Term	Half term	Unit	Topic	KS3 Ref	KS3 Objective Statement(s)
		1 Whole numbers and decimals (Number)	Negative numbers	N2	Order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols =, ≠, <, >, ≤, ≥ .
			Multiples and factors	N3	Use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property.
			Common factors	N3	Use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property.
			Prime numbers	N3	Use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property.
			Ordering decimal numbers	N1 N2	Understand and use place value for decimals, measures and integers of any size. Order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols =, ≠, <, >, ≤, ≥ .
			Rounding	N13	Round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures].
			Square numbers	N7	Use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations.
			Square numbers and square roots	N7 N15	Use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations. Use a calculator and other technologies to calculate results accurately and then interpret them appropriately.

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2 Measures, perimeter and area (Geometry and measures)	Metric measure	N12 R1	Use standard units of mass, length, time, money and other measures, including with decimal quantities. Change freely between related standard units [for example time, length, area, volume/capacity, mass].
	Metric and money conversions	N12 R1	Use standard units of mass, length, time, money and other measures, including with decimal quantities. Change freely between related standard units [for example time, length, area, volume/capacity, mass].
	Other units of measure	N12 R1	Use standard units of mass, length, time, money and other measures, including with decimal quantities. Change freely between related standard units [for example time, length, area, volume/capacity, mass].
	Reading scales	S2	Construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data.
	Perimeter and area	G1 G2	Derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms (including cylinders). Calculate and solve problems involving: perimeters of 2-D shapes (including circles), areas of circles and composite shapes.
	Area of a rectangle	G1 G2	Derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms (including cylinders). Calculate and solve problems involving: perimeters of 2-D shapes (including circles), areas of circles and composite shapes.
	Shapes made from rectangles	G2	Calculate and solve problems involving: perimeters of 2-D shapes (including circles), areas of circles and composite shapes.
	Using symbols	A1	Use and interpret algebraic notation, including: • ab in place of a × b • 3y in place of y + y + y and 3 × y • a^2 in place of a × a, a^3 in place of a × a × a; a^2b in place of a × a × b • a/b in place of a ÷ b • coefficients written as fractions rather than as decimals • brackets

3 Expressions and formulae (Algebra)	Substitution	A2	Substitute numerical values into formulae and expressions, including scientific formulae.
	Simplifying expressions	A4	Simplify and manipulate algebraic expressions to maintain equivalence by: • collecting like terms • multiplying a single term over a bracket • taking out common factors • expanding products of 2 or more binomials
	Expanding brackets	A4	Simplify and manipulate algebraic expressions to maintain equivalence by: • collecting like terms • multiplying a single term over a bracket • taking out common factors • expanding products of 2 or more binomials
	Simplifying harder expressions	A4	• collecting like terms • multiplying a single term over a bracket
	Formulae	A2	Substitute numerical values into formulae and expressions, including scientific formulae.
	Writing a formula	A6	Model situations or procedures by translating them into algebraic expressions or formulae and by using graphs.
4 Fractions, decimals and percentages	Fractions	R3	Express 1 quantity as a fraction of another, where the fraction is less than 1 and greater than 1.
	Fractions and decimals	N9 N2	Work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and 7/2 or 0.375 and 3/8). Order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols =, ≠, <, >, ≤, ≥ .
	Adding and subtracting fractions	N4	Use the 4 operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative.
	Fraction of a quantity	N11	Interpret fractions and percentages as operators.

2	(Number)	Finding 10 percent	N10	Define percentage as 'number of parts per hundred', interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express 1 quantity as a percentage of another, compare 2 quantities using percentages, and work with percentages greater than 100%.
		Percentages	N10	Define percentage as 'number of parts per hundred', interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express 1 quantity as a percentage of another, compare 2 quantities using percentages, and work with percentages greater than 100%
		Fractions, decimals and percentages	N9	Work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and 7/2 or 0.375 and 3/8).
	Assessment			
	5 Angles and 2D shapes (Geometry and measures)	Angles	G10 G6	Apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles. Use the standard conventions for labelling the sides and angles of triangle ABC, and know and use the criteria for congruence of triangles.
		Opposite angles	G10	Apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles.
		Properties of triangles	G7	Derive and illustrate properties of triangles, quadrilaterals, circles, and other plane figures [for example, equal lengths and angles] using appropriate language and technologies.
		Angles in a triangle	G12	Derive and use the sum of angles in a triangle and use it to deduce the angle sum in any polygon, and to derive properties of regular polygons.
		Parallel lines	G5 DF7	Describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric. Develop algebraic and graphical fluency, including understanding linear and simple quadratic functions.
		Properties of quadrilaterals	G7	Derive and illustrate properties of triangles, quadrilaterals, circles, and other plane figures [for example, equal lengths and angles] using appropriate language and technologies.
		Coordinates in four quadrants	A8	Work with coordinates in all 4 quadrants.

	6 Graphs (Algebra)	Coordinates and straight lines	A9	Recognise, sketch and produce graphs of linear and quadratic functions of 1 variable with appropriate scaling, using equations in x and y and the Cartesian plane.
		Drawing graphs	DF6	Develop algebraic and graphical fluency, including understanding linear and simple quadratic functions.
		Horizontal and vertical graphs	A9	Recognise, sketch and produce graphs of linear and quadratic functions of 1 variable with appropriate scaling, using equations in x and y and the Cartesian plane.
		Real-life graphs	A6 A13	Model situations or procedures by translating them into algebraic expressions or formulae and by using graphs. Find approximate solutions to contextual problems from given graphs of a variety of functions, including piece-wise linear, exponential and reciprocal graphs.
		Conversion graphs	R1 A12 RM3	Change freely between related standard units [for example time, length, area, volume/capacity, mass]. Use linear and quadratic graphs to estimate values of y for given values of x and vice versa and to find approximate solutions of simultaneous linear equations. Identify variables and express relations between variables algebraically and graphically.
		Graphs and formulae	DF6 A6	Develop algebraic and graphical fluency, including understanding linear and simple quadratic functions. Model situations or procedures by translating them into algebraic expressions or formulae and by using graphs.
3		Order of operations	N5	Use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals.
		Mental addition and subtraction	DF2	Select and use appropriate calculation strategies to solve increasingly complex problems.
		Mental multiplication and division	N1 N4	Understand and use place value for decimals, measures and integers of any size. Use the 4 operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative.
	7 Mental			

Spring term	**7 Mental calculations** **(Number)**	Addition and subtraction problems	DF2 N14 SP3	Select and use appropriate calculation strategies to solve increasingly complex problems. Use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation a<x≤b. Begin to model situations mathematically and express the results using a range of formal mathematical representations.
		Multiplication and division problems	DF2 N14 SP1	Select and use appropriate calculation strategies to solve increasingly complex problems. Use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation a<x≤b. Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems.
	8 Statistics **(Statistics and probability)**	Planning a survey	RM7	Explore what can and cannot be inferred in statistical and probabilistic settings, and begin to express their arguments formally.
		Collecting data	RM7	Explore what can and cannot be inferred in statistical and probabilistic settings, and begin to express their arguments formally.
		Frequency tables	S2	Construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data.
		Bar charts	S2	Construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data.
		Pie charts	S2	Construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data.
		Mode, median and range	S1	Describe, interpret and compare observed distributions of a single variable through: appropriate graphical representation involving discrete, continuous and grouped data; and appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers).
		The mean	S1	Describe, interpret and compare observed distributions of a single variable through: appropriate graphical representation involving discrete, continuous and grouped data; and appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers).

	Averages from frequency tables	S1	Describe, interpret and compare observed distributions of a single variable through: appropriate graphical representation involving discrete, continuous and grouped data; and appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers).	
	Comparing data sets	S2	Construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data.	
	Statistical reports	RM7	Explore what can and cannot be inferred in statistical and probabilistic settings, and begin to express their arguments formally.	
	Assessment			
4	9 Transformations and symmetry (Geometry and measures)	Reflection	G8	Identify properties of, and describe the results of, translations, rotations and reflections applied to given figures.
		Reflection symmetry	G5	Describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric.
		Rotation	G8	Identify properties of, and describe the results of, translations, rotations and reflections applied to given figures.
		Rotational symmetry	G8	Identify properties of, and describe the results of, translations, rotations and reflections applied to given figures.
		Translation	G8	Identify properties of, and describe the results of, translations, rotations and reflections applied to given figures.
		Tessellations	G8	Identify properties of, and describe the results of, translations, rotations and reflections applied to given figures.
	10 Equations	One-step equations	N6	Recognise and use relationships between operations including inverse operations.
		Equation puzzles	DF4	Substitute values in expressions, rearrange and simplify expressions, and solve equations.

10 Equations (Algebra)	Two-step equations	N6 A7	Recognise and use relationships between operations including inverse operations. Use algebraic methods to solve linear equations in 1 variable (including all forms that require rearrangement).
	Making equations	A6	Model situations or procedures by translating them into algebraic expressions or formulae and by using graphs.
11 Written and calculator methods (Number)	Written addition and subtraction	N4	Use the 4 operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative.
	Written multiplication	N4 DF2 N14	Use the 4 operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative. Select and use appropriate calculation strategies to solve increasingly complex problems. Use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation a<x≤b.
	Written division	N4	Use the 4 operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative.
	Written arithmetic problems	SP1 DF2	Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems. Select and use appropriate calculation strategies to solve increasingly complex problems.
	Calculator skills	N15	Use a calculator and other technologies to calculate results accurately and then interpret them appropriately.
	Interpreting the display	N15	Use a calculator and other technologies to calculate results accurately and then interpret them appropriately.
	Lines and angles	G3	Draw and measure line segments and angles in geometric figures, including interpreting scale drawings.

5	12 Constructions (Geometry and measures)	Constructing a triangle 1	G9	Identify and construct congruent triangles, and construct similar shapes by enlargement, with and without coordinate grids.
		Constructing a triangle 2	G9	Identify and construct congruent triangles, and construct similar shapes by enlargement, with and without coordinate grids.
		Scale drawing	R2	Use scale factors, scale diagrams and maps.
	Case study	Paper folding	RM5	Begin to reason deductively in geometry, number and algebra, including using geometrical constructions.
	Assessment			
	13 Sequences (Algebra)	Term-to-term rules	A14	Generate terms of a sequence from either a term-to-term or a position-to-term rule
		Position-to-term rules	A14 A15 RM4	Generate terms of a sequence from either a term-to-term or a position-to-term rule Recognise arithmetic sequences and find the nth term. Make and test conjectures about patterns and relationships; look for proofs or counter-examples
		Real life sequences	A14 A15	Generate terms of a sequence from either a term-to-term or a position-to-term rule Recognise arithmetic sequences and find the nth term.
		Triangular numbers	A16 RM1	Recognise geometric sequences and appreciate other sequences that arise. Extend their understanding of the number system; make connections between number relationships, and their algebraic and graphical representations.
		3D shapes	DF7 G15	Use language and properties precisely to analyse numbers, algebraic expressions, 2-D and 3-D shapes, probability and statistics. Use the properties of faces, surfaces, edges and vertices of cubes, cuboids, prisms, cylinders, pyramids, cones and spheres to solve problems in 3-D.
		Isometric drawings	RM5	Begin to reason deductively in geometry, number and algebra, including using geometrical constructions.

Summer term	**14 3D shapes** **(Geometry and measures)**	Nets of 3D shapes	DF5 DF7	Move freely between different numerical, algebraic, graphical and diagrammatic representations [for example, equivalent fractions, fractions and decimals, and equations and graphs] Use language and properties precisely to analyse numbers, algebraic expressions, 2-D and 3-D shapes, probability and statistics.
		Surface area of a cuboid	G1 G2	Derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms (including cylinders). Calculate and solve problems involving: perimeters of 2-D shapes (including circles), areas of circles and composite shapes.
		Volume of a cuboid	G1	Derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms (including cylinders).
	Case study	Perspective	RM5	Begin to reason deductively in geometry, number and algebra, including using geometrical constructions.
	15 Ratio and proportion **(Ratio and proportion)**	Simplifying ratios	R4	Use ratio notation, including reduction to simplest form.
		Dividing into ratios	R5	Divide a given quantity into 2 parts in a given part:part or part:whole ratio; express the division of a quantity into 2 parts as a ratio.
		Proportion	R3	Express 1 quantity as a fraction of another, where the fraction is less than 1 and greater than 1.
		Proportion problems	R9	Solve problems involving direct and inverse proportion, including graphical and algebraic representations.
		Ratio and proportion problems	R7 RM2	Relate the language of ratios and the associated calculations to the arithmetic of fractions and to linear functions. Extend and formalise their knowledge of ratio and proportion in working with measures and geometry, and in formulating proportional relations algebraically.
		Comparing proportions	N11 N9	Interpret fractions and percentages as operators. Work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and 7/2 or 0.375 and 3/8)

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		Calculations involving money	SP2 R9	Develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics. Solve problems involving direct and inverse proportion, including graphical and algebraic representations.
	16 Probability (Statistics and probability	Likelihood and chance	P1	Record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale.
		The probability scale	P1	Record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale.
		Equally likely outcomes	P1	Record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale.
		Experimental probability	P1	Record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale.
		Venn diagrams	P3	Enumerate sets and unions/intersections of sets systematically, using tables, grids and Venn diagrams.
	Assessment			
	Everyday maths (Real life maths)			