Underhill Year 5 Programme of Study

I Can You Can We Can

Autumn	1. Reasoning with large whole numbers (2 weeks)	- read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit - count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 - round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 - solve number problems and practical problems that involve all of the above - read Roman numerals to 1000 (M) and recognise years written in Roman numerals
	2. Problem solving with integer addition and subtraction (2 weeks)	- add and subtract numbers mentally with increasingly large numbers add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy - solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
	3. Line graphs and timetables (2 weeks)	- solve comparison, sum and difference problems using information presented in a line graph - complete, read and interpret information in tables, including timetables solve problems involving converting between units of time
	4. Multiplication and division (3 weeks)	- identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers recognise and use square numbers and the notation for squared (^{2}) - know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers - establish whether a number up to 100 is prime and recall prime numbers up to 19 - multiply and divide whole numbers by 10, 100 and 1000 - multiply and divide numbers mentally drawing upon known facts - solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes - multiply numbers up to 4 digits by a one- or two-digit number using a formal written method - divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context - solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
	5. Perimeter and area (1 week)	- measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres - calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of non-rectilinear shapes

Spring	**6. Fractions and decimals** **(3 weeks)**	• compare and order fractions whose denominators are all multiples of the same number recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$] • identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths • read and write decimal numbers as fractions [for example, $0.71 = \frac{71}{100}$] • round decimals with two decimal places to the nearest whole number and to one decimal place • read, write, order and compare numbers with up to three decimal places
	7. Angles **(2 weeks)**	• know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles • draw given angles, and measure them in degrees (°) • identify: angles at a point and one whole turn (total 360°); angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180°); other multiples of 90°
	8. Fractions, decimals and percentages **(3 weeks)**	• add and subtract fractions with the same denominator and denominators that are multiples of the same number multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates • recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal • solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and fraction and decimal equivalents of percentages that are multiples of 10 and 25 • solve problems involving number up to three decimal places • use all four operations to solve problems involving measure (for example length, mass, volume, money) using decimal notation, including scaling • associate a fraction with division (Y6) • use common factors to simplify fractions; use common multiples to express fractions in the same denomination (Y6)
	9. Transformations **(2 weeks)**	• identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed • use the properties of rectangles to deduce related facts and find missing lengths and angles • describe positions on the full coordinate grid (all four quadrants) (Y6) • interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero • use negative numbers in context, and calculate intervals across zero (Y6)

Summer	**10. Converting units of measure** **(2 week)**	• convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram) • multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints
	11. Calculating with whole numbers and decimals **(3 weeks)**	• use all four operations to solve problems involving measure (for example length, mass, volume, money) using decimal notation, including scaling • solve problems involving number up to three decimal places multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers • multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
	12. 2-D and 3-D shape **(2 weeks)**	• distinguish between regular and irregular polygons based on reasoning about equal sides and angles • use the properties of rectangles to deduce related facts and find missing lengths and angles • identify 3-D shapes, including cubes and other cuboids, from 2-D representations • recognise, describe and build simple 3-D shapes, including making nets (Y6) • illustrate and name parts of circles, including radius, diameter and circumference and know that diameter is twice the radius. (Y6)
	13. Volume **(1 week)**	• estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water] recognise and use cube numbers and the notation for cubed (^{3})
	14. Problem solving **(2 weeks)**	• consolidation and application opportunities