Year 6 Maths

Application	
Ideas, questions and lines of enquiry	● Identifies and obtains necessary information to carry through a task and solve mathematical problems - Recognises when information is or is not crucial to the solving of a problem - Determines what is missing and develops a line of enquiry ● Selects the most appropriate equipment and explains choices ● Uses their mathematical experiences to explore ideas and raises questions to pursue further lines of enquiry
Represent and communicate	● Shows understanding of situation by describing them mathematically using symbols, words and diagrams ● Divided how best to represent conclusions, using appropriate recording - Begins to understand and use formulae and symbols to represent problems ● Organises work from the outset, looks for ways to record systematically and checks results to see if they are reasonable - Checks for and spots errors while working ● Constructs complex explanations and reasoned arguments
Plan an approach and implement it	● Understands and uses facts and procedures creatively to solve complex or unfamiliar problems ● Uses appropriate mathematical concepts, processes, skills and tools to solve a problem ● Interprets the mathematical solution in the context of a problem and makes sense of the solution
Computational complexity	● Solves problems with a larger number of numeric steps and least one of which is complex

Reasoning	
Make connections	● Poses own questions and create problems for peers that are similar to ones worked on in class ● Develops own lines of enquiry
Evaluate	● Considers efficiency of methods and adapts work accordingly throughout problem solving activities
Draw conclusions	● Conjectures to develop own line on enquiry when testing outcomes ● Draws own valid conclusions and give an explanation of reasoning (including written explanations)
Generalise	● Identifies more complex patterns and begins to express generalisations using symbolic notation
Justify	● Justifies methods chosen and why the solution is not the best one ● Supports conclusions with examples and counter examples

Problem Solving Strategies
● Organises, deconstructs and prioritises information; uses systematic lists and tables to identify information ● Uses informed 'guess, check and improve' ● Identifies and uses a pattern ● Draws a mathematical model to support visualisation of a problem ● Uses and applies negative proof (uses counter argument to prove the rules) ● Uses a structured approach to tackle a problem ● Solves a simpler related problem

Number and place value	**Addition, subtraction, multiplication and division**	**Fractions (including decimals and percentages)**	**Ratio and proportion**	**Algebra**	**Measurement**	**Geometry: properties of shapes**	**Geometry: position, and direction**	**Statistics**
Solve number and practical problems involving the following: □read, write, order and compare numbers up to 10 000 000 and determine the value of each digit □round any whole number to a required degree of accuracy □use negative numbers in context, and calculate intervals across zero	□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 or short division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context □perform mental calculations, including with mixed operations and large numbers. □identify common factors, common multiples and prime numbers □use their knowledge of the order of operations to carry out calculations involving the four operations □solve problems involving addition, subtraction, multiplication and division in contexts, deciding which operations and methods to use and why □use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy	□use common factors to simplify fractions; use common multiples to express fractions in the same denomination □compare and order fractions, including fractions >1 □add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions □multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $^1/_4 \times {}^1/_2 = {}^1/_8$] □ divide proper fractions by whole numbers [for example, $^1/_3 \div 2 = {}^1/_6$] □ associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $^3/_8$] □ identify the value of each digit 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 □ 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 □ recall and use equivalences between simple fractions, decimals and percentages, including in different contexts	□solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts □solve problems involving the calculation of percentages [for example, of measures such as 15% of 360] and the use of percentages for comparison □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	□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 □enumerate possibilities of combinations of two variables	□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 □recognise that shapes with the same areas can have different perimeters and vice versa □recognise when it is possible to use formulae for area and volume of shapes □calculate the area of parallelograms and triangles □calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^3) and cubic metres (m^3), and extending to other units [for example mm^3 and km^3]	□draw 2-D shapes using given dimensions and angles □recognise, describe and build simple 3-D shapes, including making nets □compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons □illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius □recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles	▪ describe positions on the full coordinate grid (all four quadrants) ▪ draw and translate simple shapes on the coordinate plane, and reflect them in the axes	▪ interpret and construct pie charts and line graphs and use these to solve problems ▪ calculate and interpret the mean as an average