Gladstone Road Primary School Mathematics (STEM TEAM)

Curriculum design & LTP Progression 2020/2021

	Year 5 LTP Overview **2020/2021**					
Autumn Term **14 Weeks**	Place Value 3 Weeks Lesson 1 - 12	Addition and Subtraction 2 weeks	Multiplication and Division 4 weeks	Geometry 3 weeks 1 to 13	Graphs 1 week Lessons 1,2,4,6,7	
Spring Term **11 Weeks**	Length Mass 2 weeks Lessons 1 – 8	Fractions 4 weeks Lessons 1 - 11	Decimals 3 weeks	Multiplication and Division 2 weeks		
Summer Term **14 Weeks**	Fractions 3 weeks Lessons 12 - 18	Percentages 2 week Pre -teach MNP 1 - 3	Time temperature 2 weeks Lessons 9-14	Area and perimeter 2 weeks	Volume 2 weeks	Position and Movement 1 week Roman Numerals 1 week

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KS2 Y5 Units	Autumn Term (14 weeks)	Spring Term (11 weeks)	Summer Term (14 weeks)
	Place Value (numbers to 1 000 000) – 3 weeks (includes time for Review 1) MNP Lessons Chapter 1 – 1 to 12 **Progression of skills** 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 1000 000 L8 To be able to make and identify patterns in numbers using knowledge of place value. L9To be able to make number patterns that decrease in multiples of 10 000 or 100 000 read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit L1 L2 To be able to read and represent numbers to 100 000. L3 To be able to read and represent numbers to 1 000 000 using number discs. L4 L5 To be able to compare numbers to 1 000 000 using place value. L6To be able to compare numbers to 1 000 000 using pictorial representations and proportionality. L7 To be able to compare numbers to 1 000 000 from pictorial representations, using lists and number lines. *recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents*	Measurements – 2 weeks length and mass MNP Lessons Chapter 11 – 1 to 8 **Progression of skills** use all four operations to solve problems involving measure (e.g. **length, mass, volume, money**) using decimal notation including scaling. L4: To be able to solve problems by converting units of length. convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) L1 L3: To be able to convert units of length. L2: To be able to convert units of length, including centimetres and metres L5 L7: To be able to convert units of mass. L6: To be able to convert units of mass, including grams into kilograms. understand and use equivalences between metric units and common imperial units such as inches, pounds and pints L8: To be able to convert units of mass, including kilograms and pounds.	Fractions – 3 weeks (includes time for Review 6 and Revision 2) MNP Lessons Chapter 6 – 12 - 18 **Progression of skills** add and subtract fractions with the same denominator and multiples of the same number L12: To be able to subtract fractions with different denominators; to be able to subtract fractions from whole numbers. L13: To be able to subtract fractions where the denominators are not the same; to be able to use bar models as a key strategy for subtracting fractions. 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. $^{2}/_{5} + {}^{4}/_{5} = {}^{6}/_{5} = 1\,{}^{1}/_{5}$) L14 To be able to subtract fractions and mixed numbers from mixed numbers with different denominators. multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams L15: To be able to multiply fractions by whole numbers creating other fractions, mixed numbers or improper fractions. L16: To be able to multiply fractions by whole numbers where the product is an improper fraction or mixed number.

	(copied from Fractions) round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000 L10 L11 To be able to round numbers to the nearest 10 000 using number lines and bar graphs. L12 To be able to round numbers to the nearest 100, 1000, 10 000 and 100 000 using number lines. *round decimals with two decimal places to the nearest whole number and to one decimal place* (copied from Fractions) Solve number problems and practical problems that involve all of the above. L13 To be able to apply knowledge of numbers to 1 000 000 to solve problems.		L17: To be able to multiply mixed numbers by whole numbers, creating larger mixed numbers. 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. L18: To be able to multiply mixed numbers by whole numbers in multi-step word problems. L19: To be able to apply knowledge of fractions to solve problems.
	Whole Numbers: Addition and Subtraction – 2 weeks (time for Review 2 needed) MNP Lessons Chapter 2 – 1 to 10 **Progression of skills** add and subtract numbers mentally with increasingly large numbers L1To be able to add using the 'counting on' strategy with concrete materials and number lines. L2 To be able to subtract using the 'counting backwards' strategy with concrete materials. L7 To be able to add and subtract using number bonds as a key strategy and numbers within 1 000 000. add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) L3 To be able to add numbers within 1 000 000 using rounding and concrete materials. L5To be able to add numbers within 1 000 000 using the column method of addition. L6 To be able to subtract using the column method, number bonds and number discs using numbers to 1 000 000.	Fractions – 4 weeks MNP Lessons Chapter 6 – 1 to 11 **Progression of skills** 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. $^{2}/_{5} + ^{4}/_{5} = ^{6}/_{5} = 1^{1}/_{5}$) L1: To be able to divide whole numbers to create fractions; to be able to create mixed numbers and improper fractions when dividing whole numbers. L2: To be able to write improper fractions and mixed numbers using a number line and pictorial methods. L6: To be able to compare mixed numbers using pictorial representations; to to be able to find common denominators where one fraction is already the common denominator for all fractions in the question. recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (appears also in Equivalence) compare and order fractions whose denominators are all multiples of the same number	Percentage – 2 week MNP Lessons Chapter 8 – 1 to 3 **Progression of skills** recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (appears also in Equivalence) 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 L1: To be able to compare quantities. L1:To be able to compare fractions, decimals and percentages. L1: To be able to convert fractions to decimals and percentages. 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.

	L9 To be able to subtract numbers to 1 000 000 using concrete materials, the column method and number bonds. 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 solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign L4 To be able to use addition and subtraction to solve comparison problems with numbers to 1 000 000. L8 To be able to consolidate and refine addition skills and place-value knowledge to solve addition problems. L10 L11 To be able to consolidate and refine subtraction skills and place-value knowledge to solve subtraction problems. L12 To be able to apply knowledge of addition and subtraction of whole numbers to solve problems.	L4 L5: To be able to compare and order fractions using the pictorial method. identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths L3: To be able to find equivalent fractions using pictorial methods. add and subtract fractions with the same denominator and multiples of the same number L7: To be able to make number pairs (number bonds) with fractions with different denominators. L8 L9: To be able to add unlike fractions by finding a common denominator using pictorial methods. L10: To be able to add unlike fractions where the sum is greater than 1, creating mixed numbers or improper fractions. L11: To be able to add unlike fractions, which create improper fractions and mixed numbers that give rise to simplification.	L2 L3: To be able to convert values of an amount into percentages. L2 L3: To be able to convert fractions into percentages. L4: To be able to apply knowledge of percentages to solve problems.
	Whole Numbers: Multiplication and Division – 4 weeks (includes time for Review 3) MNP Lessons Chapter 3 – 1 to 19 **Progression of skills** *count forwards or backwards in steps of powers of 10 for any given number up to* *1 000 000* (copied from Number and Place Value) multiply and divide numbers mentally drawing upon known facts L8 To be able to multiply 2- and 3-digit numbers by a 1-digit number using multiple strategies. 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 L9 L10 To be able to multiply 4-digit numbers by 1-digit numbers with regrouping, using a variety of strategies L11 To be able to multiply a 4-digit number by a 1-digit number, with regrouping from the ones, tens and hundreds, using multiple methods.	Decimals – 3 weeks (time for Review 7 needed) MNP Lessons Chapter 7 – 1 to 15 The 7 sessions on adding and subtracting decimals needs to be reduced. Additional sessions required on rounding decimals. **Progression of skills** recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (appears also in Equivalence) L4: To be able to compare tenths and hundredths written as decimals. use all four operations to solve problems involving measure (e.g. **length, mass, volume, money**) using decimal notation including scaling. solve problems involving numbers up to three decimal places L8: To be able to add and subtract amounts in decimals	Measurements – 2 weeks time and temperature MNP Lessons Chapter 11 – 9-14 **Progression of skills** use all four operations to solve problems involving measure (e.g. **length, mass, volume, money**) using decimal notation including scaling. L15: To be able to apply knowledge of measurements to solve problems. solve problems involving converting between units of time L9 L13: To be able to convert units of time. L10: To be able to convert units of time from days into weeks. L11: To be able to convert units of time./P> L12: To be able to solve problems by converting units of time. L14: To be able to read the temperature on a thermometer.

	L 12 To be able to multiply 2-digit numbers by 2-digit numbers using multiple methods. L13 To be able to multiply a 2-digit number by a 2-digit number using multiple methods, including the grid method, number bonds and column method, with regrouping. L 14 L15 To be able to multiply a 3-digit number by a 2-digit number, using the grid method and column method as key strategies. 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 L 17 To be able to divide 3- and 4-digit numbers by 1-digit numbers, using number bonds and long division as the key methods L18 To be able to divide 4-digit numbers by 1-digit numbers, using number bonds and long division as the key methods. L19 To be able to divide 3-digit numbers by 1-digit numbers, using long division, short division and mental methods that give rise to remainders. multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 L7 To be able to multiply 1- and 2-digit numbers by 10, 100 and 1000. L16 To be able to find thousands, hundreds and tens in a 4-digit number using concrete materials. identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers L1 To be able to consolidate and review multiplication; to be able to find the result of multiplying by a number. L2 To be able to consolidate and review multiplication; to be able to find the factors of a given number. L3 To be able to define and find common factors of numbers to 100. Know and use 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 L4 To be able to identify and name the prime numbers; to be able to recognise prime numbers as numbers that only have two factors.	L9 L11 L13: To be able to add and subtract decimals. L9 L10 L11: To be able to add and subtract amounts in pounds and pence. L12: To be able to add and subtract decimals to find the smallest possible sum and difference. L13: To find number pairs that add up to 1. L14: To be able to add and subtract the perimeter of an object using decimals. read, write, order and compare numbers with up to three decimal places L1: To be able to write decimal numbers. L2 L3: To be able to read and write decimals. L5: To be able to order and compare decimals. L6: To be able to compare and order decimals of amounts. round decimals with two decimal places to the nearest whole number and to one decimal place L15: To be able to round decimals to the nearest whole number. To be able to round numbers to the nearest tenth. read and write decimal numbers as fractions (e.g. 0.71 = $^{71}/_{100}$) L7: To be able to write fractions as decimals.	

	L5 To be able to define and determine prime numbers to 100. recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}) L6 To be able to create and determine square and cube numbers solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates L20 To be able to apply knowledge of multiplication and division of whole numbers to solve problems.		
	Geometry – 3 weeks (includes time for Review 9) MNP Lessons Chapter 9 – 1 to 13 **Progression of skills** identify 3-D shapes, including cubes and other cuboids, from 2-D representations draw given angles, and measure them in degrees (^{o}) L2 L4 To be able to measure angles using a protractor. L3 L6 To be able to draw, measure and add angles using a protractor. L7 To be able to draw lines and angles with a high level of accuracy. use the properties of rectangles to deduce related facts and find missing lengths and angles L8 To describe the sides and angles of both rectangles and squares. L10 To be able to solve problems involving angles in rectangles. L11 L12 To be able to solve problems involving angles distinguish between regular and irregular polygons based on reasoning about equal sides and angles L9 To be able to investigate the angles of various quadrilaterals, including squares and rectangles. L13 To be able to investigate regular polygons.	Whole Numbers: Multiplication and Division – 4 weeks (includes time for Review 3) **Progression of skills** 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	Area and Perimeter – 2 weeks (time for Review 12 needed) MNP Lessons Chapter 12 – 1 to 11 (NOTE: Teach lessons 8 and 9 together – TB not needed for L8, discuss to enable children to access only WB) **Progression of skills** 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 (also included in measuring) L5: To be able to measure the area of shapes by counting squares. L6: To be able to measure the area of squares. L7: To be able to measure the area of a shape. L8 L9 L10: To be able to measure area in square metres. L11: To be able to make an estimation of area in kilometres. use all four operations to solve problems involving measure (e.g. **length, mass, volume, money**) using decimal notation including scaling. measure and calculate the **perimeter** of composite rectilinear shapes in centimetres and metres L1: To be able to find the perimeter of shapes. L2: To be able to find shapes with a specific perimeter.

	know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles L1 To be able to know the names and qualities of acute, right, obtuse and reflex angles. 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° L4 To be able to identify two angles which add up to 180º on a straight line L5 To be able to investigate angles that, when combined, make 360º.		L3: To be able to find the perimeter of different shapes. L4: To be able to use scale diagrams to find the perimeter of a shape. *recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3})* (copied from Multiplication and Division)
	Graphs – 2 weeks (includes time for Review 5) MNP Lessons Chapter 5 – 1,3,4,5,7 **Progression of skills** complete, read and interpret information in tables, including timetables L1 To be able to read the information presented in a table and interpret its meaning. L3 To be able to read and respond to tables that have a variety of data sets. L4 To be able to read and interpret information provided in a line graph where a single line represents the data. L5 To be able to read and interpret information presented on a line graph where the data is represented by more than one line. solve comparison, sum and difference problems using information presented in a line graph L7 To be able to read and interpret information presented in a table and turn it into a line graph; to be able to determine relationships between data sets.		Volume – 2 weeks (time for Review 13 needed) MNP Lessons Chapter 13 – 1 to 10 **Progression of skills** estimate volume (e.g. using 1 cm^3 blocks to build cubes and cuboids) and capacity (e.g. using water) L1: To be able to understand the volume of solids. L3: To be able to find the volume of solids. use all four operations to solve problems involving measure (e.g. **length, mass, volume, money**) using decimal notation including scaling. L2: To be able to find the volume of 3-D shapes. L4: To be able to find the capacity of a cuboid. L5: To be able to find the capacity of rectangular boxes. L9 L10 L11: To be able to solve word problems involving volume. convert between different units of measure L6: To be able to compare and convert units of volume. L7 L8: To be able to convert units of volume (metric and imperial).

			Roman Numerals – 1 week (includes time for Review 14) MNP Lessons Chapter 14 – 1 to 2 NOTE – 2 more lessons needed (children struggle with this chapter) **Progression of skills** read Roman numerals to 1000 (M) and recognise years written in Roman numerals. L1: To be able to write Roman numerals to 1000. L2: To be able to write numbers in their thousands in Roman numerals.
			Position and Movement – 1 week (time for Review 10 and Revision 3 needed) MNP Lessons Chapter 10 – 1 to 5 **Progression of skills** 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 L1: To be able to name and plot points. L2: To be able to describe the position of a shape following a translation. L3: To be able to describe movements and reflecting shapes. L4: To be able to describe the movement of a 2-D shape when reflected. L5: To be able to reflect a shape more than once.