Mathematics Y7 sets 3 and 4

Term	1			2		3		4				5			6			
Topic	**Number 1**	**Number 2**	**Number 3**	**Geometry 1**	**Geometry 2**	**Algebra 1**	**Number 4**	**Ratio and Proportion 1**	**Algebra 2**	**Ratio and Proportion 2**	**Geometry 3**	**Number 5**	**Algebra 3**	**Geometry 4**	**Number 6**	**Algebra 4**	**Geometry 5**	**Statistics 1**
Detail	Understand place value with integers, decimals and negative numbers. Use multiplication or division to increase or decrease the value of a number.	Identify and use factors, multiples and prime numbers.	Consolidation of methods for addition, subtraction, multiplication and division	Properties of 2D and 3D shapes including measuring and constructing diagrams. **Students will need a pencil, ruler, and protractor.**	Identify and use the angle sums of any polygon.	Substitute numbers into a given or created worded formula.	Understand and use fractions,decimals and percentages and their equivalents	Explore how scale factors are used in a variety of contexts.	Investigate and describe linear number sequences.	Convert between a variety of units of measurement	Discover and use angle facts, with reasoning, to find missing angles.	Accurately perform arithmetic with fractions and find percentages of an amount.	Introduction into formal use and solving of algebraic expressions in number problems.	Explore perimeter and area of 2D shapes and volume of some 3D shapes	Understand rounding to a specific degree and use this skill to estimate calculations.	Accurately plot and describe coordinates in all four quadrants.	Perform and describe reflections and translations on a coordinate grid.	Construct and interpret line graphs and pie charts.
Mastered	Interpret, analyse and generate strategies to solve problems concerning place value	Interpret, analyse and generate strategies to solve problems concerning factors, multiples, prime numbers, HcF, LCM and prime factor decomposition	Interpret, analyse and generate strategies to solve problems concerning addition, subtraction, multiplication and division Perform long division accurately.	Interpret, analyse and generate strategies to solve problems concerning properties of 2D and 3D shapes plus accurate measurement and construction.	Interpret, analyse and generate strategies to solve problems concerning angles in any polygon.	Interpret, analyse and generate strategies to use and solve problems given a written or simple algebraic formula	Interpret, analyse and generate strategies to use and solve problems given with fractions, decimals and percentages.	Interpret, analyse and generate strategies to use and solve problems given with enlargement, scale factors and ratio.	Interpret, analyse and generate strategies to use and solve problems given number sequences.	Interpret, analyse and generate strategies to use and solve problems when converting between units of measurement.	Interpret, analyse and generate strategies to use and solve problems in angle diagrams.	Interpret, analyse and generate strategies to use and solve problems containing arithmetic of fractions or using percentages to make comparisons.	Interpret, analyse and generate strategies to use and solve problems containing basic algebra in number problems.	Interpret, analyse and generate strategies to use and solve problems involving area and perimeter of 2D shapes or volume of a cuboid.	Interpret, analyse and generate strategies to estimate calculations by using rounding.	Interpret, analyse and generate strategies to solve problems involving coordinates.	Interpret, analyse and generate strategies to solve problems involving translations and reflections.	Interpret, analyse and generate strategies to solve problems involving pie charts and/or line graphs.
Secure	Recall, use, select and apply the knowledge of place value effectively	Recall, use, select and apply the knowledge of factors, multiples, prime numbers, HCF and LCM effectively	Recall, use, select and apply the knowledge of addition, subtraction, multiplication and division Solve multip-step problems involving any of the four operations	Draw accurate nets for common 3D shapes Define Tessellate a variety of different shapes. Find all the special triangles and quadrilaterals. Recall, use, select and apply the knowledge of the properties of shapes and angles.	Recall, use, select and apply the knowledge of angle sums of any polygon	Recall, use, select and apply the knowledge of substitution into written formulae and create formulae using symbols to represent variables.	Recall, use, select and apply the knowledge of fraction, decimal and percentage equivalents. Find the percentage equivalencies any fraction.	Recall, use, select and apply the knowledge of enlargement, scale factors and ratio. Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples	Recall, use, select and apply the knowledge of linear number sequences.	Recall, use, select and apply the knowledge of converting between units of measurement.	Recall, use, select and apply the knowledge of angle facts in angle diagrams.	Recall, use, select and apply the knowledge of arithmetic with fractions. Multiply mixed numbers. Divide mixed numbers.	Recall, use, select and apply the knowledge of basic algebra in number problems.	Recall, use, select and apply the knowledge of area and perimeter of 2D shapes or the volume of a cuboid.	Recall, use, select and apply the knowledge of rounding and estimating.	Recall, use, select and apply the knowledge of coordinates.	Recall, use, select and apply the knowledge of translations and reflections.	Recall, use, select and apply the knowledge of angles to construct a pie chart or a line graph.
Developing	Multiply and divide numbers up to 3 decimal places by 10, 100 and 1000. Read and order place value in numbers up to 8 digits Add and subtract using positive and negative numbers	Decompose a number and express it as a product of its prime factors. Identify the Highest Common Factor or Lowest Common Multiple of two or more numbers.	Accurately perform long multiplication up to 4 digits x 2 digits Accurately perform short division. divide up to a 4 digit number by a two digit number Apply the order of operations (BIDMAS) correctly	Construct and measure angles up to 360°. Tessellate a variety of different shapes. Find all the nets of a cube. Classify 2D shapes using given categories e.g. number of sides, lines of symmetry...	Recall and use the angle sum of a quadrilateral. Use angle properties of special triangles and quadrilaterals	Substitute numbers into a two-step worded formula written in words. Use symbols to represent variables and create a formula from given information.	Compare fractions be finding equivalent fractions. Recall the conversion of some fractions into decimal equivalences. E.g. 1/2, 1/4, 1/10 etc Find fractions of an amount. Find the percentage equivalences of fifths, eighths and tenths	Recognise enlargements and identify the scale factor. Solve problems involving similar shapes using scale factors or when written as a ratio	Generate a linear sequence from its description. Describe a number sequence and find a missing term.	Convert between non-adjacent metric units e.g. mm-m, g-tonnes and vice versa. Convert between imperial units.	Identify and use vertically opposite angles. Use known facts to find missing angles .	Add and subtract fractions with the different denominators using equivalent fractions. Multiply fractions. Divide fractions. Multiplying a decimal by a decimal. Use decimal or fraction equivalents to find a percentage of an amount.	Find solutions to issing number problems with two unknowns. Solve missing number problems expressed algebraically	Find the area of a parallelogram. Find and use the area of a triangle. Find the volume of a cuboid using V = l•w•h	Approximate any number to a specified degree of accuracy e.g. nearest 20, 50, specific decimal place. Understand estimating as the process of finding a rough value of an answer or calculation by rounding to one significant figure.	Solve problems involving coordinates.	Describe a translation. Describe a reflection which uses one of the axes as a mirror line.	Use a table of frequencies to work out the angles for a pie chart, where frequency is a factor of 360°.
Emerging	Identify and understand place value in numbers up to 3 decimal places. Multiply and divide whole numbers by 10, 100 and 1000	Identify and define a factor, multiple and prime number. Identify the common factors or multiples of two or more numbers.	Accurately perform column addition and subtraction Recall times tables up to 12 x 12 Perform short division accurately up to dividing a 3 digit number by a single digit	Construct and measure angles up to 180° accurately using a protractor. Construct 2D shapes using squared paper. Use mathematical language to describe 2D and 3D shapes. Construct 3D shapes from their nets	Find and use the angle sum of a triangle and a straight line.	Recognise a simple formula written in words. Substitute numbers into a one-step formula written in words. Use symbols to represent variables and create a formula from given information.	Write a fraction in its simplest form. Find equivalent fractions. Compare fractions by drawing diagrams and using fraction walls. Understand that a fraction is a way of representing division. Recall standard fraction/decimal/percentage equivalences e.g. 10%, 25%, 50%, 75% etc)	Solve problems involving scaling/ratio including recipe questions. Explore enlargement using scale factors.	Recognise a linear sequence using mathematical language and find the next term.	Convert between adjacent metric units e.g. mm-cm, cm-m, m-km and vice versa (using length, mass and capacity)	Identify and use angles that meet at a point on a line. Identify and use angles that meet at a point.	Converts between mixed numbers and top heavy fractions. Add and subtract fractions with the same denominators. Find equivalent fractions. (recap from Term 3) Multiplying by a decimal. Finding a percentage of an amount using non calculator methods. (up to multiples of 5%)	Solve missing number problems expressed in words. Recall the basics of algebraic notation.	Find perimeters of different 2D shapes. Recognise that shapes with the same area can have different perimeters and vice versa. Estimate the volume of a cube or cuboid using appropriate units. Find the volume of a cuboid by counting cubes.	Approximate any number by rounding (up to 1,000,000)	Plot coordinates in all four quadrants. Describe coordinates in all four quadrants.	Perform a translation Perform a reflection using one of the axes as a mirror line	Read values from a line graph. Understand that pie charts are used to show proportion. Draw and measure angles in a pie chart.
Keywords	Place value, digit, negative, positive, multiply, divide, decimal, increase, decrease	Multiple, factor, common, divisible, prime number, composite number	Addition, subtraction sum, total, difference, minus, less, column addition, column subtraction, operation, multiply, multiplication, times, product, commutative, short multiplication, long multiplication, estimate, division, long division, remainder, quotient, dividend, divisor	protractor, measure, nerest, construct, sketch, cube, cuboid, cylinder, pyramid, prism, net, edge, face, vertex (vertices), visualise, quadrilateral, square, rectangle, parallelogram, trapezium, kite, rhombus, delta, arrowhead, triangle, scalene, isosceles, equilateral, circle, radius, diameter, circumference, centre, parallel, diagonal	Pentagon, hexagon, octagon, decagon, dodecagon, polygon, interior, exterior, angle	Formula, formulae, expression, variable, substitute	Fraction, improper fraction, proper fraction, vulgar fraction, top-heavy fraction, percentage, decimal, proportion, simplify, equivalent, lowest terms division	Proportion, quantity, integer, similar, enlargement, scale factor, group, share, multiples	Pattern, sequencde, linear, term, ascending, descending	mile, kilometre, metric, imperial, millimetre, centimetre, metre, litre, millilitre, milligram, gram, kilogram, length, distance, volume, capacity, tonne, hour, minute, second, inch, foot, yard, pound, ounce, pint, gallon	Angle, degrees, right angle, acute angle, obtuse angle, reflex angle, protractor, vertocally opposite	Mixed number, equivalent fraction, simplify, cancel, lowest terms, proper fraction, improper fraction, top-heavy fraction, numerator, denominator, percent, percentage	algebra, algebraic, algebraically, symbol. Expression, variable, substitute, equation, unknown, enumerate	Perimeter, area, volume, capacity, square, rectangle, parallelogram, triangle, composite, rectilinear, polygon, cube, cuboid, millimetre, centimetre, metre, kilometre, square millimetre, square centimetre, square metre, cubic centimetre, cubic metre, formula, formulae, convert, length, breadth, width, height, depth	Approximate, round, decimal place, check, solution, answer, estimate, accurate, accuracy	2-D, grid, axis, axes, x-axis, y-axis, y-axis, origin, quadrant, (cartesian) coordinates,	2-D, grid, axis, axes, x-axis, y-axis, y-axis, origin, quadrant, (cartesian) coordinates, point, translation, reflection, transformation, reflection, object, image, congruent, congruence	data, scale, axis, axes, graph, frequency, time graph, time series, line graph, pie chart, sector, angle, protractor, degrees, maximum, minimum
Resource Links	KM: Maths to Infinity: Directed numbers KM: Reading and writing KM: Use Powers of ten to demonstrate connections.	NRICH: Factor-multiple chains KM: Extend the idea of Eratosthenes' sieve to a 12 by 12 grid KM: Exploring primes activities: Artistic Eratosthenes sieve NRICH: The Moons of Vuvv NRICH: Round and round the circle NRICH: Counting cogs	KM: Long multiplication template KM: Maximise, minimise. Adapt ideas to fit learning intentions. KM: Maths to Infinity: Complements KM: Maths to Infinity: Multiplying and dividing NRICH: Become Maths detectives NRICH: Exploring number patterns you make NRICH: Reach 100 KM: Dividing (lots) KM: Maths to Infinity: Multiplying and dividing KM: Interactive long division KM: Interactive target boards KM: Long division development KM: Maths to Infinity: Multiplication and division foundations NRICH: Interactive division NRICH Dicey Operations Game 6	KM: Visualising 3D shapes KM: Tessellating Tess KM: Fibonacci's disappearing squares KM: Unravelling dice KM: Investigate 'Platonic Solids' NRICH: Making spirals NRICH: Cut nets NRICH: Making cuboids KM: Investigate 'Tessellations' KM: Investigate exploring Pi (ratio of the circumference to the diameter) KM: Shape work: Many of the activities are suitable for this unit. NRICH: Quadrilaterals KM: 6 point circles, 8 point circles and 12 point circles can be used to support and extend the above idea NRICH: Where Are They?	KM: Investigating polygons. Tasks one and two. KM: Special polygons NRICH: Round a Hexagon NRICH: Quadrilaterals KM: 6 point circles, 8 point circles and 12 point circles can be used to support and extend the above idea	NCETM: Year 6 Algebra Activities A and D.	KM: FDP conversion KM: Carpets KM: Fraction and decimal tables NRICH: Matching fractions NRICH: Fractions made faster	KM: Proportional reasoning tables NRICH: Orange Drink NRICH: Pumpkin Pie Problem NRICH: Jumping NCETM: Activity Set A NCETM: Activity Set B NCETM: Activity Set C NCETM: Activity Set D	KM: Maths to Infinity: Sequences NRICH: Times Tables Shifts NRICH: Domino Sets NCETM: Activity B: Sticky Triangles NCETM: Activity D: Generating Sequences	KM: Fascinating food KM: Weighing up the options NRICH: Place Your Orders NRICH: Thousands and Millions NCETM: Activity E : A little bit of history - Marco Polo	KM: Maths to Infinity: Lines and Angles	NRICH: Fractions Jigsaw NRICH: Peaches Today, Peaches Tomorrow NRICH: Andy's Marbles NRICH: Would you Rather?	KM: Combinations of variables NRICH: Plenty of Pens NRICH: Your Number Is... NRICH: Number Pyramids NCETM: Activity A: Racetrack and Design a board game NCETM: Activity E: Matchbox Algebra	KM: Dotty activities KM: Fibonacci's disappearing squares KM: Dissections deductions KM: Stick on the Maths SSM9: Area and volume KM: Maths to Infinity Area and Volume NCETM: Activity C: Through the window	KM: Checking, approximating, estimating KM: Stick on the Maths CALC6: Checking results KM: Maths to Infinity Rounding KM: Alfred and the prize money NRICH: Four Go NCETM: Activity A(i) NCETM: Activity G	KM: Stick on the Maths ALG2: Coordinates in four quadrants NRICH: Cops and Robbers NRICH: Eight Hidden Squares NRICH: Coordinate Tan	NRICH: Transformation Tease NCETM: Activity B - Battleships	KM: Stick on the Maths HD6: Graphs and diagrams NRICH: Match the Matches NRICH: Graphing Number Patterns NCETM: A little bit of history (Britain since 1945)