Maths Calculation Policy

This policy has been largely adapted from the White Rose Maths Hub calculation policy with further material added. It is a working document and will be revised and amended as necessary. Calculation procedures are taught according to this document so they can be seamlessly built upon year after year, as the child moves through school.   Children at Leigham Primary School should be introduced to the processes of calculation through practical, oral and mental activities. As children begin to understand the underlying ideas, they develop ways of recording to support their thinking and calculation methods.

A useful written method is one that helps children carry out a calculation and can be understood by others. Written methods are complementary to mental methods and should not be seen as separate from them. The aim is that children use mental methods when appropriate, but for calculations that they cannot do in their heads they use an efficient written method accurately and with confidence. It is important children acquire secure mental methods of calculation and one efficient written method of calculation for addition, subtraction, multiplication and division which they know they can rely on when mental methods are not appropriate.

By the end of Year 6, children should be able to choose the most appropriate approach to solve a problem: making a choice between using jottings (an extended written method), an efficient written method or a mental method.

Our Calculation Policy illustrates how we teach children the four operations (addition, subtraction, multiplication and division) using the CPA approach below.

Concrete — using manipulatives (e.g. tens frames, dienes & place value counters)

Pictorial — drawing their own representations of the concrete

Abstract — calculations using numerals and symbols

Often, children will be encouraged to use concrete and pictorial methods to explain their problem solving and reasoning.

Each operation is broken down into skills for the year group and shows recommended models and visuals to support the teaching of the corresponding concepts alongside. To ensure consistency for pupils, it is important that the mathematical language used in Maths lessons reflects the vocabulary used within in policy and within the glossary at the end of the document.

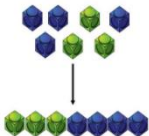# Maths Calculation Policy

Addition

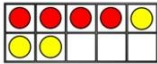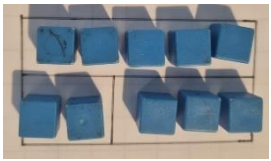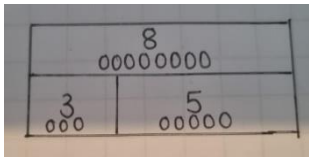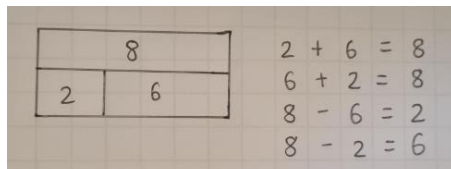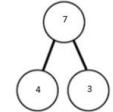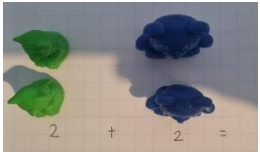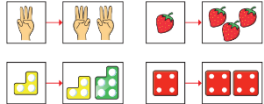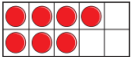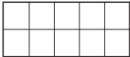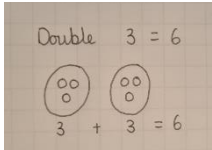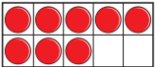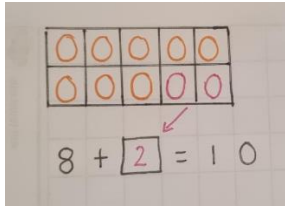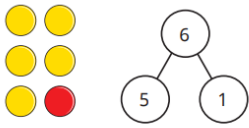| Year 1- Addition			
Curriculum Objectives read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs represent and use number bonds. add one-digit and two-digit numbers to 20, including zero solve one-step problems that involve addition, using concrete objects and pictorial representations, and missing number problems such as 9 − □ = 2 .			
Mental strategies	**Vocabulary**		
Counting forwards Number bond to and within 10 recall	Addition, add, more, make, sum, total, altogether, double, equals, is the same as, number bonds, pairs missing number, equals, is the same as, number bonds, pairs missing number		
Small Steps	**Strategies**		
	Concrete	**Pictorial**	**Abstract**
Starting at the bigger number and counting on	Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.	 4 + 3 = 7 Start at the larger number on the number line and count on in ones or in one jump to find the answer.	5 + 12 = 17 Place the larger number in your head and count on the smaller number to find your answer.
Adding ones	Combining two parts to make a whole (use other resources too e.g. eggs, dinosaurs, shells, counting bears, cars).	Draw the numbers into the tens frame and then count how many you have altogether. Use of number line 4 + 3 = 7	7 + 6 = 13 Complete number sentence by counting on or using known facts.
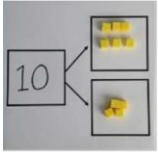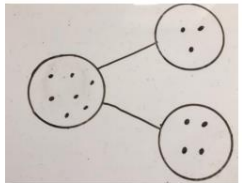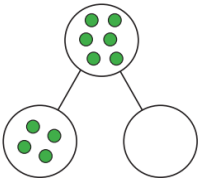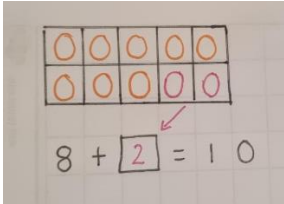
Maths Calculation Policy

		Use of base ten	
		14 + 5 = _____	
Bar model	Use of objects e.g. counters	Use of jottings	Complete the number sentences.
Combining two parts to make a whole: part- whole model	Use cubes to places into a part whole model.	Use of jottings on a part-whole model.	Complete part-whole model mentally. 4 + 3 = 7 Four is a part, 3 is a part and the whole is seven. Think of more than one number sentence for the part-whole model. 8 = 5 + 3 5 + 3 = 8
Doubles and near doubles	Use of objects e.g. counting bears or cubes	Show pictures of doubles Use of tens frames (drawing onto the tens frames)	5 + 5 = 10 Complete number sentences by counting on or using their known facts. Fingers used to help count on.

Maths Calculation Policy

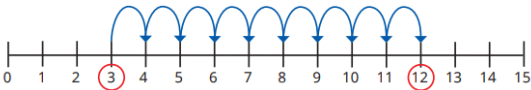|			
		Double 7 is Drawing jottings to help. Use of dice 	
Number bonds and fact families	Use of tens frames (practically) 	Draw a bar model. _____ + _____ = 7 7 = _____ + _____ _____ + _____ = 7 7 = _____ + _____ Draw a tens frame. 	Complete the number sentences using known facts. + = 7 + = 7 7 = + 7 = +

		Draw jottings	
		$1 +$ _____ $= 6$ _____ $+ 1 = 6$ _____ $=$ _____ $+ 1$ $6 =$ _____ $+$ _____	
Missing number problems	Use of cubes/objects.	Draw a part-whole $4 +$ _____ $= 6$ Use a number line ▶ $3 +$ _____ $= 12$ Use of a tens frame $8 +$ 2 $= 10$	Complete number sentences: ☐ $+ 4 = 7$

Maths Calculation Policy

Year 2- Addition

Curriculum Objectives

solve problems with addition:

- using concrete objects and pictorial representations, including those involving numbers, quantities, and measures
- applying their increasing knowledge of mental and written methods

recall and use addition to 20 fluently, and derive and use related facts up to 100

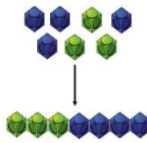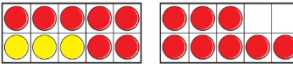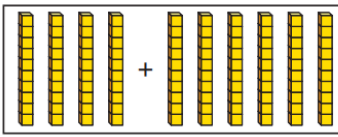add numbers using concrete objects, pictorial representations, and mentally, including:
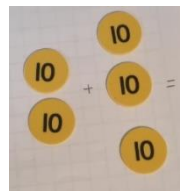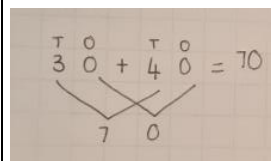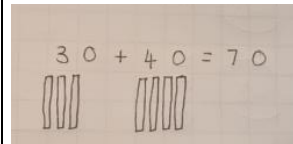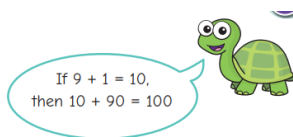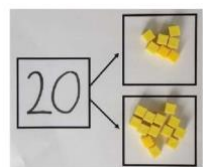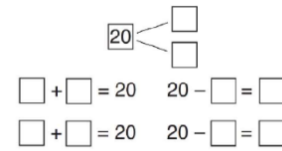
- a two-digit number and ones
- a two-digit number and tens
- two two-digit numbers
- adding three one-digit numbers

show that addition of two numbers can be done in any order (commutative).

recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.
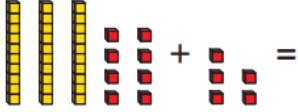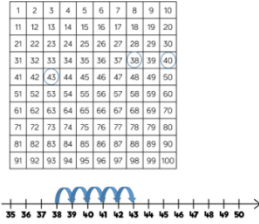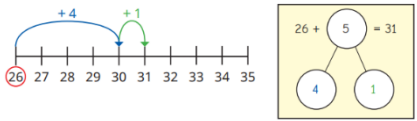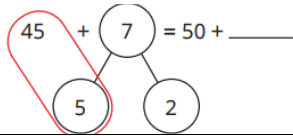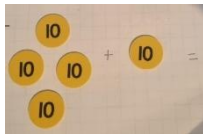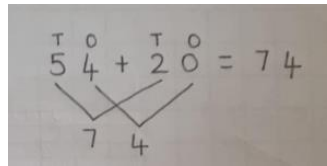
Mental strategies	Vocabulary
Using known facts (If I know 2 + 3 = 5 I also know: 3 + 2 = 5, 20 + 30 = 50, 50 – 30 = 20, 50 – 20 = 30) Rounding and adjusting (+ 9 or – 9 by adding on or subtracting 10 and adjusting by 1. +11—11 by adding on or subtracting 10 and adjusting by 1) Near doubles Bridging through 10	Addition, add, more, make, sum, total, altogether, double, near double, one more, two more, ten more, one hundred more, how many more to make …?, how many more is … than …?, how much more is …?, equals, is the same as, number bonds/ pairs/facts, tens boundary

Maths Calculation Policy

Small Steps	Strategies		
	Concrete	**Pictorial**	**Abstract**
Number bonds to and within 20	Use of counters/cubes	Use of tens frame	Complete number sentence 5 + 13 = Use of known 4 + _____ = 10 14 + _____ = 20 facts 4 + _____ = 20
Number bonds to and within 100 (multiples of ten)	Use of base ten Use of tens counters	Looping method Jottings of base ten or tens counters	Use known facts If 9 + 1 = 10, then 10 + 90 = 100
Use known number facts Part, part whole	Make a number in different ways using a variety of objects.	Using a part-whole to create a fact family.	Digit cards. Make 4 number sentences using only those digital cards. **7** **4** **3** 4 + 3 = 7 3 + 4 = 7 7 – 3 = 4 7 - 4 = 3
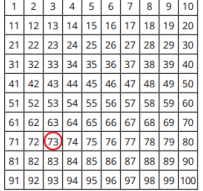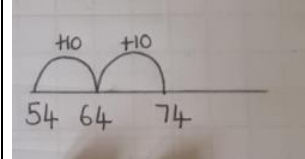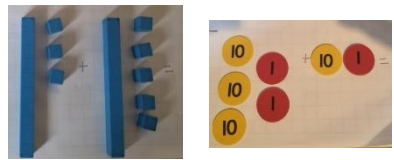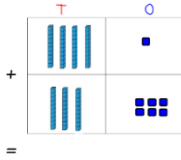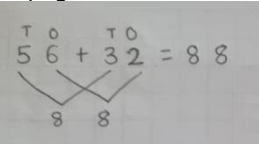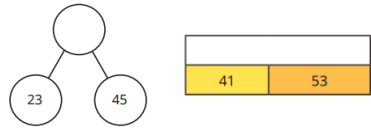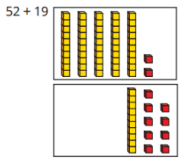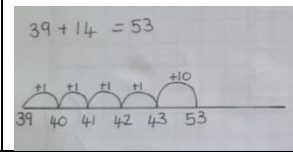
Maths Calculation Policy

Using known facts (related facts)	Use of base ten	Use of jottings	Number sentences
			3 + 4 = 7 *leads to* 30 + 40 = 70 *leads to* 300 + 400 = 700
Add a two-digit number and ones	Using base ten/place value counters 	Hundred square and number line Add to the next ten using a number line and/or part-whole model. 45 + 7 = 50 + _____ 5 2	Complete number sentences mentally 23 + 5 = Use knowledge of related facts 22 = 29 – 7 22 = 28 – 6 22 = 27 – 5
Add a 2 digit number and tens	Use of base ten/place value counters	Looping method 	Complete number sentences 23 + 50 = 23 + ☐ = 53

Maths Calculation Policy

	Use of a hundred square (find the number and jump down the amount of tens) 	Drawing a number line 	
Add two 2-digit numbers (not crossing ten)	Use of base ten and place value counters 	Draw base ten (column) Looping method 	Complete number sentences 23 + 43 = 12 + ☐ = 24 Find the wholes
Add two 2-digit numbers (crossing ten)	Use base ten 52 + 19 	Draw own number line (ones first) 39 + 14 = 53 	Complete number sentence 49 + 23 =

Maths Calculation Policy

Add three 1-digit numbers	Use of objects	Use/draw tens frames	Find the number bond/known fact to help.
		$7 + 6 + 3 = 16$ Use part-whole models and draw jottings to help 	
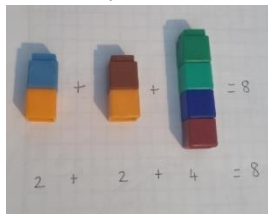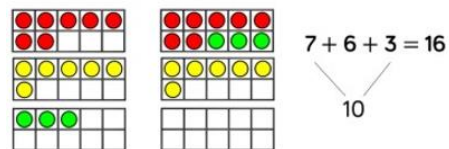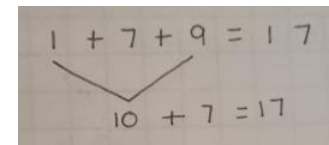
Maths Calculation Policy

Year 3- Addition

Curriculum Objectives
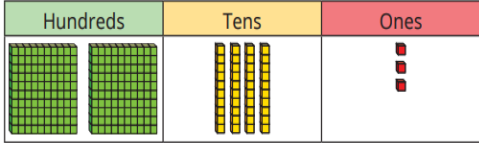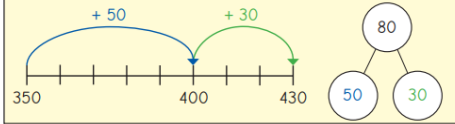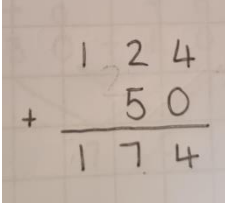
add numbers mentally, including:

- a three-digit number and ones
- a three-digit number and tens
- a three-digit number and hundreds
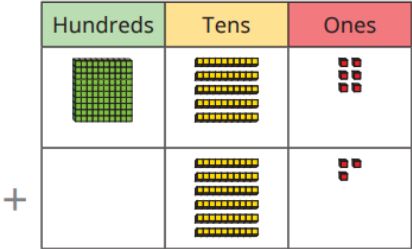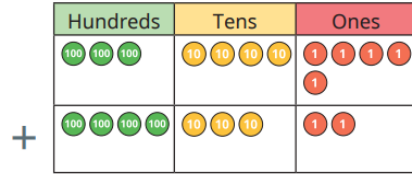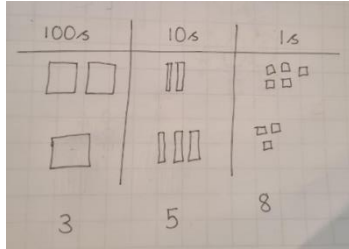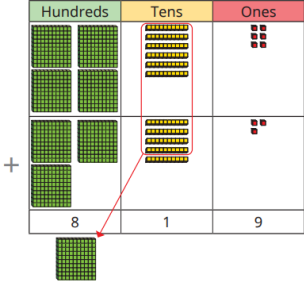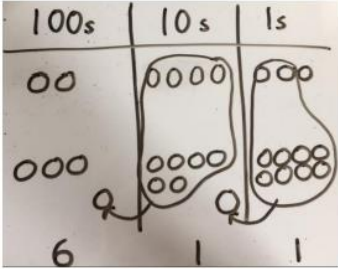
add numbers with up to three digits, using formal written methods of columnar addition.

estimate the answer to a calculation and use inverse operations to check answers
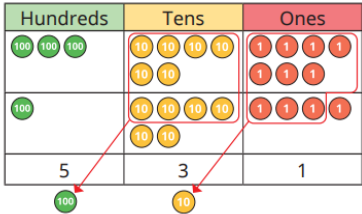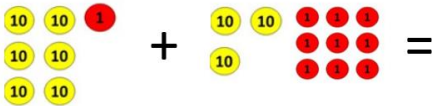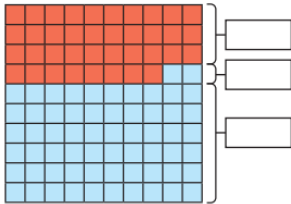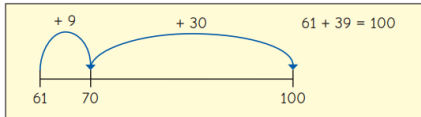
solve problems, including missing number problems, using number facts, place value, and more complex addition.

Mental strategies	Vocabulary
Bridging to 10 Complements to 10/100 Near doubles Rounding and adjusting	Addition, add, more, make, sum, total, altogether, double, near double, half, halve, one more, two more, ten more, one hundred more, how many more to make …?, how many more is … than ?, how much more is …?, equals, is the same as, number bonds/pairs/facts, missing number, tens boundary, hundreds boundary

Small Steps	Strategies		
	Concrete	**Pictorial**	**Abstract**
Add numbers mentally including: Three digit and ones Three digit and tens Three digit and hundreds	Use of base ten 243 + 5 = _____ 	Draw own number line and use part-whole model to partition. 	Model expanded method but evidence concise Use of known facts

			258 = 251 + 7
			257 = 251 + _____
			256 = 251 + _____
			255 = 251 + _____
Column Addition—no exchanging Three digit add two digit Three digit add three digit	Use of base ten and place value counters	Draw jottings of base ten/place value counters.	Formal written method Find the wholes
Column Addition with exchanging Three digit add two digit Three digit add two digit	Use of base ten and place value counters	Draw jottings of base ten/place value counters.	Formal written method 265 + 164 429 1 265 + 164 = 429

	Hundreds	Tens	Ones
	100 100 100	10 10 10 10 10 10 10	1 1 1 1 1 1 1
	100	10 10 10 10 10 10	1 1 1 1 1
	5	3	1

Number bonds to 100	Use of place value counters 10 10 1 10 10 10 10 **+** 10 10 10 10 1 1 1 1 1 1 1 1 1 1 1 1 1 **=**	Shade hundred square Draw own number line + 9 + 30 $61 + 39 = 100$ 61 70 100	Complete number sentence $61 + \square = 100$ $\square + 23 = 100$
Estimate the answers to questions and use inverse operations to check answers	Estimate number sentence	Use number lines to show estimation 86 87 88 89 91 92 93 94 95 96 97 98 99 **90** **100**	Build up known facts and use these to illustrate the inverse and check answers. $98 + 18 = 116$ $116 - 18 = 98$ $18 + 98 = 116$ $116 - 98 = 18$

Maths Calculation Policy

Year 4- Addition

Curriculum Objectives
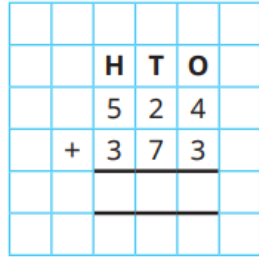
add numbers with up to 4 digits using the formal written methods of columnar addition, where appropriate.

estimate and use inverse operations to check answers to a calculation.

solve addition two-step problems in contexts, deciding which operations and methods to use and why.

Mental strategies	Vocabulary
Bridging to 10 Complements to 10/100 Near doubles Rounding and adjusting	Addition, add, more, make, sum, total, altogether, double, near double, half, halve, one more, two more, ten more, one hundred more, how many more to make …?, how many more is … than …?, how much more is …?, equals, is the same as, number bonds/pairs/facts, missing number, tens boundary, hundreds boundary, inverse

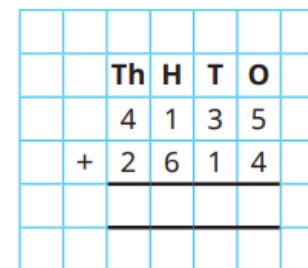| Small Steps	Strategies		
	Concrete	**Pictorial**	**Abstract**
Add numbers with up to 4 digits (no exchange)	Use of place value charts 	Use of bar model and part-whole Use of place value jottings 	Formal written method

Maths Calculation Policy

Add numbers with up to 4 digits (one exchange)	Use of place value charts	Use of place value jottings	Formal written method
Add numbers with up to 4 digits (more than one exchange)	Use of place value charts	Use of place value jottings	Formal written method
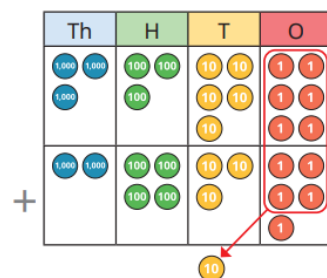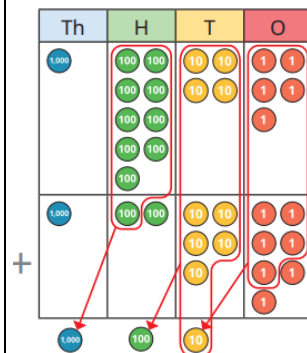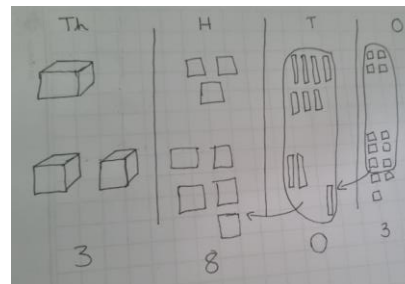
Maths Calculation Policy

Year 5- Addition

Curriculum Objectives

add whole numbers with more than 4 digits, including using formal written methods

add numbers mentally with increasingly large numbers

use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy

solve addition multi-step problems in contexts, deciding which operations and methods to use and why.

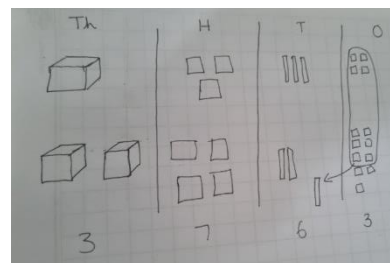| Mental strategies	Vocabulary
Bridging to 10 Complements to 10/100/1000 Near doubles Rounding and adjusting	Addition, add, more, make, sum, total, altogether, double, near double, half, halve, one more, two more, ten more, one hundred more, how many more to make ...?, how many more is ... than ...?, how much more is ...?, equals, is the same as, number bonds/pairs/facts, missing number, tens boundary, hundreds boundary, ones boundary, tenths boundary, inverse

Small Steps	Strategies		
	Concrete	**Pictorial**	**Abstract**
Add numbers with more than 4 digits.	Use of place value charts 	Bar model and part-whole models Also show with 2 step problems which include + and - 	Formal written method
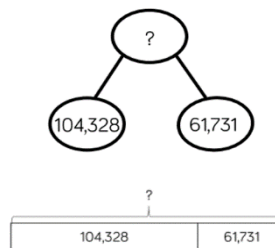
Maths Calculation Policy

Add decimals with 2 decimal places, including money	Use of place value charts	Number line	Formal written method
			$$\begin{array}{r} 3.65 \\ + 2.41 \\ \hline 6.06 \\ \hline {\scriptstyle 1} \end{array}$$
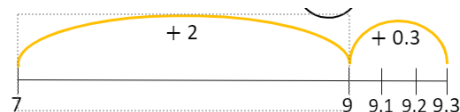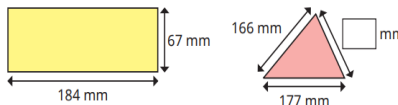
Maths Calculation Policy

Year 6- Addition

Curriculum Objectives

perform mental calculations

use their knowledge of the order of operations to carry out calculations involving the four operations

solve addition multi-step problems in contexts, deciding which operations and methods to use and why

solve problems involving addition

use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.
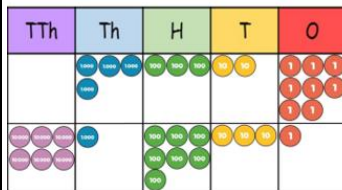
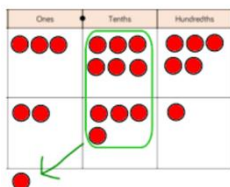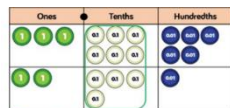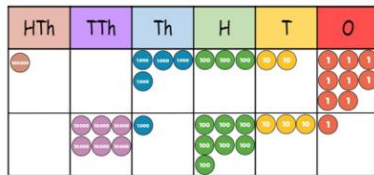| Mental strategies	Vocabulary
	Addition, add, more, make, sum, total, altogether, double, near double, half, halve, one more, two more, ten more, one hundred more, how many more to make …?, how many more is … than …?, how much more is …?, equals, is the same as, number bonds/pairs/facts, missing number, tens boundary, hundreds boundary, ones boundary, tenths boundary, inverse

Small Steps	Strategies		
	Concrete	**Pictorial**	**Abstract**
Add several numbers of increasing complexity, including adding money, measure and decimals with different numbers of decimal points.	As above	As above	As above
Adding integers	Use of place value charts	Use of jottings next to drawings. The perimeter of the triangle is equal to the perimeter of the rectangle. Work out the unknown length of the triangle.	Formal written method Missing numbers

Maths Calculation Policy

Subtraction

Year 1- Subtraction			
Curriculum Objectives			
read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs represent and use number bonds and related subtraction facts within 20 subtract one-digit and two-digit numbers to 20, including zero solve one-step problems that involve subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = – 9.			
Mental strategies	**Vocabulary**		
Counting backwards Number bond to and withing 10 recall	take away, how many are left/left over? how many have gone? one less, two less, ten less … how many fewer is … than …? how much less is …? difference between, equals is the same as, number bonds/pairs, missing number		
Small Steps	**Strategies**		
	Concrete	**Pictorial**	**Abstract**
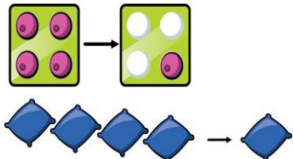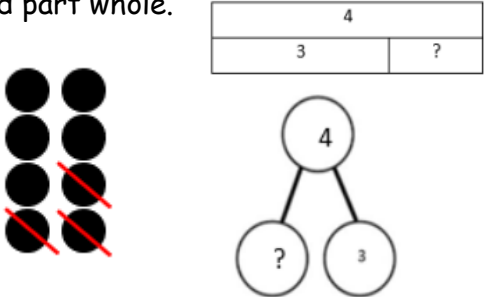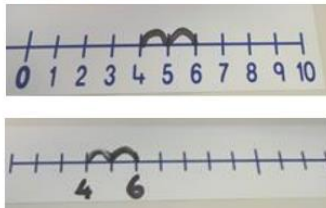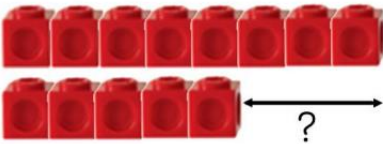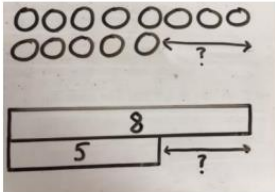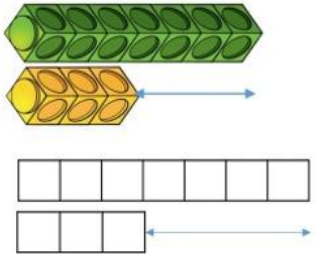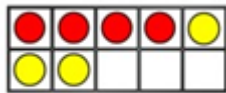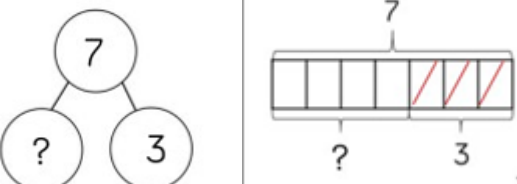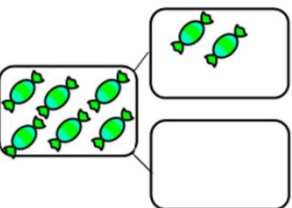
Maths Calculation Policy
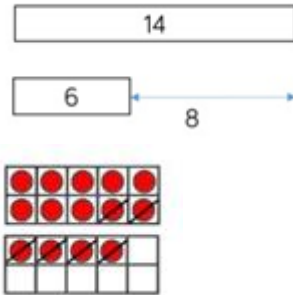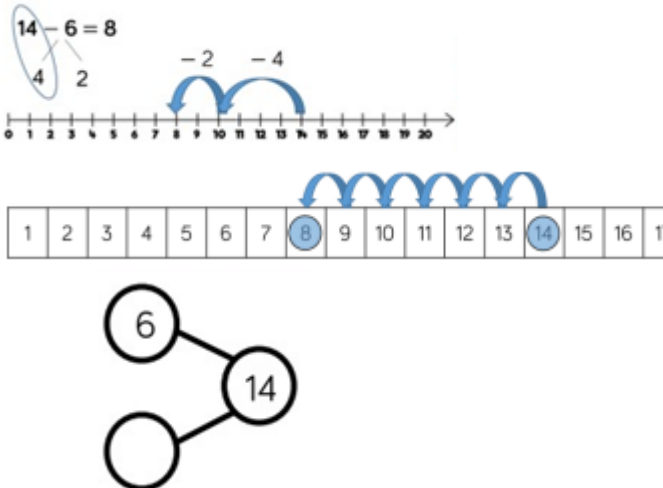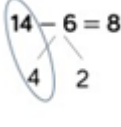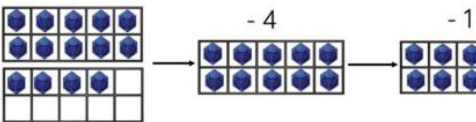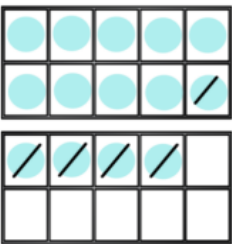
Taking away ones	Start with the biggest number and physically remove the objects from the whole. (ten frames, Numicon, cubes and other items such as beanbags could be used). 4 – 3 = 1	Start with the biggest number and cross out the part. Shown with jottings and/or bar model and part whole.	$4 - 3 =$ $\boxed{} = 4 - 3$
Counting back	6 – 2 = 4 | 1	2	3	4	5	6	7	8	9	10 | Start with the biggest number and count backwards, physically removing the objects.	Children to represent the calculation on a number line or number track and show their jumps. Encourage children to use an empty number line 0 1 2 3 4 5 6 7 8 9 10 4 6	$6 - 2 = 4$ $4 = 6 \ \boxed{}$ Complete the number sentences including missing number sentences.

Maths Calculation Policy

Find the difference	Finding the difference (using cubes, Numicon or Cuisenaire rods, other objects can also be used). Calculate the difference between 8 and 5. 	Children to draw the cubes/other concrete objects which they have used or use the bar model to illustrate what they need to calculate. 	Find the difference between 8 and 5. 8 – 5, the difference is ▢ Children to explore why 9 - 6 = 8 – 5 = 7 – 4 have the same difference.
Represent and use number bonds and related subtraction facts within 10	 Use of objects to show bonds within 10. 	 Start with the biggest number and cross out the part. Shown with jottings and/or bar model and part whole Use pictorial representations to show the part.	7 – 3 = 4 7 - ▢ = 3 Complete the number sentences including missing number sentences.

Represent and use number bonds and related subtraction facts within 20 Include subtracting zero Part Part Whole model	Use of objects to show bonds within 20.	Start with the biggest number on the NL and count backwards.	Use bridging through the ten to help with bonds.
Make 10	Making 10 using ten frames. 14 – 5	Children to present the ten frame pictorially and discuss what they did to make 10.	14 – 5 = 9 ☐ = 14 - 5 Complete the number sentences including missing number sentences.

Maths Calculation Policy

Curriculum Objectives

solve problems with subtraction:

using concrete objects and pictorial representations, including those involving numbers, quantities, and measures

applying their increasing knowledge of mental and written methods

recall and use subtraction facts to 20 fluently, and derive and use related facts up to 100

subtract numbers using concrete objects, pictorial representations, and mentally, including:

- a two-digit number and ones
- a two-digit number and tens
- two two-digit numbers
- adding three one-digit numbers

show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot

recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

Mental strategies	Vocabulary
Using known facts If I know 2 + 3 = 5 I also know: 3 + 2 = 5 20 + 30 = 50 50 – 30 = 20 50 – 20 = 30 Rounding and adjusting + 9 or – 9 by adding on or subtracting 10 and adjusting by 1. +11—11 by adding on or subtracting 10 and adjusting by 1 Near doubles Bridging through 10	subtract, take away, how many are left/left over? how many have gone? one less, two less, ten less … one hundred less, how many fewer is … than …? how much less is …? difference between, equals is the same as, number bonds/pairs/facts, tens boundary

Maths Calculation Policy

Small Steps	Strategies		
	Concrete	Pictorial	Abstract
Subtract 2 digit and ones	48 – 7 = 41 Use base 10 or PV counters to subtract 1s.	 Draw own number line and subtract in jumps of ones. Model bridging through the ten alongside the NL e.g. 34 – 4 = 30 30 – 2 = 28	48 - ☐ = 41 Show number sentence alongside the written formal method (no exchange.)
Subtract 2 digit number and multiples of tens	 63 – 10 =		65 – 10 = 55 55 = ☐ - 10

		Draw own number line and subtract in jumps of tens (larger jumps than ones).	
	Use base 10 or PV counters to subtract 10s	T o T o $46 - 20 = 26$ 2 6 Partition and subtract using the looping method	
Subtract two 2 digit numbers (not crossing ten)	$54 - 32 =$ T O 10 10 10 1 1 10 10 1 1	Use base 10 or PV counters to subtract 2 digit number.	-10 -1 -1 -1 -1 24 34 35 36 37 38 Draw own NL ensuring subtract the ones first and then (larger) jumps of 10. T o T o $46 - 23 = 23$ 2 3 Partition and subtract using the looping method	**54 – 32 = 22** Show number sentence alongside the written formal method (no exchange.)
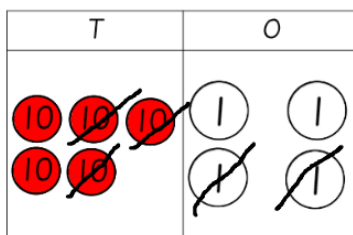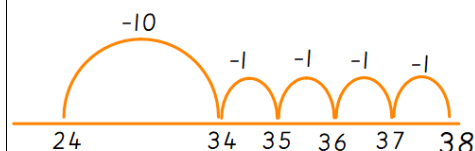
Maths Calculation Policy
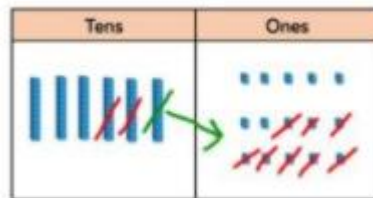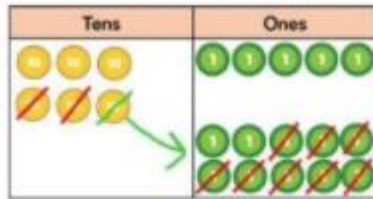
Subtract two 2 digit numbers (crossing ten)	Use base 10 or PV counters to model the exchange	Draw own NL ensuring subtract the ones first and then the jumps of 10. Show as bar model and/or part whole	**65 – 28 = 37** Show number sentence alongside the written formal method (exchange.)
Subtract three 1 digit numbers	8 – 2 –3 = Use counters or manipulatives.		12 -5 - 2 12 – 2 = 10 10 – 5 = 5 Use known facts to help.
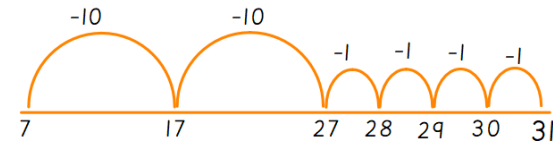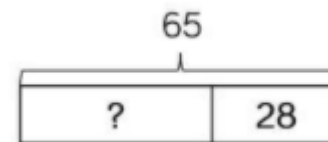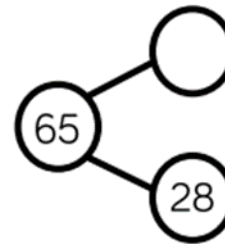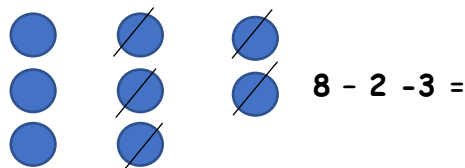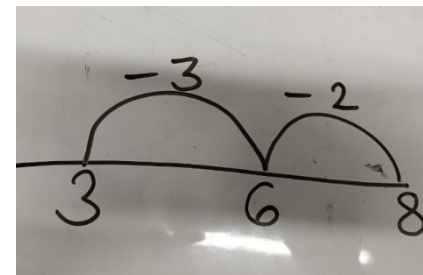
Maths Calculation Policy

Year 3- Subtraction			
Curriculum Objectives			
subtract numbers mentally, including:			
• a three-digit number and ones			
• a three-digit number and tens			
• a three-digit number and hundreds			
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 subtraction.			
Mental strategies	**Vocabulary**		
Bridging to 10 Complements to 10/100 Near doubles Rounding and adjusting	Subtract, take away, how many are left/left over? how many have gone? one less, two less, ten less … one hundred less, how many fewer is … than …? how much less is …? difference between, equals is the same as, number bonds/pairs/facts missing number, tens boundary, hundreds boundary		
Small Steps	**Strategies**		
	Concrete	**Pictorial**	**Abstract**

Maths Calculation Policy

Column subtraction without regrouping (no exchanging) three digit number – two/three digit number	counters.	Use base 10 or PV	548 / 123 table	Show as the expanded written method and the concise written method.
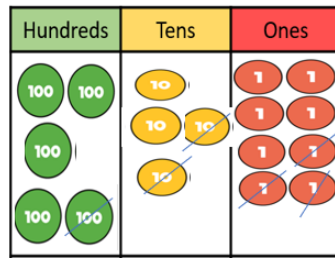
Column subtraction (exchanging) three digit number – two/three digit number	Use base 10 and PV counters,	Draw jottings and show as a bar model and/ or part whole model	Show as the expanded written method and the concise formal method.
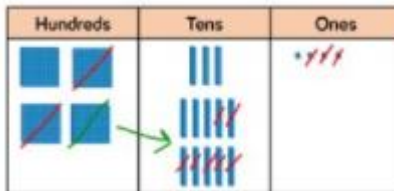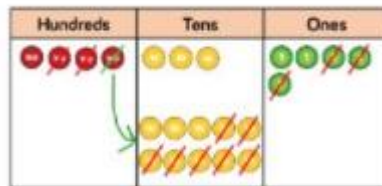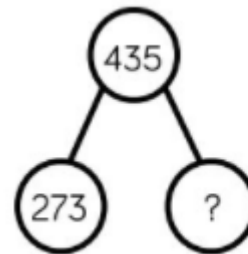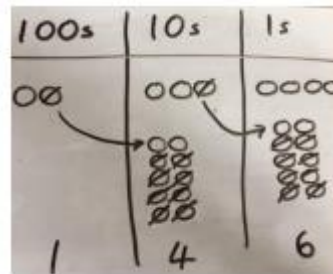
Maths Calculation Policy

Number bonds to 100	$45 + 55 = 100$ 90 10 100 ends with a place holder, so I know that the ones must make 10. 100 has 10 tens, so 90 + 10 = 100	How many squares are not shaded?	$45 + 55 = 65$

Year 4- Subtraction

Curriculum Objectives

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 subtraction two-step problems in contexts, deciding which operations and methods to use and why.

Mental strategies	Vocabulary
Bridging to 10 Complements to 10/100 Near doubles Rounding and adjusting	subtract, take away, how many are left/left over? how many have gone? one less, two less, ten less … one hundred less, how many fewer is … than …? how much less is …? difference between, equals is the same as, number bonds/pairs/facts missing number, tens boundary, hundreds boundary, inverse

Small Steps	Strategies		
	Concrete	**Pictorial**	**Abstract**

Maths Calculation Policy
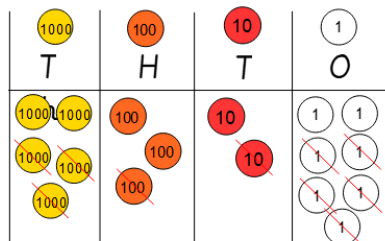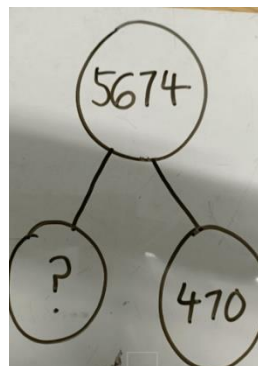
Subtract numbers with up to 4 digits (no exchange)		5327 / 3115 / ? 5674 ? 470	$$\begin{array}{cccc} & 7 & 5 & 3 & 3 \\ - & 3 & 4 & 0 & 1 \\ \hline & 4 & 1 & 3 & 2 \end{array}$$
Subtract numbers with up to 4 digits (one exchange)		4,357 / 2,735 / ?	$$\begin{array}{cccc} & 7 & 5 & \overset{2}{\cancel{3}} & \overset{1}{3} \\ - & 3 & 4 & 1 & 8 \\ \hline & 4 & 1 & 1 & 5 \end{array}$$ Show as formal written method
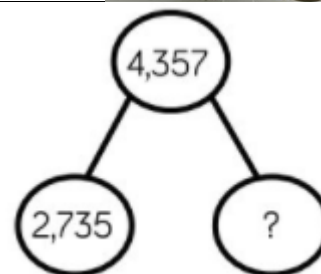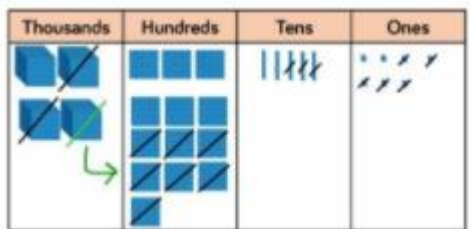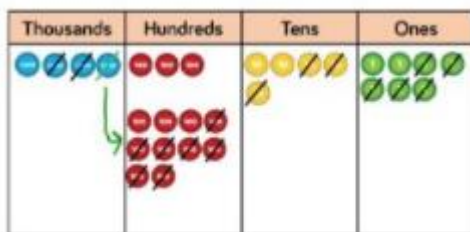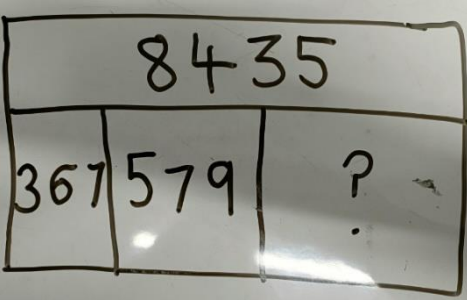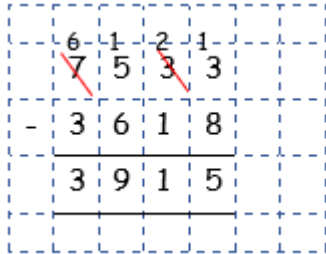
	Show using base 10 and PV counters	Use of bar model and part whole model	
Subtract numbers with up to 4 digits (more than exchange)	**As above**	**As above**	

Maths Calculation Policy

Year 5- Subtraction	
Curriculum Objectives	
subtract whole numbers with more than 4 digits, including using formal written methods subtract numbers mentally with increasingly large numbers use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy solve subtraction multi-step problems in contexts, deciding which operations and methods to use and why.	
Mental strategies	**Vocabulary**
Bridging to 10 Complements to 10/100 Near doubles Rounding and adjusting	Subtract, take away, how many are left/left over? how many have gone? one less, two less, ten less … one hundred, less how many fewer is … than …? how much less is …? difference between, equals is the same as, number bonds/pairs/facts missing number, tens boundary, hundreds boundary, ones boundary, tenths boundary, inverse

Maths Calculation Policy

Small Steps	Strategies		
	Concrete	Pictorial	Abstract
Subtract with at least 4 digits, including money and measures		Also show with 2 step problems which include + and -	As above

Maths Calculation Policy

Subtract with decimal values, including mixtures of integers and decimals and aligning the decimal Up to 3 decimal places			

Maths Calculation Policy

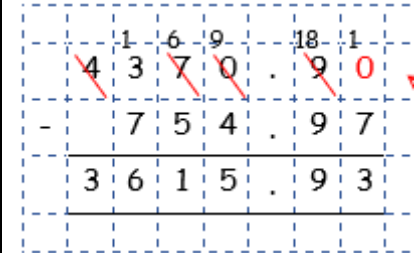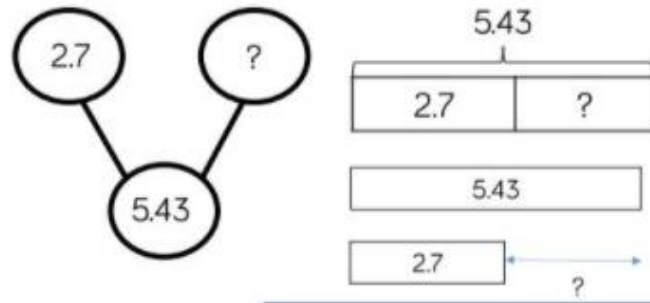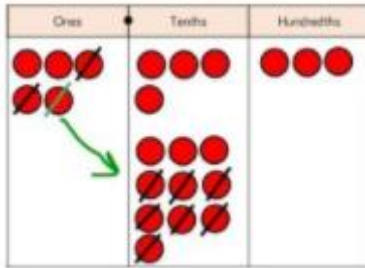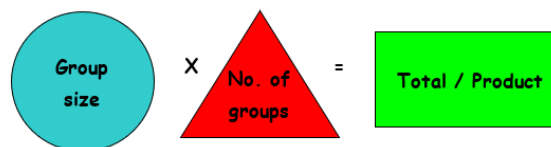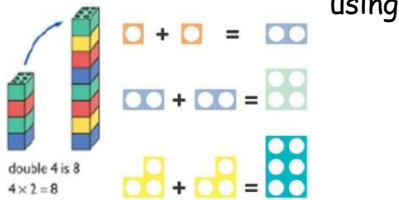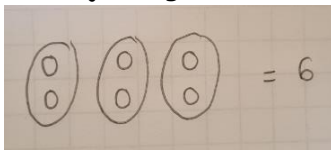| Year 6- Subtraction			
Curriculum Objectives perform mental calculations use their knowledge of the order of operations to carry out calculations involving the four operations solve subtraction multi-step problems in contexts, deciding which operations and methods to use and why solve problems involving subtraction use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.			
Mental strategies	**Vocabulary**		
Bridging to 10 **Complements to 10/100** **Near doubles** **Rounding and adjusting** **BIDMAS**	Subtract, take away, how many are left/left over? how many have gone? one less, two less, ten less … one hundred less, how many fewer is … than …? how much less is …? difference between, equals is the same as, number bonds/pairs/facts, missing number tens boundary, hundreds boundary, ones boundary, tenths boundary inverse		
Small Steps	**Strategies**		
	Concrete	**Pictorial**	**Abstract**
Subtract with increasingly large and more complex numbers and decimal values (up to 3 decimal place).	**As above**	**As above**	**As above**

Maths Calculation Policy

Group size X No. of groups = Total / Product
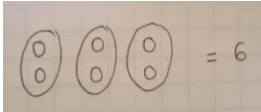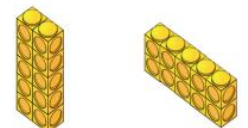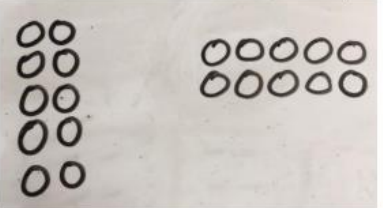
Multiplication

Year 1- Multiplication			
Curriculum Objectives solve one-step problems involving multiplication, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.			
Mental strategies	**Vocabulary**		
Counting on fingers	Multiplication, multiply, multiplied by, multiple, array, number patterns		
Small Steps	**Strategies**		
	Concrete	**Pictorial**	**Abstract**
Doubling	Use of practical activities using manipulatives including cubes and Numicon.	Draw jottings Double 4 is 8 	Use known facts Double 4 = 4 + 4 = 8
Counting in multiples (2s, 5s, 10s)	Count groups of objects.	Draw jottings 	Count in multiples of a number aloud. Write sequences with multiples of numbers.

Maths Calculation Policy

			2,4,6,8,10 5,10,15,20,25,30
Making equal groups and counting the totals	Use manipulatives to create equal groups. 	Draw jottings to show number sentence: 2 x 3 = 6 	Answer number sentences 2 x 4 = 8
Understanding arrays	Make arrays 2 lots of 5 5 lots of 2 Use of tens frames and other manipulatives to represent an array	Draw arrays 	Write number sentences for the array 2 x 5 = 10 5 x 2 = 10

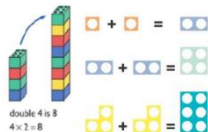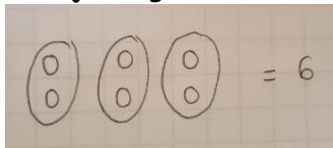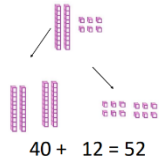| | | | |
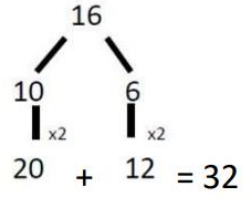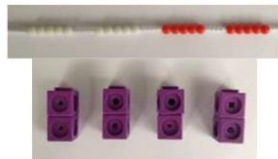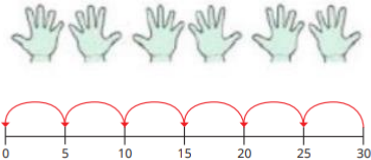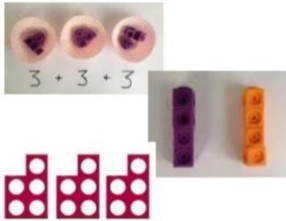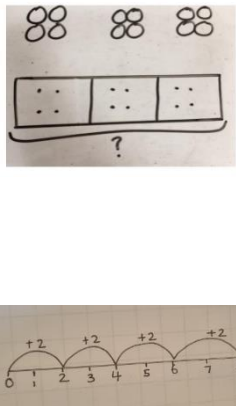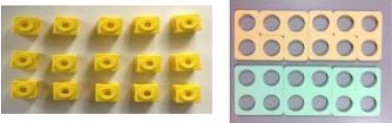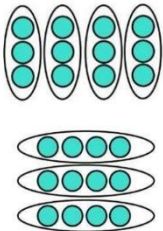
Maths Calculation Policy

Year 2- Multiplication			
Curriculum Objectives recall and use multiplication facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers calculate mathematical statements for multiplication within the multiplication tables and write them using the multiplication (×) and equals (=) signs show that multiplication of two numbers can be done in any order (commutative). solve problems involving multiplication, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.			
Mental strategies	**Vocabulary**		
Counting on fingers Doubling and halving 2, 3, 5, 10 x times table facts	Multiplication, multiply, multiplied by, multiple, groups of, times once, twice, three times, ten times, repeated addition, array, row, column, number patterns, multiplication table, multiplication fact		
Small Steps	**Strategies**		
	Concrete	**Pictorial**	**Abstract**
Equal groups	As year 1		
Doubling	Use of practical activities using manipulatives including cubes and Numicon. double 4 is 8 4 × 2 = 8	Draw jottings. = 6	Use known facts 5 + 5 = 10 Partition numbers and then double each part before recombining.
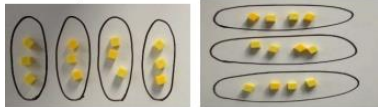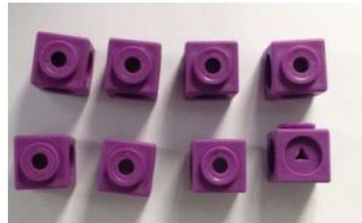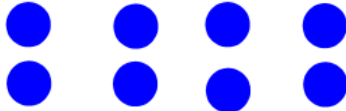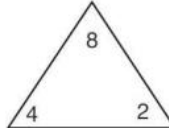
	Model doubling using base ten and place value counters whilst partitioning for doubling.		
	40 + 12 = 52		16 / 10 (x2) 6 (x2) \ 20 + 12 = 32
Counting in multiples of 2, 3, 5, 10 from 0	Count the equal groups (use of different manipulatives)	Use of number lines, bar models and pictures. 0 5 10 15 20 25 30	Count in multiples aloud. Write sequences with multiples. 0,2,4,6,8,10 0,5,10,15,20,25 0,3,6,9,12,15

Maths Calculation Policy

Repeated addition	Use different objects to add equal groups	Draw jottings to add equal groups	Write and answer repeated addition number sentences
	3 + 3 + 3	? Use number lines to jump in multiples	**2 + 2 + 2 + 2 = 8** **2 x 4 = 8**
Multiplication is commutative (arrays)	Make arrays using manipulatives. Children to understand that the order of the multiplication does not affect the answer (shown in arrays.	Draw arrays	Write number sentences for the array 5 + 5 + 5 = 15 3 + 3 + 3 + 3 + 3 = 15 5 x 3 = 15 3 x 5 = 15

Maths Calculation Policy

Using the inverse	Match number sentences to the arrays created (multiplication and division)	Draw array and then create fact family. 8 4 2	Show fact families 2 x 4 = 8 4 x 2 = 8 8 ÷ 2 = 4 8 ÷ 4 = 2 8 = 2 x 4 8 = 4 x 2 2 = 8 ÷ 4 4 = 8 ÷ 2

Maths Calculation Policy

Year 3- Multiplication	
Curriculum Objectives	
recall and use multiplication facts for the 3, 4 and 8 multiplication tables write and calculate mathematical statements for multiplication 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, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects	
Mental strategies	**Vocabulary**
Doubling and halving 2, 5, 10, 3, 4, 8 x times table facts Understand the inverse e.g. 4 x 3 = 12 12 ÷ 3 = 4 Use missing box questions to secure understanding of inverse 4 x □ = 28 □ x 5 = 60 Using known facts to multiply multiples of 10 4 x 3 = 12 So, 40 x 3 = 120 So, 30 x 4 = 120	Multiplication, multiply, multiplied by, multiple, factor, groups of, times, product, once, twice, three times, ten times, repeated addition, array, row, column, number patterns, multiplication table, multiplication fact
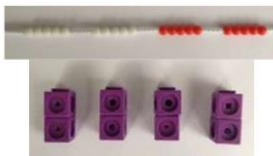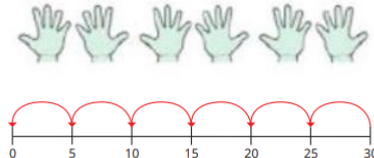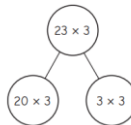
Maths Calculation Policy

Small Steps	Strategies		
	Concrete	Pictorial	Abstract
Equal groups	As KS1		
Counting in multiples of 2, 3, 4, 5, 8, 10	Count the equal groups (use of different manipulatives)	Use of number lines, bar models and pictures.	Count in multiples aloud. Write sequences with multiples. **0,2,4,6,8,10** **0,5,10,15,20,25** **0,3,6,9,12,15** **0,4, 8, 12,16,20** **0,8,16,24,32,40**
Multiply 2-digit numbers by 1-digit numbers (no exchange)	Place value charts	Use of part-whole models to partition	Expanded

Multiply 2-digit numbers by 1-digit numbers (with exchange)	Place value counters/base ten	Draw jottings to help	Formal method
	2 tens × 4 = _____ tens 4 ones × 4 = _____ ones 24 × 4 = _____ + _____ = _____ 24 × 4 = _____ 4 tens × 3 = _____ tens 5 ones × 3 = _____ ones _____ + _____ = _____ 45 × 3 = _____ 23 x 6 used to support understanding.	 understanding.	Formal method
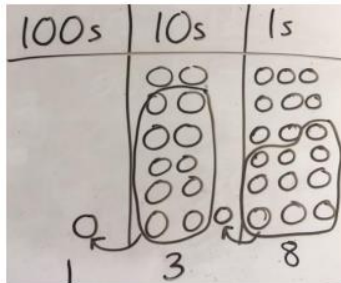
Grid method

Maths Calculation Policy

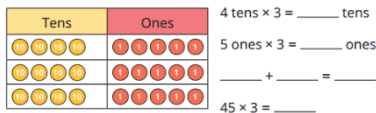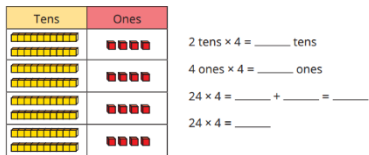| Year 4- Multiplication			
Curriculum Objectives			
recall multiplication facts for multiplication tables up to 12 × 12 use place value, known and derived facts to multiply mentally, including: multiplying by 0 and 1; multiplying together three numbers recognise and use factor pairs and commutativity 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.			
Mental strategies	**Vocabulary**		
2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 × times table facts Using known facts (multiply by 10 and 100)	Multiplication, multiply, multiplied by, multiple, factor, groups of, times, product, once, twice, three times, ten times, repeated addition, array, row, column, number patterns, multiplication table, multiplication fact, inverse, square, squared, cube, cubed		
Small Steps	**Strategies**		
	Concrete	**Pictorial**	**Abstract**
Timetables (up to 12)	Count the equal groups (use of different manipulatives)	Use of number lines, bar models and pictures.	Number sentences/known facts **3 x 4 = 12**
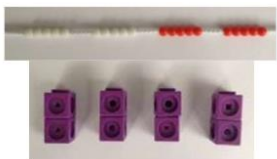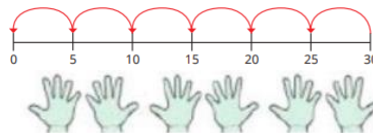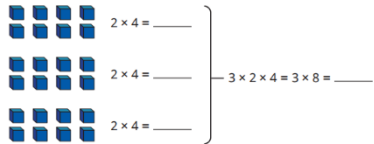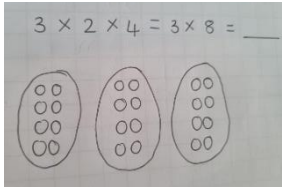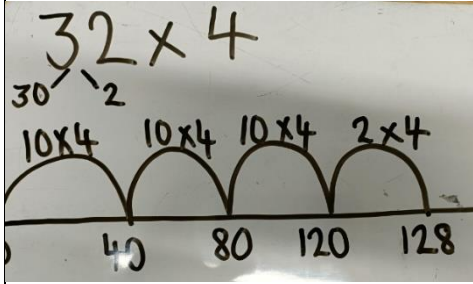
Maths Calculation Policy

Multiply three numbers	Use of manipulatives $2 \times 4 =$ ____ $2 \times 4 =$ ____ $2 \times 4 =$ ____ $3 \times 2 \times 4 = 3 \times 8 =$ ____	Draw jottings $3 \times 2 \times 4 = 3 \times 8 =$ ____	Number sentences $6 \times 5 \times 2 = 6 \times 5 \times 2$ $= 30 \times 2$ $= 60$ $6 \times 5 \times 2 = 6 \times 5 \times 2$ $= 6 \times 10$ $= 60$
Multiply a 2 digit-number by a 1-digit number (no exchange and with exchange)	As year 3	32×4 30 2 10×4 10×4 10×4 2×4 40 80 120 128	

Maths Calculation Policy

Multiply a three-digit number by a 1-digit number (no exchange and with exchange)	Use of place value charts	Part-whole model to help partition. Grid method	Formal method
	      	 $213 \times 3 = 639$ $528 \times 4 = 2,112$	 $245 \times 4 = 980$

Maths Calculation Policy

Year 5- 6   Multiplication
Curriculum Objectives
Year 5
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 numbers mentally drawing upon known facts
multiply whole numbers and those involving decimals by 10, 100 and 1000
Year 6
multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
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
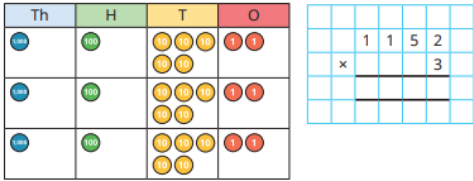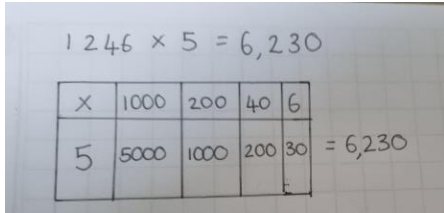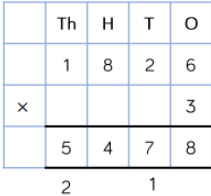
Mental strategies	Vocabulary
2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 x times table facts Using known facts Factors, squares cubes, primes Multiply by 10, 100, 1000	Multiplication, multiply, multiplied by, multiple, factor, groups of, times, product, once, twice, three times, ten times, repeated addition, array, row, column, number patterns, multiplication table, multiplication fact, inverse, square, squared, cube, cubed

Maths Calculation Policy

Small Steps	Strategies		
	Concrete	Pictorial	Abstract
Multiply 4-digit numbers by 1- digit numbers	Use of place value charts	Grid method $1246 \times 5 = 6,230$	Formal method $1,826 \times 3 = 5,478$

Maths Calculation Policy

Multiply 2-digit numbers by 2-digit numbers	The area method helps children to understand the size of the numbers that they are working with.	Grid method	Formal method

The area method helps children to understand the size of the numbers that they are working with.
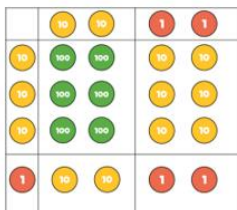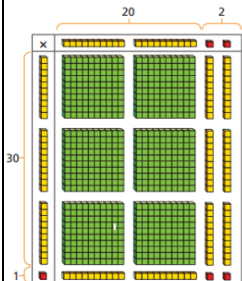
Grid method

×	20	2
30	600	60
1	20	2
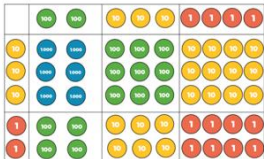
Formal method

	H	T	O
		2	2
×		3	1
		2	2
	6	6	0
	6	8	2

$$22 \times 31 = 682$$

Multiply 3-digit numbers by 2-digit numbers	Area method	Grid method 	×	200	30	4	 Formal method

Multiply 3-digit numbers by 2-digit numbers

Area method

Grid method

×	200	30	4
30	6,000	900	120
2	400	60	8

Formal method

Th	H	T	O
	2	3	4
×		3	2
	4	6	8
$_1$7	$_1$0	2	0
7	4	8	8

$234 \times 32 = 7,488$

Multiply 4-digit numbers by 2-digit numbers

Children should now be confident in the formal written method. If required move back to previous examples and use concrete resources to ensure pupils are secure in the method.

Ensure all exchanges are put in the same place, model this consistently.

Formal method

TTh	Th	H	T	O
		2	7	3	9
×				2	8
2$_2$	1$_5$	9$_3$	1$_7$	2
5$_1$	4	7$_1$	8	0
7	6	6	9	2
			1	

			$2,739 \times 28 = 76,692$
Multiply with a decimal place	Children should now be confident in the formal written method. If required move back to previous examples and use concrete resources to ensure pupils are secure in the method.	Ensure all exchanges are put in the same place, model this consistently.	Formal method 31.62 x 72 = 2276.64

Th	H	T	O	.	1/10	1/100
		3	1	.	6	2
	x		7	2		
		6	3	.	2	4
2	2	1	3	.	4	0
2	2	7	6	.	6	4

Maths Calculation Policy

Total/Product ÷ No of groups = Group size

15   5   3

Division

Year 1- Division			
Curriculum Objectives solve one-step problems involving division, by calculating the answer using concrete objects, pictorial representations and arrays			
Mental strategies	**Vocabulary**		
Counting on fingers	Division, dividing, grouping, sharing, doubling, halving, array, number patterns		
Small Steps	**Strategies**		
	Concrete	**Pictorial**	**Abstract**
Division as sharing	 I have 10 cubes, can you share them equally in 2 groups?	 6 sweets are shared between 2 children. How many sweets does each child get? <table><tr><td colspan="2">6</td></tr><tr><td>3</td><td>3</td></tr></table>	½ of 6 is 3
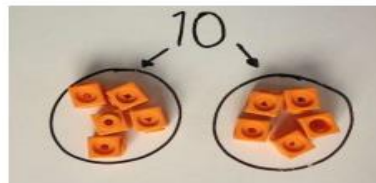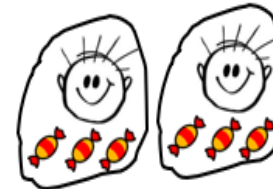
Maths Calculation Policy

	Toby bought 15 sweets at the shop. He divided them into 3 bags. How many were there in each bag?		
	jottings		
Division as grouping	Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.	There are 6 sweets. How many children can have 2 each?	6 ÷ 2 = 3 2 + 2 + 2 = 6

6		
2	2	2
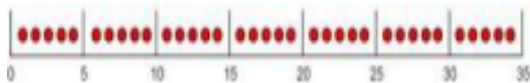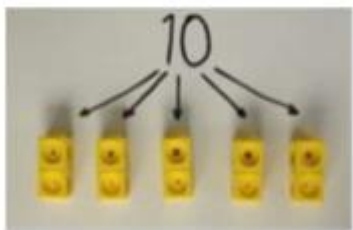
Halving and finding a quarter	8 1/2 1/4	 | 8			
4		4	
2	2	2	2		½ of 8 is 4 ¼ of 8 is 2
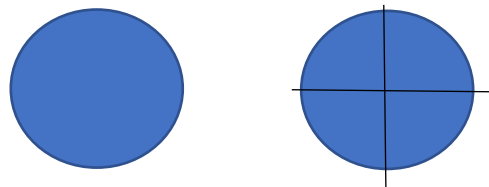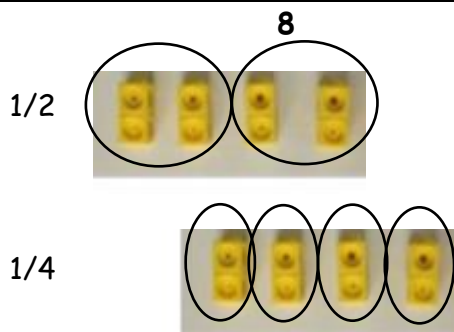
Maths Calculation Policy

Year 2- Division
Curriculum Objectives recall and use division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers calculate mathematical statements for division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot solve problems involving division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

Mental strategies	Vocabulary
Counting on fingers Doubling and halving 2, 5, 10 x times table facts	division dividing, divide, divided by, divided into grouping sharing, share, share equally left, left over one each, two each, three each … ten each group in pairs, threes … tens equal groups of doubling halving array row, column number patterns

Small Steps	Strategies		
	Concrete	**Pictorial**	**Abstract**
Division as sharing	Same as year 1 but sharing between 2, 5, 10 and 3	I have 10 sweets and a share them between 5 children. How many do they each have? 	10 ÷ 5 = 2 Counting in the multiple

Division as grouping	Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.	There are 6 sweets. How many children can have 2 each?	$6 \div 2 = 3$
		Continue to use bar modelling to aid solving division problems. $20 \div 5 = ?$ $5 \times ? = 20$	
			6
			2 / 2 / 2
			$15 \div 3 = 5$ $5 + 5 + 5 = 15$
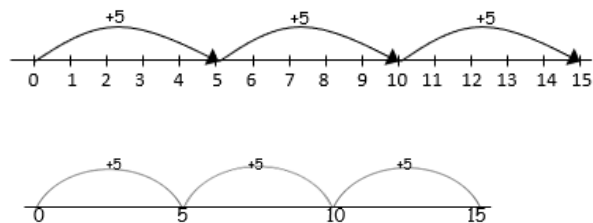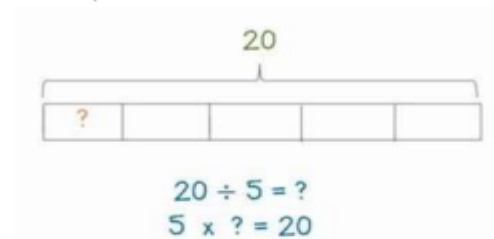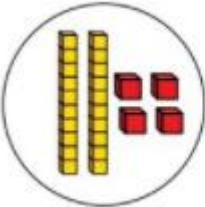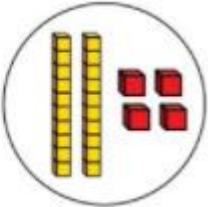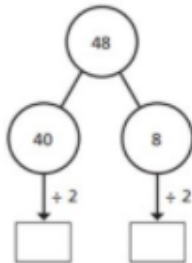
Maths Calculation Policy

Division with arrays	Link division to multiplication by creating an array and thinking about the number sentences that can be created. Eg 15 ÷ 3 = 5 5 x 3 = 15 15 ÷ 5 = 3 3 x 5 = 15	4 × 2 = 8 2 × 4 = 8 2 × 4 = 8 4 × 2 = 8	Find the inverse of multiplication and division sentences by creating eight linking number sentences. 7 x 4 = 28 4 x 7 = 28 28 ÷ 7 = 4 28 ÷ 4 = 7 28 = 7 x 4 28 = 4 x 7 4 = 28 ÷ 7 7 = 28 ÷ 4
Dividing 2 digits by 1 digit (no exchange)			48 ÷ 2 = 24

Maths Calculation Policy

Year 3- Division
Curriculum Objectives
recall and use division facts for the 3, 4 and 8 multiplication tables
write and calculate mathematical statements for 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 division, including positive integer scaling problems and correspondence problems

Mental strategies	Vocabulary
Doubling and halving 2, 5, 10, 3, 4, 8 x times table facts Understand the inverse e.g. 4 x 3 = 12 12 ÷ 3 = 4 Use missing box questions to secure understanding of inverse 4 x □ = 28 □ x 5 = 60 Using known facts to divide mutliples of 10 12 ÷ 4 = 3 So 120 ÷ 4 = 30 So 120 ÷ 30 = 4	division dividing, divide, divided by, divided into left, left over, remainder grouping sharing, share, share equally one each, two each, three each … ten each group in pairs, threes … tens equal groups of doubling halving array row, column number patterns
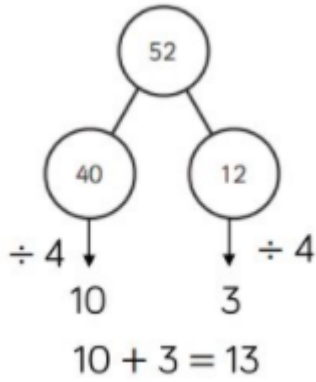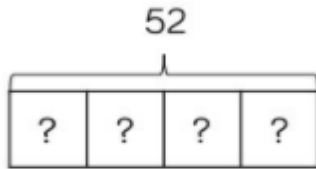
Maths Calculation Policy

Small Steps	Strategies		
	Concrete	Pictorial	Abstract
Division as sharing and grouping	As KS1 Show sharing only as concrete Use grouping to count in the multiple		
Dividing 2 digits by 1 digit (with exchange)			52 ÷ 4 = 13

Maths Calculation Policy

Making links between division and multiplication		I had a length of ribbon that was 28cm long and I cut it in half. How long is each new piece of ribbon?	Children should understand that halving is the same as dividing by 2 ½ of 28 = 14 28 ÷ 2 = 14 and that it is the inverse of doubling. 14 x 2 = 28
				28	
				14	14	
Division with remainders	14 ÷ 3 = Divide objects between groups and see how much is left over	Draw dots and group them to divide an amount and clearly show a remainder. remainder 2 14 ÷ 3 = 4 remainder 2	12 ÷ 5 = 2 r 2
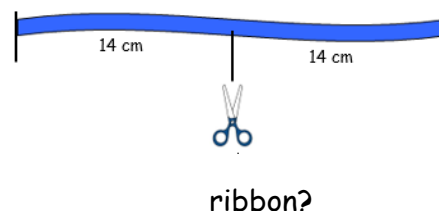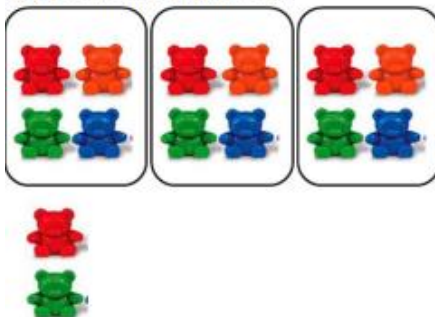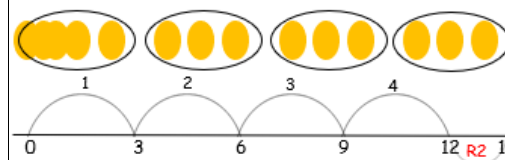
Maths Calculation Policy
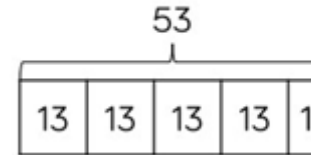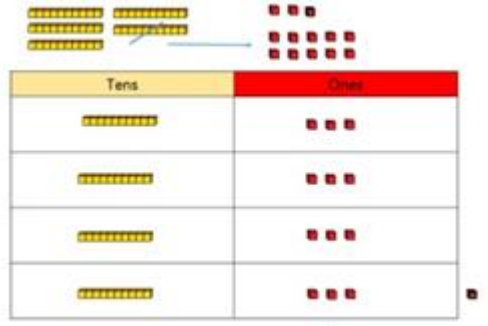
Maths Calculation Policy

Year 4 Division

Curriculum Objectives

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 3 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
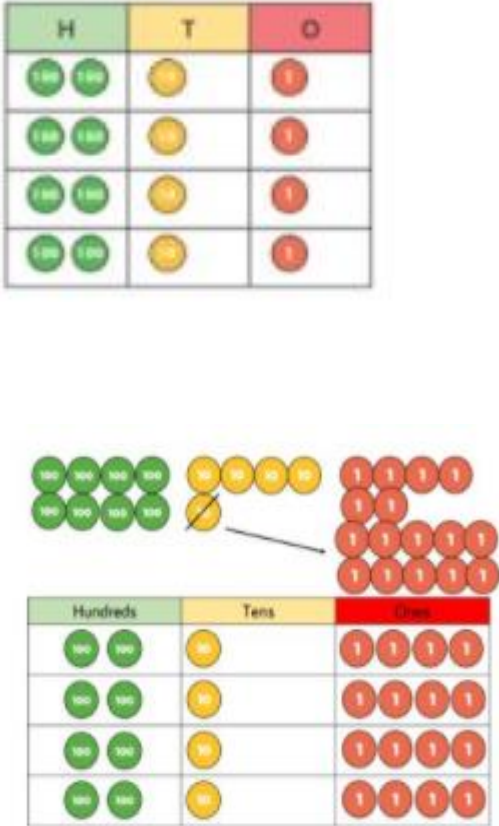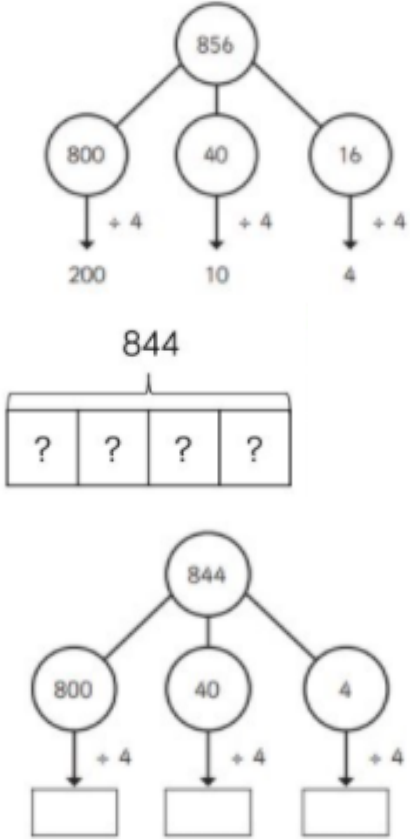
Mental strategies	**Vocabulary**
2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 x times table facts Using known facts	division dividing, divide, divided by, divided into left, left over, remainder grouping sharing, share, share equally one each, two each, three each … ten each group in pairs, threes … tens equal groups of doubling halving array row, column number patterns multiplication table multiplication fact, division fact inverse

Maths Calculation Policy

Small Steps	Strategies		
	Concrete	**Pictorial**	**Abstract**
Divide 3 digit numbers by 1 digit.			Begin with divisions that divide equally with no remainder. Move onto divisions with a remainder.

Maths Calculation Policy

Year 5-6 Division

Curriculum Objectives

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 1,000

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
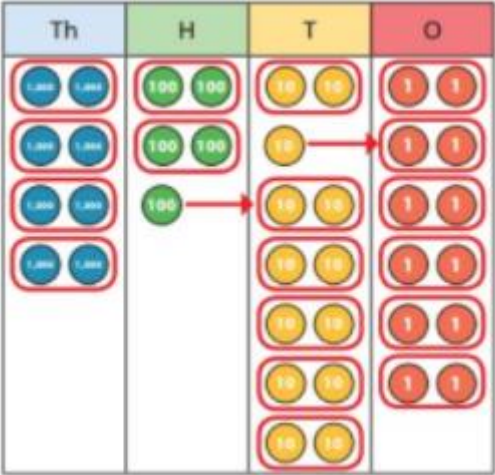
Mental strategies	**Vocabulary**
2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 x times table facts Using known facts Factors, squares cubes, primes	division dividing, divide, divided by, divided into left, left over, remainder grouping sharing, share, share equally one each, two each, three each … ten each group in pairs, threes … tens equal groups of doubling halving array row, column number patterns multiplication table multiplication fact, division fact inverse square, squared cube, cubed

Maths Calculation Policy

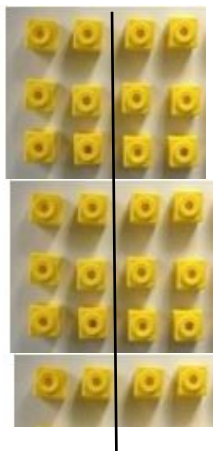| Small Steps	Strategies		
	Concrete	Pictorial	Abstract
Divide at least 3 digit numbers by 1 digit.		As above	Begin with divisions that divide equally with no remainder. $$2\ 1\ 8$$ $$3$$ $$4\ |\ 8\ 7\ 2$$ Move onto divisions with a remainder. $$8\ 6\ \ r\ 2$$ $$3$$ $$5\ |\ 4\ 3\ 2$$ Finally move into decimal places to divide the total accurately. $$1\ 4\ .\ 6$$ $$16\ \ \ 21$$ $$3\ 5\ |\ 5\ 1\ 1\ .\ 0$$ $$0\ 6\ 6\ 3\ r\ 5$$ $$8\overline{)5\ ^53\ ^50\ ^29}$$

Short division	**Short division** using place value counters to group. 615 ÷ 5 1. Make 615 with place value counters. 2. How many groups of 5 hundreds can you make with 6 hundred counters? 3. Exchange 1 hundred for 10 tens. 4. How many groups of 5 tens can you make with 11 ten counters? 5. Exchange 1 ten for 10 ones. 6. How many groups of 5 ones can you make with 15 ones?	Represent the place value counters pictorially.	Children to the calculation using the short division scaffold.
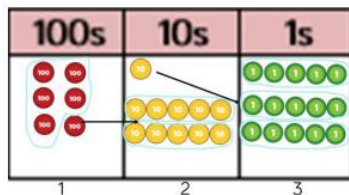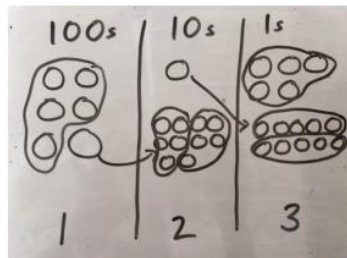
Maths Calculation Policy

Long division	

Long division using place value counters

$2544 \div 12$

1000s	100s	10s	1s
● ●	● ● ● ● ●	● ● ● ●	● ● ● ●

We can't group 2 thousands into groups of 12 so will exchange them.

1000s	100s	10s	1s
	(24 red counters)	● ● ● ●	● ● ● ●

We can group 24 hundreds into groups of 12 which leaves with 1 hundred.

1000s	100s	10s	1s
	(red counters)	(yellow counters)	● ● ● ●

After exchanging the hundred, we have 14 tens. We can group 12 tens into a group of 12, which leaves 2 tens.

```
        0 2 1
12 ) 2 5 4 4
     2 4
     ─────
       1 4
       1 2
     ─────
         2
```

1000s	100s	10s	1s
	(red counters)	(yellow counters)	(green counters)

After exchanging the 2 tens, we have 24 ones. We can group 24 ones into 2 group of 12, which leaves no remainder.

```
        0 2 1 2
12 ) 2 5 4 4
     2 4
     ─────
       1 4
       1 2
     ─────
         2 4
         2 4
     ─────
           0
```

```
        0 3 6
1 2 ) 4 3 2        (×30)
    − 3 6 0
    ─────────
        7 2        (×6)
    −   7 2
    ─────────
          0
```

$12 \times 1 = 12$
$12 \times 2 = 24$
$12 \times 3 = 36$
$12 \times 4 = 48$
$12 \times 5 = 60$
$12 \times 6 = 72$
$12 \times 7 = 84$
$12 \times 8 = 96$
$12 \times 7 = 108$
$12 \times 10 = 120$

```
        0 4 8 9
15 ) 7 3 3 5
   − 6 0 0 0      (×400)
   ─────────────
     1 3 3 5
   − 1 2 0 0      (×80)
   ─────────────
       1 3 5
   −   1 3 5      (×9)
   ─────────────
           0
```

$1 \times 15 = 15$
$2 \times 15 = 30$
$3 \times 15 = 45$
$4 \times 15 = 60$
$5 \times 15 = 75$
$10 \times 15 = 150$

$1 \times 15 = 15$
$2 \times 15 = 30$
$3 \times 15 = 45$
$4 \times 15 = 60$
$5 \times 15 = 75$
$10 \times 15 = 150$

$$372 \div 15 = 24\frac{4}{5}$$

Move onto partitioning the 2 digit to help with the timestables to support the division of 2 digits.

10 + 5 = 15
20 + 10 = 30
30 + 15 = 45
40 + 20 = 60
50 + 25 = 75

60 + 30 = 90
70 + 35 = 105
80 + 40 = 120

Teach putting the answer as a decimal as well.

Maths Calculation Policy

Glossary of Terms

2-digit number– a number with 2 digits like 23, 45, 12 or 60

3-digit number – a number with 3 digits like 123, 542, 903 or 561

Addition facts – knowing that 1+1 = 2 and 1+3 = 4 and 2+5 = 7. Normally we only talk about number facts with totals of 20 and under.

Array - An array is an arrangement of a set of numbers or objects in rows and columns –it is mostly used to show how you can group objects for repeated

addition or subtraction.

Bead String/Bar – a string with (usually 100) beads on, grouped by colour in tens. The bead string is a good bridge between a number track and a number line

as it maintains the cardinality of the numbers whilst beginning to develop the concepts of counting 'spaces' rather than objects.

Bridging – when a calculation causes you to cross a 'ten boundary' or a 'hundred boundary' e.g. 85 + 18 will bridge 100.

Compact vertical – the name of the recommended written method for addition whereby the numbers are added in columns, 1s first then 10s and so on.

Where the total exceeds 10, the ten 1s are exchanged for a 10 and written below the answer line. Sometimes referred to as 'carrying'.

Concrete apparatus – objects to help children count and calculate– these are most often cubes (multilink) but can be anything they can hold and move

including Cuisenaire rods, Dienes rods (hundreds, tens and units blocks), straws, Numicon, Place Value counters and much more.

Maths Calculation Policy

Count all – when you add by counting all the items/objects e.g. to add 11 and 5 you would count out 11, then count out 5, then put them together and count

them all to get 16.

Count on – when you add (or sometimes subtract) by counting onwards from a given number. E.g. to add 11 and 5 you would count on 5 from 11 i.e. 12, 13,

14, 15, 16

Decimal number – a number with a decimal point e.g. 2.34 (said as two point three four)

Decomposition – the name of the recommended written method for subtraction whereby the smaller number is subtracted from the larger, 1s first then 10s

and so on. Where the subtraction cannot be completed as the second number is larger than the first, a 10 is exchanged for ten 1s to facilitate this. This is the

traditional 'borrowing' form of column method, which is different to the 'payback' method.

Dienes Rods (or Base 10) – this is a set of practical equipment that represents the numbers to help children with place value and calculation. The Dienes rods

show 1s, 10s, 100s and 1000s as blocks of cubes that children can then combine. Dienes rods do not break up so the child has to 'exchange' them for smaller

or larger blocks where necessary.

Difference – the gap between numbers that is found by subtraction e.g. 7-5 can be read as '7 take away 5' or as the 'difference between 7 and 5'

Dividend – the number being divided in a calculation

Divisor – the smaller number in a division calculation.

Maths Calculation Policy

Double – multiply a number by 2

Efficient Methods – the method(s) that will solve the calculation most rapidly and easily

Equals - is worth the same as (be careful not to emphasise the use of = to show the answer)

Exchanging – Swapping a '10' for ten '1s' or a '100' for ten '10s' or vice versa (used in addition and subtraction when 'moving' 'ten' or a 'hundred' from its

column into the next column and splitting it up). Heavily relied upon for addition and subtraction of larger numbers. Skills in this can be built up practically

with objects, then Dienes rods/base 10, then place value counters before relying on a solely written method.

Expanded Multiplication – a method for multiplication where each stage is written down and then added up at the end in a column

Factor – a number that divides exactly into another number, without remainder

Grid method – a method for multiplying two numbers together involving partitioning and multiplying each piece separately.

Grouping – an approach to division where the dividend is split into groups of the size of the divisor and the number of groups created are then counted.

Half - a number, shape or quantity divided into 2 equal parts

Halve – divide a number by 2

Integer - a whole number (i.e. one with no decimal point)

Inverse – the opposite operation. For example, addition is the inverse of subtraction and multiplication is the inverse of division.

Known Multiplication Facts – times tables and other number facts that can be recalled quickly to support with larger or related calculations e.g. if you know

4x7 then you also know 40 x 70, 4 x 0.7 etc.

Maths Calculation Policy

Long Division – formal written of division where the remainders are calculated in writing each time (extended version of short division)

Long Multiplication – formal written method of column multiplication

Multiple - a number which is an exact product of another number i.e. a number which is in the times table of another number

Number bonds – 2 numbers that add together to make a given total, e.g. 8 and 2 bond to 10 or 73 and 27 bond to 100

Number line – a line either with numbers or without (a blank numberline).

The number line emphasises the continuous nature of numbers and the existence of 'in-between' numbers that are not whole. It is based around the gaps

between numbers.

Children use this tool to help them count on or count back for addition of subtraction. As they get older, children will count in 'jumps' on a number line e.g.

to add 142 to a number they may 'jump' 100 and then 40 and then 2. The number line is sometimes used in multiplication and division but can be time

consuming.

Number track – a sequence of numbers, each inside its own square. It is a simplified version of the number line that emphasises the whole numbers.

Numicon – practical maths equipment that teaches children the names and values of numbers 1-10 initially but them helps them with early addition,

subtraction, multiplication and division. Numicon is useful for showing the real value of a number practically.

One-Step Calculation – a calculation involving only one operation e.g. addition. Usually the child must decide what that operation is.

Maths Calculation Policy

Partition – split up a larger number into parts, such as the hundreds, tens and units e.g. 342 can be partitioned into 300 and 40 and 2

Place Value – the value of a digit created by its position in a number e.g. 3 represents thirty in 234 but three thousand in 3567

Recombine – for addition, once you have partitioned numbers into hundreds, tens and units then you have to add then hundreds together, then add the tens

to that total, then add the units to that total

Remainder – a whole number left over after a division calculation

Repeated addition – repeatedly adding groups of the same size for multiplication

Scaling – an approach to multiplication whereby the number is 'scaled up' by a factor of the multiplier e.g. 4 x 3 means 4 scaled up by a factor of 3.

Sharing – an approach to division whereby the dividend is shared out into a given number of groups (like dealing cards)

Short Division - traditional method for division with a single digit divisor (this is a compact version of long division, sometimes called 'bus stop')

Significant digit – the digit in a number with the largest value e.g. in 34 the most significant digit is the 3, as it has a value of '30' and the '4' only has a value

of '4'

Single digit – a number with only one digit. These are always less than 10.

Sum – the total of two or more numbers (it implies addition). Sum should not be used as a synonym for calculation.

Two-step calculation - a calculation where two different operations must be applied e.g. to find change in a shop you will usually have to add the individual

prices and then subtract from the total amount. Usually the child has to decide what these two operations are and the order in which they should be applied.