

Number and place value

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| EYFS | <ul style="list-style-type: none"> • Recites numbers in order to 10. • Knows that numbers identify how many objects are in a set. • Beginning to represent numbers using fingers, marks on paper or pictures. • Sometimes matches numeral and quantity correctly. • Shows curiosity about numbers by offering comments or asking questions. • Compares two groups of objects, saying when they have the same number. • Separates a group of three or four objects in different ways, beginning to recognise that the total is still the same. • Shows an interest in numerals in the environment. • Recognises numerals 1 to 5. • Counts up to three or four objects by saying one number name for each item. • Counts actions or objects which cannot be moved. • Counts objects to 10, and beginning to count beyond 10. • Counts out up to six objects from a larger group. <ul style="list-style-type: none"> • Selects the correct numeral to represent 1 to 5, then 1 to 10 objects. • Counts an irregular arrangement of up to ten objects. • Estimates how many objects they can see and checks by counting them. • Uses the language of 'more' and 'fewer' to compare two sets of objects. • Says the number that is one more than a given number. • Finds one more or one less from a group of up to five objects, then ten objects. <p>Write numerals to 10 with some reversals</p> <ul style="list-style-type: none"> • Can place 0-20 in order and say which number • one more or one less than a given number up to 20 • Count to and cross 20, forwards and backwards beginning with 0 or 1 from any given number (exceeding) <p>Write numerals to 20 with some reversal.</p> |
| Year 1 | <ul style="list-style-type: none"> ■count to and across 50, forwards and backwards, beginning with 0 or 1, or from any given number ■read numbers to 20 in numerals ■order numbers up to 50 and say one more and one less using concrete objects or pictorial representations ■using quantities or objects, count in multiples of 2 ■identify and represent numbers using objects and pictorial representations ■use language one more and one less in practical situations using concrete objects or pictorial representations ■count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number ■count, read and write numbers to 100 in numerals; count in multiples of twos and tens ■count in multiples of twos to 50 and tens to 100 ■given a 2 digit number, identify one more and one less ■identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least ■read and write numbers from 1 to 20 in numerals ■begin to recognise odd and even numbers ■begin to understand the place value of tens and units ■count beyond 100, forwards and backwards, beginning with 0 or 1, or from any given number ■able to say one more or one less than a number beyond 100 ■count in multiples of 2s, 5s to 100 and 10s to 120 ■given a number, say one more and one less ■write numbers 1-20 in numerals and words (not necessarily spelt correctly) ■recognise odd and even numbers |
| Year 2 | <ul style="list-style-type: none"> ■count in steps of 2 and 5 from 0; forwards and backwards ■Begin to use the term 'multiple' ■identify and represent numbers using different representations ■estimate number of objects up to 20 ■compare and order numbers of objects up to 20 ■compare and order numbers up to 100 ■use number facts to solve problems ■read and write numbers up to 50 in words and numerals (not necessarily spelt correctly) ■count in steps of ten from any number, forward and backward |

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| | <ul style="list-style-type: none"> ■ Demonstrate an understanding of place value eg the difference in tens and ones 77 and 33 has a difference of 40 and 4 ones (can be practically) ■ recognise the place value of each digit in a two-digit number (tens, ones) ■ partition numbers into tens and ones ■ name the value of any digit in whole numbers up to 99 ■ identify, represent and estimate numbers using different representations, including the number line ■ compare and order numbers from 0 up to 100; use <, > and = signs ■ read and write numbers to at least 100 in numerals and in words ■ identify odd and even numbers ■ use place value and number facts to solve problems. ■ count in steps of 3 from 0 to at least 30 ■ understand the importance of 0 as a place holder in 2 and 3 digit numbers ■ partition numbers in different ways e.g. 23 as 20+3 or 10+13 ■ begin to understand the place value of 3 digit numbers ■ estimate numbers on an empty number line ■ compare and order numbers beyond 100 ■ round numbers to the nearest 10 ■ read and write numbers beyond 100 in numerals and words ■ solve problems and explain reasoning |
| Year 3 | <ul style="list-style-type: none"> ■ begin to count from 0 in multiples of 50 and 100 ■ recognise the place value of each digit in a three-digit number (hundreds, tens, ones) ■ identify and represent numbers up to 1000 using different representations (using counters, jottings, pictures) ■ partition 3 digit numbers into hundreds, tens and ones ■ partition numbers in different ways e.g. 23 as 20+3 or 10+13 @ ■ estimate numbers on an empty number line @ ■ round numbers to the nearest 10 @ ■ find 10 or 100 more or less than a given number ■ read numbers up to 1000 in numerals ■ count from 0 in multiples of 50 and 100 ■ understand importance of 0 as a place holder in numbers up to 1000 ■ name the value of any digit in whole numbers up to 999 ■ partition 3 digit numbers in different ways e.g. 342 becomes 300 +20 +22 ■ identify, represent and estimate numbers up to 1000 using different representations using counters, jottings, pictures) ■ compare and order numbers up to 1000, using >, < and = ■ round numbers to the nearest 100 ■ find 10 or 100 more or less than a given number ■ read and write numbers up to 1000 in numerals and in words ■ solve number problems and practical problems involving these ideas. ■ count from 0 in multiples of 4, 8, 50 and 100 ■ use partitioning up to 999 to solve problems ■ identify, represent and estimate numbers using different representations including measures up to 1000 ■ compare and order numbers beyond 1000, using >, < and = ■ round numbers to nearest 10 or 100 ■ confidently read and write numbers beyond 1000 in numerals and in words ■ read Roman numerals up to 20 ■ solve number problems and practical problems involving these ideas and explain reasoning |
| Year 4 | <ul style="list-style-type: none"> ■ confidently count on in multiples of 2, 3, 4, 5, 8, 10 @ 50 and 100 (from any given starting number) ■ recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) ■ begin to identify, represent and estimate numbers four digit up to 9999 using different representations (using counters, jottings, pictures) ■ begin to find 1000 more or less than a given number ■ read Roman numerals to 50 (I to L) ■ begin to understand the concept of negative numbers ■ solve number and practical problems that involve all of the above ■ begin to count in multiples of 25 and 1000 |

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| | <ul style="list-style-type: none"> ■begin to identify, represent and estimate numbers four digit up to 9999 using different representations (using counters, jottings, pictures) ® ■order and compare numbers beyond 1000 using $< > =$ ® ■round any number to the nearest 1000 ■find 1000 more or less than a given number ■<u>read Roman numerals to 100 (I to C)</u> and know that over time, the numeral system changed to include the concept of zero and place value. ■<u>count backwards through zero to include negative numbers</u> ■solve number and practical problems that involve all of the above and with increasingly large positive numbers up to 10 000 ■count in multiples of 6, 9, 25 and 1000 ■use partitioning up to 9999 to solve problems ■beginning to identify, represent and estimate numbers up to 10 000 using different representations ■read, write and order numbers to 10 000 ■<u>round any number to the nearest 10, 100 or 1000</u> ■<u>read Roman numerals to 100 (I to C)</u> and know that over time, the numeral system changed to include the concept of zero and place value. ® ■begin to order and compare negative numbers ■<u>count forwards through zero from a negative number</u> ■<u>order and compare numbers beyond 1000 using $>$, $<$ and $=$</u> ■solve number and practical problems that involve all of the above and with increasingly large positive numbers up to 10 000 and explain reasoning. Begin to solve problems with negative numbers in context e.g. temperature |
| Year 5 | <ul style="list-style-type: none"> ■count in multiples of 7 ■count forwards or backwards in steps of powers of 10 for any given number up to 10 000 ■ identify, represent and estimate numbers up to 10 000 using different representations ■read, write, order and compare numbers to at least 10 000 and determine the value of each digit ■<u>order and compare negative numbers using $>$, $<$ and $=$</u> ■<u>round any number up to 10 000 to the nearest 10, 100 and 1000</u> ■<u>read Roman numerals to 1000 (M)</u> ■recognise and describe linear number sequences ■count forwards or backwards in steps of powers of 10 for any given number up to 100 000 ■read, write, order and compare numbers to at least 100 000 and determine the value of each digit using $>$, $<$ and $=$ ■<u>round any number up to 10 000 to the nearest 10, 100 and 1000</u> ® ■<u>interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero</u> ■<u>recognise and describe linear number sequences including fractions and decimals</u> ■solve number problems and practical problems that involve all of the above ■count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 ■<u>read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit</u> ■round any number up to 100 000 to the nearest 10, 100, 1000, and 10 000 ■recognise years written in Roman numerals (i.e. read <u>and write</u> Roman numerals to at least 3000- MMM) ■recognise and describe linear number sequences including fractions and decimals and find term to term rule in words |
| Year 6 | <ul style="list-style-type: none"> ■count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 ® ■<u>read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit using $>$, $<$ and $=$</u> ■round any number up to 1000 000 to the nearest 10, 100, 1000, 10 000 and 1000 000 ■<u>read and write numbers up to 10 000 000 in numerals and words and determine the value of each digit</u> ■<u>round any whole number to a required degree of accuracy</u> ■<u>use negative numbers in context</u> ■<u>solve number and practical problems that involve all of the above.</u> ■<u>read, write, order and compare numbers up to 10 000 000 and determine the value of each digit</u> ■round any whole number to a required degree of accuracy ■use negative numbers in context, and calculate intervals across zero ■solve number and practical problems that involve all of the above |

Addition and subtraction – four operations

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| EYFS | <p>Sings action songs and rhyme related to addition and subtraction</p> <ul style="list-style-type: none"> • In practical activities and discussion, beginning to use the vocabulary involved in adding and subtracting. • Finds the total number of items in two groups by counting all of them • Subtracts practically by removing objects (e.g. taking away) • Records, using marks that they can interpret and explain <p>In practical activities and discussion, begin to use the vocabulary involved in adding and subtracting</p> <ul style="list-style-type: none"> • Using quantities and objects add and subtract two single-digit numbers and count on or back to find the answer • Beginning to have an awareness of the addition and subtraction sign • In practical situations, begin to know their addition number facts to 10 <p>In practical activities and discussion, use the vocabulary involved in adding and subtracting (add, take away)</p> |
| Year 1 | <ul style="list-style-type: none"> ■ start to read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs within 10 ■ begin to know number bonds to 10 (using concrete objects or pictorial representations) ■ solve one-step problems that involve addition and subtraction using concrete objects ■ use the vocabulary associated with + and - (e.g. add, take away, more, less, subtract, minus) ■ read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs within 20 [e.g. $7+6=13$, $5-3=2$, and $13 = 7+6$, $2=5-3$] ■ know bonds of all numbers to 10 (with concrete objects or pictorial representations) ■ represent and use number bonds ■ add and subtract one-digit and two-digit numbers to 20, including zero ■ solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = [] - 9$. Numbers to 20. ■ understand the vocabulary associated with problem solving ■ read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs within 100. ■ add and subtract one digit and two digit numbers to 100 [e.g. $46+3=49$, $65-3=62$, and $43 = 41+2$, $52=55-3$] ■ represent and use number bonds and related subtraction facts within 20 (using concrete objects or pictorial representations) ■ begin to know bonds of all numbers to 20 (using concrete objects or pictorial representations) ■ solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = [] - 9$. Numbers to 100. |
| Year 2 | <ul style="list-style-type: none"> ■ solve problems with addition and subtraction: <ul style="list-style-type: none"> □ using concrete objects and pictorial representations, including those involving numbers, quantities and measures ■ understand and use 'sum' and 'difference' ■ add and subtract numbers using a range of strategies e.g. concrete objects, hundred square, number line ■ begin to recall and use addition and subtraction facts for all numbers up to 10 ■ begin to relate number facts to 10 to adding and subtracting multiples of 10 to 100 ■ show that addition of two numbers can be done in any order (commutative) ■ solve 2 step problems with addition and subtraction: <ul style="list-style-type: none"> □ applying their increasing knowledge of mental and written methods (2 digit and 2 digit) ■ add and subtract numbers using concrete objects, pictorial representations, and mentally, including: <ul style="list-style-type: none"> □ a two-digit number and ones □ a two-digit number and tens e.g. $23+10$, $43+20$ (not over 100 boundary) □ two two-digit numbers (Begin to do this mentally for numbers that don't cross the 100 boundary e.g. $23+31$) ■ recall and use addition and subtraction facts to at least 10, and begin to derive and use related facts up to 100 ■ 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 and solve missing number problems e.g. $__ - 14 = 28$ |

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| | <ul style="list-style-type: none"> ■ Use estimation to check that their answers to a calculation are reasonable e.g. knowing $48 + 35$ will be less than 100 ■ solve 3 step problems with addition and subtraction within 100: <ul style="list-style-type: none"> □ applying their increasing knowledge of mental and written methods ■ Add 2 two digit numbers within 100 e.g. $48+35$ and demonstrate their method using concrete apparatus or pictorial representations. ■ add and subtract numbers mentally and using written columnar methods, including: <ul style="list-style-type: none"> □ adding several two-digit numbers □ subtracting two-digit numbers e.g. $74-33$ □ mental calculations where regrouping is required e.g. $91-73$ □ adding a two-digit number to a three-digit number □ adding and subtracting several single digit numbers ■ begin to solve + and – in columns without crossing boundaries ■ recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 ■ recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems (involving a two-digit number and 1s or 10s). ■ reason about addition e.g. the sum of 3 odd numbers will always be odd. ■ solve more complex missing number problems e.g. $14 + _ - 3 = 17$. |
| Year 3 | <ul style="list-style-type: none"> ■ <u>add or subtract two 2-digit numbers where answers may exceed 100 (mentally)</u> ■ solve 3 step problems with addition and subtraction within 100: <ul style="list-style-type: none"> □ applying their increasing knowledge of mental and written methods ® ■ solve + and – in columns without crossing boundaries ■ use rounding to make estimates ■ reason about addition e.g. the sum of 3 odd numbers will always be odd. ® ■ solve more complex missing number problems e.g. $14 + _ - 3 = 17$. ® ■ add and subtract numbers mentally, including: <ul style="list-style-type: none"> □ a three-digit number and ones □ a three-digit number and tens (multiples of 10) □ a three-digit number and hundreds (multiples of 100) ■ <u>use columnar method for + and – with 2-digit numbers, crossing tens boundaries</u> ■ estimate the answer to a calculation ■ begin to solve problems, using number facts, place value, and multiple step addition and subtraction with numbers up to 100. ■ begin to solve missing number problems involving addition and subtraction with numbers bonds up to 100, which include balancing equations.e.g. $48 + _ = 100$ ■ add and subtract numbers mentally, including: <ul style="list-style-type: none"> □ a three-digit number and ones ® □ a three-digit number and tens (multiples of 10) ® □ a three-digit number and hundreds (multiples of 100) ® ■ <u>add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction up to 999</u> ■ estimate the answer to a calculation and use inverse operations to check answers ■ solve problems, using number facts, place value, and multiple step addition and subtraction (with numbers up to 100) ■ solve missing number problems involving addition and subtraction with numbers up to 100, which include balancing equations e.g. $48 + _ = 100 - 32$ |
| Year 4 | <ul style="list-style-type: none"> ■ add and subtract numbers mentally, including: <ul style="list-style-type: none"> 4 digit numbers and ones (multiples of 10) 4 digit numbers and tens (multiples of 100) With different numbers of digits e.g. 3-digit +/- 2-digit (without crossing the 100s boundary) ■ <u>add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction with answers exceeding 999</u> ■ solve problems, using number facts, place value, and multiple step addition and subtraction. With numbers up to 100 explaining reasoning ■ solve missing number problems involving addition and subtraction, which include balancing equations numbers up to 100, explaining reasoning ■ <u>add and subtract numbers mentally, including:</u> <ul style="list-style-type: none"> □ <u>4-digit numbers and hundreds (multiples of 100)</u> □ <u>4-digit numbers and thousands (multiples of 1000)</u> (including crossing the 100s boundary) |

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| | <ul style="list-style-type: none"> ■ add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate not crossing thousands barrier ■ begin to estimate and use inverse operations to check answers to a calculation with appropriate numbers (up to 9999) ■ begin to solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why; with numbers up to 9999 ■ begin to solve missing number problems involving addition and subtraction with numbers bonds up to 1000, which include balancing equations ■ <u>add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate, crossing the thousands barriers with different numbers of digits</u> e.g. 4-digit =? - 3-digit ■ <u>estimate and use inverse operations to check answers to a calculation with appropriate numbers, explaining reasoning and beginning to ensure solutions make sense in the context of a problem</u> ■ solve missing number problems involving addition and subtraction, which include balancing equations numbers up to 1000, explaining reasoning |
| Year 5 | <ul style="list-style-type: none"> ■ solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why; with four digit numbers and explain their reasoning (<i>with numbers up to 10,000 and/or mixed numbers of digits</i>) ■ add and subtract numbers mentally with increasingly large numbers up to 10,000 ■ <u>add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)</u> ■ use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy ■ solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why (<i>with numbers up to 100,000 and/or mixed numbers of digits</i>) ■ add and subtract numbers mentally with increasingly large numbers up to 100,000 ■ <u>add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)</u> ■ use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy ■ solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why ■ use calculators to explore more complex number problems |
| Year 6 | <ul style="list-style-type: none"> Add and subtract numbers mentally with increasingly large numbers up to 10,000 ■ Add and subtract numbers mentally with increasingly large numbers up to 10,000 @ ■ <u>add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)</u> ■ use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy ■ <u>solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</u> ■ use letters to symbolise unknown numbers to help to solve missing number problems involving addition and subtraction (with one unknown) ■ use calculators to develop and investigate patterns and sequences ■ <u>start to understand the use of brackets</u> ■ <u>perform mental calculations, including with mixed operations and large numbers</u> ■ <u>solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</u> ■ <u>use estimation (and approximation) to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy</u> ■ explore the order of operations using brackets e.g. $2 + 1 \times 3 = 5$; $[2 + 1] \times 3 = 9$ ■ <u>use their knowledge of the order of operations to carry out calculations involving the four operations</u> |

Multiplication and division

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| EYFS | In practical situations they solve problems, including doubling, halving and sharing |
| Year 1 | <ul style="list-style-type: none"> ■begin to know doubles up to double 5 ■begin to know halves up to 10 ■solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, with the support of the teacher. ■recognise patterns of numbers in 10x table begin to know doubles to double 10 ■begin to know corresponding halves ■solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations with the support of the teacher. ■recognise patterns of numbers in X2, X10 ■recognise odd and even numbers ■group objects into 2,5,or 10 to aid counting ■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. ■recognise patterns of numbers in x2, x10, x5 |
| Year 2 | <ul style="list-style-type: none"> ■begin to recall X facts for 2s, 5s, 10s ■Recall doubles and halves to 20 @ ■begin to derive double multiples of 10 and relate this to the inverse e.g. double 30 is 60, half of 60 is 30 ■understand multiplication as repeated addition (for 2x, 5x and 10x) ■read and interpret $\div =$ signs (when used in a number sentence) ■solve 1 step problems involving multiplication and division, using materials, arrays, including problems in contexts. ■begin to recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, use counting strategies to solve problems ■make connections between multiplication by 2 and doubling and halving (and use these to reason about problems and calculations) ■calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs (within 2, 5 and 10 times tables) ■solve 1 step problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts. (within 2, 5 and 10 times tables) ■begin to recognise (using equipment) the relationship between addition and subtraction and can rewrite addition statements as simplified multiplication statements e.g. $2 + 2 + 2 = 3 \times 2$ ■show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot ■recognise odd and even numbers to at least 100 (and explain why) ■recall X facts for X2,5,10 and their inverse using the multiplication (\times), division (\div) and equals (=) signs ■relate fractions and measures e.g. $40 \div 2 = 20$, and 20 is half of 40 ■derive facts for multiples of 5 by (for example) multiplying by 10 and halving ■solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts ■solve word problems that involve more than one step ■use multiplication facts to make deductions outside known multiplication facts e.g. 18×5 cannot be 92 as it does not have a 0 or 5 in the ones ■determine remainders given known facts ■recognise the relationship between addition and subtraction and can rewrite addition statements as simplified multiplication statements e.g. $10+10+10+5+5 = 3 \times 10 + 2 \times 5 = 4 \times 10$ ■Count in 3s to solve \times and \div problems for the 3 x table |
| Year 3 | <ul style="list-style-type: none"> ■learn facts for 3 times tables and inverse ■learn multiplication facts up to 12×3 ■derive facts for x4, x8 by doubling ■solve mathematical statements for multiplication and division using known tables ■recall and use multiplication and division facts for the 3, 4 and 8 times tables ■begin to write and calculate mathematical statements for multiplication and division using the multiplication tables above, including for two-digit numbers times one-digit numbers, using mental methods and jottings |

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| | <ul style="list-style-type: none"> ■ begin to write and calculate mathematical statements for multiplication and division using the multiplication tables above, including for two-digit numbers times one-digit numbers, using formal written methods ■ solve missing number problems involving multiplication and division ■ <u>know facts for 2,3,4,5,8,10 times tables up to x12</u> ■ write and calculate mathematical statements for multiplication and division using the multiplication tables above, including for two-digit numbers times one-digit numbers, using mental methods and jottings ■ write and calculate mathematical statements for multiplication and division using the multiplication tables above, including for two-digit numbers times one-digit numbers, using formal written methods ■ solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems |
| Year 4 | <ul style="list-style-type: none"> ■ <u>know facts for 2,3,4,5,8,10 times tables up to x12 @</u> ■ understand the term 'factor' ■ solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects (e.g. <i>Suppose that there were 10 children and 10 rats and that they all have the usual number of legs, there will be 60 legs in the town belonging to people and rats. But now, what if you were only told that there were 60 legs belonging to people and rats but you did not know how many children/rats there were – work out what solutions exist</i>) ■ <u>use place value, known and derived facts to multiply and divide mentally, including:</u> <ul style="list-style-type: none"> □ <u>multiplying by 0 and 1</u> □ <u>dividing by 1</u> ■ <u>e.g. $2 \times 3 = 6$ so $600 \div 3 = 200$</u> ■ know multiplication and division facts for 6 and 9 times tables ■ recall multiplication and division facts for all multiplication tables up to 12 x12 ■ recognise and use factor pairs and commutativity in mental calculations ■ <u>multiply two-digit and three-digit numbers by a one-digit number using formal written layout</u> ■ begin to divide two-digit and three-digit numbers by a one-digit number using formal written layout ■ solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects (<i>using appropriate x tables</i>) see 4C for base example ■ know 7 and 11 times tables ■ <u>instantly recall all facts for tables to 12x12</u> ■ <u>begin to use formal method of short multiplication</u> ■ <u>begin to use formal method of short division</u> ■ solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects (<i>using appropriate x tables</i>) see 4C for base example ■ use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers ■ <u>multiply and divide whole numbers by 10, 100</u> |
| Year 5 | <ul style="list-style-type: none"> ■ <u>instantly recall all facts for tables to 12x12 @</u> ■ identify multiples and factors, including finding all factor pairs of a number ■ <u>multiply and divide numbers mentally drawing upon known facts</u> ■ use formal methods of short multiplication ■ divide numbers up to 4 digits by a one-digit number using the formal written method of short division without remainders in the context ■ solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects (<i>using appropriate times tables</i>) see 4C for base example ■ <u>multiply and divide whole numbers by 10, 100 and 1000</u> ■ <u>know and use the vocabulary of prime numbers</u> ■ recognise and use square numbers, and the notation for squared (²) ■ identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers |

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| | <ul style="list-style-type: none"> ■ multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers ■ <u>divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context</u> ■ solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign ■ multiply and divide whole numbers and those involving decimals by 10, 100 ■ establish whether a number up to 100 is prime and recall prime numbers up to 19 ■ recognise and use square numbers and cube numbers, and the notation for squared (²) ■ multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers ® ■ divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context and express remainders as a fraction or decimal e.g. $98 \div 4 = 98/4$ see guidance notes ■ solve problems involving multiplication and division, including scaling [<i>multiplicative reasoning</i>] by simple fractions and problems involving simple rates ■ multiply and divide whole numbers and those involving decimals (up to 3dp) by 10, 100 and 1000 ■ know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers ■ recognise and use square numbers (up to at least 144) and cube numbers, and the notation for squared (²) and cubed (³) ■ solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes ■ begin to use letters to symbolise unknown numbers to help to solve missing number problems involving multiplication and division (with one unknown) |
| Year 6 | <ul style="list-style-type: none"> ■ Multiply and divide numbers mentally drawing upon known facts ■ divide numbers up to 4 digits by a two-digit number using the formal written method of short division ■ perform mental calculations, including with mixed operations and large numbers ■ multiply multi-digit numbers 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, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context ■ solve multiplication and division multi-step problems in contexts, deciding which operations and methods to use and why ■ solve problems involving addition, subtraction, multiplication and division ■ identify common factors, common multiples and prime numbers ■ use their knowledge of the order of operations to carry out calculations involving the four operations ■ use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy ■ check with a calculator |

Statistics

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| EYFS | N/A |
| Year 1 | <ul style="list-style-type: none"> ■ <u>begin to Interpret</u> simple pictograms where the picture is worth 1 unit ■ <u>begin to Interpret</u> simple tally charts |
| Year 2 | <ul style="list-style-type: none"> ■ accurately interpret and construct simple pictograms, tally charts and block diagrams. ■ interpret and construct simple tables ■ ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity ■ Interpret and construct pictograms (where the symbols show many-to-one correspondence) and block graphs (where the scale is divided into 2s and 5s) ■ ask and answer questions about totalling and comparing categorical data |
| Year 3 | <ul style="list-style-type: none"> ■ Interpret and construct pictograms (where the symbols show many-to-one correspondence) and block graphs (where the scale is divided into 2s and 5s) ® ■ understand and use simple scales (e.g. divisions 2, 5 and 10) ■ interpret and present data using bar charts, pictograms and tables ■ solve one-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables ■ <u>solve two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables</u> |
| Year 4 | <ul style="list-style-type: none"> ■ <u>solve two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables ®</u> ■ <u>draw and read line graphs</u> ■ <u>draw and read line graphs ®</u> ■ interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs |
| Year 5 | <ul style="list-style-type: none"> ■ solve comparison, sum and difference problems using information presented in a line graph ■ solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs ■ complete, read and interpret information in tables, including timetables |
| Year 6 | <ul style="list-style-type: none"> ■ interpret pie charts and line graphs and use these to solve problems ■ construct pie charts and line graphs and use these to solve problems. ■ calculate and interpret the mean as an average (for sets of discrete data in different contexts) |

Length and height, perimeter, area and volume

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| EYFS | Shows interest in practical activities related to length, capacity and weight <ul style="list-style-type: none"> • Orders two or three items by length or height <p>Uses everyday language to talk about size, weight, capacity, time and money to compare quantities and objects and to solve problems</p> |
| Year 1 | <ul style="list-style-type: none"> ■ compare, describe and solve practical problems for: <ul style="list-style-type: none"> □ lengths and heights [for example, long/short, longer/shorter, tall/short, double/half] e.g. which is taller? Which is shorter? ■ measure and begin to record the following using non-standard measures <ul style="list-style-type: none"> □ lengths and heights e.g. cubes, hands, worms ■ begin to measure and record the following using standard units of measurement and equipment when given the equipment and units of measure to use <ul style="list-style-type: none"> □ lengths and heights e.g. pen = 7cm |
| Year 2 | <ul style="list-style-type: none"> ■ begin to choose and use appropriate standard units to measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, (e.g. nearest cm or m) using rulers, scales, thermometers and measuring vessels ■ begin to read labelled divisions for measure ■ choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, and measuring vessels (not converting units – to the nearest appropriate unit) ■ Read scales in divisions of ones, twos, fives and tens in a practical situation where all numbers on the scale are given ■ compare and order lengths, mass, volume/capacity and record the results using >, < and = (within the same measurement e.g. 30cm > 23cm) ■ Read scales in divisions of ones, twos, fives and tens in a practical situation where NOT all numbers on the scale are given. |
| Year 3 | <ul style="list-style-type: none"> ■ measure, compare: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) ■ add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) ■ measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) ■ measure the perimeter of simple 2-D shapes |
| Year 4 | <ul style="list-style-type: none"> ■ Find the area of rectilinear shapes by counting squares ■ measure and calculate the perimeter of a rectilinear figure (including squares) in cm and m ■ read labelled/unlabelled divisions for measure - in 25s, 50s, 100s, and other multiples of 1000 ■ begin to read (and apply to problem solving) labelled divisions for measure – including decimals (tenths) |
| Year 5 | <ul style="list-style-type: none"> ■ measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres ■ begin to read (and apply to problem solving) labelled divisions for measure with both decimals (up to 3dp) and whole numbers up to 1,000,000 ■ use all four operations to solve problems involving measure [for example, length, mass, money] using decimal notation, including scaling with appropriate numbers. ■ calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm²) and square metres (m²) and estimate the area of irregular shapes (if necessary, by counting squares including fractions of squares) ■ begin to read (and apply to problem solving) unlabelled divisions for measure with both decimals (up to 3dp) and whole numbers up to 1,000,000 ■ convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) ■ use all four operations to solve problems involving measure [for example, length, mass, money] using decimal notation, including scaling with appropriate numbers. ■ read labelled/unlabelled divisions for measure with both decimals (up to 3dp) and whole numbers up to 1,000,000 ■ estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water] ■ understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints |
| Year 6 | <ul style="list-style-type: none"> ■ use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling with appropriate numbers ■ recognise that shapes with the same areas can have different perimeters and vice versa |

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| | <p>■ 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</p> <p>■ recognise when it is possible to use formulae for area and volume of shapes</p> <p>■ solve problems involving the calculation and conversion of units of measure, using decimal notation</p> |
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Shape

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| EYFS | <ul style="list-style-type: none"> • Shows an interest in shape and space by playing with shapes or making arrangements with objects • Shows awareness of similarities of shapes in the environment • Shows interest in shape by sustained construction activity or by talking about shapes or arrangements • Shows interest in shapes in the environment • Uses shapes appropriately for tasks <p>Beginning to talk about the shapes of everyday objects, e.g. 'round' and 'tall'</p> <ul style="list-style-type: none"> • Beginning to use mathematical names for 'solid' 3D shapes (including cube, cuboid, sphere, cylinder, cone, pyramid) and 'flat' 2D shapes (including circle, triangle, square, oblong, oval) and mathematical terms to describe shapes <p>Selects a particular named shape</p> <ul style="list-style-type: none"> • Explores characteristics of everyday objects and shapes and use mathematical language to describe them <p>Recognises, creates and describes pattern</p> |
| Year 1 | <ul style="list-style-type: none"> ■ begin to recognise and name common 2-D shapes, including: <ul style="list-style-type: none"> □ 2-D shapes [for example, rectangles (including squares), circles and triangles] □ selects a particular named shape e.g. pick up the square, triangle, rectangle. ■ recognise and name common 2-D and 3-D shapes, including: <ul style="list-style-type: none"> □ 2-D shapes [for example, rectangles (including squares), circles and triangles] □ 3-D shapes [for example, sphere, cone, cube] ■ recognise and name common 2-D shapes in different orientations and sizes ■ recognise and name cube, cuboids, sphere, cylinder, cone and pyramid |
| Year 2 | <ul style="list-style-type: none"> ■ recognise and name common 2-D shapes in different orientations and sizes for example hexagons and pentagons. ■ recognise and name 3-D shapes for example cylinder ■ 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 using more than one criterion (on the basis of their geometric properties including vertices, sides, edges, faces) ■ describe similarities and differences of shape properties e.g. that a cube and cuboid have the same number of edges, vertices and faces but can describe what is different ■ identify line symmetry in a vertical line when exploring 2-D shapes |
| Year 3 | <ul style="list-style-type: none"> ■ recognise and name prisms ■ draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them ■ identify right angles (as a quarter turn) ■ identify horizontal and vertical lines ■ recognise angles as a property of shape or a description of a turn ■ identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn ■ identify vertical and horizontal lines of symmetry in common 2-D shapes. ■ identify pairs of perpendicular and parallel lines ■ identify whether angles are greater than or less than a right angle |
| Year 4 | <ul style="list-style-type: none"> ■ know names of common quadrilaterals ■ know and name common triangles ■ identify all lines of symmetry in common 2-D shapes ■ complete a simple symmetric figure with respect to a specific line of symmetry ■ compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes ■ identify lines of symmetry in 2-D shapes presented in different orientations ■ identify acute and obtuse angles ■ compare and order angles up to two right angles by size |
| Year 5 | <ul style="list-style-type: none"> ■ identify 3-D shapes, including cubes and other cuboids, from 2-D representations ■ distinguish between regular and irregular polygons based on reasoning about equal sides and angles ■ know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles ■ draw given angles, and measure them to the nearest 10° |

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| | <ul style="list-style-type: none"> ■ identify: <ul style="list-style-type: none"> □ <u>angles at a point and one whole turn (total 360°)</u> □ <u>angles at a point on a straight line and ½ a turn (total 180°)</u> □ <u>angles at other multiples of 90°</u> ■ draw given angles, and measure them to the nearest 5° ■ use the properties of rectangles to deduce related facts and find missing lengths and angles. ■ <u>draw given angles, and measure them to the nearest °</u> |
| Year 6 | <ul style="list-style-type: none"> ■ use the properties of rectangles to deduce related facts and find missing lengths and angles ® ■ <u>draw given angles, and measure them to the nearest °</u> ® ■ <u>draw 2-D shapes using given dimensions and angles</u> ■ <u>recognise, describe and build simple 3-D shapes, including making nets</u> ■ calculate, estimate and compare the volume of cubes/cuboids using standard units ■ <u>compare and classify geometric shapes based on their properties</u> ■ <u>illustrate and name parts of circles, including radius, diameter and circumference</u> and know that the diameter is twice the radius ■ find unknown angles in any triangles, and quadrilaterals ■ recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles |

Time

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| EYFS | <ul style="list-style-type: none"> • Uses everyday language related to time |
| Year 1 | <ul style="list-style-type: none"> ■ begin to recognise and use language relating to including days of the week and be able to sequence these ■ tell the time to the hour and begin to draw the hands on a clock face to show these times. ■ use everyday language to compare, describe and solve practical problems for time for example, quicker, slower, earlier and later ■ measure and begin to record time (hours, minutes, seconds) ■ know the names of the seasons ■ know the names and sequence of the months |
| Year 2 | <ul style="list-style-type: none"> ■ tell and write the time to o'clock, half past and quarter past the hour and draw the hands on a clock face to show o'clock and half past ■ tell and write the time to (o'clock, half past, quarter past and) quarter 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. ■ tell and write the time to five minutes and draw the hands on a clock face to show these times ■ know that there are 60 minutes in an hour and 24 hours in a day and use these facts to solve problems ■ compare and sequence intervals of time (e.g. I know a month is longer than a week – not converting and comparing units of time) |
| Year 3 | <ul style="list-style-type: none"> ■ tell and write the time to five minutes and draw the hands on a clock face to show these times ® ■ estimate and read time with increasing accuracy to the nearest minute ■ know the number of seconds in a minute ■ tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12 hour clock ■ compare durations of events [for example to calculate the time taken by particular events or tasks] ■ tell and write the time from an analogue clock, including using 12-hour and 24-hour clocks ■ estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, morning, afternoon, noon and midnight ■ know the number of days in each month, year and leap year |
| Year 4 | <ul style="list-style-type: none"> ■ read and write analogue and digital time ■ convert time between analogue and digital 12- and 24-hour clocks (using am and pm) ■ convert between different units of measure [for example, kilometre to metre, hour to minute] ■ convert between different units of measure [for example, kilometre to metre, hour to minute] ® ■ <u>solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days using appropriate amounts</u> |
| Year 5 | <ul style="list-style-type: none"> ■ solve problems involving converting between units of time (including problems involving the duration of events) ■ use all four operations to solve problems involving measure [for example, length, mass, money] using decimal notation, including scaling with appropriate numbers. |
| Year 6 | N/A |

Fractions, decimals and percentages

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| EYFS | In practical situations they solve problems, including doubling, halving and sharing |
| Year 1 | <ul style="list-style-type: none"> ■ recognise, find and name a half as one of two equal parts of a shape ■ find half of a quantity less than 10 using concrete objects ■ recognise, find and name a half as one of two equal parts of an object, shape or quantity using concrete objects ■ recognise, find and name a quarter as one of four equal parts of an object or shape using concrete objects ■ recognise, find and name a quarter as one of four equal parts of an object, shape or a quantity using concrete objects |
| Year 2 | <ul style="list-style-type: none"> ■ count in halves from 0 to 10 ■ recognise, find and name fractions $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$ of a shape, set of objects or quantity using objects ■ begin to find $\frac{1}{2}$ and $\frac{1}{4}$ of a set of objects ■ count in halves up to 10 from any number ■ recognise, find, name and write fractions $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$ of a shape, set of objects or quantity ■ recognise, find, name and write fractions of a $\frac{1}{2}$ a length, shape, set of objects or quantity ■ write simple fractions for example, $\frac{1}{2}$ of 6 = 3 ■ count in quarters up to 10 from any number ■ recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity using objects (INCLUDE 2/4) ■ recognise the equivalence of $\frac{1}{2}$ and $\frac{2}{4}$ in practical contexts and when counting in fractions ■ find and compare fractions of amounts e.g. $\frac{1}{4}$ of £20 = £5 which is greater than $\frac{1}{2}$ of £8 |
| Year 3 | <ul style="list-style-type: none"> ■ count up in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 ■ recognise the equivalence of $\frac{1}{2}$ and $\frac{2}{4}$ in practical contexts and when counting in fractions ® ■ find and compare fractions of amounts e.g. $\frac{1}{4}$ of £20 = £5 which is greater than $\frac{1}{2}$ of £8 ® ■ solve problems that involve all of the above, with appropriate fractions ■ count up and down in tenths ■ recognise, find and write fractions of a discrete set of objects: unit fractions with small denominators ■ recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators ■ compare and order unit fractions, and fractions with the same denominators ■ recognise and show, using diagrams, equivalent fractions with small denominators ■ place fractions on a number line ■ add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$] with appropriate fractions ■ solve problems that involve all of the above, with appropriate fractions ■ count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 ■ recognise, find and write fractions of a discrete set of objects: non-unit fractions with small denominators ■ compare and order unit fractions, and fractions with the same denominators using <, > = ■ solve problems that involve all of the above, with appropriate fractions, including measures |
| Year 4 | <ul style="list-style-type: none"> ■ count up in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten ■ compare and order unit fractions, and fractions with the same denominators using <, > = ® ■ add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$] with appropriate fractions ® ■ solve problems with simple non-unit fractions [$\frac{3}{4}$, $\frac{52}{3}$,] to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number ■ round decimals with one decimal place to the nearest whole number ■ solve simple measure and money problems involving fractions and decimals to one decimal place ■ count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten, including use of number line ■ recognise and show, using diagrams, families of common equivalent fractions $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{3}$ ■ add and subtract fractions with the same denominator within and beyond 1 |

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| | <ul style="list-style-type: none"> ■ solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number ■ recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ ■ compare numbers with one decimal place ■ solve simple measure and money problems involving fractions and decimals to two decimal places ■ connect hundredths to tenths and place value and decimal measures ■ recognise and write decimal equivalents of any number of tenths or hundredths, including use of number line ■ compare numbers with two decimal places ■ find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths ■ solve simple measure and money problems involving fractions and decimals to two decimal places, with mixed number of decimal places |
| Year 5 | <ul style="list-style-type: none"> ■ identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths ■ compare and order fractions whose denominators are all multiples of the same number ■ add and subtract fractions with the same denominator ■ read, write, order and compare numbers with up to two decimal places ■ round decimals with two decimal places to the nearest whole number ■ read and write decimal numbers as fractions [for example, $0.71 = \frac{71}{100}$] ■ recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents ■ add and subtract fractions with the same denominator and denominators that are multiples of the same number ■ recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [e.g. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$] ■ multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams ■ calculate simple fractions and percentages of whole numbers and quantities ■ read, write, order and compare numbers with up to three decimal places ■ round decimals with two decimal places to the nearest whole number and to one decimal place ■ add and subtract decimal numbers (to at least 3dp) and round as required ■ solve problems involving decimals with up to 3dp ■ identify equivalent fractions, using common multiples to express fractions in the same denomination ■ recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal ■ solve problems which require knowing percentages and decimals e.g. $\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{5}$ $\frac{2}{5}$ $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25 |
| Year 6 | <ul style="list-style-type: none"> ■ Add and subtract decimal numbers (to at least 3dp) and round as required ® ■ solve problems involving numbers up to three decimal places ■ solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25 ■ Calculate simple fractions and percentages of whole numbers and quantities ® ■ compare and order fractions, including fractions > 1 ■ multiply simple pairs of proper fractions ■ divide proper fractions by whole numbers [e.g. $\frac{1}{3} \div 2 = \frac{1}{6}$] ■ associate a fraction with division and calculate decimal fraction equivalents [e.g. 0.375] for a simple fraction [e.g. $\frac{3}{8}$] ■ 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 ■ multiply one-digit numbers with up to two decimal places by whole numbers ■ recall and use equivalences between simple fractions, decimals and percentages ■ round decimals for simple fractions with recurring decimal equivalents ■ add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions ■ use common factors to simplify fractions; use common multiples to express fractions in the same denomination ■ multiply simple pairs of proper fractions, writing the answer in its simplest form [e.g. $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$] |

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| | <ul style="list-style-type: none">■ recall and use equivalences between simple fractions, decimals and percentages, including in different contexts■ use written division methods in cases where the answer has up to two decimal places■ solve problems which require answers to be rounded to specified degrees of accuracy |
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Mass, capacity, temperature

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| EYFS | <p>Shows interest in practical activities related to length, capacity and weight</p> <ul style="list-style-type: none"> • Uses familiar objects and common shapes to create and recreate patterns and build models <p>Orders two items by weight or capacity</p> <p>Uses everyday language to talk about size, weight, capacity, time and money to compare quantities and objects and to solve problems</p> |
| Year 1 | <ul style="list-style-type: none"> ■ children use everyday language to talk about mass/weight and volume/capacity ■ compare, describe and solve practical problems for: <ul style="list-style-type: none"> □ mass/weight [for example, heavy/light, heavier than, lighter than] e.g. which is heavier? Which is the heaviest? □ capacity and volume [for example, full/empty, more than, less than, half, half full, quarter] ■ measure and begin to record the following using non-standard measures <ul style="list-style-type: none"> □ mass/weight e.g. cubes, teddy bears □ capacity and volume e.g. cups, sand, rice ■ begin to measure and record the following using standard units of measurement and equipment when given the equipment and units of measure to use <ul style="list-style-type: none"> □ mass/weight e.g. glue stick = 10g □ capacity and volume e.g. cup = 100ml |
| Year 2 | <p>to choose and use appropriate standard units to measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, (e.g. nearest cm or m) using rulers, scales, thermometers and measuring vessels</p> <ul style="list-style-type: none"> ■ begin to read labelled divisions for measure ■ choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, and measuring vessels (not converting units – to the nearest appropriate unit) ■ Read scales in divisions of ones, twos, fives and tens in a practical situation where all numbers on the scale are given ■ compare and order lengths, mass, volume/capacity and record the results using >, < and = (within the same measurement e.g. 30cm > 23cm) ■ Read scales in divisions of ones, twos, fives and tens in a practical situation where NOT all numbers on the scale are given. |
| Year 3 | <ul style="list-style-type: none"> ■ read (and apply to problem solving) unlabelled divisions for measure - in 1s, 2s, 10s) ■ reason about simple multiplicative relationships such as twice as long or 10 times as high (and drawing upon 2, 5 and 10 times table) ■ measure, compare: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) ■ add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) ■ read (and apply to problem solving) labelled divisions for measure - in 1s, 2s, 5s, 10s, 100s) – and begin to do so for unlabelled divisions up to the same numbers ■ measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) ■ read (and apply to problem solving) labelled and unlabelled divisions for measure - in 1s, 2s, 5s, 10s, 100s, and other multiples of 1000) |
| Year 4 | <ul style="list-style-type: none"> ■ read labelled/unlabelled divisions for measure - in 25s, 50s, 100s, and other multiples of 1000) ■ convert between different units of measure [for example, kilometre to metre, hour to minute] ■ begin to read (and apply to problem solving) labelled divisions for measure – including decimals (tenths) ■ convert between different units of measure [for example, kilometre to metre, hour to minute] |
| Year 5 | <ul style="list-style-type: none"> ■ begin to read (and apply to problem solving) labelled divisions for measure with both decimals (up to 3dp) and whole numbers up to 1,000,000 ■ use all four operations to solve problems involving measure [for example, length, mass, money] using decimal notation, including scaling with appropriate numbers. ■ begin to read (and apply to problem solving) unlabelled divisions for measure with both decimals (up to 3dp) and whole numbers up to 1,000,000 ■ convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) ■ use all four operations to solve problems involving measure [for example, length, mass, money] using decimal notation, including scaling with appropriate numbers. ■ read labelled/unlabelled divisions for measure with both decimals (up to 3dp) and whole numbers up to 1,000,000 |

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| | <ul style="list-style-type: none"> ■ estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water] ■ understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints |
| Year 6 | <ul style="list-style-type: none"> ■ read and apply to problem solving labelled/unlabelled divisions for measure with both decimals (up to 3dp) and whole numbers up to 1,000,000 ■ use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling with appropriate numbers ■ 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 ■ recognise when it is possible to use formulae for area and volume of shapes |

Position and direction

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| EYFS | <p>Uses positional language</p> <p>Describes their relative position such as 'behind' or 'next to'</p> <p>Uses everyday language to talk about position and distance (near, far, in front, on top, next to, under...)</p> |
| Year 1 | <p>know the vocabulary 'left' and 'right'</p> <ul style="list-style-type: none"> ■ describe position, direction and movement, using the terms 'whole' and 'half' turns practically ■ describe position, direction and movement using the terms 'quarter' and 'three-quarter' turns |
| Year 2 | <ul style="list-style-type: none"> ■ order and arrange combinations of mathematical objects in (increasingly complex) patterns and sequences ■ use mathematical vocabulary to describe position, direction and movement, including movement in a straight line ■ explore, describe and explain patterns ■ distinguish between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns ■ use the terms clockwise and anti-clockwise to describe position, direction and movement |
| Year 3 | <ul style="list-style-type: none"> ■ use the terms clockwise and anti-clockwise to describe position, direction and movement ® ■ know and use the terms 'North,' 'South,' 'East' and 'West' ■ know and use the terms 'North,' 'North-East,' 'East,' 'South-East,' 'South,' 'South-West,' 'West' and 'North-West' ■ be able to move between compass directions in half and quarter turns |
| Year 4 | <ul style="list-style-type: none"> ■ know and use all terms relating to compass directions ■ describe positions on a 2-D grid as coordinates in the first quadrant ■ read, write and use pairs of co-ordinates (2,5) ■ 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 |
| Year 5 | <ul style="list-style-type: none"> ■ describe positions on a 2-D grid as coordinates in the first quadrant ® ■ 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 ■ describe positions on a 2-D grid as coordinates in the first two quadrants |
| Year 6 | <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 in the first quadrant ■ draw and translate simple shapes on the coordinate plane in any quadrant, and reflect them in the axes ■ solve problems relating to coordinates, reflections and translations |

Weight and volume

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| EYFS | Shows interest in practical activities related to length, capacity and weight Orders two items by weight or capacity Uses everyday language to talk about size, weight, capacity, time and money to compare quantities and objects and to solve problems |
| Year 1 | <ul style="list-style-type: none"> ■ children use everyday language to talk about mass/weight and volume/capacity ■ compare, describe and solve practical problems for: <ul style="list-style-type: none"> □ mass/weight [for example, heavy/light, heavier than, lighter than] e.g. which is heavier? Which is the heaviest? □ capacity and volume [for example, full/empty, more than, less than, half, half full, quarter] ■ measure and begin to record the following using non-standard measures <ul style="list-style-type: none"> □ mass/weight e.g. cubes, teddy bears □ capacity and volume e.g. cups, sand, rice ■ begin to measure and record the following using standard units of measurement and equipment when given the equipment and units of measure to use <ul style="list-style-type: none"> □ mass/weight e.g. glue stick = 10g □ capacity and volume e.g. cup = 100ml |
| Year 2 | <p>to choose and use appropriate standard units to measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, (e.g. nearest cm or m) using rulers, scales, thermometers and measuring vessels</p> <ul style="list-style-type: none"> ■ begin to read labelled divisions for measure ■ choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, and measuring vessels (not converting units – to the nearest appropriate unit) ■ Read scales in divisions of ones, twos, fives and tens in a practical situation where all numbers on the scale are given ■ compare and order lengths, mass, volume/capacity and record the results using >, < and = (within the same measurement e.g. 30cm > 23cm) ■ Read scales in divisions of ones, twos, fives and tens in a practical situation where NOT all numbers on the scale are given. |
| Year 3 | <ul style="list-style-type: none"> ■ read (and apply to problem solving) unlabelled divisions for measure - in 1s, 2s, 10s) ■ reason about simple multiplicative relationships such as twice as long or 10 times as high (and drawing upon 2, 5 and 10 times table) ■ measure, compare: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) ■ add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) ■ read (and apply to problem solving) labelled divisions for measure - in 1s, 2s, 5s, 10s, 100s) – and begin to do so for unlabelled divisions up to the same numbers ■ measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) ■ read (and apply to problem solving) labelled and unlabelled divisions for measure - in 1s, 2s, 5s, 10s, 100s, and other multiples of 1000) |
| Year 4 | <ul style="list-style-type: none"> ■ read labelled/unlabelled divisions for measure - in 25s, 50s, 100s, and other multiples of 1000) ■ convert between different units of measure [for example, kilometre to metre, hour to minute] ■ begin to read (and apply to problem solving) labelled divisions for measure – including decimals (tenths) ■ convert between different units of measure [for example, kilometre to metre, hour to minute] <p>®</p> |
| Year 5 | <ul style="list-style-type: none"> ■ use all four operations to solve problems involving measure [for example, length, mass, money] using decimal notation, including scaling with appropriate numbers. ■ calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm²) and square metres (m²) and estimate the area of irregular shapes (if necessary, by counting squares including fractions of squares) ■ convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) ■ solve problems involving converting between units of time (including problems involving the duration of events) ■ use all four operations to solve problems involving measure [for example, length, mass, money] using decimal notation, including scaling with appropriate numbers. ■ estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water] |

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| | <ul style="list-style-type: none"> ■ understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints |
| Year 6 | <ul style="list-style-type: none"> ■ read and apply to problem solving labelled/unlabelled divisions for measure with both decimals (up to 3dp) and whole numbers up to 1,000,000 ■ use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling with appropriate numbers ■ 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 ■ recognise when it is possible to use formulae for area and volume of shapes ■ solve problems involving the calculation and conversion of units of measure, using decimal notation |

Algebra

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| EYFS | N/A |
| Year 1 | N/A |
| Year 2 | N/A |
| Year 3 | N/A |
| Year 4 | N/A |
| Year 5 | N/A |
| Year 6 | <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■ find possible values in missing number problems and equations involving 1 or 2 unknowns |

Converting units (within other units) - Money

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| EYFS | N/A |
| Year 1 | <ul style="list-style-type: none"> ■begin to recognise different denominations of coins and notes ■recognise the value of different denominations of coins and notes (NOT conversion at this stage) |
| Year 2 | <ul style="list-style-type: none"> ■recognise and use symbols for pounds (£) and pence (p) ■begin to solve simple problems in a practical context involving addition of money of the same unit, using appropriate amounts (e.g. 48p – 23p, £5-£4 – refer to addition and subtraction section for clarification) ■compare and order lengths, mass, volume/capacity and record the results using >, < and = (within the same measurement e.g. 30cm > 23cm) ■combine amounts of money to make a particular value using pounds and pence e.g. 36p = 20p+10p+5p+1p £9.52 = £9 + 50p + 2p ■solve simple problems in a practical context involving addition and subtraction of money of the same unit using appropriate amounts (see 2B addition and subtraction statements for guidance) ■find different combinations of coins that equal the same amounts of money ■solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change with appropriate amounts (e.g. change from £1 or change from £50 e.g. £50 - £36) |
| Year 3 | <ul style="list-style-type: none"> ■add and subtract amounts of money to give change, using both £ and p in practical contexts using appropriate amounts up to £5 |
| Year 4 | <ul style="list-style-type: none"> ■use decimal notation to record money ■compare and calculate different measures, including money in pounds and pence ■estimate, compare and calculate different measures, including money in pounds and pence |
| Year 5 | <p>use all four operations to solve problems involving measure [for example, length, mass, money] using decimal notation, including scaling with appropriate numbers.</p> <ul style="list-style-type: none"> ■use all four operations to solve problems involving measure [for example, length, mass, money] using decimal notation, including scaling with appropriate numbers. |
| Year 6 | <ul style="list-style-type: none"> ■use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling with appropriate numbers |

Ratio

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| EYFS | N/A |
| Year 1 | N/A |
| Year 2 | N/A |
| Year 3 | N/A |
| Year 4 | N/A |
| Year 5 | N/A |
| Year 6 | <ul style="list-style-type: none"> ■ solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison, multiples of 5 and 10 ■ solve problems involving similar shapes where the scale factor is known or can be found ■ use simple ratio and proportional reasoning to solve problems ■ solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison, single digit percentages e.g. 7%, 22% ■ solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts |