+For Schools within our Collaboration:

Calculation Policy

Equality Statement

At our collaboration of schools, we are committed to ensuring equality of education and opportunity for all pupils, staff, parents and carers receiving services from the school, irrespective of race, gender, disability, faith or religion or socio-economic background. We aim to develop a culture of inclusion and diversity in which all those connected to the school feel proud of their identity and able to participate fully in school life.

The achievement of pupils will be monitored by race, gender and disability and we will use this data to support pupils, raise standards and ensure inclusive teaching. We will tackle discrimination by the positive promotion of equality, challenging bullying and stereotypes and creating an environment which champions respect for all. At our schools, we believe that diversity is a strength, which should be respected and celebrated by all those who learn, teach and visit here.

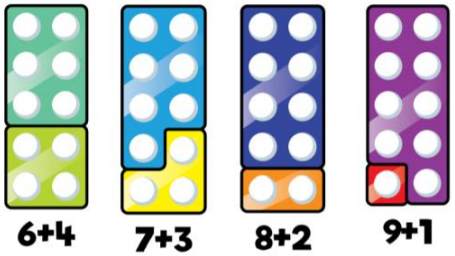
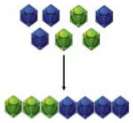
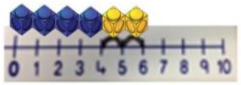
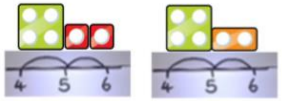
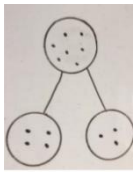
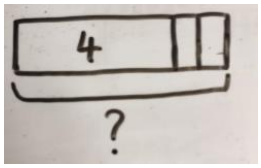
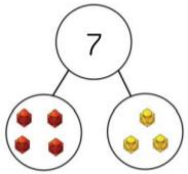
This booklet is designed to show the progression in calculation strategies for each of the four operations: addition, subtraction, multiplication and division. For each operation there are stages that children need to work through and build upon their basic skills. This should be used to bridge gaps within calculation processes and move through the stages at a speed appropriate to each year group.

CALCULATION POLICY

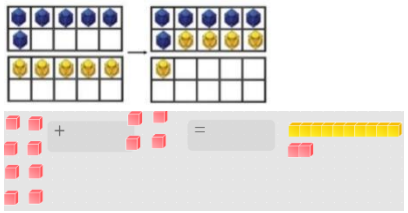
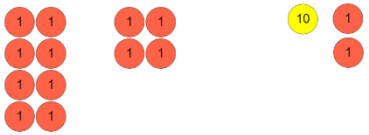
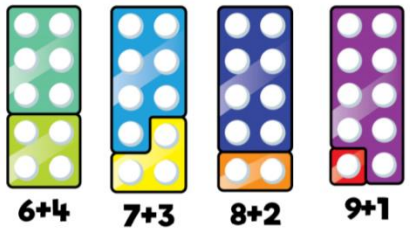
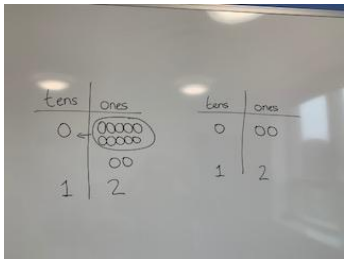
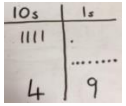
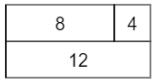
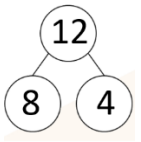
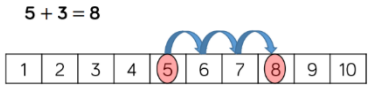
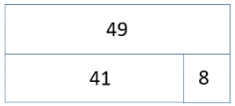
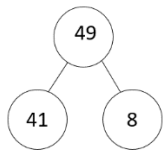
This policy lays out the expectations for both mental and written calculations for the 4 number operations and has been created to support the teaching of a mastery approach to mathematics. This is underpinned by the use of models and images that support conceptual understanding and this policy promotes a range of representations to be used across the primary years. Mathematical understanding is developed through use of representations that are first of all concrete (e.g. Dienes apparatus and place value counters), and then pictorial (e.g. bar models) to then facilitate abstract working (e.g. standard written methods).This policy is a guide through an appropriate progression of representations and if at any point a pupil is struggling with the abstract, they should revert to familiar pictorial and/or concrete materials/representations as appropriate.

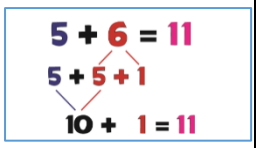
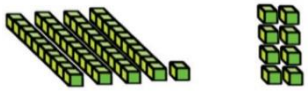
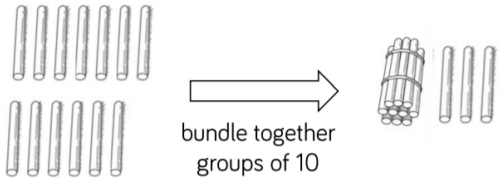
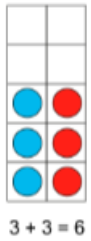
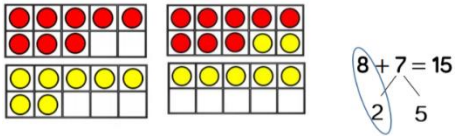
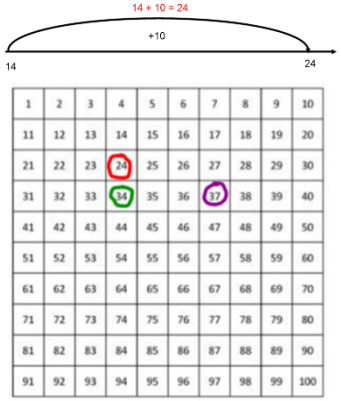
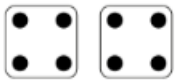
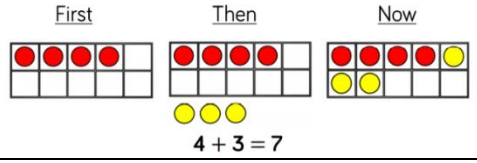
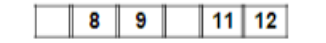
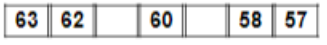
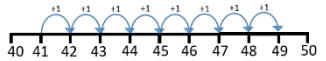
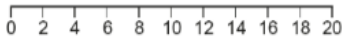
Although this policy sets out the main methods of mental and written calculations to be taught, it has been appended with a list of recommendations and effective practice teaching ideas aimed at informing and enhancing teaching across all the primary phases. Many of these ideas come from the DFE Mathematics guidance: key stages 1 and 2 (published June 2020) and the NCETM's Calculation Guidance document (published October 2015) and the which is intended to sit alongside a school's calculation policy.

EYFS Addition

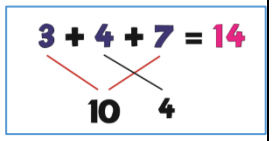
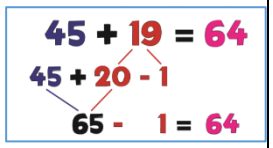
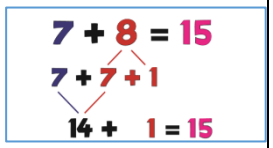
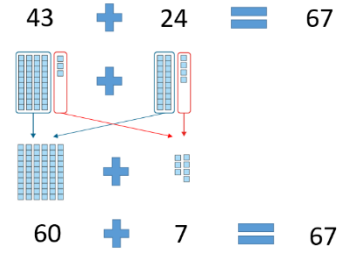
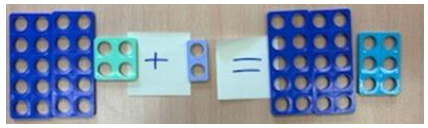
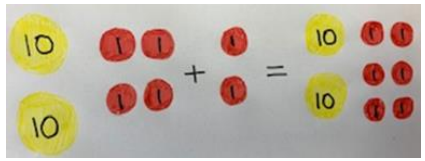
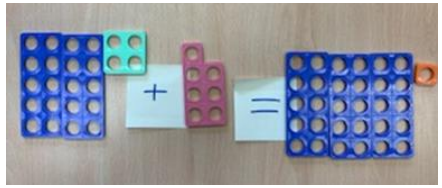
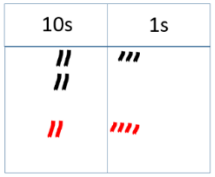
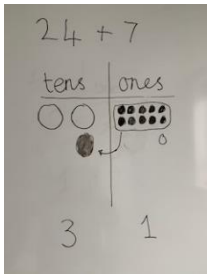
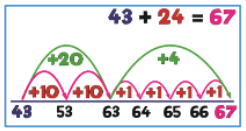
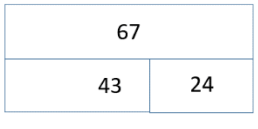
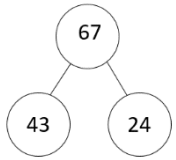
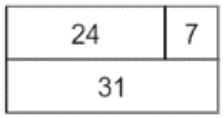
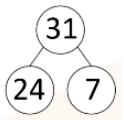
	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
EYFS	If available, Numicon shapes are introduced straight away and can be used to : Identify 1 more/less Combine pieces to add Find number bonds Add without counting Subitise/recognise patterns to support addition for example arrange objects as you would see them on a dice. Adding with a tens frame for example we know if a tens frame is full this is 10, one line equals 5, one less than a line equals 4 etc.	 Combining two parts to make a whole (use other resources too e.g. eggs, shells, teddy bears, cars).  Counting on using number lines using cubes or Numicon.  	Children to represent the cubes using dots or crosses. They could put each part on a part whole model too.  A bar model which encourages the children to count on, rather than count all.   Children can use bead strings practically or colouring in different sums. For example: 4 + 3 = 7	4 + 3 = 7 Four is a part, 3 is a part and the whole is seven.  $7 = 4 + 3$ $7 = 3 + 4$ The abstract number line: What is 2 more than 4? What is the sum of 2 and 4? What is the total of 4 and 2? 4 + 2 	Tens Ones Units Add More And Make Sum Total Altogether Double One more two more ten more Add five more. How many more to make ….? How many more is … than …?	100 square Number lines Number tracks Bead strings Tens Frame Numicon Place Value Counters Base ten (Dienes)

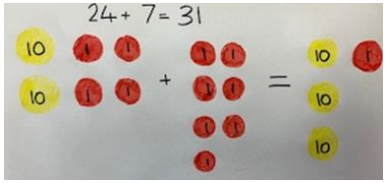
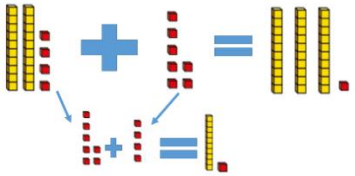
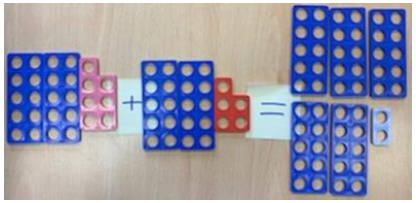
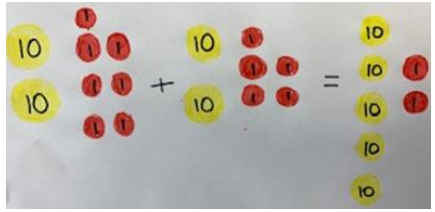
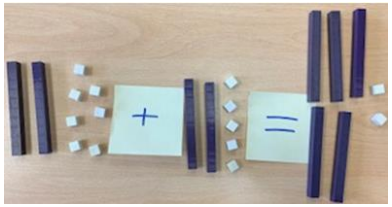
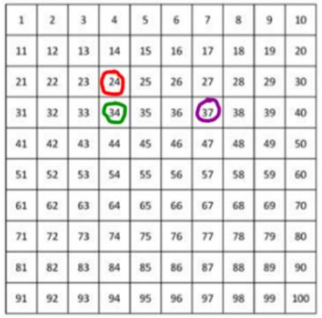
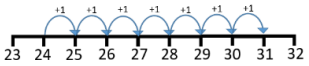
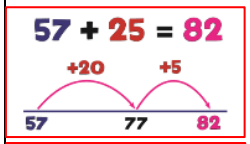
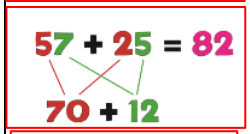
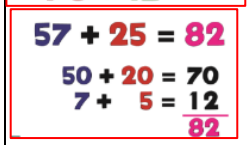
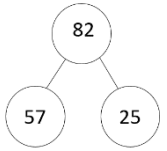
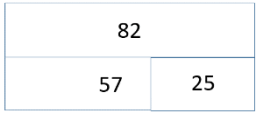
Year One Addition

	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
Year 1	Use counting sticks, counting on, fingers or songs to add together 2 small amounts mentally. Add a pair of single-digit numbers, including crossing 10, e.g. 5 + 8 Add one-digit number to a teens number, e.g. 13 + 5 Add one-digit to 10, and a multiple of 10 to a one-digit number, e.g. 10 + 7, 7 + 30 Add one-digit and two-digit numbers to 20 (9 + 9, 18 - 9), including zero Add doubles and near doubles, e.g. 6 + 7	**Regrouping to make 10** using ten frames and counters/cubes or using Numicon. 6 + 5   **Number bonds to 10 using Numicon**  	**Regrouping to make 10** Children to draw the ten frame and counters/cubes. Also draw counters in place value frames.  **2-digit + 1-digit not crossing 10s** Children to represent the base 10 e.g. lines for tens and dot/crosses for ones. e.g. **41 + 8 = 49**  	**Regrouping to make 10** Children to develop an understanding of equality: Use a bar model    6 + □ = 11 6 + 5 = 5 + □ 6 + 5 = □ + 4 **2-digit + 1-digit not crossing 10s** Use a part whole model 41+8 = 49   	Add Total More Tens Ones Units Digit	100 square Number lines Number tracks Bead strings Tens Frame Numicon Place Value Counters Base ten (Dienes)

	 Represent and use number bonds to 20	**2-digit + 1-digit not crossing 10s** Using base 10 or place value counters. Continue to develop understanding of partitioning and place value. 41 + 8  **1 digit + 1 digit crossing 10s** 7 + 6 = 13  **Adding doubles.** 	**1 digit + 1 digit crossing 10s**  **2-digit + 10** **24 + 10 = 34** Using a hundred square or number line to add a multiple of ten.  **Adding doubles.**  **Using the vocabulary first, then and now:** 	**Counting forwards and backwards in 1s and multiples of 2, 5 and 10**     		

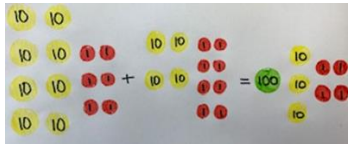
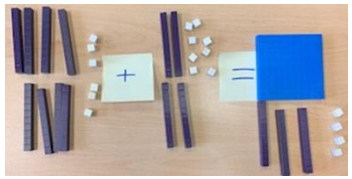
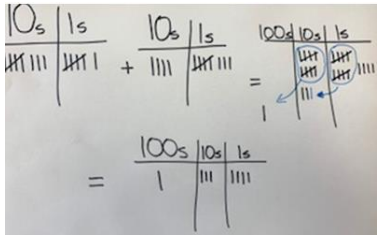
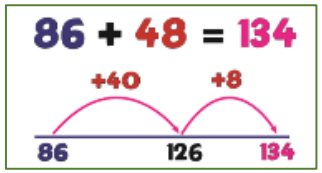
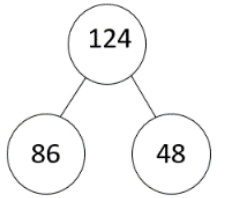
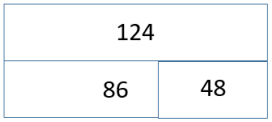
Year Two Addition

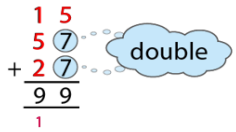
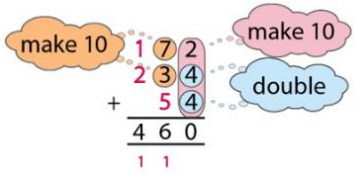
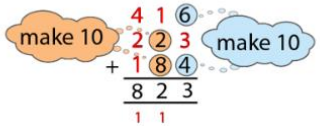
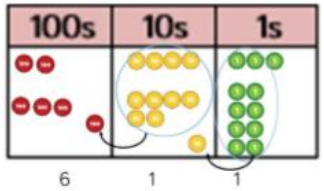
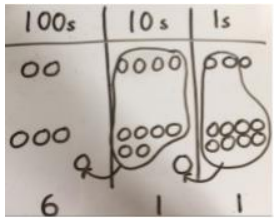
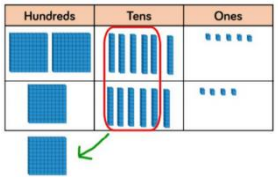
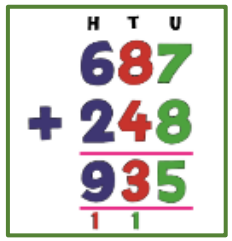
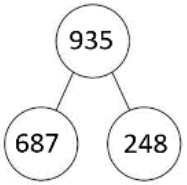
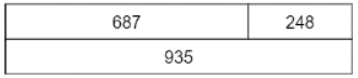
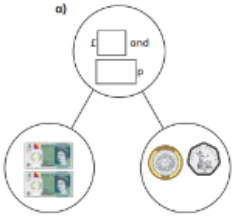
	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
Year 2	Use counting sticks, counting on, fingers or songs to add together 2 small amounts mentally. Add a single-digit number to a two-digit number, including crossing the tens boundary, e.g. 23 + 5, then 28 + 5 Add a multiple of 10 to any two-digit number, e.g. 27 + 60 add two two-digit numbers Adding three one-digit numbers  Add 9, 19, 29, … or 11, 21, 31, …  Add near doubles, e.g. 13 + 14, 39 + 40 	**2-digit + 2-digit not crossing 10s** E.g. **43 + 24**  **24 + 2 =**  **24 + 2 =**  **2-digit + 1-digit crossing 10s** e.g. **24 + 7** 	**2-digit + 2-digit not crossing 10s** E.g. 43 + 24  **2-digit + 1-digit crossing 10s** e.g. 24 + 7  Chn could also draw base ten (if appropriate)	**2-digit + 2-digit not crossing 10s** E.g. **43 + 24**    **2-digit + 1-digit crossing 10s** e.g. **24 + 7**  	Add Sum More than Total Altogether Plus Digit Partition into tens and ones/units	100 square Number lines Number tracks Bead strings Tens Frame Numicon Place Value Counters Base ten (Dienes) Arrow Cards

	Recall number bonds to 20 fluently and derive and use related facts to 100 Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot.	  **2-digit + 2-digit crossing 10s** Crossing the tens **27 + 25**   	**2-digit + 2-digit crossing 10s** Crossing the tens 57 + 25 10s | 1s 5 | 7 2 | 5 Using hundred squares 	 7 + 24 = 31 24 + 7 = 31 31 = 24 + 7 31 = 7 + 24 24 + □ = 31 20 + 4 + 7 = □ 20 + 7 + □ = 31 **2-digit + 2-digit crossing 10s** Crossing the tens **57 + 25**     		

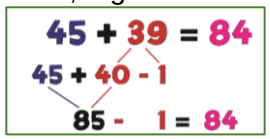
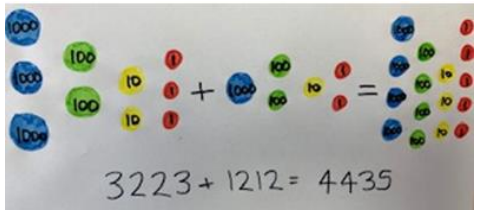
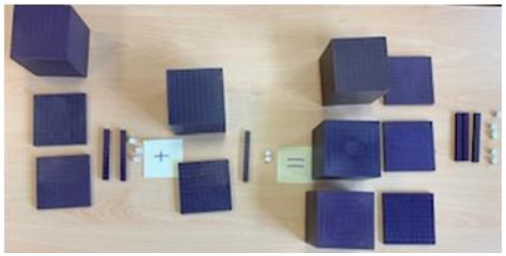
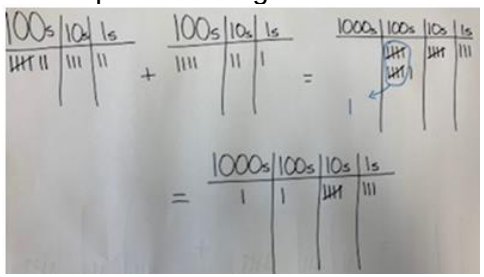
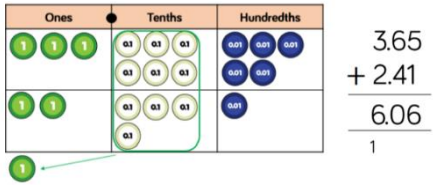
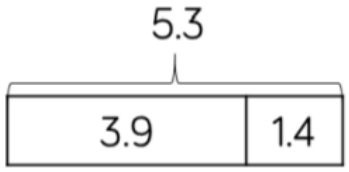
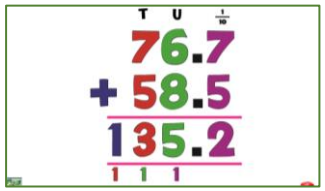
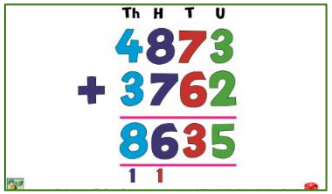
				21 + 10 = 21 + 10 Record the calculation vertically adding the column of ones then the column of tens.		

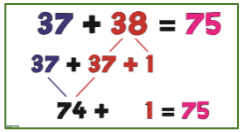
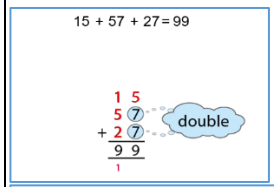
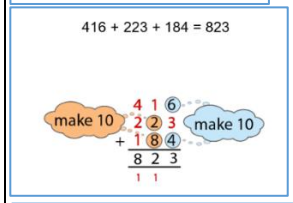
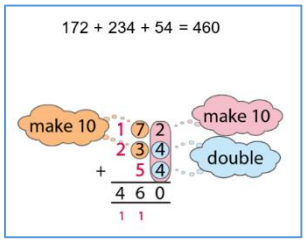
Year 3 Addition

	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
Year 3	Use number bonds to 20 and links to bonds of multiples of 10 to 100, complements to 100 e.g. 45 + 55 = 100 Practise solving varied addition questions mentally with two-digit numbers, the answers could exceed 100. Add numbers mentally, including: • a three-digit number and ones • a three-digit number and tens • a three-digit number and hundreds Recall number bonds to 20 fluently and derive and use related facts to 100 Partition numbers in different ways Eg: 62 = 60 + 2, 50+12, 40+22 etc Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot. Apply mental strategies to written methods:	**2-digit + 2-digit crossing 10s (into 100)** See Y2 and now crossing 100s and bridging/carrying **86 + 48 = 134**  	**2-digit + 2-digit crossing 10s (into 100)** See Y2 and now crossing 100s and bridging/carrying **86 + 48 = 134** 	**2-digit + 2-digit crossing 10s (into 100)** See Y2 and now crossing 100s and bridging/carrying **86 + 48 = 134**    Introduce column addition: For 76 + 47 + 47 123 1 1	Add Sum More than Total Altogether Plus Partition into hundreds, tens and ones/units Count on Carry ten Bridge ten	100 square Number lines Number tracks Tens Frame Numicon Place Value Counters Base ten (Dienes) Arrow Cards

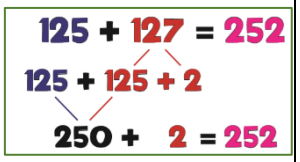
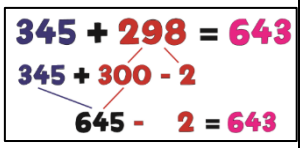
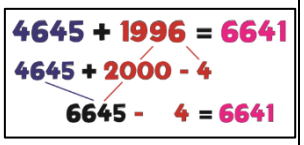
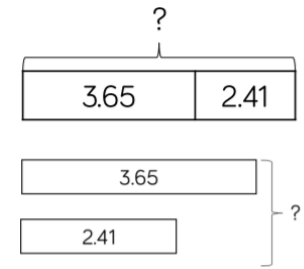
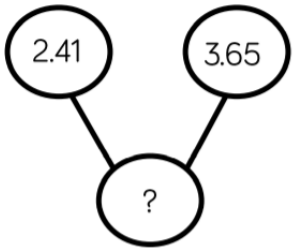
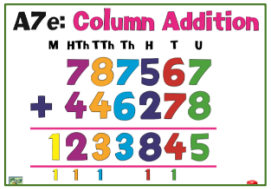
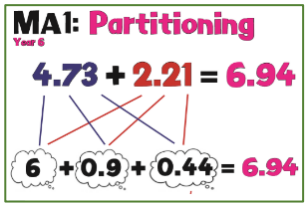
	15 + 57 + 27 = 99  172 + 234 + 54 = 460  416 + 223 + 184 = 823  	**3-digit + 3-digit** e.g. 243 + 368  **223 + 122 =** 	**3-digit + 3-digit** e.g. 243 + 368   265 + 164 429 1	**3-digit + 3-digit** e.g. 243 + 368      *Decimal point for money is in Y4*		

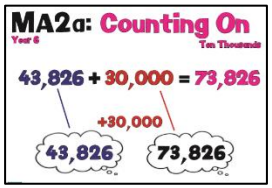
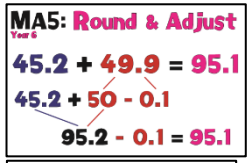
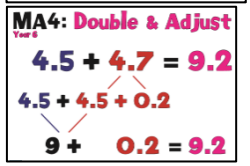
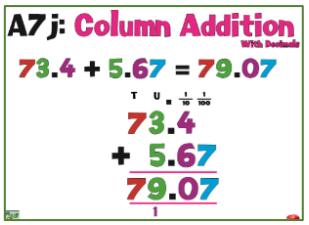
Year 4 Addition

	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
Year 4	Practise mental methods with increasingly large numbers to aid fluency Add numbers mentally, including: A 3-digit number and hundreds A 4-digit number and thousands Add any pair of two-digit numbers, including crossing the tens and 100 boundary, e.g. 47 + 58 add a near multiple of 10, e.g. 45 + 39  Add near doubles of two-digit numbers, e.g. 38 + 37	Use of place value counters to add 4 digit numbers and also money too.  	Use of place value grid.   3.65 + 2.41 6.06 1  	4-digit numbers and decimals - same number of digits.  Money up to 4 digits   	Add Sum More than Total Altogether Plus Partition into thousands, hundreds, tens and ones Count on Carry/Bridge ten Carry/Bridge 100 Two digit three digit Four digit Crossing tens boundary	100 square Number lines Number tracks Place Value Counters Base ten (Dienes). Arrow Cards

	    Understand addition as inverse of subtraction.				Inverse	

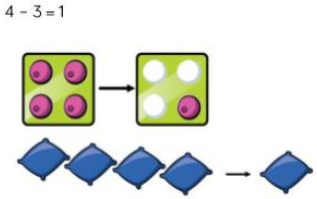
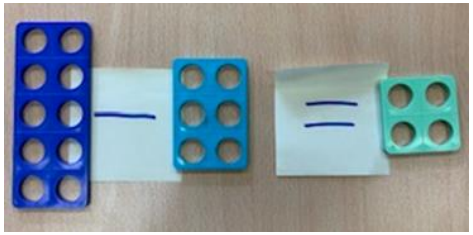
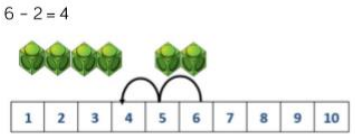
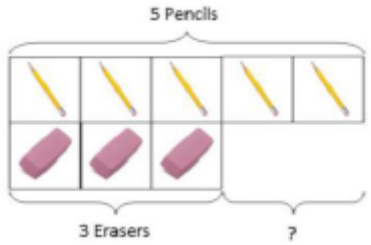
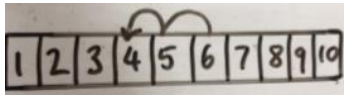
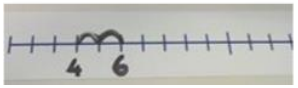
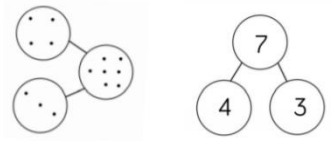
Year 5 and 6 Addition

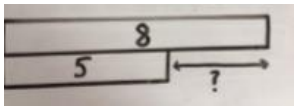
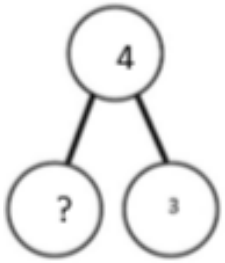
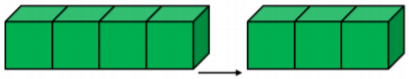
	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
Year 5 And Year 6	**Y5** Add numbers mentally with increasingly large numbers to aid fluency e.g. 12 462 + 2 300 = 14 762 Use rounding to check answers and determine, levels of accuracy Add a pair of two or three-digit  multiples of 10, e.g. 30 + 80, 35 +36 and 350+ 360 Add a near multiple of 10, 100 and 1000 to any two-digit, three-digit   	Use of place value counters to add up to 6 digits. 	Use of place value grid. See Y4 for some examples.   	Varied sized numbers up to millions or 3DP added using compact method. Includes measures and money   	Add Sum More than Total Altogether Plus Partition into hundred thousands, ten thousands, thousands, hundreds, tens and ones Count on Carry ten Carry 100 Carry 1000 Carry 10000 Carry 100000	100 square Number lines Number tracks Place Value Counters. Base ten (Diennes). Arrow Cards

	number or four-digit number, e.g. 235 + 198 Add pairs of decimal fractions each with units and tenths, e.g. 5.7 + 2.5, 6.3 + 4.8 **Y6** Calculate mentally with increasingly large numbers and more complex calculations. Including Counting on in multiples  Addition facts for multiples of 10 to 1000 and decimal numbers with one decimal place, e.g. 650 + __ = 930 ___ + 1.4 = 2.5  Know the related  vocabulary for addition See the images from Y4.			Decimals - same and different number of digits 	Two digit three digit Crossing tens boundary Inverse addend	

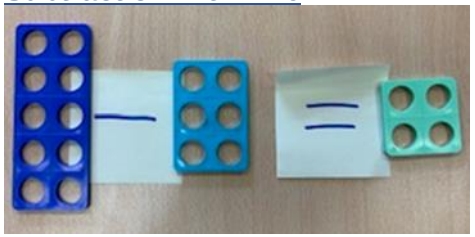
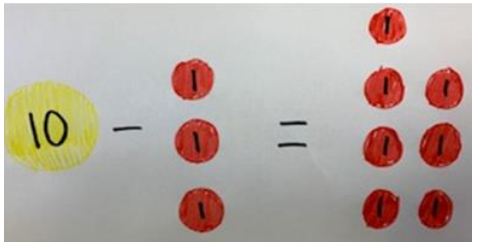
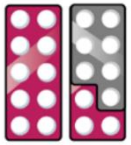
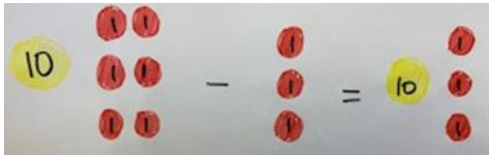
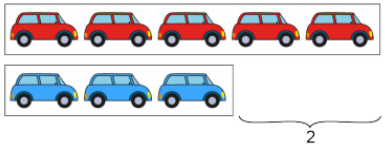
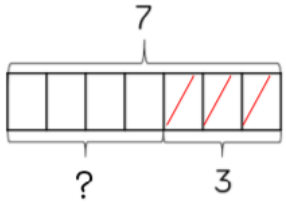
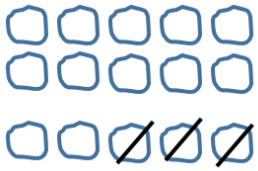
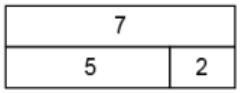
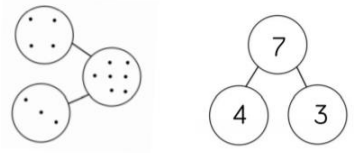
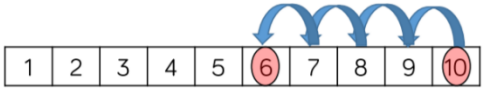
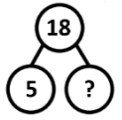
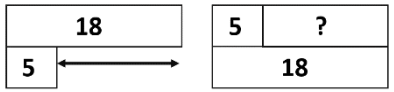
Primary Calculation Policy

EYFS Subtraction

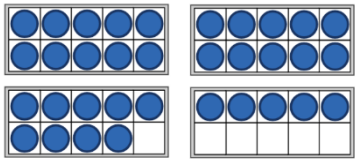
	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
EYFS	Children are encouraged to read number sentences aloud in different ways “five take away one leaves four” “four is equal to five take away one” Children make a record in pictures, words or symbols of subtraction activities carried out. Solve simple problems using fingers 	Physically taking away and removing objects from a whole   Finding the difference (using cubes, Numicon or Cuisenaire rods, other objects can also be used).	Counting back (using number lines or number tracks) children start with 6 and count back 2.  Children to draw the concrete resources they are using and cross out the correct amount. The bar model can also be used. **4 – 3 = 1**  Children to represent what they see pictorially e.g. **6 – 2 = 4**  Children to draw the cubes/other concrete objects which they have used or use the bar model to illustrate what they need to calculate.	Children to represent the calculation on a number line or number track and show their jumps. Encourage children to use an empty number line    7 – 3 = 4 7 – 4 = 3	Take (away) Leave How many are left/left over? How many have gone? One less, two less … ten less… How many fewer is … than Difference between Is the same as	100 square Number lines Number tracks Bead strings Tens Frame Numicon Place Value Counters Base ten

			8 – 5 = 3   Using cubes practically or images of cubes to represent calculations.  7 – 3 = 4			

Year One Subtraction

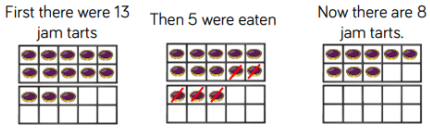
	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
Year 1	Counting forwards, backwards and chanting. Using counting stick and songs. Subtract a pair of one-digit numbers e.g. 9 -5 – see EYFS Represent and use number bonds to 20	**Subtraction within 10**   **Subtracting not crossing ten** 20 – 7 using numicon   15 – 2 using base ten	**Subtraction within 10** Draw 7 cookies and cross out 4 Draw a first, then, now    **Subtracting not crossing 10** 15 – 3 	**Subtraction within 10**  7 – 2 = 5  7 – 3 = 4 7 – 4 = 3 10 – 4 = 6  **Subtracting not crossing 10** 18 -5 use a part whole model  18 – 5 – bar modelling  18 – 5 - number equation	As above Count back Count on Less than Difference Take away Subtract Part – whole First Then Now	100 square Number lines Number tracks Bead strings Tens Frame Numicon Place Value Counters Base ten (Diennes).

19 – 4 using tens frame

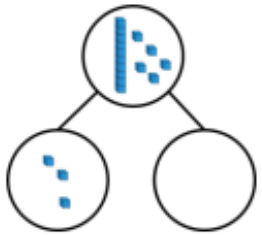


Subtracting crossing 10

Making 10 using ten frames. 13 – 5



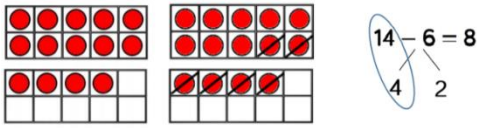
Can also use base ten, counters, numicon – as shown above



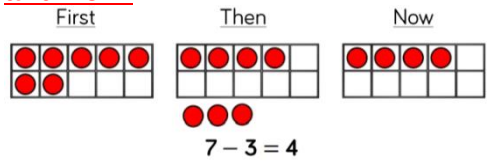
Subtracting crossing 10

Draw the jam tarts 13 – 5

Can also draw the counters and cross out – as above.



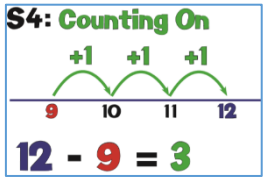
Using the vocabulary first, then and now:



18 – 5 = 13
13 = 18 - 5

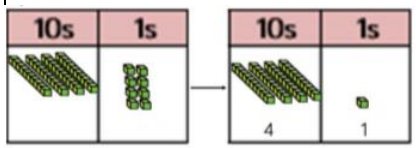
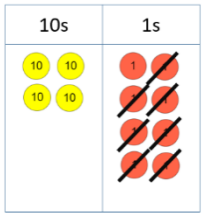
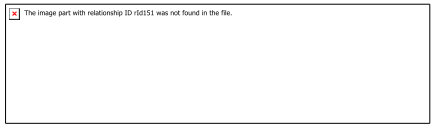
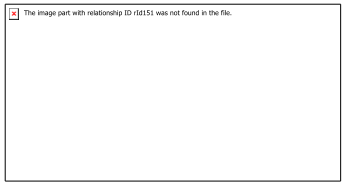
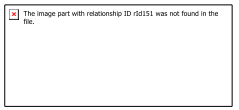
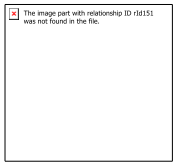
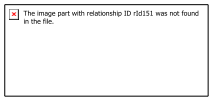
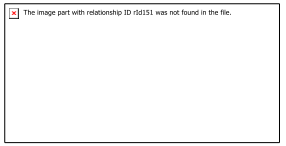
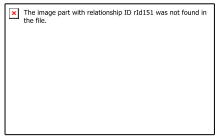
Subtracting crossing 10

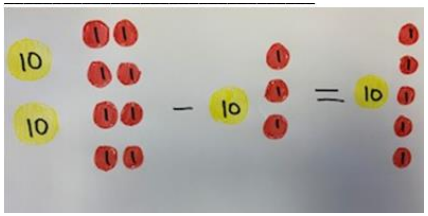
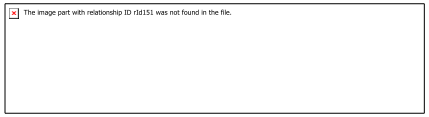
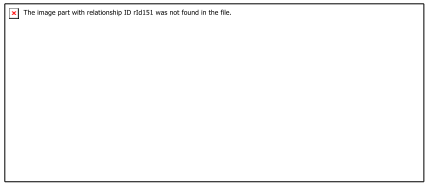
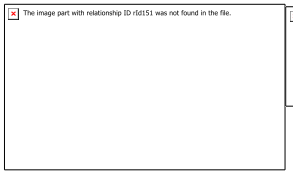
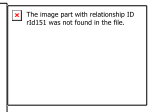
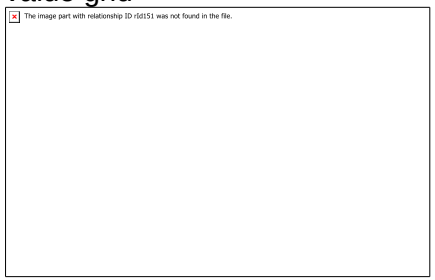
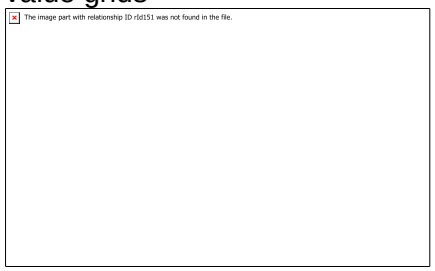
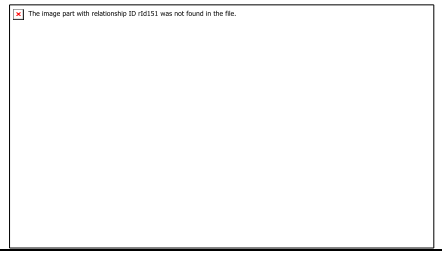
12- 9 – number line on count



Bar models, number equations and part whole models as shown above.

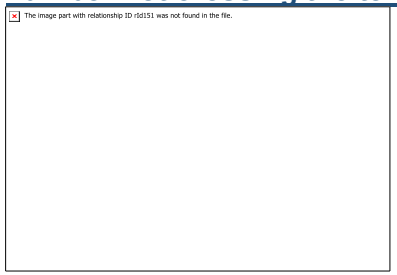
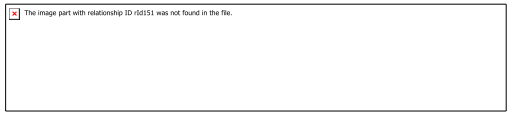
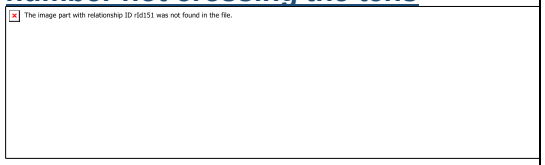
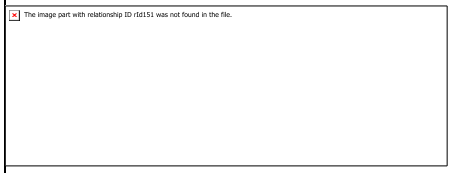
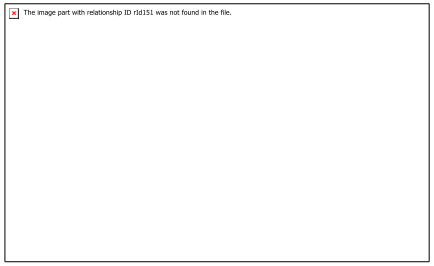
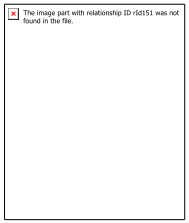
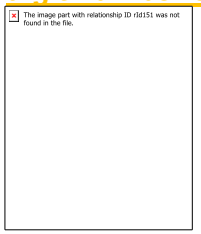
Year Two Subtraction

	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
Year 2	Subtract a multiple of 10 from any two-digit number, e.g. 67 -20 subtract 9, 19, 29, … or 11, 21, 31... Recall number bonds to 20 fluently and derive and use related facts to 100 Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot	**Subtracting not crossing ten** 48 -7  Tens frames and Numicon can also be used (see Y1 examples)  **Subtracting a single digit crossing 10** 24 -7 – using base ten and exchanging a tens rod for ones  Tens frames and Numicon can also be used.	**Subtracting not crossing ten**  **Subtracting a single digit crossing 10** 24 -7 - children draw them 	**Subtracting not crossing ten** 48 -7 – bar models, part whole models, number lines, number sentence    **Subtracting a single digit crossing 10**  24 - 7 Can use the bar model, part whole model and number lines as shown above. 	Count back Count on Less than Difference Take away Subtract Part – whole Minus Decrease	100 square Number lines Number tracks Bead strings Tens Frame Numicon Place Value Counters Cuisenaire Base ten Arrow Cards

		Subtracting a 2-digit from a 2-digit number not crossing the tens 28 – 13 =   **Subtracting a 2-digit from a 2-digit number crossing the tens** 63-17    Tens frames and Numicon can also be used.	**Subtracting a 2-digit from a 2-digit number not crossing the tens** 28 – 13 – can draw in the place value grid  **Subtracting a 2-digit from a 2-digit number crossing the tens** 64-17 – can be drawn in place value grids  	**Subtracting a 2-digit from a 2-digit number not crossing the tens** 28 – 13 – can draw in the place value grid Can use the bar model, part whole model and number lines as shown above. Part whole below.  Introduce column subtraction wihout regrouping: 21 - 10 = 21 - 10 Record the calculation vertically subtracting the column of ones then the column of tens.		

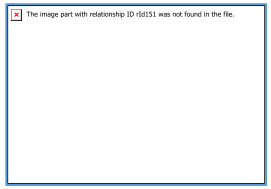
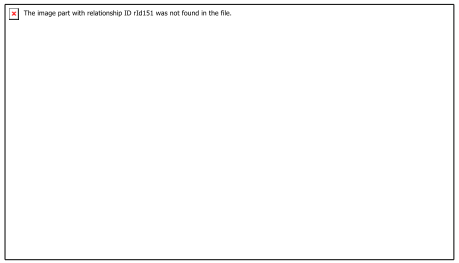
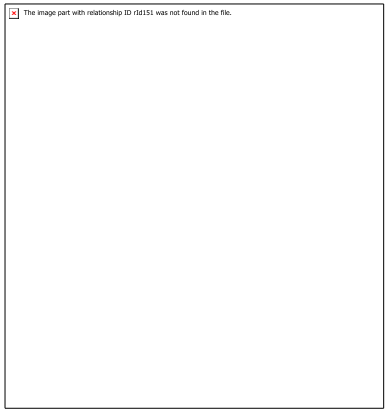
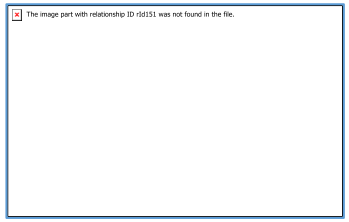
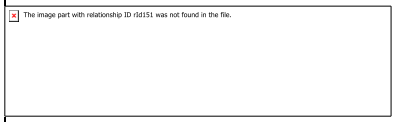
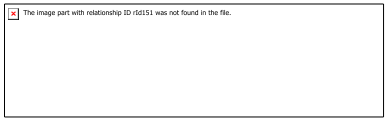
		The image part with relationship ID rId151 was not found in the file.		**Subtracting a 2-digit from a 2-digit number crossing the** The image part with relationship ID rId151 was not found in the file. The image part with relationship ID rId151 was not found in the file. The image part with relationship ID rId151 was not found in the file. The image part with relationship ID rId151 was not found in the file. The image part with relationship ID rId151 was not found in the file. **ten**		

Year 3 Subtraction

	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
Year 3	Recall number bonds to 20 and links to bonds of multiples of 10 to 100 , complements to 100 e.g. 100 – 55 = 45 Practise solving varied subtraction questions mentally with two-digit numbers, the answers could exceed 100 Subtract numbers mentally, including: a three-digit number and ones	**Subtracting a 2-digit from a 2-digit number not crossing the tens**  **Subtracting a 2-digit from a 2-digit number crossing the tens** 41 – 23 =  **Subtracting a 3-digit from a 3-digit number not crossing the tens** 	**Subtracting a 2-digit from a 2-digit number not crossing the tens**  **Subtracting a 2-digit from a 2-digit number crossing the tens** 64-17 – can be drawn in place value grids 	**Subtracting a 2-digit from a 2-digit number not crossing the tens**  **Subtracting a 2-digit from a 2-digit number crossing the tens**  **Subtracting 3 digit numbers crossing tens and hundreds** Use formal written methods where exchange is also required.	Subtraction Partition into hundreds, tens and ones Count on Carry back First Then Now Empty number line Difference Find the difference Decrease by	100 square Number lines Number tracks Bead strings Tens Frame Numicon Place Value Counters Base ten (Diennes) Arrow Cards

	a three-digit number and tens a three-digit number and hundreds groups of small numbers, e.g. 9 – 3 – 2. a two-digit number from a multiple of 10, eg. 50 - 38, 90 – 27, 68 – 35	**Subtracting 3 digit numbers crossing tens and hundreds** When using equipment children need to see the exchanging of hundreds for tens etc. The image part with relationship ID rId151 was not found in the file. The image part with relationship ID rId151 was not found in the file. The image part with relationship ID rId151 was not found in the file. The image part with relationship ID rId151 was not found in the file.	**Subtracting 3 digit numbers crossing tens and hundreds** The image part with relationship ID rId151 was not found in the file. The image part with relationship ID rId151 was not found in the file. **Subtracting money - no decimals** The image part with relationship ID rId151 was not found in the file.	The image part with relationship ID rId151 was not found in the file. **Subtracting money - no decimals** Formal part whole and counting backwards on a numberline also. The image part with relationship ID rId151 was not found in the file. The image part with relationship ID rId151 was not found in the file.		

Year 4 Subtraction

	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
Year 4	Practise mental methods with increasingly large numbers to aid fluency Subtract any pair of two-digit and three-digit numbers, including crossing the 10 and 100 boundary, e.g. 58 - 23 Count on and back in 10s from any number Subtract a near multiple of 10, e.g. 84 - 29  Understand subtraction as inverse of addition	**Subtracting 4 digit numbers crossing tens and hundreds** See Y3 guidance for 3 digit numbers – it is the same principle. **Subtracting with money up to 4 digits using decimals** Use with real money to show how to find differences	**Subtracting 4 digit numbers crossing tens and hundreds** See Y3 guidance for 3 digit numbers – it is the same principle.   **Subtracting with money up to 4 digits using decimals** Children can draw the coins and notes and show the exchange.	**Subtracting 4 digit numbers crossing tens and hundreds** See Y3 guidance for 3 digit numbers – it is the same principle. **Subtracting with money up to 4 digits using decimals**   	Subtraction Partition into thousands, hundreds, tens and ones Count on Carry back First Then Now Difference Find the difference Decrease / reduced by	100 square Number lines Number tracks Place Value Counters Base ten Arrow Cards

		The image part with relationship ID rId151 was not found in the file.				

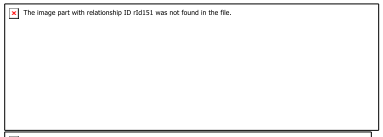
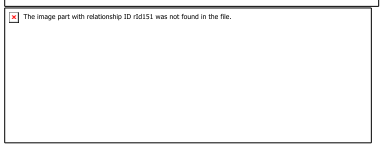
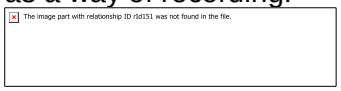
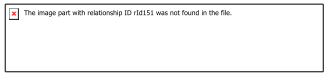
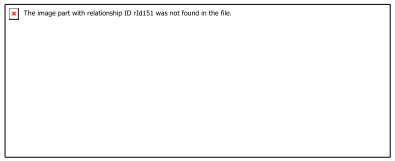
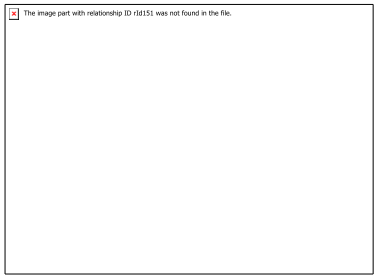
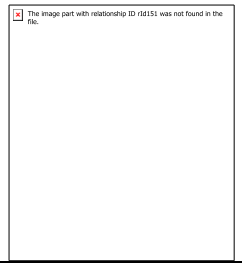
Year 5 and Year 6 Subtraction

	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
Year 5 And Year 6	Subtract numbers with increasingly large numbers to aid fluency e.g. 12 462 - 2 300 = 10 162 Use rounding to check answers and determine, levels of accuracy Subtract a pair of two or three-digit multiples of 10, e.g. 80 - 30, 45 -36 and 450 – 360 Subtract a near multiple of 10 or 100 from any two-digit or three-digit number, e.g. 235 - 199 Subtract pairs of decimal fractions each with ones and tenths, The image part with relationship ID rId151 was not found in the file. e.g. 5.7 - 2.5, 6.3 -4.8	Subtract whole numbers with more than 4 digits and increasingly large numbers using efficient column written methods with decomposition to aid fluency Please see the Year 3 and Year 4 examples as they have the same principles The image part with relationship ID rId151 was not found in the file.	Subtract whole numbers with more than 4 digits and increasingly large numbers using efficient column written methods with decomposition to aid fluency Please see the Year 3 and Year 4 examples as they have the same principles The image part with relationship ID rId151 was not found in the file. The image part with relationship ID rId151 was not found in the file. The image part with relationship ID rId151 was not found in the file. The image part with relationship ID rId151 was not found in the file.	Subtract whole numbers with more than 4 digits and increasingly large numbers using efficient column written methods with decomposition to aid fluency Please see the Year 3 and Year 4 examples as they have the same principles Negative numbers 7 – 9 = -2 There is a negative difference of 2 The difference between 9 and -3. The image part with relationship ID rId151 was not found in the file.	Subtraction Partition into millions, hundred thousands, ten thousands, thousands, hundreds, tens and ones Empty number line Count on Carry back First, Then Now Difference Find the difference Decrease / reduced by Negative	100 square Number lines Number tracks Place Value Count Base ten. Arrow Cards

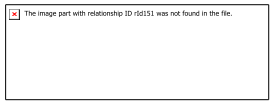
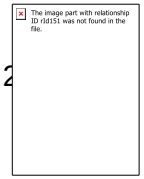
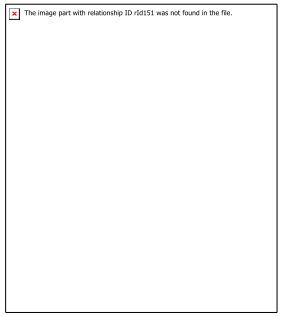
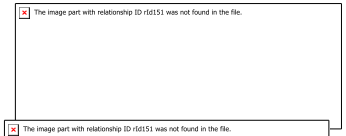
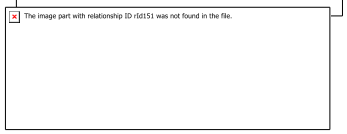
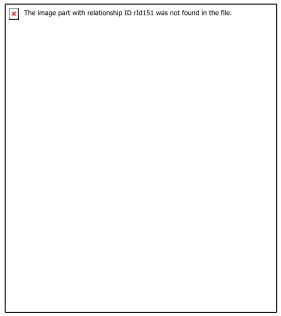
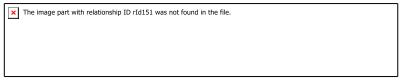
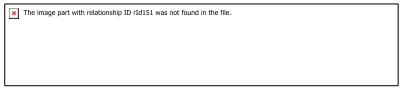
	See Y3 missing subtrahend and addend problems.		Negative numbers Negative numbers represent change 9 – 12 = -3 The image part with relationship ID rId151 was not found in the file.			

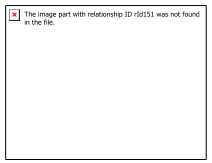
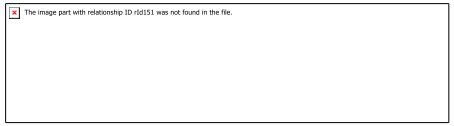
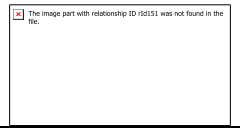
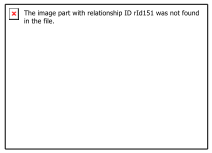
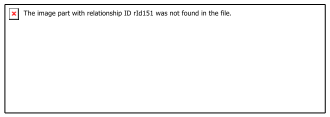
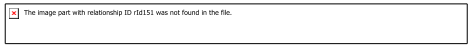
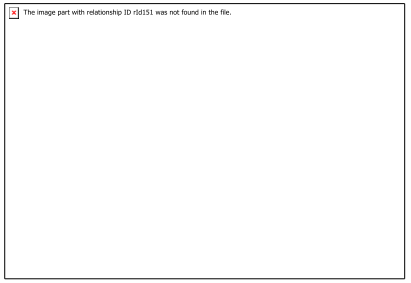
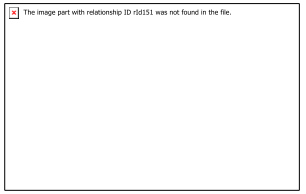
Primary Calculation Policy

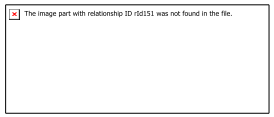
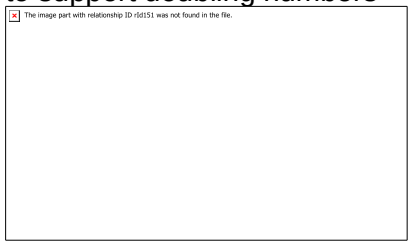
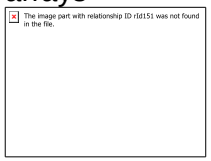
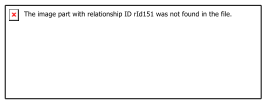
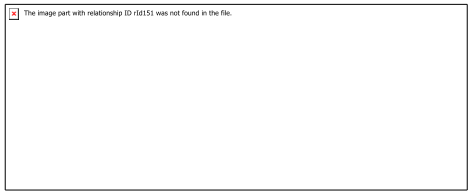
EYFS Multiplication

	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
EYFS	The link between addition and multiplication should be introduced though doubling. Count in twos; fives; tens both aloud and with objects. I have two tens frame so that means I have 20 etc.	**Repeated grouping/repeated addition**   If available, Numicon is used to visualise the repeated adding of the same number. These can then be drawn around or printed as a way of recording.  Real life contexts and use of practical equipment to count in repeated groups of the same size: How many wheels are there altogether? 	**Children to draw the concrete resources they are using.**   	**Write the number sentence** 2 + 2 + 2 = 6	Lots of Groups of Repeated addition Double	100 square Number lines Number tracks Bead strings Bead bar Tens Frame Numicon Place Value Counters Cuisenaire Base ten (Diennes).

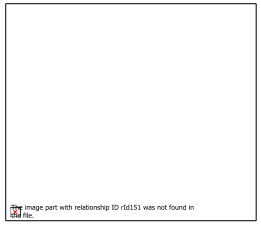
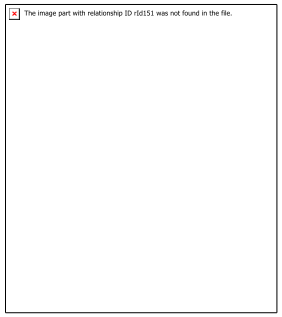
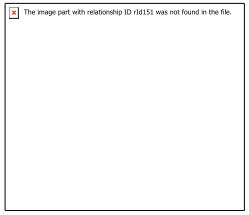
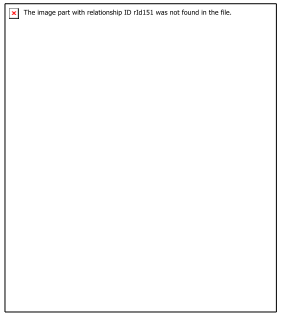
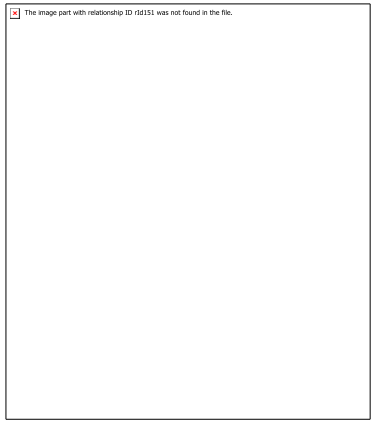
Year One Multiplication

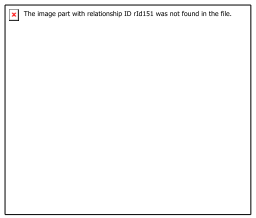
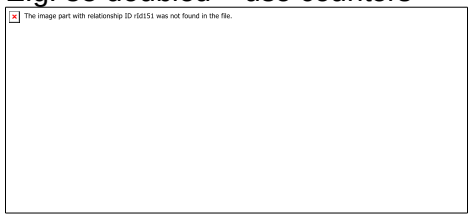
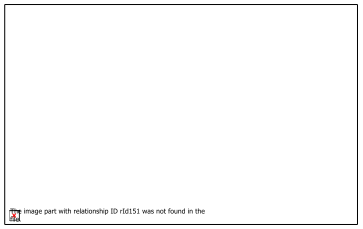
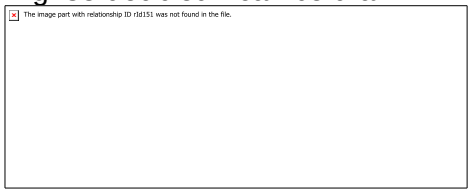
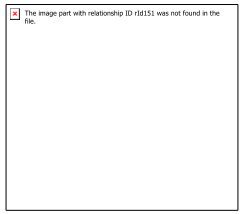
	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
Year 1	Count on from and back to zero in ones, twos, fives or tens Make connections between arrays, number patterns, and counting in twos, fives and tens. Recognise odd and even numbers	**Repeated Addition – Counting in 2s (also apply to counting in 10's and 5's)** Use images of different objects  There are 7 groups of 2   Tens frames can also be used to show times tables such as 2s, 5s and 10s.	**Repeated Addition - – Counting in 2s** Draw the objects   There are 7 groups of 2  Tens frames can also be used to show times tables such as 2s, 5s and 10s.	**Repeated Addition - – Counting in 2s** Can use bar model, number line and equation   2 + 2 + 2 + 2 + 2 + 2 + 2 = 14 2 x 7 = 14 (introduce the multiplication symbol) Introduce the multiplication symbol 5 + 5 + 5 = 5 x 3 = 15 **Repeated addition – Counting in Tens**	Lots of Groups of Times Multiply Repeated addition Double Sets Groups, Pairs Array	100 square Number lines Number tracks Bead strings. Tens Frame Numicon Place Value Counters Base ten (Diennes).

		Repeated addition – Counting in Tens Use images of different objects – including Numicon  4 groups of 10 (fingers and thumbs)  4 groups of 10 pens 18 – 5 using counters **Repeated addition – Counting in Fives** Please follow the guidance from counting in 2s and 10s – exactly the same principle **Using arrays** Explain the language of columns and rows. Use concrete apparatus. 	**Repeated addition – Counting in Tens** Draw the objects  4 groups of ten (t represents ten)  Try to avoid pupils drawing out ALL ten objects 4 times. **Repeated addition – Counting in Fives** Please follow the guidance from counting in 2s and 10s – exactly the same principle  	As above  10 + 10 + 10 + 10 = 40 **Repeated addition – Counting in Fives** Please follow the guidance from counting in 2s and 10s – exactly the same principle **Doubling** Use a bar model and equation 		

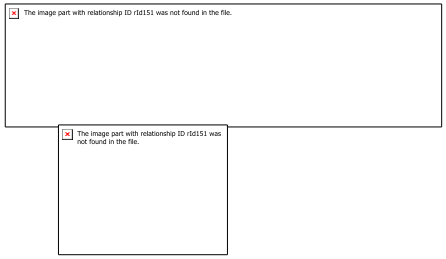
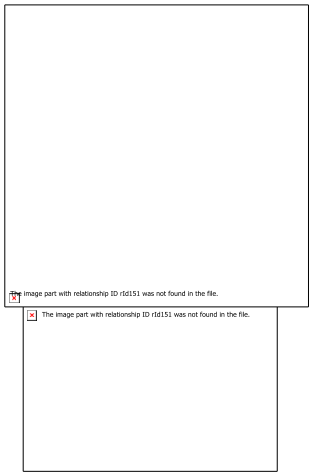
		There are 3 apples in each column. There are 4 columns. There are 12 apples altogether.  There are 5 counters in each row. There are 2 rows. There are 10 counters altogether. **Doubling** Use lots of different manipulatives to support doubling numbers 	**Using arrays** Explain the language of columns and rows. Children can draw the arrays  There are 3 apples in each column. There are 4 columns. There are 12 apples altogether.  There are 5 counters in each row. There are 2 rows. There are 10 counters altogether. **Doubling** Children can draw it 	4 + 4 = 8		

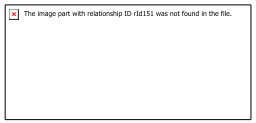
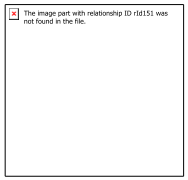
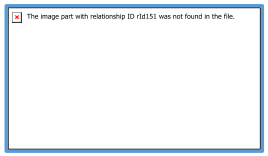
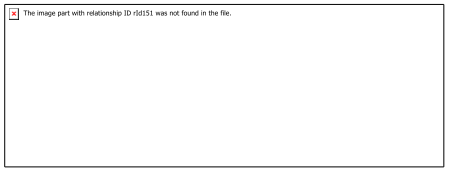
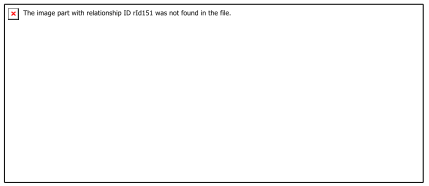
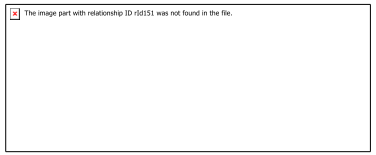
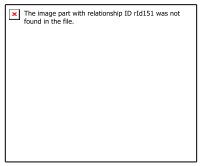
Year Two Multiplication

	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
Year 2	Add in link to Shanghai maths sessions for counting in 2's, 5's and 10's Practise to become fluent in recall and use of multiplication facts for the 2, 5 and 10 multiplication tables, (connect the 10x table to place value, and the 5x table to the divisions on the clock face) Double any multiple of 5 up to 50, eg. double 35 Find the total number of objects when they are organised into groups of 2, 5 or 10 Show that multiplication of	**Fluent in the recall and calculations of 2, 5 and 10 multiplication tables** Here is one example  3 equal groups of 5 equals 15 cubes  Tens frames can also be used to show times tables such as 2s, 5s and 10s. **Using arrays**	**Fluent in the recall and calculations of 2, 5 and 10 multiplication tables** Here is one example – hand drawn **3 x 5 = 15**   Tens frames can also be used to show times tables such as 2s, 5s and 10s. **Using arrays**	**Fluent in the recall and calculations of 2, 5 and 10 multiplication tables**  **Using a range of representations** 	Lots of Groups of Times Repeated addition Double Sets Groups, Pairs Array symbol x times as big …as wide …as long	100 square Number lines Number tracks Bead strings Tens Frame Numicon Place Value Counters Base ten (Diennes). Arrow Cards

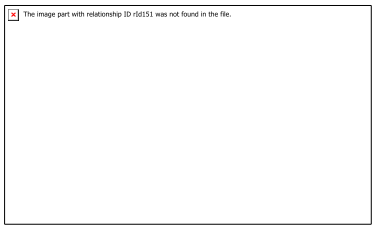
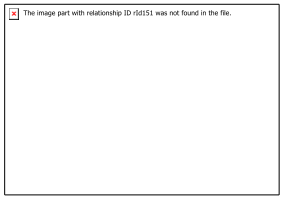
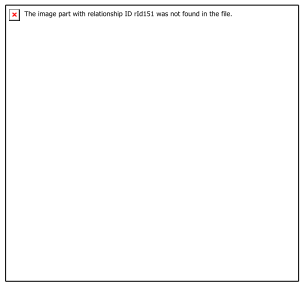
	two numbers can be done in any order (commutative) and division of one number by another cannot Introduce the symbol for multiplication	Please see the guidance for Year 1 and using arrays below  **Doubling** See Y1. Children need to double multiples of 10 to 100, then double multiples of 5 to 100 E.g. 35 doubled – use counters – 	Please see the guidance for Year 1 and using arrays below. An example of how to demonstrate 3 x 5 is:  **Doubling** See Y1. Children need to double multiples of 10 to 100, then double multiples of 5 to 100 E.g. 35 doubled - can be drawn 	4 + 4 + 4 + 4 = 4 x 4 **Doubling** See Y1. Children need to double multiples of 10 to 100, then double multiples of 5 to 100 E.g. 35 doubled 		

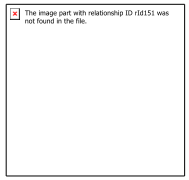
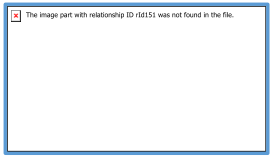
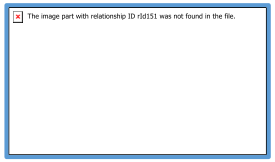
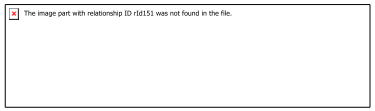
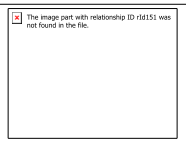
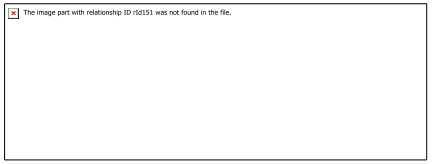
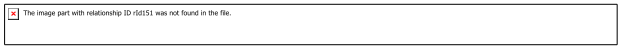
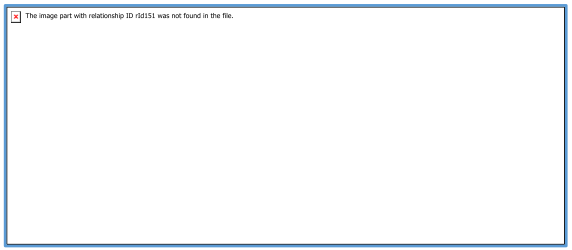
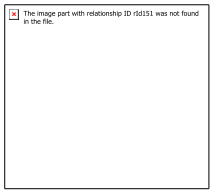
Year 3 Multiplication

	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
Year 3	Recall and use multiplication facts for the 4, 8 and 3 multiplication tables Practise mental recall of x tables to improve fluency. Use doubling to connect the 2, 4 and 8 x tables. Use x facts to derive related facts and write mathematical statements e.g. using 3 × 2 = 6 to derive 30 × 2 =60 Develop efficient mental methods using commutativity e.g. 4 × 12 × 5 = 4 × 5 × 12 = 20 × 12 = 240) Double any two-digit number, e.g. double 39 and any multiple of 5 , 10 or 100, e.g. double 340, double 800, Multiply one-digit or two-digit numbers	**Consolidate 2, 5 10 times table** Please see Y2 examples **4, 8 then 3 times table** Please see Y2 examples showing concrete groups and arrays as they hold the same principles **Make connections x10** 4 x 3, 4 x 30, 4 x 300 – use counters 	**Consolidate 2, 5 10 times table** Please see Y2 examples **4, 8 then 3 times table** Please see Y2 examples showing pictorial groups and arrays as they hold the same principles **Make connections x10** 4 x 30 = 120 – draw it Draw on a place value grid 	**Consolidate 2, 5 10 times table** Please see Y2 examples **4, 8 then 3 times table** Please see Y2 examples as they hold the same principles **Make connections x10** 4 x 3 = 12 4 x 30 =120	Lots of Groups of Times Repeated addition Double Sets Groups, Pairs Array symbol x factor product multiple ten times the size hundred times the size	100 square Number lines Number tracks Tens Frame Place Value Counters Base ten (Dienes) Arrow Cards Gattegno chart Place Value Grid

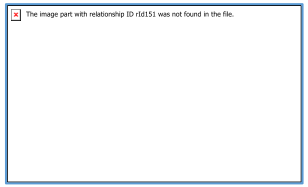
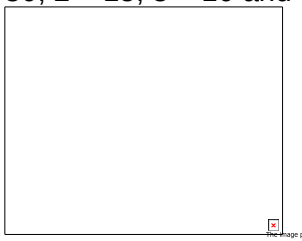
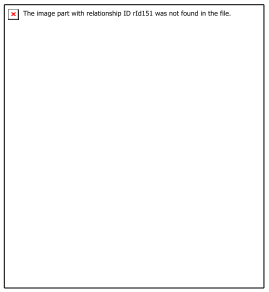
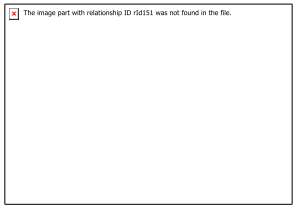
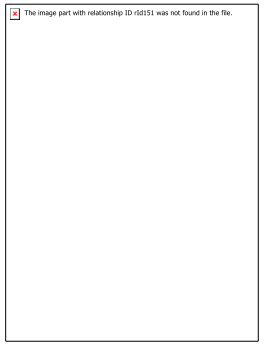
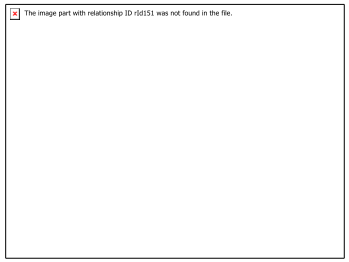
	by 10 or 100 and understand the effect e.g. 7 × 100, 46 × 10, 54 x 100  Factor flower for 20  Know the vocabulary below Factor multiplied by factor equals  product	Also use the Gattegno Chart to help  **Simple 2 digit by one digit** Use dienes or counters **23 x 5 = 115**  **14 x 3** 	**Simple 2 digit by one digit** Draw it in a grid **23 x 5 = 115** 	**Simple 2 digit by one digit** **Add array and grid images from current policy**	a tenth the size a hundredth the size	

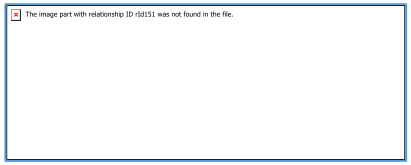
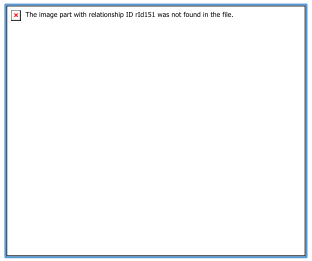
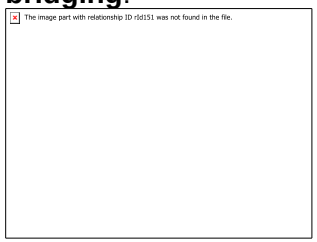
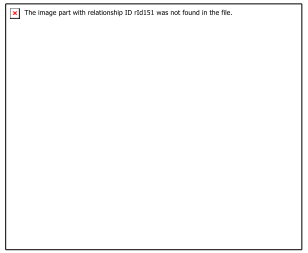
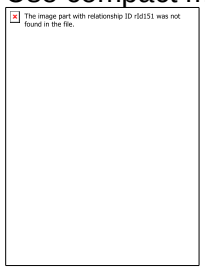
Year 4 Multiplication

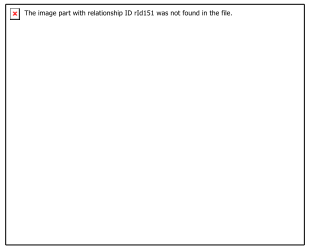
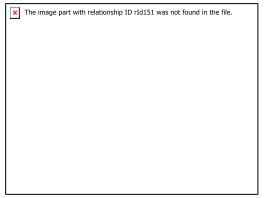
	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
Year 4	Recall and practise multiplication facts for tables up to 12 × 12 to aid fluency. Use place value, known and derived facts to multiply mentally, including multiplying by 0 and 1 TU by 4 or 8, eg. 26 × 4 by doubling three numbers together two digit by a unit eg. 17 × 3 numbers to 1000 by 10 and 100 (whole-number answers) eg. 325 × 10, 42 × 100 Extend mental methods to HTU to derive facts e.g. 200 × 3 = 600 into 600 ÷ 3 = 200 Recognise and use factor pairs e.g. give the factor pair associated with a multiplication fact, (if	**Consolidate 3, 4, 8 times table** See Y3 guidance - same principle **Learn the remaining tables to x 12** See Y2 examples showing concrete groups and arrays as they hold the same principles **Multiply 2 digit by one digit** 24 x 3 – Use Dienes or counters 	**Consolidate 3, 4, 8 times table** See Y3 guidance - same principle **Learn the remaining tables to x 12** See Y2 examples showing pictorial groups and arrays as they hold the same principles **Multiply 2 digit by one digit** 24 x 3 – Draw it  **Make connections x10 x 100** The counters can be drawn also Using	**Consolidate 3, 4, 8 times table** See Y3 guidance - same principle **Learn the remaining tables to x 12** See Y3 guidance - same principle **Multiply 2 digit by one digit**  **Make connections x10 x 100** 12 x 10 = 120 12 x 100 = 1200	Lots of Groups of Times Repeated addition Double Sets Groups, Pairs Array symbol x factor product multiple ten times the size hundred times the size	100 square Number lines Number tracks Tens Frame Numicon Place Value Counters. Base ten (Diennes). Arrow Cards Gattegno chart Place Value Grid

	2 x 3 = 6 then 6 has the factor pair 2 and 3) Factor flower for 20  Know the vocabulary below Factor multiplied by factor equals product   Use divisibility tests to identify multiples of 2, 4, 10 and 5	**Make connections x10 x 100** 4 x 3, 4 x 30, 4 x 300 – use counters   Also use the Gattegno Chart to help  Understand the distributive law. Where a factor can be partitioned and multiplied out.  	X 10  First  then  		a tenth the size a hundredth the size scaling adjacent multiples	

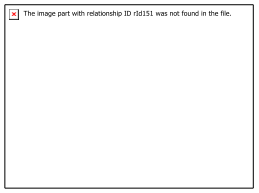
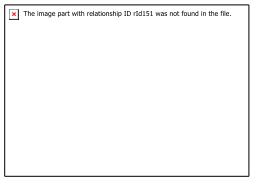
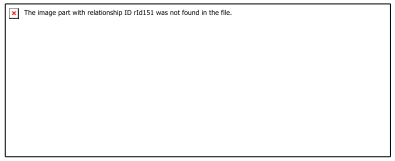
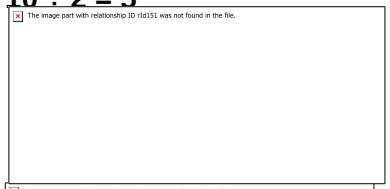
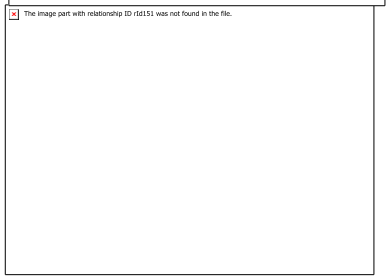
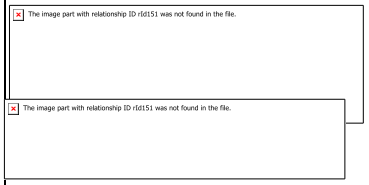
Year 5 and Year 6 Multiplication

	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
Year 5 and 6	Multiply TU X U mentally using known facts for all multiplication tables to 12 x 12 numbers  Identify multiples and factors, including finding all factor pairs for numbers to 100, e.g. 30 has the factor pairs 1 × 30, 2 × 15, 3 × 10 and 5 × 6  Establish whether a number up to 100 is prime and recall prime numbers up to 19 Recognise and use square and cube numbers, and relevant notation.	**Multiply up to 4 digits by a one- number** 2214 x 4 – use counters  **Multiply up to 4 digits by a two- number** If children are working at this level – moving straight to a formal method is the best approach.	**Multiply up to 4 digits by a one- number** 2214 x 4 – can draw in a place value grid  **Multiply up to 4 digits by a two- number** If children are working at this level – moving straight to a formal method is the best approach.	**Multiply up to 4 digits by a one- number** **Year 5** **Start with expanded with brackets:**  **Then move on to compact method showing bridging:** 	As above factor product multiple ten times the size hundred times the size a tenth the size a hundredth the size scaling adjacent multiples prime square cubed	100 square Number lines Number tracks Tens Frame Numicon Place Value Counters Base ten (Diennes). Arrow Cards Gattegno chart Place Value Grid

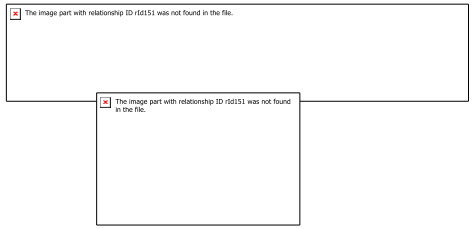
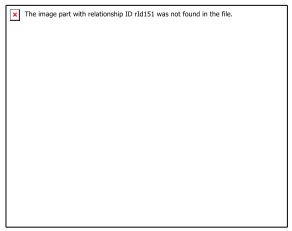
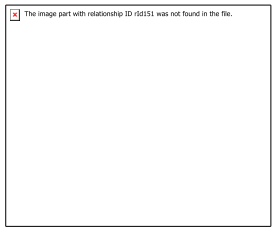
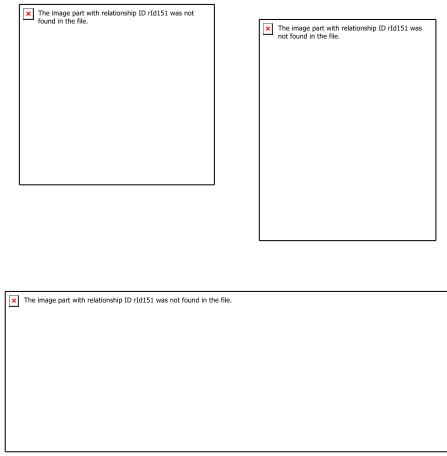
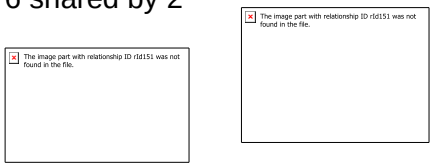
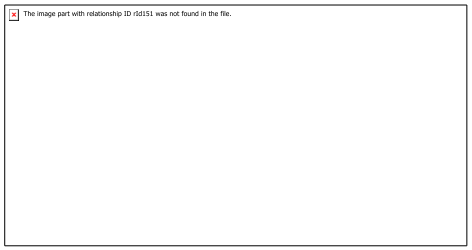
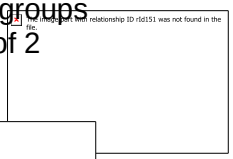
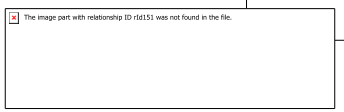
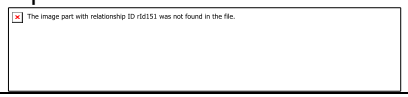
	Multiply by 25 or 50, e.g. 48 × 25, 32 × 50 Multiply whole numbers decimals by 10, 100 and 1000 e.g. 4.3 × 10, 0.75 × 100 Multiply pairs of multiples of 10, e.g. 60 × 30, and a multiple of 100 by a single digit number, e.g. 900 × 8  Use divisibility tests to identify multiples of 3, 6, 9 8 and revise 2, 4, 10 and 5  Express a product as a multiple of three factors **Year 6** Multiply two-digit decimals such as 0.8 × 7 and pairs of multiples of 10 and 100, e.g. 50 × 30, 600 × 20			**Year 6** **Start with compact method showing bridging**:  **Multiply up to 4 digits by a two- number** First, use the expanded method  Use compact method: 		

	Double decimals with units and tenths, e.g. double 7.6 Scale up and down using known facts, e.g. given that three oranges cost 24p, find the cost of four oranges Identify numbers with an odd number of factors (square numbers), even numbers of factors and no factor pairs other than 1 and themselves (prime numbers) Explore the order of operations using brackets; eg. 2 + 1 x 3 = 5 and (2 + 1) x 3 = 9. Use multiplication facts to solve ratio and proportion problems.			**Year 6 – multiply decimal numbers** Start with the expanded method  Then move on to the compact  		

EYFS Division

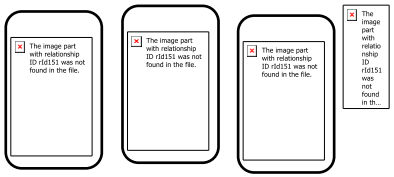
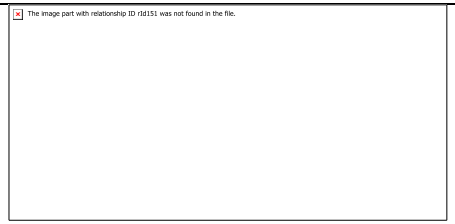
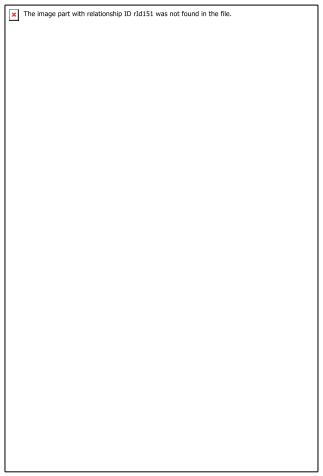
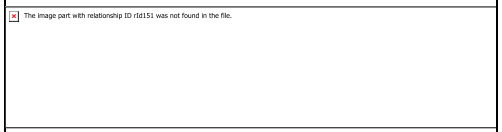
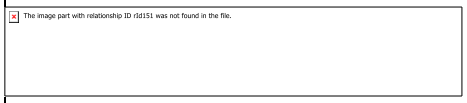
	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
EYFS	Count in twos; fives; tens both aloud and with objects.	**Grouping or Sharing Model**   I have 10 cubes, can you share them equally in 2 groups?	**Grouping or Sharing Model** Children to draw the concrete resources they are using. **6 ÷ 3 = 2**  **10 ÷ 2 = 5**  	**Grouping or Sharing Model** Write the number sentence  	Share Sharing grouping Equal Groups Left over Half Halving	100 square Number lines Number tracks Bead strings Tens Frame Numicon Place Value Counters Base ten (Dienes)

Year One Division

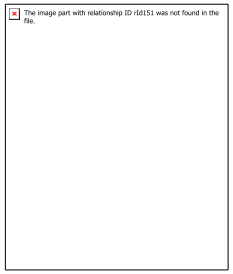
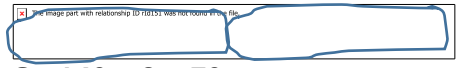
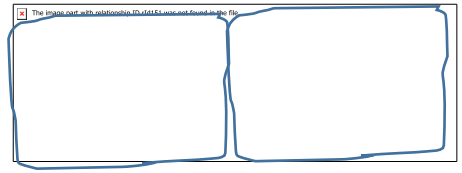
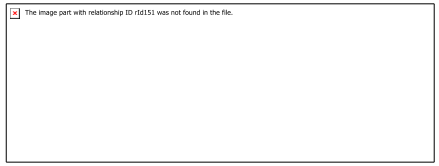
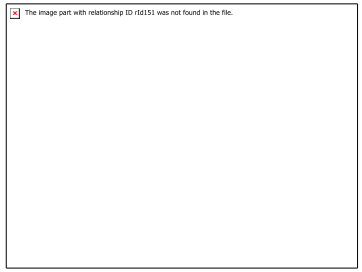
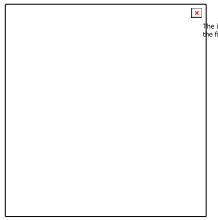
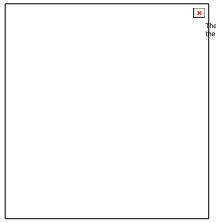
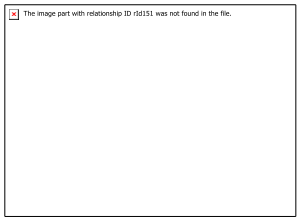
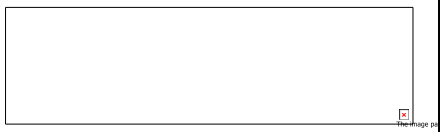
	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
Year 1	Share objects into equal groups and count how many in each group and consider 'left over'. Count on from and back to zero in ones, twos, fives or tens – including starting from different points.	**Sharing using a range of objects.** Focus on EQUAL groups 6 shared by 2  There are 10 sweets. How many people can have 2 sweets each? 	**Sharing using a range of objects.** Focus on EQUAL groups 6 shared by 2  Focus on EQUAL groups Put 8 into groups of 2 	**Sharing using a range of objects.** Focus on EQUAL groups 6 shared by 2   Focus on EQUAL groups Put 8 into groups of 2   Move on to use a number line to show jumps in groups. The number of jumps equals the number of groups. 	Share Sharing grouping Equal Groups Left over Half Halving	100 square Number lines Number tracks Bead strings Tens Frame Numicon Place Value Counters Base ten (Dienes)

Year Two Division

	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
Year 2	Practise to become fluent in recall and use of multiplication and division facts for the 2, 5 and 10 multiplication tables, Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot Introduce the symbol for division ÷	**Sharing into arrays of 2, 5 and 10 using a range of objects** 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 The image part with relationship ID rId151 was not found in the file. The image part with relationship ID rId151 was not found in the file.	**Sharing into arrays of 2, 5 and 10 using a range of objects** Children may begin with less sophisticated drawings of groupings **30 ÷ 5 = 6** The image part with relationship ID rId151 was not found in the file. And move on to draw an array showing groups to make multiplication and division sentences. **15 ÷ 5 = 3** **15 ÷ 3 = 5** The image part with relationship ID rId151 was not found in the file.	**Sharing into arrays of 2, 5 and 10 using a range of objects (using only numerals)** **30 ÷ 5 = 6** The image part with relationship ID rId151 was not found in the file. The image part with relationship ID rId151 was not found in the file. **40 ÷ 10 = 4** On a number line they could jump forwards or backwards. The image part with relationship ID rId151 was not found in the file. The image part with relationship ID rId151 was not found in the file. Also link to inverse number sentences: **40 ÷ 10 = 4** **40 ÷ 4 = 10** **4 x 10 = 40** **10 x 4 = 40**	Divide Share equally One each, two each…, Grouping Equal groups How many lots of…. How many groups of… half of halved symbol ÷	100 square Number lines Number tracks Bead strings Tens Frame Numicon Place Value Counters Base ten (Dienes)

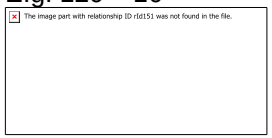
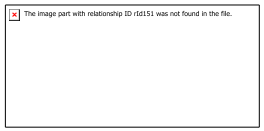
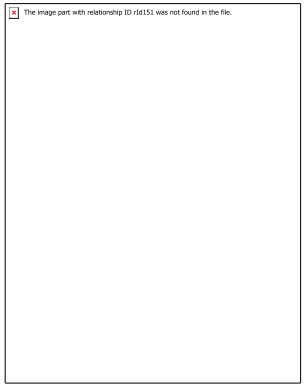
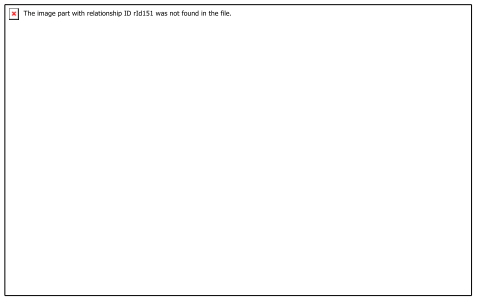
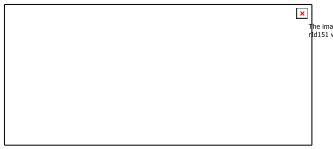
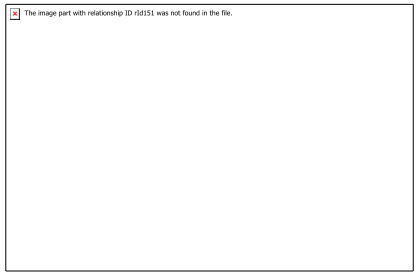
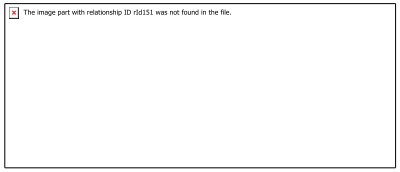
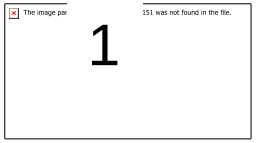
		Introducing the concept of a remainder (Greater Depth ITAF statement) Divide objects into groups or share equally and see how much is left over. **14 ÷ 3 = 4 r2** 	  **Introducing the concept of a remainder (Greater Depth ITAF statement)** Draw dots and group them to divide an amount and clearly show a remainder. **14 ÷ 4 = 3 r2** 	**Introducing the concept of a remainder (Greater Depth ITAF statement)** Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder. **13 ÷ 4 = 3 r1** 		

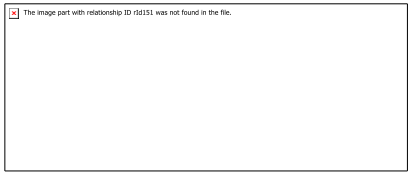
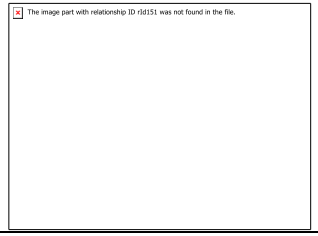
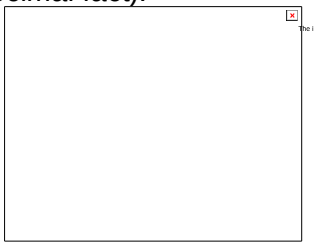
Year 3 Division

	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
Year 3	Halve any multiple of 10 up to 200, e.g. halve 170  Recall and use division facts for the 3, 4 and 8 x tables, use halving to derive division by 2, 4 and 8 Calculate and write mathematical statements for division using related x tables facts, including for TU ÷ U mentally Develop efficient mental methods using facts e.g 6 ÷ 3 = 2 and 2 = 6 ÷ 3 to derive related facts	**Variation/related number facts** **14 ÷ 2 = 7**  **So 140 ÷ 2 = 70**  Also use the Gattegno Chart to help  **2 digit divided by 1 digit no remainders (using Y3 ARE times tables)** 	**Variation/related number facts** Draw both facts **14 ÷ 2 = 7**  **140 ÷ 2 = 70**  **2 digit divided by 1 digit no remainders (using Y3 ARE times tables)** *£69 is shared between 3 children. How much money does each child get?* 	**Variation/related number facts** **14 ÷ 2 = 7** **140 ÷ 2 = 70**  **2 digit divided by 1 digit no remainders (using Y3 ARE times tables)** **76 ÷ 4 = 19** 	Divide Share equally, one each, two each…, Grouping equal groups, how many lots of, groups of… half of halved symbol ÷ Remainder Left over Repeated subtraction	100 square Number lines Number tracks Tens Frame Place Value Counters Base ten (Dienes) Arrow Cards Gattegno chart Place Value Grid

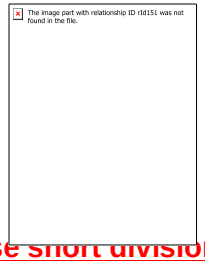
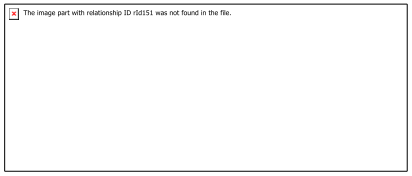
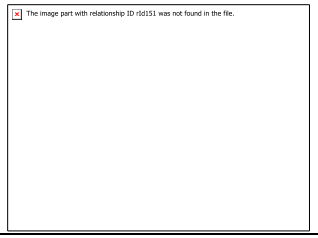
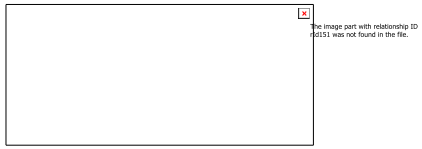
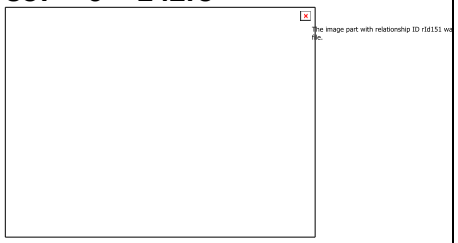
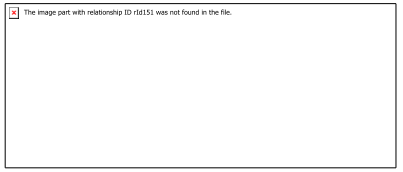
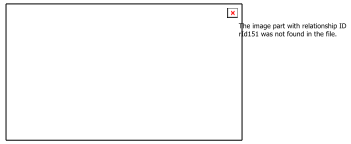
	60 ÷ 3 = 20 and 20 = 60 ÷ 3 Divide TU and HTU numbers by 10, understand the effect of ÷10 e.g. 700 ÷ 10, The image part with relationship ID rId151 was not found in the file. Also use the Gattegno Chart to help Identify remainders when dividing by 2, 5 or 10	**2 digit divided by 1 digit with remainders (using Y3 ARE times tables)** **87 ÷ 4 = 21 r 3** The image part with relationship ID rId151 was not found in the file.	The image part with relationship ID rId151 was not found in the file. **2 digit divided by 1 digit with remainders (using Y3 ARE times tables)** *£65 is shared between 3 children. How much money does each child get?* The image part with relationship ID rId151 was not found in the file.	**2 digit divided by 1 digit with remainders (using Y3 ARE times tables)** **92 ÷ 10 = 3 r2** The image par	a tenth of the size	

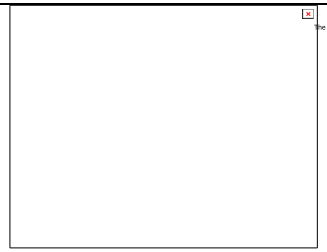
Year 4 and Year 5 Division

	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
Year 4 **Year 5**	Divide numbers mentally using known facts for all multiplication tables to 12 x 12 Practise and extend mental methods to three-digit numbers to derive facts e.g. 200 × 3 = 600 into 600 ÷ 3 = 200 Divide multiples of 10 up to 1000 by 10 E.g. 120 ÷ 10  Divide multiples of 100 up to 10, 000 by 100 e.g. 600 ÷ 100 or 2800 ÷ 100  Find halves of multiples of 10, even numbers to 200 and	**Variation/related number facts** E.g. 1200 pencils shared between 6 classes  **52 ÷ 4 =**  **Year 4 - 3-digit number divided by 1-digit (Short division) using**	**Variation/related number facts** E.g. 1200 pencils shared between 6 classes   **Year 4 - 3-digit number divided by 1-digit (Short division) using all times table facts and including reminders** **Year 5 - 4-digit number divided by 1-digit (Short division) using all times table facts and including reminders** **857 ÷ 6 = 142r5**	**Variation/related number facts** E.g. 1200 pencils shared between 6 classes  **Year 4 - 3-digit number divided by 1-digit (Short division) using all times table facts and including reminders** **Year 5 - 4-digit number divided by 1-digit (Short division) using all times table facts and including reminders** £705 shared between five using short division layout  	Divide Share equally, one each, two each…, Grouping equal groups, how many lots of, groups of… half of halved symbol ÷ Remainder Left over Repeated subtraction	100 square Number lines Number tracks Tens Frame Place Value Counters Base ten (Dienes) Arrow Cards Gattegno chart Place Value Grid

	three-digit multiples of 10 to 500 e.g. 760 ÷ 2	**all times table facts and including reminders** **Year 5 - 4-digit number divided by 1-digit (Short division) using all times table facts and including reminders** **980 ÷ 5 = 245**  **376 ÷ 3 = 122r1** 		 Year 5 to also interpret that remainder as a fraction or simple decimal (if known decimal fact). 	a tenth or hundredth of the size Fraction Decimals	

Year 6 Division

	Mental Strategies	Concrete	Pictorial	Abstract	Vocabulary	Models, Images and resources
Year 6	Divide TU by U number, eg. 68 ÷ 4. Divide by 25 or 50, eg. 480 ÷ 25, 3200 ÷ 50 Divide two-digit decimals eg. 4.8 ÷ 6 using known times table facts Find halves of decimals with units and tenths, eg. half of 15.2 Divide multiples of 100 by a multiple of 10 or 100 (whole number and decimal answers), e.g. 600 ÷ 20, 800 ÷ 400, 2100 ÷ 300 Scale up and down using known facts, e.g. given that six oranges cost 24p, find the cost of four oranges	**Variation/related number facts** E.g. 1200 pencils shared between 6 classes  **Use short division to divide any sized number by a 1-diigit number (including remainders)** Same strategy as Y4 and Y5 but with increasingly large numbers **980 ÷ 5 = 245**  **376 ÷ 3 = 122r1** 	**Variation/related number facts** E.g. 1200 pencils shared between 6 classes  **Use short division to divide any sized number by a 1-diigit number (including remainders)** Same strategy as Y4 and Y5 but with increasingly large numbers **857 ÷ 6 = 142r5** 	**Variation/related number facts** E.g. 1200 pencils shared between 6 classes  **Use short division to divide any sized number by a 1-diigit number (including remainders)** Same strategy as Y4 and Y5 but with increasingly large numbers **7584 ÷ 6 = 1264**  To also interpret that remainder as a fraction or simple decimal (if known decimal fact) **9321 ÷ 4 =**	Divide Share equally, one each, two each…, Grouping equal groups, how many lots of, groups of… half of halved symbol ÷ Remainder Left over Repeated subtraction	100 square Number lines Number tracks Tens Frame Place Value Counters Base ten (Dienes) Arrow Cards Gattegno chart Place Value Grid

		Use long division to divide any sized number by a 2-diigit number (including remainders) No concrete representation due to complexity.	**Use long division to divide any sized number by a 2-diigit number (including remainders)** No pictorial representation due to complexity.	 Also apply to decimal numbers Year 6 - Finally move into decimal places to divide the total accurately. **79 ÷ 4 = 19.75** 1 9 . 7 5 4) 7 $^{3}9.^{3}0\,^{2}0$ **39.9 ÷ 7 = 5.7** 0 5 . 7 7) 3 $^{3}9.^{4}9$ **Use long division to divide any sized number by a 2-diigit number (including remainders)** Staff to have flexibility between use of chunking method and use of arrows (each to be used alongside a fact box)	a tenth or hundredth of the size Fraction Decimals	

				The image part with relationship ID rId151 was not found in the file.		

Glossary

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

3-digit – 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.

Bridge to ten – a strategy when using number lines. Adding a number that takes you to the next 'tens' number.

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

Dienes (purple hundreds, tens and units blocks), Base Ten, Numicon, Cuisenaire rods are also referred to as concrete apparatus.

Column chunking – method of division involving taking chunks or groups or the divisor away from the larger number

Decimal number – a number with a decimal point

Divisor – the smaller number in a division calculation. The number in each group for chunking.

Double – multiply a number by 2

Exchanging – Moving a 'ten' or a 'hundred' from its column into the next column and splitting it up into ten 'ones' (or 'units') or ten 'tens' and putting it into a different column

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

Find the difference – A method for subtraction involving counting up from the smaller to the larger number

Half - a number, shape or quantity divided into 2 equal parts Halve – divide a number by 2

Integer - a whole number with no decimal point

Inverse – the opposite operation. Addition is the inverse of subtraction, multiplication is the inverse of division

Long Multiplication – column multiplication where only the significant figures are noted

Number bonds to ten – 2 numbers that add together to make ten, like 2 and 8, or 6 and 4.

Number bonds to 100 – 2 numbers that add together to make 100 like 20 and 80, or 45 and 55 or 12 and 88

Number line – a line either with numbers or without (a blank number line). Children use this tool to help them count on for addition of subtraction and also in multiplication and division.

Number sentence – writing out a calculation with just the numbers in a line E.G. 2+4=6 or 35 ÷7 = 5 or 12 x 3 =36 or 32 – 5 = 27

Partition – split up a larger number into the hundreds, tens and units. E.G. 342 – 300 and 40 and 2

Place Value – knowing that in the number 342 – the '3' means '3 hundreds', the '4' means '4 tens' and the '2' means '2'.

Quarter - a number, shape or quantity divided into 4 equal parts Remainder – a whole number left over after a division calculation repeated addition – repeatedly adding groups of the same size for multiplication

Short division Method - traditional method for division with a single digit divisor.

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.

Tens number - a number in the ten times tables – 10,20,30,40 50,etc.

Ones – another term for single digit numbers. The right hand column in column methods is the 'ones' column

Progression of Additional Vocabulary:

- Addition:
    - Add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, sum, partition, column, tens boundary, hundreds boundary, increase, vertical, bridging, expanded, compact, inverse, thousands, hundreds, digits, decimal point and decimal

- Subtraction:
    - Equal to, less, minus, subtract, distance between, difference, number line, how many more, how many fewer, less than, most, least, count back, how many left, how much less is, count on, difference, count on, strategy, exchange, decrease, value, inverse, decimal point, decimal, tenths and hundredths.

- Multiplication:
    - Groups of, times, multiply, count, array, altogether, multiplied by, repeated addition, column, row, sets of, commutative, equal groups, as big as, one twice three times, partition, grid method, multiple, product, tens, units, lots of, equal groups, square, factor, integer, decimal, short/long, carry and decimal.

- Division:
    - Share, share equally, one each, two each, group, groups of, lots of, array, divide, divided by, divided into, grouping, number line, left, left over, inverse, short division, carry, remainder, multiple, factor, divisible by, common factor, remainder, quotient, prime number, prime factors and composite number (non-prime)

Appendix

Listed below are a range of recommendations and teaching ideas aimed at informing and enhancing the teaching of primary mathematics:

1. Developing children's understanding of the = symbol

The = symbol is an assertion of equivalence. If we write 3 + 4 = 6 + 1 then we are saying that what is on the left of the = symbol is equivalent to what is on the right of the symbol. But many children interpret = as always being an instruction to work out the value of a calculation. This is as a result of always seeing it used as follows:

3 + 4 =

5 × 7 =

16 – 9 =

If children only think of = as meaning "Work out the answer to this calculation" then they are likely to get confused by empty box questions such as:

3 + ☐ = 8 and are are very likely to struggle with even simple algebraic equations, such as: 3y = 18. This can be overcome by doing the following:

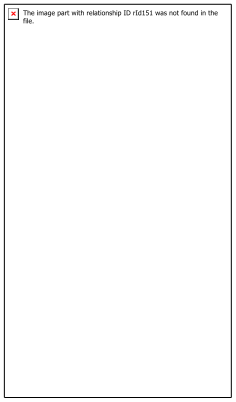
- Vary the position of the = symbol e.g. 24 = 4 x 6
- Include lots of empty box problems e.g. 12 - ☐ = 4; ☐ x 6 = 24
- Teach inequality alongside equality e.g. 5 + 9 ☐ 3 x 5 (< > or =?)

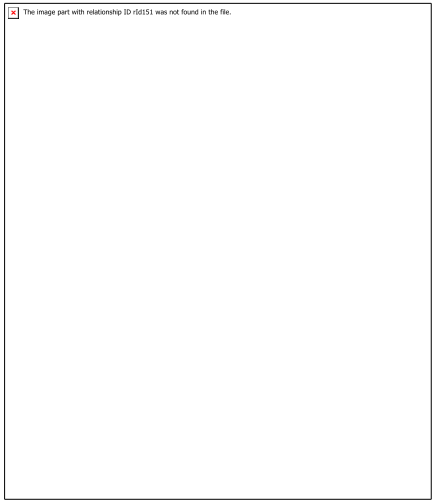
2. Recognising the actual value of ones, tens, hundreds etc. in a number

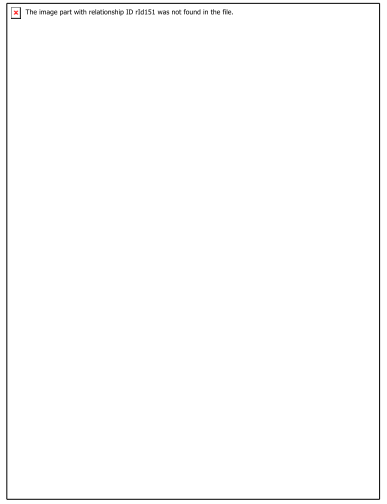
Many children are able to recognise the value of each digit in a number like 347 but find it harder to explain, for example, how many tens there are in 347. Once they are able to recognise that there are 34 tens (rather than 4 tens), it makes it much easier to be able to carry out a calculation such as 347 + 30 as they are adding 3 tens to the 34 tens. Traditionally, children often struggle when tackling a calculation involving crossing over a hundred e.g. 293 + 10 but using this method takes much of the difficulty away as they only need to add 1 ten to the 29 tens to give 30 tens and an answer of 303. It is equally effective when subtracting e.g. for 112 – 20, we subtract 2 tens from the 11 tens to leave is with 9 tens and an answer of 92.

3. Reasoning about mathematical relationships

Children need to be exposed to images and structures that help them to make links between inverse operations from an early age







Opportunities should be taken wherever possible to demonstrate how children can use what they already know to work out a related fact e.g.:

.- if 6 + 4 = 10, then 6 tens + 4 tens = 10 tens i.e. 60 + 40 = 100

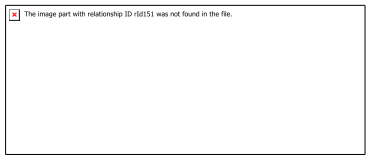
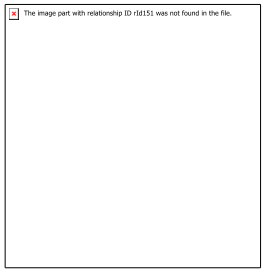
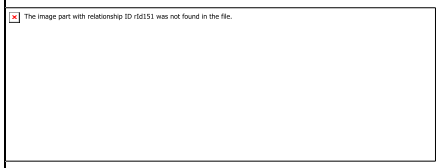
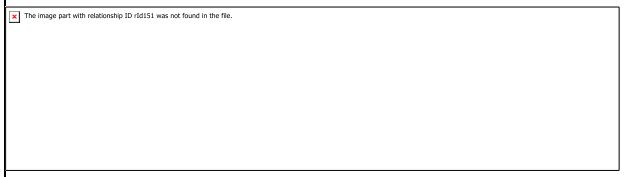
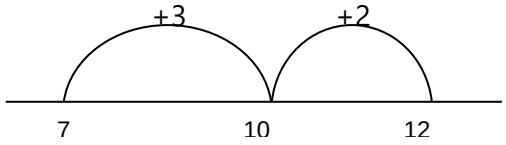
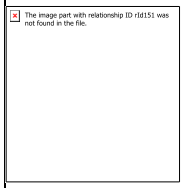
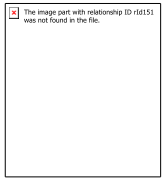
- If you know 3 + 5, you can use this to work out 23 + 5

4. Developing children's fluency with basic number facts

Fluent computational skills are dependent on accurate and rapid recall of basic number bonds to 20 and times-tables facts. Research has shown that spending a short time every day on these basic facts quickly leads to improved fluency.

5. Developing fluency in mental calculations (The Magic 10)

Children who learn to 'make 10' to create an easier calculation are able to develop mental fluency and an ability to look for patterns. Using knowledge of number bonds that make 10, they can see that 9 + 6 = 9 + 1 + 5 = 10 + 5 = 15

Addition	Regroup 9 + 3 into 10 + 2 before adding together:   6 + 5 = 11 Start with the bigger number and use the smaller number to make 10.	 Use pictures or a number line. Regroup or partition the smaller number  to make 10 before adding. Children move on to using an 'empty number line'. E.g. 7 + 5 becomes 7 + 3 + 2 	7 + 5 = 7 + 3 + 2 = 12 If I have seven, how many of my 5 do I need to add to make 10. How many more do I still need to add on?
Subtraction	14 – 5 =    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.	 Start at 13. Count back 3 to reach 10. Then count back the remaining 4 so you have taken away 7 altogether. You have reached your answer.	16 – 8= How many do we take off to reach the previous 10? (6) How many do we have left to take off? (2)