Year 5 Year Maths Progression in Knowledge

NC Knowledge
Autumn Unit 1: Number and Place Value
• 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 • interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero • 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.
Autumn Unit 2: Addition and subtraction
• add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • add and subtract numbers mentally with increasingly large numbers • 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.
Autumn Unit 3: Statistics
• solve comparison, sum and difference problems using information presented in a line graph • complete, read and interpret information in tables, including timetables
Autumn Unit 4: Number Multiplication and division.
• multiply and divide numbers mentally drawing upon known facts • multiply by 10,100 and 1000 • identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers • know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers • establish whether a number up to 100 is prime and recall prime numbers up to 19 • recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}) • solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes • solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.
Autumn Unit 5: Measurement: Area and Perimeter
• 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 irregular shapes.
Spring 1: Multiplication and division
• 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 numbers mentally drawing upon known facts • 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
Spring 2: Number: Fractions
• compare and order fractions whose denominators are all multiples of the same number

- identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths ♣ 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, 2/5 + 4/5 = 6/5 = 1 1/5]
- 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
- read and write decimal numbers as fractions [for example, 0.71 = 71/100]
- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

Spring 3: Number: Decimal and percentages

- read, write, order and compare numbers with up to three decimal places
- recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
- round decimals with two decimal places to the nearest whole number and to one decimal place
- solve problems involving number up to three decimal places
- 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 ½, ¼, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25.

Summer 1: Decimals

- Recognise and write decimal equivalents of any number of tenths or hundredths
- Find the effect of dividing a one or two-digit number to 10 or 100, identify the value of the digits in the answer as ones, tenths and hundredths
- Solve simple measure and money problems involving fractions and decimals to two decimal places
- convert between different units of measure (for example km to m)

Summer 2: Geometry: Properties of Shape

- identify 3-D shapes, including cubes and other cuboids, from 2-D representations
- 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 ½ a turn (total 180°), other multiples of 90°
- use the properties of rectangles to deduce related facts and find missing lengths and angles
- distinguish between regular and irregular polygons based on reasoning about equal sides and angles.

Summer 3: Geometry: Position and direction

- 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

Summer 4: Measurement: Converting units

- convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)
- solve problems involving converting between units of time
- understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints

Summer 5: Measurement: Volume

• estimate volume [for example, using 1 cm3 blocks to build cuboids (including cubes)] and capacity [for example, using water] • use all four operations to solve problems involving measure

Year 5 Maths Progression in Skills and Knowledge

Y 5 / 6 Working Mathematically:
• ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the **connections** that pupils make between multiplication and division with fractions, decimals, percentages and ratio.
• develop their ability to **solve a wider range of problems**, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.
• By the end of year 6, pupils should be **fluent** in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.
• Pupils should read, spell and pronounce mathematical vocabulary correctly.