Rotation A

Maths Long Term Plan

3 Class Scenario (September 2021 – July 2022)

	Autumn		Spring		Summer	
Rec/Y1	• **Number and place value** -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 -use the language of: equal to, more than, less than (fewer), most, least -identify and represent numbers using objects and pictorial representations including the number line -read and write numbers from 1 to 20 in numerals and words • **Measure** - compare, describe and solve practical problems for: * lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half] * mass/weight [e.g. heavy/light, heavier than, lighter than] * capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter] -measure and begin to record the following: * lengths and heights * mass/weight * capacity and volume order using language [e.g. 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 • **Geometry**	• **Addition and Subtraction** -represent and use number bonds and related subtraction facts within 20 -add and subtract one-digit and two-digit numbers to 20, including zero - read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs -solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = * - 9 • **Multiplication and Division** -count in multiples of twos, fives and tens -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 • **Measure** - recognise and know the value of different denominations of coins and notes	• **Fractions** -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 • **Geometry** - recognise and name common 2-D and 3-D shapes, including: * 3-D shapes [e.g. cuboids (including cubes), pyramids and spheres]	• **Measure** - compare, describe and solve practical problems for: * lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half] * mass/weight [e.g. heavy/light, heavier than, lighter than] * capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter] * time [e.g. quicker, slower, earlier, later]	• **Geometry – Position and Direction** - describe position, direction and movement, including half, quarter and three-quarter turns. -	• **Measure – revisit concepts**

	- recognise and name common 2-D and 3-D shapes, including: * 2-D shapes [e.g. rectangles (including squares), circles and triangles]					
Y2/3/4	• Number and Place Value (review y1) <u>Year 2</u> -count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward -compare and order numbers from 0 up to 100; use <, > and = signs -identify, represent and estimate numbers using different representations, including the number line -read and write numbers to at least 100 in numerals and in words -recognise the place value of each digit in a two-digit number (tens, ones) -use place value and number facts to solve problems <u>Year 3</u> -count from 0 in multiples of 4, 8, 50 and 100; -find 10 or 100 more or less than a given number -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 -recognise the place value of each digit in a three-digit number (hundreds, tens, ones) -solve number problems and practical problems involving these ideas. <u>Year 4</u> -count backwards through zero to include negative numbers -count in multiples of 6, 7, 9, 25 and 1 000 -find 1 000 more or less than a given number -order and compare numbers beyond 1 000 -identify, represent and estimate numbers using different representations	• Addition and Subtraction <u>Year 2</u> - 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 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 -recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. -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 <u>Year 3</u> - add and subtract numbers mentally, including: * a three-digit number and ones * a three-digit number and tens * a three-digit number and hundreds -add and subtract numbers with up to three 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	• Multiplication and Division <u>Year 2</u> -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 -calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs -solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts <u>Year 3</u> - 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 • Measure <u>Year 3</u> - measure the perimeter of simple 2-D shapes -	• Fractions <u>Year 2</u> -recognise, find, name and write fractions 1/3, 1/4, 2/4 and 3/4 of a length, shape, set of objects or quantity -write simple fractions e.g. 1/2 of 6 = 3 and recognise the equivalence of 2/4 and 1/2. - • Multiplication and Division <u>Year 4</u> -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 three numbers -recognise and use factor pairs and commutativity in mental calculation -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 one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects • Measure <u>Year 2</u> -compare and order lengths, mass, volume/capacity and record the results using >, < and = -compare and sequence intervals of time - choose and use appropriate standard units to estimate and	• Fractions <u>Year 3</u> -count up and down in tenths -recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators -recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10. -recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators -compare and order unit fractions, and fractions with the same denominators -recognise and show, using diagrams, equivalent fractions with small denominators -add and subtract fractions with the same denominator within one whole (e.g. 5/7 + 1/7 = 6/7) -solve problems that involve all of the above <u>Year 4</u> -count up and down in hundredths -recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten -compare numbers with the same number of decimal places up to two decimal places -round decimals with one decimal place to the nearest whole number -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; ¾ -add and subtract fractions with the same denominator -find the effect of dividing a one- or two-digit number by 10 and	• Statistics <u>Year 3</u> - interpret and present data using bar charts, pictograms and tables - interpret and present data using bar charts, pictograms and tables <u>Year 4</u> - 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. • Geometry <u>Year 2</u> -identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line -identify and describe the properties of 3-D shapes, including the number of edges, vertices and face -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 <u>Year 3</u> - draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them <u>Year 4</u> - identify lines of symmetry in 2-D shapes presented in different orientations

	-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. -recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) -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 ● Measure Year 3 - compare durations of events, for example to calculate the time taken by particular events or tasks - estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight - measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) - compare durations of events, for example to calculate the time taken by particular events or tasks - 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, compare and calculate different measures, including money in pounds and pence - know the number of seconds in a minute and the number of days in each month, year and leap year Year 4 - 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	more complex addition and subtraction Year 4 -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 ● Geometry Year 2 -identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line -identify and describe the properties of 3-D shapes, including the number of edges, vertices and face -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 Year 3 - draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them Year 4 - 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 - compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes ● Measure Year 2 -choose and use appropriate standard units to estimate and measure length/height in any	Year 4 - measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres - find the area of rectilinear shapes by counting square	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 - 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, describe and solve practical problems for: * lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half] * mass/weight [e.g. heavy/light, heavier than, lighter than] * capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter] * time [e.g. quicker, slower, earlier, later]	100, identifying the value of the digits in the answer as ones, tenths and hundredths -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 -solve simple measure and money problems involving fractions and decimals to two decimal places. ● Geometry – Position and Direction Year 2 - describe position, direction and movement, including half, quarter and three-quarter turns. Year 3&4 - 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	- complete a simple symmetric figure with respect to a specific line of symmetry - compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes Consolidation of work Gap analysis

	- solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days - convert between different units of measure (e.g. kilometre to metre; hour to minute) • **Geometry** <u>Year 3</u> - 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 <u>Year 4</u> - identify acute and obtuse angles and compare and order angles up to two right angles by size	direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels -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 <u>Year 3</u> - measure the perimeter of simple 2-D shapes - <u>Year 4</u> - measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres - find the area of rectilinear shapes by counting square				
Y5/6	• **Number and place value** <u>Year 5</u> -Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero -count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 -read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit -read Roman numerals to 1 000 (M) and recognise years written in Roman numerals. -round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000 <u>Year 6</u> -use negative numbers in context, and calculate intervals across zero -read, write, order and compare numbers up to 10 000 000 and determine the value of each digit	• **Multiply and Division** <u>Year 5</u> - multiply and divide numbers mentally drawing upon known facts - multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 - 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 - 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 - 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** <u>Year 6</u> - compare and order fractions, including fractions >1 - identify the value of each digit in numbers given to three decimal places - solve problems which require answers to be rounded to specified degrees of accuracy - 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. - add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions	• **Ratio** <u>Year 5 and 6</u> - 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 [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. • **Measure (area)** <u>Year 5</u> - calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm2) and square metres (m2) and estimate	Consolidation of skills, gap analysis and investigations.	

-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
-solve number and practical problems that involve all of the above

- **Addition and Subtraction**

Year 5
-add and subtract numbers mentally with increasingly large numbers
-add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
-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

Year 6
-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
-use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.
-Solve problems involving addition, subtraction, multiplication and division

- **Position and Direction**

Year 5 & 6
-describe positions on the full coordinate grid (all four quadrants)

- **Geometry (shape)**

Year 5
-identify 3-D shapes, including cubes and other cuboids, from 2-D representations

fractions and problems involving simple rates

Year 6
- perform mental calculations, including with mixed operations and large numbers
- multiply multi-digit numbers up to 4 digits by a two-digit whole number 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 short division where appropriate for the context 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
- use their knowledge of the order of operations to carry out calculations involving the four operations
- use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy
- solve problems involving addition, subtraction, multiplication and division

- **Fractions**

Year 5
- recognise and use thousandths and relate them to tenths, hundredths and decimal equivalent
- compare and order fractions whose denominators are all multiples of the same number
- read, write, order and compare numbers with up to three decimal places
- round decimals with two decimal places to the nearest whole number and to one decimal place
- 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 the per cent symbol (%) and understand that per cent

- multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. 1/4 × 1/2 = 1/8
- multiply one-digit numbers with up to two decimal places by whole numbers
- 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
- multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
- 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 three decimal places
- associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3/8)
- use written division methods in cases where the answer has up 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.

- **Statistics**

Year 5
- solve comparison, sum and difference problems using information presented in a line graph

Year 6
- interpret and construct pie charts and line graphs and use these to solve problems

- **Geometry – circles.**

Year 5 & 6
illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius

the area of irregular shapes (also included in measuring
- calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes

Year 6
- recognise that shapes with the same areas can have different perimeters and vice versa
- calculate the area of parallelograms and triangles

- **Statistics (mean)**

-calculate and interpret the mean as an average

- **Position and Direction (translations and reflections)**

Year 5
-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

Year 6
-draw and translate simple shapes on the coordinate plane, and reflect them in the axes.

- **Algebra**

Year 5
- use the properties of rectangles to deduce related facts and find missing lengths and angles

Year 6
- express missing number problems algebraically
- find pairs of numbers that satisfy number sentences involving two unknowns
- enumerate all possibilities of combinations of two variables
- use simple formulae
- generate and describe linear number sequences

	- draw given angles, and measure them in degrees (o) - 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 - know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles - identify: * angles at a point and one whole turn (total 360o) * angles at a point on a straight line and ½ a turn (total 180o) * other multiples of 90o ## Year 6 - recognise, describe and build simple 3-D shapes, including making nets - illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius - draw 2-D shapes using given dimensions and angles - compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygon - recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles **● Statistics (tables)** <u>Year 5 & 6</u> -complete, read and interpret information in tables, including timetables **● Measure (perimeter)** <u>Year 5</u> -measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres Year 6 - recognise that shapes with the same areas can have different perimeters and vice versa **● Time** <u>Year 5 & 6</u>	relates to "number of parts per hundred", and write percentages as a fraction with denominator 100 as a decimal fraction - add and subtract fractions with the same denominator and multiples of the same number - 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 - multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams **● Measure** (mass/capacity/volume) <u>Year 5</u> - estimate volume (e.g. using 1 cm3 blocks to build cubes and cuboids) and capacity (e.g. using water) - use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling. - convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) - understand and use equivalences between metric units and common imperial units such as inches, pounds and pints <u>Year 6</u> - solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal 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, and vice versa, using decimal notation to up to three decimal places - convert between miles and kilometres **● Number** <u>Year 5</u>				

	-solve problems involving converting between units of time	- 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 notation for squared (2) and cubed (3) - solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes <u>Year 6</u> - identify common factors, common multiples and prime numbers			