Maths Programme of Study – Year 6

	Autumn	Spring	Summer
Place Value and a Sense of Number	Read, write and compare numbers up to 10,000,000. Determine the value of each digit. Generate and describe linear umber sequences. Perform mental calculations, including large numbers with mixed operations (jottings are important here). Round any number to a required degree of accuracy when estimating or problem solving. Identify the value of each digit and multiply and divide by 10, 100, 1000 (up to 3 dps). Round any number to a required degree of accuracy when estimating or problem solving. Identify the value of each digit and multiply and divide by 10, 100, 1000 (up to 3 dps). Secure multiplication and division facts. Be able to generate 'new for old' using a range of jottings and representations and an understanding of PV.	Use partitioning to make sense of very large numbers. Round to an appropriate degree of accuracy when estimating. Be able to represent any number using a range of resources and jottings to demonstrate an understanding of structure. Decide which operations and methods to use when calculating and problem solving with number. Explain their choices. Embed the use of the inverse to check an answer. (bar model) Estimate through rounding to an appropriate degree of accuracy before calculating.	Addition and subtraction related and derived facts. Place value, rounding and estimation. Partitioning. Factors, multiples and primes. Additive facts and related facts. Multiplicative facts and related facts.
Problem Solving	Solve problems involving perimeter and area	Solve ratio and proportion problems involving	Solve a wide range of problems in different

and Reasoning	of compound rectilinear shapes and triangles. Explore shapes with the same perimeter and different areas and vice versa (e.g. Pentominoes). Solve problems involving equivalence between fractions, decimals and percentages in different contexts. Solve problems involving ratio, proportion and percentages such as sharing £50 out in the ratio 4:1, or receiving 20% of £50, , or receiving $\frac{1}{5}$ of £50. Solve missing number problems in context. Problem solving heuristics: Develop finding all possibilities through being systematic. Use of tables and lists to organise information.	similar shapes where the scale factor is known or can be found. Solve ratio and proportion problems involving unequal sharing and grouping using knowledge of fractions and multiples (John gets three times as many marbles as Peter; there are 44 marbles in total. How many marbles does Peter have?) Use a bar model. Solve multi-step problems involving all four operations and numbers of any size (very large and very small). Problem solving heuristics: Develop finding all possibilities through being systematic. Use of tables and lists to organise information.	contexts and with a variety of numbers and operations. • Patterning (what is the same and what is different) • Find all possibilities (make a list or use a table) • Work systematically • Trial and Improvement • Start with a simpler example • Draw a diagram Use equipment (can you say it, make it, draw it, write it, explain it?).
Calculations	<u>Calculation</u> Solve problems involving addition and subtraction using formal methods alongside structural representations such as PV counters. Multiply and divide up to 4-digit numbers by a 2-digit number using a formal method, alongside structural representations such as PV counters. Interpret remainders in context. Use knowledge of the order of operations to carry out calculations involving all four. Multiply one-digit numbers with numbers with up to two dps	<u>Calculation</u> Calculation with four operations (for whole and part numbers). Use knowledge of the order of operations to carry out calculations involving all four. <u>Fractions</u> Divide proper fractions by whole numbers ($\frac{1}{3} \div 2 = \frac{1}{6}$) Use a bar model. Use written division methods in cases where the answer has up to two decimal places. Recall and use equivalences between fractions, decimals and percentages. <u>Algebra</u>	<u>Calculation</u> Addition and subtraction strategies including algebra and sequences (for part and whole numbers including money and measure). Multiplication and division strategies including algebra (for part and whole numbers including money and measure). Ratio and proportion: link to fractions and unequal sharing. Reasoning and missing number problems in any context. Secure and be fluent with formal methods alongside visual and concrete models and

	Identify the common factors or common multiples of up to three numbers. Recognise prime numbers to 100. (know up to 20). Calculation with four operations (for whole and part numbers). Use knowledge of the order of operations to carry out calculations involving all four. <u>Fractions</u> Use equivalence and common multiples to simplify fractions. Compare and order fractions, including >1 (use bar modelling and a number line to demonstrate). Add and subtract fractions, using the idea of common denominators to write equivalent fractions (bar model). Multiply simple pairs of proper fractions (use arrays). Write the answer in its simplest form. Know that fraction and division are linked and use short division to change common fractions into decimals ($\frac{3}{8}$ = 3÷8 = 0.375). Multiply and divide with simple fractions (use arrays). <u>Algebra</u> Use simple formulae. Recognise when it is possible to use formulae for the area and volume of shapes (rectangles and triangles). Express missing number problems	Find pairs of numbers that satisfy number sentences involving two unknowns. Use simple formulae. Substitute values into formulae to find total costs, for example. Enumerate all possibilities of combinations in two variables (e.g. find pairs of numbers with a product of 7).	images. Extend calculation to negative numbers, using reasoning and the number line for support. Calculate with numbers and in context. <u>Fractions</u> Fractions, decimals and percentages including x and ÷ by 10, 100 and 1000. Four operations with fractions. Using fractions as an operator and as a number (so ½ has a value on the number line and we can also find half of an amount). Use fractions in the context of money, measure and time. <u>Algebra</u> Solve missing number problems and use simple formulae. Begin to reason and generalise the arithmetic when solutions are found.

	algebraically. Enumerate all possibilities of combinations in two variables (e.g. find pairs of numbers with a product of 7). Find pairs of numbers that satisfy number sentences involving two unknowns.		
Measurement	Recognise that shape with the same area can have different perimeters and vice versa. Convert between standard units of measure up to three dps. Recognise, describe and build simple 3-D shapes, including constructing nets accurately. Calculate, estimate and compare the volume of cubes and cuboids using standard cubic units (from km^3 to mm^3).	Convert between miles and kms. Calculate the area of parallelograms and triangles. Solve problems involving calculation with units of measure and conversion between related units up to 3dps.	Measure: conversions between metric related measures. Equivalence between metric and imperial.
Geometry	Describe positions on the full coordinate grid (all four quadrants). Illustrate and name parts of the circle (radius, diameter, and circumference). Know that 2 radii equal one diameter. Be able to calculate missing angles at a point, on a straight line and when they are vertically opposite. Revise from Y5: Compare and classify shapes based on properties, angles and symmetry. Be able to calculate missing angles in triangles, quadrilaterals and regular polygons. Compare and classify geometric shapes.	Draw and translate simple shapes on the coordinate plane and reflect them in the axes. Classify and compare geometric shapes using known properties and angle facts. Find unknown angles in shapes (triangles, quadrilaterals and regular polygons).	Properties of shape. Angle. Coordinates and transformations. Parts of a circle. Perimeter and area. Rotations , reflections and translations. Using an angle measurer and reasoning about angles.

	Find unknown angles by calculation.		
Statistics	Calculate and interpret the mean as an average. Interpret and construct line graphs	Interpret and construct pie charts.	Mean average. Pie Charts, Line graphs. Time and timetables. Using the mean. Introduce the median and the mode. Represent and interpret data on different graphs and charts. Carry out some data collection and allow pupils to display in different ways to explore the best charts to use etc.