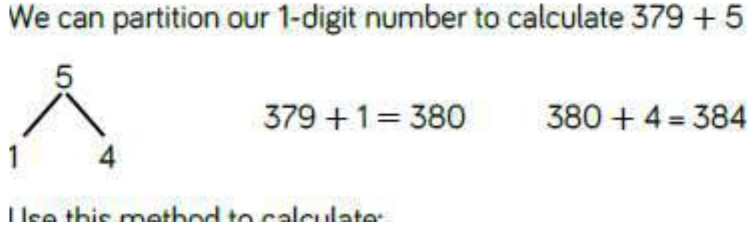
214 – 3 = ___ 214 + 3 = ___



We can use Base 10 to solve 245 + 7

Use this method to calculate:

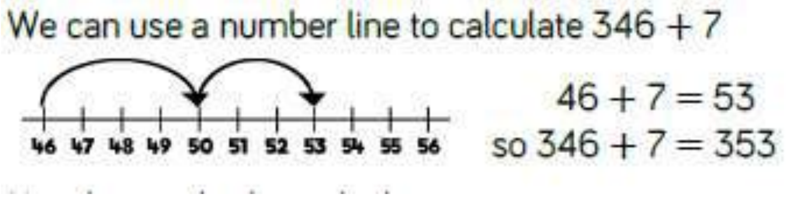
357 + 8 286 + 5 419 + 1



We can partition our 1-digit number to calculate 379 + 5

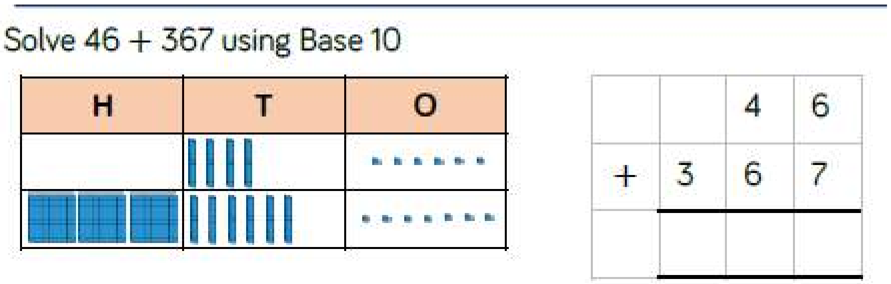
379 + 1 = 380 380 + 4 = 384

Use this method to calculate:



We can use a number line to calculate 346 + 7

46 + 7 = 53
so 346 + 7 = 353



Solve 46 + 367 using Base 10

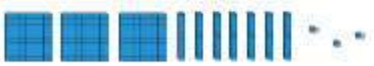
H	T	O
	||||	▪ ▪ ▪ ▪ ▪ ▪
▦ ▦ ▦	||||||	▪ ▪ ▪ ▪ ▪ ▪ ▪

		4	6
+	3	6	7

Use place value counters to calculate 455 + 466

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

	4	5	5
+	4	6	6

Start with 

Now subtract 142

Copy and complete the column subtraction.

−	1	4	2

Complete the calculations using place value counters.

372 − 165

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

629 − 483

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

Kassie is working out 406 − 289

Here is her working out:

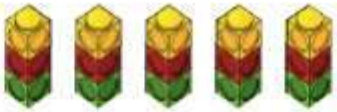
$$\begin{array}{r} \overset{3}{\cancel{4}}\,0\,{}^{1}6 \\ -\,2\,8\,9 \\ \hline 7 \\ \hline \end{array} \qquad \begin{array}{r} \overset{2\,\cancel{3}}{\cancel{4}}\,{}^{1}0\,{}^{1}6 \\ -\,2\,8\,9 \\ \hline 0\,2\,7 \\ \hline \end{array}$$

Explain her mistake.

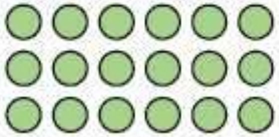
There are five towers with 3 cubes in each tower.
How many cubes are there altogether?

___ + ___ + ___ + ___ + ___ = ___

___ × ___ = ___



Circle the counters in groups of 3 and complete the division.



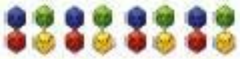
___ ÷ 3 = ___

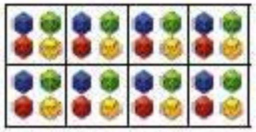
Match the multiplication to the representation.

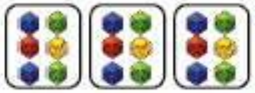
8 × 4

4 × 4

4 × 6

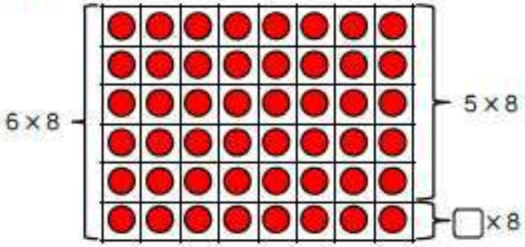






Complete the diagram using known facts.

6 × 8
5 × 8 = ☐
☐ × 8 = ☐
altogether ☐



Fill in the table to show that multiplying by 8 is the same as double, double and double again.

6	6	6	6	6	6	6	6
6 × 2 = ___		6 × 2 = ___		6 × 2 = ___		6 × 2 = ___	
___ × 2 = ___				___ × 2 = ___			
___ × 2 = ___							

Year 4 programme of study (statutory requirements)

Number and place value	Addition and subtraction	Multiplication and division	Fractions (including decimals)	Measurement	Geometry: properties of shapes	Geometry: position and direction	Statistics
Pupils should be taught to: • count in multiples of 6, 7, 9, 25 and 1000 • find 1000 more or less than a given number • count backwards through zero to include negative numbers • recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) • order and compare numbers beyond 1000 • identify, represent and estimate numbers using different representations • round any number to the nearest 10, 100 or 1000 • solve number and practical problems that involve all of the above and with increasingly large positive numbers • read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value	Pupils should be taught to: • add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate • estimate and use inverse operations to check answers to a calculation • solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	Pupils should be taught to: • recall multiplication and division facts for multiplication tables up to 12 × 12 • use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers • recognise and use factor pairs and commutativity in mental calculations • multiply two-digit and three-digit numbers by a one-digit number using formal written layout • solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects	Pupils should be taught to: • recognise and show, using diagrams, families of common equivalent fractions • count up and down in hundredths; recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten. • solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number • add and subtract fractions with the same denominator • recognise and write decimal equivalents of any number of tenths or hundredths • recognise and write decimal equivalents to $^{1}/_{4}$; $^{1}/_{2}$; $^{3}/_{4}$ • find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths • round decimals with one decimal place to the nearest whole number • compare numbers with the same number of decimal places up to two decimal places • solve simple measure and money problems involving fractions and decimals to two decimal places	Pupils should be taught to: • convert between different units of measure [for example, kilometre to metre; hour to minute] • measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres • find the area of rectilinear shapes by counting squares • estimate, compare and calculate different measures, including money in pounds and pence • read, write and convert time between analogue and digital 12 and 24-hour clocks • solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days	Pupils should be taught to: • compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes • identify acute and obtuse angles and compare and order angles up to two right angles by size • identify lines of symmetry in 2-D shapes presented in different orientations • complete a simple symmetric figure with respect to a specific line of symmetry	Pupils should be taught to: • describe positions on a 2-D grid as coordinates in the first quadrant • describe movements between positions as translations of a given unit to the left/right and up/down • plot specified points and draw sides to complete a given polygon	Pupils should be taught to: • interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs • solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs

Methods taught:

In year 4

Use counters and a place value grid to calculate 3,242 + 2,213

1,000s	100s	10s	1s
1,000 1,000 1,000	100 100	10 10 10 10	1 1
1,000 1,000	100 100	10	1 1 1

Anne, Beth and Alex are working out the solution to the calculation 6,374 + 2,823

Anne's Strategy

6,000 + 2,000 = 8,000
300 + 800 = 110
70 + 20 = 90
4 + 3 = 7
8,000 + 110 + 90 + 7 = 8,207

Beth's Strategy

	6	3	7	4
+	2	8	2	3
	8	1	9	7

Alex's Strategy

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

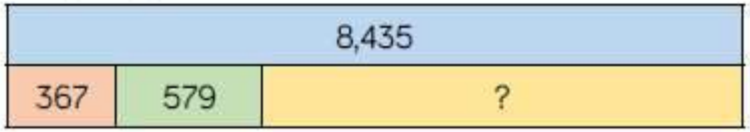
Who is correct?

Complete the subtraction.

	Th	H	T	O
	7	6	4	6
−	4	3	3	5

A shop has 8,435 magazines.
367 are sold in the morning and 579 are sold in the afternoon.

How many magazines are left?



There are ____ magazines left.

Sam, Lucas and Jemima are calculating 7,000 – 3,582

Here are their methods:

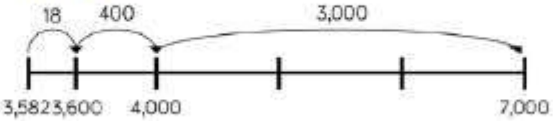
Sam

	Th	H	T	O
	$^{6}\cancel{7}$	$^{9}\cancel{0}$	$^{9}\cancel{0}$	$^{1}0$
−	3	5	8	2
	3	4	1	8

Lucas

	Th	H	T	O
	6	9	9	9
−	3	5	8	1
	3	4	1	8

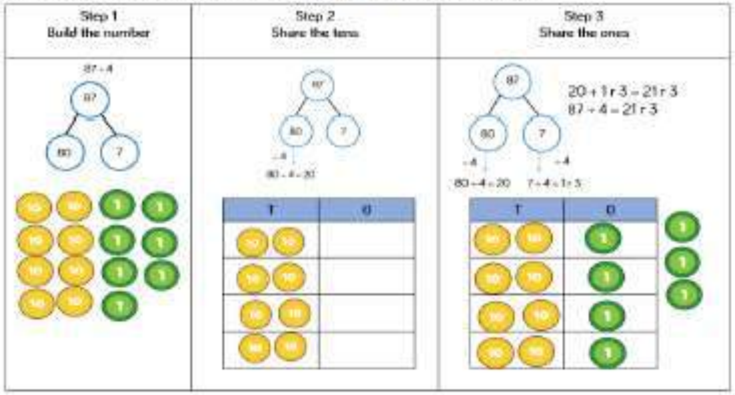
Jemima


18
400
3,000
3,582
3,600
4,000
7,000

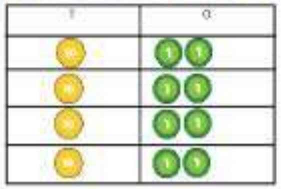
3,000 + 400 + 18 = 3,418

Whose method is most efficient?
Use the different methods to calculate 4,000 – 2,831

Phoebe solves 87 ÷ 4 using this approach

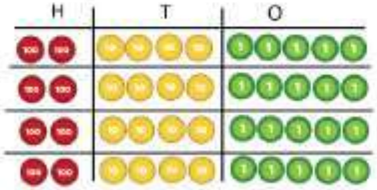

Step 1
Build the number
87 ÷ 4
87
80
7
Step 2
Share the tens
80 ÷ 4 = 20
T
O
Step 3
Share the ones
20 + 1 r 3 = 21 r 3
87 ÷ 4 = 21 r 3
80 ÷ 4 = 20
7 ÷ 4 = 1 r 3
T
O

Calculate 12 × 4
Use place value counters and the formal method.



	1	2
×		4

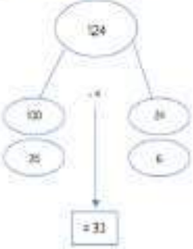
A school has 245 packets of sweets.
Each packet contains 4 sweets.
How many sweets are there altogether?

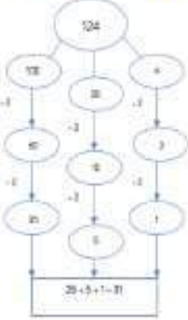


H	T	O
2	4	5
×		4

Use the place value counters to solve the problem.
Remember, if there are ten or more counters in a column, to make an exchange.

Erin uses partitioning and the part whole model to help her calculate 124 ÷ 4


124
100
24
25
6
÷4
= 31



Use this method to solve:

- 235 ÷ 5
- 147 ÷ 7
- 432 ÷ 8

Year 5 programme of study (statutory requirements)

Number and place value	Addition and subtraction	Multiplication and division	Fractions (including decimals and percentages)	Measurement	Geometry: properties of shapes	Geometry: position and direction	Statistics
Pupils should be taught to: • read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit • count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 • interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero • round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 • solve number problems and practical problems that involve all of the above • read Roman numerals to 1000 (M) and recognise years written in Roman numerals	Pupils should be taught to: • add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • add and subtract numbers mentally with increasingly large numbers • use rounding to check answes to calculations and determine, in the context of a problem, levels of accuracy • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	Pupils should be taught to: • identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. • know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers • establish whether a number up to 100 is prime and recall prime numbers up to 19 • multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers • multiply and divide numbers mentally drawing upon known facts • divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context • multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • recognise and use square numbers and cube numbers, and the notation for squared $(^2)$ and cubed $(^3)$ • solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes • solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign • solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates	Pupils should be taught to: • compare and order fractions whose denominators are all multiples of the same number • identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths • recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$] • add and subtract fractions with the same denominator and multiples of the same number • multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams • read and write decimal numbers as fractions [for example, $0.71 = \frac{71}{100}$] • recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • round decimals with two decimal places to the nearest whole number and to one decimal place • read, write, order and compare numbers with up to three decimal places • solve problems involving number up to three decimal places • recognise the per cent symbol (%) and understand that per cent relates to "number of parts per hundred", and write percentages as a fraction with denominator 100, and as a decimal • solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those with a denominator of a multiple of 10 or 25	Pupils should be taught to: • convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) • understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints • measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres • calculate and compare the area of rectangles (including squares) using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes • estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water] • solve problems involving converting between units of time • use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation including scaling	Pupils should be taught to: • identify 3-D shapes, including cubes and other cuboids, from 2-D representations • know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles • draw given angles, and measure them in degrees (°) • identify: - angles at a point and one whole turn (total 360°) - angles at a point on a straight line and ½ a turn (total 180°) - other multiples of 90° • use the properties of rectangles to deduce related facts and find missing lengths and angles • distinguish between regular and irregular polygons based on reasoning about equal sides and angles	Pupils should be taught to: • identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed	Pupils should be taught to: • solve comparison, sum and difference problems using information presented in a line graph • complete, read and interpret information in tables, including timetables

Methods taught:

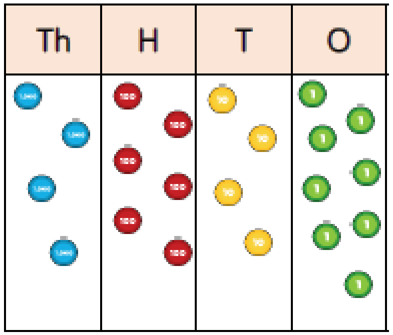
In year 5

Calculate.

	3	2	4	6	1
+		4	3	5	2

Calculate:

4,648 – 2,347

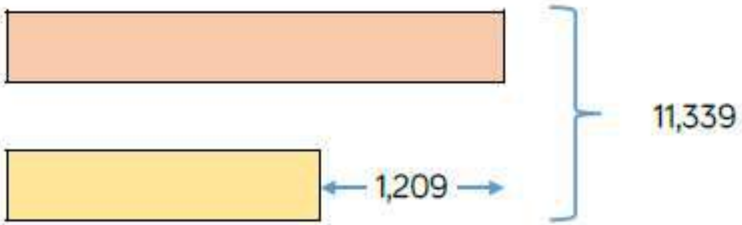


Use a place value grid and counters to calculate 4,434 + 3,325

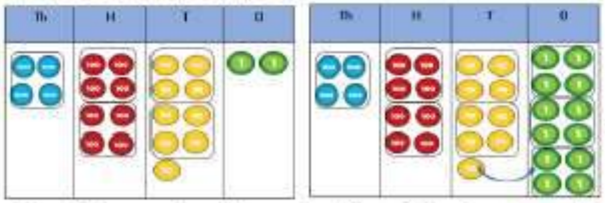
Show the column method alongside.

Th	H	T	O

The sum of two numbers is 11,339
The difference between the same two numbers is 1,209
Use the bar model to help you find the numbers.

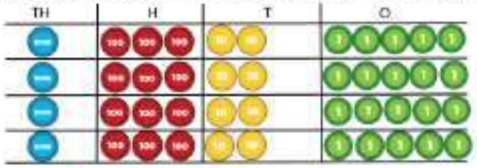


Here is a method to solve 4,892 divided by 4 using place value counters and short division.



1223
4 | 4892

Sam earns £1,325 per week.
How much would he earn in 4 weeks?



TH	H	T	O
1	3	2	5
×			4

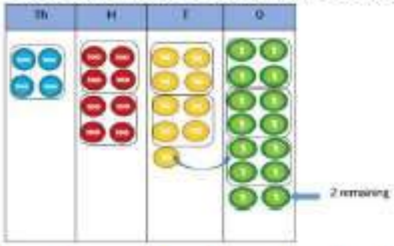
Use the place value counters to solve the problem.

Complete the following to calculate 23 × 14:

23
× 14
92 (23 × 4)
230 (23 × 10)

Use the method to calculate:
34 × 26 58 × 15 72 × 35

Here is a method to solve 4,894 divided by 4 using place value counters and short division.


Th
H
T
O
2 remaining

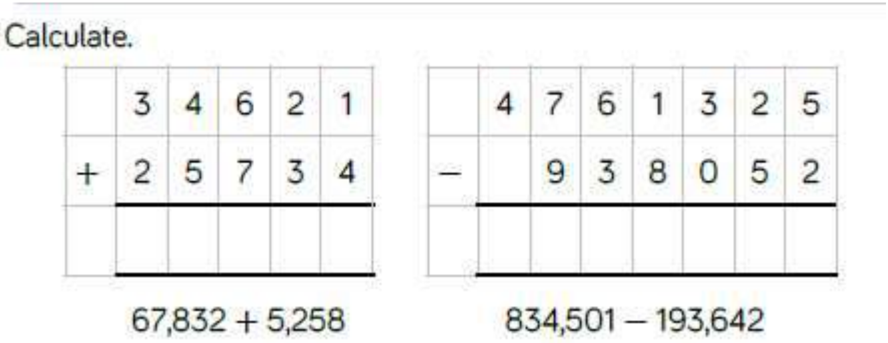
$$\begin{array}{r} 1223 \\ 4\overline{)4894}\text{ r2} \end{array}$$

Year 6 programme of study (statutory requirements)

Number and place value	**Addition, subtraction, multiplication and division**	**Fractions (including decimals and percentages)**	**Ratio and proportion**	**Algebra**	**Measurement**	**Geometry: properties of shapes**	**Geometry: position, and direction**	**Statistics**
Pupils should be taught to: ▪ read, write, order and compare numbers up to 10 000 000 and determine the value of each digit ▪ round any whole number to a required degree of accuracy ▪ use negative numbers in context, and calculate intervals across zero ▪ solve number and practical problems that involve all of the above	Pupils should be taught to: ▪ multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication ▪ divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context ▪ divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context ▪ perform mental calculations, including with mixed operations and large numbers. ▪ identify common factors, common multiples and prime numbers ▪ use their knowledge of the order of operations to carry out calculations involving the four operations ▪ solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why ▪ solve problems involving addition, subtraction, multiplication and division ▪ use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy	Pupils should be taught to: ▪ use common factors to simplify fractions; use common multiples to express fractions in the same denomination ▪ compare and order fractions, including fractions > 1 ▪ add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions ▪ multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$] ▪ divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$] associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$] ▪ identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places ▪ multiply one-digit numbers with up to two decimal places by whole numbers ▪ use written division methods in cases where the answer has up to two decimal places ▪ solve problems which require answers to be rounded to specified degrees of accuracy ▪ recall and use equivalences between simple fractions, decimals and percentages, including in different contexts	Pupils should be taught to: ▪ solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts ▪ solve problems involving the calculation of percentages [for example, of measures such as 15% of 360] and the use of percentages for comparison ▪ solve problems involving similar shapes where the scale factor is known or can be found ▪ solve problems involving unequal sharing and grouping using knowledge of fractions and multiples	Pupils should be taught to: ▪use simple formulae ▪generate and describe linear number sequences ▪express missing number problems algebraically ▪find pairs of numbers that satisfy an equation with two unknowns ▪enumerate possibilities of combinations of two variables	Pupils should be taught to: ▪ solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate ▪ use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places ▪ convert between miles and kilometres ▪ recognise that shapes with the same areas can have different perimeters and vice versa ▪ recognise when it is possible to use formulae for area and volume of shapes ▪ calculate the area of parallelograms and triangles ▪ calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^3) and cubic metres (m^3), and extending to other units [for example mm^3 and km^3]	Pupils should be taught to: ▪ draw 2-D shapes using given dimensions and angles ▪ recognise, describe and build simple 3-D shapes, including making nets ▪ compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons ▪ illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius ▪ recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles	Pupils should be taught to: ▪ describe positions on the full coordinate grid (all four quadrants) ▪ draw and translate simple shapes on the coordinate plane, and reflect them in the axes	Pupils should be taught to: ▪ interpret and construct pie charts and line graphs and use these to solve problems ▪ calculate and interpret the mean as an average

Methods taught:

In year 6



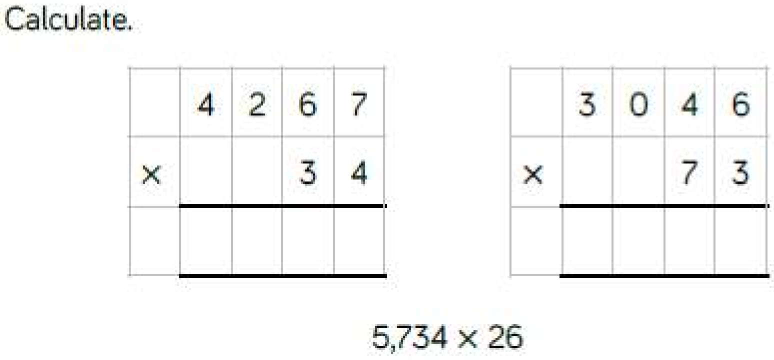
Calculate.

	3	4	6	2	1
+	2	5	7	3	4

	4	7	6	1	3	2	5
−		9	3	8	0	5	2

67,832 + 5,258

834,501 − 193,642

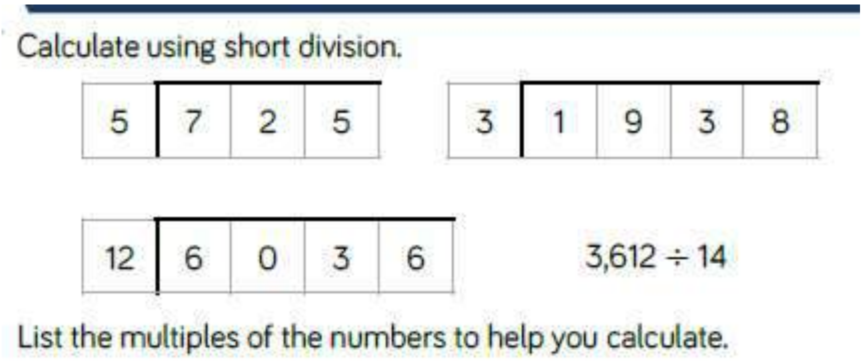


Calculate.

	4	2	6	7
×			3	4

	3	0	4	6
×			7	3

5,734 × 26



Calculate using short division.

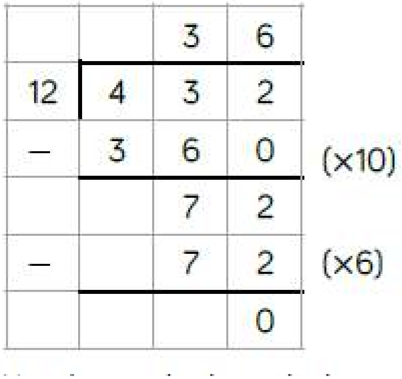
5	7	2	5

3	1	9	3	8

12	6	0	3	6

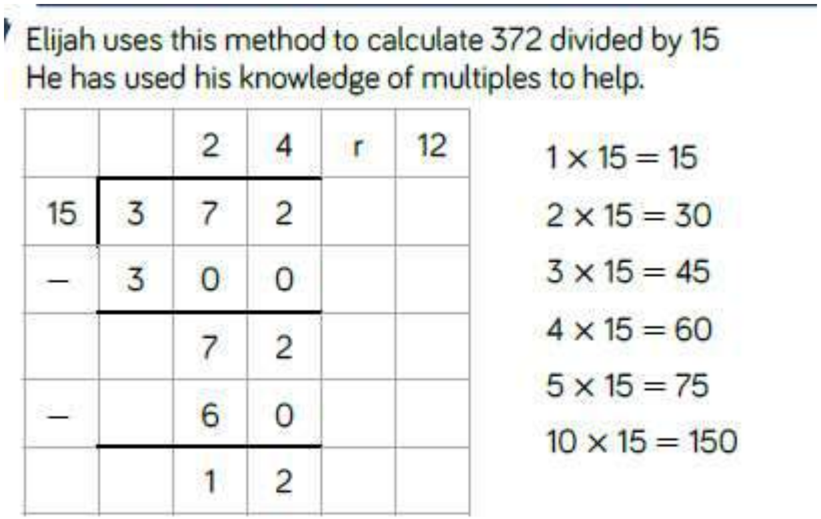
3,612 ÷ 14

List the multiples of the numbers to help you calculate.



		3	6	
12	4	3	2	
–	3	6	0	(×10)
		7	2	
–		7	2	(×6)
			0	

Multiples to help
12 × 1 = 12
12 × 2 = 24
12 × 5 = 60
12 × 10 = 120



Elijah uses this method to calculate 372 divided by 15
He has used his knowledge of multiples to help.

		2	4	r	12
15	3	7	2		
–	3	0	0		
		7	2		
–		6	0		
		1	2		

1 × 15 = 15
2 × 15 = 30
3 × 15 = 45
4 × 15 = 60
5 × 15 = 75
10 × 15 = 150

❖ Mathematics is foremost an activity of the mind, and written calculations are an aid to that mental activity.

❖ **At Ladbrooke**, we aim to develop children's mental strategies. We then focus on written methods that derive from and support mental methods.

We want children to ask themselves:

Can I do this in my head?

Can I do this in my head using drawings or jottings?

Do I need to use an expanded/shortened written method?

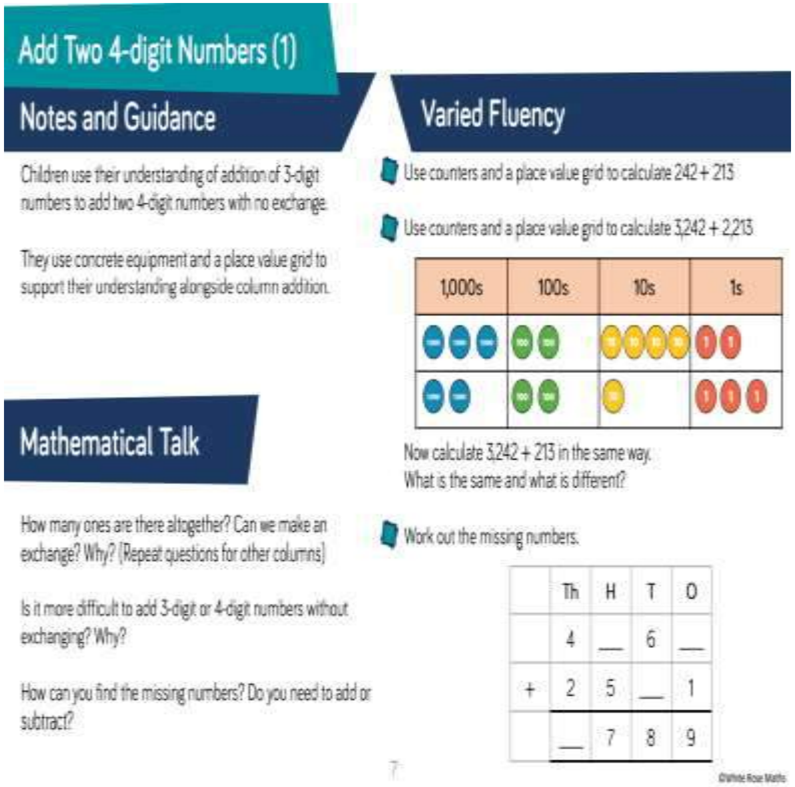
Do I need a calculator?

Have I checked my answers using a different method?

Finding from 2018 papers - Children need to correctly identify between mental and written questions and when to use strategies accordingly

As a school, the scheme we follow is called WhiteRose. This is also supplemented with Target your Maths workbooks and Nrich challenging activities.

WhiteRose is based on three aspects - **Fluency** **Reasoning** **Problem Solving**
This is a Year 4 White Rose example.



Add Two 4-digit Numbers (1)

Notes and Guidance

Children use their understanding of addition of 3-digit numbers to add two 4-digit numbers with no exchange.

They use concrete equipment and a place value grid to support their understanding alongside column addition.

Mathematical Talk

How many ones are there altogether? Can we make an exchange? Why? (Repeat questions for other columns)

Is it more difficult to add 3-digit or 4-digit numbers without exchanging? Why?

How can you find the missing numbers? Do you need to add or subtract?

Varied Fluency

- Use counters and a place value grid to calculate 242 + 213
- Use counters and a place value grid to calculate 3,242 + 2,213

1,000s	100s	10s	1s
●●●	●●	●●●●	●●
●●	●●	●	●●●

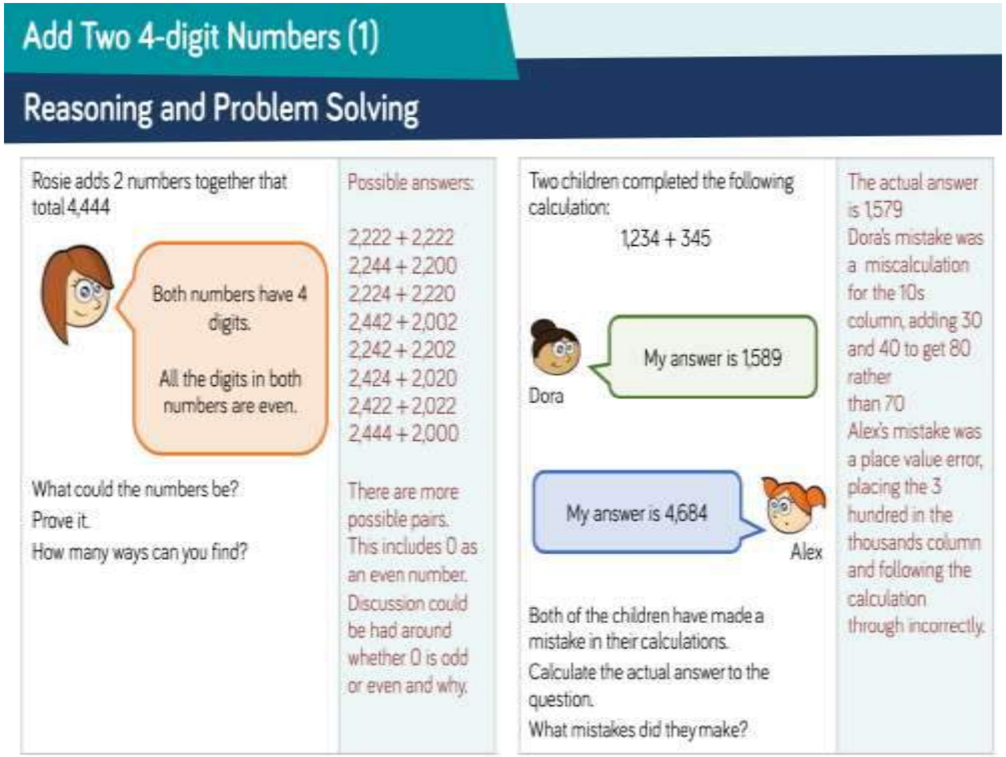
Now calculate 3,242 + 213 in the same way.
What is the same and what is different?

- Work out the missing numbers.

	Th	H	T	O
	4	__	6	__
+	2	5	__	1
	__	7	8	9

7

©White Rose Maths



Add Two 4-digit Numbers (1)

Reasoning and Problem Solving

Rosie adds 2 numbers together that total 4,444

Both numbers have 4 digits.

All the digits in both numbers are even.

What could the numbers be?
Prove it.
How many ways can you find?

Possible answers:

2,222 + 2,222
2,244 + 2,200
2,224 + 2,220
2,442 + 2,002
2,242 + 2,202
2,424 + 2,020
2,422 + 2,022
2,444 + 2,000

There are more possible pairs. This includes 0 as an even number. Discussion could be had around whether 0 is odd or even and why.

Two children completed the following calculation:

1,234 + 345

Dora

My answer is 1,589

My answer is 4,684

Alex

Both of the children have made a mistake in their calculations.
Calculate the actual answer to the question.
What mistakes did they make?

The actual answer is 1,579
Dora's mistake was a miscalculation for the 10s column, adding 30 and 40 to get 80 rather than 70
Alex's mistake was a place value error, placing the 3 hundred in the thousands column and following the calculation through incorrectly.

Fluency –knowing mathematical facts and being able to recall them quickly and accurately.

Varied fluency – talking about and explaining concepts with mathematical language and vocabulary

Reasoning – the process of applying logical and critical thinking to mathematical problems. Talking and explaining ideas

Problem Solving – enables children to use developed skills towards working through a problem. Children will be working thinking through a problem.

Try these…

- 1989 + 723 =
- 17 x 26 =
- 9645 – 700 =
- 1435 ÷ 7

How did you do each one?

Compare strategies

Questions that should not require a written method:
By the end of Key stage 2

$39 + 673 =$

$6^2 + 10 =$

$5{,}400 \div 9 =$

$270 \div 3 =$

$2 \times 45 =$

$60 \div 15 =$

Some will use a written method, others might not:

10 – 5.4 =

7,064 – 502 =

56.38 + 24.7 =

Qu.20

			7	8	5
×				2	3

Qu. 22

$$43\,\overline{)\,645}$$

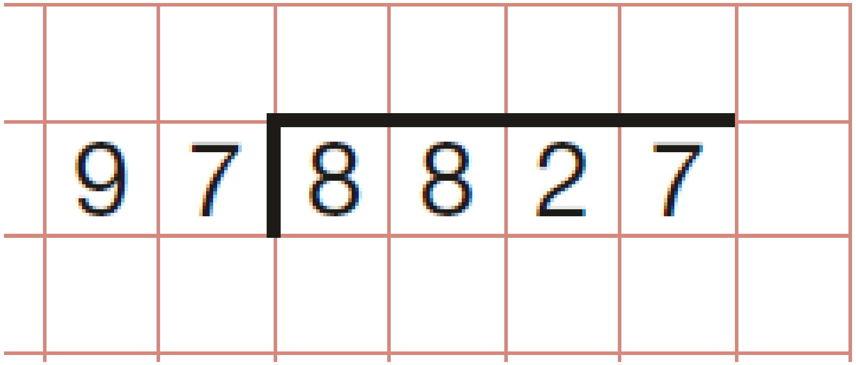
Qu. 27

$3.9 \times 30 =$

Qu. 29

$$\begin{array}{r} 5413 \\ \times \quad 86 \\ \hline \\ \end{array}$$

Qu. 36



$97\overline{)8827}$

Variation?

- ______ + 823 = 1027
- £12.50 + £27.45
- 35cm + 479cm

What is seven hundred and forty plus six hundred and five?

James, Ellie and Amir collect marbles. James has 114, Ellie has 403, Amir has 189. How many do they have altogether?

What went wrong?

$$\begin{array}{rl} 1247 & \\ 2934 & + \\ \hline 3171 & \\ \hline \end{array}$$

12. The Arithmetic paper continued to reply upon accurate detection of written and mental questions

Takeaways from the papers:

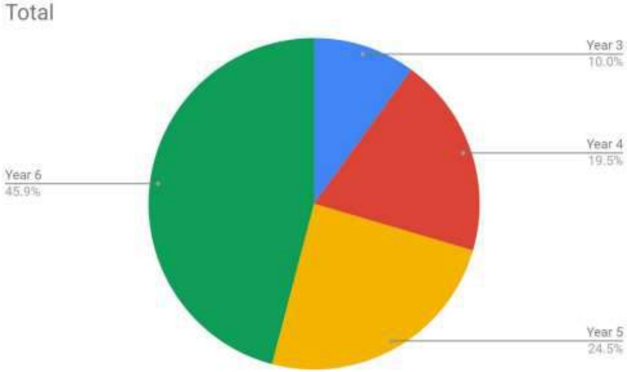
- The key to the arithmetic paper is children identifying between questions that could be carried out mentally (or with jottings) vs those that need a fuller written method.
- If children struggled to identify between the mental and written questions, they would likely have struggled to complete the paper in time.
- However pupils that identified the mental questions should have easily been able to complete the full paper in 30 minutes.

13. It is likely to be possible to achieve the expected standard with no Year 6 maths needed!

Takeaways from the papers:

- As is the case with SATs every year, it is important to remember that **they are not just Year 6 SATs.**
- Papers test the full KS2 curriculum and make it clear that over half the marks will be drawn from the Year 3 to Year 5 content domains.

Year by year content domain breakdown for all 3 2019 Maths SATs papers:



Thank you so much for attending this workshop and for your continued support.

I hope you have found it helpful.

Please fill in an evaluation form.

herts for learning essential maths - YouTube

Games to support children's learning KS1 and KS2