St Joseph's Catholic Primary School

Mathematics Progression

Place Value:

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Place Value: Counting	-count to and across 100, forwards and backwards, beginning with 0 or 1 or from any given numbers -count numbers to 100 in numerals, 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 and backwards	-count from 0 in multiples of 4, 8, 50 and 100; find 10 more or less than a given number	-count in multiples of 6, 7, 9, 25 and 1000 - 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 - count forwards and backward with positive and negative whole numbers including through zero	
Place Value: Represent	-identify and represent numbers using objects and pictorial representations -read and write numbers to 100 in numerals -read and write numbers from 1 to 20 in numerals and words	-read and write numbers to at least 100 in numerals and words -identify, represent and estimate numbers using different representations, including the number line	-identify, represent and estimate numbers using different representations -read and write numbers up to 1000 in numerals and words	-identify, represent and estimate numbers using different representations - read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value	-read, write (order and compare) numbers to at least 1 000 000 and determine the value of each digit - read Roman numerals to 1000 (M) and recognise years written in Roman numerals	- read, write (order and compare) numbers to at least 10 000 000 and determine the value of each digit
Place Value: Compare	-given a number, identify one more and one less	-recognise the place value of each digit in a two digit number - compare and order numbers from 0 to 100: use <, > and = signs	-recognise the place value of each digit in a three digit number -compare and order numbers up to 1000	-find 1000 more or less than a given number - recognise the place value of each digit in a four digit number --compare and order numbers beyond 1000	-(read, write) order and compare 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
Place Value: Problems and Rounding		-use place value and number facts to solve problems	-solve number problems and practical problems involving these ideas	-round any number to the nearest 10, 100 and 1000 -solve number and practical problems that involve all of the above and with increasingly large positive numbers	-interpret negative numbers in context -round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000, and 100, 000 -solve number problems and practical problems that involve all of the above	-round any number to a required degree of accuracy - use negative numbers in context, and calculate intervals across zero -solve number problems and practical problems that involve all of the above

Addition and Subtraction:

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Addition & Subtraction: Recall, Represent and Use	-read, write and interpret mathematical statements involving addition, subtraction and equals (same as) signs -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 - show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot -recognise and use inverse relationship between addition and subtraction and use this to check calculations and solve 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	
Addition & Subtraction: Calculations	-add and subtract one-digit and two digit numbers to 20, including zero	-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 and adding three one digit numbers	-add and subtract mentally including: a three digit number and ones, a three digit number and tens and a three digit number and hundreds -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 method of columnar addition and subtraction where appropriate	-add and subtract whole numbers with more than 4 digits using the formal written methods (columnar addition and subtraction) - add and subtract numbers mentally with increasingly large numbers	-perform mental calculations, including with mixed operations and large numbers - use their knowledge of the order of operations to carry out calculations involving the four operations
Addition & Subtraction: Solve Problems	-solve on step problems that involve addition and subtraction, using concrete objects and	-solve problems with addition and subtraction: using concrete and pictorial	-solve problems including missing numbers, number problems, using number facts, place	-solve addition and subtraction two-step problems in context, deciding which	-solve addition and subtraction two-step problems in context, deciding which operations and	-solve addition and subtraction multi-step problems in contexts, deciding which operations and

	pictorial representation and missing number problems	representations, including those involving numbers, quantities and measures, applying their increasing knowledge of mental and written methods	value and more complex addition and subtraction	operations and methods to use and why	methods to use and why -solve problems involving addition, subtraction, multiplication and division and a combination of these including understanding the meaning of the equals sign	method to use and why

Multiplication and Division:

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Multiplication and division : Recall, Represent and Use		-recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers -show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot	-recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	- recall multiplication and division facts for multiplication tables up to 12 x 12 - 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	-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 - 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 correct notation	-identify common factors, common multiples and prime numbers - use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.
Multiplication & Division: Calculations		-calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication, division and equals sign	- 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	- 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 formal written method including long multiplication for two digit numbers - multiply and divide numbers mentally drawing upon know 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 context	-multiply multi-digit numbers up to 4 digits by a two digit whole number using the formal written method of long multiplication - divide number up to 4 digits by a two digit whole number using the formal written method for long division and interpret remainders as whole number remainders, fractions, or by rounding as appropriate for the context - divide number up to 4 digits by a two digit

					- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	whole number using the formal written method of short division where appropriate - perform mental calculations, including with mixed operations and large numbers
Multiplication & Division: Solve Problems	-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 division facts including problems in contexts	-solve problems involving missing numbers, multiplication and division including positive integers, scaling problems and correspondence problems	-solve problems involving multiplying and adding including using the distributive law to multiply two digit numbers, integer scaling problems and harder correspondence problems	-solve problems involving multiplication and division including using their knowledge of factors, multiples, squares and cubes - solve problems involving multiplication and division including scaling by simple fractions and problem solving	-solve problems involving addition, subtraction, multiplication and division
Multiplication & Combined Operations					-solve problems involving addition, subtraction, multiplication and division and a combination of these, including the understanding of the equals sign	-use their knowledge of the order of operations to carry out calculations involving the four operations

Fractions, Decimals and Percentages:

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Fractions: Recognise and Write	-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 $\frac{1}{3}$ $\frac{1}{4}$ $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity	-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	-count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.	-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 e.g. $\frac{2}{5}+\frac{4}{5}=\frac{6}{5}=1\frac{1}{5}$	
Fractions: Compare		-recognise the equivalence of $\frac{1}{2}$ and $\frac{2}{4}$	-recognise and snow using diagrams, equivalent fractions with small denominators - compare and order unit fractions and fractions with the same denominators	-recognise and snow using diagrams families of common equivalent fractions	-compare and order fractions whose denominators are all multiples of the same number	-use common factors to simplify fractions; use common multiples to express fractions I the same denominator -compare and order fractions
Fractions: Calculations		-write simple fractions for example $\frac{1}{2}$ of 6 = 3	-add and subtract fractions with the same denominator within one whole e.g. $\frac{5}{7}+\frac{1}{7}=\frac{6}{7}$	- add and subtract fractions with the same denominator	-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	-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

					numbers, supported by materials and diagrams	-divide proper fractions by whole numbers
Fractions: Solve Problems			-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		
Decimals: Recognise and Write				-recognise and write decimal equivalences of any number of tenths and hundredths – recognise and write decimal equivalences to $\frac{1}{4}$ $\frac{1}{2}$ $\frac{2}{4}$	-read and write decimal numbers as fractions - use thousandths and relate them to tenths, hundredths and decimal equivalences	-identify the value of each digit in numbers given to three decimal places
Decimals: Compare				-round decimals with one decimal place to the nearest whole number -compare numbers with the same number of decimal places up to two decimal places	-round decimals with two decimal places to the nearest whole number and to one decimal place - read, write, order and compare numbers with up to three decimal places	
Decimals: Calculations and Problems				-find the effect of dividing a one or two digit number by 10 and 100 identifying the value of digits in the answer as ones, tenths and hundredths	-solve problems involving number up to three decimal places	-multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places - multiply one digit numbers with up to two decimal places by whole numbers -use written division methods in cases

						where the answer has up to two decimal places - solve problems which require answers to be rounded to specified degrees of accuracy
Fractions, Decimals and Percentages				-solve simple measure and money problems involving fractions and decimals to two decimal places	-recognise the percent symbol and understand that percent relates to number of parts per hundred and write percentages as a fraction with denominator 100, and as a decimal -solve problems which require knowing percentage and decimal equivalences 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	-associate a fraction with division and calculate decimal fraction equivalents -recall and use equivalences between simple fractions, decimals and percentages

Ratio and Proportion:

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Ratio and Proportion						-solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts - solve problems involving the calculation of percentages and the use of percentages for comparison - solve problems involving similar shapes where the scale factor is known or can be found - solve problems involving unequal sharing and grouping using knowledge of fractions and multiples

Algebra:

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Algebra						-use simple formulae -generate and describe linear number sentences - express missing number problems algebraically -find pairs of numbers that satisfy an equation with two unknown -enumerate possibilities of combinations of two values

Measurement:

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Measurement: Using Measures	-compare, describe and solve practical problems for: length/height, mass/weight, capacity/volume and time - measure and begin to record the following: length/height, mass/weight, capacity/volume and time	-choose and use appropriate standard units to estimate and measure length/ height in any direction; mass; temperature and capacity to the nearest appropriate unit using rulers, scales, thermometers and measuring vessels. - compare and order length, mass, volume/capacity and record the results using <, > and =	-measure, compare add and subtract; lengths, mass, volume and capacity	-convert between different units of measure e.g. KM to M -estimate, compare and calculate different measures	- convert between different units of measure e.g. L to ML - understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints -use all four operations to solve problems involving measures using decimal notation	-solving problems involving the calculations and conversions of units of measure, using decimal notation up to three decimals places where appropriate - use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit or vice versa using decimal notation up to three decimal places -convert between miles and kilometers
Measurement: Money	-recognise and know the denomination of different notes and coins	-recognise and use symbols for pounds and pence; combine amounts to make a particular value -find different combinations of coins that equal the same amount of money - solve simple problems in practical contexts involving addition and subtraction of money of the same unit including giving change	-add and subtract amounts of money to give change, using both £ and pence in practical contexts	-estimate, compare and calculate different measures, including money in pounds and pence	- use all four operations to solve problems involving measure	

Measurement: Time	-sequence events in chronological order using the correct language - 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	-tell the time from an analogue clock, including Roman Numerals on a 12 and 24 hour clock. - estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, and hours -know the number of seconds in a minute and the number of days in each month, year and leap year -compare durations of events	-read, write and convert time between analogue and digital 12 and 24 hour clock - solve problems involving converting from hours to minutes, minutes to seconds; years to months; weeks to days	-solve problems involving converting between units of time	-use, read, write and convert between standard units, converting measurements of time for a smaller unit of measure to a larger unit and vice versa
Measurement: Perimeter, Area and Volume			-measure the perimeter of simple 2D shapes	-measure and calculate the perimeter of rectilinear figure in centimeters and meters - find the area of rectilinear shapes by counting squares	-measure and calculate the perimeter of composite rectilinear shapes in centimeters and meters -calculate and compare the area of rectangles and estimate the area of irregular shapes -estimate volume and capacity	-recognise that shapes with the same areas can have different perimeters and vice versa. - recongnise when it is possible to use formulae for area and volumes of shapes - calculate the area of parallelograms and triangles -estimate volume and capacity of cubes and cuboids

Geometry:

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Geometry: 2D Shapes	-recognise and name common 2D shapes	-identify and describe the properties of 2D shapes including the number of sides and lines of symmetry -identify 2D shapes on the surface of 3D shapes -compare and sort common 2D shapes and everyday objects	-draw 2D shapes	-compare and classify geometric shapes, including quadrilaterals and triangles based on their properties and sizes -identify lines of symmetry in 2D shapes presented in different orientations	-distinguish between regular and irregular polygons based on reasoning about equal sides and angles -use the properties of rectangles to deduce related facts and find missing lengths and angles	-draw 2D shapes using given dimensions and angles -compare and classify geometric shapes based upon their properties and size -illustrate and name parts of circles including: radius, diameter and circumference and know the diameter is twice the radius
Geometry: 3D Shapes	-recognise and name common 3D shapes	- recognise and name common 3D shapes and compare and sort them	-make 3D shapes using modeling materials; recognise 3D shapes in different orientations and describe them		-identify 3D shapes including cubes and other cuboids from 2D representations	-recognise, describe and build simple 3D shapes including making nets
Geometry: Angles and Lines			-recognise angles as a property of shape or a description of a turn -identify right angles, recognise that two right angles make a half turn, three make three quarters of a turn and four 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	-identify acute and obtuse angles and compare and order angles up to two right angles by size -identify lines of symmetry in 2D shapes presented in different orientations -complete a simple symmetric figure with respect to a specific line of symmetry	-know angles are measured in degrees; estimate and compare acute, obtuse and reflex angles -draw given angles and measure them in degrees - identify angles at a point and one whole turn total 360 degrees -identify angles at a point on a straight line total 180 degrees	-find known angles in any triangle, quadrilaterals and regular polygons - recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles

Geometry: Position and Direction	-describe position, direction and movement, including whole, half, quarter, and three quarter turns	-order and arrange combinations of mathematical objects in patterns and sequences -use mathematical vocabulary to describe position, direction and movement.		-describe positions on a 2D grid as coordinates in the first quadrant -describe movements between position as translations of a given unit.	-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	-describe positions on the full coordinate grid -draw and translate simple shapes on the coordinate plane, and reflect them in the axes

Statistics:

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Statistics: Present and Interpret		-interpret and construct simple pictograms, tally charts, block diagrams and simple tables	-interpret and present data using bar charts, pictograms and tables	-interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs	-complete, read and interpret information in tables, including timetables	-interpret and construct pie charts and line graphs and use these to solve problems
Statistics: Solve Problems		-ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity -ask and answer questions about totaling and comparing data	-solve one and two step questions using information presented in scaled bar charts and pictograms and tables	-solve comparison, sum and difference problems using information presented in bar charts, pictograms tables and other graphs	-solve comparison, sum and difference problems using information presented in a line graph	-calculate and interpret the mean as an average