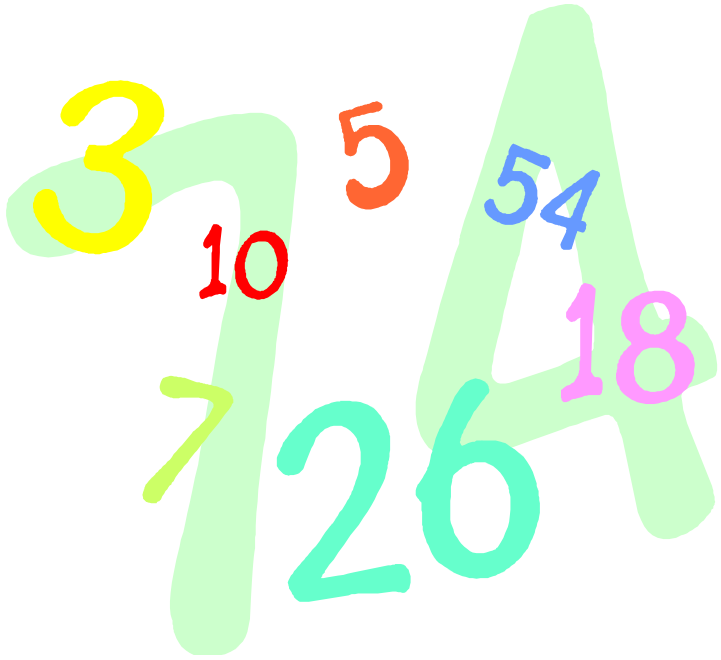
Holy Trinity Catholic School

Calculations Policy

Calculation Policy



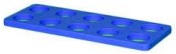
Introduction:

Children are introduced to the processes of calculation through practical, oral and mental activities. As they begin to understand the underlying ideas, they develop ways of recording to support their thinking and calculation methods, so that they develop both **conceptual understanding** and **fluency** in the fundamentals of mathematics. Whilst interpreting signs and symbols involved with calculation, orally in the first instance,

children use models and images to support their mental and written methods of calculation. As childrenôs mental methods are strengthened and refined they begin to work more efficiently, which will support them with using succinct written calculation strategies as they are developed.

From Early Years to Year 1:

There are fundamental skills that it is important for children to develop an early understanding of as building blocks to future learning in maths, including that linked to calculation. A selection of the skills include:

- Ordinality ï ôthe ordering of numbers in relation to one anotherôï e.g. (1, 2, 3, 4, 5é)
- Cardinality ï óunderstanding the value of different numbersôï e.g. (7 =  17 =  +  12 = 
- Equality ï óseven is the same total as four add threeôï e.g. =


- Subitising ï ôinstantly recognizing the number of objects in a small group, without counting themôï e.g.  Ÿ five
- Conservation of numberï órecognising that a value of objects are the same, even if they are laid out differentlyôï e.g.  
- One-to-one correspondence ï e.g. 

- Counting on and back from any number ï e.g. ôfive add three more totals eightô ôten take away three totals sevenô


- Using apparatus and objects to represent and communicate thinking ï e.g. 
- Maths language ï using mathematical words verbally in every-day situations ï e.g. óclimb up to the topô/ óclimb down to the bottomô

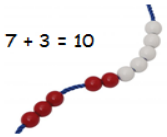
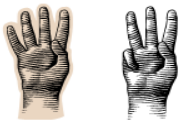
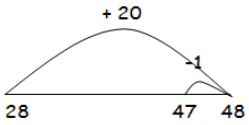
The ability to calculate mentally forms the basis of all methods of calculation and has to be maintained and refined. A good knowledge of numbers or a ôfeelô for numbers is the product of structured practice through progression in relevant practical maths experiences and visual representations.

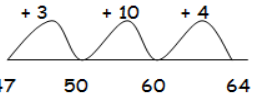
By the end of Year 6, children will be equipped with efficient mental and written calculation methods, which they use with fluency. Decisions about when to progress should always be based on the security of pupilsôunderstanding and their readiness to progress to the next stage. At whatever stage in their learning, and whatever method is being used, childrenôs strategies must still be underpinned by a secure understanding and knowledge of number facts that can be recalled fluently.

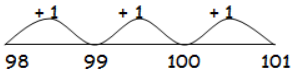
The overall aims are that when children leave primary school they:

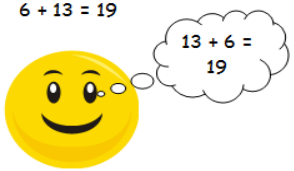
- Are able to recall number facts with fluency, having developed conceptual understanding through being able to visualise key ideas ï such as those related to place value - through experience with practical equipment and visual representations;
- Make use of diagrams and informal notes to help record steps and part answers when using mental methods that generate more information than can be kept in their heads;
- Have an efficient, reliable, written method of calculation for each number operation that they can apply with confidence when undertaking calculations that they cannot carry out mentally;
- Are able to make connections between all four number operations, understanding how they relate to one another, as well as how the rules and laws of arithmetic can be applied.

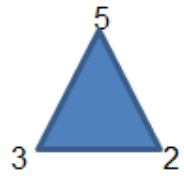
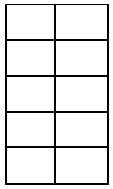
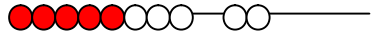
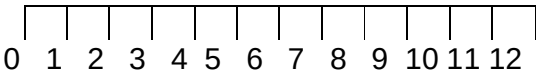
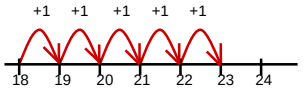
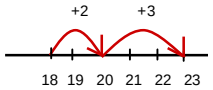
Addition:

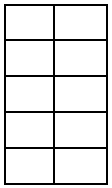
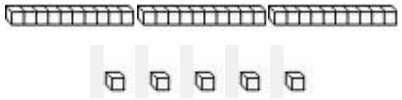
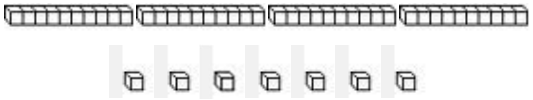
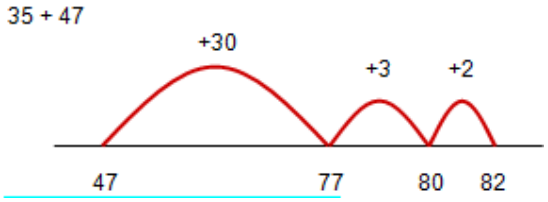
<table>
<tr><td></td><td colspan="5"><u>Mental Calculation Strategies for Addition and Subtraction</u>
Number Bonds
7 + 3 = 10
 
Doubles
 
Near Doubles
 
Adjusting
28 + 19 = 47
 

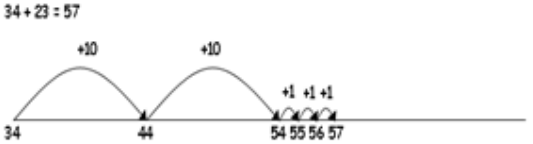
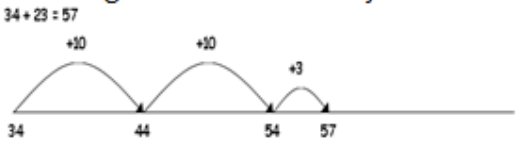
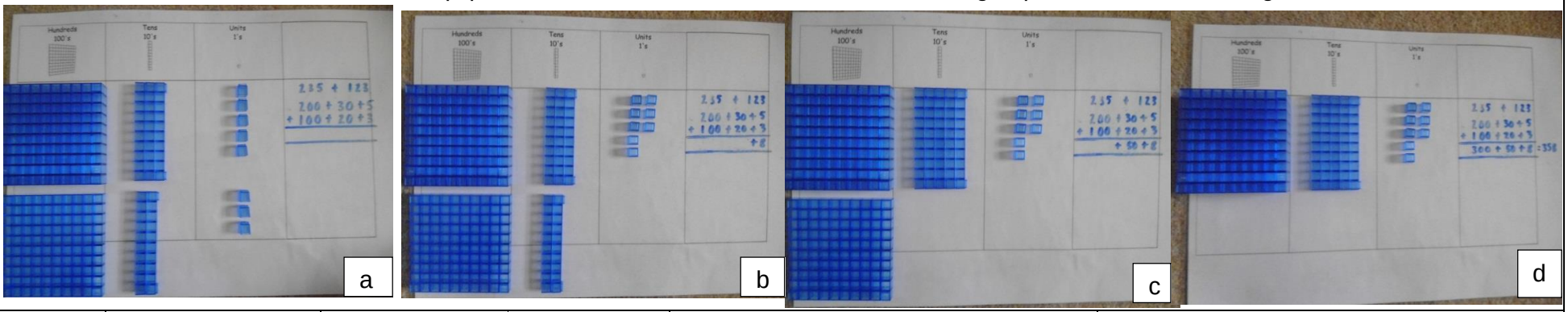
Bridging
47 + 17 = 64
 

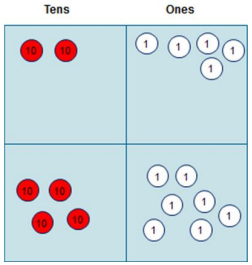
Partitioning
44 + 34 = 78
70 + 8 = 78
Finding the Difference
101 - 98 = 3
 

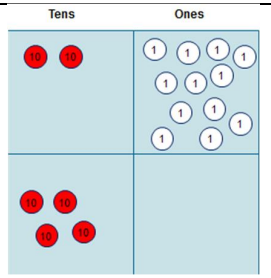
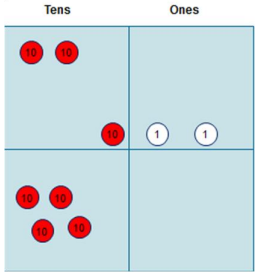
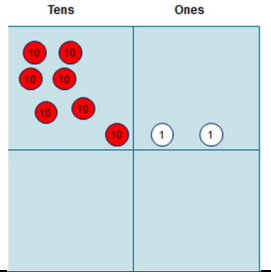
Reordering
e.g. put big number in head when counting on
6 + 13 = 19
 
</td></tr>
<tr><td></td><td>Counting</td><td>Mental maths strategies</td><td>Rapid recall</td><td colspan="2">Written calculation and appropriate models and images to support conceptual understanding</td></tr>
<tr><td>Stage 1:</td><td>Count in ones to</td><td>Pupils use</td><td>Rapid recall</td><td>Combining two groups:</td><td> 
</td></tr>
</table>

	and across 100 forwards and backwards starting from 0, 1 and other numbers. Count in multiples of two, five and ten.	apparatus to explore addition as the inverse of subtraction. .   4 add 1 is 5 5 subtract 4 leaves 1	of all pairs of numbers totalling numbers up to 20. Use structured apparatus ï i.e.Numicon, tens frames, abaci,etc. 	• Children develop a mental picture of the number system for use with calculation. A range of key models and images support this, alongside practical equipment. • Teachers model use of number tracks to count on or line up counters/objects along the number track. This is a precursor to use of a fully numbered number-line.	 3 + 2 = 5  éeight add two more makes tenô  éone more than four is fiveô
Stage 2:	Continue practicing above skills. Count in steps of 2, 3 and 5 forwards and backwards to and from zero. Count in tens from any number ï link to coins in a piggy bank as well as a number square.	Reorder numbers when adding,i.e. start with largest number, find bonds, etc. Add doubles and derive near doubles. Round numbers to the nearest 10.	Recall addition facts for all numbers to 20.	**Counting on from any number:** • Children begin to use numbered lines to support their own calculations, initially counting in ones before beginning to work more efficiently. **Counting on from the largest number:** • Children reorder calculations to start with the largest number.	Number line with all numbers labelled  18 + 5  é toé 

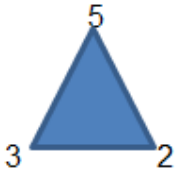
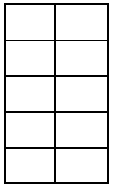
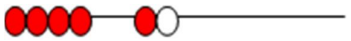
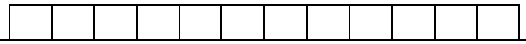
					 Use of questions such as: ôHow might I rearrange these to find the total?ô
Stage 3:	Continue practicing above skills. Count from 0 in multiples of 4,8, 50 and 100. Count on by 10 or 100 from any two digit number. Link to counting stick: counting forwards and backwards flexibly. Count up and down in tenths ï linking to visual image.	Partitioning by bridging through 10 and multiples of 10 when adding. Adjusting when adding 11 or 9 to a number. Relating inverse number operations ï using structured apparatus to explore and understand that subtraction undoes addition.	Connect pairs totalling ten to pairs of multiples of 10 totalling 100.  Use 10ps in tens frame. Recall pairs of two-digit numbers with a total of 100,i.e. 32 + ? = 100.	**Expanded horizontal addition:** • Add numbers using structured apparatus to support understanding of place value. • Make connections between partitioning both numbers using structured apparatus and partition the second number only using a number line.	Addé  é andé  By partitioning and recombining 30+ 40 = 70 5 + 7= 12 70 + 12 = 82 
Stage 4:	Continue practicing previous skills. Count forwards and backwards from 0 in multiples of 6,7,9,25 and 1000 using counting sticks,	Bridging through 60 for time,i.e. 70 minutes = 1 hour and 10 minutes. Rounding any number to the nearest 10, 100 or 1000.	As above. Use known facts and place value to derive new ones,i.e. ôif I know 8 + 3 = 11, I also know 0.8 +	**Expanded horizontal method, leading to columnar addition:** • Written recording should follow teacher modelling around the size of numbers and place value using a variety of concrete materials, e.g. straws, Numicon, Dienes and place-value cards. • Teachers model how numbers	It is crucial that empty number lines are kept as well as using more formal written calculation methods.

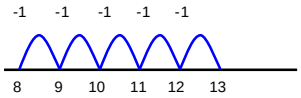
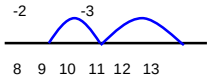
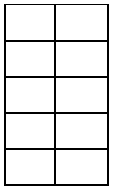
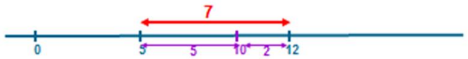
	number lines, number squares, etc. Count up and down in tenths, hundredths and simple fractions using models and images,i.e.Dienes equipment, counting stick, ITPs.	Rounding numbers with one decimal place to nearest whole number. Explore inverse as a way to derive new facts and to check accuracy of answers.	0.3 = 1.1 and 8/100 + 3/100 = 11/100.ô Sums and differences of pairs of multiples of 10,100 or 1000. Addition doubles of numbers to 100. Pairs of fractions totalling 1.	can be partitioned into tens and ones, as well as in different ways, e.g. 20 + 5 10 + 15 • As children move towards using a columnar method, links continue to be made with earlier models and images, including the number line.	Counting on in tens and ones to solve an addition calculation:  Counting on more efficiently: 
Illustration of how to use Dienes equipment to ensure children have an understanding of place value when using columnar addition. 					
Stage 5:	Count forwards and backwards in steps of powers of 10 for any given number up to one million. Continue to count forwards and	Use apparatus and knowledge of place value to add decimals,i.e. 3.8 + 2.5 = 5 + 1.3 Reorder	Continue to practice previous stage and make links between known facts and addition	**Expanded vertical method, leading to columnar addition:** • Teachers model a column method that records and explains partial mental methods. • There remains an emphasis on the language of calculation,	Informal columnar: Adding the tens first: 47 + 76 110 13 123

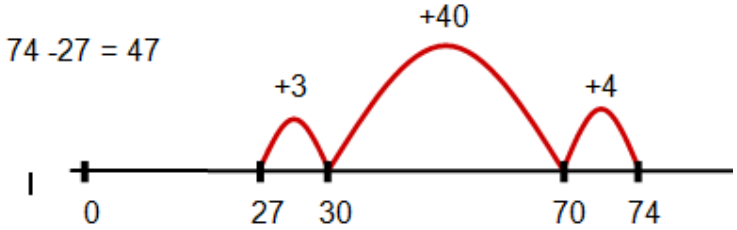
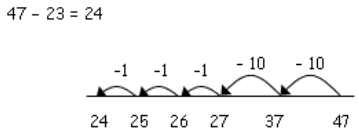
	backwards in simple fractions. Count forward and backwards in appropriate decimals and percentages.	increasingly complex calculations,i.e. 1.7 + 2.8 + 0.3 = 1.7 + 0.3 + 2.8 Compensating ï i.e. 405 + 399 Ÿ add 400 and then subtract 1.	pairs for fractions, percentages and decimals Doubles and halves of decimals,i.e. half of 5.6, double 3.4. Sums and differences of decimals,i.e. 6.5 + 2.7	e.g. óForty plus seventy equals one-hundred and ten.ôé óSeven add six equals thirteen.ôé before recombining numbers. Teachers also model the language of: óFour tens add seven tens total eleven tens or 110.ô • Teachers similarly advance to model the addition of two 3-digit numbers with the expectation that as childrenôs knowledge of place value is secured, they become ready to approach a formal compact method.	Adding the ones first: 47 + 76 13 110 123
Stage 6:	Continue to practice previous skills. Count forwards and backwards in simple fractions, decimals and percentages.	Bridging through decimals, i.e. 0.8 + 0.35 = 0.8 +0.2 + 0.15 using empty number lines. Partitioning using near doubles, i.e. 2.5 + 2.6 = 5 + 0.1 Reorder decimals, i.e. 4.7 + 5.6 ï 0.7 é asé 4.7 ï 0.7 + 5.6 = 4 + 5.6.	Ensure all children are confident recalling basic facts to 20 and deriving facts using place value. Make links between decimals, fractions and percentages.	**Columnar addition (formal written method):** • The concept of exchange is introduced through continued use of practical equipment (manipulatives). • Teachers model: 1. ñI have two tens and five ones, which need adding to four tens and seven ones.ò 2. ñI add five ones to seven ones, which gives me twelve ones.ò 3. ñI exchange ten of my twelve ones for a ten counter.ò 4. ñI add my three tens and four tens to make seven tens.ò ñAltogether, I have seven tens and two ones.ò	**Pupils to be encouraged to consider mental strategies first.** Formal columnar: 25 +47  25 +47 2 1

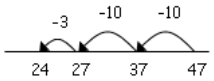
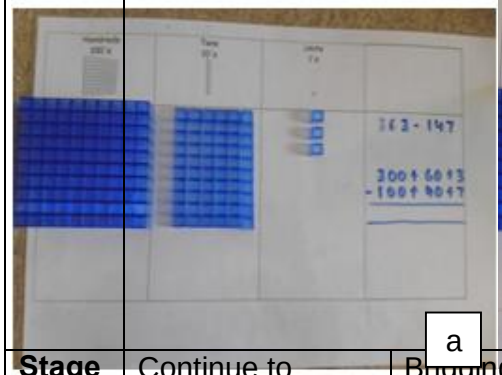
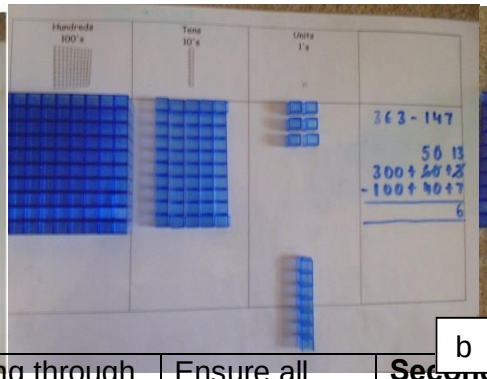
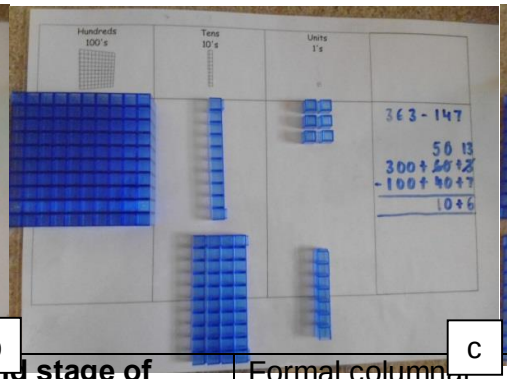
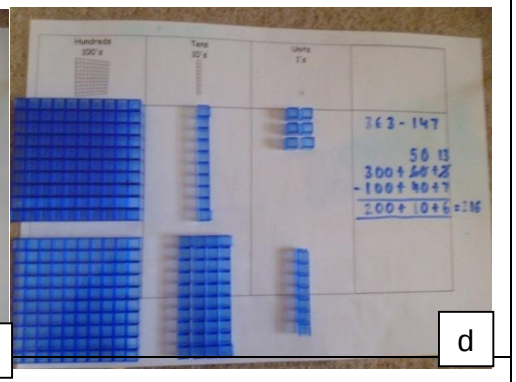
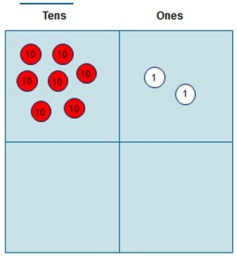
				• Teachers similarly advance to model the addition of two 3-digit numbers, e.g. 587 + 475 1062 1 1	 25 +47 2 1  25 +47 72 1 

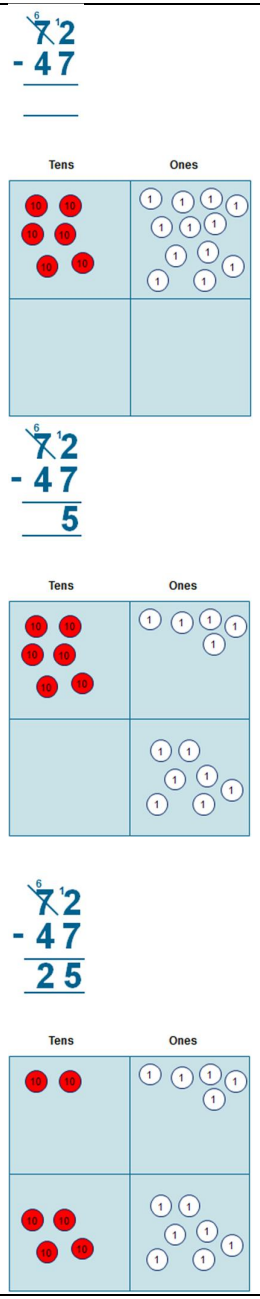
Subtraction:

	Counting	Mental strategies	Rapid Recall	Written calculation and appropriate models and images to support conceptual understanding	
Stage 1:	Count in ones to and across 100, forwards and backwards starting from 0, 1 and other numbers. Count in multiples of two, five and ten.	Pupils use apparatus to explore addition as the inverse of subtraction: .   ófour add one is five.ô ófive subtract four leaves oneô	Rapid recall of subtraction facts for numbers up to 10. Use structured apparatus, i.e. Numicon, tens frames, abaci etc. 	**Subtraction as taking away from a group:** • Children develop a mental picture of the number system for use with calculation. A range of key models and images support this, alongside practical equipment. • Teachers model use of number tracks to count back or remove counters/objects fromthe number track or set. This is a precursor to use of a fully numbered number-line.	5- 2 = 3    ósix take away two leaves fourô  óone less than six is fiveô
Stage 2:	Continue practicing above skills.	Bridging through two digit numbers,i.e. 24 ï	Recall subtraction (and addition)	**Subtracting by counting back and on:**	Number line with all numbers labelled 

	Count in steps of 2, 3and 5, forwards and backwards to and from zero. Count in tens from any number ï link to coins in a piggy bank as well as a number square.	19 = 19 + 1 + 4 using number lines. Subtracting 11 by subtracting 10 and then 1 more. Move to subtracting 9 by subtracting 10 and adding 1 using apparatus.	facts for all numbers to 20.	• Children begin to use numbered lines to support their own calculations, initially counting back in ones before beginning to work more efficiently.	0 1 2 3 4 5 6 7 8 9 10 11 12 13 ï 5 = 8  13 ï 5 = 8 
Stage 3:	Continue practicing above skills. Count from 0 in multiples of 4,8,50 and 100. Count on and back by 10 or 100 from any two digit number. Link to counting stick counting forwards and backwards flexibly. Count up and down in tenths ï linking to visual image.	Partitioning by bridging through 10 and multiples of 10 when subtracting. Continue to practice adjusting when subtracting 11 or 9 from a number. Relating inverse number operations ï use structured apparatus to explore and understand that subtraction undoes addition.	Connect subtractions fromten tosubtractions from multiples of 10 totalling 100.  Use 10ps in tens frame. Subtracttwo digit numbers from 100 i.e.? = 100 - 78	**Finding the difference:** • Teachers model how to find the difference when two numbers are relatively ócloseô together. • Initially children compare two sets before moving on to a number line comparison. • **Pupils are taught to choose whether to count on or back** depending on which is more	Comparing two sets: comparison or difference.  Finding the difference on a number line.  Note: Finding the difference is often the most efficient way of solving a subtraction problem, e.g. 61 ï 59 2,003 ï 1,997

				efficient.	
Stage 4:	Continue practicing of previous skills. Count forwards and backwards from 0 in multiples of 6,7,9,25 and 1000 using counting sticks, number lines, number squares, etc. Count up and down in tenths, hundredths and simple fractions using models and images,i.e.Dienes equipment, counting stick, ITPs.	Bridging through 60 for time,i.e. 70 minutes = 1 hour and 10 minutes Rounding any number to the nearest 10, 100 or 1000. Rounding numbers with one decimal place to nearest whole number. Explore inverse as a way to derive new facts and to check accuracy of answers.	As above. Use known facts and place value to derive new ones,i.e. if I know 11 - 3 = 8, I also know 1.1 - 0.3 = 0.8 and 8/100 - 3/100 = 5/100. Sums and differences of pairs of multiples of 10,100 or 1000. Subtraction of fractions totalling 1, i.e. 1 ï 0.3 = 0.7	**Subtracting TU – U and TU – TU:**	Use empty numberlines to find the difference by bridging through multiples of ten.  Subtract by starting with the first number and partitioning the second, i.e. 74 - 27 74 ï 20 = 54 54 ï 4 = 50 50 ï 3 = 47
Stage 5:	Count forwards and backwards in steps of powers of 10 for any given number up to one million. Continue to count forwards and backwards in simple fractions. Count forward and backwards in appropriate	Use apparatus and knowledge of place value to subtract decimals,i.e. 3.8 -2.5 =1.3 Reorder increasingly complex calculations,i.e. 1.7 ï 5 ï 0.7 = 1.7 ï 0.7 ï 5. Compensating ï	Continue to practice previous stage and make links between known facts and addition pairs for fractions, percentages and decimals. Doubles and	**First stage of column method, including expanded method:** • Written recording should follow teacher modelling around the size of numbers and place value using a variety	Children should continue to use empty numberlines and use more formal written methods when numbers become too big or complex. Counting back in tens and ones to solve an addition calculation:  Counting back more efficiently:

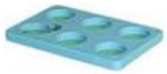
	decimals and percentages.	i.e. 405 - 399 Ÿ subtract 400 and then add 1.	halves of decimals,i.e. half of 5.6, double 3.4. Sums and differences of decimals,i.e. 6.5 + 2.7	of concrete materials, e.g. straws, Numicon, Dienes and place-value cards.	47 – 23 = 24 
	363 – 147 = 216 50 13 300 + 60 + 3 100 + 40 + 7 200 + 10 + 6 = 216 Illustration of how to use Dienes equipment to ensure children understand transference of numbers when using columnar subtraction.  a  b  c  d				
Stage 6:	Continue to practice previous skills. Count forwards and backwards in simple fractions, decimals and percentages.	Bridging through decimals,i.e.1.5 ï 0.8 = 1.5 ï 0.5 then -0.3 using empty number line. d	Ensure all children are confident recalling basic facts to 20 and deriving using place value. Make links between decimals, fractions and percentages.	**Second stage of column method:** • The concept of exchange is introduced through continued use of practical equipment (manipulatives) . • Teachers model:	Formal columnar: 72 -47 

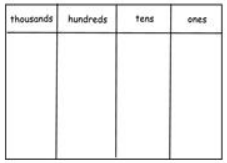
				1. ñI have seven tens and two ones. I need to subtract four tens and seven ones.ò 2. ñAt the moment, I cannot subtract seven ones from two ones, so I need to transfer one ten to become ten ones.ò 3. ñNow I can take away seven ones from twelve ones, so that I have fives ones left. 4. ñI can now subtract four tens from six tens, which leaves me with two tens.ò 5. ñI	

				recombine two tens and fives ones to understand that I am left with twenty-five.ò • Teachers similarly advance to model the subtraction of one 3-digit number from another, e.g. $\begin{array}{r} {}^{5}\not{6}^{1}\not{3} \\ \underline{246} \\ 317 \end{array}$	

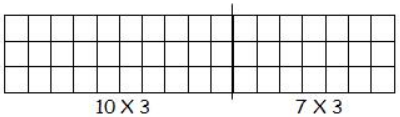
Multiplication:

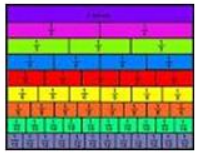
<table>
<tr><td></td><td colspan="5"><u>Mental Calculation Strategies for Multiplication and Division</u>

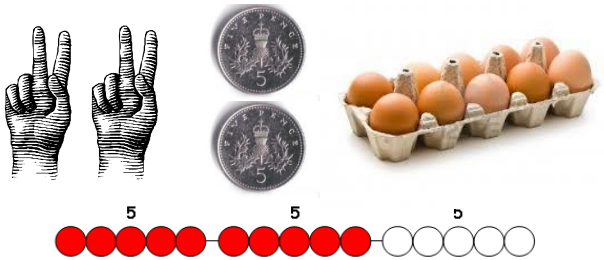
Knowing multiplication and division facts to 12 X 12
  

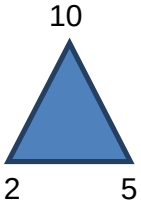
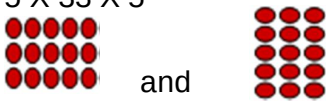
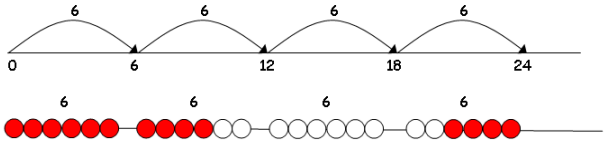
Multiplying and dividing by multiples of 10
  

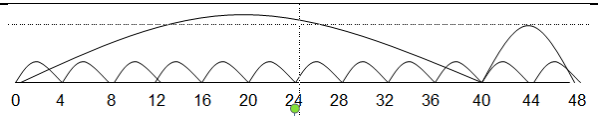
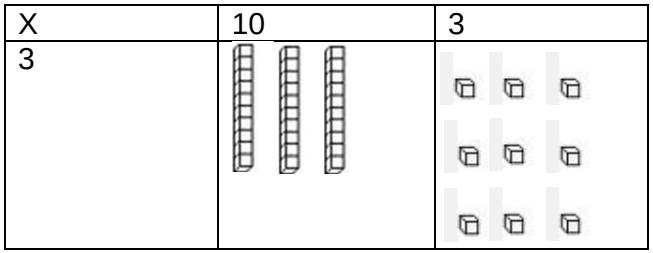
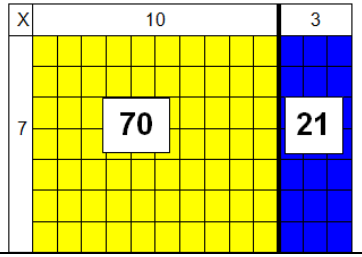
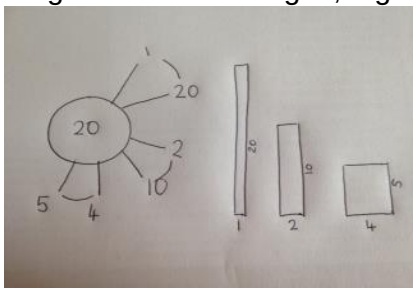
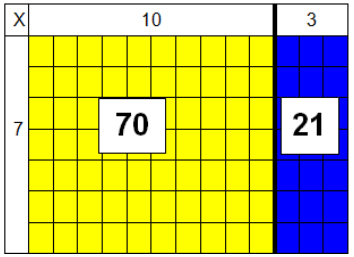
Doubling and halving
 

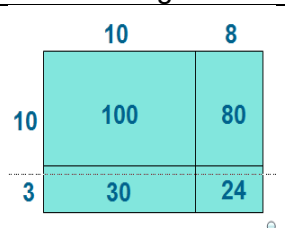
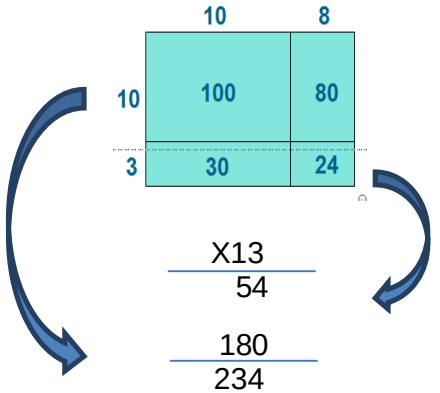
Multiplying and dividing by single-digit numbers and multiplying by two-digit numbers
 
10 X 3 7 X 3
17 X 3

Finding fractions, decimals and percentages
   </td></tr>
<tr><td></td><td>Counting</td><td>Mental strategies</td><td>Rapid recall</td><td colspan="2">Written calculation and appropriate models and images to support conceptual understanding</td></tr>
<tr><td>Stage 1:</td><td>Count forwards and backwards in 2s, 5s and 10s</td><td>Doubling up to six and then ten whilst using related models and images.</td><td>Derive/recall doubles up to five and derive/recall halves up to ten.

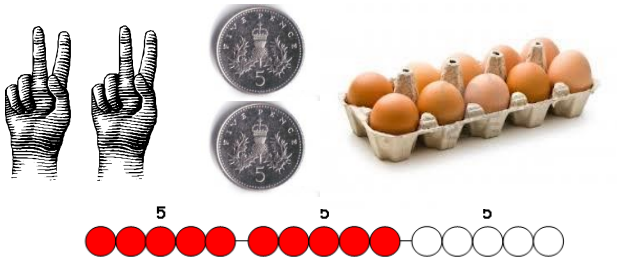
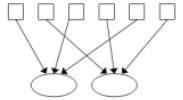
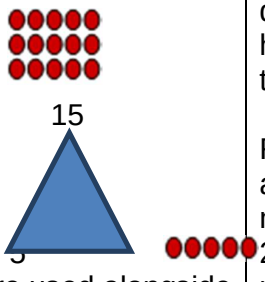
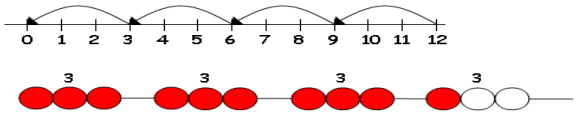
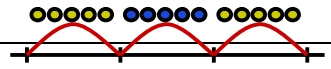
Recall odd and even numbers to 10 in reference to</td><td>Developing early conceptual understanding of multiplication:</td><td>Use objects, pictorial representations and arrays to show the concept of multiplication:
  </td></tr>
</table>

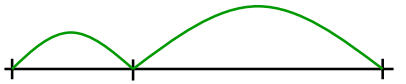
			structured apparatus. 		
Stage 2:	Count forwards and backwards in 2s, 3s, 5s and 10s from zero.	Begin to understand and use inverse number operations:  Stories are used alongside a triad to help children understand links between number operations, e.g. ñThere are five pencils in two packs, which means that there are ten pencils altogether.ò	Derive/recall doubles up to ten and derive/recall halves up to twenty. Recall odd and even numbers to 20 in reference to structured apparatus. Recall & use multiplication facts for the 2X, 5X and 10X-tables.	**Understanding multiplication as repeated addition:** • Investigate multiplication as repeated addition, so that the law of cummutativity is understood. • Whilst arrays are also modelled explicitly at this stage, it is important to note that they will continue to be a key model at later stages, alongside more formal methods of calculation.	Arrays: 5 X 3 3 X 5  Number lines: 6 X 4 = 24  So: ó Six taken four timesò
Stage 3:	Counting forwards and backwards	Use doubling to make connections between the 2X, 4X and 8X-tables.	Recall odd and even numbers to 100 in	**Relate multiplying a 2-digit by 1-digit number using repeated addition**	Children use an empty number line to chunk efficiently: 4 X 12 = 48 4 X 10 = 40 4 X 2 = 8

	in 2s, 3s, 4s, 5s, 8s and 10s from zero. Count up and down in tenths.	Understand that multiplication can be undertaken by partitioning numbers, e.g. 12 X 4 = 10 X 4 + 2 X 4 Introduce the structure of scaling: e.g. Find a ribbon that is 4 times as long as the blue ribbon  2cm 8cm	reference to structured apparatus. Recall and use multiplication facts for the 2X, 3X, 4X, 5X, 8X and 10X tables.	**and arrays to represent:**	 3 X 13 = 39  7 X 13 = 91 
Stage 4:	Counting forwards and backwards in 2s, 3s, 4s, 5s, 7s, 8s, 10s, 25s and 1000s from zero. Count up and down in tenths and hundredths.	Derive factor pairs of numbers using models and images, e.g.  Know what happens when a number is multiplied by zero or one. Use reordering to multiply three numbers.	Recall & use multiplication facts for all times-tables up to 12 X 12.	**Relate multiplying a 3/2-digit by 1-digit number with arrays towards using long/short multiplication:**	Relate multiplying a 3/2-digit by 1-digit number, now also setting it out as short multiplication.  7 X 13 = 91 7 X 10 = 70 7 X 3 = 21 = 91 At this stage, the **non-statutory** guidance in the

					national curriculum suggests teaching short multiplication; however, the team feel that an expanded form of calculation (as set out above) isbe a better lead into long/short multiplication.
Stage 5:	Counting forwards and backwards in 2s, 3s, 4s, 5s, 6s, 7s, 8s, 9s, 10s, 25s and 1000s from zero.	Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.	Recall &use multiplication facts for all times-tables up to 12 X 12.	**Relate multiplying a 4/3/2-digit by 1/2-digit number with grid to using long multiplication:**	 18 X13 24 30 80 100 234
Stage 6:	Consolidate all previous counting, including forwards and backwards in fractions.	Perform mental calculations, including with mixed numbers and operations.	Recall &use multiplication facts for all times-tables up to 12 X 12. In addition, use facts confidently to make larger calculations.	**Relate multiplying a 4/3/2-digit by 1/2-digit number with grid to using short multiplication:**	18 2  X13 54 180 234

Division:

	Counting	Mental strategies	Rapid recall	Written calculation and appropriate models and images to support conceptual understanding	
Stage 1:	Count forwards and backwards in 2s, 5s and 10s	Doubling up to six and then ten whilst using related models and images.	Derive/recall doubles up to five and derive/recall halves up to ten. Recall odd and even numbers to 10 in reference to structured apparatus. 	**Developing early conceptual understanding of division as grouping and sharing:**	Use objects, pictorial representations and arrays to show the concept of division as grouping and sharing.  ñTwo children share six pencils between themò  ñSix children are asked toget intothreeequal groupsò 
Stage 2:	Count forwards and backwards in 2s, 3s, 5s and 10s from zero.	Begin to understand and use inverse number operations.  Stories are used alongside a triad to help children	Derive/recall doubles up to ten and derive/recall halves up to twenty. Recall odd and even numbers to 20 in reference to structured	**Understanding division as repeated subtraction:** • Investigate division as repeated subtraction. • Through teacher modelling, children need to know that division is not	Number lines and arrays: 12 ÷ 3 = 4  15 ÷ 5 = 3 

		understand links between number operations, e.g. ñ15 children are asked to get into three groups and find out that there are five people in each group.ò	apparatus. Recall and use multiplication facts for the 2X, 5X and 10X-tables.	commutative.	0 5 10 15
Stage 3:	Counting forwards and backwards in 2s, 3s, 4s, 5s, 8s and 10s from zero.	Use doubling to make connections between the 2X, 4X and 8X-tables. Understand that multiplication can be undertaken by partitioning numbers, e.g. 12 X 4 = 10 X 4 + 2 X 4 Introduce the structure of scaling: e.g. Find a ribbon that is 4 times as long as the blue ribbon.  2cm 8cm	Recall odd and even numbers to 100 in reference to structured apparatus. Recall & use multiplication facts for the 2X, 3X, 4X, 5X, 8X and 10X tables.	**Dividing a 2-digit by 1-digit number, representing this efficiently on a number line:**	Children use an empty number line to chunk efficiently. 96 ÷ 6 = 16 6 x 6 = 3610 x 6 = 60  0 3696
Stage 4:	Counting forwards and backwards in 2s, 3s, 4s, 5s, 7s, 8s, 10s, 25s and 1000s from zero.	Derive factor pairs of numbers using models and images. Know what happens when a number is multiplied by zero or one. Use reordering to multiply three numbers.	Recall &use multiplication facts for all times-tables up to 12 X 12.	**Dividing a 3/2-digit by 1-digit number,representing this efficiently on a number line, also in relation to long division:** • At this stage, no remainders are present unless in a practical context.	Children use an empty number line to chunk efficiently. 224 ÷ 8 = 28 8 x 8 = 64 20 x 8 = 160  0 64 224 2828 8 ⟌224 8224 - 160 (8 X 20) 20 X 8 = 160

					64 - 64 (8 X 8) 0 é oré 64 8 X 8 = 64 0
Stage 5:	Counting forwards and backwards in 2s, 3s, 4s, 5s, 6s, 7s, 8s, 9s, 10s, 25s and 1000s from zero.	Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.	Recall & use multiplication facts for all times-tables up to 12 X 12.	**Dividing a 4/3/2-digit by 1-digit number,in relation to long division:** • By this stage, there is a statutory requirement that children can use a formal written calculation method, such as long division. • Short division may begin to be taught alongside long division, but still with use of visual representations	As schools have autonomy to decide children's progression in learning between long and short division in Years 5 and 6, the maths team suggest beginning with long division. Remainders should be interpreted in the following ways when long division is used: • as whole numbers • as fractions • through rounding in an appropriate way to the context Long division: 415 ÷ 9 = 46 and 1/9 46 and 1/9 9 | 415 - 360 (9 X 40) 55 - 54 (9 X 6) 1
Stage 6:	Consolidate all previous counting, including forwards and backwards in fractions.	Perform mental calculations, including with mixed numbers and different number operations.	Recall & use multiplication facts for all times-tables up to 12 X 12. In addition, use facts confidently to make larger	**Dividing a 4/3/2-digit by 2/1-digit number, in relation to long and then short division:** • By this stage, there is a statutory requirement that children canuse formal	As schools have autonomy to decide children's progression in learning between long and short division in Years 5 and 6, the maths team suggest moving from long division to short division. Remainders should be interpreted in the following way when short division is used: • through rounding in an appropriate way to the context Long division: 432 ÷ 15 = 28 4/5

			calculations.	written calculation methods, including long and short division. • Use of visual representations ï like the ones opposite ï remain important.	2 8 1 5 | 4 3 2 – 3 0 0 15×20 1 3 2 – 1 2 0 15×8 1 2 $\frac{\cancel{12}}{\cancel{15}} = \frac{4}{5}$ Answer: $28\frac{4}{5}$ Short division: 138 ÷ 6 = 23