Waterville Primary School Progression of Skills and Vocabulary in MATHS

Year 5

KS2 National Curriculum

The principal focus of mathematics teaching in upper 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 5 pupils should:

*Know that 10 tenths are equivalent to 1, and that 1 is 10 times the size of 0.1.

*Recognise the place value of each digit in numbers with up to 2 decimal places.

*Reason about the location of any number with up to 2 decimal places.

*Divide 1 into 2, 4, 5 and 10 equal parts and read scales and number lines.

*Convert between units of measure, including using common decimals and fractions.

*Secure fluency in multiplication tables facts and corresponding division facts.

*Apply place value knowledge to known additive and multiplicative number facts.

*Multiply and divide numbers by 10 and 100.

*Find factors and multiples of positive whole numbers.

*Multiply any whole number with up to 4 digits by any one-digit number.

*Divide a number with up to 4 digits by a one-digit number.

*Find non-unit fractions of quantities.

*Find equivalent fractions and understand their place on a number line.

*Recall decimal fraction equivalents for ½, ¼, 1/5 and 1/10.

*Compare angles, estimate and measure angles in degrees.

*Compare areas and calculate the area of rectangles using standard units.

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TEACH – MODEL – USE MANIPULATIVES – RECORD – INVESTIGATE – MASTER - REPEAT

Year 5 Maths Skills	Number – Number and Place Value	Number – Addition and Subtraction	Number – Multiplication and Division	Number – Fractions
	Counting To interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero. To count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000. **Comparing Numbers** To order and compare numbers beyond 1000. **Identifying, Representing and Estimating Numbers** To identify, represent and estimate numbers using different representations **Reading and Writing Numbers** To read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit. To read Roman numerals to 1000 (M) and recognise years written in Roman numerals. **Understanding Place Value** To read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit. **Rounding** To read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit. To round decimals with two decimal places to the nearest whole number and to one decimal place. **Problem Solving** To solve number problems and practical problems that involve all of the above.	**Mental Calculation** To add and subtract numbers mentally with increasingly large numbers. **Written Methods** To add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction). **Inverse Operations, Estimating and Checking Answers** To use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy. **Problem Solving** To solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.	**Multiplication and Division Facts** To count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000. **Mental Calculation** To multiply and divide numbers mentally drawing upon known facts. To multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. **Written Calculation** To 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. To 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. **Properties of Numbers** To identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. To know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. To establish whether a number up to 100 is prime and recall prime numbers up to 19. To recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}). **Problem Solving** To solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes. To solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign. To solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.	**Recognising Fractions** To recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents. **Comparing Fractions** To compare and order fractions whose denominators are all multiples of the same number. **Comparing Decimals** To read, write, order and compare numbers with up to three decimal places. **Rounding** To round decimals with two decimal places to the nearest whole number and to one decimal place. **Equivalence** To identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths To read and write decimal numbers as fractions (e.g. $0.71 = \frac{71}{100}$). To recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents. To recognise the per cent symbol (%) and understand that per cent relates to "number of parts per hundred", and write percentages as a fraction with denominator 100 as a decimal fraction. **Addition and Subtraction of Fractions** To add and subtract fractions with the same denominator and multiples of the same number. To 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. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$). **Multiplication and Division of Fractions** To multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. **Problem Solving** To solve problems involving numbers up to three decimal places. To solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$ and those with a denominator of a multiple of 10 or 25.

Vocabulary

Ten thousands, one hundred thousands, powers of, integer.		Multiples, factors, prime numbers, square numbers, cube numbers, short division, product, dividend, divisor, quotient, operations.	Fifth, thousandths, mixed numbers, percent %, factors, integer.

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TEACH – MODEL – USE MANIPULATIVES – RECORD – INVESTIGATE – MASTER - REPEAT

Year 5 Maths Skills	Algebra	Measurement	Geometry – Properties of Shape	Geometry – Position and Direction	Statistics
	Equation To use the properties of rectangles to deduce related facts and find **missing lengths and angles.**	**Comparing and Estimating** To calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes. To estimate volume (e.g. using $1\ cm^3$ blocks to build cubes and cuboids) and capacity (e.g. using water). **Measuring and Calculating** To use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling. To measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres. To calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes. To recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}). **Time** To solve problems involving converting between units of time. **Converting** To convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre). To solve problems involving converting between units of time. To understand and use equivalences between metric units and common imperial units such as inches, pounds and pints.	**Identifying Shapes and their Properties** To identify 3-D shapes, including cubes and other cuboids, from 2-D representations. **Drawing and Constructing** To draw given angles, and measure them in degrees (^{o}). **Comparing and Classifying** To use the properties of rectangles to deduce related facts and find missing lengths and angles. To distinguish between regular and irregular polygons based on reasoning about equal sides and angles. **Angles** To know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles. To 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°	**Position, Direction and Movement** 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.	**Interpreting, Constructing and Presenting Data** To complete, read and interpret information in tables, including timetables. **Solving Problems** To calculate and interpret the mean as an average.
			Vocabulary		
		Measure and Length Decimal notation, scaling, metric units, imperial units, inches, compound shape, irregular shapes, square centimetres, square meters. **Height, Weight and Capacity** Cubic centimetre, pounds, pints.	Regular polygon, irregular polygon, reflex angles, degrees, one whole turn, angles on straight line, angles around a point, vertically opposite, missing angles.	Reflection.	Timetable, two-way tables.