St Uny C of E Academy: MATHS 2016 -2017

Year 1

Number - Number and Place Value Pupils will be taught to:	Addition and Subtraction Pupils will be taught to:	Multiplication and Division Pupils will 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 (fewer), most, least - read and write numbers from 1 to 20 in numerals and words	- read, write and interpret mathematical statements involving 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	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
Fractions Pupils will be taught to:	Geometry - Properties of Shapes Pupils will be taught to:	Geometry - Position and Direction Pupils will 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	- recognise and name common 2-D and 3-D shapes, including: 2-D shapes [for example, rectangles (including squares), circles and triangles] 3-D shapes [for example, cuboids (including cubes), pyramids and	describe position, direction and movement, including whole, half, quarter and three-quarter turns

	spheres]	

Measurement
Pupils will 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, 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, 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

YEAR 2

Number – Number, Place Value and Counting	Addition and Subtraction	Multiplication and Division
Pupils will be taught to:	Pupils will be taught to:	Pupils will be taught to:
- To count in steps of 2, 3 and 5 from zero; and count in tens from any number forwards and backwards. - To recognise the place value of each digit in a two digit number (tens,ones). - To identify, represent and estimate numbers using different representations, including the number line. - To compare and order numbers from 0 to 100; use < > = signs. - To read and write numbers to at least 100 in numerals and words. - To use place value and number facts to solve problems.	- To 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. - To recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100. - To add and subtract using concrete objects, pictorial representations and mentally including: 2 digit number and ones, a 2 digit number and tens, 2 two digit numbers, adding three 1 digit numbers. - To show that addition can be done in any order (commutative) and subtraction cannot. - To recognise and use the inverse relationship between addition and subtraction and use this to check calculation and missing number problems.	- To recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers. - To calculate the mathematical statements for multiplication and division within the multiplication tables and write them using multiplication, division and equal signs. - To recognise and use the inverse relationship between multiplication and division in calculations. - To show that multiplication of two numbers can be done in any order (commutative) and division for one number by another cannot. - To solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in context.
Fractions	Geometry - Properties of Shapes/Position and	Statistics

Pupils will be taught to:	Direction Pupils will be taught to:	Pupils will be taught to:
- To recognise, find, name and write fractions for a third, quarter, two quarters and three quarters. - To write simple fractions for example 1/2 of 6 = 3 - Recognise the equivalence of two quarters and one half.	- To identify and describe the properties of 2D shapes, including the number of sides and symmetry in a vertical line. - To identify and describe the properties of 3D shapes including the number of edges, vertices and faces. - To identify 2D shapes on the surface of 3D shapes, for example a circle on a cylinder and a triangle on a pyramid. - To compare and sort common 2D and 3D shapes and everyday objects. - To order and arrange combinations of mathematical objects in patterns. - To use mathematical vocabulary to describe position, direction and movement, including distinguishing between rotation as a turn and in terms of right angles for quarter, half and three quarter turns (both clockwise and anticlockwise) and movement in a straight line.	- To interpret and construct simple pictograms, tally charts, block diagrams and simple tables. - To ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity. - To ask and answer questions about totalling and compare categorical data.

Measurement

Pupils will be taught to:

- To compare and sequence intervals of time.
- To 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.
- To choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm/mm); mass (kg/g), temperature (°C); volume and capacity (litres/ml) to the nearest appropriate unit using rulers, scales, thermometers and measuring vessels.
- To compare and order lengths, mass, volume/capacity and record the results using < > =
- To recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value.
- To find different combinations of coins to equal the same amount of money.
- To solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change.

YEAR 3

Number - Number and Place Value Pupils will be taught to:	Addition and Subtraction Pupils will be taught to:	Multiplication and Division Pupils will 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: - add and subtract numbers mentally, including: - a three-digit number and 1s - 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.	- recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables - 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
Fractions Pupils will be taught to:	Geometry Pupils will be taught to:	Statistics Pupils will 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-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, $\frac{5}{7}$	- 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 - 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	- 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

$+ \dfrac{1}{7} = \dfrac{6}{7}$]

- compare and order unit fractions, and fractions with the same denominators
- solve problems that involve all of the above

Measurement

Pupils will 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
- 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]

YEAR 4

Number - Number and Place Value Pupils will be taught to:	Addition and Subtraction Pupils will be taught to:	Multiplication and Division Pupils will 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 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	- add and 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	- recall multiplication and division facts for multiplication 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 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
Fractions Pupils will be taught to:	Geometry - Properties of Shapes Pupils will be taught to:	Statistics Pupils will 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 - 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	Position of shapes - 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 2 right angles by size - identify lines of symmetry in 2-D shapes presented in different orientations - complete a simple symmetric figure with	- 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

- recognise and write decimal equivalents of any number of tenths or hundreds
- recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$
- find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths
- 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

respect to a specific line of symmetry

Position and direction

- 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

Measurement

Pupils will 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 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.

YEAR 5

Number - Number and Place Value Pupils will be taught to:	Addition and Subtraction Pupils will be taught to:	Multiplication and Division Pupils will 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	- add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) - 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	- 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 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 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
Fractions (Including decimals and percentages) Pupils will be taught to:	**Geometry** Pupils will be taught to:	**Statistics** Pupils will 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, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$]
• 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, $0.71 = \frac{71}{100}$]
• 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
	<u>Properties of shapes</u>
	
	• 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 (°)
	• identify:
	   o angles at a point and 1 whole turn (total 360°)
	   o angles at a point on a straight line and half a turn (total 180°)
	   o other multiples of 90°
	   o use the properties of rectangles to deduce related facts and find missing lengths and angles
	   o distinguish between regular and irregular polygons based on reasoning about equal sides and angles
	
	<u>Geometry: Positon and direction.</u>
	
	• 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.
		• solve comparison, sum and difference problems using information presented in a line graph
		• complete, read and interpret information in tables, including timetables

- understand that per cent relates to 'number of parts per 100', and write percentages as a fraction with denominator 100, and as a decimal fraction
- 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 fractions with a denominator of a multiple of 10 or 25

Measurement

Pupils will 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 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

Year 6

Number - Number and Place Value Pupils will be taught to:	Addition and Subtraction Pupils will be taught to:	Multiplication and Division Pupils will be taught to:
- To read, write, order and compare numbers at least to 10,000.000 and determine the value of each digit. - To round any whole number to a required degree of accuracy. - To use negative numbers in context and calculate intervals across zero. - To solve number problems and practical problems that involve all of the above.	- To perform mental calculation including with mixed operations and large numbers. - To solve addition and subtraction multistep problems in contexts deciding which operations and methods to use and why. - To use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.	- To perform mental calculations, including with mixed operations and large numbers. - To identify common factors, common multiples and prime numbers. - To solve problems involving multiplication and division. - To use estimation to check answers. - To multiply multi-digit numbers up to 4 digit numbers by a 2 digit whole number using the efficient written method of long multiplication. - To divide numbers, up to 4 digits, by a 2 digit whole number using the efficient written method of long division, and interpret remainders as whole number remainders, fractions or by rounding, as appropriate for the context. - To identify the value of each digit to three decimal places, and multiply and divide numbers by 10, 100 and 1000 where the answers are up to 3 decimal places. - To solve problems which require answers to be rounded to specified degrees of accuracy. - To use their knowledge of the order of operations to carry out calculations involving the operations. - To multiply one digit numbers with up to 2 decimal places by whole numbers.

		• To use written division methods in cases where the answer has up to 2 decimal places.
Fractions Pupils will be taught to:	**Geometry - Properties of Shapes** Pupils will be taught to:	**Geometry - Position and Direction** Pupils will be taught to:
• To add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions. • To associate a fraction with division to calculate decimal fraction equivalents (0.375) for a simple fraction 3/8. • To multiply simple pairs of proper fractions, writing the answer in its simplest form (1/4 ÷1/2 = 1/8) • To divide proper fractions by whole numbers (1/3 ÷2 = 1/6) • To solve problems involving the calculation of percentages of whole numbers or measures (such as 15% of 360) and the use of percentages for comparison. • To recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. • To use common factors to simplify fractions; use common multiples to express fractions in the same denomination. • To compare and order fractions, including fractions >1	• To illustrate and name parts of circles, including radius, diameter and circumference. • To recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. • To draw 2D shapes using given dimensions and angles. • To compare and classify geometric shapes based on their properties and sizes; and find unknown angles in any triangles, quadrilateral and regular polygons. • To recognise, describe and build simple 3D shapes, including making nets.	• To describe positions on the full coordinate grid (all four quadrants) • To draw and translate simple shapes on the coordinate plane, and reflect them in the axis.
Measurement Pupils will be taught to:	**Algebra:** Pupils will be taught to:	**Statistics:** Pupils will be taught to:
• To solve problems involving the calculation and conversion of units of measure, using decimal notation to 3 decimal places where appropriate. • To use, read, write and covert between	• To express missing number problems algebraically. • To use simple formulae expressed in words. • To find pairs of number that satisfies number sentences involving two unknowns.	• To interpret and construct pie charts and line graphs, and use these to solve problems. • To calculate and interpret the mean as an

standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit of measure, and vice versa using decimal natation to 3 decimal places. • To convert between miles and kilometers. • To recognise that shapes with the same area can have different perimeters and vice versa. • To calculate the area of parallelograms and triangles. • To recognise when it is necessary to use the formulae for area and volume of shapes. • To calculate, estimate and compare volume of cubes and cuboids, using standard units, including cm cubed (cm³) and cubic meters (m³) and extending to others units such as mm³ and km³. •	• To enumerate all possibilities of combinations of two variables. • To generate and describe linear number sequences.	average.

Ratio and proportion
Pupils will be taught:

• To solve problems involving the relative size of two quantities, where missing values can be found by using integer multiplication and division facts.
• To solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.
• To solve problems involving similar shapes where the scale factor is known or can be found.

Updated by KL (September 2016)