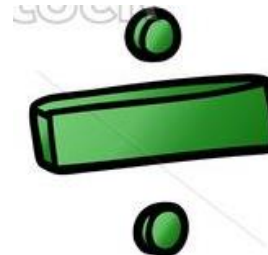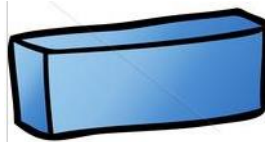# Arley Primary School Calculation Policy

This policy supports the White Rose maths scheme used throughout the school. Progression within each area of calculation is in line with the programme of study in the 2014 National Curriculum. This calculation policy should be used to support children to develop a deep understanding of number and calculation. This policy has been designed to teach children through the use of concrete, pictorial and abstract representations.

• Concrete representation - a pupil is first introduced to an idea or skill by acting it out with real objects. This is a 'hands on' component using real objects and is a foundation for conceptual understanding.
• Pictorial representation - a pupil has sufficiently understood the 'hands on' experiences performed and can now relate them to representations, such as a diagram or picture of the problem.
• Abstract representation - a pupil is now capable of representing problems by using mathematical notation, for example 12 x 2 = 24.

It is important that conceptual understanding, supported by the use of representation, is secure for all procedures. Reinforcement is achieved by going back and forth between these representations.
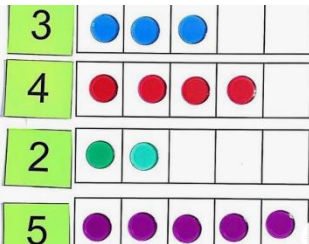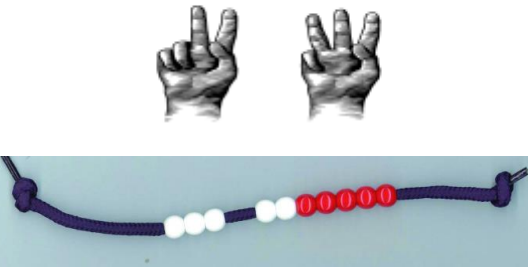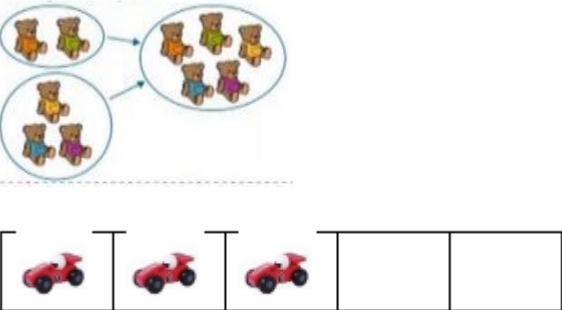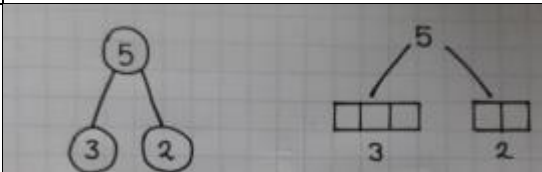
Updated March 2022

J.Mackley

Addition Guidance

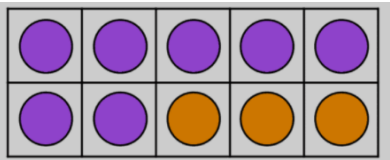| EYFS – Addition |
|---|
| **Vocabulary:** fives frame, tens frame, whole, part, add, plus, greater than, less than, the same as, most, least, bigger, smaller, equal |
| **Helpful Videos/Resources:** https://www.ncetm.org.uk/classroom-resources/ey-numberblocks-support-materials/ |

Method:	Concrete:	Pictorial:	Abstract:
Subitise (recognise quantities without counting) up to 5	Use toys and general classroom resources for children to physically manipulate, group/regroup.	Use fives frames to sort objects/counters	Relationships between pictures and objects as numerals
Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 and some number bonds to 10	Show me 5 fingers using both hands.	How many have we got? What is our whole? How many spaces are there? How many could we have?	Using both of these representations for number bonds will ensure children are provided with variation in their representations and also begin to build foundations for independently drawing these in Year 1. A large emphasis is placed on the part and whole vocabulary.
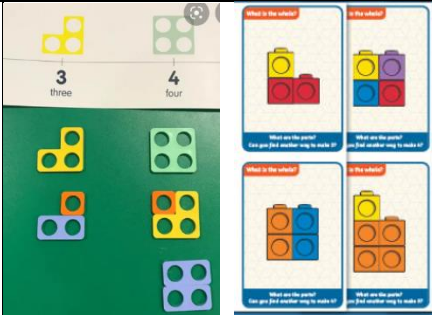
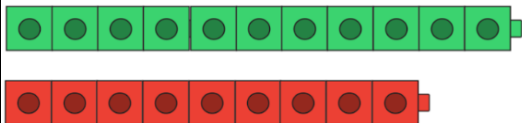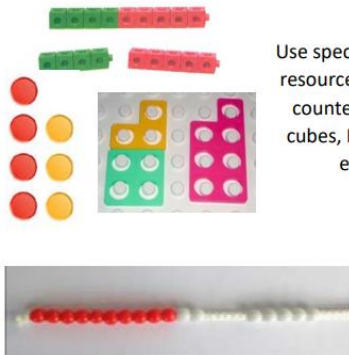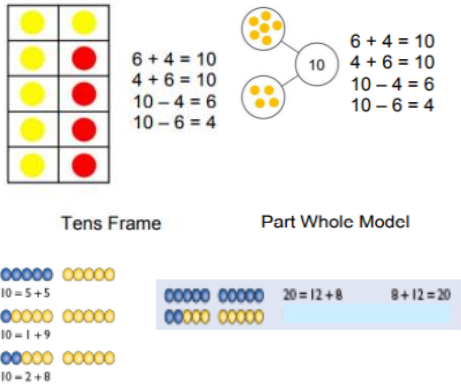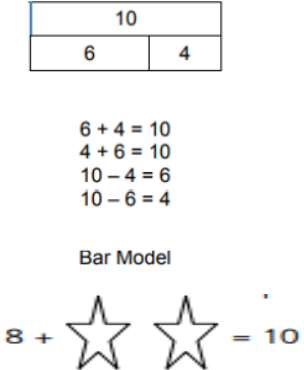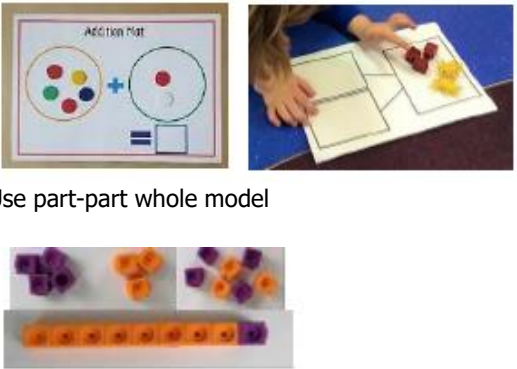|		Use of tens frames to sort objects/counters	Relationships between pictures and objects as numerals and words
Have a deep understanding of number to 10, including the composition of each number	 Represent numbers in different ways using numicon/other resources eg. Multilink		
Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity	 Use of balance scales to compare number of objects (items such as numicon are weighted correctly for this).	 James Oscar _____ has the most marbles. Which tower is bigger/smaller?	
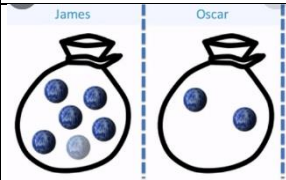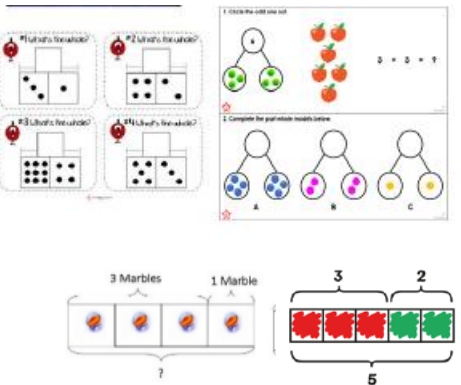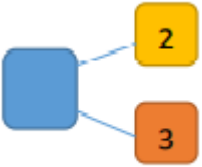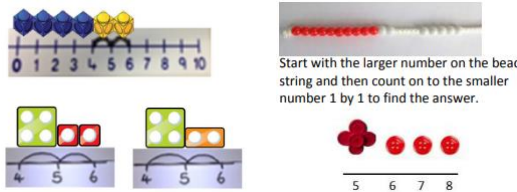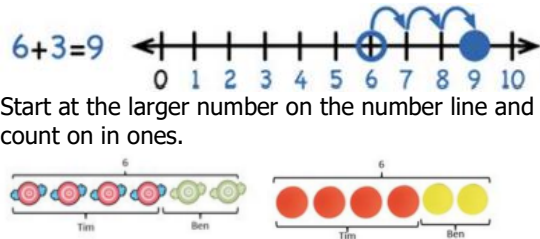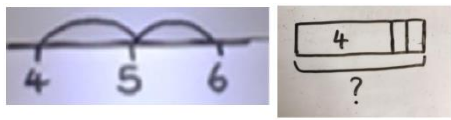
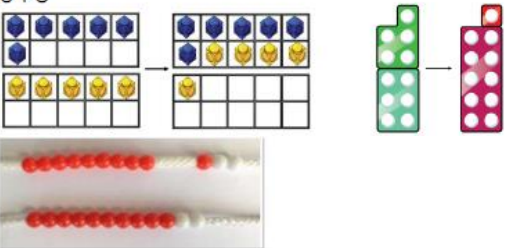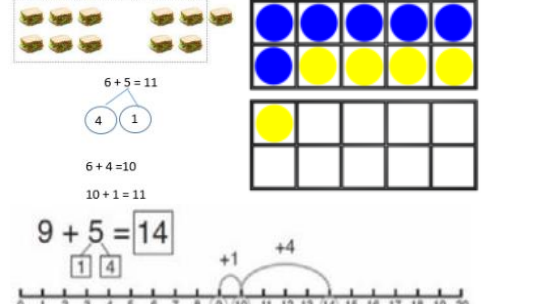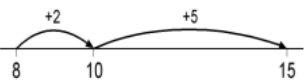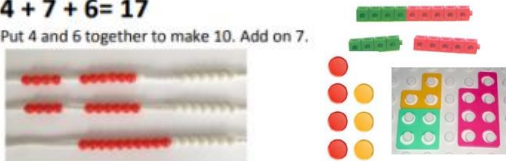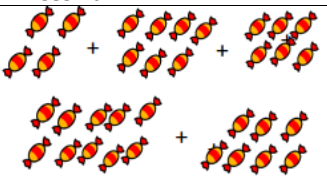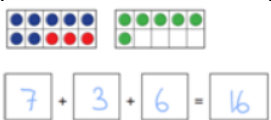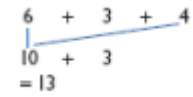**MENTALSTRATEGIES:**
- Verbally count beyond 20
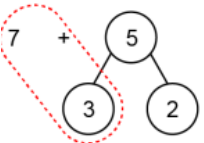
Year 1 – Addition

Vocabulary: add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, balancing, part, part, whole

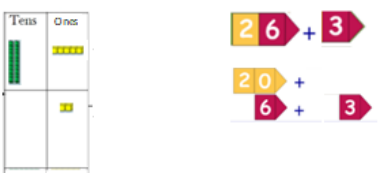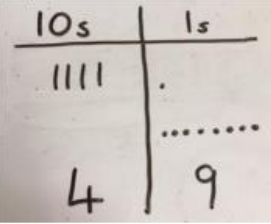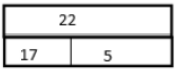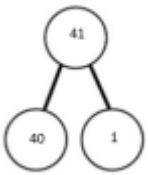| Method:	Concrete:	Pictorial:	Abstract:
Represent and use number bonds and related subtraction facts within 20	Use specific maths resources such as counters, snap cubes, Numicon etc.	Tens Frame Part Whole Model $6 + 4 = 10$ $4 + 6 = 10$ $10 - 4 = 6$ $10 - 6 = 4$ $10 = 5 + 5$ $10 = 1 + 9$ $10 = 2 + 8$ $20 = 12 + 8$ $8 + 12 = 20$	Bar Model $6 + 4 = 10$ $4 + 6 = 10$ $10 - 4 = 6$ $10 - 6 = 4$ $8 + $ ☆ $ + $ ☆ $ = 10$
Combining two parts to make a whole: part whole model.	Use part-part whole model Use cubes to add two numbers together as a group or in a bar. (Some children may still need to use real objects)	The Bar Model will be continued from EYFS as a method to support problem solving involving addition, continuing with the concrete representations and moving onto using pictorial representations of objects.	A focus on symbols and numbers to form a calculation and fact families. $2 + 3 = 5$ $3 + 2 = 5$ $5 = 3 + 2$ $5 = 2 + 3$

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.	$6+3=9$ Start at the larger number on the number line and count on in ones.	 $3 + \square = 5$
Regrouping to make 10 *Regrouping builds on pupils' understanding that 10 ones is equivalent to 1 ten	$6 + 5$ Start with the bigger number and use the smaller number to make 10.	 $6 + 5 = 11$ $6 + 4 = 10$ $10 + 1 = 11$ $9 + 5 = 14$	$6 + 5 = 11$ $6 + 4 = 10$ $10 + 1 = 11$ $8 + 7 = 15$

MENTALSTRATEGIES:
- Memorise and reason with number bonds to 10 and 20 in several forms (for example, $9 + 7 = 16$; $16 - 7 = 9$; $7 = 16 - 9$)
- Realise the effect of adding or subtracting zero
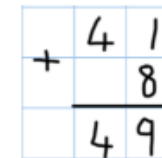- Combine and increase numbers, counting forwards and backwards

Year 2 – Addition

Vocabulary: add, addition, more, plus, make, sum, total, altogether, score, 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…?, tens boundary

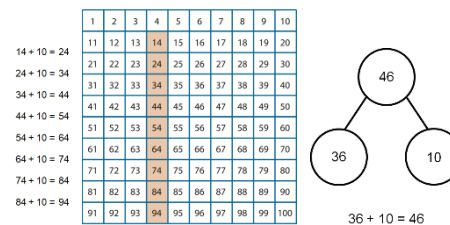| Method:	Concrete:	Pictorial:	Abstract:
Adding 3 1-digit numbers	Following on from making 10, make 10 with 2 of the digits (if possible) then add on the third digit. Could us counters, cubes, numicon etc.	Add together three groups of objects. Draw a picture to recombine the groups to make 10.	Children should relate adding 3 numbers to adding 2 numbers e. 7+3+2 = 7+5
Adding a 2-digit number and ones\n\n*Regrouping and exchange build on pupils' understanding that 10 ones is equivalent to 1 ten. Base 10/tens frames/Numicon can be used to model the calculations, and to draw attention to the regrouping/exchange.	Continue to develop understanding of partitioning and place value using base 10 and place value grids:\n\n25 +2\n\n\nUse 10's frames, numicon and base 10 to build on knowledge of regrouping:		Explore related facts\n\n17 + 5 = 22\n5 + 17 = 22\n22 — 17 = 5\n22 — 5 = 17\n\n41 + 8\n\n1 + 8 = 9\n40 + 9 = 49\n\n*Pupils do not need to learn formal written methods for addition and subtraction in year 2,
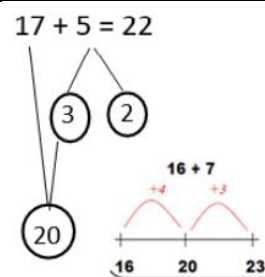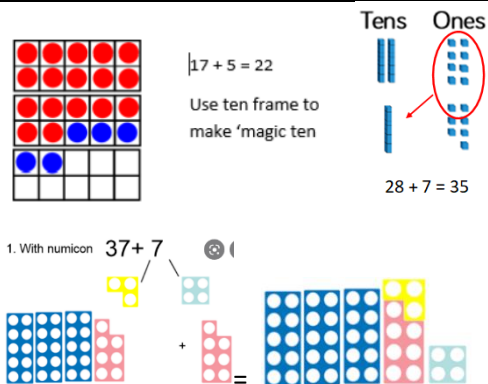
| | | | but column addition and column subtraction could be used as an alternative way to record two-digit calculations at this stage.

17 + 5 = 22

Use ten frame to make 'magic ten'

28 + 7 = 35

1. With numicon 37+ 7

17 + 5 = 22

$$+\;41$$
$$+\;8$$
$$49$$

Adding a 2-digit number and multiples of 10

25 + 10 = 35

26 + 50

20 + 50

6 +

27 + 30
+10 +10 +10

27   37   47   57

Base 10 may be used above the number line initially.

	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
14 + 10 = 24	21	22	23	24	25	26	27	28	29	30
24 + 10 = 34	31	32	33	34	35	36	37	38	39	40
34 + 10 = 44	41	42	43	44	45	46	47	48	49	50
44 + 10 = 54	51	52	53	54	55	56	57	58	59	60
54 + 10 = 64	61	62	63	64	65	66	67	68	69	70
64 + 10 = 74	71	72	73	74	75	76	77	78	79	80
74 + 10 = 84	81	82	83	84	85	86	87	88	89	90
84 + 10 = 94	91	92	93	94	95	96	97	98	99	100

46
36   10
36 + 10 = 46
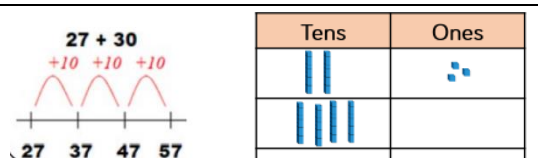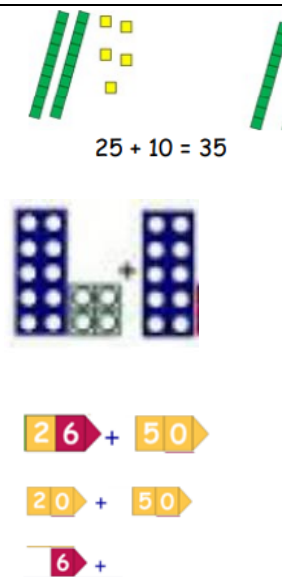
*Ensure understanding that the ones digit does not change with all representations

45 + 30 = 75
40   5

10s	1s
4 + 3	5
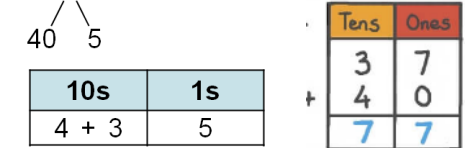
27 + 10 = 37

27 + 20 = 47

27 + □ = 57

*Pupils should be able to apply known one-digit additive facts:

	4	+	3	=	7
so	40	+	30	=	70
	45	+	30	=	75

| Adding two 2-digit numbers | | | $26 + 37 = 63$ $26 + 37 = 63$ |

Adding two 2-digit numbers

Using a Hundred Square:

$$26 + 37 = 63$$
20 6   30 7

$$26 + 37 = 63$$
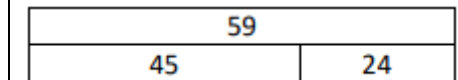30 7
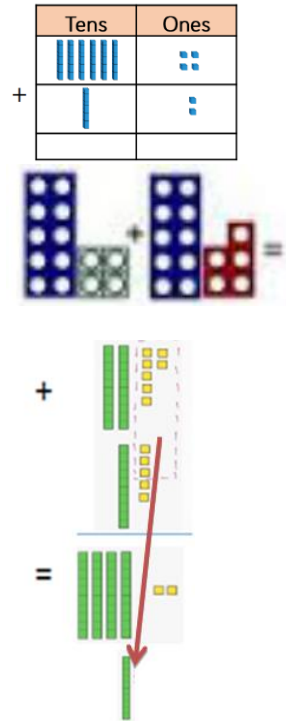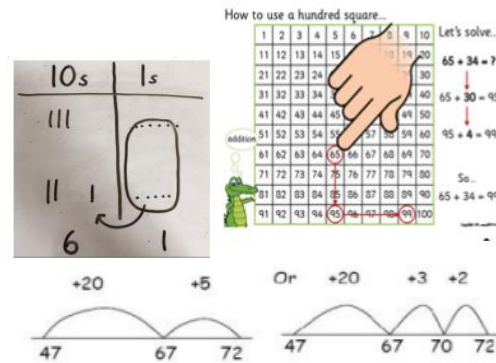
$20 + 30 = 50$
$6 + 7 = 13$
$50 + 13 = 63$

$26 + 30 = 56$
$56 + 7 = 63$

*Recording addition in columns supports place value and prepares for formal written methods with larger numbers.

$40 + 7$
$30 + 5$
$70 + 12$

```
  64
+ 17
  11
+ 70
  81
```

Use continuous bars, with increasing proportionality:
e.g. $45 + 24$

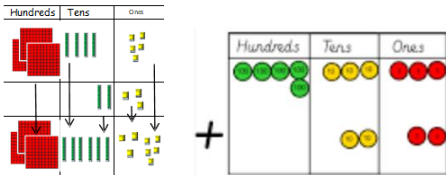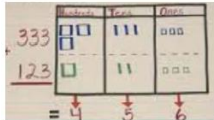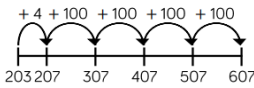| 59	
45	24
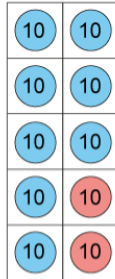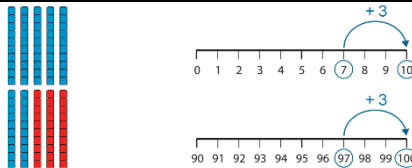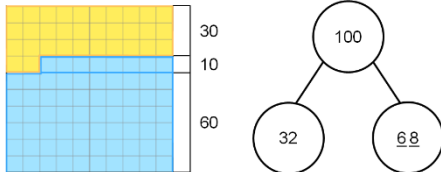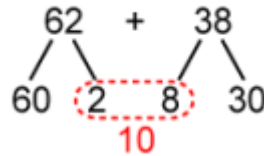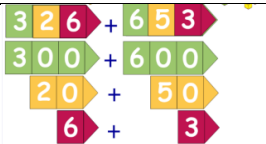
MENTALSTRATEGIES:
- Know that addition is the inverse of subtraction
- Add numbers mentally, including: a 2-digit number and ones, a multiple of 10 to a 2-digit number, two 2-digit numbers, three 1-digit numbers
- Use knowledge of inverse to check calculations and solve missing number problems
- Use knowledge of number bonds to 10 to calculate numbers bonds to 100
- Count on in tens from any given number (e.g.19– 29 – 39 –49 etc)

Year 3 – Addition

Vocabulary: Pupils should use unitising language to describe within-column calculations : "3 ones plus 5 ones is equal to 8 ones." "4 tens plus 2 tens is equal to 6 tens."
Pupils should learn and use the correct names for the terms in addition and subtraction equations and understand addition is commutative:
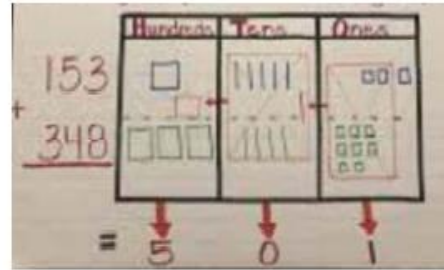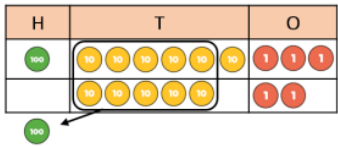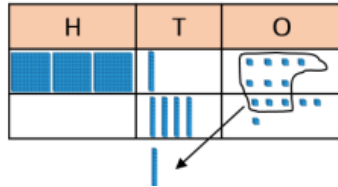Addend + addend = sum

sum	
addend	addend

Helpful Videos/Resources: https://www.ncetm.org.uk/classroom-resources/cp-year-3-curriculum-map/ , https://www.ncetm.org.uk/teaching-for-mastery/mastery-materials/primary-mastery-professional-development/number-addition-and-subtraction/ , https://www.ncetm.org.uk/media/oaqfcvjq/mastery_assessment_y3.pdf , https://whiterosemaths.com/resources?year=year-3

Method:	Concrete:	Pictorial:	Abstract:
Calculating complements to 100	Scaling with tens frames:	First make 10, then work out the additional number of tens needed: $100 = 32 + \underline{68}$	$7 + 3 = 10$ $97 + 3 = 100$
Add numbers with up to 3-digits, using formal written methods of columnar addition (no regrouping)		*Children can draw a pictoral representation of the columns and place value counters to further support their learning and understanding.	$\begin{array}{r} 2\ 2\ 3 \\ +\ 1\ 1\ 4 \\ \hline 3\ 3\ 7 \end{array}$

|			
Add numbers with up to 3-digits, using formal written methods of columnar addition (regrouping) *Regrouping and exchange build on pupils' understanding that 10 ones is equivalent to 1 ten, and that 10 tens is equivalent to 1 hundred. Base 10/counters can be used to model the calculations, and to draw attention to the regrouping/exchange.			
To solve calculations with more than 2 addends. *Discuss concept of commutative properties of addition		• Range of pictorial strategies available as above eg. Tens frames, place value grids, part-part whole, bar models. 	
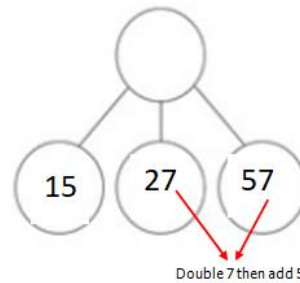
MENTALSTRATEGIES:
- Know number pairs that total 1000 (multiples of100)
- Calculate 10 or100 more than any given number
- Add numbers mentally, including: a 3-digit number and single digit number, a 3-digit number and multiples of10, a 3-digit number and multiples of100
- Estimate the answer to a calculation and use inverse operations to check answers

Year 4 – Addition

Vocabulary: make connections between known facts and related calculations: "8 plus 6 is equal to 14, so 8 hundreds plus 6 hundreds is equal to 14 hundreds." "14 hundred is equal to 1,400."
Pupils should learn and use the correct names for the terms in addition and subtraction equations and understand addition is commutative:
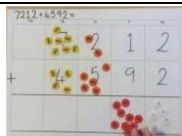Addend + addend = sum

sum	
addend	addend

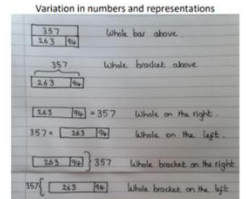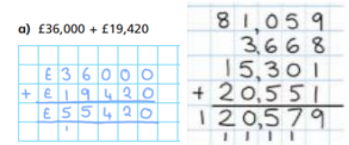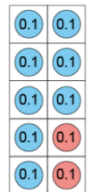| Method:	Concrete:	Pictorial:	Abstract:
Using formal written methods of columnar addition where appropriate add numbers with up to 4 digits with regrouping.	*Ideally children should move on to using counters to support understanding of unitising but base 10 can still be used if relative size understanding is still needed.		
Add 2 or more numbers using columnar addition, including calculations whose addends have different numbers of digits.	*Concrete resources such as place-value counters, partitioning diagrams and tens-frames can be used to help pupils understand calculation strategies and make connections between known facts and related calculations.	As above. 1,003 + 10= 1,113	Pupils should add the digits within a column in the most efficient order *beginning by making 10 in the ones column then making double-6 in the hundreds column
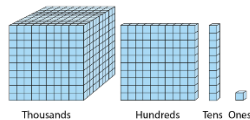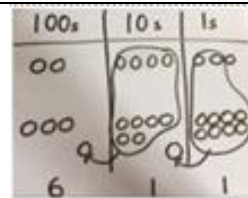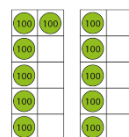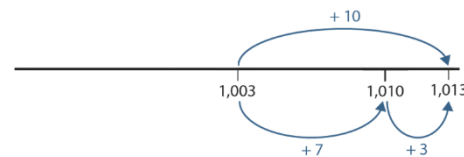
| Use inverse operations to check answers to a calculation | *Concreate resources such as place-value counters, partitioning diagrams and tens-frames can be used to help show relationship between addition and subtraction facts by physically removing and regrouping amounts.
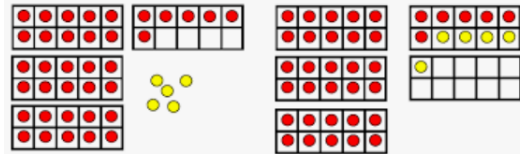
Eg. Tens frame above can show both addition and subtraction facts. | Show the following calculations using place value counters.
 | 527 + 121 = 648
121 + 527 = 648
648 – 121 = 527
648 – 527 = 121

527 – 121 = 648 ✗
This would NOT be a correct sentence because 527 – 121 would equal 406.

*Use of column subtraction can help check answers.

Part + Part = Whole

Whole – Part = Part |
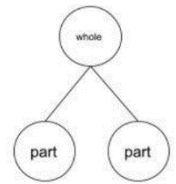
MENTALSTRATEGIES:
- Add numbers mentally, including: a four digit number and multiples of one thousand
- Use knowledge of doubles to derive related facts (e.g 15 +16 =31 because 15 + 15 = 30 and 30 +1= 31)
- Know number pairs that total 1000 (multiples of10)
- Estimate the answer to a calculation and use inverse operations to check answers
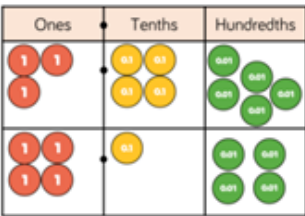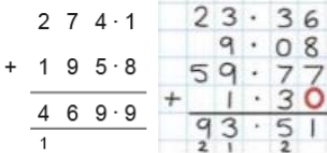
Year 5 – Addition

Vocabulary: make connections between known facts and related calculations: "8 plus 6 is equal to 14, so 8 tenths plus 6 tenths is equal to 14 tenths." "14 tenths is equal to 1 one and 4 tenths."

Pupils should learn and use the correct names for the terms in addition and subtraction equations and understand addition is commutative:

Addend + addend = sum

sum	
addend	addend

Helpful Videos/Resources: **https://www.ncetm.org.uk/classroom-resources/cp-year-5-curriculum-map/** , **https://www.ncetm.org.uk/teaching-for-mastery/mastery-materials/primary-mastery-professional-development/number-addition-and-subtraction/** , **https://www.ncetm.org.uk/media/lp0o2lgv/mastery_assessment_y5.pdf** , **https://whiterosemaths.com/resources?year=year-5**

Method:	Concrete:	Pictorial:	Abstract:
Children will add numbers with more than 4-digits using the formal written method of column addition in a variety of contexts	*Concrete resources such as place-value counters, partitioning diagrams and tens-frames can be used to help pupils understand calculation strategies and make connections between known facts and related calculations. However, pupils should not rely on such representations for calculating. Pupils should instead be able to calculate by verbalising the relationship eg. **Language focus** "8 plus 6 is equal to 14, so 8 tenths plus 6 tenths is equal to 14 tenths." "14 tenths is equal to 1 one and 4 tenths."	Children know and understand the variation in representing addition using bar modelling: Variation in numbers and representations 'Whole below' is less conventional though children should understand that it is not incorrect.	a) £36,000 + £19,420 Children should make a transition from discrete to continuous bar models for most areas of maths and be able to draw these independently and accurately with increasing levels of proportionality.
Children will add numbers with up to 2 decimal places.	Scaling with 10's frames and decimal counters.	Ones / Tenths / Hundredths	274.1 + 195.8 = 469.9 Calculate numbers with increasing complexity including use of zero as place holder when addends have different numbers of digits.

MENTALSTRATEGIES:
- Add numbers mentally with increasingly large numbers (e.g 10,162 + 2,300 =12,462)
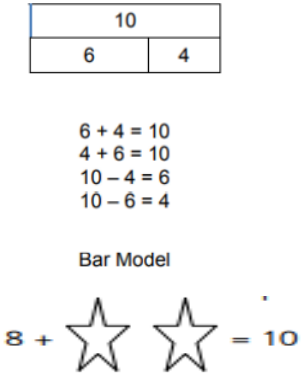- Mentally add tenths (e.g0.2+ 0.6 = 0.8) and 1-digit whole numbers and tenths (8 + 0.3=8.3)
- Use number bonds to 100 knowledge to calculate complements to one using hundreths (e.g0.83 +0.17 =1)
- Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy

Year 6 – Addition

Vocabulary: Children know that the relationship between 2 numbers can be expressed additively. In year 6, pupils should learn the compensation property of addition: "If one addend is increased and the other is decreased by the same amount, the sum stays the same."
Pupils should learn and use the correct names for the terms in addition and subtraction equations and understand addition is commutative:
Addend + addend = sum

sum	
addend	addend

Method:	Concrete:	Pictorial:	Abstract:
Children should continue to practise adding whole numbers with increasing difficulty, and numbers with different amounts of decimal places, using columnar addition to solve problems in a range of contexts.	*Concrete resources such as place-value counters, partitioning diagrams and tens-frames can be used to help pupils understand calculation strategies and make connections between known facts and related calculations. However, pupils should not rely on such representations for calculating. Pupils should instead be able to calculate by verbalising the relationship	Gentengo charts support understanding of scaling numbers:	

MENTALSTRATEGIES:
- Add numbers mentally with increasingly large numbers (e.g10,162 +2,300 =12,462)
- Add decimal numbers mentally (up to 2 decimal places)
- Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.
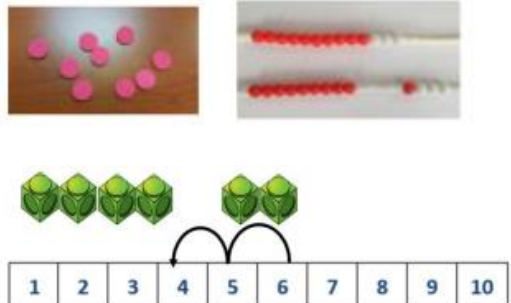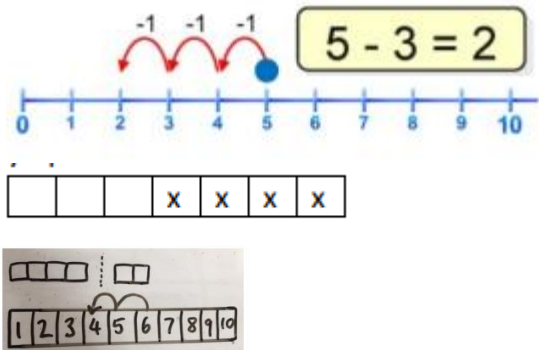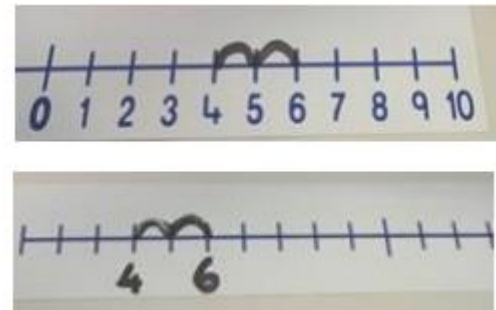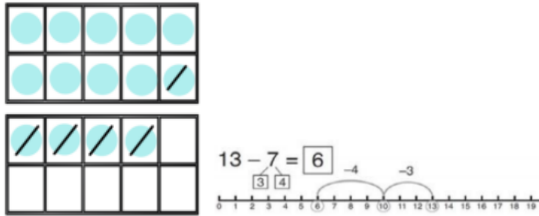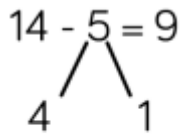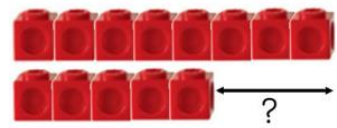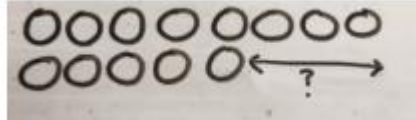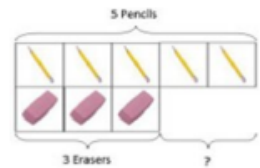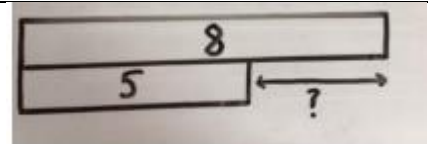
 Subtraction Guidance
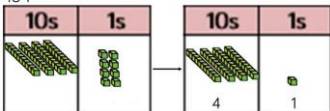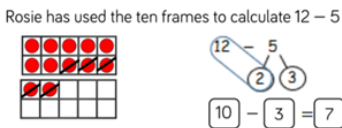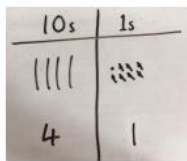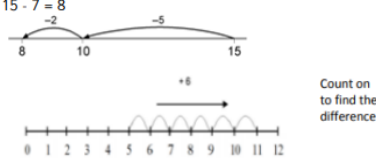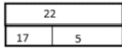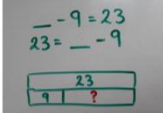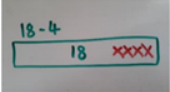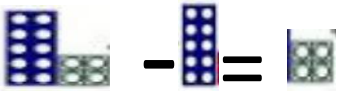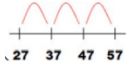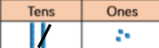
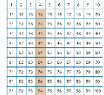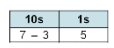| **EYFS – Subtraction**			
Vocabulary: fives frame, tens frame, whole, part, take away, subtract, bigger, smaller, equal			
Helpful Videos/Resources: https://www.ncetm.org.uk/classroom-resources/ey-numberblocks-support-materials/			
Method:	**Concrete:**	**Pictorial:**	**Abstract:**
Counting backwards from 5	Child initiated games indoors and outdoors such as acting out counting songs and running races (children shouting "5,4,3,2,1,0 - GO!").		Relationships between pictures and objects as numerals
Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 including subtraction facts	Children to understand that subtraction is taking away objects practically. Equals means we find out how many we have got left.		Using both of these representations for number bonds will ensure children are provided with variation in their representations and also begin to build foundations for independently drawing these in Year 1. A large emphasis is placed on the part and whole vocabulary and links between addition and subtract facts.
Have a deep understanding of number to 10, including the composition of each number	Represent numbers in different ways using numicon/other resources eg. Multilink. Make links to subtraction facts to build on addition facts.	Use of tens frames to sort objects/counters to take off as well as add on.	Relationships between pictures and objects as numerals and words – counting backwards as well as forwards.
MENTALSTRATEGIES: - Verbally count beyond 20			

Year 1 – Subtraction

Vocabulary: equal to, take, take-away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least count back, how many left, how much less is…

Method:	Concrete:	Pictorial:	Abstract:
Represent and use number bonds and related subtraction facts within 20	Use specific maths resources such as counters, snap cubes, Numicon etc.	Tens Frame Part Whole Model $6 + 4 = 10$ $4 + 6 = 10$ $10 - 4 = 6$ $10 - 6 = 4$ $6 + 4 = 10$ $4 + 6 = 10$ $10 - 4 = 6$ $10 - 6 = 4$ $10 = 5 + 5$ $10 = 1 + 9$ $10 = 2 + 8$ $20 = 12 + 8$ $8 + 12 = 20$	10 / 6 / 4 $6 + 4 = 10$ $4 + 6 = 10$ $10 - 4 = 6$ $10 - 6 = 4$ Bar Model $8 +$ ☆ ☆ $= 10$
Links to part whole model and addition – finding a part if you know the whole.	Link to addition. Use PPW model to model the inverse. If 10 is the whole and 6 is one of the arts, what s the other part? $10 - 6 = 4$ Use cubes to partition numbers into groups or in a bar. (Some children may still need to use real objects)	The Bar Model will be continued from EYFS as a method to support problem solving involving addition, continuing with the concrete representations and moving onto using pictorial representations of objects.	A focus on symbols and numbers to form a calculation and fact families. 10 — 5 / 10 — (orange)

Starting at the bigger number and counting back	Use counters, move them away from the group counting backwards as you go. Can use cubes, numicon, counters or objects.	 5 - 3 = 2	
Subtracting to make 10	14 − 9 = Make 14 on the ten frame. Take away the four first to make 10 and then takeaway one more so you have taken away 5. You are left with the answer of 9.	 13 − 7 = 6	14 − 5 = 9 4 1 14 − 4 = 10 10 − 1 = 9
Finding the difference	Use concrete apparatus in linear fashion to compare the sizes. Identify the gap representing the difference. Discuss how many more / how many less. Can use cubes, numicon, counters or objects.	 5 Pencils 3 Erasers	 8 5 ?

MENTALSTRATEGIES:
- Memorise and reason with number bonds to 10 and 20 in several forms (for example, 9 + 7 = 16; 16 − 7 = 9; 7 = 16 − 9)
- Realise the effect of adding or subtracting zero
- Combine and increase numbers, counting forwards and backwards

Year 2 – Subtraction

Vocabulary: subtract, minus, leave, how many are left/left over?, how many less is… than…?, how much fewer is…?, difference between, half, halve, equals, sign, is the same as, partition, inverse, count on, count back, one less, ten less…one hundred less.

Helpful Videos/Resources: https://www.ncetm.org.uk/classroom-resources/cp-year-2-curriculum-map/ , https://www.ncetm.org.uk/teaching-for-mastery/mastery-materials/primary-mastery-professional-development/number-addition-and-subtraction/ , https://www.ncetm.org.uk/media/dnobtk14/mastery_assessment_yr2.pdf , https://whiterosemaths.com/resources?year=year-2

Method:	Concrete:	Pictorial	Abstract:
Subtracting a 2-digit number and ones *Regrouping and exchange build on pupils' understanding that 10 ones is equivalent to 1 ten. Base 10/tens frames/Numicon can be used to model the calculations, and to draw attention to the regrouping/exchange.	Continue to develop understanding of partitioning and place value using base 10 and place value grids: $48 - 7 = 41$ Use 10's frames, numicon and base 10 to build on knowledge of regrouping/making 10: Rosie has used the ten frames to calculate $12 - 5$ 	Draw base 10 image and cross out to show: $48 - 7 = 41$ Steps in subtraction can be recorded on a number line. The steps often bridge through a multiple of 10. $15 - 7 = 8$ Count on to find the difference.	Explore related facts $17 + 5 = 22$ $5 + 17 = 22$ $22 - 17 = 5$ $22 - 5 = 17$ Draw on a continuous model and count back $18 - 4$ *Pupils do not need to learn formal written methods for addition and subtraction in year 2, but column addition and column subtraction could be used as an alternative way to record two-digit calculations at this stage.
Subtracting a 2-digit number and multiples of 10	 $25 - 10 = 15$ $14 - 10 = 4$	$57 - 30 = 27$ $23 - 3 = 13$ Base 10 may be used above the number line initially. *Ensure understanding that the ones digit does not change with all representations	$75 - 30 = 45$ *Pupils should be able to apply known one-digit additive facts: $7 - 3 = 4$ $70 - 30 = 40$ $75 - 30 = 45$

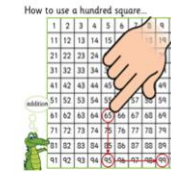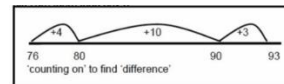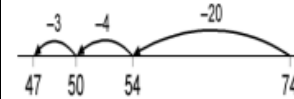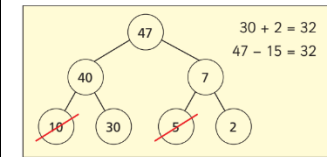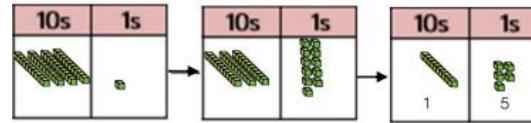| Subtracting two 2-digit numbers			
	$34—13 = 21$ Use Dienes to show how to partition the number when subtracting without regrouping. $18 - 11 = 7$ $7 \quad 8 \qquad 18$ $2 \quad 4$ $28 \; 30 \qquad 34$ $34—28$ Use a bead bar or bead strings to model counting to next ten and the rest.	Children draw representations of Dienes and cross off. $43—21 = 22$ Use base 10 to support subtracting on a numberline: $74 - 27 = 47$ worked by counting back: $-3 \quad -4 \qquad -20$ $47 \; 50 \quad 54 \qquad 74$ $+4 \qquad +10 \qquad +3$ $76 \; 80 \qquad 90 \; 93$ 'counting on' to find 'difference' Use a number line to count on to next ten and then the rest.	Using a Hundred Square: How to use a hundred square...	Jack is working out $47 - 15$ 47 $40 \qquad 7$ $10 \quad 30 \quad 5 \quad 2$ $30 + 2 = 32$ $47 - 15 = 32$ $74 - 27$ $74 - 20 = 54$ $54 - 4 = 50$ $50 - 3 = 47$ *Recording subtraction in columns supports place value and prepares for formal written methods with larger numbers. $40 + 8$ $\underline{10 + 6} \; -$ $30 + 2$ Use continuous bars, with increasing proportionality: $42 - 17 =$ 42 17
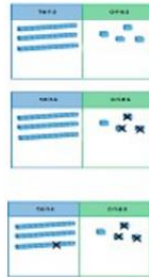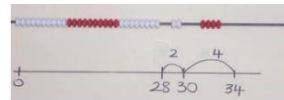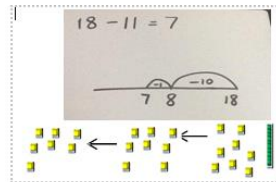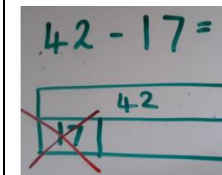
MENTALSTRATEGIES:

- Know that addition is the inverse of subtraction
- Subtract numbers mentally, including: a 2-digit number and ones, a multiple of 10 to a 2-digit number, two 2-digit numbers
- Use knowledge of inverse to check calculations and solve missing number problems
- Use knowledge of number bonds to 10 to calculate numbers bonds to 100
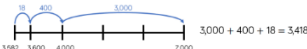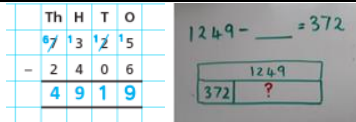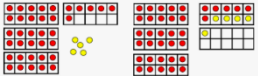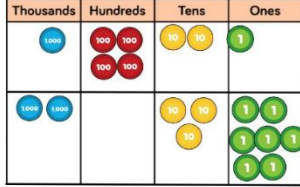- Count back in tens from any given number (e.g19– 29 – 39 –49 etc)

Year 3 – Subtraction

Vocabulary: Pupils should use unitising language to describe within-column calculations : "5 ones minus 3 ones is equal to 2 ones." "6 tens minus 2 tens is equal to 4 tens."
Pupils should learn and use the correct names for the terms in addition and subtraction equations:
"If we swap the values of the subtrahend and difference, the minuend remains the same."

minuend	
subtrahend	difference

minuend	
difference	subtrahend

Method:	Concrete:	Pictorial:	Abstract:
Calculating complements to 100	Scaling with tens frames: 	 First make 10, then work out the additional number of tens needed: 	Use knowledge of fact families and complements to 100 to solve increasingly complex problems. $10 - 7 = 3$ $10 - 3 = 7$ $70 + \_\_ = 100$ $\_\_ + 30 = 100$
Subtract numbers with up to 3-digits, using formal written methods of columnar addition (no regrouping)	 Use base 10 or numicon to model	*Children can draw a pictoral representation of the columns and place value counters to further support their learning and understanding. 	

Subtract numbers with up to 3-digits, using formal written methods of columnar addition (one exchange) *Regrouping and exchange build on pupils' understanding that 10 ones is equivalent to 1 ten, and that 10 tens is equivalent to 1 hundred. Base 10/counters can be used to model the calculations, and to draw attention to the regrouping/exchange.	45-26 1) Start by partitioning 45 2) Exchange one ten for ten more ones 3) Subtract the ones, then the tens. 	41 – 26 Begin to record by drawing and showing the exchange. 	Formal column method. Children must understand that when they have exchanged the 10 they still have 41 because 41 = 30 + 11.
Subtract numbers with up to 3-digits, using formal written methods of columnar addition (more than one exchange) *Regrouping and exchange build on pupils' understanding that 10 ones is equivalent to 1 ten, and that 10 tens is equivalent to 1 hundred. Base 10/counters can be used to model the calculations, and to draw attention to the regrouping/exchange.	234 – 88 		242 – 94 = 148 Use continuous bars, with increasing proportionality:
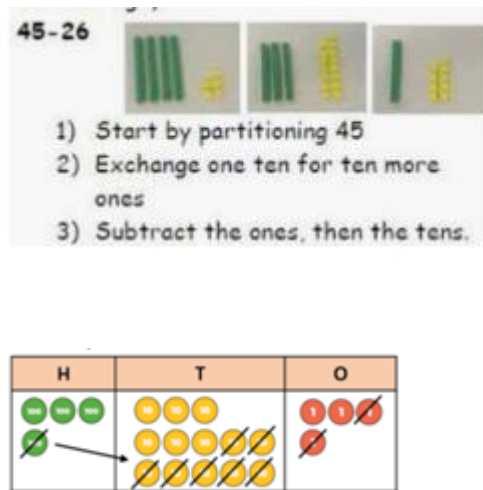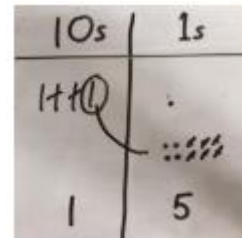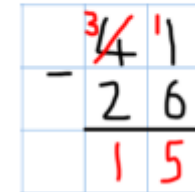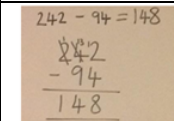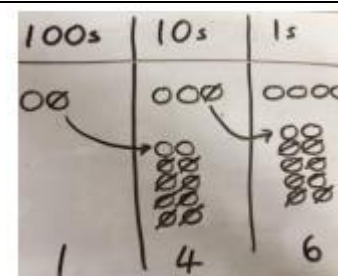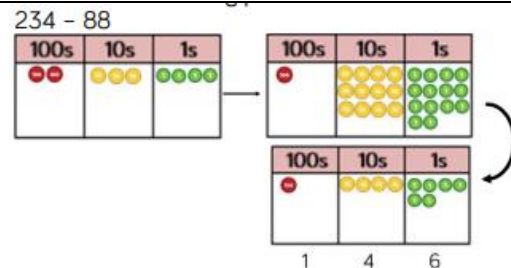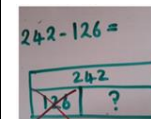
MENTALSTRATEGIES:
- Know number pairs that total 1000 (multiples of100)
- Calculate 10 or100 more than any given number
- Subtract numbers mentally, including: a 3-digit number and single digit number, a 3-digit number and multiples of10, a 3-digit number and multiples of100
- Estimate the answer to a calculation and use inverse operations to check answers
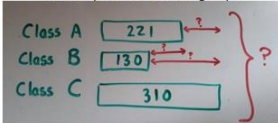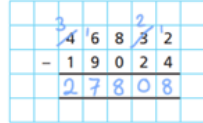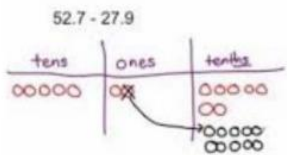
Year 4 – Subtraction
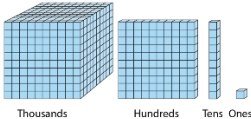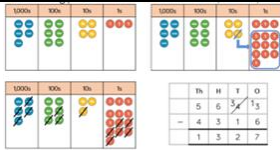
Vocabulary: Vocabulary: Pupils should use unitising language to describe within-column calculations : "5 ones minus 3 ones is equal to 2 ones." "6 hundreds minus 2 hundreds is equal to 4 hundreds."
Pupils should learn and use the correct names for the terms in addition and subtraction equations:
"If we swap the values of the subtrahend and difference, the minuend remains the same."

minuend	
subtrahend	difference

minuend	
difference	subtrahend

Method:	Concrete:	Pictorial:	Abstract:
Using formal written methods of columnar subtraction where appropriate to subtract numbers with up to 4 digits with exchanging.	*Ideally children should move on to using counters to support understanding of unitising but base 10 can still be used if relative size understanding is still needed.	*Use columnar subtraction where appropriate - Finding the difference on a number line may be more appropriate when minuend is multiple of 1000: Eg. 7000 - 3418	Pupils should make sensible decisions about how and when to use columnar subtraction. They may transform to an equivalent calculation before using column subtraction, avoiding the need to exchange through zeroes: $$\begin{array}{ccc} 7,000 & \xrightarrow{-1} & 6,999 \\ -2,648 & \xrightarrow{-1} & -2,647 \end{array}$$
Use inverse operations to check answers to a calculation	*Concreate resources such as place-value counters, partitioning diagrams and tens-frames can be used to help show relationship between addition and subtraction facts by physically removing and regrouping amounts. Eg. Tens frame above can show both addition and subtraction facts.		527 + 121 = 648 121 + 527 = 648 648 – 121 = 527 648 – 527 = 121 527 – 121 = 648 ✗ This would NOT be a correct sentence because 527 – 121 would equal 406. *Use of column subtraction can help check answers.

MENTALSTRATEGIES:
- Subtract numbers mentally, including: a four digit number and multiples of one thousand
- Use knowledge of doubles to derive related facts (e.g 15 +16 =31 because 15 + 15 = 30 and 30 +1= 31)
- Know number pairs that total 1000 (multiples of10)
- Estimate the answer to a calculation and use inverse operations to check answers

Year 5 – Subtraction

Vocabulary: make connections between known facts and related calculations: "8 plus 6 is equal to 14, so 8 tenths plus 6 tenths is equal to 14 tenths." "14 tenths is equal to 1 one and 4 tenths."
Pupils should learn and use the correct names for the terms in addition and subtraction equations:
"If we swap the values of the subtrahend and difference, the minuend remains the same."

Method:	Concrete:	Pictorial:	Abstract:
Children will subtract numbers with more than 4-digits using the formal written method of column subtraction in a variety of contexts including finding the difference	*Concrete resources such as place-value counters, partitioning diagrams and tens-frames can be used to help pupils understand calculation strategies and make connections between known facts and related calculations. However, pupils should not rely on such representations for calculating. Pupils should instead be able to calculate by verbalising the relationship.	Children know and understand the variation in representing subtraction using bar modelling: Use comparison continuous models to find the difference, find the whole with numbers ≥ 3 digits. Also compare more than 2 groups.	Children should make a transition from discrete to continuous bar models for most areas of maths and be able to draw these independently and accurately with increasing levels of proportionality.
Children will subtract numbers with up to 2 decimal places.		When confident, children can find their own way to record the exchange/regrouping	Calculate numbers with increasing complexity including use of zero as place holder when subtrahends have different numbers of digits.

MENTALSTRATEGIES:
- Subtract numbers mentally with increasingly large numbers (e.g 10,162 - 2,100 =8,062)
- Mentally subtract tenths (e.g 0.8 - 0.6 = 0.2) and 1-digit whole numbers and tenths (8 - 0.3 = 7.7)
- Use number bonds to 100 knowledge to calculate complements to one using hundreths (e.g0.83 +0.17 =1)
- Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy

Year 6 – Subtraction

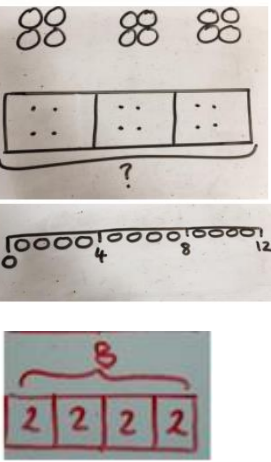**Vocabulary:** make connections between known facts and related calculations: "8 plus 6 is equal to 14, so 8 tenths plus 6 tenths is equal to 14 tenths." "14 tenths is equal to 1 one and 4 tenths."
Pupils should learn and use the correct names for the terms in addition and subtraction equations:
"If we swap the values of the subtrahend and difference, the minuend remains the same."

minuend	
subtrahend	difference

minuend	
difference	subtrahend

Method:	Concrete:	Pictorial:	Abstract:
Children should continue to practise subtracting whole numbers with increasing difficulty, and numbers with different amounts of decimal places, using columnar subtraction to solve problems in a range of contexts.	*Concrete resources such as place-value counters, partitioning diagrams and tens-frames can be used to help pupils understand calculation strategies and make connections between known facts and related calculations. However, pupils should not rely on such representations for calculating. Pupils should instead be able to calculate by verbalising the relationship	Gentengo charts support understanding of scaling numbers: Find the difference between A and B.	Pupils should make sensible decisions about how and when to use columnar methods. For example, when subtracting a decimal fraction from a whole number, pupils may be able to use their knowledge of complements, avoiding the need to exchange through zeroes. For example, to calculate 8 – 4.85 pupils should be able to work out that the decimal complement to 5 from 4.85 is 0.15, and that the total difference is therefore 3.15.
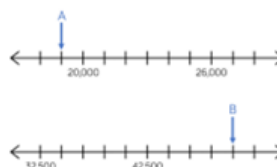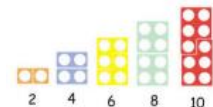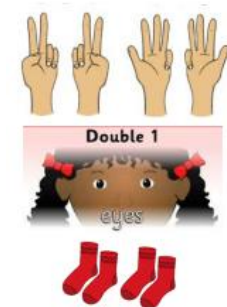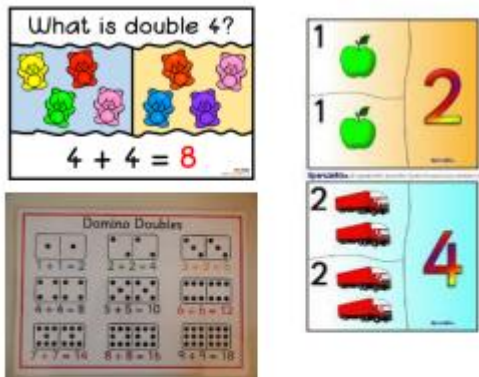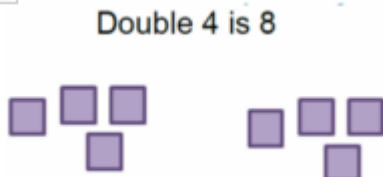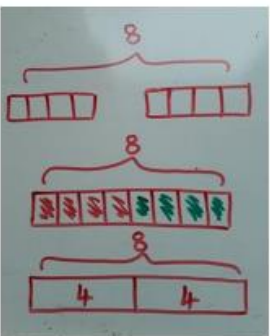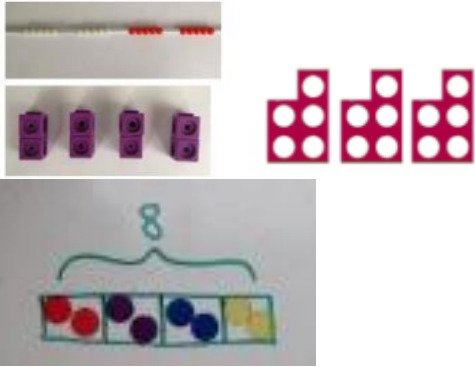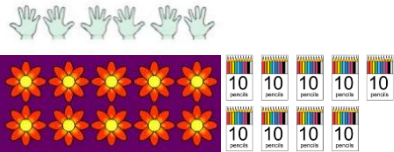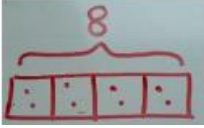
MENTALSTRATEGIES:
- Subtract numbers mentally with increasingly large numbers
- Subtract decimal numbers mentally (up to 2 decimal places)
- Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.
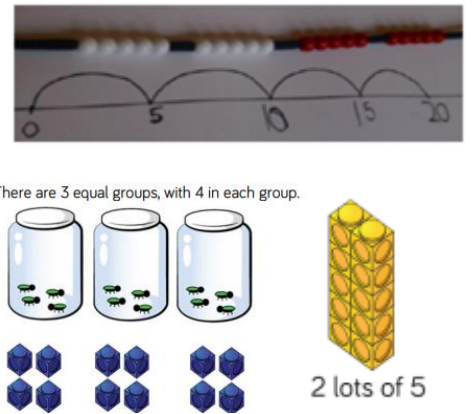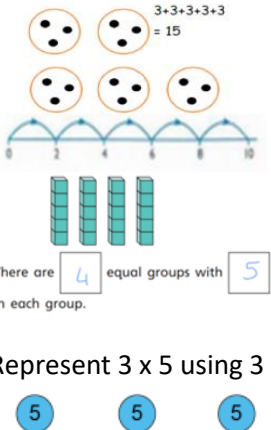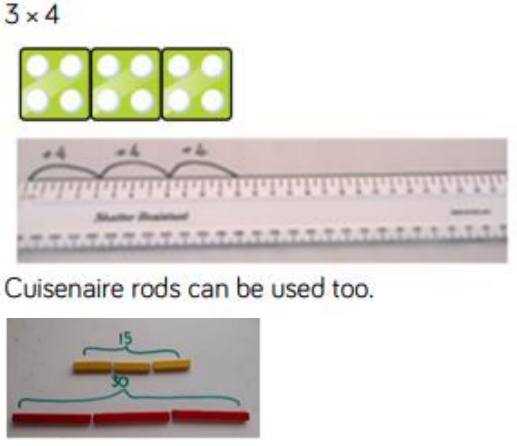
Multiplication Guidance

EYFS – Multiplication
Vocabulary: double, equal, groups, altogether, add
Helpful Videos/Resources: https://www.ncetm.org.uk/classroom-resources/ey-numberblocks-support-materials/

Method:	Concrete:	Pictorial:	Abstract:
Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 and some number bonds to 10, including double facts.	Counting and other maths resources for children to make 2 equal groups. Physical and real life examples that encourage children to see concept of doubling as adding two equal groups.	Pictures and icons that encourage children to see concept of doubling as adding two equal groups.	Addition calculations to model adding two equal groups.

MENTALSTRATEGIES:
- Verbally count beyond 20

Year 1 – Multipliction

Vocabulary: Groups of, lots of, times, array, altogether, multiply

Method:	Concrete:	Pictorial:	Abstract:
Through grouping and sharing small quantities, pupils begin to understand doubling numbers and quantities	Use specific maths resources such as counters, snap cubes, Numicon etc.	Double 4 is 8	
Count in multiples of 2s, 5s, 10s		Use images and arrays to support recall of multiples through repeated addition and skip counting.	2, 4, 6, 8, 10 5, 10, 15, 20, 25, 30 *Pupils do not need to be introduced to the words 'multiplication' and 'division' or to the multiplication and division symbols in year 1 and are not expected to solve calculations presented as written equations.

MENTALSTRATEGIES:
- count fluently, both forwards and backwards
- sequencing in ones will extend to sequencing in multiples of 2, 5 and 10
- recite the odd number sequence, both forwards and backwards.

Year 2 – Multiplication

Vocabulary: odd, even, twos, fives, tens, threes, lots of, groups of, once, twice, three times, five times, ten times, multiple of, times, multiply, multiply by, repeated addition, array, row, column, double.

Helpful Videos/Resources: https://www.ncetm.org.uk/classroom-resources/cp-year-2-curriculum-map/ , https://www.ncetm.org.uk/teaching-for-mastery/mastery-materials/primary-mastery-professional-development/multiplication-and-division/, https://www.ncetm.org.uk/media/dnobtk14/mastery_assessment_yr2.pdf, https://whiterosemaths.com/resources?year=year-2

Method:	Concrete:	Pictorial	Abstract:
Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers	There are 3 equal groups, with 4 in each group. 2 lots of 5	Represent 3 x 5 using 3 five-value counters:	Skip counting: Write sequences with multiples of numbers. 0, 2, 4, 6, 8, 10
Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs	3×4 Cuisenaire rods can be used too.		$3 \times 4 = 12$ $4 + 4 + 4 = 12$

| Show that multiplication of two numbers can be done in any order (commutative) | Create arrays using counters and cubes and Numicon. Pupils should understand that an array can represent different equations and that, as multiplication is commutative, the order of the multiplication does not affect the answer. | $4 \times 2 = 8$ $2 \times 4 = 8$ $2 \times 4 = 8$ $4 \times 2 = 8$ | $5 \times 3 = 15$ $3 \times 5 = 15$ e.g. 4 x 10 is 4 lots of 10
 40 / 10 / 10 / 10 / 10
 4 x 10 is 10 lots of 4
 40 / 4 4 4 4 4 4 4 4 4 4 |
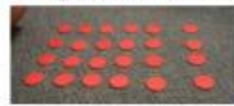
MENTALSTRATEGIES:

- Count forwards and backwards in multiples of 3.
- Know the 2, 5 and 10 times tables (in and out of order)
- Recognise odd and even numbers

Year 3 – Multiplication

Vocabulary: "factor times factor is equal to product", "The order of the factors does not affect the product."

Helpful Videos/Resources: https://www.ncetm.org.uk/classroom-resources/cp-year-3-curriculum-map/ , https://www.ncetm.org.uk/teaching-for-mastery/mastery-materials/primary-mastery-professional-development/multiplication-and-division/, https://www.ncetm.org.uk/media/oaqfcvjq/mastery_assessment_y3.pdf , https://whiterosemaths.com/resources?year=year-3

Method:	Concrete:	Pictorial:	Abstract:
Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental methods	4×15 $23 \times 3 =$	Ron, Eva and Mo each have 23 marbles.	4×15 $10 \times 4 = 40$ $5 \times 4 = 20$ $40 + 20 = 60$ A number line can also be used
Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, progressing to formal written methods	Use manipulatives next to column method to introduce/support: Numicon and base 10 can still be used to represent place value and relative size of amounts.	2 3 3 x 9 (3 × 3) 6 0 (3 × 20) 6 9 Pupils can use expanded to begin with to ensure place value is explicit and support with carrying but move onto compact method as soon as ready making links with previous work on column addition.	

MENTALSTRATEGIES:
- Count forwards and backwards in multiples of 4, 8, 50 &100
- Know the3, 4 and 8 times tables (in and out of order)
- Connect the 2, 4 and 8 times tables through doubling
- Use knowledge of place value to calculate multiplication (e.g.2 x 2 = 4, 2 x 20 =40, 2x200 =400)

Year 4 – multiplication

Vocabulary: "factor times factor is equal to product", "The order of the factors does not affect the product."

Pupils should be able reason in terms of unitising in hundreds, or in terms of scaling a factor by 100:
"3 times 5 is equal to 15. 3 times 5 hundreds is equal to 15 hundreds. 15 hundreds is equal to 1,500."
"If I multiply one factor by 100, I must multiply the product by 100."

Method:	Concrete:	Pictorial:	Abstract:
Multiply two-digit and three-digit numbers by a one-digit number using formal written layout	$25 \times 8 = 20 \times 8 + 5 \times 8$ $= 160 + \square = \square$		Irvin bought 6 bags of apples, each weighing 132kg.

MENTALSTRATEGIES:
- Recall multiplication and division facts for multiplication tables up to 12×12
- Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers
- Recognise and use factor pairs and commutativity in mental calculations
- Know that TO x 5 is TO x 10 then divide by 2 (e.g18 x 5= (18x 10)÷ 2 =90)
- Know that TO x 9 is TO x 10 then subtract TO (e.g18 x9= (18 x 10)– 18 =162)
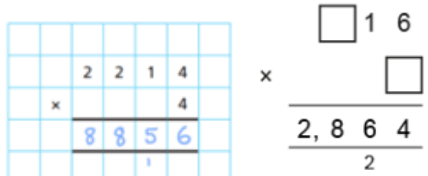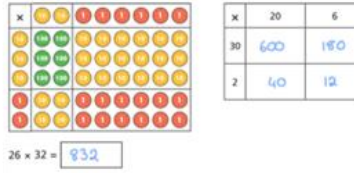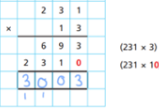
Year 5 – Multiplication

Vocabulary: "factor times factor is equal to product", "The order of the factors does not affect the product."

Pupils should be able reason in terms of unitising in hundreds, or in terms of scaling a factor by 100:
"3 times 5 is equal to 15. 3 times 5 hundreds is equal to 15 hundreds. 15 hundreds is equal to 1,500."
"If I multiply one factor by 100, I must multiply the product by 100."

Method:	Concrete:	Pictorial:	Abstract:
To multiply numbers up to 4 digits by a one-digit number using a formal written method	*Concrete resources such as place-value counters, partitioning diagrams and tens-frames can be used to help pupils understand calculation strategies and make connections between known facts and related calculations. However, pupils should not rely on such representations for calculating. Pupils should instead be able to calculate by verbalising the relationship	Children can use own jottings to support their working out so long as knowledge of unitising is used.	
To multiply numbers up to 4 digits by a two-digit number using a formal written method, including long multiplication for two-digit numbers	As above if needed.	Most children will not need images to support at this point but grid method can be used if needed:	$124 \times 26 = 124 \times 20 + 124 \times 6$ $= 124 \times 2 \times 10 + 124 \times 6$ $= 2{,}480 + 744$ $= 3{,}224$

MENTALSTRATEGIES:
- identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers
- pupils should be able to use mixed operation equations to represent the relationships: 5x6 = 3x6+2x6
- Pupils should then use the distributive property and known multiplication table facts to multiply 2-digit numbers (above 12) by one-digit numbers. 14 x 3 , for example, can be calculated by relating it to 10 x 3 and 4 x 3 or partitioned in ways other than into '10 and a bit'. For example 14 x 3 could also be related to double 7 x 3
- To multiply and divide numbers by 10, 100 and 1000
- Establish whether a number is a prime number (up to100) or a composite number (not prime) and recall prime numbers up to 19
- To know what a square number is and recall all square numbers (up to and including 144) and know what a cube number is and recall the first 5 cube numbers

Year 6 – Multiplication

Vocabulary: "factor times factor is equal to product", "The order of the factors does not affect the product."

Pupils should be able reason in terms of unitising in hundreds, or in terms of scaling a factor by 100:
"3 times 5 is equal to 15. 3 times 5 hundreds is equal to 15 hundreds. 15 hundreds is equal to 1,500."
"If I multiply one factor by 100, I must multiply the product by 100."

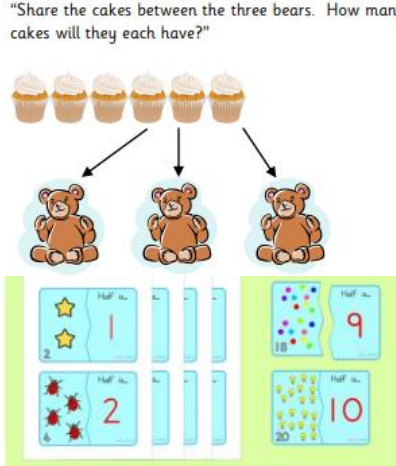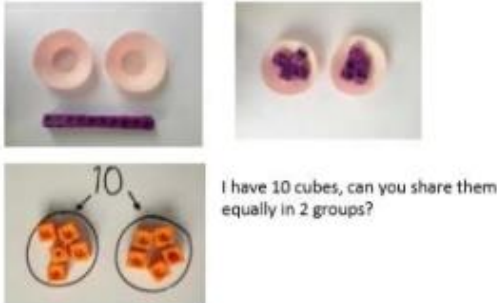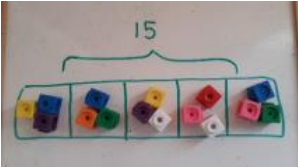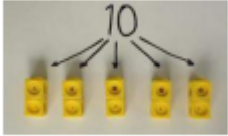| Method:	Concrete:	Pictorial:	Abstract:
Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication	*Concrete resources such as place-value counters, partitioning diagrams and tens-frames can be used to help pupils understand calculation strategies and make connections between known facts and related calculations. However, pupils should not rely on such representations for calculating. Pupils should instead be able to calculate by verbalising the relationship	*Children can use own jottings to support their working out so long as knowledge of unitising is used.	1 2 4 × 2 6 7 4 4 2,4 8 0 3,2 2 4 1 1
multiply one-digit numbers with up to two decimal places by whole numbers	As above	As above	5·3 5 × 4 2 1·4 0 1 2 Children can also use knowledge of associated facts and scaling: 5.35 x 100 = 535 So 535 x 4 = 2,140 (can be done in a formal method) Then 2,140 ÷ 100 = 21.40

MENTALSTRATEGIES:
- Secure and maintain fluency in all multiplication tables, and corresponding division facts, through continued practice.
- Identify common factors, common multiples and prime numbers
- Use common factors to simplify fractions mentally
- Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy
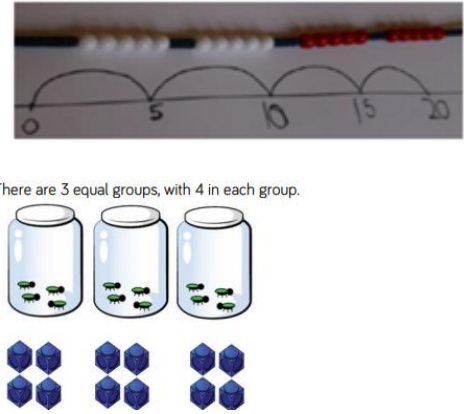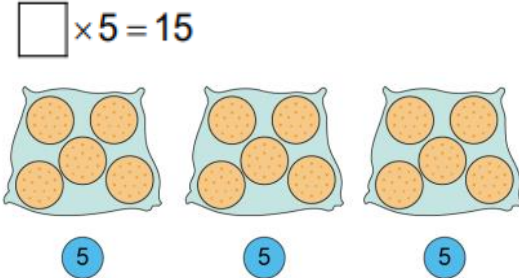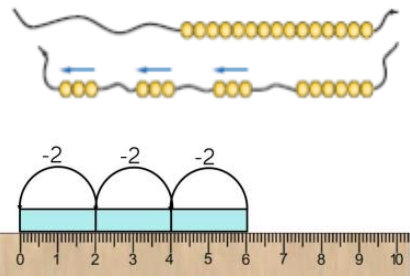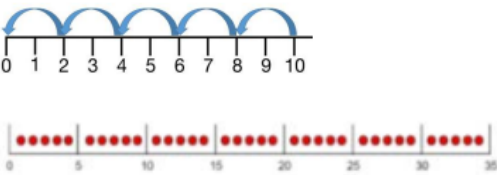
 Division Guidance
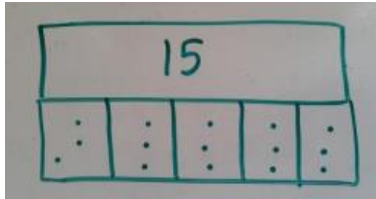
EYFS – Division			
Vocabulary: share, equal, groups,			
Helpful Videos/Resources: https://www.ncetm.org.uk/classroom-resources/ey-numberblocks-support-materials/			
Method:	**Concrete:**	**Pictorial:**	**Abstract:**
Explore and represent patterns within numbers up to 10, including how quantities can be distributed equally.	 Practise sharing range of objects into groups/between children or characters fairly.	"Share the cakes between the three bears. How many cakes will they each have?" Pictures and icons that encourage children to see concept of halving in relation to subitising, addition and subtraction knowledge. i.e. Knowing 4 is made of 2 groups of 2, so half of 4 is 2.	
MENTALSTRATEGIES:			

Year 1 – Division

Vocabulary: share, share equally, one each, two each…, group, groups of, lots of, array

Helpful Videos/Resources: **https://www.ncetm.org.uk/classroom-resources/cp-year-1-curriculum-map/** , **https://www.ncetm.org.uk/teaching-for-mastery/mastery-materials/primary-mastery-professional-development/multiplication-and-division/, https://www.ncetm.org.uk/media/qjpctp24/mastery_assessment_y1.pdf** , **https://whiterosemaths.com/resources?year=year-1**

Method:	Concrete:	Pictorial:	Abstract:
Through sharing small quantities, pupils begin to understand and division	I have 10 cubes, can you share them equally in 2 groups?	15 cubes shared between 5 friends. How many does each person get?	*Pupils do not need to be introduced to the words 'multiplication' and 'division' or to the multiplication and division symbols in year 1 and are not expected to solve calculations presented as written equations.
Through grouping small quantities, pupils begin to understand and division	I have 10 cubes – how many groups of 2 will I have?	15 cubes into groups of 5. How many groups?	*Pupils do not need to be introduced to the words 'multiplication' and 'division' or to the multiplication and division symbols in year 1 and are not expected to solve calculations presented as written equations.

MENTALSTRATEGIES:
- count fluently, both forwards and backwards
- sequencing in ones will extend to sequencing in multiples of 2, 5 and 10
- recite the odd number sequence, both forwards and backwards.

Year 2 – Division

Vocabulary: share, share equally, one each, two each…, group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over

Helpful Videos/Resources: https://www.ncetm.org.uk/classroom-resources/cp-year-2-curriculum-map/ , https://www.ncetm.org.uk/teaching-for-mastery/mastery-materials/primary-mastery-professional-development/multiplication-and-division/, https://www.ncetm.org.uk/media/dnobtk14/mastery_assessment_yr2.pdf, https://whiterosemaths.com/resources?year=year-2

Method:	Concrete:	Pictorial	Abstract:
Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers	There are 3 equal groups, with 4 in each group.	$\square \times 5 = 15$	Pupils need to be able to solve missing-factor and division problems connected to the 2, 5 and 10 multiplication tables, for example: $\square \times 5 = 20$ $20 \div 5 = \square$ Pupils should solve division (and missing-factor) problems, such as these, by connecting division to their emerging fluency in skip counting and known multiplication facts.
Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs		Use a number line to show jumps in groups. The number of jumps equals the number of groups.	$10 \div 5 = 2$

| They use commutativity and inverse relations to develop multiplicative reasoning

(for example, 4 × 5 = 20 and 20 ÷ 5 = 4) | Create arrays using counters and cubes and Numicon.
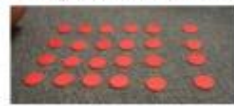
Pupils should understand that an array can represent different equations and that, as multiplication is commutative, the order of the multiplication does not affect the answer. | 3 x 5 = 15
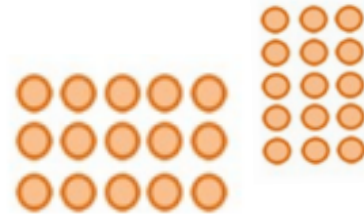
5 x 3 = 15

15 ÷ 3 = 5

15 ÷ 5 = 3 | ⬜ × ⬜ = ⬜

⬜ × ⬜ = ⬜

⬜ ÷ ⬜ = ⬜

⬜ ÷ ⬜ = ⬜ |
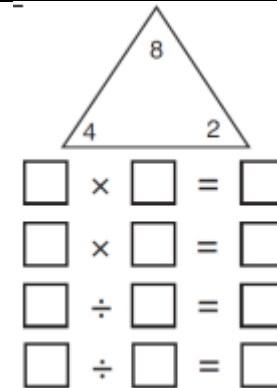
MENTALSTRATEGIES:

- To know that division is the inverse of multiplication
- Recall division facts for the 2, 5 and 10 times tables
- Recall halves for even numbers up to and including 20

Year 3 – Division
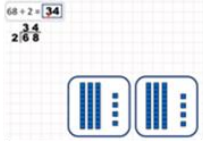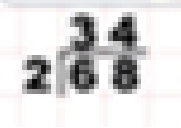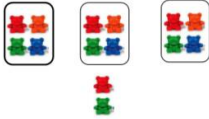
Vocabulary:
Pupils need to use known facts to solve both quotitive (grouping) and partitive (sharing) contextual division problems.
"7 times 2 is 14, so 14 divided by 2 is 7." "14 divided into groups of 2 is equal to 7." "£14 shared between 2 is equal to £7 each."

dividend ÷ divisor = quotient

quotient
divisor | dividend

Helpful Videos/Resources: https://www.ncetm.org.uk/classroom-resources/cp-year-3-curriculum-map/ , https://www.ncetm.org.uk/teaching-for-mastery/mastery-materials/primary-mastery-professional-development/multiplication-and-division/, https://www.ncetm.org.uk/media/oaqfcvjq/mastery_assessment_y3.pdf , https://whiterosemaths.com/resources?year=year-3

Method:	Concrete:	Pictorial:	Abstract:
Children will start to use practical resources to support the short division method	Use cubes, counters, objects or place value counters to aid understanding. 24 divided into groups of 6 = 4 96 ÷ 3 = 32	Tens / Ones place value counters; 66 ÷ 3 branched into 60 ÷ 3 and 6 ÷ 3 68 ÷ 2 = 34 2|68 → 34	34 2|6 8
Children will start to use practical resources to support the short division method with remainders	13 – 4 Use of lollipop sticks to form wholes- squares are made because we are dividing by 4. There are 3 whole squares, with 1 left over. 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 69 ÷ 2 = 34r1 2|69 → 34 r 1	29 ÷ 8 = 3 REMAINDER 5 ↑ ↑ ↑ ↑ dividend divisor quotient remainder 34 r 1 2|6 9

MENTALSTRATEGIES:
- Count forwards and backwards in multiples of 4, 8, 50 &100
- Know the division facts from the 3, 4 and8 times tables
- Use knowledge of place value to calculate division (e.g. 14÷2 =7, 140 ÷ 2 =70, 1400 ÷2=700)

Year 4 – Division

Helpful Videos/Resources: https://www.ncetm.org.uk/classroom-resources/cp-year-4-curriculum-map/ , https://www.ncetm.org.uk/teaching-for-mastery/mastery-materials/primary-mastery-professional-development/multiplication-and-division/ , https://www.ncetm.org.uk/media/x45na0cs/mastery_assessment_y4.pdf , https://whiterosemaths.com/resources?year=year-4
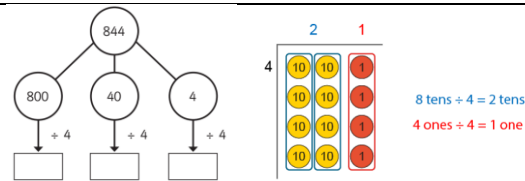
Method:	Concrete:	Pictorial:	Abstract:
Solve division problems, with two/three-digit dividends and one-digit divisors		8 tens ÷ 4 = 2 tens / 4 ones ÷ 4 = 1 one	$844 ÷ 4 =$
Solve division problems, with two/three-digit dividends and one-digit divisors, that involve remainders			
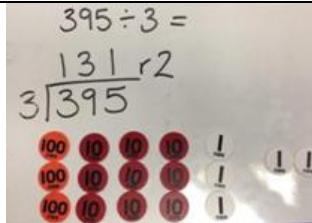
MENTALSTRATEGIES:
- Recall multiplication and division facts for multiplication tables up to 12×12
- Use place value, known and derived facts to multiply and divide mentally, including: dividing by 1
- Recognise and use factor pairs and commutativity in mental calculations

Year 5 – Division

Vocabulary:
"If we swap the values of the divisor and quotient, the dividend remains the same."
"If the dividend is a multiple of the divisor there is no remainder."
"If the dividend is not a multiple of the divisor, there is a remainder."
"The remainder is always less than the divisor."
"If I make the dividend one-hundredth times the size and the divisor one-hundredth times the size, the quotient remains the same."

$$dividend \div divisor = quotient$$

Method:	Concrete:	Pictorial:	Abstract:
Divide numbers up to 4 digits by a one-digit number using the formal written method of short division			Within-column calculations: $4 \div 8 = 0$ r 4 $49 \div 8 = 6$ r 1 $15 \div 8 = 1$ r 7 $72 \div 8 = 9$
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		There are 324 chairs to put in the hall. The headteacher wants to put them in 6 rows. How many chairs will be in each row? Children could represent it as: 324 [? ? ? ? ? ?] Pupils will be encouraged to use multiples of the divisor to assist.	Pupils do not need to be able to express remainders arising from short division, using proper fractions or decimal fractions

MENTALSTRATEGIES:
- identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers
- pupils should be able to use mixed operation equations to represent the relationships: 5x6 = 3x6+2x6
- To multiply and divide numbers by 10, 100 and 1000

Year 6 – Division

Helpful Videos/Resources: https://www.ncetm.org.uk/classroom-resources/cp-year-6-curriculum-map/ , https://www.ncetm.org.uk/teaching-for-mastery/mastery-materials/primary-mastery-professional-development/number-addition-and-subtraction/ , https://www.ncetm.org.uk/media/uitj1x5g/mastery_assessment_y6.pdf , https://whiterosemaths.com/resources?year=year-6

Method:	Concrete:	Pictorial:	Abstract:
Divide numbers up to 4 digits by a two-digit number using the formal written method of short division and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context	*Concrete resources such as place-value counters, partitioning diagrams and tens-frames can be used to help pupils understand calculation strategies and make connections between known facts and related calculations. However, pupils should not rely on such representations for calculating. Pupils should instead be able to calculate by verbalising the relationship	Pupils will be encouraged to use multiples of the divisor to assist. Eg.	
Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division			
Use written division methods in cases where the answer has up to two decimal places	As above	*Children can use own jottings to support their working out so long as knowledge of unitising is used.	

MENTALSTRATEGIES:
- identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers
- To multiply and divide numbers by 10, 100 and 1000

References

See below the following sources of information that enabled the compilation of this document:

The National Curriculum England 2013:
- https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/335158/PRIMARY_national_curriculum_-_Mathematics_220714.pdf
- https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1017683/Maths_guidance_KS_1_and_2.pdf
- https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/974907/EYFS_framework_-_March_2021.pdf

National Centre for Excellence in Teaching Mathematics:

- https://www.ncetm.org.uk/teaching-for-mastery/mastery-materials/primary-mastery-professional-development/

White Rose Maths:

- https://whiterosemaths.com/primary-sols/
- https://whiterosemaths.com/resources/classroom-resources/barvember/
- https://whiterosemaths.com/resources/primary

Bar Modelling, Whole School Progression Document – Lois Rooney 2020:

- https://www.tes.com/teaching-resource/bar-modelling-whole-school-progression-12371051

Michael Drayton Junior School Calculation Policy:

- https://primarysite-prod-sorted.s3.amazonaws.com/michael-drayton/UploadedDocument/dbff55077953472191f037b31c642383/1.calculation-policy-2020.pdf

Old Oak Primary Calculation guidance:

- https://www.oldoakprimary.co.uk/ckfinder/userfiles/files/White-Rose-calculation-policy.pdf