



Rationale

Mathematics equips pupils with a uniquely powerful set of tools to understand and change the world. These tools include logical reasoning, problem-solving skills and the ability to think in abstract ways. Mathematics is important in everyday life, many forms of employment, science and technology, medicine, the economy, the environment and development and in public decision-making. Different cultures have contributed to the development and application of mathematics. Today, the subject transcends cultural boundaries and its importance is universally recognised. Mathematics is a creative discipline. It can stimulate moments of pleasure and wonder when a pupil solves a problem for the first time, discovers a more elegant solution to that problem, or suddenly sees hidden connections.

(National Curriculum Orders 2000)

Aims

Our aims in teaching mathematics are that children will:

- Find mathematics an enjoyable and exciting challenge, providing a sense of achievement at appropriate levels
- Develop inquisitive minds, and an ability to question and explain using appropriate mathematical vocabulary
- Be numerate and acquire and apply a range of mathematical skills and knowledge, with confidence, speed and accuracy, to solve real life problems

Equal Opportunities

As a staff we endeavour to maintain an awareness of, and to provide for equal opportunities for, all our pupils in mathematics. We aim to take into account cultural background, gender and special needs, both in our teaching attitudes and in the published materials we use with our pupils.

Content

We are implementing the National Curriculum 2014 in Key Stages 1 and 2. The National Curriculum provides detailed guidance on the End of Year Expectations for children during each year and ensures continuity and progression in the teaching of mathematics. We use The White Rose Learning Schemes and Active Learn resources by Pearson which support the weekly planning completed by teachers. These resources have been published to support schools in implementing the National Curriculum. In the foundation stage we follow the EYFS Framework 2012 which focuses on two specific areas: numbers and shape, space and measures.

Organisation

At Foundation Stage, the organisation is flexible and will cover the EYFS. Children take part in regular planned activities which can be teacher led or independent. They are differentiated to ensure that children are challenged at an appropriate level. During the school week children are encouraged to use mathematical vocabulary during other subjects too in order to make the links between the maths they have been learning and other activities that they are taking part in. During Thursday assemblies (KS1 and KS2) a 'Maths Problem of the Week' PowerPoint is shared with the children where they are given three differentiated word problems to solve, encouraging mathematical vocabulary and providing more opportunity to problem solve. Children who solve the problems and can explain their reasoning are rewarded with a 'Mathematician of the Week' certificate.

In KS1, the daily maths lessons last for approximately 55 minutes. The children are taught in class based groups with work being differentiated to ensure that children are challenged at an appropriate level. Where possible links will be made with other subjects as part of our creative curriculum.



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In KS2, the daily maths lessons last for approximately one hour. In Years 3, 4 & 5 children are currently taught in class based groups with work being differentiated to ensure that children are challenged at an appropriate level. In Year 6 children are taught in ability groups. Where possible links will be made with other subjects as part of our creative curriculum. In KS2, all classes teach five morning maths lessons and one afternoon session which is either a Mental Maths test or an Arithmetic test. A short input is given to the children before completing the test based on what is in the paper. This was recommended by Anne Barry, Babcock maths consultant. Pupils are given regular 3 minute times table tests based on the times tables they are working on. Each classroom has a times table ladder with steps focussing on different times tables and division facts. Each child's name is on the ladder at the step they are currently working on. Once a child has completed a step on the ladder by passing the test correctly, they will move up the ladder and their success will be celebrated in class with a certificate to keep them motivated and enthusiastic to learn their next times tables. Once a child has completed the entire ladder, they will be rewarded with a special times tables badge which will be celebrated during assemblies.

The Role of the Co-ordinator

The co-ordinator will:

- Advise and support staff according to the National Curriculum
- Provide demonstration lessons
- Ensure that the resources are organised and staff know where they are kept
- Identify and lead INSET and staff meetings
- Attend courses and keep up to date with new initiatives and training
- Monitor and review the delivery of Maths
- Analyse SATs and other data and communicate findings to staff
- Manage the budget
- Communicate with the management team in order to produce annual targets and areas for development
- Provide appropriate training for teaching assistants and parents advising them on the methods we use to teach calculations (see Appendix A – St Mary's Calculation Policy 2014)
- Attend any relevant network meetings with local schools

Teaching methods and approaches

The teaching of Maths at St Mary's provides opportunities for direct, interactive whole class and group teaching, independent group work, paired and individual work

Pupils engage in the development of mental strategies, written methods, practical work, investigational work, problem- solving, mathematical discussion, using appropriate vocabulary, consolidation of basic skills and routines.

We recognise the importance of establishing a secure foundation in mental calculation and recall of number facts before standard written methods are introduced. We have agreed a whole school approach for developing mental into written methods (see Appendix A).

Planning

Planning is undertaken at three levels using common documentation and is monitored termly by the Maths Subject Leader.

Long term planning is based on the yearly teaching programmes set out in the National Curriculum and EYFS Framework (see Appendix B).



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Medium term planning is carried out half-termly to ensure a balanced mathematics curriculum. We recognise the need to revisit topics regularly to revise and consolidate skills and then extend them. Every objective in the yearly teaching programme is covered at least once by the end of the year.

Short term planning is carried out weekly. These plans include learning objectives, a mental oral starter, the main activity, teaching strategies and make explicit the role of the Teacher and Teaching Assistant(s). They also include the vocabulary to be introduced and used throughout the week's teaching.

Homework

See Homework Policy.

Cross –Curricular Links

Mathematics is taught mainly as a separate subject but every effort is made to link maths with other areas of the curriculum as part of our creative curriculum. We also draw children's attention to the links between maths and other curricular work so children see that maths is not an isolated subject.

Differentiation

More able pupils will be provided, within the daily mathematics lesson, with opportunities to extend their thinking and broaden their experience. Wherever possible we aim to fully include SEN pupils in the daily mathematics lesson so that they benefit from the emphasis on oral and mental work and by listening and participating with other children in demonstrating and explaining their methods. When planning, teachers will try to address the child's needs through simplified or modified tasks or the use of support staff.

Assessment and Record – keeping

We see assessment as an integral part of the teaching process, informing our planning at all levels enabling the tracking of each pupil's progress through the school.

In Foundation Stage records are kept on the child's progress through the EYFS.

In KS1 & KS2 teachers provide Next Steps on children's work to indicate how the children may improve. There are also opportunities for the children to complete self-assessments and peer assessments within lessons. Teacher's also update Target books regularly to show children's progress against the End of Year Expectations

Formal assessments are also used termly to support teacher assessment.

Reporting

All parents receive an annual written report on which there is a summary of their child's effort and progress in mathematics over the year and have the opportunity to discuss progress at consultation evenings in the Autumn and Spring Terms, including the targets they have met and those that they are yet to meet. At the end of Key Stage 1 and Key Stage 2 each pupil's level of achievement against national standards is included as part of their annual written report.

Resources

Resources for the delivery of the Maths curriculum are stored both centrally and in classrooms. Everyday basic equipment is kept in classrooms. Pupils also have individual toolkits which have resources matched to their needs within them which they have access to during very lesson. Additional equipment and topic-specific items are stored centrally. St. Mary's uses a variety of published materials to facilitate the teaching of mathematics but recognises the need for the teaching of maths to be 'scheme assisted not scheme



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driven.' A variety of teacher books are also available. Materials are constantly updated as new and relevant items become available.

Policy written by: Becky Booth (Maths Co-ordinator)
Next review date: Autumn 2018



St Mary's Calculation Policy 2014 – Staff Guidelines (Appendix A)

These methods support the development and progression of skills outlined on the Whole School Overview (Appendix B)

KEY STAGE 1			
Year 1			
	Mental calculation	Written calculation	Vocabulary and Resources
Y1 +	<ul style="list-style-type: none"> Number bonds ('story' of 5, 6, 7, 8, 9 and 10) Count on in 1s from a given 2-digit number Add two 1-digit numbers Add three 1-digit numbers, spotting doubles or pairs to 10, eg $\underline{6} + 2 + \underline{4} = 12$ (<i>underlined pair make 10</i>) $\underline{4} + 1 + \underline{4} = 9$ (<i>underlined pairs are doubles</i>) Count on in 10s from any given 2-digit number Add 10 to any given 2-digit number Use number facts to add 1-digit numbers to 2-digit numbers, eg Use $4 + 3$ to work out $24 + 3$ or $34 + 3$ Add by putting the larger number first 	<ul style="list-style-type: none"> Begin to record calculations as number sentences using mathematical symbols, eg $5 + 3 = 8$ 	<ul style="list-style-type: none"> Altogether More Number bonds (a pair of numbers that make a specific total, eg 10) Add Total Equals Double (adding two of the same number, eg $3 + 3$) Tens Ones 2 digit number (made up of 10s and ones, eg 34 – 3 tens and 4 ones) Larger Smaller <p>Resources to support teaching</p> <p>Numicon Hundred squares Bead strings Marked number lines Dienes equipment to represent 10s and 1s Other representations of 10s and 1s, eg straws, coins Multi link cubes Counters</p>



	Mental Calculation	Written Calculation	Vocabulary and Resources
Y1 —	<ul style="list-style-type: none">• Number bonds ('story' of 5, 6, 7, 8, 9 and 10)• Count back in 1s from a given 2-digit number• Subtract one 1-digit number from another• Count back in 10s from any given 2-digit number• Subtract 10 from any given 2-digit number• Use number facts to subtract 1-digit numbers from 2-digit numbers <p>eg Use $7 - 2$ to work out $27 - 2$ or $37 - 2$</p>	<ul style="list-style-type: none">• Begin to record calculations as number sentences using mathematical symbols, eg $5 - 3 = 2$	<ul style="list-style-type: none">• Less than• Take away• Subtract• Equals• Tens• Ones• 2 digit number (made up of 10s and ones, eg $34 - 3$ tens and 4 ones)• Number bonds (a pair of numbers that make a specific total, eg 10) <p><u>Resources to support teaching</u></p> <p>Numicon Hundred squares Bead strings Marked Number lines Dienes equipment to represent 10s and 1s Other representations of 10s and 1s, eg straws, coins Multi link cubes Counters</p>



	Mental Calculation	Written Calculation	Vocabulary and Resources
Y1 x	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• Begin to record calculations as number sentences using mathematical symbols, eg $2 \times 3 = 6$	<ul style="list-style-type: none">• Times• Lots of• Multiply• Equals• Tens• Ones• Array (representation of a multiplication using dots, eg $2 \times 3 = 6$ shown using 2 rows of 3 dots)• Commutativity (multiplication sums can be shown in 2 ways but keep the same value, eg $2 \times 3 = 6$; $3 \times 2 = 6$)• Double (adding 2 of the same number or multiplying a number by 2, eg $3 + 3 = 6$, $2 \times 3 = 6$) <p><u>Resources to support teaching</u></p> <p>Numicon Bead strings Marked number lines Other representations of 2s and 5s, eg coins Multi link cubes Counters</p>



	Mental Calculation	Written Calculation	Vocabulary and Resources
Y1 ÷	<ul style="list-style-type: none">• Begin to count in 2s, 5s and 10s• Find half of even numbers to 12 and know it is hard to halve odd numbers, eg $6 \div 2 = 3$• Find half of even numbers by sharing (using cubes or other equipment)• Begin to use visual and concrete arrays or 'sets of' to find how many sets of a small number make a larger number	<ul style="list-style-type: none">• Begin to record calculations as number sentences using mathematical symbols, eg $6 \div 2 = 3$	<ul style="list-style-type: none">• Divide• Share (shown by sharing objects into a certain number of groups)• Half• Equals• Even numbers• Odd numbers• Array (representation of a multiplication using dots, eg $2 \times 3 = 6$ shown using 2 rows of 3 dots)• Tens• Ones <p><u>Resources to support teaching</u></p> <p>Numicon Bead strings Marked number lines Other representations of 2s and 5s, eg coins Multi link cubes Counters</p>



Year 2			
	Mental calculation	Written calculation	Vocabulary and Resources
Y2 +	<ul style="list-style-type: none"> Number bonds – know all the pairs of numbers which make all the numbers to 12, and pairs with a total of 20 Count on in 1s and 10s from any given 2-digit number Add two or three 1-digit numbers Add a 1-digit number to any 2-digit number using number facts, including bridging multiples of 10, eg $45 + 4$ eg $38 + 7$ Add 10 and small multiples of 10 (eg 20, 30, 40 etc.) to any given 2-digit number Add any pair of 2-digit numbers 	<ul style="list-style-type: none"> Record calculations accurately using written number sentences and mathematical symbols, eg $38 + 7 = 45$ $40 = 30 + 10$ Use number lines to support and represent addition calculations, eg $38 + 7 = 45$ <p>Number line</p> <p>Bridging a multiple of 10</p> <ul style="list-style-type: none"> Use partitioning to support addition and begin to use expanded column addition, eg $23 + 36 = 59$ <p>Partitioning</p> $20 + 30 = 50$ $3 + 6 = 9$ $50 + 9 = 59$ <p>Expanded column addition</p> $\begin{array}{r} + 20 + 3 \\ 30 + 6 \\ \hline 50 + 9 \end{array}$	<ul style="list-style-type: none"> Altogether More Number bonds (a pair of numbers that make a specific total, eg $20 = 13 + 7$) Add Total Equals Tens Ones 2 digit number (made up of 10s and ones, eg $34 = 3$ tens and 4 ones) Partition (splitting a 2 or 3 digit numbers into different parts using place value, eg $37 = 30 + 7$, $37 = 30 + 5 + 2$, $125 = 100 + 20 + 5$) Bridging multiples of 10 (using multiples of 10 and number bonds to 10 to support addition – see example on number line) Expanded column addition (Introduction to column addition using partitioned numbers) <p>Resources to support teaching</p> <p>Numicon Hundred squares Bead strings Marked and unmarked number lines Dienes equipment to represent 10s and 1s Place value cards and charts Other representations of 10s and 1s, eg straws, coins</p>

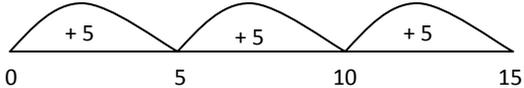


	Mental Calculation	Written Calculation	Vocabulary and Resources
Y2 —	<ul style="list-style-type: none"> Number bonds – know all the pairs of numbers which make all the numbers to 12 Count back in 1s and 10s from any given 2-digit number Subtract a 1-digit number from any 2-digit number using number facts, including bridging multiples of 10, eg $56 - 3$ eg $53 - 5$ Subtract 10 and small multiples of 10 (eg 20, 30, 40 etc..) from any given 2-digit number Subtract any pair of 2-digit numbers by counting back in 10s and 1s or by counting up 	<ul style="list-style-type: none"> Record calculations accurately using written number sentences and mathematical symbols, eg $38 + 7 = 45$ $40 = 30 + 10$ Use number lines to support and represent subtraction calculations, eg $36 - 17 = 19$ <p>Number line - counting back</p> <p>Bridging a multiple of 10</p> <p>Number line – counting up</p> <ul style="list-style-type: none"> Partitioning smaller number, eg $45 - 12 = 33$ $45 - 10 = 35$ $35 - 2 = 33$ 	<ul style="list-style-type: none"> Less than Take away Subtract Difference between Equals Hundreds Tens Ones 2 digit number (made up of 10s and ones, eg $34 - 3$ tens and 4 ones) Number bonds (a pair of numbers that make a specific total, eg 10) Partition (splitting a 2 or 3 digit numbers into different parts using place value, eg $37 = 30 + 7$, $37 = 30 + 5 + 2$, $125 = 100 + 20 + 5$) Bridging multiples of 10 (using multiples of 10 and number bonds to 10 to support addition – see example on number line) <p>Resources to support teaching</p> <p>Numicon Hundred squares Bead strings Marked and unmarked number lines Dienes equipment to represent 10s and 1s Place value cards and charts Other representations of 10s and 1s, eg straws, coins</p>



	Mental Calculation	Written Calculation	Vocabulary and Resources
Y2 x	<ul style="list-style-type: none"> Count in 2s, 5s and 10s Begin to count in 3s Begin to understand that multiplication is repeated addition and to use arrays, eg 3×4 is three rows of 4 dots Begin to learn the $\times 2$, $\times 3$, $\times 5$ and $\times 10$ tables, seeing these as 'lots of' eg 5 lots of 2, 6 lots of 2, 7 lots of 2 Double numbers up to 20 Begin to double multiples of 5 to 100 (eg 25, 40 etc...) Begin to double 2-digit numbers less than 50 with 1s digits of 1, 2, 3, 4 or 5 	<ul style="list-style-type: none"> Record calculations accurately using written number sentences and mathematical symbols, eg $3 \times 4 = 12$ $10 = 5 \times 2$ Use partitioning to support doubling, eg $24 \times 2 = 48$ $20 \times 2 = 40$ $4 \times 2 = 8$ $40 + 8 = 48$ 	<ul style="list-style-type: none"> Times Lots of Multiply Multiplication Groups of Equals Tens Ones Partition (splitting a 2 or 3 digit numbers into different parts using place value, eg $37 = 30 + 7$, $125 = 100 + 20 + 5$) Array (representation of a multiplication using dots, eg $2 \times 3 = 6$ shown using 2 rows of 3 dots) Commutativity (multiplication sums can be shown in 2 ways but keep the same value, eg $2 \times 3 = 6$; $3 \times 2 = 6$) Double (adding 2 of the same number or multiplying a number by 2, eg $3 + 3 = 6$, $2 \times 3 = 6$) <p>Resources to support teaching</p> <p>Numicon Bead strings Marked and unmarked number lines Place value cards and charts Dienes equipment to represent 10s and 1s Other representations of 2s and 5s, eg coins Multi link cubes Counters</p>



	Mental Calculation	Written Calculation	Vocabulary and Resources
Y2 ÷	<ul style="list-style-type: none">Count in 2s, 5s and 10sBegin to count in 3sUsing fingers, say where a given number is in the 2s, 5s or 10s count eg <i>8 is the fourth number when I count in 2s</i>Relate division to grouping eg <i>How many groups of 5 in 15?</i>Halve numbers to 20Begin to halve numbers to 40 and multiples of 10 to 100Find $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$ and $\frac{3}{4}$ of a quantity of objects and of amounts (whole number answers)	<ul style="list-style-type: none">Use number lines to support and represent calculations, eg $15 \div 5 = 3$ <p>A number line from 0 to 15 with major ticks at 0, 5, 10, and 15. Three arcs are drawn above the line, each starting at a multiple of 5 and ending at the next multiple of 5. The first arc is from 0 to 5, the second from 5 to 10, and the third from 10 to 15. Each arc is labeled with '+ 5' below it.</p>Use partitioning to support halving, eg $12 \div 2 = 6$ $10 \div 2 = 5$ $2 \div 2 = 1$ $5 + 1 = 6$	<ul style="list-style-type: none">DivideShare (shown by sharing objects into a certain number of groups)GroupHalfEqualsTensOnesArray (representation of a multiplication using dots, eg $2 \times 3 = 6$ shown using 2 rows of 3 dots)Fraction (splitting something into equal parts)Numerator (top number shown by the fraction – the number of parts you are focusing on)Denominator (bottom number – the number of equal parts that your object or number is split into) <p>Resources to support teaching</p> <p>Numicon Bead strings Marked number lines Other representations of 2s and 5s, eg coins Multi link cubes Counters</p>



LOWER KEY STAGE 2			
Year 3			
	Mental calculation	Written calculation	Vocabulary and Resources
Y3 +	<ul style="list-style-type: none"> Know pairs with each total to 20, eg $2 + 6 = 8$, $12 + 6 = 18$, $7 + 8 = 15$ 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, eg $300 + 8 + 50 = 358$ Use place value and number facts to add a 1-digit or 2-digit number to a 3-digit number, eg $104 + 56$ is 160 since $104 + 50 = 154$ and $6 + 4 = 10$ $676 + 8$ is 684 since $8 = 4 + 4$ and $76 + 4 + 4 = 84$ Add pairs of 'friendly' 3-digit numbers, eg $320 + 450$ (multiples of 10) Begin to add amounts of money using partitioning 	<ul style="list-style-type: none"> Use expanded column addition to add two or three 3-digit numbers or three 2-digit numbers, eg $124 + 35 = 159$ $100 + 20 + 4$ $+ \quad 30 + 5$ <hr/>$100 + 50 + 9$ Use expanded column addition to add two or three 3-digit numbers or three 2-digit numbers, including some carrying, eg $142 + 29 = 171$ $100 + 40 + 2$ $+ \quad 20 + 9$ <hr/>$100 + 70 + 1$ <hr/>10  <p>As 9 + 2 equals 11, the 10 is carried into the 10s column.</p> <ul style="list-style-type: none"> Begin to use compact column addition to add numbers with 3 digits, eg $123 + 145 = 268$ 123 $+ 145$ <hr/>268 	<ul style="list-style-type: none"> Altogether More Number bonds (a pair of numbers that make a specific total, eg $20 = 13 + 7$) Add Total Equals Hundreds Tens Ones 2 digit number (made up of 10s and ones, eg $34 = 3$ tens and 4 ones) Partition (splitting a 2 or 3 digit numbers into different parts using place value, eg $37 = 30 + 7$, $37 = 30 + 5 + 2$, $125 = 100 + 20 + 5$) Bridging multiples of 10 (using multiples of 10 and number bonds to 10 to support addition – see example on number line) Expanded column addition Carrying (moving amounts into the correct column, eg $9 + 2 = 11$ so 10 is moved into the tens column and 1 remains in the 1s) <p>Resources to support teaching Hundred squares Marked and unmarked number lines Dienes equipment to represent 10s and 1s</p>



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		<ul style="list-style-type: none">• Begin to add like fractions eg $\frac{3}{8} + \frac{1}{8} + \frac{1}{8} = \frac{5}{8}$• Recognise fractions that add to 1 eg $\frac{1}{4} + \frac{3}{4}$ eg $\frac{3}{5} + \frac{2}{5}$	Place value cards and charts Place value counters Other representations of 100s, 10s and 1s, eg coins
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	Mental calculation	Written calculation	Vocabulary and Resources
Y3 —	<ul style="list-style-type: none"> Know pairs with each total to 20, eg $8 - 2 = 6$ eg $18 - 6 = 12$ eg $15 - 8 = 7$ Subtract any two 2-digit numbers Perform place-value subtractions without a struggle, eg $536 - 30 = 506$ Subtract 2-digit numbers from numbers > 100 by counting up, eg $143 - 76$ 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 	<ul style="list-style-type: none"> Use counting up as an informal written strategy for subtracting pairs of 3-digit numbers, eg $423 - 357 = 66$ <p style="text-align: center;">Bridging through a multiple of 10</p> <ul style="list-style-type: none"> Use expanded column subtraction to subtract 2 or 3-digit numbers, eg $144 - 32 = 112$ $ \begin{array}{r} 100 + 40 + 4 \\ - \quad 30 + 2 \\ \hline 100 + 10 + 2 \end{array} $ <ul style="list-style-type: none"> Begin to subtract like fractions eg $\frac{7}{8} - \frac{3}{8} = \frac{4}{8}$ 	<ul style="list-style-type: none"> Take away Subtract Difference between Equals Hundreds Tens Ones 3 digit number (made up of 100s, 10s and 1s) Partition (splitting a 2 or 3 digit numbers into different parts using place value, eg $37 = 30 + 7$, $125 = 100 + 20 + 5$) Bridging multiples of 10 (using multiples of 10 and number bonds to 10 to support addition – see example on number line) <p>Resources to support teaching</p> <p>Hundred squares Marked and unmarked number lines Dienes equipment to represent 10s and 1s Place value cards and charts Place value counters Other representations of 100s, 10s and 1s, eg coins</p>



	Mental calculation	Written calculation	Vocabulary and Resources						
Y3 x	<ul style="list-style-type: none"> Know by heart all the multiplication facts in the $\times 2$, $\times 3$, $\times 4$, $\times 5$, $\times 8$ and $\times 10$ tables Multiply whole numbers by 10 and 100 Recognise that multiplication is commutative Use place value and number facts in mental multiplication eg 30×5 is 15×10 Partition teen numbers to multiply by a 1-digit number eg 3×14 as 3×10 and 3×4 Double numbers up to 50 	<ul style="list-style-type: none"> Use partitioning (grid multiplication) to multiply 2-digit and 3-digit numbers by 'friendly' 1-digit numbers, eg $27 \times 5 = 135$ <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">x</td> <td style="text-align: center;">20</td> <td style="text-align: center;">7</td> </tr> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">100</td> <td style="text-align: center;">35</td> </tr> </table> <p style="text-align: center;">$100 + 35 = 135$</p>	x	20	7	5	100	35	<ul style="list-style-type: none"> Times Lots of Multiply Multiplication Groups of Equals Tens Ones Partition (splitting a 2 or 3 digit numbers into different parts using place value, eg $37 = 30 + 7$, $125 = 100 + 20 + 5$) Commutativity (multiplication sums can be shown in 2 ways but keep the same value, eg $2 \times 3 = 6$; $3 \times 2 = 6$) Double (adding 2 of the same number or multiplying a number by 2, eg $24 + 24 = 48$, $2 \times 24 = 48$) <p><u>Resources to support teaching</u></p> <p>Numicon Marked and unmarked number lines Place value cards and charts Multiplication grids Dienes equipment to represent 10s and 1s Place value counters Other representations of 100s, 10s and 1s, eg coins</p>
x	20	7							
5	100	35							



	Mental calculation	Written calculation	Vocabulary and Resources
Y3 <div style="font-size: 2em;">÷</div>	<ul style="list-style-type: none"> Know by heart all the division facts derived from the $\times 2$, $\times 3$, $\times 4$, $\times 5$, $\times 8$ and $\times 10$ 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, eg $84 \div 4$ is half of 42 Divide larger numbers mentally by subtracting the 10th multiple as appropriate, including those with remainders, eg $57 \div 3$ is $10 + 9$ as $10 \times 3 = 30$ & $9 \times 3 = 27$ Halve even numbers to 100, halve odd numbers to 20 	<ul style="list-style-type: none"> Perform divisions just above the 10th multiple using horizontal or vertical jottings and understanding how to give a remainder as a whole number, Vertical jottings eg $57 \div 4 = 14 \text{ r } 1$ $\begin{array}{r} 57 \\ - 40 \text{ (10} \times 4\text{)} \\ \hline 17 \\ - 16 \text{ (4} \times 4\text{)} \\ \hline 1 \end{array}$ 1 ← remainder Horizontal jottings eg $56 \div 4 = 14$ Find unit fractions of quantities and begin to find non-unit fractions of quantities, eg $\frac{1}{6}$ of 30 = 5 $30 \div 6 = 5$ $\frac{2}{6}$ of 30 = 10 $2 \times 5 = 10$ 	<ul style="list-style-type: none"> Divide Share (shown by sharing objects into a certain number of groups) Group Half Equals Tens Ones Array (representation of a multiplication using dots, eg $2 \times 3 = 6$ shown using 2 rows of 3 dots) Fraction (splitting something into equal parts) Numerator (top number shown by the fraction – the number of parts you are focusing on) Denominator (bottom number – the number of equal parts that your object or number is split into) <p>Resources to support teaching</p> <p>Marked and unmarked number lines Other representations of 100s, 10s and 1s, eg coins Multi link cubes Counters Dienes equipment to represent 100s, 10s and 1s Place value counters</p>



Year 4			
	Mental calculation	Written calculation	Vocabulary and Resources
Y4 +	<ul style="list-style-type: none"> 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 100, £1 and whole number, eg $234 + 66 = 300$ eg $3.4 + 0.6 = 4$ Perform place-value additions without a struggle eg $300 + 8 + 50 + 4000 = 4358$ 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, eg $4004 + 156$ by knowing that: $6 + 4 = 10$ and that $4004 + 150 = 4154$ so the total is 4160 	<ul style="list-style-type: none"> Column addition for 3-digit and 4-digit numbers eg $5347 + 2286 =$ $\begin{array}{r} 5347 \\ + 2286 \\ \hline 7633 \\ \hline 11 \end{array}$  Amounts carried across to the next column Add like fractions eg $\frac{3}{5} + \frac{4}{5} = \frac{7}{5} = 1\frac{2}{5}$ Be confident with fractions that add to 1 and fraction complements to 1 eg $\frac{2}{3} + \frac{1}{3} = 1$ 	<ul style="list-style-type: none"> Altogether More Add Total Equals Thousands Hundreds Tens Ones Bridging multiples of 10 (using multiples of 10 and number bonds to 10 to support addition – see example on number line) Column addition Carrying (moving amounts into the correct column, eg $9 + 2 = 11$ so 10 is moved into the tens column and 1 remains in the 1s) Fraction (splitting something into equal parts) Numerator (top number shown by the fraction – the number of parts you are focusing on) Denominator (bottom number – the number of equal parts that your object or number is split into) Common denominator (fractions with the same denominator) <p>Resources to support teaching Marked and unmarked number lines Dienes equipment to represent 10s and 1s Place value cards, charts and counters</p>



	Mental calculation	Written calculation	Vocabulary and Resources
Y4 —	<ul style="list-style-type: none"> Subtract any two 2-digit numbers Know by heart/quickly derive number bonds to 100 Perform place-value subtractions without a struggle, eg $4736 - 706 = 4030$ Subtract multiples and near multiples of 10, 100, 1000, £1 and 10p Subtract multiples of 0.1 Subtract by counting up, eg $503 - 368$ 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 	<ul style="list-style-type: none"> Use expanded column subtraction for 3- and 4-digit numbers, eg $2345 - 273 = 2072$ $ \begin{array}{r} 2000 + 200 + 300 + 140 + 5 \\ - \quad \quad \quad 200 + 70 + 3 \\ \hline 2000 + \quad 0 + 70 + 2 \end{array} $ <p>Exchanging one of the 100s</p> <ul style="list-style-type: none"> Subtract by counting on to find the difference, eg $503 - 368 = 135$ <p>Bridging through a multiple of 10</p> <ul style="list-style-type: none"> Subtract like fractions eg $\frac{4}{5} - \frac{3}{5} = \frac{1}{5}$ Use fractions that add to 1 to find fraction complements to 1 eg $1 - \frac{2}{3} = \frac{1}{3}$ 	<ul style="list-style-type: none"> Take away Subtract Difference between Equals Thousands Hundreds Tens Ones 3 digit number (made up of 100s, 10s and 1s) Partition (splitting a 2 or 3 digit numbers into different parts using place value, eg $37 = 30 + 7$, $125 = 100 + 20 + 5$) Bridging multiples of 10 (using multiples of 10 and number bonds to 10 to support addition – see example on number line) Fraction (splitting something into equal parts) Numerator (top number shown by the fraction – the number of parts you are focusing on) Denominator (bottom number – the number of equal parts that your object or number is split into) Common denominator (fractions with the same denominator) <p>Resources to support teaching</p> <p>Marked and unmarked number lines Dienes equipment to represent 10s and 1s Place value cards and charts Place value counters</p>



St Mary's C of E Primary School

Maths Policy – Autumn 2017

	Mental calculation	Written calculation	Vocabulary and Resources									
Y4 x	<ul style="list-style-type: none"> Know by heart all the multiplication facts up to 12×12 Recognise factors up to 12 of 2-digit numbers Multiply whole numbers and 1-place decimals by 10, 100, 1000 Multiply multiples of 10, 100 and 1000 by 1-digit numbers, eg 300×6 eg 4000×8 Use understanding of place value and number facts in mental multiplication, eg 36×5 is half of 36×10 eg $50 \times 60 = 3000$ (using 5×6) Partition 2-digit numbers to multiply by a 1-digit number mentally, eg 4×24 as 4×20 and 4×4 Multiply near multiples by rounding, eg 33×19 as $(33 \times 20) - 33$ Find doubles to double 100 and beyond using partitioning Begin to double amounts of money eg $£35.60$ doubled is $£71.20$ 	<ul style="list-style-type: none"> Use a vertical written method to multiply a 1-digit number by a 3-digit number, eg $134 \times 4 = 536$ $\begin{array}{r} 134 \\ \times 4 \\ \hline 16 \quad (4 \times 4) \\ 120 \quad (4 \times 30) \\ \hline 400 \quad (4 \times 100) \\ \hline 536 \end{array}$ Use an efficient written method to multiply a 2-digit number by a number between 10 and 20 by partitioning (grid method), eg $27 \times 14 = 378$ <table border="1" style="margin: 10px auto;"> <tr> <td style="text-align: center;">x</td> <td style="text-align: center;">20</td> <td style="text-align: center;">7</td> </tr> <tr> <td style="text-align: center;">10</td> <td style="text-align: center;">200</td> <td style="text-align: center;">70</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">80</td> <td style="text-align: center;">28</td> </tr> </table> $200 + 70 = 270$ $80 + 28 = 108$ $270 + 108 = 378$ 	x	20	7	10	200	70	4	80	28	<ul style="list-style-type: none"> Times Lots of Multiply Multiplication Groups of Equals Ones Tens Hundreds Commutativity (multiplication sums can be shown in 2 ways but keep the same value, eg $2 \times 3 = 6$; $3 \times 2 = 6$) Double (adding 2 of the same number or multiplying a number by 2, eg $24 + 24 = 48$, $2 \times 24 = 48$) <p>Resources to support teaching</p> <p>Numicon</p> <p>Marked and unmarked number lines</p> <p>Place value cards and charts</p> <p>Multiplication grids</p> <p>Dienes equipment to represent 10s and 1s</p> <p>Place value counters</p> <p>Other representations of 100s, 10s and 1s, eg coins</p>
x	20	7										
10	200	70										
4	80	28										



	Mental calculation	Written calculation	Vocabulary and Resources
Y4 <div style="font-size: 2em;">÷</div>	<ul style="list-style-type: none"> Know by heart all the division facts up to $144 \div 12$ Divide whole numbers by 10, 100, to give whole number answers or answers with 1 decimal place Divide multiples of 100 by 1-digit numbers using division facts, eg $3200 \div 8 = 400$ Use place value and number facts in mental division, eg $245 \div 20$ is half of $245 \div 10$ Divide larger numbers mentally by subtracting the 10th or 20th multiple as appropriate, eg $156 \div 6$ is 20×6 as $20 \times 6 = 120$ and $6 \times 6 = 36$ Find halves of even numbers to 200 and beyond using partitioning Begin to halve amounts of money eg <i>half of £52.40 is £26.20</i> 	<ul style="list-style-type: none"> Use a written method to divide a 2-digit or a 3-digit number by a 1-digit number. Give remainders as whole numbers eg $115 \div 4 = 28 \text{ r } 3$ $ \begin{array}{r} 115 \\ - 80 \text{ (} 20 \times 4 \text{)} \\ \hline 35 \\ - 32 \text{ (} 8 \times 4 \text{)} \\ \hline 3 \leftarrow \text{remainder} \end{array} $ <ul style="list-style-type: none"> Begin to reduce fractions to their simplest forms, eg $\frac{9}{12} = \frac{3}{4}$ Find unit and non-unit fractions of larger amounts, eg $\frac{3}{7}$ of 700 = 300 $700 \div 7 = 100$ $100 \times 3 = 300$	<ul style="list-style-type: none"> Divide Share (shown by sharing objects into a certain number of groups) Group Half Equals Ones Tens Hundreds Fraction (splitting something into equal parts) Numerator (top number shown by the fraction – the number of parts you are focusing on) Denominator (bottom number – the number of equal parts that your object or number is split into) <p>Resources to support teaching</p> <p>Marked and unmarked number lines Other representations of 100s, 10s and 1s, eg coins Multi link cubes Counters Dienes equipment to represent 100s, 10s and 1s Place value counters Multiplication grids</p>



UPPER KEY STAGE 2			
Year 5			
	Mental calculation	Written calculation	Vocabulary and Resources
Y5 +	<ul style="list-style-type: none"> Know number bonds to 1 and to the next whole number Add to the next 10 from a decimal number, eg $13.6 + 6.4 = 20$ Add numbers with 2 significant digits only, using mental strategies, eg $3.4 + 4.8$ eg $23\ 000 + 47\ 000$ Add 1- or 2-digit multiples of 10, 100, 1000, 10 000 and 100 000, eg $8000 + 7000$ eg $600\ 000 + 700\ 000$ Add near multiples of 10, 100, 1000, 10 000 and 100 000 to other numbers, eg $82\ 472 + 30\ 004$ Add decimal numbers which are near multiples of 1 or 10, including money, eg $6.34 + 1.99$ eg $£34.59 + £19.95$ Use place value and number facts to add two or more 'friendly' numbers, including money and decimals, eg $3 + 8 + 6 + 4 + 7$ eg $0.6 + 0.7 + 0.4$ eg $2056 + 44$ 	<ul style="list-style-type: none"> Use column addition to add two or three whole numbers with up to 5 digits, eg $12374 + 3175 = 15549$ $\begin{array}{r} 12374 \\ + 3175 \\ \hline 15549 \end{array}$ <p style="text-align: center;">1 ↖</p> Amount carried across to the next column Use column addition to add any pair of 2-place decimal numbers, including amounts of money, eg $37.23 + 16.17 = 53.40$ $\begin{array}{r} 37.23 \\ + 16.17 \\ \hline 53.40 \end{array}$ <p style="text-align: center;">1 1 ↖</p> Amounts carried across to the next column Begin to add related fractions using equivalences eg $\frac{1}{2} + \frac{1}{6} = \frac{3}{6} + \frac{1}{6}$ 	<ul style="list-style-type: none"> Altogether More Add Total Equals Hundred thousands Ten thousands Tenths Hundredths Column addition Carrying (moving amounts into the correct column, eg $9 + 2 = 11$ so 10 is moved into the tens column and 1 remains in the 1s) Fraction (splitting something into equal parts) Numerator (top number shown by the fraction – the number of parts you are focusing on) Denominator (bottom number – the number of equal parts that your object or number is split into) Common denominator (fractions with the same denominator) <p>Resources to support teaching</p> <p>Marked and unmarked number lines Dienes equipment to represent 10s and 1s Place value cards, charts and counters</p>



	Mental calculation	Written calculation	Vocabulary and Resources
Y5 —	<ul style="list-style-type: none"> Subtract numbers with 2 significant digits only, using mental strategies, eg $6.2 - 4.5$ eg $72\ 000 - 47\ 000$ Subtract 1- or 2-digit multiples of 10, 100, 1000, 10 000 and 100 000, eg $8000 - 3000$ eg $60\ 000 - 200\ 000$ Subtract 1- or 2-digit near multiples of 10, 100, 1000, 10 000 and 100 000 from other numbers, eg $82\ 472 - 30\ 004$ Subtract decimal numbers which are near multiples of 1 or 10, including money, eg $6.34 - 1.99$ eg $£34.59 - £19.95$ Use counting up subtraction, with knowledge of number bonds to 10, 100 or £1, as a strategy to perform mental subtraction, eg $£10 - £3.45$ eg $1000 - 782$ Recognise fraction complements to 1 and to the next whole number, eg $1\frac{2}{5} + \frac{3}{5} = 2$ 	<ul style="list-style-type: none"> Use compact or expanded column subtraction to subtract numbers with up to 5 digits Expanded column subtraction eg $12345 - 2273 = 10072$ $\begin{array}{r} 10000 + 2000 + 200 + 300 + 40 + 5 \\ - 2000 + 200 + 70 + 3 \\ \hline 10000 + 0 + 0 + 70 + 2 \end{array}$ Exchanging one of the 100s Compact column subtraction eg $12\overset{2}{3}\overset{1}{4}5$ $\begin{array}{r} 12\overset{2}{3}\overset{1}{4}5 \\ - 2\overset{1}{2}73 \\ \hline 10\ 0\ 72 = 10072 \end{array}$ Exchanging one of the 100s Begin to subtract related fractions using equivalences, eg $\frac{1}{2} - \frac{1}{6} = \frac{2}{6}$ 	<ul style="list-style-type: none"> Altogether More Add Total Equals Hundred thousands Ten thousands Thousands Tenths Hundredths Column subtraction Exchanging (taking amounts from one column to another) Fraction (splitting something into equal parts) Numerator (top number shown by the fraction – the number of parts you are focusing on) Denominator (bottom number – the number of equal parts that your object or number is split into) Common denominator (fractions with the same denominator) <p>Resources to support teaching Marked and unmarked number lines Dienes equipment to represent 10s and 1s Place value cards, charts and counters</p>

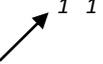


	Mental calculation	Written calculation	Vocabulary and Resources
Y5 x	<ul style="list-style-type: none"> Know by heart all the multiplication facts up to 12×12 Multiply whole numbers and 1- and 2-place decimals by 10, 100, 1000, 10 000 Use knowledge of factors and multiples in multiplication, eg 43×6 is double 43×3 eg 28×50 is $\frac{1}{2}$ of $28 \times 100 = 1400$ Use knowledge of place value and rounding in mental multiplication, eg 67×199 as $67 \times 200 - 67$ Use doubling and halving as a strategy in mental multiplication, eg 58×5 is half of 58×10 eg 34×4 is 34 doubled twice Partition 2-digit numbers, including decimals, to multiply by a 1-digit number mentally, eg 6×27 as 6×20 (120) plus 6×7 (42) eg 6.3×7 as 6×7 (42) plus 0.3×7 (2.1) Double amounts of money by partitioning, eg $£37.45$ doubled is $£37$ doubled ($£74$) plus $45p$ doubled ($90p$) giving a total of $£74.90$ 	<ul style="list-style-type: none"> Use short multiplication to multiply a 1-digit number by a number with to 4 digits, eg $2134 \times 4 = 8536$ $\begin{array}{r} 2134 \\ \times 4 \\ \hline 8536 \\ \hline 11 \end{array}$ <p style="text-align: center;">↙ Amounts carried across to the next column</p> Use long multiplication to multiply 3-digit and 4-digit numbers by a number between 11 and 20, eg $4235 \times 12 = 50820$ $\begin{array}{r} 4235 \\ \times 12 \\ \hline 8470 \\ + 42350 \\ \hline 50820 \end{array}$ Find simple percentages of amounts eg 10%, 5%, 20%, 15% and 50% Begin to multiply fractions and mixed numbers by whole numbers ≤ 10 eg $4 \times \frac{2}{3} = \frac{8}{3} = 2 \frac{2}{3}$ 	<ul style="list-style-type: none"> Times Lots of Multiply Multiplication Product Groups of Equals Double (adding 2 of the same number or multiplying a number by 2, eg $24 + 24 = 48$, $2 \times 24 = 48$) Short multiplication Long multiplication Tens Ones Hundreds Thousands Partition <p>Resources to support teaching</p> <p>Place value cards and charts Multiplication grids Dienes equipment to represent 10s and 1s Place value counters Other representations of 100s, 10s and 1s, eg coins</p>



	Mental calculation	Written calculation	Vocabulary and Resources
Y5 ÷	<ul style="list-style-type: none"> Know by heart all the division facts up to $144 \div 12$ 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, eg $34 \div 5$ is $(34 \div 10) \times 2$ Use knowledge of multiples and factors, as well as tests for divisibility, in mental division, eg $246 \div 6$ is $123 \div 3$ eg <i>We know that 525 divides by 25 and by 3</i> Halve amounts of money by partitioning, eg $\frac{1}{2}$ of $\pounds 75.40 = \frac{1}{2}$ of $\pounds 75$ ($\pounds 37.50$) plus half of 40p (20p) which is $\pounds 37.70$ Divide larger numbers mentally by subtracting the 10th or 100th multiple as appropriate, eg $96 \div 6$ is $10 + 6$, as $10 \times 6 = 60$ and $6 \times 6 = 36$ eg $312 \div 3$ is $100 + 4$ as $100 \times 3 = 300$ and $4 \times 3 = 12$ Know tests for divisibility by 2, 3, 4, 5, 6, 9 and 25 Know square numbers and cube numbers Reduce fractions to their simplest form 	<ul style="list-style-type: none"> Use short division to divide a number with up to 4 digits by a number ≤ 12, eg $139 \div 3 = 46 \text{ r } 1$ or $\frac{1}{3}$ <div style="text-align: center;"> <p style="text-align: center;"><i>Amounts carried over</i></p> </div> <ul style="list-style-type: none"> Give remainders as whole numbers or as fractions (see above) Find non-unit fractions of large amounts, eg $\frac{3}{5}$ of $250 = 150$ <div style="text-align: center;"> $250 \div 5 = 50$ $3 \times 50 = 150$ </div> <ul style="list-style-type: none"> Turn improper fractions into mixed numbers and vice versa, eg $\frac{14}{5} = 2\frac{4}{5}$ 	<ul style="list-style-type: none"> Divide Share (shown by sharing objects into a certain number of groups) Group Half Equals Ones Tens Hundreds Thousands Remainder Fraction (splitting something into equal parts) Numerator (top number shown by the fraction – the number of parts you are focusing on) Denominator (bottom number – the number of equal parts that your object or number is split into) <p>Resources to support teaching</p> <p>Marked and unmarked number lines Other representations of 100s, 10s and 1s, eg coins Multi link cubes Counters Dienes equipment to represent 100s, 10s and 1s Place value counters Multiplication grids</p>



Year 6			
	Mental calculation	Written calculation	Vocabulary and Resources
Y6 +	<ul style="list-style-type: none"> Know by heart number bonds to 100 and use these to derive related facts, eg $3.46 + 0.54$ 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 mentally, eg $34\ 000 + 8000$ Add multiples of powers of 10 and near multiples of the same, eg $6345 + 199$ 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, eg $4.5 + 6.3$ eg $0.74 + 0.33$ Add positive numbers to negative numbers, eg <i>Calculate a rise in temperature or continue a sequence beginning with a negative number</i> 	<ul style="list-style-type: none"> Use column addition to add numbers with up to 5 digits, eg $12374 + 3175 = 15549$ $\begin{array}{r} 12374 \\ + 3175 \\ \hline 15549 \end{array}$  Amount carried across to the next column Use column addition to add decimal numbers with up to 3 decimal places eg $37.23 + 16.17 = 53.40$ $\begin{array}{r} 37.23 \\ + 16.17 \\ \hline 53.40 \end{array}$  Amounts carried across to the next column Add mixed numbers and fractions with different denominators, eg $1\frac{2}{4} + \frac{5}{8} =$ $\frac{12}{8} + \frac{5}{8} = \frac{17}{8} = 2\frac{1}{8}$ 	<ul style="list-style-type: none"> Altogether More Add Total Equals Hundred thousands Ten thousands Tenths Hundredths Column addition Carrying (moving amounts into the correct column, eg $9 + 2 = 11$ so 10 is moved into the tens column and 1 remains in the 1s) Fraction (splitting something into equal parts) Numerator (top number shown by the fraction – the number of parts you are focusing on) Denominator (bottom number – the number of equal parts that your object or number is split into) Common denominator (fractions with the same denominator) <p>Resources to support teaching Marked and unmarked number lines Dienes equipment to represent 10s and 1s Place value cards, charts and counters</p>



	Mental calculation	Written calculation	Vocabulary and Resources
Y6 —	<ul style="list-style-type: none"> Use number bonds to 100 to perform mental subtraction of any pair of integers by complementary addition, eg $1000 - 654$ as $46 + 300$ in our heads Use number bonds to 1 and 10 to perform mental subtraction of any pair of 1-place or 2-place decimal numbers using complementary addition and including money, eg $10 - 3.65$ as $0.35 + 6$ eg $£50 - £34.29$ as $71p + £15$ Use number facts and place value to perform mental subtraction of large numbers or decimal numbers with up to 2 places, eg $467\,900 - 3005$ eg $4.63 - 1.02$ Subtract multiples of powers of 10 and near multiples of the same Subtract negative numbers in a context such as temperature where the numbers make sense 	<ul style="list-style-type: none"> Use column subtraction to subtract numbers with up to 6 digits, eg $12345 - 2273 = 10072$ $ \begin{array}{r} 12^2 \overset{1}{3} 45 \\ - \quad 2 \ 2 \ 73 \\ \hline 10 \ 0 \ 72 = 10072 \end{array} $ <p style="text-align: center;"><i>Exchanging one of the 100s</i></p> <ul style="list-style-type: none"> Subtract mixed numbers and fractions with different denominators, eg $1 \frac{4}{6} - \frac{5}{12} = 1 \frac{3}{12}$ $\frac{20}{12} - \frac{5}{12} = \frac{15}{12} = 1 \frac{3}{12}$ 	<ul style="list-style-type: none"> Altogether More Add Total Equals Hundred thousands Ten thousands Thousands Tenths Hundredths Column subtraction Exchanging (taking amounts from one column to another) Fraction (splitting something into equal parts) Numerator (top number shown by the fraction – the number of parts you are focusing on) Denominator (bottom number – the number of equal parts that your object or number is split into) Common denominator (fractions with the same denominator) Mixed numbers (amounts made up of whole numbers and fractions, eg $2 \frac{1}{4}$) <p>Resources to support teaching Marked and unmarked number lines Dienes equipment to represent 10s and 1s Place value cards, charts and counters</p>



	Mental calculation	Written calculation	Vocabulary and Resources
Y6 x	<ul style="list-style-type: none"> Know by heart all the multiplication facts up to 12×12 Multiply whole numbers and decimals with up to 3 places by 10, 100 or 1000, eg $234 \times 1000 = 234\ 000$ eg $0.23 \times 1000 = 230$ Identify common factors, common multiples and prime numbers and use factors in mental multiplication, eg 326×6 is 652×3 which is 1956 Use place value and number facts in mental multiplication, eg $4000 \times 6 = 24\ 000$ eg $0.03 \times 6 = 0.18$ Use doubling and halving as mental multiplication strategies, including to multiply by 2, 4, 8, 5, 20, 50 and 25, eg 28×25 is a quarter of $28 \times 100 = 700$ Use rounding in mental multiplication, eg 34×19 as $(34 \times 20) - 34$ Multiply 1- and 2-place decimals by numbers up to and including 10 using place value and partitioning, eg 3.6×4 is $12 + 2.4$ eg 2.53×3 is $6 + 1.5 + 0.09$ Double decimal numbers with up to 2 places using partitioning, eg 36.73 doubled is double 36 (72) plus double 0.73 (1.46) 	<ul style="list-style-type: none"> Use short multiplication to multiply a 1-digit number by a number with up to 4 digits, eg $2134 \times 4 = 8536$ $\begin{array}{r} 2134 \\ \times 4 \\ \hline 8536 \\ \leftarrow 11 \end{array}$ <p>Amounts carried across to the next column</p> Use long multiplication to multiply a 2-digit number by a number with up to 4 digits, eg $4235 \times 12 = 50820$ $\begin{array}{r} 4235 \\ \times 12 \\ \hline 8470 \\ + 42350 \\ \hline 50820 \end{array}$ Use short multiplication to multiply a 1-digit number by a number with 1 or 2 decimal places, including amounts of money (see example on next page) eg $13.4 \times 4 =$ 	<ul style="list-style-type: none"> Times Lots of Multiply Multiplication Product Groups of Equals Double (adding 2 of the same number or multiplying a number by 2, eg $24 + 24 = 48$, $2 \times 24 = 48$) Short multiplication Long multiplication Ones Tens Hundreds Thousands Tenths Hundredths Partition Mixed numbers (amounts made up of whole numbers and fractions, eg $2 \frac{1}{4}$) <p>Resources to support teaching Place value cards and charts Multiplication grids Dienes equipment to represent 10s and 1s Place value counters</p>



		$\begin{array}{r} 13.4 \\ \times 4 \\ \hline 53.6 \\ \hline 11 \end{array}$ <p> Amounts carried across to the next column</p> <ul style="list-style-type: none">• Multiply fractions and mixed numbers by whole numbers, eg $\frac{3}{4} \times 6 = \frac{18}{4}$ <p>Numerator multiplied by the whole number. Denominator remains the same.</p> <ul style="list-style-type: none">• Multiply fractions by proper fractions eg $\frac{1}{2} \times \frac{1}{4} = \frac{1}{8}$ <p>Multiply the numerators, then multiply the denominators.</p>	
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	Mental calculation	Written calculation	Vocabulary and Resources
Y6 ÷	<ul style="list-style-type: none"> Know by heart all the division facts up to $144 \div 12$ Divide whole numbers by powers of 10 to give whole number answers or answers with up to 3 decimal places Identify common factors, common multiples and primes numbers and use factors in mental division, eg $438 \div 6$ is $219 \div 3$ which is 73 Use tests for divisibility to aid mental calculation Use doubling and halving as mental division strategies, for example to divide by 2, 4, 8, 5, 20 and 25, eg $628 \div 8$ is halved three times: 314, 157, 78.5 Divide 1- and 2-place decimals by numbers up to and including 10 using place value, eg $2.4 \div 6 = 0.4$ eg $0.65 \div 5 = 0.13$ eg $\pounds 6.33 \div 3 = \pounds 2.11$ Halve decimal numbers with up to 2 places using partitioning, eg <i>Half of 36.86 is half of 36 (18) plus half of 0.86 (0.43)</i> Know and use equivalence between simple fractions, decimals and percentages, including in different contexts Recognise a given ratio and reduce a given ratio to its lowest terms 	<ul style="list-style-type: none"> Use short division to divide a number with up to 4 digits by a 1-digit or a 2-digit number, eg $139 \div 3 = 46 \text{ r } 1$ or $\frac{1}{3}$ <div style="text-align: center;"> <p style="text-align: center;">Amounts carried over</p> </div> <ul style="list-style-type: none"> Use long division to divide 3-digit and 4-digit numbers by 'friendly' 2-digit numbers eg $4176 \div 13 = 321 \text{ r } 3$ or $\frac{3}{13}$ or 0.23 <div style="text-align: center;"> $300 + 20 + 1 = 321 \text{ r } 3 \text{ or } \frac{3}{13}$ </div> <ul style="list-style-type: none"> Give remainders as whole numbers or as fractions or as decimals (see example above) 	<ul style="list-style-type: none"> Divide Share (shown by sharing objects into a certain number of groups) Group Half Equals Hundreds Thousands Decimal Tenths Hundredths Short division Long division Remainder Fraction (splitting something into equal parts) Numerator (top number shown by the fraction – the number of parts you are focusing on) Denominator (bottom number – the number of equal parts that your object or number is split into) <p>Resources to support teaching</p> <p>Marked and unmarked number lines Other representations of 100s, 10s and 1s, eg coins Multi link cubes Counters Dienes equipment to represent 100s, 10s and 1s Place value counters Multiplication grids</p>



St Mary's C of E Primary School Maths Policy – Autumn 2017

		<ul style="list-style-type: none">• Divide a 1-place or a 2-place decimal number by a number ≤ 12 using place value, eg $3.65 \div 5 =$ $365 \div 5$ (using short division) = 73 $73 \div 100 = 0.73$• Divide proper fractions by whole numbers eg $\frac{1}{4} \div 2 = \frac{1}{8}$	
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St Mary's Whole School Overview for Mathematics – Autumn 2013 – Appendix B

	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Number and place value (NPV)	<ul style="list-style-type: none"> Count reliably with numbers from 1 to 20 and place them in order. 	<ul style="list-style-type: none"> Count using one-to-one correspondence (≤ 20). Order and compare numbers to 20, using $<$ and $>$. Understand 0 as the empty set. Estimate a set of objects (≤ 20). Use language: equal to, more than, less/fewer than, most, least. Say ordinal numbers (≤ 20). Understand place value in teen numbers. Count to and across 100. Count, read and write numbers to 100 in numerals. 	<ul style="list-style-type: none"> Read and write numbers to at least 100 in numerals and in words. Estimate a set of objects (≤ 100) and count in 5s or 10s to check. Understand place value in 2-digit numbers by creating 2-digit numbers, placing them on a number line and solving place value additions and subtractions. Order and compare 2-digit numbers and say a number between. Use language: equal to, more than, less/fewer than, most, least. Count on and back in 10s from any number up to 100. Understand place value in teen numbers. Use $<$, $>$ and $=$ signs. 	<ul style="list-style-type: none"> Understand place value in 2-digit numbers. Understand place value in 3-digit numbers. Order and compare 3-digit numbers and say a number between. Count in 1s beyond 100. Count in 10s and 100s up to 1000. Count from 0 in multiples of 4, 8, 50 and 100. Round 3-digit numbers up or down to the nearest 100 and 10. 	<ul style="list-style-type: none"> Understand place value in 4-digit numbers. Order and compare 4-digit numbers and say a number between. Count in multiples of 6, 7, 9, 25 and 1000. Count up and down in hundredths. Divide 3-digit multiples of 10 by 10. Divide 2-digit numbers by 10 to get 1-place decimal answers. Round 4-digit numbers up or down to the nearest 10, 100 or 1000. Find 1000 more or less than a given number. Count backwards through zero to include negative numbers. Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value. 	<ul style="list-style-type: none"> Understand place value in 5-digit and 6-digit numbers. Count in 1s, 100s and 1000s beyond 9999. Order and compare 5-digit numbers and say a number between. Understand the effect of multiplying or dividing a given number by 10, 100 or 1000; answers < 100000 and with not more than 2 decimal places. Round 5-digit numbers up or down to the nearest 10, 100, 1000 or 10000. Round 6-digit numbers up or down to the nearest 10, 100, 1000, 10000 or 100,000. Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero. Read Roman numerals to 1000 (M) and recognise years written in Roman numerals. 	<ul style="list-style-type: none"> Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit. Round any whole number to a required degree of accuracy. Use negative numbers in context, and calculate intervals across zero.



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Mental addition and subtraction (MAS)	<ul style="list-style-type: none"> • Say which number is one more or one less than a given number. • Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. 	<ul style="list-style-type: none"> • Say the number 1 more or less than (numbers ≤ 10). • Find addition pairs and subitise to 5, 6, 7, 8, 9 & 10. • Count on 1, 2, 3 more than numbers up to and just beyond 20. • Use number facts to 10 to solve problems including word problems. • Add several 1-digit numbers. • Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = __ - 9$. 	<ul style="list-style-type: none"> • Recall number facts to 20; number pairs (4 to 20) and bonds to 10 and 20. • Know number bonds to 100, including multiple of 10 and 5 bonds. • Add and subtract 1-digit to/from 2-digit numbers, bridging 10 and using known facts. • Add and subtract multiples of 10 to and from a 2-digit number. • Add three 1-digit numbers. • Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot. • Recognise and use the inverse relationship between addition and subtraction. 	<ul style="list-style-type: none"> • Use number facts to 10 to solve problems including word problems. • Add several 1-digit numbers. • Know number bonds to 100, including multiple of 10 and 5 bonds. • Add and subtract multiples of 10 to and from a 2-digit number. • Add 1-digit to 2-digit numbers, bridging 10 and using known facts. • Add and subtract near multiples of 10 to and from 2-digit numbers. • Add pairs of 2-digit numbers using partitioning (totals ≤ 100). • Subtract 2-digit from 2-digit numbers by counting up or back. 	<ul style="list-style-type: none"> • Know number bonds to 100. • Add to the next multiple of 100 by counting up from any 2-digit or 3-digit number. • Subtract a 3-digit from a 3-digit number by counting up. • Add mentally several 1-digit numbers, multiples of 10 or 100. • Add pairs of 2-digit numbers with a total ≤ 198. • Subtract 2-digit from 2-digit numbers by counting up or back. 	<ul style="list-style-type: none"> • Add pairs of 2-digit numbers using partitioning (totals ≤ 100). • Subtract 2-digit from 2-digit numbers by counting up or back. • Use number facts to 10 to solve problems including word problems. • Count up to subtract any 3-digit from 3-digit number. • Use mental strategies to add 2-digit, 3-digit and 4-digit numbers. • Subtract 3-digit from 4-digit numbers by counting up. • Use counting up strategies to quickly calculate change. • Understand addition and subtraction as inverses of each other and use this to find relationships. 	<ul style="list-style-type: none"> • Perform mental calculations, including with mixed operations and large numbers.
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ental multiplication and division (MMD)	<ul style="list-style-type: none"> Solve problems, including doubling, halving and sharing. 	<ul style="list-style-type: none"> Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher. 	<ul style="list-style-type: none"> Double numbers to 20, including partitioning teen numbers, and find related halves. Count in 2s to 20. Count in 10s to 100. Count in 5s to 50. Recognising odd and even numbers. Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot. 	<ul style="list-style-type: none"> Recall multiplication and division facts for the $\times 10$ table. Count in 5s and recall multiplication and division facts for the $\times 5$ table. Count in 2s and recall multiplication and division facts for the $\times 2$ table. Count on and back in 4s. Recall multiplication and division facts for the $\times 4$ table. Recall multiplication and division facts for the $\times 3$ table. Double numbers to 12 and find related halves. Double numbers to 20, including partitioning teen numbers, and find related halves. Double and halve numbers to 100, including partitioning 2-digit numbers. Learn to divide with remainders. 	<ul style="list-style-type: none"> Count in 6s and recall multiplication and division facts for the $\times 6$ table. Count in 9s and recall multiplication and division facts for the $\times 9$ table. Multiply multiples of 10 or 100 by 1-digit numbers. Multiply mentally 2-digit by 1-digit numbers using partitioning. Double and halve 3-digit numbers by partitioning. Multiplying together three numbers. 	<ul style="list-style-type: none"> Use doubling and halving to multiply and divide by 4 and 8 and solve correspondence problems. Use advanced mental multiplication strategies. Apply divisibility tests for 2, 3, 4, 5, 9 and 25. Identify factors and multiples, and begin to find common factors. Use mental strategies to solve divisions including dividing by 1. Multiply and divide multiples of 10, 100 and 1000 by 1-digit numbers. Understand division as the inverse of multiplication. Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. Establish whether a number up to 100 is prime and recall prime numbers up to 19. 	<ul style="list-style-type: none"> Perform mental calculations, including with mixed operations and large numbers. Identify common factors, common multiples and prime numbers.
Written addition and subtraction (WAS)				<ul style="list-style-type: none"> Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction. Estimate the answer to a calculation and use inverse operations to check answers. Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. 	<ul style="list-style-type: none"> Use compact column addition to add pairs of 3-digit numbers with a total < 1000. Use column addition to add three 3-digit numbers with a total < 1000. Use expanded decomposition to subtract 3-digit from 3-digit numbers. Use column addition to add two 4-digit numbers. 	<ul style="list-style-type: none"> Use column addition to add two 4-digit numbers. Use expanded or compact decomposition to subtract 3-digit from 3-digit numbers Use expanded or compact decomposition to subtract numbers with up to 4-digits. 	<ul style="list-style-type: none"> Solve addition and subtraction multi-step problems in context.



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Written multiplication and division (WMD)				<ul style="list-style-type: none">• Multiply 2-digit numbers by 1-digit numbers, using written methods, including partitioning and grid method.	<ul style="list-style-type: none">• Multiply 3-digit by 1-digit numbers using the grid method.• Multiply 3-digit by 1-digit numbers using the ladder method.• Divide numbers just beyond the tables by subtracting the multiple of 10, eg. $84 \div 7 =$• Divide numbers just beyond the tables, with integer remainders.	<ul style="list-style-type: none">• Multiply 3-digit or 4-digit by 1-digit numbers using the ladder method.• Multiply 3-digit by 1-digit numbers using the grid method.• Use the grid method to multiply 2-digit by 2-digit numbers and solve problems.• Divide 3-digit by 1-digit numbers using a written method drawn from mental strategies with integer remainders and answers < 50.• Divide numbers just beyond the tables, with remainders given as fractions where the fraction is obvious.	<ul style="list-style-type: none">• Multiply up to 4 digits by a two-digit whole number using the formal written method of long multiplication.• Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division• Interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context.• Multiply one-digit numbers with up to two decimal places by whole numbers.• Use written division methods in cases where the answer has up to two decimal places.
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Fractions, ratio and proportion (FRP)		<ul style="list-style-type: none"> Recognise, find and name a half as one of two equal parts of an object, shape or quantity. Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity. 	<ul style="list-style-type: none"> Recognise, find, name and write fractions, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, and of a length, shape, set of objects or quantity. Write simple fractions for example, $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{1}{2}$ and $\frac{2}{4}$. 	<ul style="list-style-type: none"> Compare fractions using number lines and fraction strips. Use fraction strips to find fractions of amounts. Understand the concept of a unit fraction; $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{8}$. Find unit fractions of small numbers. Count up and down in tenths. Recognise and show, using diagrams, equivalent fractions with small denominators. Add and subtract fractions with the same denominator within one whole. 	<ul style="list-style-type: none"> Find unit fractions of amounts and relate to division. Begin to understand equivalence by placing fractions on a number line. Use equivalent fractions to reduce any given fraction to its simplest form. Count in $\frac{1}{4}$s beyond 1 to 10, saying equivalent fractions Count in fractions, including equivalents. Recognise and write decimal equivalents of any number of tenths or hundredths. 	<ul style="list-style-type: none"> Compare and order unit fractions and related fractions, using fraction walls and strips. Place mixed fractions on a number line to compare fractions with the same denominator. Use equivalent fractions to reduce any given fraction to its simplest form. Recognise the equivalence of simple fractions and decimals. Recognise mixed numbers and improper fractions and convert from one form to the other. Add and subtract fractions with the same denominator and denominators that are multiples of the same number. Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. Read and write decimal numbers as fractions. 	<ul style="list-style-type: none"> Use common factors to simplify fractions; use common multiples to express fractions in the same denomination. Compare and order fractions, including fractions > 1. Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions. Multiply simple pairs of proper fractions, writing the answer in its simplest form. Divide proper fractions by whole numbers. Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts. Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison. Solve problems involving similar shapes where the scale factor is known or can be found. Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.
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Decimals, percentages and their equivalence to fractions (DPE)					<ul style="list-style-type: none">• Understand 2-place decimals in the context of money and length, recognise and write decimal equivalents to $1/4$; $1/2$; $3/4$.• Relate 1-place decimals to 2-place decimals in the context of length (m and cm).• Match 1-place decimals to $1/10$s.• Divide integers by 10, 100 and 1000 to get 1-place decimal answers.• Round decimals with one decimal place to the nearest whole number.	<ul style="list-style-type: none">• Match 2-place decimals to $1/100$s, using a place value grid.• Use place value to multiply and divide numbers by 10 and 100, involving 2-place decimals.• Use place value to add and subtract 0.1 and 0.01 to and from decimal numbers.• Locate and write 2- place decimals on a number line using length as a context.• Round 1- and 2-place decimals up and down to the nearest whole number or one decimal place.• Order and compare 1- and 2-place decimals and find a number between.• Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.• Read, write, order and compare numbers with up to three decimal places.• Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred'.• Write percentages as a fraction with denominator 100, and as a decimal.• Solve problems which require knowing percentage and decimal equivalents.	<ul style="list-style-type: none">• Associate a fraction with division and calculate decimal fraction equivalents for a simple fraction.• Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places.• Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.
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Measurement (MEA)	<ul style="list-style-type: none"> Children use everyday language to talk about size, weight, capacity, distance, time and money to compare quantities and objects and to solve problems. 	<ul style="list-style-type: none"> Compare lengths or heights using direct comparison. Compare and measure lengths or heights using non-standard uniform units. Choose and use appropriate standard units to measure lengths and heights in any direction. Use vocabulary: long/short, longer/shorter, tall/short, double/half, heavy/light, heavier than, lighter than, full/empty, more than, less than, half, half full, quarter, quicker, slower, earlier, later. Recognise and know the value of 1p, 2p, 5p, 10p, 20p, 50p, £1 and £2 coins; £5, £10, £20, £50 notes. Sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]. Recognise and use language relating to dates, including days of the week, weeks, months and years. Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. 	<ul style="list-style-type: none"> Choose and use appropriate standard units to measure lengths and heights in any direction. Compare and order lengths, mass, volume/capacity and record the results using >, < and =. Recognise and know the value of 1p, 2p, 5p, 10p, 20p, 50p, £1 and £2 coins; £5, £10, £20, £50 notes. Combine amounts to make particular values; match different combinations of coins to make equal amounts of money. Compare and sequence intervals of time. Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times. Know the number of minutes in an hour and the number of hours in a day. 	<ul style="list-style-type: none"> Know the number of seconds in a minute, minutes in an hour, hours in a day and days in a week. Know the number of days in each month, and days in a year and leap year. Tell the time to the nearest five minutes using digital and analogue clocks. Identify Roman numerals from I to XII. Recognise and know the value of 1p, 2p, 5p, 10p, 20p, 50p, £1 and £2 coins; £5, £10, £20, £50 notes. Recognise and use symbols for pounds and pence. Record amounts using £.p notation. Add and subtract money of the same unit; solving money problems in a practical context. Choose and use appropriate standard units to measure lengths and heights in any direction. Measure, compare, add and subtract capacities and volumes using l/ml. Measure the perimeter of simple 2-D shapes. 	<ul style="list-style-type: none"> Write and tell the time to the nearest minute using analogue and digital clocks. Solve problems converting from hours to minutes, minutes to seconds, years to months and weeks to days. Compare durations of events to calculate the time taken by particular events or tasks. Begin to convert between different units of measure. Measure, compare, add and subtract lengths or heights using m/cm/mm. Read relevant scales to the nearest numbered unit. Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres. Find the area of rectilinear shapes by counting squares. 	<ul style="list-style-type: none"> Read, write and convert time between analogue and digital 12 and 24 hour clocks. Compare durations of events to calculate the time taken by particular events or tasks. Convert between different units of measure, eg kilometres to metres, metres to centimetres, etc. Measure and calculate the perimeter of composite rectilinear shapes in m/cm. Calculate and compare the area of rectangles and estimate the area of irregular shapes. Estimate volume and capacity. 	<ul style="list-style-type: none"> Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate. Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places. Convert between miles and kilometres. Recognise that shapes with the same areas can have different perimeters. Recognise when it is possible to use formulae for area and volume of shapes. Calculate the area of parallelograms and triangles. Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres and cubic metres.
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Geometry: properties of shapes (GPS)	<ul style="list-style-type: none"> Children explore characteristics of everyday objects and shapes and use mathematical language to describe them. 	<ul style="list-style-type: none"> Recognise, name, describe and sort squares, rectangles, circles and triangles. Begin to recognise basic line symmetry. Sort 2D shapes into Venn diagrams using properties incl. symmetry, number of sides, corners and right angles. 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]. 	<ul style="list-style-type: none"> Sort 2D shapes into Venn diagrams using properties incl. symmetry. Begin to identify right angles in pictures and shapes. Recognise, name and describe squares, rectangles, circles and triangles. Recognise and name several 2D shapes and discover which tessellate. Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces. Identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]. Compare and sort common 2-D and 3-D shapes and everyday objects. Sort shapes according to their properties using a 2-way Carroll diagram. 	<ul style="list-style-type: none"> Sort and categorise 3D shapes according to the number of faces, vertices and edges. Name and describe 3D shapes using the terms: faces, edges and vertices. Begin to identify edges, vertices, faces on cones, pyramids, triangular prisms, cubes, cuboids. Identify horizontal and vertical lines and pairs of perpendicular and parallel lines. Identify right angles. Identify whether angles are greater than or less than a right angle 	<ul style="list-style-type: none"> Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes. Identify acute and obtuse angles and compare and order angles up to two right angles by size. Identify lines of symmetry in 2-D shapes presented in different orientations. Complete a simple symmetric figure with respect to a specific line of symmetry. 	<ul style="list-style-type: none"> Calculate and compare the area of rectangles (including squares) and estimate the area of irregular shapes. Use the properties of rectangles to deduce related facts and find missing lengths and angles. Distinguish between regular and irregular polygons based on reasoning about equal sides and angles. Estimate and measure angles, recognising that they are measured in degrees. Use a protractor to measure angles, including of a given size. Compare and classify acute and obtuse angles; order angles up to 180°. Draw a specified given angle and measure it in degrees. Compare angles up to 360°, including reflex angles. Recognise and identify angles that are multiples of 90°. Recognise that angles on a straight line total 180° and angles round a point total 360°. Know and use the terms radius and diameter; identify the radius and diameter of different circles. Draw circles and arcs, including using compasses. Draw circles and arcs with a given radius. Find missing angles using angles round a point = 360° or angles on a straight line = 180°. 	<ul style="list-style-type: none"> Draw 2-D shapes using given dimensions and angles. Recognise, describe and build simple 3-D shapes, including making nets. Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius. Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.
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Geometry: position and direction (GPD)	<ul style="list-style-type: none"> Children use everyday language to describe position. Children recognise, create and describe patterns. 	<ul style="list-style-type: none"> Use 2D shapes to create patterns. Describe position, direction and movements including half turns, using common words. 	<ul style="list-style-type: none"> Describe position, direction and movements including half turns, using common words. Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise). 	<ul style="list-style-type: none"> Recognise that two right angles make a half-turn; three make three quarters of a turn and four a complete turn. 	<ul style="list-style-type: none"> Describe positions on a 2-D grid as coordinates in the first quadrant. Describe movements between positions as translations of a given unit to the left/right and up/down. Plot specified points and draw sides to complete a given polygon. 	<ul style="list-style-type: none"> Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed. 	<ul style="list-style-type: none"> Describe positions on the full coordinate grid (all four quadrants). Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.
Statistics (STA)		<ul style="list-style-type: none"> Sort objects on to a Carroll diagram (two by two). 	<ul style="list-style-type: none"> Sort objects on to a Carroll diagram (two by two). Interpret and construct simple pictograms, tally charts, block diagrams and simple tables. Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity. Ask and answer questions about totalling and comparing categorical data. 	<ul style="list-style-type: none"> Interpret and present data using bar charts, pictograms and tables. Solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables. 	<ul style="list-style-type: none"> Draw and interpret bar charts where 1 division represents 100 units. Interpret and present data using bar charts where one division represents one unit. Interpret and present data in bar charts where 1 division represents 2 units. 	<ul style="list-style-type: none"> Solve comparison, sum and difference problems using information presented in a line graph. Complete, read and interpret information in tables, including timetables. 	<ul style="list-style-type: none"> Interpret and construct pie charts and line graphs and use these to solve problems. Calculate and interpret the mean as an average.
Algebra							<ul style="list-style-type: none"> Use simple formulae. Generate and describe linear number sequences. Express missing number problems algebraically. Find pairs of numbers that satisfy an equation with two unknowns. Enumerate possibilities of combinations of two variables.