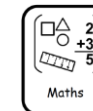# Progression in Mathematics
at Harry Hotspur CE Primary School

MATHEMATICS

National Curriculum Expectations

Purpose of Study

Mathematics is a creative and highly interconnected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

Aims

The national curriculum for mathematics aims to ensure that all pupils:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.
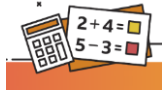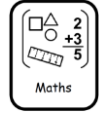
Statutory and Non-Statutory Frameworks:

EYFS	

Statutory Framework for the early years foundation stage

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. 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.

ELG: Number

Children at the expected level of development will:

- Have a deep understanding of number to 10, including the composition of each number; 14

- Subitise (recognise quantities without counting) up to 5;

- 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.


ELG: Numerical Patterns

Children at the expected level of development will:

- Verbally count beyond 20, recognising the pattern of the counting system;

- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity;

- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.
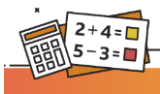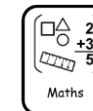
Mathematics at St Michael's CE Primary School

Our maths provision aims to create a culture of high achievement in maths which leads to confident children who show resilience as they master the key concepts of fluency of calculation, logical reasoning and problem solving. Children develop respect for the discipline through pattern spotting, proving and disproving ideas, classifying and comparing.
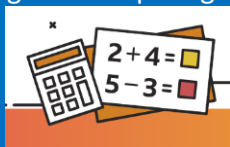
Big Ideas

Fluency: the ability to perform mathematical operations and processes accurately and quickly. Mathematical fluency has 4 parts: accuracy, automaticity, speed, flexibility.

Reasoning: The ability to logically justify and identify key information in problems. To select the most appropriate process to arrive at a solution.

Problem Solving: to able to think systematically in order to make appropriate decisions to apply known skills in a variety of contexts.

'Pure mathematics is, in its way, the poetry of logical ideas.'

Albert Einstein (German Physicist)

Links with other subjects

History: Chronological ordering of dates and timelines, Roman Numerals.
Geography: Map work with links to position and direction including grid references, knowledge of time zones, data handling and analysis of statistics, measures including temperature, straight line distances and economic activity links to money.
Science: Gathering and recording scientific results
Art: Pattern spotting, use of perpendicular and parallel lines.
Design Technology: Links to measures including measuring materials accurately and to money with costing products.
Languages: Counting, reading and writing numbers in a different language.
Music: identifying repeated patterns.

Pedagogy
- Focus on arithmetical fluency using a 'concrete, pictorial, abstract' approach.
- Low stakes quizzing for long term memory
- Varied teaching and learning activities
- Thoughtful sequencing of content
- Specific teaching of vocabulary
- Higher order thinking tasks – linked specifically to reasoning and problem-solving

Progress
- Units of work are carefully sequenced so prior knowledge and concepts are built upon
- Regular formative assessment and assessment for learning ensures gaps are filled
- Effective questioning and higher order thinking features in every level
- Progress and attainment within units is recorded and shared with all teaching staff
- Opportunity for revisiting content and consolidating or applying learning at greater depth
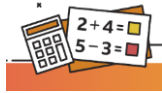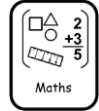
Support
For staff:
- National Curriculum
- Subject associations - – NECTM
- White Rose Maths
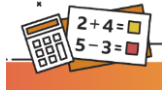- Mathematical Association

For Pupils:
- TTRockstars
- Numbots
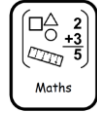-

3

|			
Computing: To reason about algorithms making amendments to sets of instructions to debug code and overcome any experienced problems.		• Opportunities for Low stakes Quizzes incorporated for children to retain key mathematical facts	

Progression in Mathematics
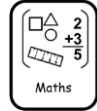## *at Harry Hotspur CE Primary School*

Long term plan over a 2-year cycle:

	Aut 1		Aut 2		Spr 1		Spr 2		Sum 1			Sum 2	
EYFS	Getting to know you	Just like me!	It's me 1, 2, 3!	Light and Dark	Alive in 5!	Growing 6, 7, 8	Building 9 and 10		To 20 and Beyond	First, then, now	Find my Pattern	On the Move	
KS1	Number: place Value Y1 – to 20 Y2 – to 100	Number: addition and Subtraction Y1 – within 20 Y2 – within 100 (both including money)	Number: Y1 – Place value to 50 Y2 - Multiplication	Number: Y1 – division Y2 - Division	Y1 – Place value to 100 / Y2 - Statistics	Geometry Y1 – Shape Y2 – Properties of shape	Number Y1 – Fractions Y2 - Fractions	Geometry Position and Direction	Measure Time	Y1 – Place value / Y2 – Problem solving	Measure Y1 – Weight and volume Y2 – Mass, capacity and temperature	Y1 – Four operations / Y2 – Consolidation and investigations
LKS2	Number: Place value	Number: Addition and subtraction	Number: Multiplication and Division	Number: Multiplication and Division	Measure: Length, perimeter and Area	Number: Fractions	Y3 – Measures: Mass and Capacity Y4: Number Decimals	Number: Decimals (including money)	Measure: Time	Statistics	Geometry: Properties of Shape including Y4 – Position and Direction
UKS2	Number: Place Value	Number: Four Opertations	Number: Fractions	Y5 – Fractions Y6 - Ratio	Decimals and Percentages	Y5 – Decimals Y6 - Algebra	Measure – converting units	Measure: perimeter, area and volume	Statistics	Geometry: Properties of Shape	Geometry: Position and Direction
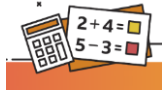
5

Progression in Mathematics
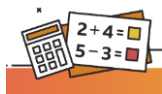## at Harry Hotspur CE Primary School

Skills are progressive and children build upon these over the key stages
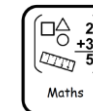
EYFS and KS1

Sequence – describe – match – repeat – identify – count – explain – compare – find – represent - estimate
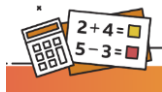
KS2

Solve problems – reason – sequence – making connections – persevering-understand – explain – use vocabulary – think logically – manipulate ideas– representations – independence – evaluate – team work – critical thinker
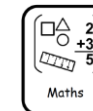
Progression in Mathematics
at Harry Hotspur CE Primary School

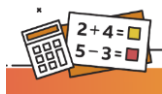| Skills Progression	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Number - number and place value	Develop fast recognition of up to 3 objects, without having to count them individually ('subitising'). Recite numbers past 5. Say one number for each item in order: 1,2,3,4,5. Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').	Count objects, actions and sounds Subitise; including linking the number symbol with its cardinal value Count beyond ten and compare numbers.	Pupils should be taught to: count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number count, read and write numbers to 100 in numerals; count in multiples of 2s, 5s and 10s given a number, identify 1 more and 1 less identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than	Pupils should be taught to: count in steps of 2, 3, and 5 from 0, and in 10s from any number, forward and backward recognise the place value of each digit in a two-digit number (10s, 1s) identify, represent and estimate numbers using different representations, including the number line compare and order numbers from 0 up to 100; use <, > and = signs read and write numbers to at least 100 in	Pupils should be taught to: count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number recognise the place value of each digit in a 3-digit number (100s, 10s, 1s) compare and order numbers up to 1,000 identify, represent and estimate numbers using different representations read and write numbers up to 1,000 in numerals and in words solve number problems and practical problems involving these ideas.	Pupils should be taught to: count in multiples of 6, 7, 9, 25 and 1,000 find 1,000 more or less than a given number count backwards through 0 to include negative numbers recognise the place value of each digit in a four-digit number (1,000s, 100s, 10s, and 1s) order and compare numbers beyond 1,000 identify, represent and estimate numbers using	Pupils should be taught to: 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 0 round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000 solve number problems and practical problems that involve all of the above read Roman numerals to 1,000 (M) and recognise years written in Roman numerals	Pupils should be taught to: 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 0 solve number and practical problems that involve all of the above

7

Progression in Mathematics
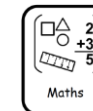## *at Harry Hotspur CE Primary School*

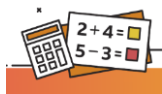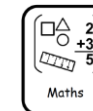| Skills Progression	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Show 'finger numbers' up to 5. Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5. Experiment with their own symbols and marks as well as numerals.		(fewer), most, least read and write numbers from 1 to 20 in numerals and words	numerals and in words use place value and number facts to solve problems		different representations round any number to the nearest 10, 100 or 1,000 solve number and practical problems that involve all of the above and with increasingly large positive numbers read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of 0 and place value		
Number – addition and subtraction	Solve real world mathematical problems with numbers up to 5.	Understand the one more than/one less than relationship between	Pupils should be taught to: read, write and interpret mathematical statements involving	Pupils should be taught to: solve problems with addition and subtraction: using concrete objects and	Pupils should be taught to: add and subtract numbers mentally, including: a three-digit number and 1s	Pupils should be taught to: add and subtract numbers with up to 4 digits using the	Pupils should be taught to: add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	Pupils should be taught to: multiply multi-digit numbers up to 4 digits by a two-digit whole number

8

Progression in Mathematics
at Harry Hotspur CE Primary School

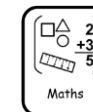| Skills Progression	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Compare quantities using language: 'more than', 'fewer than'	consecutive numbers Explore the composition of numbers to 10 Automatically recall number bonds for numbers 0-5 and some to 10	addition (+), subtraction (−) and equals (=) signs represent and use number bonds and related subtraction facts within 20 add and subtract one-digit and two-digit numbers to 20, including 0 solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? − 9	pictorial representations, including those involving numbers, quantities and measures applying their increasing knowledge of mental and written methods recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and 1s a two-digit number and 10s	a three-digit number and 10s a three-digit number and 100s add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction estimate the answer to a calculation and use inverse operations to check answers solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.	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 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	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 division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders

9

Progression in Mathematics
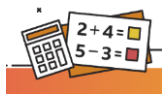## *at Harry Hotspur CE Primary School*

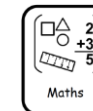| Skills Progression	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				2 two-digit numbers adding 3 one-digit numbers show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 number from another cannot recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.				according to 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 4 operations solve addition and
Number – multiplication and division			Pupils should be taught to: solve one-step problems involving multiplication and division, by calculating the	Pupils should be taught to: recall and use multiplication and division facts for the 2, 5 and 10 multiplication	Pupils should be taught to: recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	Pupils should be taught to: recall multiplication and division facts for multiplication	Pupils should be taught to: identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 numbers know and use the vocabulary of prime	subtraction multi-step problems in contexts, deciding which operations and methods to use and why

Progression in Mathematics
at Harry Hotspur CE Primary School
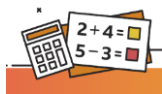
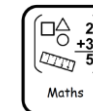| Skills Progression	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			answer using concrete objects, pictorial representations and arrays with the support of the teacher	tables, including recognising odd and even numbers calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot solve problems involving multiplication and division, using materials, arrays, repeated addition, mental	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 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	tables up to 12 × 12 use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers recognise and use factor pairs and commutativity in mental calculations multiply two-digit and three-digit numbers by a one-digit number using formal written layout solve problems involving multiplying and adding, including using the distributive	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 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 multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000 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	solve problems involving addition, subtraction, multiplication and division use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

11
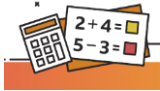
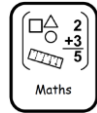| Skills Progression	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				methods, and multiplication and division facts, including problems in contexts		law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects	knowledge of factors and multiples, squares and cubes solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.	
Number - fractions			Pupils should be taught to: recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity	Pupils should be taught to: recognise, find, name and write fractions 1/3,1/4, 2/4, 3/4 of a length, shape, set of objects or quantity write simple fractions, for example 1/2 of 6 = 3 and recognise the equivalence of 2/4 and 1/2	Pupils should be taught to: count up and down in tenths; 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-	Pupils should be taught to: 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 100 and dividing tenths by 10	Pupils should be taught to: 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 = 11/5]	Pupils should be taught to: 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

Progression in Mathematics
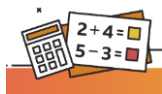## *at Harry Hotspur CE Primary School*

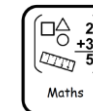| Skills Progression	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					unit fractions with small denominators recognise and show, using diagrams, equivalent fractions with small denominators add and subtract fractions with the same denominator within one whole [for example, 5/7 + 1/7 =6/7] compare and order unit fractions, and fractions with the same denominators solve problems that involve all of the above	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 add and subtract fractions with the same denominator recognise and write decimal equivalents of any number of tenths or hundreds recognise and write decimal equivalents to 1/4, 1/2, 3/4 find the effect of dividing a one- or two-digit number by	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] recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents round decimals with 2 decimal places to the nearest whole number and to 1 decimal place read, write, order and compare numbers with up to 3 decimal places solve problems involving number up to 3 decimal places recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per 100', and write percentages as a fraction with denominator	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 × 1/8 = 1/2] divide proper fractions by whole numbers [for example, 1/3 ÷ 2 = 1/6] associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction

Progression in Mathematics
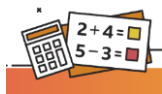## at Harry Hotspur CE Primary School

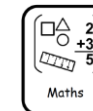| Skills Progression	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
						10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths round decimals with 1 decimal place to the nearest whole number compare numbers with the same number of decimal places up to 2 decimal places solve simple measure and money problems involving fractions and decimals to 2 decimal places.	100, and as a decimal fraction solve problems which require knowing percentage and decimal equivalents of 1/2, 1/4, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25	[for example 3/8] identify the value of each digit in numbers given to 3 decimal places and multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3 decimal places multiply one-digit numbers with up to 2 decimal places by whole numbers use written division methods in cases where the answer has up to 2 decimal places solve problems which require answers to be rounded to specified

Progression in Mathematics
at Harry Hotspur CE Primary School

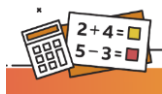| Skills Progression	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
								degrees of accuracy recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.
Measurement	Make comparisons between objects relating to size, length, weight and capacity.	Compare length, weight and capacity	Pupils should be taught to: compare, describe and solve practical problems for: lengths and heights [for example, long/short, longer/shorter, tall/short, double/half] mass/weight [for example, heavy/light, heavier than, lighter than] capacity and volume [for example,	Pupils should be taught to: choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels	Pupils should be taught to: measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) measure the perimeter of simple 2-D shapes add and subtract amounts of money to give change, using both £ and p in practical contexts tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks	Pupils should be taught to: convert between different units of measure [for example, kilometre to metre; hour to minute] measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres find the area of rectilinear shapes by	Pupils should be taught to: convert between different units of metric measure [for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre] understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres calculate and compare the area of rectangles (including squares), including using standard units, square	Pupils should be taught to: solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 decimal places where appropriate use, read, write and convert between standard units, converting measurements of length,

15

Progression in Mathematics
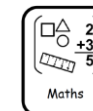## *at Harry Hotspur CE Primary School*

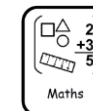| Skills Progression	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			full/empty, more than, less than, half, half full, quarter] time [for example, quicker, slower, earlier, later] measure and begin to record the following: lengths and heights mass/weight capacity and volume time (hours, minutes, seconds) recognise and know the value of different denominations of coins and notes sequence events in chronological order using language [for example, before and after, next, first, today,	compare and order lengths, mass, volume/capacity and record the results using >, < and = recognise and use symbols for pounds (£) and pence (p); combine amounts 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 and subtraction of money of the same unit, including giving change	estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, am/pm, 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 compare durations of events [for example, to calculate the time taken by particular events or tasks]	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 solve problems involving converting from hours to minutes, minutes to seconds, years to months, weeks to days	centimetres (cm²) and square metres (m²), and estimate the area of irregular shapes estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water] solve problems involving converting between units of time use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling	mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to 3 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

16

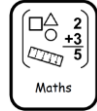| Skills Progression	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			yesterday, tomorrow, morning, afternoon and evening] recognise and use language relating to dates, including days of the week, weeks, months and years tell the time to the hour and half past the hour and draw the hands on a clock face to show these times	compare and sequence intervals of time tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times know the number of minutes in an hour and the number of hours in a day				compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³]
Geometry- Properties of shape	Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and	Select, rotate and manipulate shapes to develop spatial reasoning skills Compose and decompose	Pupils should be taught to: recognise and name common 2-D and 3-D shapes, including: 2-D shapes [for example, rectangles (including	Pupils should be taught to: identify and describe the properties of 2-D shapes, including the number of sides, and line symmetry in a vertical line	Pupils should be taught to: draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them recognise angles as a property of shape or a description of a turn	Pupils should be taught to: compare and classify geometric shapes, including quadrilaterals and triangles, based on their	Pupils should be taught to: 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 (°)	Pupils should be taught to: draw 2-D shapes using given dimensions and angles recognise, describe and build simple 3-D shapes,

Progression in Mathematics
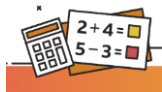## *at Harry Hotspur CE Primary School*

Skills Progression	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	mathematical language: 'sides', 'corners'; 'straight', 'flat', 'round'.

Make comparisons between objects relating to size, length, weight and capacity. Select shapes appropriately: flat surfaces for building, a triangular prism for a roof, etc. Combine shapes to make new ones – an arch, a bigger triangle, etc. Talk about and identify | shapes so that children recognise a shape can have other shapes within it, just as numbers can. Continue, copy and create repeating patterns | squares), circles and triangles] 3-D shapes [for example, cuboids (including cubes), pyramids and spheres] | identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid] compare and sort common 2-D and 3-D shapes and everyday objects | 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 | properties and sizes identify acute and obtuse angles and compare and order angles up to 2 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 | identify: angles at a point and 1 whole turn (total 360°) angles at a point on a straight line and half 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 | 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 |
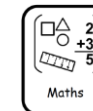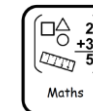
Skills Progression	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs', etc. Extend and create ABAB patterns – stick, leaf, stick, leaf. Notice and correct an error in a repeating pattern. Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then…'							find missing angles

19

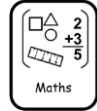| Skills Progression	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Geometry- position and direction	Understand position through words alone – for example, "The bag is under the table," – with no pointing. Describe a familiar route. Discuss routes and locations, using words like 'in front of' and 'behind'.		Pupils should be taught to: order and arrange combinations of mathematical objects in patterns and sequences use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)	Pupils should be taught to: order and arrange combinations of mathematical objects in patterns and sequences use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)		Pupils should be taught to: 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	Pupils should be taught to: 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	Pupils should be taught to: describe positions on the full coordinate grid (all 4 quadrants) draw and translate simple shapes on the coordinate plane, and reflect them in the axes

20

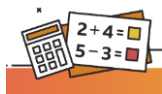# Progression in Mathematics
at Harry Hotspur CE Primary School

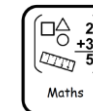| Skills Progression	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Statistics				Pupils should be taught to: interpret and construct simple pictograms, tally charts, block diagrams and tables ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity ask-and-answer questions about totalling and comparing categorical data	Pupils should be taught to: interpret and present data using bar charts, pictograms and tables solve one-step and two-step questions [for example 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables	Pupils should be taught to: 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	Pupils should be taught to: solve comparison, sum and difference problems using information presented in a line graph complete, read and interpret information in tables, including timetables.	Pupils should be taught to: interpret and construct pie charts and line graphs and use these to solve problems calculate and interpret the mean as an average.
Ratio and Proportion								Pupils should be taught to: solve problems involving the relative sizes of 2 quantities where missing values can be found by using

21

Progression in Mathematics
at Harry Hotspur CE Primary School

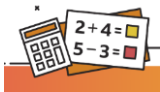| Skills Progression	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
								integer multiplication and division facts solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison solve problems involving 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

Progression in Mathematics
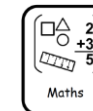## *at Harry Hotspur CE Primary School*

Skills Progression	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Algebra								Pupils should be taught to: use simple formulae generate and describe linear number sequences express missing number problems algebraically find pairs of numbers that satisfy an equation with 2 unknowns enumerate possibilities of combinations of 2 variables.

Promoting SMSC and British Values in Mathematics

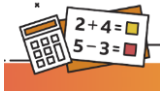| Spiritual	Moral	Social	Cultural
• Developing deep thinking and questioning through maths about the way in which the world works promotes spiritual growth.	• Within the classroom, we encourage respect and reward good behaviour.	• In classrooms, we look for opportunities for pupils to use miniwhiteboards to promote self-esteem and build self-confidence.	• We incorporate mathematics into cross-curricular topics.

23

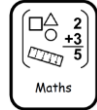|			
• We aim to give all students an appreciation of the richness and power of maths. • Maths in Nature is embedded in Sequences, Patterns and Symmetry • We promote a sense of wonder in the exactness of mathematics in the exploration of shapes, number patterns and real world examples.	• We value listening to others' views and opinions on problem solving. • We promote discussion about mathematical understanding and challenge assumptions, supporting students to question information and data that they are presented with. • We recognise how logical reasoning can be used to make decisions and choices that help them to learn in mathematics.	• We encourage collaborative learning in the classroom – in the form of listening and learning from each other and paired discussion / working partners in order to show that the result is often better than they could achieve alone. • We help pupils develop their mathematical voice and powers of logic, reasoning and explanation by offering explanations to each other. • We exhibit pupils work in classrooms on working walls and displays to share their good practice and celebrate achievement.	

Democracy 🇬🇧	The Rule of Law 🇬🇧	Individual Liberty 🇬🇧	Respect 🇬🇧	Tolerance of those with different faiths 🇬🇧
o Ethical issues e.g. business and economics. o How data can be manipulated through its presentation to convey different messages	o Through maths we can encourage an understanding of rules and patterns. Maths is driven by rules; children are encouraged to have	o Opportunities to discuss different ways and approaches to problem solving o To become lifelong learners and develop	o Respect or the way other people are working o Encouragement of collaborative learning in all subjects	o Acceptance of positive criticism o Allowing mistakes and building on these

o This could be linked to elections	an understanding of these. o Through mathematical investigations children are encouraged to develop their own rules and to give examples that follow the rule and exceptions to the rule	their own methods and strategies		o Trying different methods and showing resilience