St. Wilfrid's Church of England Primary Academy

Mathematics Policy

June 2017

Our Christian Values

As a Voluntary Aided Church of England Primary Academy, we have eight Christian Values, underpinned by love at the heart of everything we do.

Our Christian Values are:

Fair, Kind, Joy, Courage, Forgive, Hope, Peace and Trust
Love

Rationale

Mathematics helps children to make sense of the world around them by developing their ability to calculate, reason and solve problems. It enables children to understand and appreciate relationships and patterns in number, geometry, measurement and statistics in their everyday lives. It can be used to analyse and communicate ideas and information effectively, and to tackle a range of practical tasks and real life problems. Through their growing knowledge and understanding, children learn to appreciate the contribution made by many cultures to the development and application of Mathematics.

Aims

At St Wilfrid's C of E Primary Academy we aim to:

- Present Mathematics as a challenging, exciting and creative subject in order to promote positive and confident attitudes towards learning.
- Promote enjoyment and enthusiasm for Mathematics by getting children to use and apply maths in different contexts, providing opportunities for exploration and discussion, and encouraging them to take part in a range of practical activities.
- Develop mathematical understanding through the teaching of appropriate learning objectives, including skills, knowledge and a quick recall of basic facts.
- Provide opportunities for children to develop the ability to express themselves fluently, using correct mathematical language and vocabulary.
- Develop children's ability to be flexible, creative, accurate and to use their initiative and systematic logical thinking.
- Encourage the effective use of maths as a tool in a wide range of activities within school and in everyday life.
- Involve parents and carers in their child's learning.

Statutory Requirements

Mathematics is a core subject in the National Curriculum and we use this as the basis for implementing the statutory requirements of the programme of study for Mathematics.

Mathematics is divided into the following strands of learning:

- Number- number and place value
- Number- addition and subtraction
- Number- multiplication and division
- Number- fractions (including decimals and percentages)
- Measurement
- Geometry- properties of shape
- Geometry- position and direction
- Statistics

The Governing Body

An annual report on the provision and progress related to mathematics is submitted to the governors in the summer term.

Monitoring, Evaluation and Review

Monitoring and evaluation will be carried out by the:

- Headteacher
- Mathematics Subject Leaders
- Mathematics Governor
- Class teachers

The teaching of Mathematics is monitored through: Mathematical learning walks, book scrutiny, lesson observations, pupil interviews, tracking data of groups and individuals and pupil progress meetings. The teaching staff monitor their pupils through observation, discussion, teacher assessment, marking work and assessments (formative and summative.)

Subject Organisation and Approaches

Mathematics lessons normally take place each morning. Each lesson lasts between 45 and 60 minutes. Teachers spend time in direct teaching and questioning of the whole class, a group of pupils, or individuals. For a large proportion of the lesson children will be taught as a whole class with the teacher using a range of questions to develop mathematical thinking. Teaching strategies will be varied and will encourage a high level of interaction. Teachers place strong emphasis on the development of written and mental calculation skills (see Appendix i Calculation Policy).

Children are asked to explain their methods and to check for reasonableness. There is also strong emphasis on the development of mathematical vocabulary. Key words are displayed and teachers ensure that they model the correct use of mathematical words. Teachers value pupils' oral contributions and create an ethos in which all children feel they can contribute. Activities are planned to encourage the full and active participation of all pupils and teachers differentiate tasks in order to meet the needs of all abilities.

Early Years Foundation Stage

Learning undertaken within the Foundation Stage is guided by the requirements and recommendations set out in the Early Years Foundation Stage document. We give all children ample opportunity to develop their understanding of Mathematics and we aim to do this through varied activities that allow them to use, enjoy, explore, practise and talk confidently about different aspects of Mathematics.

Differentiation

In all classes there are children of differing mathematical ability; in some years classes are grouped in order to respond to the individual needs of the pupils. We provide suitable learning opportunities for all children by matching the challenge of the work to the ability of the child.

Differentiation is planned for by the use of;

- teaching assistants
- additional resources and extension activities
- targeted questioning
- open questions
- open ended investigation activities
- interventions, both to support closing the gap and to extend and deepen learning.

Inclusion

- All pupils take part in the daily mathematics lesson.
- Teachers plan lessons so that all pupils can be included and can make progress in the lesson.
- In oral work teachers plan a range of differentiated questions, with some targeted at specific pupils.
- Teachers also ask open questions that allow all children to take part.
- Teachers use a wide range of visual resources to illuminate meaning.
- During whole class teaching, discreet help is given to particular children by teaching assistants where available.
- During activities, children are supported by teaching assistants where available.

Further guidance on inclusion may be found in the SEND inclusion policy.

Marking of written work

Children's work in mathematics is marked in line with the agreed Academy's Marking Policy. Through marking and feedback, children's misconceptions are identified and addressed. Next step comments are made where appropriate, to move the learning on. Children are given time, within the mathematics lesson, to respond to feedback; this feedback and marking informs future planning. At the end of each lesson children are expected to self-assess their work against the learning objective using a traffic light system.

Curriculum Planning

The National Curriculum is the basis for implementing the statutory requirements of the programmes of study. It ensures progression across the full range of mathematical skills and practice.

Teachers use the National Curriculum to plan teaching sequences that build learning over time. The emphasis is to develop and sequence of teaching and learning that encompasses the cycle of assess (prior learning knowledge), plan, teach, practise, apply and review (post learning knowledge) through every unit. The strong emphases on using and applying including reasoning and problem solving in mathematics is embedded within the curriculum.

Extended Learning Opportunities

We recognise the importance of making links between home and school and encourage parental involvement with the learning of mathematics. Homework tasks provide opportunities for children:

- to practise and consolidate their skills and knowledge,
- to develop and extend their techniques and strategies
- to share their mathematical work with their family
- to prepare for their future learning.

Assessment

Assessment takes place at three connected levels: short term, medium term and long term. These assessments are used to inform teaching in a continuous cycle of planning, teaching and assessment.

Assessment is carried out:

- Orally through questioning (open and closed)
- By observation of children at work
- Marking of children's work
- Through planned assessment activities linked to the key objectives

Informal assessment takes place continuously and teachers record on statement tracking grids, using Target Tracker, the achievement of each individual child from their class in the learning objectives, to inform planning. Assessments include:

- Maths assessment tests (Assertive Mentoring and Rising Stars) are used throughout the Academy to assist with teacher assessment.
- Moderation takes place to ensure consistency of teacher assessments.
- Teachers use statement tracking grids and test data to make and record a termly and end-of-year assessment of each child's 'best fit' against the national curriculum statements. This is shared with senior management through termly Pupil Progress Meetings to monitor progress and attainment.

Reporting Procedures

Annual reports to parents include comments on:

- pupil progress and attainment
- pupil attitude
- pupil strengths and next step targets

Inclusion, Equal Opportunities and Disability Equality Scheme.

All children are provided with equal access to the Mathematics curriculum. We aim to provide suitable learning opportunities regardless of gender, ethnicity or home background.

Equal opportunities are considered under the Equal Opportunity Policy.
Reasonable adjustments will be made to take into consideration the needs of children and adults with disabilities to ensure they are not discriminated against on the grounds of that disability.
St Wilfrid's C of E Primary Academy is an inclusive learning community committed to removing barriers to learning welcoming pupils, staff and families, regardless of ability, race or social background.

Role of the Subject Leader

The subject leader will:

- Produce the Mathematics Policy and ensure that this meets statutory requirements;
- Produce the Mathematics development plan with realistic and developmental targets;
- Provide advice to teachers or seek information to help to support teachers with appropriate resources and approaches to teaching and assessment;
- Purchase and organise suitable mathematics resources for use across the school;
- Attend relevant in-service courses and feedback to staff new information and ideas to support teaching and learning;
- Monitor Teaching and Learning and Assessment procedures

Signed:

Headteacher: Mr. S. Colothan

Date: June 2017

Appendix 1
Calculation policy document

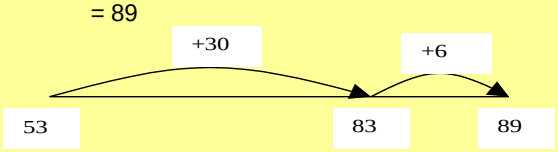
Key Stage 1

Year		Mental or written calculation	Default for ALL children
	Overview of KS1	Children in Years 1 and 2 will be given a really solid foundation in the basic building blocks of mental and written arithmetic. Through being taught place value, they will develop an understanding of how numbers work, so that they are confident in 2-digit numbers and beginning to read and say numbers above 100. A focus on number bonds, first via practical hands-on experiences and subsequently using memorisation techniques, enables a good grounding in these crucial facts, and ensures that all children leave Y2 knowing the pairs of numbers which make all the numbers up to 10 at least. They will also have experienced and been taught pairs to 20. Their knowledge of number facts enables them to add several single-digit numbers, and to add/subtract a single digit number to/from a 2-digit number. Another important conceptual tool is their ability to add/subtract 1 or 10, and to understand which digit changes and why. This understanding is extended to enable children to add and subtract multiples of ten to and from any 2-digit number. The most important application of this knowledge is their ability to add or subtract any pair of 2-digit numbers by counting on or back in tens and ones. Children may extend this to adding by partitioning numbers into tens and ones. Children will be taught to count in 2s, 3s, 5s and 10s, and will have related this skill to repeated addition. They will have met and begun to learn the associated 2x, 3x, 5x and 10x tables. Engaging in a practical way with the concept of repeated addition and the use of arrays enables children to develop a preliminary understanding of multiplication, and asking them to consider how many groups of a given number make a total will introduce them to the idea of division. They will also be taught to double and halve numbers, and will thus experience scaling up or down as a further aspect of multiplication and division. Fractions will be introduced as numbers and as operators, specifically in relation to halves, quarters and thirds.	
Year		**Mental Calculation**	**Default for ALL children**
Year 1	***Addition***	Mental Calculation Number bonds ('story of' 5, 6, 7, 8, 9 and 10) Count on in ones from a given 2-digit number Add two single-digit numbers Add three single-digit numbers spotting doubles or pairs to 10 Count on in tens from any given 2-digit number Add 10 to any given 2-digit number Use number facts to add single-digit numbers to two-digit numbers, e.g. use 4 + 3 to work out 24 + 3, 34 + 3… Add by putting the larger number first	Pairs with a total of 10 Counting in ones Counting in tens Count on 1 from any given 2-digit number
	Subtraction	Number bonds ('story of' 5, 6, 7, 8, 9 and 10) Count back in ones from a given 2-digit number Subtract one single-digit number from another Count back in tens from any given 2-digit number Subtract 10 from any given 2-digit number Use number facts to subtract single-digit numbers from two-digit numbers, e.g. use 7 – 2 to work out 27 – 2, 37 – 2…	Pairs with a total of 10 Counting back in ones from 20 to 0 Counting back in tens from 100 to 0 Count back 1 from any given 2-digit number

Year		Mental or written calculation	Default for ALL children
	Multiplication	Begin to count in 2s, 5s and 10s Begin to say what three 5s are by counting in 5s or what four 2s are by counting in 2s, etc. Double numbers to 10	Begin to count in 2s and 10s Double numbers to 5 using fingers
	Division	Begin to count in 2s, 5s and 10s Find half of even numbers to 12 and know it is hard to halve odd numbers Find half of even numbers by sharing Begin to use visual and concrete arrays or 'sets of' to find how many sets of a small number make a larger number.	Begin to count in 2s and 10s Find half of even numbers by sharing
Year 2	***Addition***	Number bonds – knowing all the pairs of numbers which make all the numbers to 12, and pairs with a total of 20 Count on in ones and tens from any given 2-digit number Add two or three single-digit numbers Add a single-digit number to any 2-digit number using number facts, including bridging multiples of 10. (E.g. 45 + 4, 38 + 7) Add 10 and small multiples of 10 to any given 2-digit number Add any pair of 2-digit numbers	Know pairs of numbers which make each total up to 10 Add two single digit numbers Add a single-digit number to a 2-digit number by counting on in ones Add 10 and small multiples of 10 to a 2-digit number by counting on in tens
	Subtraction	Number bonds – knowing all the pairs of numbers which make all the numbers to 12 Count back in ones and tens from any given 2-digit number Subtract a single-digit number from any 2-digit number using number facts, including bridging multiples of 10, e.g. 56 – 3, 53 – 5. Subtract 10 and small multiples of 10 from any given 2-digit number Subtract any pair of 2-digit numbers by counting back in tens and ones or by counting up.	Know pairs of numbers which make each total up to 10 Subtract a single-digit number from a 2-digit number by counting back in ones Subtract 10 and small multiples of 10 from a 2-digit number by counting back in tens

Year		Mental or written calculation	Default for ALL children
	Multiplication	Count in 2s, 5s and 10s Begin to count in 3s. Begin to understand that multiplication is repeated addition and to use arrays (E.g. 3 x 4 is three rows of 4 dots) Begin to learn the 2x, 3x, 5x and 10x tables, seeing these as 'lots of', e.g. 5 lots of 2, 6 lots of 2, 7 lots of 2, etc. Double numbers up to 20 Begin to double multiples of 5 to 100 Begin to double two-digit numbers less than 50 with 1s digits of 1, 2, 3 4 or 5	Count in 2s, 5s and 10s Begin to use and understand simple arrays, e.g. 2 x 4 is two lots of four buns. Double numbers up to 10 Double multiples of 10 to 50
	Division	Count in 2s, 5s and 10s Begin to count in 3s Using fingers, say where a given number is in the 2s, 5s or 10s count. (E.g. 8 is the fourth number when I count in twos.) Relate division to grouping. (E.g. how many groups of five in fifteen?) Halve numbers to 20 Begin to halve numbers to 40 and multiples of 10 to 100 Find ½, $^1/_3$, ¼ and ¾ of a quantity of objects and of amounts (whole number answers)	Count in 2s, 5s and 10s Say how many rows in a given array. (E.g. how many rows of 5 in an array of 3 x 5) Halve numbers to 12 Find ½ of amounts
Lower Key stage 2	***Overview of LKS2***	In the lower juniors, children build on the concrete and conceptual understandings they have gained in the Infants to develop a real mathematical understanding of the four operations, in particular developing arithmetical competence in relation to larger numbers. In addition and subtraction, they are taught to use place value and number facts to add and subtract numbers mentally and will develop a range of strategies to enable them to discard the 'counting in ones' or fingers-based methods of the infants. In particular, they will learn to add and subtract multiples and near multiples of 10, 100 and 1000, and will become fluent in complementary addition as an accurate means of achieving fast and accurate answers to 3-digit subtractions. Standard written methods for adding larger numbers are taught, learned and consolidated, and written column subtraction is also introduced. This key stage is also the period during which all the multiplication and division facts are thoroughly memorised, including all facts up to the 12 x 12 table. Efficient written methods for multiplying or dividing a 2-digit or 3-digit number by as single-digit number are taught, as are mental strategies for multiplication or division with large but friendly numbers, e.g. when dividing by 5 or multiplying by 20. Children will develop their understanding of fractions, learning to reduce a fraction to its simplest form as well as finding non-unit fractions of amounts and quantities. The concept of a decimal number is introduced and children consolidate a firm understanding of one-place decimals, multiplying and dividing whole numbers by 10 and 100.	

<table>
<tr><th>Year</th><th></th><th colspan="2">Mental or written calculation</th><th>Default for ALL children</th></tr>
<tr><td>Year 3</td><td>Addition</td><td>Know pairs with each total to 20
Know pairs of multiples of 10 with a total of 100
Add any two 2-digit numbers by counting on in 10s and 1s or by using partitioning
Add multiples and near multiples of 10 and 100
Perform place value additions without a struggle. (E.g. 300 + 8 + 50 = 358)
Use place value and number facts to add a 1-digit or 2-digit number to a 3-digit number. (E.g. 104 + 56 is 160 since 104+50=154 and 6+4=10 and 676 + 8 is 684 since 8=4+4 and 76+4+4=84)
Add pairs of ‘friendly’ 3-digit numbers, e.g. 320 + 450
Begin to add amounts of money using partitioning.</td><td>Use expanded column addition to add two or three 3-digit numbers or three 2-digit numbers
Begin to use compact column addition to add numbers with three digits.
Begin to add like fractions. (E.g. $^3/_8 + {}^1/_8 + {}^1/_8$)
Recognise fractions that add to 1. (E.g. $^1/_4 + {}^3/_4$ or $^3/_5 + {}^2/_5$)</td><td>Know pairs of numbers which make each total up to 10, and which total 20
Add two 2-digit numbers by counting on in tens and ones (E.g. 56 + 35 is 56 + 30 and then add the 5)
Understand simple place value additions: 200 + 40 + 5 = 245
Use place value to add multiples of 10 or 100

<u>+ = signs and missing numbers</u>
Continue using a range of equations as in Year 1 and 2 but with appropriate, larger numbers.
<u>Partition into tens and ones and recombine</u>
Partition both numbers and recombine. Refine to partitioning the second number only e.g.
36 + 53 = 53 + 30 + 6
= 83 + 6
= 89
 

<u>Add a near multiple of 10 to a two-digit number</u>

Continue as in Year 2 but with appropriate numbers

e.g. 35 + 19 is the same as 35 + 20 – 1.

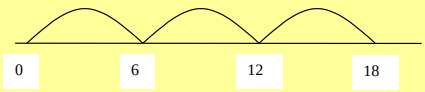
<u>pencil and paper procedures</u>

83 + 42 = 125
80 + 3 83 83
<u>+40 + 2</u> + <u>42</u> + <u>42</u>
120 + 5 =125 120 5
<u>5</u> <u>120</u>
125 125</td></tr>
</table>

Year		Mental or written calculation		Default for ALL children
	Subtraction	Know pairs with each total to 20 Subtract any two 2-digit numbers Perform place value subtractions without a struggle. (E.g. 536 – 30 = 506, etc.) Subtract 2-digit numbers from numbers >100 by counting up. (E.g. 143 – 76 is done by starting at 76, add 4 (80) then add 20 (100) then add 43 making the difference a total of 67) Subtract multiples and near multiples of 10 and 100 Subtract, when appropriate, by counting back or taking away, using place value and number facts. Find change from £1, £5 and £10.	Use counting up as an informal written strategy for subtracting pairs of three-digit numbers, e.g. 423 – 357 is +3 +40 +23 = 66 357 360 400 423 Begin to subtract like fractions. (E.g. $^{7}/_{8}$ - $^{3}/_{8}$)	Know pairs of numbers which make each total up to 10, and which total 20 Count up to subtract 2-digit numbers: 72 – 47 is +3 +10 +10 +2 = 25 47 50 60 70 2 Subtract multiples of 5 from 100 by counting up +5 +60 = 65 35 40 100 Subtract multiples of 10 and 100 **<u>= signs and missing numbers</u>** Continue using a range of equations as in Year and 2 but with appropriate numbers. **<u>Find a small difference by counting up</u>** Continue as in Year 2 but with appropriate numbers e.g.102– 97 = 5 **<u>Subtract mentally a 'near multiple of 10' to or from a two-digit number</u>** Continue as in Year 2 but with appropriate numbers e.g. 78 – 49 is the same as 78 – 50 + 1 **<u>Use known number facts and place value to subtract</u>** Continue as in Year 2 but with appropriate numbers e.g. 97 – 15 = 72 82 87 97 -5 -10 ***Pencil and paper procedures*** Complementary addition 84 – 56 = 28 + 4 + 20 + 4 56 60 80 84 OR 127 –34 100 + 20 + 7 - <u>30 +4</u>

<table>
<tr><th>Year</th><th></th><th colspan="2">Mental or written calculation</th><th>Default for ALL children</th></tr>
<tr>
<td></td>
<td>Multiplication</td>
<td>Know by heart all the multiplication facts in the 2x, 3x, 4x, 5x, 8x and 10x tables
Multiply whole numbers by 10 and 100
Recognise that multiplication is commutative
Use place value and number facts in mental multiplication. (E.g. 30 x 5 is 15 x 10)
Partition teen numbers to multiply by a single-digit number. (E.g. 3 x 14 as 3 x 10 and 3 x 4)
Double numbers up to 50</td>
<td>Use partitioning (grid multiplication) to multiply 2-digit and 3-digit numbers by ‘friendly’ single digit numbers.</td>
<td>Know by heart the 2x, 3x, 5x and 10x tables
Double given tables facts to get others
Double numbers up to 25 and multiples of 5 to 50

<u>x = signs and missing numbers</u>
Continue using a range of equations as in Year 2 but with appropriate numbers.

Number lines
6 x 3
 

Arrays and repeated addition
Continue to understand multiplication as repeated addition and continue to use arrays (as in Year 2).
Doubling multiples of 5 up to 50
35 x 2 = 70

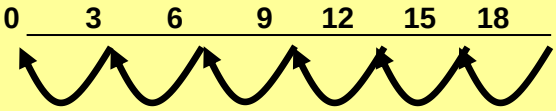
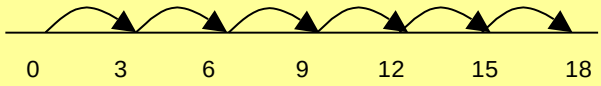
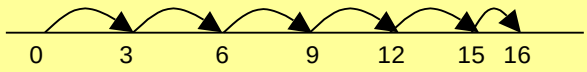
<table>
<tr><td>x</td><td>30</td><td>5</td></tr>
<tr><td>2</td><td>60</td><td>10</td></tr>
</table>

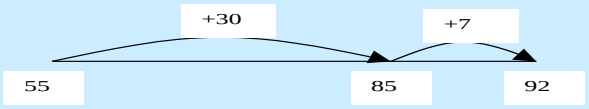
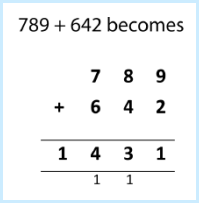
Partition

Use known facts and place value to carry out simple multiplications

Use the same method as above (partitioning), e.g. 32 x 3 = 96

<table>
<tr><td>x</td><td>30</td><td>2</td></tr>
<tr><td>3</td><td>90</td><td>6</td></tr>
</table>
</td>
</tr>
</table>

Year		Mental or written calculation		Default for ALL children
	Division	Know by heart all the division facts derived from the 2x, 3x, 4x, 5x, 8x and 10x tables. Divide whole numbers by 10 or 100 to give whole number answers Recognise that division is not commutative. Use place value and number facts in mental division. (E.g. 84 ÷ 4 is half of 42) Divide larger numbers mentally by subtracting the tenth multiple, including those with remainders. (E.g. 57 ÷ 3 is 10 + 9 as 10x3=30 and 9x3=27) Halve even numbers to 100, halve odd numbers to 20	Perform divisions just above the 10th multiple using the written layout and understanding how to give a remainder as a whole number. Find unit fractions of quantities and begin to find non-unit fractions of quantities	Know by heart the division facts derived from the 2x, 3x, 5x and 10x tables Halve even numbers up to 50 and multiples of ten to 100 Perform divisions within the tables including those with remainders, e.g. 38 ÷ 5. **÷ = signs and missing numbers** Continue using a range of equations as in Year 2 but with appropriate numbers. **Understand division as sharing and grouping** 18 ÷ 3 can be modelled as: Sharing – 18 shared between 3 (see Year 2 diagram) OR  Or Grouping - How many 3's make 18?  *Remainders* 16 ÷ 3 = 5 r1 Sharing - 16 shared between 3, how many left over? Grouping – How many 3's make 16, how many left over? e.g. 

Year		Mental or written calculation		Default for ALL children
Year 4	***Addition***	Add any two 2-digit numbers by partitioning or counting on Know by heart/quickly derive number bonds to 100 and to £1 Add to the next hundred, pound and whole number. (E.g. 234 + 66 = 300, 3.4 + 0.6 = 4) Perform place value additions without a struggle. (E.g. 300 + 8 + 50 + 4000 = 4358) Add multiples and near multiples of 10, 100 and 1000. Add £1, 10p, 1p to amounts of money Use place value and number facts to add 1-, 2-, 3-and 4-digit numbers where a mental calculation is appropriate'. (E.g. 4004 + 156 by knowing that 6+4=10 and that 4004+150= 4154 so total is 4160)	Column addition for 3-digit and 4-digit numbers Add like fractions, e.g. $^3/_5 + {}^4/_5 = {}^7/_5 = 1\ ^2/_5$. Be confident with fractions that add to 1 and fraction complements to 1. (E.g. $^2/_3$ + ? = 1)	Add any 2-digit numbers by partitioning or counting on Number bonds to 20 Know pairs of multiples of 10 with a total of 100 Add friendly larger numbers using knowledge of place value and number facts Use expanded column addition to add 3-digit numbers **+ = signs and missing numbers** Continue using a range of equations as in Year 1 and 2 but with appropriate numbers. **Partition into tens and ones and recombine** Either partition both numbers and recombine or partition the second number only e.g. 55 + 37 = 55 + 30 + 7 = 85 + 7 = 92  **Add the nearest multiple of 10, then adjust** Continue as in Year 2 and 3 but with appropriate numbers e.g. 63 + 29 is the same as 63 + 30 - 1 **Pencil and paper procedures** 358 + 73 = 431 **either** **or** 300+50+8 + 70+3 300+120+11 = 431 358 73 11 120 300 431  Extend to decimals in the context of money (vertically) £ 2.50 + £ 1.75 = £ 4.25 £ 2.50 + £ 1.75 £ 4.25 1 (Revert to expanded methods if the children experience any difficulty.)

Year		Mental or written calculation		Default for ALL children
	Subtraction	Subtract any two 2-digit numbers Know by heart/quickly derive number bonds to 100 Perform place value subtractions without a struggle. (E.g. 4736 – 706 = 4030, etc.) Subtract multiples and near multiples of 10, 100 and 100 Subtract by counting up. (E.g. 503 – 368 is done by adding: 368 +2 +30 +100 +3 so we added 135) Subtract, when appropriate, by counting back or taking away, using place value and number facts. Subtract £1, 10p, 1p from amounts of money Find change from £10, £20 and £50.	Use expanded column subtraction for 3-digit and 4-digit numbers Use complementary addition to subtract amounts of money, and for subtractions where the larger number is a near multiple of 1000 or 100 E.g. 2002 – 1865 is +5 +30 +102 = 137 1865 1870 1900 2002 Subtract like fractions, e.g. $\frac{1}{4} + \frac{1}{8} = \frac{3}{8}$ Use fractions that add to 1 to find fraction complements to 1, e.g. $1 - \frac{2}{3} = \frac{1}{3}$	Use counting up with confidence to solve most subtractions, including finding complements to multiples of 100. (E.g. 512 – 287 is done by +3 +10 +100 +100 +12 = 225 287 290 300 400 500 512 67 + ? = 100 +3 +30 = 33 67 70 100 **- = signs and missing numbers** Continue using a range of equations as in Year 1 and 2 but with appropriate numbers. Find a small difference by counting up e.g. 5003 – 4996 = 7 This can be modelled on an empty number line (see complementary addition below). **Subtract the nearest multiple of 10, then adjust.** Continue as in Year 2 and 3 but with appropriate numbers. **Use known number facts and place value to subtract** 92 – 15 = 67 77 82 92 -5 -10 **Pencil and paper procedures** Complementary addition 754 – 86 = 668 +14 +600 +54 86 100 700 754 874 – 523 becomes 8 7 4 – 5 2 3 3 5 1 932 – 457 becomes 8 12 1 9 3 2 – 4 5 7 4 7 5

<table>
<tr><th>Year</th><th></th><th colspan="2">Mental or written calculation</th><th>Default for ALL children</th></tr>
<tr>
<td></td>
<td>Multiplication</td>
<td>Know by heart all the multiplication facts up to 12 x 12.
Recognise factors up to 12 of two-digit numbers.
Multiply whole numbers and one-place decimals by 10, 100, 1000
Multiply multiples of 10, 100, 1000 by single digit numbers. (E.g. 300 x 6 or 4000 x 8)
Use understanding of place value and number facts in mental multiplication. (E.g. 36 x 5 is half of 36 x 10 and 50 x 60 = 3000)
Partition 2-digit numbers to multiply by a single-digit number mentally. (E.g. 4 x 24 as 4 x 20 and 4 x 4)
Multiply near multiples using rounding. (E.g. 33 x 19 as 33 x 20 – 33)
Find doubles to double 100 and beyond using partitioning
Begin to double amounts of money. (E.g. £35.60 doubled = £71.20.)</td>
<td>Use a vertical written method to multiply a one-digit by a 3-digit number (ladder)
Use an efficient written method to multiply a 2-digit number by a number between 10 and 20 by partitioning (grid method)</td>
<td>Know by heart multiplication tables up to 10 x 10
Multiply whole numbers by 10 and 100
Use grid method to multiply a 2-digit or a 3-digit number by a number up to and including 6

<u>x = signs and missing numbers</u>
Continue using a range of equations as in Year 2 but with appropriate numbers

<u>Partition</u>
23 x 4 = 92

23 x 4 = (20 x 4) + (3 x 4)
= (80) + (12)
= 92

OR
Use the grid method of multiplication (as below)

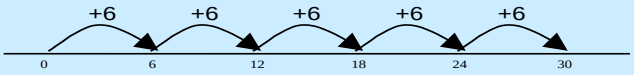
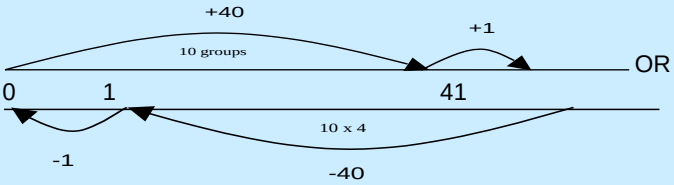
<u>Pencil and paper procedures</u>
Grid method
23 x 7 is approximately 20 x 10 = 200

<table>
<tr><td>x</td><td>20</td><td>3</td></tr>
<tr><td>7</td><td>140</td><td>21</td></tr>
</table>
<table>
<tr><td>x</td><td>70</td><td>2</td></tr>
<tr><td>30</td><td>2100</td><td>60</td></tr>
<tr><td>8</td><td>560</td><td>16</td></tr>
</table>
<u>Short multiplication</u>

24 × 6 becomes
2 4
× 6
1 4 4
2
Answer: 144

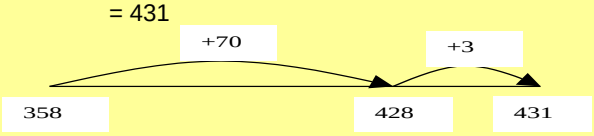
342 × 7 becomes
3 4 2
× 7
2 3 9 4
2 1
Answer: 2394

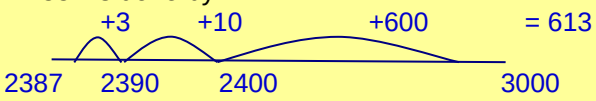
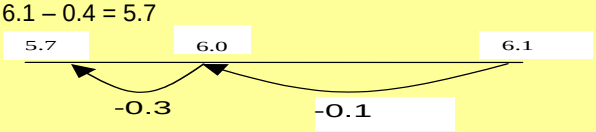
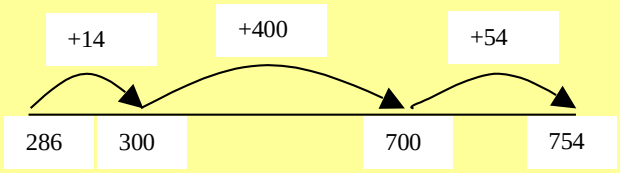
2741 × 6 becomes
2 7 4 1
× 6
1 6 4 4 6
4 2
Answer: 16 446
</td>
</tr>
</table>

Year		Mental or written calculation		Default for ALL children
	Division	Know by heart all the division facts up to 144 ÷ 12. Divide whole numbers by 10, 100 to give whole number answers or answers with one decimal place Divide multiples of 100 by 1-digit numbers using division facts. (E.g. 3200 ÷ 8 = 400) Use place value and number facts in mental division. (E.g. 245 ÷ 20 is double 245 ÷ 10) Divide larger numbers mentally by subtracting the 10th or 20th multiple as appropriate. (E.g. 156 ÷ 6 is 20 + 6 as 20x6=120 and 6x6=36) Find halves of even numbers to 200 and beyond using partitioning Begin to halve amounts of money. (E.g. Half of £52.40 = £26.20)	Use a written method to divide a 2-digit or a 3-digit number by a single-digit number. Give remainders as whole numbers. Begin to reduce fractions to their simplest forms. Find unit and non-unit fractions of larger amounts.	Know by heart all the division facts up to 100 ÷ 10. Divide whole numbers by 10 and 100 to give whole number answers or answers with one decimal place. Perform divisions just above the 10th multiple using the written layout and understanding how to give a remainder as a whole number. Find unit fractions of amounts **÷ = signs and missing numbers** Continue using a range of equations as in Year 2 but with appropriate numbers. **Sharing and grouping** 30 ÷ 6 can be modelled as: grouping – groups of 6 taken away and the number of groups counted e.g.  sharing – sharing among 6, the number given to each person Remainders 41 ÷ 4 = 10 r1  OR 41 = (10 x 4) + 1 **Pencil and paper procedures** 72 ÷ 5 lies between 50 ÷ 5 = 10 and 100 ÷ 5 = 20 72 - 50 (10 groups) or (10 x 5) 22 - 20 (4 groups) or (4 x 5) 2 Answer : 14 remainder 2

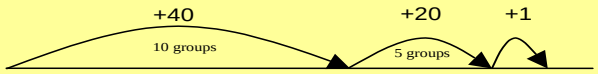
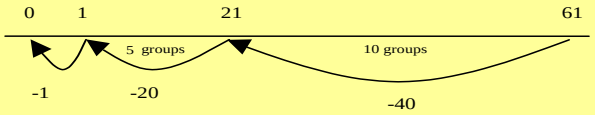
Upper Key stage 2

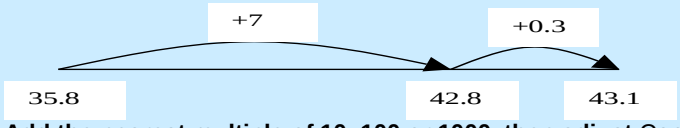
	Overview of LKS2	Children move on from dealing mainly with whole numbers to performing arithmetic operations with both decimals and fractions. They will consolidate their use of written procedures in adding and subtracting whole numbers with up to 6 digits and also decimal numbers with up to two decimal places. Mental strategies for adding and subtracting increasingly large numbers will also be taught. These will draw upon children's robust understanding of place value and knowledge of number facts. Efficient and flexible strategies for mental multiplication and division are taught and practised, so that children can perform appropriate calculations even when the numbers are large, such as 40,000 x 6 or 40,000 ÷ 8. In addition, it is in Y5 and Y6 that children extend their knowledge and confidence in using written algorithms for multiplication and division. Fractions and decimals are also added, subtracted, divided and multiplied, within the bounds of children's understanding of these more complicated numbers, and they will also calculate simple percentages and ratios. Negative numbers will be added and subtracted.

Year 5	***Addition***	Know numbers bonds to 1 and to the next whole number Add to the next 10 from a decimal number, *e.g. 13·6 + 6·4 = 20* Add numbers with two significant digits only, using mental strategies. (E.g. 3.4 + 4.8 or 23,000 + 47,000) Add one or two-digit multiples of 10, 100, 1000, 10,000 and 100,000. (E.g. 8000 + 7000 or 600,000 + 700,000) Add near multiples of 10, 100, 1000, 10,000 and 100,000 to other numbers. (E.g. 82,472 + 30,004) Add decimal numbers which are near multiples of 1 or 10, including money. *(E.g. 6·34 + 1·99 or £34·59 + £19·95)* Use place value and number facts to add two or more friendly numbers including money and decimals. (E.g. 3 + 8 + 6 + 4 + 7, 0.6 + 0.7 + 0.4, or 2,056 + 44)	Use column addition to add two or three whole numbers with up to 5 digits Use column addition to add any pair of two-place decimal numbers including amounts of money. Begin to add related fractions using equivalences. (E.g. $\frac{1}{2} + \frac{1}{6} = \frac{3}{6} + \frac{1}{6}$) Choose the most efficient method in any given situation	Add numbers with only 2-digits which are not zeros, e.g. 3.4 + 5.8 Derive swiftly and without any difficulty number bonds to 100 Add friendly large numbers using knowledge of place value and number facts Use expanded column addition to add pairs of 4- and 5-digit numbers **+ = signs and missing numbers** Continue using a range of equations as in Year 1 and 2 but with appropriate numbers. **Partition into hundreds, tens and ones and recombine** Either partition both numbers and recombine or partition the second number only e.g. 358 + 73 = 358 + 70 + 3 = 428 + 3 = 431  **Add or subtract the nearest multiple of 10 or 100, then adjust** Continue as in Year 2, 3 and 4 but with appropriate numbers e.g. 458 + 79 = is the same as 458 + 80 - 1 **Pencil and paper procedures** Leading to formal method, showing numbers carried underneath for all children. 358 + 73 431 11 Extend to numbers with at least four digit 3587 + 675 = 4262 3587 + 675 4262 111 Revert to expanded methods if the children experience any difficulty. Extend to decimals (same number of decimals places) and adding several numbers (with different numbers of digits). ***Model negative numbers using a number line.***

	Subtraction	Subtract numbers with two significant digits only, using mental strategies. (E.g. 6.2 – 4.5 or 72,000 – 47,000) Subtract one or two-digit multiples of 100, 1000, 10,000 and 100,000. (E.g. 8000 – 3000 or 600,000 – 200,000) Subtract one or two digit near multiples of 100, 1000, 10,000 and 100,000 from other numbers. (E.g. 82,472 – 30,004) Subtract decimal numbers which are near multiples of 1 or 10, including money. (E.g. 6·34 – 1·99 or £34·59 – £19·95) Use counting up subtraction, with knowledge of number bonds to 10/100 or £1, as a strategy to perform mental subtraction. (E.g. £10 - £3.45 or 1000 – 782] Recognise fraction complements to 1 and to the next whole number. (E.g. $1\ ^{2}/_{5} + {}^{3}/_{5} = 2$) 4 – 5	Use compact or expanded column subtraction to subtract numbers with up to 5 digits. Use complementary addition for subtractions where the larger number is a multiple or near multiple of 1000. Use complementary addition for subtractions of decimals with up to two places incl. amounts of money Begin to subtract related fractions using equivalences. (E.g. $\frac{1}{2} - {}^{1}/_{6} = {}^{2}/_{6}$) Choose the most efficient method in any given situation	Derive swiftly and without difficulty number bonds to 100 Use counting up with confidence to solve most subtractions, including finding complements to multiples of 1000. (E.g. 3000 – 2387 is done by  **- = signs and missing numbers** Continue using a range of equations as in Year 1 and 2 but with appropriate numbers. *Find a difference by counting up* e.g. 8006 – 2993 = 5013 This can be modelled on an empty number line (see complementary addition below). **Subtract the nearest multiple of 10 or 100, then adjust.** Continue as in Year 2, 3 and 4 but with appropriate numbers. **Use known number facts and place value to subtract** 6.1 – 0.4 = 5.7  Pencil and paper procedures. Complementary addition 754 – 286 = 468  ***OR*** ***754 - 286 = 468*** 14 (300) 400 (700) 54 (754) 468 can be refined to 14 (300) 454 (754) 468

	Multiplication	Know by heart all the multiplication facts up to 12 x 12. Multiply whole numbers and one-and two-place decimals by 10, 100, 1000, 10,000 Use knowledge of factors and multiples in multiplication. (E.g. 43 x 6 is double 43 x 3, and 28 x 50 is ½ of 28 x 100 = 1400) Use knowledge of place value and rounding in mental multiplication. (E.g. 67 x 199 as 67 x 200 – 67) Use doubling and halving as a strategy in mental multiplication. (E.g. 58 x 5 = half of 58 x 10, and 34 x 4 is 34 doubled twice) Partition 2-digit numbers, including decimals, to multiply by a single-digit number mentally. (E.g. 6 x 27 as 6 x 20 (120) plus 6 x 7 (42) making 162 or 6.3 x 7 as 6 x 7 plus 0.3 x 7) Double amounts of money by partitioning. (E.g. £37.45 doubled = £37 doubled (£74) plus 45p doubled (90p) £74.90)	Use short multiplication to multiply a 1-digit number by a number with up to 4 digits Use long multiplication to multiply 3-digit and 4-digit number by a number between 11 and 20 Choose the most efficient method in any given situation Find simple percentages of amounts 9e.g. 10%, 5%, 20%, 155 and 50%) Begin to multiply fractions and mixed numbers by whole numbers ≤ 10, e.g. $4 \times {}^{2}/_{3} = {}^{8}/_{3} = 2{}^{2}/_{3}$.	Know multiplication tables to 11 x 11 Multiply whole numbers and one-place decimals by 10, 100 and 1000 Use knowledge of factors as aids to mental multiplication. (E.g. 13 x 6 = double 13 x 3 and 23 x 5 is ½ of 23 x 10) Use grid method to multiply numbers with up to 4-digits by one-digit numbers. Use grid method to multiply 2-digit by 2-digit numbers. **x = signs and missing numbers** Continue using a range of equations as in Year 2 but with appropriate numbers **Partition** 47 x 6 = 92 47 x 6 = (40 x 6) + (7 x 6) = (240) + (42) = 282 OR Use the grid method of multiplication (as below) **Pencil and paper procedures** Grid method 72 x 38 is approximately 70 x 40 = 2800 x | 70 | 2 30 | 2100 | 60 8 | 560 | 16 Extend to simple decimals with one decimal place. 12.5 x 2 1.0 (2.0 x 0.5) 4.0 (2.0 x 2.0) 20.0 (2.0 x 10.0) 25.0 **Moving to formal methods of multiplication for decimals.** **Carrying numbers underneath.**

	Division	Know by heart all the division facts up to 144 ÷ 12. Divide whole numbers by 10, 100, 1000, 10,000 to give whole number answers or answers with 1, 2 or 3 decimal places Use doubling and halving as mental division strategies. (E.g. 34 ÷ 5 is (34 ÷ 10) x 2) Use knowledge of multiples and factors, also tests for divisibility ,in mental division. (E.g. 246 ÷ 6 is 123 ÷ 3 and we know that 525 divides by 25 and by 3) Halve amounts of money by partitioning. (E.g. Half of £75.40 = half of £75 (37.50) plus half of 40p (20p) which is £37.70) Divide larger numbers mentally by subtracting the 10th or 100th multiple as appropriate. (E.g. 96 ÷ 6 is 10 + 6, as 10 × 6 = 60 and 6 × 6 = 36; 312 ÷ 3 is 100 + 4 as 100 x 3 = 300 and 4 x 3 = 12) Reduce fractions to their simplest form.	Use short division to divide a number with up to 4 digits by a number ≤12. Give remainders as whole numbers or as fractions. Find non-unit fractions of large amounts. Turn improper fractions into mixed numbers and vice versa. Choose the most efficient method in any given situation	Know by heart division facts up to 121 ÷ 11 Divide whole numbers by 10, 100 or 1000 to give answers with up to one decimal place. Use doubling and halving as mental division strategies Use efficient chunking to divide numbers ≤ 1000 by 1-digit numbers. Find unit fractions of 2 and 3-diigt numbers **<u>÷ = signs and missing numbers</u>** Continue using a range of equations as in Year 2 but with appropriate numbers. **<u>Sharing and grouping</u>** Continue to understand division as both sharing and grouping (repeated subtraction). **Remainders** Quotients expressed as fractions or decimal fractions 61 ÷ 4 = 15 ¼ or 15.25  ***OR***  **<u>Pencil and paper procedures</u>** 256 ÷ 7 lies between 210 ÷ 7 = 30 and 280 ÷ 7 = 40 256 - <u>70</u> (10 groups) or (10 x 7) 186 - <u>140</u> (20 groups) or (20 x 7) 46 - <u>42</u> <u>(6 groups)</u> or <u>(6 x 7)</u> 4 (36 groups Answer: 36 remainder 4 **BUS STOP** **Short division** 98 ÷ 7 becomes 1 4 7 | 9 2 8 Answer: 14 432 ÷ 5 becomes 8 6 r 2 5 | 4 3 3 2 Answer: 86 remainder 2

Year 6	***Addition***	Know by heart number bonds to 100 and use these to derive related facts. (E.g. 3.46 + 0.54 = 4) Derive quickly and without difficulty, number bonds to 1000 Add small and large whole numbers where the use of place value or number facts makes the calculation do-able 'in our heads'. (E.g. 34,000 + 8000.) Add multiples of powers of ten and near multiples of the same. (E.g. 6345 + 199.) Add negative numbers in a context such as temperature where the numbers make sense. Add two 1-place decimal numbers or two 2-place decimal numbers less than 1 (E.g. 4.5 + 6.3 or 0.74 + 0.33) Add positive numbers to negative numbers, e.g. calculate a rise in temperature, or continue a sequence beginning with a negative number	Use column addition to add numbers with up to 5 digits. Use column addition to add decimal numbers with up to 3-digits Add mixed numbers and fractions with different denominators.	Derive swiftly and without difficulty, number bonds to 100 Use place value and number facts to add friendly large or decimal numbers, e.g. 3.4 + 6.6 or 26,000 + 5,400 Use column addition to add numbers with up to 4-digits. Use column addition to add pairs of two-place decimal numbers. **+ = signs and missing numbers** Continue using a range of equations as in Year 1 and 2 but with appropriate numbers. **Partition into hundreds, tens, ones and decimal fractions and recombine** Either partition both numbers and recombine or partition the second number only e.g. 35.8 + 7.3 = 35.8 + 7 + 0.3 = 42.8 + 0.3 = 43.1  **Add the nearest multiple of 10, 100 or 1000, then adjust** Continue as in Year 2, 3, 4 and 5 but with appropriate numbers including extending to adding 0.9, 1.9, 2.9 etc **Pencil and paper procedures** Extend to numbers with any number of digits and decimals with 1 and 2 decimal places. 124.9 + 117.25 = 242.15 124.9 + 117.25 242.15 11 Revert to expanded methods if the children experience any difficulty. Extend to decimals (either one or two decimal places).

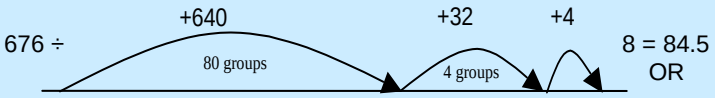
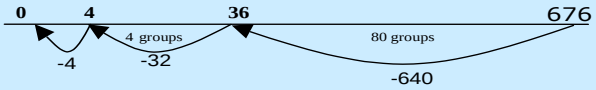
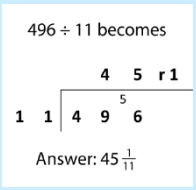
	Subtraction	Use number bonds to 100 to perform mental subtraction of any pair of integers by complementary addition. (E.g. 1000 – 654 as 46 + 300 in our heads Use number bonds to 1 and 10 to perform mental subtraction of any pair of one-place or two-place decimal numbers using complementary addition and including money. (E.g. 10 – 3.65 as 0.35 + 6, £50 – £34.29 as 71p + £15) Use number facts and place value to perform mental subtraction of large numbers or decimal numbers with up to two places. (E.g. 467,900 – 3,005 or 4.63 – 1.02) Subtract multiples of powers of ten and near multiples of the same. Subtract negative numbers in a context such as temperature where the numbers make sense.	Use column subtraction to subtract numbers with up to 6 digits. Use complementary addition for subtractions where the larger number is a multiple or near multiple of 1000 or 10,000. Use complementary addition for subtractions of decimal numbers with up to three places including money. Subtract mixed numbers and fractions with different denominators.	Use number bonds to 100 to perform mental subtraction of numbers up to 1000 by complementary addition. (E.g. 1000 – 654 as 46 + 300 in our heads.) Use complementary addition for subtraction of integers up to 10,000. E.g. 2504 – 1878 as +2 +20 +100 +504 = 626 1878 1880 1900 2000 2504 Use complementary addition for subtractions of one-place decimal numbers and amounts of money. (E.g. £7.30 – £3.55 as +5p +40p +£3.30 = £3.75 £3.55 £3.60 £4.00 £7.30 **- = signs and missing numbers** Continue using a range of equations as in Year 1 and 2 but with appropriate numbers. **Find a difference by counting up** e.g. 0.5 – 0.31 = 0.19 This can be modelled on an empty number line (see complementary addition below). +0.09 +0.1 0.31 0.4 0.5 **Subtract the nearest multiple of 10, 100 or 1000, then adjust** Continue as in Year 2, 3, 4 and 5 but with appropriate numbers. Use known number facts and place value to subtract Continue as year 5 **Pencil and paper procedures** Complementary addition 6467 – 2684 = 3783 +16 +300 +3467 2684 2700 3000 6467 ***OR 6467 – 2684 = 3783*** 16 (2700) can be refined to 316 (3000) 300 (3000) 3467 (6467) 3467 (6467) 3783 3783 **(Decomposition for all children only when secure.)**

<table>
<tr>
<td></td>
<td>Multiplication</td>
<td>Know by heart all the multiplication facts up to 12 x 12.
Multiply whole numbers and decimals with up to three places by 10, 100 or 1000, e.g. 234 x 1000 = 234,000 and</td>
<td>Use short multiplication to multiply a 1-digit number by a number with up to 4 digits
Use long multiplication to multiply a 2-digit by a number with up to 4 digits
Use short multiplication to multiply a 1-</td>
<td colspan="2">Know by heart all the multiplication facts up to 12 x 12.
Multiply whole numbers and one-and two-place decimals by 10, 100 and 1000.
Use an efficient written method to multiply a one-digit or a teens number by a number with up to 4-digits by partitioning (grid method).
Multiply a one-place decimal number up to 10 by a number ≤100 using grid method.
<u>x = signs and missing numbers</u> Continue using a range of equations as in Year 2 but with appropriate numbers</td>
</tr>
<tr>
<td colspan="3"></td>
<td colspan="2"><u>Partition</u>
87 x 6 = 522

87 x 6 = (80 x 6) + (7 x 6)
= (480) + (42)
= 522

OR
87
X 6
42 (6 x 7)
<u>480</u> (6 x 80)
522 (units, then tens, hundreds etc)</td>
</tr>
</table>

		0.23 x 1000 = 230) Identify common factors, common multiples and prime numbers and use factors in mental multiplication. (E.g. 326 x 6 is 652 x 3 which is 1956) Use place value and number facts in mental multiplication. (E.g. 40,000 x 6 = 24,000 and 0.03 x 6 = 0.18) Use doubling and halving as mental multiplication strategies, including to multiply by 2, 4, 8, 5, 20, 50 and 25 (E.g. 28 x 25 is ¼ of 28 x 100 = 700) Use rounding in mental multiplication. (34 x 19 as (20 x 34) – 34) Multiply one and two-place decimals by numbers up to and including 10 using place value and partitioning. (E.g. 3.6 x 4 is 12 + 2.4 or 2.53 x 3 is 6 + 1.5 + 0.09) Double decimal numbers with up to 2 places using partitioning *e.g. 36·73 doubled is double 36 (72) plus double 0·73 (1·46)*	digit number by a number with one or two decimal places, including amounts of money. Multiply fractions and mixed numbers by whole numbers. Multiply fractions by proper fractions. Use percentages for comparison and calculate simple percentages.	OR 53 X 8 424 2 OR Use the grid method of multiplication (as below) **Pencil and paper procedures** **Grid method** 372 x 24 is approximately 400 x 20 = 8000 x | 300 | 70 | 2 20 | 6000 | 1400 | 40 4 | 1200 | 280 | 8 Extend to decimals with up to two decimal places. 12.5 x2.5 1.25 (2.5 x 0.5) 5.0 (2.5 x 2.0) 25.0 (2.5 x 10.0) 31.25 284 X 63 21 852 52 17040 17892 **Moving to formal methods of multiplication for decimals. Carrying numbers underneath.**

	Division	Know by heart all the division facts up to 144 ÷ 12. Divide whole numbers by powers of 10 to give whole number answers or answers with up to three decimal places. Identify common factors, common multiples and prime numbers and use factors in mental division. (E.g. 438 ÷ 6 is 219 ÷ 3 which is 73) Use tests for divisibility to aid mental calculation. Use doubling and halving as mental division strategies, e.g. to divide by 2, 4, 8, 5, 20 and 25. (E.g. 628 ÷ 8 is halved three times: 314, 157, 78.5) Divide one and two place decimals by numbers up to and including 10 using place value. (E.g. 2.4 ÷ 6 = 0.4 or 0.65 ÷ 5 = 0.13, £6.33 ÷ 3 = £2.11) Halve decimal numbers with up to 2 places using partitioning *e.g. Half of 36·86 is half of 36 (18) plus half of 0·86 (0·43)* Know and use equivalence	Use short division to divide a number with up to 4 digits by a 1-digit or a 2-digit number Use long division to divide 3-digit and 4-digit numbers by 'friendly' 2-digit numbers. Give remainders as whole numbers or as fractions or as decimals Divide a one-place or a two-place decimal number by a number ≤ 12 using multiples of the divisors. Divide proper fractions by whole numbers.	Know by heart all the division facts up to 144 ÷ 12. Divide whole numbers by 10, 100, 1000 to give whole number answers or answers with up to two decimal places. Use efficient chunking involving subtracting powers of 10 times the divisor to divide any number of up to 1000 by a number ≤ 12. (E.g. 836 ÷ 11 as 836 – 770 (70x11) leaving 66 which is 6x11. So that we have 70 + 6 = 76 as the answer). Divide a one-place decimal by a number ≤10 using place value and knowledge of division facts. **÷ = signs and missing numbers** Continue using a range of equations as in Year 2 but with appropriate numbers. **Sharing and grouping** Continue to understand division as both sharing and grouping (repeated subtraction). ***Remainders*** Quotients expressed as fractions or decimal fractions   **Pencil and paper procedures** 977 ÷ 36 is approximately 1000 ÷ 40 = 25 977 - 360 (10 groups) = 617 617 - 360 (10 groups) = 257 257 - 180 (5 groups) = 77 77 - 72 (2 groups) = 5 **refine to** 977 - 720 (20 groups) = 257 257 - 180 (5 groups) = 77 77 - 72 (2 groups) = 5 Answer: 27 5/36 **Short Division** 

		between simple fractions, decimals and percentages, including in different contexts. Recognise a given ratio and reduce a given ratio to its lowest terms.		**Long division** 432 ÷ 15 becomes 2 8 r 12 1 5 | 4 3 2 3 0 0 1 3 2 1 2 0 1 2 Answer: 28 remainder 12 432 ÷ 15 becomes 2 8 1 5 | 4 3 2 3 0 0 15×20 1 3 2 1 2 0 15×8 1 2 $\frac{12}{15} = \frac{4}{5}$ Answer: $28\frac{4}{5}$ 432 ÷ 15 becomes 2 8 · 8 1 5 | 4 3 2 · 0 3 0 ↓ 1 3 2 1 2 0 ↓ 1 2 0 1 2 0 0 Answer: 28·8 (Formal method to continue to be taught to present Y6) .