LOWER HEATH CE PRIMARY MATHEMATICS LONG TERM PLAN Year 5/6

AUTUMN TERM				
	YEAR 5		**YEAR 6**	
Week:	PM Unit	Objectives	PM Unit	Objectives
1-3	**1. Place Value within 100,000**	• 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 • 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	**1. Place Value within 10,000,000**	• read, write, order and compare numbers up to • 10,000,000 and determine the value of each digit • solve number and practical problems that involve all of the above • round any whole number to a required degree of accuracy • use negative numbers in context, and calculate intervals across zero
4-6	**2. Place Value within 1,000,000**	• read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit • solve number problems and practical problems that involve all of the above • round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000 • 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 solve number problems and practical problems that involve all of the above	**2. 4 operations (1)**	• solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why • 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 number using the formal written method of short division, where appropriate, interpreting remainders according to 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

7-9	**3. Addition and Subtraction**	• 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 • add and subtract numbers mentally with increasingly large numbers • solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why • estimate and use inverse operations to check answers to a calculation	**3. 4 Operations (2)**	• identify common factors, common multiples and prime numbers • recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}) (Year 5) • use their knowledge of the order of operations to carry out calculations involving the four operations • perform mental calculations, including with mixed operations and large numbers • solve problems involving addition, subtraction, multiplication and division
10-12	**5. Multiplication and Division (1)**	• identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers • solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes • 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), identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers • solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates • multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000	**9. Algebra**	• generate and describe linear number sequences • use simple formulae • express missing number problems algebraically • use simple formulae • find pairs of numbers that satisfy an equation with two unknowns • enumerate possibilities of combinations of two variables

13-14	7. Multiplication and Division (2)	• multiply and divide numbers mentally drawing upon known facts • 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	12. Ratio and Proportion	• solve problems involving unequal sharing and grouping using knowledge of fractions and multiples • 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 similar shapes where the scale factor is known or can be found

SPRING TERM				
	YEAR 5		**YEAR 6**	
Week:	**PM Unit**	**Objectives**	**PM Unit**	**Objectives**
1-3	**8. Fractions (1)**	• 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, 2/5 + 4/5 = 6/5 = 1 1/5] • compare and order fractions whose denominators are all multiples of the same number	**4. Fractions (1)**	• use common factors to simplify fractions; use common multiples to express fractions in the same denomination • compare and order fractions, including fractions > 1 • add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
4-6	**9. Fractions (2)**	• add and subtract fractions with the same denominator and denominators that are 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 [for example, 2/5 + 4/5 = 6/5 = 1 1/5] •	**5. Fractions (2)**	• multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams • multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, 1/4 × 1/2 = 1/8] • divide proper fractions by whole numbers [for example, 1/3 ÷ 2 = 1/6] • add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions • use their knowledge of the order of operations to carry out calculations involving the four operations • use written division methods in cases where the answer has up to two decimal places

7-8	**10. Fractions (3)**	• multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams • recognise mixed numbers and improper fractions and convert from one form to the other • write mathematical statements > 1 as a mixed number [for example, 2/5 + 4/5 = 6/5 = 1 1/5]	**7. Decimals**	• identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1,000 giving answers up to three decimal places • associate a fraction with division and calculate decimal fraction equivalents [for example, 0·375] for a simple fraction [for example, 3/8] • use written division methods in cases where the answer has up to two decimal places • multiply one-digit numbers with up to two decimal places by whole numbers • solve problems that require answers to be rounded to specified degrees of accuracy
9-11	**11. Decimals and Percentages**	• read, write, order and compare numbers with up to three decimal places • recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • round decimals with two decimal places to the nearest whole number and to one decimal place • 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, and as a decimal •	**8. Percentages**	• recall and use equivalences between simple fractions, decimals and percentages, including in different contexts • solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison • multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, • 1/4 × 1/2 = 1/8] • multiply one-digit numbers with up to two decimal places by whole numbers • compare and order fractions, including fractions • > 1 • solve problems that require answers to be rounded to specified degrees of accuracy • solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison

12-13	**6. Area and Perimeter**	• measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres • calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes	**11. Perimeter. Area and Volume**	• recognise that shapes with the same areas can have different perimeters and vice versa • recognise when it is possible to use formulae for area and volume of shapes • calculate the area of parallelograms and triangles • calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm3) and cubic metres (m3), and extending to other units [for example, mm3 and km3]

SUMMER TERM				
	YEAR 5		**YEAR 6**	
Week:	**PM Unit**	**Objectives**	**PM Unit**	**Objectives**
1-3	**12. Decimals**	• add and subtract decimals with up to three decimal places • solve problems involving addition and subtraction of decimals • use addition and subtraction to complete decimal sequences • multiply and divide decimals and whole numbers by 10, 100 and 1,000	**6. Geometry - Position and Direction** **13. Geometry - Properties of shapes**	• describe positions on the full coordinate grid (all four quadrants) • draw and translate simple shapes on the coordinate plane, and reflect them in the axes • draw 2D 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 polygons • recognise angles where they meet at a point, are on a straight line or are vertically opposite, and find missing angles • illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius • recognise, describe and build simple 3D shapes, including making nets • identify 3D shapes, including cubes and other cuboids, from 2D representations

4-5	**13. Geometry - Properties of Shapes (1)**	• identify:
		  o angles at a point and one whole turn (total 360°)
		  o angles at a point on a straight line and 1/2 a turn (total 180°)
			10. Measure-imperial and metric	• 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 up to three decimal places

| | **14. Geometry – Properties of Shapes (2)** | o other multiples of 90°
• know angles are measured in degrees; estimate and compare acute, obtuse and reflex angles
• draw given angles, and measure them in degrees (°)
• use the properties of rectangles to deduce related facts and find missing lengths and angles

• identify:
   o angles at a point and one whole turn (total 360°)
   o angles at a point on a straight line and 1/2 a turn (total 180°)
   o other multiples of 90°
• draw given angles, and measure them in degrees (°)
• 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
• identify 3D shapes, including cubes and other cuboids, from 2D representations
• 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 | **15. Statistics** | • solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places, where appropriate
• convert between miles and kilometres

• calculate and interpret the mean as an average
• interpret and construct pie charts and line graphs and use these to solve problems |

6-10	15. Geometry – Position and Direction	• identify, describe and represent the position of a shape following a reflection or translation, using appropriate language, and know that the shape has not changed	14. Problem Solving	• use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
	16. Measure – Converting Units	• convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) • use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling • understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints • solve problems involving converting between units of time		• solve problems involving addition, subtraction, multiplication and division • solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why • use knowledge of the order of operations to carry out calculations involving the four operations • recall and use equivalences between simple fractions, decimals and percentages, including in different contexts • solve problems involving unequal sharing and grouping using knowledge of fractions and multiples • solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts • 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
	17. Measure – Volume and Capacity	• estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water]		• describe positions on the full coordinate grid (all four quadrants) • recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
	4. Graphs and Tables	• complete, read and interpret information in tables, including timetables • solve comparison, sum and difference problems using information presented in a line graph		• compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons