Malmesbury Park Primary School

PROGRESSION OF SKILLS AND KNOWLEDGE FOR MATHS

Children should be:

- Fluent in all of the basic concepts;
- Able to use their skills to develop and follow different lines of enquiry within mathematics;
- Able to apply their knowledge confidently in a wide range of contexts and to solve a range of problems.

Working at Greater Depth in Maths:

Where appropriate a working at greater depth statement has been included within this progression of skills and knowledge.

Key Stage 1 and Key Stage 2:

Children working at greater depth in KS1 and KS2 must have a secure knowledge and be working "more deeply" in all areas of expectations within their year group. They will also be able to solve problems of greater complexity (i.e. where the approach is not immediately obvious) demonstrating their maths creativity and imagination. In addition to this, children will be able to justify and explain how they have answered mathematical questions and why they have used the methods they have.

NUMBER AND PLACE VALUE

COUNTING

EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
• counts up to three or four objects by saying one number name for each item. • counts objects to 10, and beginning to count beyond 10. • counts out up to six objects from a larger group. • count actions or objects which cannot be moved. • count an irregular arrangement of up to ten objects.	• 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 twos, fives and tens • given a number, identify one more and one less	• count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward	• count from 0 in multiples of 4, 8, 50 and 100; • find 10 or 100 more or less than a given number	• count in multiples of 6, 7, 9, 25 and 1000 • find 1000 more or less than a given number • count backwards through zero to include negative numbers	• 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 through zero	• use negative numbers in context, and calculate intervals across zero

• finds the total number of items in two groups by counting all of them • says the number that is one more than a given number • finds one more or one less from a group of up to five objects, then ten objects **Children at greater depth will:** • count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number						
COMPARING NUMBERS						
EYFS	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
• use the language of 'more' and 'fewer' to compare two sets of objects	• use the language of: equal to, more than, less than (fewer), most, least	• compare and order numbers from 0 up to 100; use and = signs	• compare and order numbers up to 1000	• order and compare numbers beyond 1000	• order and compare numbers to at least 1 000 • 000 and determine the value of each digit	• read and write numbers up to 10 000 000 and • determine the value of each digit
IDENTIFYING, REPRESETNING AND ESTIMATING NUMBER						
EYFS	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
• estimate how many objects they can see and checks by counting them	• identify and represent numbers using objects and pictorial representations	• identify, represent and estimate numbers using different representations,	• identify, represent and estimate numbers using different representations	• identify, represent and estimate numbers using different representations		

• records, using marks that they can interpret and explain	including the number line	including the number line				
UNDERSTANDING PLACE VALUE						
EYFS	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
• select the correct numeral to represent 1 to 10 objects		• recognise the place value of each digit in a two-digit number (tens, ones)	• recognise the place value of each digit in a three digit number (hundreds, tens, ones)	• recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)	• read and write numbers to at least 1 000 000 and determine the value of each digit	• read, write, order and compare numbers up to 10 000 000 and determine the value of each digit
ROUNDING						
EYFS	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
				• round any number to the nearest 10, 100 or • 1 000	• round any number up to 1 000 000 to the nearest 10, 100, 1 000, • 10 000 and 100 000	• round any whole number to a required degree of accuracy
PROBLEM SOLVING						
EYFS	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
• begins to identify own mathematical problems based on own interests and fascinations		• use place value and number facts to solve problems	• solve number problems and practical problems involving these ideas	• solve number and practical problems that involve all of the above and with increasingly large positive numbers	• solve number problems and practical problems that involve all of the above	• solve number and practical problems that involve all of the above

ADDITION AND SUBTRACTION

NUMBER BONDS

EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
	▪ represent and use number bonds and related subtraction facts within 20	▪ recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100				

MENTAL CALCULATIONS

EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
▪begin to use the vocabulary involved in adding and subtracting in practical activities and discussion **Children working at greater depth will:** ▪ use quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer	▪read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs ▪ add and subtract one-digit and two-digit numbers to 20, including zero number problems such as 7 = - 9	▪ add and subtract numbers using concrete objects, pictorial representations, and mentally, including: ▪ a two-digit number and ones ▪ a two- digit number and tens ▪ two two-digit numbers ▪ adding three one-digit numbers show that addition of two numbers can be done in any order (commutative) and subtraction of one ▪ number from another cannot	▪ add and subtract numbers mentally, including: ▪ a three-digit number and ones ▪ a three-digit number and tens ▪ a three-digit number and hundreds	▪continue to practise mental methods with increasingly larger numbers	▪ add and subtract numbers mentally with increasingly large numbers	▪ perform mental calculations, including with mixed operations and large numbers

WRITTEN METHODS

EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
	▪read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs		▪ add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	▪ add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction	▪ add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and	▪ solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

				where appropriate	subtraction)	▪use their knowledge of the order of operations to carry out calculations involving the four operations
INVERSE OPERATIONS, ESTIMATING AND CHECKING ANSWERS						
EYFS	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
		▪ recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems	▪ estimate the answer to a calculation and use inverse operations to check answers	▪ estimate and use inverse operations to check answers to a calculation	▪ use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	▪ use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy
PROBLEM SOLVING						
EYFS	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
▪ Begin to identify own mathematical problems based on own interests and fascinations	▪ solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = - 9	▪ solve problems with addition and subtraction: * using concrete objects and pictorial representations, including those involving numbers, quantities and measures * applying their increasing knowledge of mental and written methods	▪ solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	▪ solve addition and subtraction two- step problems in contexts, deciding which operations and methods to use and why	▪ solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	▪ solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

MULTIPLICATION AND DIVISION

MULTIPLICATION AND DIVISION FACTS

EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
	▪count in multiples of twos, fives and tens	▪ count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward ▪ recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers	▪ count from 0 in multiples of 4, 8, 50 and 100 ▪ recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	▪ count in multiples of 6, 7, 9, 25 and 1 000 ▪ recall multiplication and division facts for multiplication tables up to 12 × 12	▪ count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000	

MENTAL CALCULATIONS

EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
		▪ show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot	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	▪ 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 ▪ recognise and use factor pairs and commutativity in mental calculations	▪ multiply and divide numbers mentally drawing upon known facts ▪ multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	▪ perform mental calculations, including with mixed operations and large numbers

WRITTEN CALCULATIONS

EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
		▪ calculate mathematical statements for multiplication and division within the	▪ write and calculate mathematical statements for multiplication and division using the	▪ multiply two-digit and three-digit numbers by a one-digit number using formal written layout	▪ multiply numbers up to 4 digits by a one- or two-digit number using a formal written method,	▪ multiply multi- digit numbers up to 4 digits by a two- digit whole number using the formal written method

		multiplication tables and write them using the multiplication (×),division (÷) and equals (=) signs	multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods		including long multiplication for two-digit numbers ▪ 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	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 whole number using the formal written method of short division where appropriate for the context, interpreting reminders according to the context use their knowledge of the order of operations to carry out calculations involving the four operations
PROPERTIES OF NUMBERS: MULTIPLES, FACTORS, PRIMES, SQUARE AND CUBE NUMBERS						
EYFS	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
				▪ recognise and use factor pairs and commutativity in mental calculations	▪ identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers ▪ know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers	▪ identify common factors, common multiples and prime numbers

					▪ establish whether a number up to 100 is prime and recall prime numbers up to 19 ▪ recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)	
PROBLEM SOLVING AND ESTIMATING						
EYFS	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
Children at greater depth will: ▪ solve problems, including doubling, halving and sharing	▪ solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher	▪ solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	▪ solve problems, including missing number problems, involving multiplication and division, including integer scaling problems and correspondence problems in which n objects are connected to m objects. Multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	▪ solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects	▪ 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. ▪ solve problems involving multiplication and division where larger numbers are used by decomposing them into their factors	▪ use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy ▪ solve problems involving multiplication, division, addition and subtraction

FRACTIONS (INCLDUING DECIMALS AND PERCENTAGES)

COUNTING IN FRACTIONS

EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
		▪ count in fractions up to 10, starting from any number and using the1/2 and 2/4 equivalence on the number line	▪ count up and down in tenths	▪ count up and down in hundredths		

RECOGNISING FRACTIONS

EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
	▪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 an object, shape or quantity	▪ recognise, find, name and write fractions 1 / 3 , 1 / 4 , 2 / 4 and 3 / 4 of a length, shape, set of objects or quantity	▪ 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 denominators	▪ recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten	▪ recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	

COMPARING FRACTIONS AND DECIMALS

EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
			▪ compare and order unit fractions, and fractions with the same denominators	▪ compare numbers with the same number of decimal places up to two decimal places	▪ compare and order fractions whose denominators are all multiples of the same number ▪ read, write, order and compare numbers with up to	▪ compare and order fractions, including fractions >1 ▪ identify the value of each digit to three decimal places

					three decimal places	
ROUNDING DECIMALS						
EYFS	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
				▪ round decimals with one decimal place to the nearest whole number	▪ round decimals with two decimal places to the nearest whole number and to one decimal place	▪ solve problems which require answers to be rounded to specified degrees of accuracy
EQUIVALENCE						
EYFS	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
		▪ write simple fractions e.g. 1 / 2 of 6 = 3 and recognise the equivalence of 2 / 4 and 1 / 2	▪ recognise and show, using diagrams, equivalent fractions with small denominators	▪ recognise and show, using diagrams, families of common equivalent fractions ▪ recognise and write decimal equivalents of any number of tenths or hundredths ▪ recognise and write decimal equivalents to 1 / 4 ; 1 / 2 ; 3 / 4	▪ identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths ▪ read and write decimal numbers as fractions (e.g. 0.71 = 71/ 100) ▪ recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents ▪ 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 hundred, and as a decimal fraction	▪ use common factors to simplify fractions; use common multiples to express fractions in the same denomination ▪ associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3 / 8) ▪ recall and use equivalences between simple fractions, decimals and percentages, including in different contexts
ADDITION, SUBTRACTION, MULTIPLICATION AND DIVISION OF FRACTIONS AND DECIMALS						
EYFS	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**

			▪ add and subtract fractions with the same denominator within one whole (e.g. 5 / 7 + 1 / 7 = 6 / 7)	▪ add and subtract fractions with the same denominator ▪ 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	▪ 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) ▪ add and subtract fractions with the same denominator and multiples of the same number ▪ multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	▪ add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions ▪ multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. 1 / 4 × 1 / 2 = 1 / 8) ▪ divide proper fractions by whole numbers (e.g. 1 / 3 ÷ 2 = 1 / 6) ▪ 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 ▪ associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3 /8) ▪multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
PROBLEM SOLVING						
EYFS	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
			▪ solve problems that involve all of the above	▪ solve problems involving increasingly harder fractions to calculate quantities,	▪ solve problems involving number up to three decimal places	

				and fractions to divide quantities, including non-unit fractions where the answer is a whole number ▪ solve simple measure and money problems involving fractions and decimals to two decimal places	▪ 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	