ACE Learning Progression Grid : Maths

Separate schemes are followed in each school:

FP to refer to SMART Maths **HS to refer to** White Rose Maths

Progression Grid for Maths: (linked to PATT & NC expectations/ Smart Maths/ White Rose)

Main Strand	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Place Value	Children count reliably with numbers from 1 to 20, place them in order and say which number is one more or one less than a given number. Children count beyond 20, recognising the pattern of the counting system. Understand cardinal law and link numerals with their cardinal number value. Children understand the one more than and one less than relationship between consecutive numbers.	Count to and across 100, forwards and backwards, beginning with 0 or 1 or any given number. Count, read and write numbers to 100 in numerals. Count in multiples of twos, fives and tens. Given a number, identify one more, Given a number, identify one less. Identify and represent numbers using objects and pictorial representations including the number line.	Count in steps of 2/3/5/10 from 0, forward or backward. Recognise odd and even numbers. Recognise the place value of each digit in a two-digit number (tens, ones). Identify, represent and estimate numbers using different representations, inc. the number line. Compare and order numbers from 0 up to 100 using < > = signs. Read and write numbers to at least 100 in numerals. Read and write numbers to at least 100 in words.	Count from 0 in multiples of 4/8/50/100. Find 10 or 100 more or less than a given number. Recognise the place value of each digit in a three-digit number (hundreds, tens, ones). Compare and order nos up to 1000. Read and write nos up to 1000 in numerals and in words. Identify, represent and estimate numbers using different representations.	Count in multiples of 6/7/9/25/1000 Find 1000 more or less than a given number. Round any number to the nearest 10/ 100/ 1000. Count backwards through zero to include negative numbers. Recognise the place value of each digit in a 4-digit number (thousands, hundreds, tens, and ones). Order and compare numbers beyond 1000. 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.	Read and write numbers to at least 1 000 000 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 Interpret negative numbers in context Count forwards and backwards with positive and negative whole numbers, including through zero. Read Roman numerals to	Read and write numbers up to 10 000 000 and determine the value of each digit. Order and numbers up to 10 000 000 and determine the value of each digit. 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. Solve number and practical problems that involve all of the above.

		Understand and use the language of: equal to, more than, less than (fewer), most, least. Read and write numbers from 1 to 20 in numerals. Read and write numbers from 1 to 20 in words.		Solve number problems and practical problems involving these ideas.		1000 (M) and recognise years written in Roman numerals.	
Addition and Subtraction	Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. Explore and have a deep understanding of number to 10, including the composition of numbers to 10. Recall number bonds to 5 and some to 10. Solve real world mathematical problems with numbers to 5	Read, write and interpret mathematical statements involving addition (+) and equals (=) signs. Read, write and interpret mathematical statements involving subtraction (-) and equals (=) signs. Represent and use number bonds and related subtraction facts within 20. Add one-digit and two-digit numbers to 20, including zero. Subtract one-digit and two-digit numbers to 20, including zero. Solve one-step problems that involve addition using concrete objects and pictorial representations.	Solve problems with addition: using concrete objects and pictorial representations; Solve problems with addition; applying their increasing knowledge of mental and written methods. Solve problems with subtraction: using concrete objects and pictorial representations; Solve problems with subtraction applying their increasing knowledge of mental and written methods. Recall and use add and subtract facts to 20 fluently, and derive and use related facts up to 100. Add numbers using concrete objects, pictorial representations, and mentally, including: a 2-digit no and 1s or 10s; adding three 1-digit	Add and subtract numbers mentally 3-digit no and 1s. Add and subtract numbers mentally 3-digit no and 10s. Add and subtract numbers mentally 3-digit no and 100s. Add numbers with up to 3 digits, using formal written methods of columnar addition. Subtract numbers with up to 3 digits, using formal written methods of columnar subtraction. Estimate the answer to a calculation. Use inverse operations to check answers to a question.	Add numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate. Subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate. Estimate and use inverse operations to check answers to a calculation. Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.	Add whole numbers with more than 4 digits including using formal written methods. Subtract whole numbers with more than 4 digits including using formal written methods. Add numbers mentally with increasingly large numbers. Subtract numbers mentally with increasingly large numbers. Use rounding to check answers to calculations and levels of accuracy. Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.	Solve addition multi-step problems in contexts, deciding which operations and methods to use and why. Solve subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

		Solve one-step problems that involve subtraction, using concrete objects and pictorial representations. Solve missing number problems such as 7 = ☐ - 9	numbers. Add two 2-digit numbers using concrete objects, pictorial representations and mentally Subtract numbers using concrete objects, pictorial representations, and mentally, including: a 2-digit no and 1s or 10s; two 2-digit numbers. Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot. Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems.	Solve problems, inc, missing number problems, using number facts, place value, and more complex addition and subtraction.			
Multiplication and Division	They solve problems, including doubling, halving and sharing. Explore and represent patterns within numbers to 10 including odds and evens, doubling facts, and how quantities can be distributed equally.	Solve one-step problems involving multiplication, by calculating the answer using concrete objects pictorial reps and arrays with the support of the teacher. Solve one-step problems involving division, by calculating the answer using concrete objects, pictorial reps and arrays with the support of the teacher.	Recall, write and use multiplication and division facts for the 2x tables. Recall, write and use multiplication and division facts for the 5x tables. Recall, write and use multiplication and division facts for the 10x tables. Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot. Solve problems involving multiplication, using materials, arrays, and	Recall and use multiplication and use division facts for the 3x tables. Recall and use multiplication and use division facts for the 4x tables. Recall and use multiplication and use division facts for the 8x tables. Write and calculate math statements for x using the tables they know, including 2-digit numbers times 1-digit numbers, using	Recall multiplication facts for multiplication tables up to 12 × 12. Recall division facts for multiplication tables up to 12 × 12. Recognise and use factor pairs and commutativity in mental calculations. Multiply two-digit numbers by a one-digit number using formal written layout. Multiply three-digit numbers by a one-digit number using formal written layout. Solve problems involving	Identify multiples. Identify factors, including finding all factor pairs of a number. Identify common factors of two numbers. Know and use the vocabulary of prime numbers and composite (non-prime) numbers. Identify prime factors . Establish whether a number up to 100 is prime and recall prime numbers up to 19. Multiply numbers up to 4 digits by a 1- or 2-digit	Multiply numbers up to 4 digits by a 2-digit whole number using the formal written methods. Divide numbers up to 4 digits by a 2-digit whole number using the formal written methods. Interpret remainders as whole number remainders, fractions, or by rounding. Identify common factors. Identify common multiples. Identify common prime numbers.

			repeated addition. Solve problems involving multiplication using mental methods, and multiplication and division facts, including problems in contexts. Solve problems involving division, using materials and arrays. Solve problems involving division using mental methods, and multiplication and division facts, including problems in contexts.	mental and formal written methods. Write and calculate math statements for ÷ using the tables they know, including 2-digit numbers times 1-digit numbers, using mental and formal written methods. Solve problems and missing number problems, involving multiplication and division including integer scaling problems and corresponding problems in which n objects are connected to m objects.	multiplication and addition inc. using the distributive law to multiply 2 digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.	number using a formal written method. Divide numbers up to 4 digits by a 1-digit number using the formal written method of short division. Multiply whole numbers and those involving decimals by 10, 100 and 1000. Divide whole numbers and those involving decimals by 10, 100 and 1000. Recognise and use square numbers and the notation for squared. Recognise and use cube numbers, and the notation for cubed.	Use their knowledge of the order of operations to carry out calculations involving the four operations.
Fractions and Decimals		Recognise, find and name a half as one of two equal parts of an object, shape or quantity. Recognise, find and name a quarter as one of four equal parts of a quantity.	Recognise/find/name/write fractions ⅓, ¼, 2/4, ¾ of a set of objects or quantity. Recognise/find/name/write fractions ⅓, ¼, 2/4, ¾ of a length. Recognise/find/name/write fractions ⅓, ¼, 2/4, ¾ of a shape. Write simple fractions e.g. ½ of 6 = 3 Recognise the equivalence of 2/4 and ½.	Count up and down in tenths and recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10. Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators. Recognise and use fractions as numbers: unit fractions and non-unit fractions with small	Recognise and show, using diagrams, families of common equivalent fractions. Count up and down in hundredths; recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten. Add fractions with the same denominator. Subtract fractions with the same denominator. Recognise and write decimal equivalents of any number of tenths or hundredths; and the decimal equivalents to ¼. Recognise and write decimal equivalents of	Compare and order fractions whose denominators are all multiples of the same number. Add and subtract fractions with the same denominator. Add and subtract fractions with 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	Use common factors to simplify fractions. Use common multiples to express fractions in the same denomination. Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions. Multiply simple proper fractions and simplify the answer (e.g. ¼ x ½ = ⅛). Divide proper fractions by whole numbers (e.g. ⅓ ÷ 2 = ⅙). Identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the

				denominators. Recognise and show, using diagrams, equivalent fractions with small denominators. Add and sub fractions with the same denominator within one whole (e.g. $^5/_7 + {}^1/_7 = {}^6/_7$). Compare unit fractions, and fractions with the same denominators. Order unit fractions, and fractions with the same denominators.	any number of tenths or hundredths; and the decimal equivalents to ½. Recognise and write decimal equivalents of any number of tenths or hundredths; and the decimal equivalents to ¾. Find the effect of dividing a one digit number by 10, identifying the value of the digits in the answer as ones, tenths and hundredths. Find the effect of dividing a one digit number by 100, identifying the value of the digits in the answer as ones, tenths and hundredths. Find the effect of dividing a two-digit number by 10, identifying the value of the digits in the answer as ones, tenths and hundredths. Find the effect of dividing a two-digit number 100, identifying the value of the digits in the answer as ones, tenths and hundredths. Round decimals with one decimal place to the nearest whole number. Solve simple measure and money problems involving fractions and decimals to 2 decimal places.	mathematical statements > 1 as a mixed number. Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. Round decimals with two decimal places to the nearest whole number and to one decimal place. Read and write decimal numbers as fractions (e.g. $0.72 = {}^{72}/_{100}$). Read, write, order and compare numbers with up to three decimal places. Solve problems involving number up to three decimal places. Write percentages as a fraction. Solve problems which require knowing percentage and decimal equivalents of ½, ¼, ⅕, ⅖, ⅘ and those with a denominator of a multiple of 10 or 25.	answers are 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. Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

Ratio and Proportion							Solve problems involving the calculation of percentages (e.g. 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.
Algebra							Express missing number problems algebraically. Use simple formulae expressed in words. Generate and describe linear number sequences. Find pairs of numbers that satisfy number sentences involving two unknowns. Enumerate all possibilities of combinations of two variables.
Measure	Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use	Compare, describe & solve pract probs for: lengths/heights (short/tall, half/ double). Compare, describe & solve pract probs for mass/weight (heavier/lighter). Compare, describe & solve pract probs for: cap/vol (full/empty, more/less) Compare, describe &	Choose/use appropriate stand units to estimate/measure length/height (m/cm) to nearest unit, using rulers. Choose/use appropriate stand units to estimate/measure mass (kg/g) to nearest unit, using scales. Choose/use appropriate stand units to estimate/measure temp (°C); to nearest unit, using thermometers.	Measure, compare, add and subtract lengths (m/cm/mm) Measure, compare, add and subtract mass (kg/g) Measure, compare, add and subtract volume/capacity (l/ml). Measure the perimeter of simple 2-D shapes.	Convert between different units of measure (e.g. kilometre to metre). Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days). Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres. Find the area of	Convert between different units of metric measure (e.g. km & m; cm & m; cm & mm; g & kg; l & ml). Use approx. equivalences between metric and imperial units (e.g. inches, pounds & pints). Measure & calculate the perimeter of composite rectilinear shapes in cm/m. Calculate the area of squares/rectangles using	Solve problems involving the calculation and conversion of units of measure (basic, whole numbers). Solve problems involving the calculation and conversion of units of measure using decimal notation up to three decimal places where appropriate. Convert between miles and km. Convert between standard

	mathematical language to describe them. Compare quantities using the language more/fewer. Describe and discuss routes and locations using language such as under, in front of, behind. Talk about and describe patterns. Extend and create ABAB patterns and correct errors in repeat patterns.	solve pract probs for: time (quicker/slower/later) Measure and begin to record the following: lengths/heights; Measure and begin to record the following: mass/weight; Measure and begin to record the following: capacity/volume; Measure and begin to record the following: time (hours, minutes, seconds). Recognise and know the value of different denominations of coins and notes. Sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening. Recognise and use language relating to dates, including days of the week, weeks, months and years. Tell the time to the hour and draw the hands on a clock face to show these times. Tell the time to half	Choose/use appropriate stand units to estimate/measure capacity (litres/ml) to nearest unit, using measuring vessels. Compare and order lengths, mass, volume/capacity and record the results using >, < and = Recognise and use symbols for pounds (£) and pence (p); Combine amounts of money to make a particular value. Find different combinations of coins that equal the same amounts of money. Solve simple problems in a practical context involving addition of money of the same unit Solve simple problems in a practical context involving subtraction of money of the same unit, including giving change. Know the number of minutes in an hour and the number of hours in a day. Compare and sequence intervals of time. Tell and write the time; quarter past.to the hour and draw the hands on a clock face to show these	Add amounts of money using both £ and p in practical contexts. Subtract amounts of money to give change, using both £ and p in practical contexts. Tell/write the time from an analogue clock. Tell/write the time Roman numerals from I to XII. Tell/write the time from 12-hr/24-hr clocks. Estimate and read time with increasing accuracy to nearest min; record/compare time in secs, mins, hrs. Use vocab such as o'clock, a.m./p.m., morning, afternoon, noon and midnight. Know the number of seconds in a minute and the number of days in each month, year and leap year.	rectilinear shapes by counting squares. Estimate, compare and calculate different measures, including money in pounds and pence. Read, write and convert time between analogue and digital 12 and 24-hour clocks.	standard units, square cm/m. Estimate the area of irregular shapes. Estimate volume (e.g. using 1 cm blocks to build cubes/cuboids) and capacity (e.g. using water). Solve problems involving converting between units of time. Use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling.	units of measure, converting length, mass, volume & time from smaller to larger units, and vice versa, using decimal notation to up to 3 dec places. Recognise that shapes with the same areas can have different perimeters and vice versa. Calculate the area of parallelograms, and recognise when it is possible to use formulae for area. Calculate the area of triangles and recognise when it is possible to use formulae for area and volume of shapes. To use and apply the formulae for volume of shapes. Calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm2) and cubic metres (m3), and extending to other units.

		past the hour and draw the hands on a clock face to show these times.	times. Tell and write the time to five minutes, draw the hands on a clock face to show these times.				
Geometry	Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them. Talk about and explore 2D and 3D shapes using informal mathematical language such as sides, corners, flat, round. Select shapes appropriately for purpose I.e triangular prism for a roof. Combine shapes to make new ones. Compose and decompose shapes and recognise shapes can have other shapes within them.	Recognise and name common 2-D shapes (e.g. rectangles, circles and triangles). Recognise and name common and 3-D shapes (e.g. cuboids, cubes, pyramids and spheres). Describe position, directions and movements, including whole, half, quarter and three-quarter turns.	Identify and describe the properties of 2D shapes, including the number of sides, Recognise and draw a line of symmetry in a vertical line in a 2D shape. Identify and describe the properties of 3D shapes, inc the no. of edges, vertices and faces. Identify 2D shapes on the surface of 3D shapes, e.g. circle on a cylinder; a triangle on a pyramid. Compare and sort common 2D and 3D shapes and everyday objects. Order and arrange combinations of mathematical objects in patterns and sequences. Use maths vocab to describe position, direction including, forwards, backwards, NSEW, left and right. Use maths vocab to describe movement including movement in a straight line and distinguishing rotation as a turn & in terms of right angles for ¼, ½, & ¾ turns	Draw 2-D shapes and describe their properties. Make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them. Recognise that angles are a property of shape or a description of a turn. Identify right angles, recognise that 2 right angles make a half-turn, 3 make three quarters of a turn and 4 a complete turn. Identify whether angles are greater than or less than a right angle. Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.	Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes. Identify acute and obtuse angles and compare and order angles up to two right angles by size. Identify lines of symmetry in 2-D shapes presented in different orientations. Complete a simple symmetric figure with respect to a specific line of symmetry. Describe positions on a 2-D grid as coordinates in the first quadrant. Describe movements between positions as translations of a given unit to the left/right and up/down. Plot specified points and draw sides to complete a given polygon.	Identify 3D shapes, including cubes and other cuboids, from 2D 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. Use the properties of rectangles to deduce angles. Identify, describe and represent the position of a shape following a reflection using the appropriate language, and know that the shape has not changed. Identify, describe and represent the position of a shape following a translation, using the appropriate language, and know that the shape has not changed.	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. 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 and find missing angles where they meet at a point. Recognise and find missing angles where they are on a straight line. Recognise and find missing angles where they are vertically opposite. 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.

			(clock/anti-clockwise).				
Statistics			Interpret and construct simple pictograms and tally charts. Interpret and construct simple block diagrams and simple tables. Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity. Ask and answer questions about totaling and comparing categorical data.	Interpret and present data using bar charts, pictograms and tables. Solve one-step and two-step questions such as 'How many more?' and 'How many fewer?' using information presented in scaled bar charts and pictograms and tables.	Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.	Solve comparison, sum and difference problems using information presented in a line graph. Complete, read and interpret information in tables, including timetables.	Interpret and construct line graphs and use these to solve problems. Interpret and construct pie charts and use these to solve problems. Calculate and interpret the mean as an average.

Curriculum end points- what are we trying to achieve?

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes. We aim for mathematics to stimulate curiosity, foster creativity and equip children with the skills they need in life beyond school.

EYFS (linked to ELG number)	KS1	KS2
• Have a deep understanding of number to 10, including the composition of each number (11) • Subitise (recognise quantities without counting) up to 5 (11) • Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts. (11) • Verbally count beyond 20, recognising the pattern of the counting system (12) • Compare quantities up to 10 in different contexts, recognizing when one quantity is greater than, less than or the same as the other quantity (12) • Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally. (12)	The principal focus of mathematics teaching in Key Stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources [for example, concrete objects and measuring tools]. At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. We aim for children to have been exposed to using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money. By the end of KS1, pupils should know the number bonds to 20 and be precise in using and understanding place value, fluently.	The principal focus of mathematics teaching by the end of Key Stage 2 is to 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. At this stage, pupils should 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.