Updated 2022-23

CURRICULUM SUMMARY Mathematics – Years 3-6 Overview

	Year 3	Year 4	Year 5	Year 6
Number & place value	Y1 - count from 0 in multiples of 4, 8, 50 and 100 Y2 - find 10 or 100 more or less than a given number Y3 - compare and order numbers up to 1000 Y4 - identify, represent and estimate numbers using different representations Y5 - read and write numbers up to 1 000 in numerals and in words Y6 - tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks (copied from Measurement) Y7 - recognise the place value of each digit in a three-digit number (hundreds, tens, ones) Y8 - solve number problems and practical problems involving these ideas.	G1 - count backwards through zero to include negative numbers G2 - count in multiples of 6, 7, 9, 25 and 1000 G3 - find 1 000 more or less than a given number G4 - order and compare numbers beyond 1 000 G5 - compare numbers with the same number of decimal places up to two decimal places (copied from Fractions) G6 - identify, represent and estimate numbers using different representations G7 - read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value G8 - recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) G9 - find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as units, tenths and hundredths (copied from Fractions) G10 - round any number to the nearest 10, 100 or 1 000 G11 - round decimals with one decimal place to the nearest whole number (copied from Fractions) G12 - solve number and practical problems that involve all of the above and with increasingly large positive numbers	B1 - interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero B2 - count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 B3 - read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers) B4 - read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Comparing Numbers) B5 - read Roman numerals to 1000 (M) and recognise years written in Roman numerals B6 - read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers) B7 - recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (copied from Fractions) B8 - round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000 B9 - round decimals with two decimal places to the nearest whole number and to one decimal place (copied from Fractions)	I1 - use negative numbers in context, and calculate intervals across zero I2 - read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers) I3 - read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Understanding Place Value) I4 - read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers) I5 - identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1 000 where the answers are up to three decimal places (copied from Fractions) I6 - round any whole number to a required degree of accuracy I7 - solve problems which require answers to be rounded to specified degrees of accuracy (copied from Fractions) I8 - solve number and practical problems that involve all of the above
Addition & subtraction	Y9 - add and subtract numbers mentally, including: *a three-digit number and ones *a three-digit number and tens *a three-digit number and hundreds Y10 - add and subtract numbers with up to three digits, using formal written	G13 - add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate G14 - estimate and use inverse operations to check answers to a calculation G15 - solve addition and subtraction two-	B11 - add and subtract numbers mentally with increasingly large numbers B12 - add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) B13 - use rounding to check answers to	I9 - perform mental calculations, including with mixed operations and large numbers I10 - use their knowledge of the order of operations to carry out calculations involving the four operations I11 - use estimation to check answers to calculations and determine, in the

	methods of columnar addition and subtraction Y11 - estimate the answer to a calculation and use inverse operations to check answers Y12 - solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	step problems in contexts, deciding which operations and methods to use and why	calculations and determine, in the context of a problem, levels of accuracy B14 - solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	context of a problem, levels of accuracy I12 - solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why I13 - Solve problems involving addition, subtraction, multiplication and division
Multiplication & division	Y13 - count from 0 in multiples of 4, 8, 50 and 100 (copied from Number and Place Value) Y14 - recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables Y15 - write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Written Methods) Y16 - write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Mental Methods) Y17 - estimate the answer to a calculation and use inverse operations to check answers (copied from Addition and Subtraction) Y18 - solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects	G16 - count in multiples of 6, 7, 9, 25 and 1 000 (copied from Number and Place Value) G17 - recall multiplication and division facts for multiplication tables up to 12 × 12 G18 - use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers G19 - recognise and use factor pairs and commutativity in mental calculations (appears also in Properties of Numbers) G20 - multiply two-digit and three-digit numbers by a one-digit number using formal written layout	B15 - count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 (copied from Number and Place Value) B16 - multiply and divide numbers mentally drawing upon known facts B17 - multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 B18 - 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 B19 - 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	I14 - perform mental calculations, including with mixed operations and large numbers I15 - associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3/8) (copied from Fractions) I16 - multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication I17 - divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context I18 - use written division methods in cases where the answer has up to two decimal places (copied from Fractions (including decimals)
Properties of numbers		G21 - recognise and use factor pairs and commutativity in mental calculations (repeated) G22 - estimate and use inverse operations to check answers to a calculation (copied from Addition and Subtraction) G23 - solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling	B20 - identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers B21 - know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers B22 - establish whether a number up to 100 is prime and recall prime numbers up to 19	I19 - identify common factors, common multiples and prime numbers I20 - use common factors to simplify fractions; use common multiples to express fractions in the same denomination (copied from Fractions) I21 - calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm3) and cubic metres (m3), and

		problems and harder correspondence problems such as n objects are connected to m objects	B23 - recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3) B24 - solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes B25 - solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign B26 - solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates	extending to other units such as mm3 and km3 (copied from Measures) I22 - use their knowledge of the order of operations to carry out calculations involving the four operations I23 - use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy I24 - solve problems involving addition, subtraction, multiplication and division I25 - solve problems involving similar shapes where the scale factor is known or can be found (copied from Ratio and Proportion)
Fractions, decimals & percentages	Y19 - count up and down in tenths Y20 - recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators Y21 - recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10 Y22 - recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators Y23 - compare and order unit fractions, and fractions with the same denominators Y24 - recognise and show, using diagrams, equivalent fractions with small denominators Y25 - add and subtract fractions with the same denominator within one whole (e.g. 5/7 + 1/7 = 6/7) Y26 - solve problems that involve all of the above	G24 - count up and down in hundredths G25 - recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten G26 - compare numbers with the same number of decimal places up to two decimal places G27 - round decimals with one decimal place to the nearest whole number G28 - recognise and show, using diagrams, families of common equivalent fractions G29 - recognise and write decimal equivalents of any number of tenths or hundredths G30 - recognise and write decimal equivalents to 1/4; 1/2; 3/4 G31 - add and subtract fractions with the same denominator G32 - find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths G33 - solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number G34 - solve simple measure and money problems involving fractions and decimals to two decimal places	B27 - recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (appears also in Equivalence) B28 - compare and order fractions whose denominators are all multiples of the same number B29 - read, write, order and compare numbers with up to three decimal places B30 - round decimals with two decimal places to the nearest whole number and to one decimal place B31 - identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths B32 - read and write decimal numbers as fractions (e.g. 0.71 = 71/100) B33 - recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents B34 - 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 as a decimal fraction B35 - add and subtract fractions with the same denominator and multiples of the same number B36 - recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. 2/5 + 4/5 = 6/5 = 11/5) B37 - multiply proper fractions and mixed numbers by whole numbers, supported by	I26 - compare and order fractions, including fractions >1 I27 - identify the value of each digit in numbers given to three decimal places I28 - solve problems which require answers to be rounded to specified degrees of accuracy I29 - use common factors to simplify fractions; use common multiples to express fractions in the same denomination I30 - associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3/8) I31 - recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. I32 - add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions I33 - multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. 1/4 × 1/2 = 1/8) I34 - multiply one-digit numbers with up to two decimal places by whole numbers I35 - divide proper fractions by whole numbers (e.g. 1/3 ÷ 2 = 1/6) I36 - multiply one-digit numbers with up to two decimal places by whole numbers I37 - multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places I38 - identify the value of each digit to

			materials and diagrams B38 - solve problems involving numbers up to three decimal places B39 - solve problems which require knowing percentage and decimal equivalents of 1/2, 1/4, 1/5, 2/5, 4/5 and those with a denominator of a multiple of 10 or 25.	three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places I39 - associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3/8) I40 - use written division methods in cases where the answer has up to two decimal places
Algebra	Y27 - solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. (copied from Addition and Subtraction) Y28 - solve problems, including missing number problems, involving multiplication and division, including integer scaling (copied from Multiplication and Division)	G35 - Perimeter can be expressed algebraically as 2(a + b) where a and b are the dimensions in the same unit (Copied from NSG measurement)	B40 - use the properties of rectangles to deduce related facts and find missing lengths and angles (copied from Geometry: Properties of Shapes)	I45 - express missing number problems algebraically I46 - find pairs of numbers that satisfy number sentences involving two unknowns I47 - enumerate all possibilities of combinations of two variables I48 - use simple formulae I49 - recognise when it is possible to use formulae for area and volume of shapes (copied from Measurement) I50 - generate and describe linear number sequences
Measurement	Y29 - compare durations of events, for example to calculate the time taken by particular events or tasks Y30 - estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight (appears also in Telling the Time) Y31 - measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) Y32 - measure the perimeter of simple 2-D shapes Y33 - add and subtract amounts of money to give change, using both £ and p in practical contexts Y34 - tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks Y35 - estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as	G36 - estimate, compare and calculate different measures, including money in pounds and pence (also included in Measuring) G37 - estimate, compare and calculate different measures, including money in pounds and pence (appears also in Comparing) G38 - measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres and find the area of rectilinear shapes by counting squares G39 - read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting) G40 - solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Converting) G41 - convert between different units of measure (e.g. kilometre to metre; hour to minute) G42 - read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting)	B41 - calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes (also included in measuring) B42 - estimate volume (e.g. using 1 cm3 blocks to build cubes and cuboids) and capacity (e.g. using water) B43 - use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling. B44 - measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres B45 - calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3) (copied from Multiplication and Division) B46 - solve problems involving converting between units of time B47 - convert between different units of	I51 - calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm3) and cubic metres (m3), and extending to other units such as mm3 and km3. I52 - solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate (appears also in Converting) I53 - recognise that shapes with the same areas can have different perimeters and vice versa I54 - calculate the area of parallelograms and triangles I55 - calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm3) and cubic metres (m3), and extending to other units [e.g. mm3 and km3] I56 - recognise when it is possible to use formulae for area and volume of shapes I57 - use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure

	a.m./p.m., morning, afternoon, noon and midnight (appears also in Comparing and Estimating) Y36 - know the number of seconds in a minute and the number of days in each month, year and leap year	G43 - solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Telling the Time)	metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) B48 - solve problems involving converting between units of time B49 - understand and use equivalences between metric units and common imperial units such as inches, pounds and pints	to a larger unit, and vice versa, using decimal notation to up to three decimal places I58 - solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate (appears also in Measuring and Calculating) I59 - convert between miles and kilometres
Geometry	Y37 - draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them Y38 - recognise angles as a property of shape or a description of a turn Y39 - identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle Y40 - identify horizontal and vertical lines and pairs of perpendicular and parallel lines	G44 - identify lines of symmetry in 2-D shapes presented in different orientations G45 - complete a simple symmetric figure with respect to a specific line of symmetry G46 - compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes G47 - identify acute and obtuse angles and compare and order angles up to two right angles by size G48 - describe positions on a 2-D grid as coordinates in the first quadrant G49 - describe movements between positions as translations of a given unit to the left/right and up/down G50 - plot specified points and draw sides to complete a given polygon	B50 - identify 3-D shapes, including cubes and other cuboids, from 2-D representations B51 - draw given angles, and measure them in degrees (o) B52 - use the properties of rectangles to deduce related facts and find missing lengths and angles B53 - distinguish between regular and irregular polygons based on reasoning about equal sides and angles B54 - know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles identify: *angles at a point and one whole turn (total 360o) *angles at a point on a straight line and ½ a turn (total 180o) *other multiples of 90o B55 - 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	I60 - recognise, describe and build simple 3-D shapes, including making nets (appears also in Drawing and Constructing) I61 - illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius I62 - draw 2-D shapes using given dimensions and angles I63 - recognise, describe and build simple 3-D shapes, including making nets (appears also in Identifying Shapes and Their Properties) I64 - compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons I65 - recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles I66 - describe positions on the full coordinate grid (all four quadrants) I67 - draw and translate simple shapes on the coordinate plane, and reflect them in the axes
Statistics	Y41 - interpret and present data using bar charts, pictograms and tables Y42 - solve one-step and two-step questions [e.g. 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables	G51 - interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs G52 - solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs	B56 - complete, read and interpret information in tables, including timetables B57 - solve comparison, sum and difference problems using information presented in a line graph	I68 - interpret and construct pie charts and line graphs and use these to solve problems I69 - calculate and interpret the mean as an average

Our rationale for sequencing the subject in this way

At Whitehall Junior School, we take pride in teaching children to go above and beyond. Our mathematics provision enables children to challenge themselves in all aspects of mathematical knowledge. The spiral curriculum that we provide ensures the revisiting and extension of all topics each term. This allows children to rehearse, recap and retain their knowledge and to reason with

it and apply it to the current real-world setting. All lessons within mathematics stem from our medium-term plans which are progressive, covering a wide breadth of mathematical topics, adapted from the National Curriculum. The medium-term plan incorporates a mental maths objective (taught at the beginning of the lesson, to build number fluency) and an objective which is developed in further detail throughout the lesson. As a school, teachers have planned, designed and created lessons using a variety of high-quality resources to ensure quality-first teaching. Using summaries, like this one, teachers can understand the prerequisites for their year group's objectives whilst also understanding the next steps, allowing for adapted scaffolding which challenges each child on an individual level.

The sequence of our weekly lessons follows an introduction of the topic which highlights key vocabulary and elicits prior knowledge to address any misconceptions. After this, subsequent lessons are based on the direct teaching of new knowledge, skills and concepts, enabling practise and consolidation. The last lesson of the week consolidates understanding of the objectives assigned to the week. To enable further articulation of learning, AfL is used daily and Fortnightly Friday offers an opportunity for children to problem-solve and experience mathematics through a holistic scenario. We also offer opportunities to participate in mathematics challenge events (with a proud history of success), both virtually and at local secondary schools. Outside of lessons, children are encouraged with an assortment of mathematics tasks, including: Fluent in Five, Friday Mental Maths, the annual Barvember event, TTRS booklets etc., to enthuse and entice children to pursue their own mathematical journeys' and to thrive, numerically, in life beyond school learning.