



Curriculum Overview Year 7

Unit 1 Number: Place Value and Rounding

Support	Core	Extension
<ul style="list-style-type: none">Place a set of negative numbers in orderPlace a set of mixed positive and negative numbers in orderUse negative numbers in context, and calculate intervals across zeroSolve number and practical problems that involve all of the aboveUnderstand place value in numbers with up to three decimal placesMultiply whole numbers by 10 (100, 1000)Divide whole numbers by 10 (100, 1000) when the answer is a whole numberMultiply (divide) numbers with up to three decimal places by 10 (100, 1000)Understand (order, write, read) place value in numbers with up to eight digitsUnderstand and use negative numbers when working with temperatureUnderstand and use negative numbers when working in other contextsApproximate any number by rounding to the nearest 10, 100, 1000Approximate any number by rounding to a specified degree of accuracy; e.g. nearest 20, 50Use estimation to predict the order of magnitude of the solution to a (decimal) calculation; Check order of magnitude of solution to a (decimal) calculation	<ul style="list-style-type: none">Use inequality symbols to compare numbersRound any whole number to a required degree of accuracyOrdering decimalsApproximate by rounding to any number of decimal placesUse inverse operations to check solutions to calculationsUnderstand estimating as the process of finding a rough answer to a calculationKnow how to identify and round to n^{th} significant figure in any number > 1Approximate any number by rounding to the first significant figureEstimate calculations by rounding numbers to one significant figure	<ul style="list-style-type: none">Rounding to significant figuresKnow how to identify the n^{th} significant figure in any number including < 1Approximate by rounding to the n^{th} significant figure in any number including < 1Estimate calculations by rounding numbers to n^{th} significant figure including < 1Convince me that 39 652 rounds to 40 000 to one significant figureConvince me that 0.6427 does <u>not</u> round to 1 to one significant figureWhat is wrong: $\frac{11 \times 28.2}{0.54} \approx \frac{10 \times 30}{0.5} = 150$. How can you correct it?Jenny writes $7.1 \times 10^{-5} = 0.0000071$. Kenny writes $7.1 \times 10^{-5} = 0.000071$. Who do you agree with? Why?



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Unit 2 Number: Four operations I

Support	Core	Extension
<ul style="list-style-type: none"> ● perform mental calculations, including with mixed operations and large numbers ● solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why ● Be <u>fluent</u> at multiplying a three digit or a two digit number by a two digit number ● Be <u>fluent</u> when using the method of short division ● Combine addition and subtraction when multiplying mentally ● Multiply a two-digit number by a single-digit number mentally ● Add a three-digit number to a two-digit number mentally (when bridging of hundreds is required) ● Multiply a four-digit number by a two-digit number using long multiplication ● Identify when addition, subtraction or multiplication is needed as part of solving multi-step problems ● Explain why addition or subtraction is needed at any point when solving multi-step problems ● Solve multi-step problems involving addition, subtraction and/or multiplication ● Know that addition and subtraction have equal priority ● Know that multiplication and division have equal priority ● Know that multiplication and division take priority over addition and subtraction ● Add/(subtract from) a negative number ● Add/(subtract) a negative number to/(from) a positive number ● Add/(subtract) a negative number to/(from) a negative number ● Understand how to use the order of operations including powers and roots ● 	<ul style="list-style-type: none"> ● Use knowledge of place value to multiply with decimals ● Use knowledge of place value to divide a decimal ● Know and apply the order of operations BODMAS ● Use brackets in problem involving the order of operations ● multiply numbers up to four digits by a two digit whole number using the formal written method of long multiplication ● divide numbers up to four 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 ● Use short division to divide a four-digit number by a one-digit number ● Use short division to divide a three- (or four-) digit number by a two-digit number ● Understand the method of long division ● Use long division to find the remainder at each step of the division ● Know how to write, and use, the remainder at each step of the division ● Use long division to divide a three- (or four-) digit number by a two-digit number ● Write the remainder to a division problem as a remainder ● Write the remainder to a division problem as a fraction ● Extend beyond the decimal point to write the remainder as a decimal ● Identify when division is needed to solve a problem ● Extract the correct information from a problem and set up a written division calculation ● Interpret a remainder when carrying out division ● Multiply with negative numbers ● Divide with negative numbers ● Know how to square (or cube) a negative number 	<ul style="list-style-type: none"> ● To be able to multiply and divide decimals ● Worded integer and decimal problems ● Enter negative numbers into a calculator ● Negative number worded problems



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Unit 3 Number: Number Properties I

Support	Core	Extension
<ul style="list-style-type: none">• Understand the use of notation for powers• Know the meaning of the square root symbol ($\sqrt{\quad}$)• Make the connection between squares and square roots (and cubes and cube roots)• Recall the first 15 square and first 5 cube numbers;	<ul style="list-style-type: none">• Understand what factors, multiples and prime numbers are• Recall prime numbers up to 50• Know how to test if a number up to 150 is prime• identify first 10 triangular numbers• Know the meaning of a common multiple (factor) of two numbers• Identify common multiples (factors) of two numbers•	<ul style="list-style-type: none">• Prime factorisations• HCF and LCM• Indices



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Unit 4 Geometry: Properties of Angles I

Support	Core	Extension
<ul style="list-style-type: none">• Use a protractor to draw angles up to 180°• Use a protractor to work out and construct reflex angles• Use a ruler to draw lines to the nearest millimetre• To be able to use standard units of measure for length• Use AB notation for describing lengths• To be able to label and recognise angles and use $\angle ABC$ notation• Identify <u>fluently</u> angles at a point, on a line and vertically opposite angles• To be able to recognise right angles	<ul style="list-style-type: none">• Identify and apply known angle facts in more complex geometrical diagrams• Use knowledge of angles to calculate missing angles in geometrical diagrams• Know that angles sums for angles in a triangle, quadrilateral, point and a straight line• Find missing angles in triangles, quadrilateral, point and a straight line	<ul style="list-style-type: none">• Find missing angles in isosceles triangles• Explain reasoning using vocabulary of angles• To be able to recognise vertically opposite angles



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Unit 5 Geometry: Properties of Shapes I

Support	Core	Extension
<ul style="list-style-type: none">• Know the vocabulary of 2D and 3D shapes• Recall the names and shapes of special triangles and quadrilaterals• Know the meaning of faces, edges and vertices• Use notation for parallel lines• Know the meaning of 'regular' polygons• Use AB notation for describing lengths• know the names of common 3D shapes• Use mathematical language to describe 3D shapes	<ul style="list-style-type: none">• draw 2-D shapes using given dimensions and angles• Know properties of quadrilaterals (diagonals)• illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius• Know the meaning of 'perpendicular' and identify perpendicular lines• To be able to identify the number of faces, edges and vertices of 3D shapes• recognise, describe and build simple 3-D shapes, including making nets• Construct 3D shapes from given nets• Draw accurate nets for common 3D shapes• Find all the nets for a cube	<ul style="list-style-type: none">• Visualise a 3D shape from its net• Use a net to visualise the edges (vertices) that will meet when• To be able to recognise plans and elevations of 3D shapes• Apply the properties of triangles to solve problems• Apply the properties of quadrilaterals to solve problems



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Unit 6 Geometry: Construction I

Support	Core	Extension
<ul style="list-style-type: none">• Use squared paper to guide construction of 2D shapes• Use notation for parallel lines• Use notation for equal sides• Know the meaning of 'perpendicular' and identify perpendicular lines• Know the meaning of 'regular' polygons• Use AB notation for describing lengths	<ul style="list-style-type: none">• Identify line and rotational symmetry in polygons• Use ruler to construct equilateral triangles from written descriptions• Use a ruler and protractor to construct triangles from written descriptions with 1 side and 2 angles• Use a ruler and protractor to construct triangles from written descriptions with 2 sides and 1 angle	<ul style="list-style-type: none">• Use ruler and compasses to construct triangles when all three sides known• To be able to reflect and rotate shapes on a coordinate axes



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Unit 7 Number: Fractions

Support	Core	Extension
<ul style="list-style-type: none">• Write a fraction in its lowest terms by cancelling common factors• Understand that two fractions can be equivalent• Identify a common factor of two numbers• Simplify a fraction• Write a fraction in its lowest terms• Confirm that a fraction is written in its lowest terms• Compare two fractions by considering diagrams• Compare two fractions by considering equivalent fractions• Compare two top-heavy fractions• Understand that a fraction is also a way of representing a division• Know standard fraction / decimal equivalences (e.g. $\frac{1}{2} = 0.5$, $\frac{1}{4} = 0.25$, $\frac{1}{10} = 0.1$)• Work out the decimal equivalents of fifths, eighths and tenths•	<ul style="list-style-type: none">• Convert between mixed numbers and top-heavy fractions• compare and order fractions, including fractions > 1, use common factors to simplify fractions; use common multiples to find a common denominator• associate a fraction with division and calculate decimal fraction equivalents for a simple fraction [for example, 0.375 for $\frac{3}{8}$]•	<ul style="list-style-type: none">• Write one quantity as a fraction of another where the fraction is less than 1• Write one quantity as a fraction of another where the fraction is greater than 1



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Unit 8: Percentages

Support	Core	Extension
<ul style="list-style-type: none">• Understand that a percentage means 'number of parts per hundred'• Compare two quantities using percentages• Find 10% of a quantity• Use non-calculator methods to find a percentage of an amount• Know standard fraction / decimal / percentage equivalences (e.g. 10%, 25%, 50%, 75%)• Work out the percentage equivalents of fifths, eighths and tenths•	<ul style="list-style-type: none">• Use the equivalence between fractions, decimals and percentages when solving problems• recall and use equivalences between simple fractions, decimals and percentages, including in different contexts• solve problems involving the calculation of percentages and the use percentages for comparison [for example 15% of 360 vs 12% of 400]• Write a percentage as a fraction• Convert a fraction to a decimal by scaling (when possible)• Write a decimal as a percentage• Write a fraction as a percentage• Write a decimal as a fraction• Order fractions, decimals and percentages	<ul style="list-style-type: none">• Percentage increases and decreases• Use calculators to find a percentage of an amount using multiplicative methods• Write a quantity as a percentage of another• Worded percentage problems• Identify whether a fraction is terminating or recurring• Use a calculator to change any fraction to a decimal•



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Unit 9 Ratio: Ratio and Proportion I

Support	Core	Extension
<ul style="list-style-type: none">• Use ratio notation to describe a comparison of more than two measurements or objects• State a ratio of measurements in the same units• Simplify a ratio by cancelling common factors• Identify when a ratio is written in its lowest terms• solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts• Identify when a comparison problem can be solved using multiplication• Identify when a comparison problem can be solved using division• Identify when a comparison problem requires both division and multiplication• Find the value of a single item in a comparison problem• Use the value of a single item to solve a comparison problem••	<ul style="list-style-type: none">• Describe a comparison of measurements or objects using the language 'a to b'• Describe a comparison of measurements or objects using ratio notation a:b• Find the value of a 'unit' in a division in a ratio problem• 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• Basic proportion, unit costs to solve problems	<ul style="list-style-type: none">• Divide a quantity in two parts in a given part : part ratio• Divide a quantity in two parts in a given part : whole ratio• Express correctly the solution to a division in a ratio problem• Unitary method



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Unit 10 Algebra: Algebraic Manipulation I

Support	Core	Extension
<ul style="list-style-type: none">• Use letters to represent variables• Identify like terms in an expression• To be able to create expressions/formulae from words•	<ul style="list-style-type: none">• Know the meaning of expression, term, formula, and equation• Use and interpret basic algebraic notation e.g $a \times a = a^2$• Simplify an expression by collecting like terms• Know how to multiply a (positive) single term over a bracket• Substitute positive numbers into expressions and formulae• Correctly apply order of operations in algebra	<ul style="list-style-type: none">• To be able to expand and simplify brackets and more than 1 more bracket• To be able to factorise single brackets



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Unit 11 Algebra: Solving Equations I

Support	Core	Extension
<ul style="list-style-type: none">• Recognise a simple formula written in words• Interpret the information given in a written formula• Substitute numbers into a one-step formula written in words• Substitute numbers into a two-step formula written in words• Interpret the information that results from substituting into a formula• Create a one-step formula from given information• Create a two-step formula from given information• Know the basic rules of algebraic notation• Given a function, establish outputs from given inputs• Given a function, establish inputs from given outputs• Use a mapping diagram (function machine) to represent a function•	<ul style="list-style-type: none">• Choose the required inverse operation when solving an equation• Identify the correct order of undoing the operations in an equation• Solve one-step equations when the solution is a whole number (fraction)• Solve two-step equations (including the use of brackets) when the solution is a whole number• Solve two-step equations (including the use of brackets) when the solution is a fraction• Check the solution to equation by substitution• Express missing number problems algebraically and solve missing number problems expressed algebraically•	<ul style="list-style-type: none">• find pairs of numbers that satisfy an equation with two unknowns and enumerate possible combinations of two variables• Solve three-step equations (including the use of brackets) when the solution is a whole number• Solve three-step equations (including the use of brackets) when the solution is a fraction•



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Unit 12 Algebra: Sequences and Graphs I

Support	Core	Extension
<ul style="list-style-type: none">• Use a term-to-term rule to generate a linear sequence• Find the term-to-term rule for a sequence• Describe a number sequence• To be able to recognise special types of sequences	<ul style="list-style-type: none">• Use an informal term-to-term rule to generate a non-linear sequence (<u>not</u> n^{th} term notation yet)• Solve problems involving the term-to-term rule for a sequence• Solve problems involving the term-to-term rule for a non-numerical sequence• To be able to work with coordinates in all four quadrants• To be able to recognise and use the Fibonacci and Fibonacci-type sequences• recognise and use sequences of triangular, square and cube numbers, simple arithmetic progressions•	<ul style="list-style-type: none">• To find the n^{th} term of a sequence• To be able to find numbers in a sequence given the N^{th} term• Use the n^{th} term of a sequence to deduce if a given number is in a sequence• To create the N^{th} term from patterns/shapes



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Unit 13 Statistics: Representing Data I

Support	Core	Extension
<ul style="list-style-type: none">• Construct and interpret pictograms, bar charts.• Know their appropriate use• Construct and interpret vertical line charts• Understand that pie charts are used to show proportions• Make statements about proportions shown in a pie charts• Make statements to compare proportions in pie charts• Identify the scale used on the axes of a graph• Read values from a line graph involving scaling• Use scaling when constructing line graphs•	<ul style="list-style-type: none">• Interpret and construct frequency tables• Know the meaning of categorical data• Know the meaning of discrete data• Construct and interpret comparative bar charts• Construct simple pie charts when the total frequency is a factor of 360	<ul style="list-style-type: none">• Interpret pie charts and know their appropriate use• Construct pie charts when the total frequency is not a factor of 360• Choose appropriate graphs or charts to represent data•

Unit 14 Statistics: Averages and Range I

Support	Core	Extension
<ul style="list-style-type: none">• Find the mode of set of data• Find the median of a set of data• Understand the meaning of 'average' as a typicality (or location)• Understand the mean as a measure of typicality (or location)• Interpret the mean as a way of levelling the data	<ul style="list-style-type: none">• Calculate and interpret the mean as an average• Find the median of a set of data when there are an even number of numbers in the data set• Understand the range as a measure of spread (or consistency)• Calculate the range of a set of data• Choose an appropriate approximation when required•	<ul style="list-style-type: none">• Use the mean to find a missing number in a set of data• Find the mode from a frequency table• Find the median from a frequency table• Calculate the mean from a frequency table• Analyse and compare sets of data• Appreciate the limitations of different statistics (mean, median, mode, range)



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Unit 15 Statistics: Probability I

Support	Core	Extension
<ul style="list-style-type: none">• Know that probability is a way of measuring likeliness of an event• Know the vocabulary and link to 0-1 scale• Assess and place events on a probability scale•	<ul style="list-style-type: none">• Identify equally likely outcomes• List outcomes of an event systematically• Know how to represent probability as F/D/P• Know and apply fact that sum of probabilities for all outcomes = 1• Use a table to list all outcomes of an event• Use theoretical probability to calculate expected outcomes• List outcomes using Carroll diagram (aka two-way table)• Calculate probabilities using possibility space• List all the outcomes for an experiment	<ul style="list-style-type: none">• Use experimental probability to calculate expected outcomes• Work out theoretical probabilities for equally likely outcomes• Recognise when it is not possible to work out a theoretical probability for an event• Use frequency trees to record outcomes of probability experiments• Make inferences about probabilities in frequency trees• List all elements in sets using a Venn diagram



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Unit 16 Geometry: Mensuration

Support	Core	Extension
<ul style="list-style-type: none">• Use a ruler to measure <u>accurately</u> line segments to the nearest millimetre• Use a protractor to measure <u>accurately</u> angles to the nearest degree	<p>Convert <u>fluently</u> between:</p> <ul style="list-style-type: none">• metric units of length• metric units of mass• metric units of volume / capacity• units of time• units of money• 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	<ul style="list-style-type: none">• Solve practical problems that involve converting between units• State conclusions clearly using the units correctly• Imperial to metric conversions to develop estimating skills



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Unit 17: Geometry: Perimeter and Area I

Support	Core	Extension
<ul style="list-style-type: none">• To be able to calculate the area and perimeter of a squares and rectangles• To be able to recognise 2D shapes•	<ul style="list-style-type: none">• To be able to calculate the area and perimeter of triangles• calculate the area of parallelograms and triangles; recognise when it is possible to use formulae for area/(volume) of shapes• Find missing lengths in 2D shapes when the area is known• To be able to find the area and perimeter of compound shapes	<ul style="list-style-type: none">• Know that the area of a trapezium is given by the formula:• $\text{area} = \frac{1}{2}(a + b)h = \left(\frac{a+b}{2}\right)h = \frac{(a+b)h}{2}$• Calculate the area of a trapezium• Recognise that the value of the perimeter can equal the value of area• recognise that shapes with the same areas can have different perimeters and vice versa



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Unit 18: Geometry: Volume and Surface Area I

Support	Core	Extension
<ul style="list-style-type: none">• To be able to calculate the area and perimeter of a squares, rectangles, parallelograms.• To be able to recognise 3D shapes• To know the properties of 3D shapes• To be able to recognise nets of 3D shapes• To be able to calculate the volume of cubes and cuboids by counting cubes	<ul style="list-style-type: none">• Understand the meaning of volume• Understand the meaning of surface area• To be able to calculate the volume and surface area of cubes, cuboids and triangular prisms.	<ul style="list-style-type: none">• To be able to find the volume and surface area of more complicated prisms• calculate, estimate and compare volume of cubes and cuboids using standard units, including cm^3 and m^3 and extending to mm^3 and km^3• Find the surface area of cubes/cuboids when lengths are known• Find missing lengths in 3D shapes when the volume or surface area is known•