Grateley Primary School

Maths Medium Term Plan – Year 5 and 6

Term: Autumn

Week	Date	Year	Block / Focus	Prior Objectives	Year group objectives	Big Ideas, Problem Solving Activities
1	07.09.2020	5	Place Value	Y4: Order and compare numbers beyond 1000. Y4: Become fluent in counting in tens and hundreds. Y4: Round any number to the nearest 10, 100 or 1000.	Read, write, order and compare numbers to at least 100,000 and determine the value of each digit. Identify, represent and estimate numbers using different representations including number-lines. Round any number to the nearest 10, 100, 1000, 10,000 and 100,000 (represent on a number line).	• Revise different representations for NPV – bar models, number lines, part whole models. • Using different resources, children to add 10s and 100s to a number to understand and explain what it is they are doing at each stage. • Model decimals PV using place value charts, two part 'cherry' models, arrow cards and on number lines. Support calculations involving decimals with place value charts, structured resources. • Large numbers of six digits are named in pattern of three: hundreds of thousands, tens of thousands, ones of thousands, mirroring hundreds, tens and ones. • Relate large numbers to real-world contexts, form example the number of people that a local sports arena can hold.
		6		Y5: Read, write, order and compare numbers to at least 100,000 and determine the value of each digit.	Read, write, order and compare numbers to at least 10,000,000 and determine the value of each digit. Identify, represent and estimate numbers using	• Represent calculations and solutions to problems using a range of representations to help pupils to make link with prior learning and to notice structure and relationships within a domain and between domains. • Models decimals PV using value charts, two part 'cherry' modes, arrow cards and on number lines. Support calculations involving

					different representations including number-lines. Round any whole number to a required degree of accuracy.	decimals with place value charts, structured resources. • For whole numbers, the more digits a number has, the larger it must be; any 4-digit whole number is larger than any 3-digit whole number. But this is not true of decimal numbers; having more digits does not make a decimal number necessarily bigger. For example, 0.5 is larger than 0.35.
2	14.09.2020	5	Place Value / Addition and Subtraction	Y3: Add and subtract numbers mentally including a 3-digit number and ones and a 3-digit number and hundreds. Y4: Add and subtract numbers with up to 4 digits using formal written methods of columnar addition and subtraction where appropriate. Y4: Estimate the answer to a calculation and use inverse operations to check answers. Y4: Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.	Add and subtract mentally with increasingly large numbers eg. 12,462 – 2300 = 10,612. Add and subtract whole numbers with more than 4 digits. Represent solutions appropriately using informal and formal written methods. Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.	• Use number lines to identify where they should round (making explicit links with decimals). • Rounding numbers in context may mean rounding up or down. Buying sacks of 100 potatoes may mean rounding up so make sure we have enough. • Link to place value for children to partition and identify what they are adding and subtracting mentally. • Before starting and calculation is it helpful to think about whether or not you are confident that you can do it mentally. For example, 3689 + 4998 may be done mentally but 3689 + 4756 may require paper and pencil. • Carrying out an equivalent calculation might be easier than carrying out the given calculation. For example, 3682 – 2996 is equivalent to 3686 – 3000 (constant difference).
		6		Y5: Add and subtract whole numbers with more	Perform mental calculations, including	• Provide regular opportunities to discuss and justify whether a calculation could be solved

				than 4 digits (represent solutions appropriately using informal and formal written methods). Y5: Add and subtract mentally with increasingly larger numbers eg. 12,462 – 2300 = 10,612	with mixed operations and large numbers. Add and subtract whole numbers with more than 4 digits. Represent solutions appropriately using informal and formal written methods Solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why. Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.	mentally using facts and related/ derived facts. • Provide regular opportunities to discuss and justify whether a calculation could be solved mentally using facts and related/ derived facts. • Deciding which calculation method to use is supported by being able to take apart and combing numbers in many ways. For example, calculating 8.78 + 5.26 might involve 8.75 + 5.25 and then adjusting the answer. • The associative rule helps when adding three or more numbers; 367 + 275 + 525 is probably best thought of as 367 + (275 + 252) rather than (367 + 275) + 525.
3	21.09.2020	5	Addition and Subtraction/ Statistics	Y4: Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why. Y4: Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres.	Measure and calculate the perimeter of composite rectilinear shapes on cm and m. Use all four operations to solve problems involving measure (length), using decimal notation.	• In everyday life, area and perimeter are used constantly – for example, for describing the size of a house by talking about its floor area, or for working out how much wire is needed to fence of a field. • The perimeter of a figure is the distance around the figure. The area of a figure is the number of square units enclosed by the figure. • Nurture intuitive understanding and transform it into a more theoretical understanding, and link to outside life experiences.

		6		Y5: Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. Y5: Measure and calculate the perimeter of composite rectilinear shapes on cm and m.	Recognise the same areas can have different perimeters and vice versa. Use knowledge of the order of operations to carry out calculations including the four operations,	
4	28.09.2020	5	Multiplication and Division	Y2/3: Recall and use multiplication and division facts for the 2, 3, 4, 5, 8, 10 multiplication tables. Y4: Use place value, known and derived facts to multiply and divide mentally. Y4: Represent multiplication and division facts as arrays using a grid (rather than dots) and a number line.	Represent multiplication and division facts as grid arrays, link to rectangular areas, identifying factors as whole number side lengths of rectangles. 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. Use place value knowledge to multiply and divide whole numbers and those involving decimals by 10 and 100.	• Pupils have a firm understanding of what multiplication and division mean and have a range of strategies for dealing with large numbers, including both mental and standard written methods. They see the idea of factors, multiples and prime numbers as connected not separate ideas to learn. • Factors and multiples are connected ideas: 48 is a multiple of 6 and 5 is a factor of 48 • Prime numbers have exactly 2 factors, themselves and 1. Remind children that other numbers are composite.
		6		Y5: Represent multiplication and division	Multiply multi-digit numbers up to 4 digits	• Standard written multiplication method involves a number of partial products. For

				facts as grid arrays, link to rectangular areas, identifying factors as whole number side lengths of rectangles	by a 2-digit whole number using a formal written method of long multiplication. Identify common factors, common multiples and prime numbers.	example, 36 x 24 is made up of four partial products 30 x 20, 30 x 4, 6 x 20, 6 x 4. • There are connections between factors, multiples and prime numbers.
5	05.10.2020	5	Multiplication and Division	Y4: Find the area of rectilinear shapes by counting squares (relate to tables facts on array grids).	Calculate and compare the area of rectangles, including squares, and including using standard units (cm2 and m2) and estimate the area of irregular shapes. Use knowledge of multiples to estimate division calculations eg. 1075 ÷ 25 ≈ 40 (since 4 x 25 = 100).	• They recognise how to use their skills of multiplying and dividing in new problem and solving situations. • The relationship between area and perimeter is not a simple one. Increasing or decreasing area does not necessarily mean the perimeter increases or decreases respectively, or vice versa. • Area is measured in square unity. For rectangles, measuring the length and breadth is a shortcut to finding out how many squares would fit into each of these dimensions.
		6		Y5: Divide numbers up to 4 digits by a one digit number using formal written method of short division and interpret remainders appropriately for the context.	Divide numbers up to 4-digits by a 2-digit whole number using a formal written method of long division, and interpret remainders as a whole number, fraction or by rounding as appropriate for the context.	• They recognise how to use their skills of dividing in new problem solving situations. • Using estimation to chunk, chunking involves working out roughly how many times one number will go into another using existing knowledge about other, smaller numbers.
6	12.10.2020	5	Multiplication and Division	Y4: Estimate the answer to a calculation and use inverse operations to check answers.	Understand division as grouping, moving on from sharing, to make efficient use of multiplication facts when dividing.	• They recognise how to use their skills of multiplying and dividing in new problem and solving situations. • Recording division problems using bar models, number lines and arrays to secure understanding.

					Represent division calculations (not the solution) as number lines and bar models to support conceptual understanding before solving. Solve two step problems in context, choosing the appropriate operations.	• Using bus stop method to divide (use place value counters to show how we are sharing and clearly show what each number is representing).
		6		Y5: Divide mentally drawing upon known facts.	Use estimation to check answers and to calculations and determine, in the context of a problem, levels of accuracy.	• Children to draw on known facts to answer. • Use number lines to estimate numbers.
7	19.10.2020	5	Fractions	Y4: Add and subtract fractions with the same denominator. Y4: Recognise and show using diagrams, families of common equivalent fractions. Y4: 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.	Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths. Compare and order fractions whose denominators are all multiples of the same number.	• Fractions and division are connected ideas: eg. 36 ÷ 18 = 36/18 = 2; 18/36 = ½. • Representations that may appear different sometimes have similar underlying ideas. For example ¼, 0.25 and 25% are used in different contexts nut are all connected to the same idea. • Express a relationship between a whole and equal parts of a whole.

		6		Y5: Add and subtract fractions with the same denominator and denominators that are multiples of the same number. Y5: Identify, name and write equivalent fractions of a given, represented visually, including tenths and hundredths. Y5: 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 in the same denomination. 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. Compare and order fractions, including fractions larger than one.	• Use a range of representations, number lines, part-part whole models such as bar models and 'cherry' models to model steps in calculating with fractions, particularly showing equivalence and links between place value and decimal fractions. • Use part-part whole models to support calculating with mixed numbers and fractions with different denominators. • Refer to examples of end of Key Stage SATs paper 1 to discuss strategies and practise linked examples (fractions). • Fractions express a relationship between a whole and equal parts of a whole. Pupils should recognise this and speak in full sentences when answering a question involving fractions. • Equivalent fractions are connected to the idea of ratio: keeping the numerator and denominator of a fraction in the same proportion create an equivalent fraction. • Putting fractions in place on the number line helps understand fractions as numbers in their own right.
Half Term						
8	02.11.2020	5	Fractions	Y4: Recognise and write decimal equivalents of any number of tenths and hundredths. Y4: Recognise and write decimal equivalents to ½, 1/4 and ¾.	Recognise mixed numbers and improper fractions and convert from one form to another. Write mathematical statements >1 as a mixed number eg. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$	• Use a place value chart of whole numbers, tenths and hundredths. Children to describe each row and identify values within a number. • Use physical manipulatives and pictorial representations to give a greater understanding of what factions are. • Relate to every day objects such as cake, pizza, chocolate etc.

					Identify, name and write equivalent fractions of a given fraction, represented visually including tenths and hundredths.	
		6	Percentages	Y5: Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred'. And writes percentages as a fraction with denominator 100 and as a decimal.	Solve problems involving the calculation of percentages, eg 15% of 360 and the use of percentages for comparison.	• Refer to examples of end of Key Stage SATs paper 1 to discuss strategies and practise linked examples (percentages). • Use place value knowledge to find 10% and 1% of any number, • Know that 50% is the same as finding one half, 25% is the same as finding one quarter and 75% is the same as finding three quarters of a quantity (or shape).
9	09.11.2020	5	Measurement (time)	Y4: read, write and convert between analogue and digital 12 and 24 hour clocks. Y4: Solve problems involving converting from hours to minutes, minutes to seconds, year to months, weeks to days.	Complete, read and interpret information in tables, including time tables. Solve problems involving converting between units of time.	• Relate to real life – when do we see a timetable? When would we need to use a timetable? • Draw timetables from specific information given to them. • Give them hypothetical stories to which they need to plan a journey. • Open-ended tasks which require the children to plan their own journey using the timetable.
		6		Y5: Solve problems involving converting between units of time. Y5: Solve problems involving converting between units of time.	Complete, read and interpret information in tables, including timetables. Solve problems involving durations of time and fractions of time eg. 2/3 of a day in hours.	• Relate to real life – when do we see a timetable? When would we need to use a timetable? • Draw timetables from specific information given to them. • Give them hypothetical stories to which they need to plan a journey. • Open-ended tasks which require the children to plan their own journey using the timetable.

10	16.11.2020	5	Geometry		Identify 3-D shapes, including cubes and other cuboids, from 2-D representations. Draw 2-D shapes using given dimensions and angles. Recognise, describe and build simple 3-D shapes, including making nets.	• Children to relate 3D shapes to 2D nets. • Identify 3D shapes, including cubes and cuboids, from 2D representations. • Children to have shapes to see and hold. To create their own nets for 3D shapes.
		6		Y5: Know angles are measured in degrees.	Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.	• A circle's radius is the distance from the centre of the circle to the outer edge. • A circle's diameter is the length of a line through the centre from one edge to another. • A circle's circumference is the distance around the edge. • Have various circles that they need to measure the circumference, radius and diameter of. • Diameter is twice the radius. • May introduce formulae – 2 x π x r
11	23.11.2020	5	Geometry	Y4: Identify acute and obtuse angles and compare and order angles up to two right angles by size.	Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles. Identify angles at a point and one whole turn (360°), at a point on a straight line and a half turn (180°) and other multiples of 90°.	• Know that there are four right angles in a complete turn and two right angles in half a turn. • Pupils will learn about a range of angle facts and use them to describe certain shapes and derive facts about them. • Regular shapes have to have all sides and all angles the same. Although non-square rectangles have four equal angles, the fact that they do not have four equal sides means that they are not regular.

						• A rectangle is defined as a quadrilateral with four right angles. It does not have to be defined as a quadrilateral with four right angles and two pairs of equal sides.
		6		Y5: Know angels are measured in degrees: estimate and compare acute, obtuse and reflex angels. Y5: Identify angles at a point and one whole turn (total 360°). Y5: Identify angles at a point on a straight line and ½ a turn.	Identify angles where they meet at a point, on a straight line or are vertically opposite and find missing angles. Describe positions on the full coordinate grid (all four quadrants). Draw and translate simple shapes in the coordinate plane and reflect them in the axes.	• Link to negative numbers on a number-line. • Angle properties are a mix of necessary conditions and conventions. • It is a necessary condition that angles on a straight line combine to a complete half turn. • That we measure the half turn as 180° is conventional.
12	30.11.2020	5	Place Value/ Measure	Y4: Round decimals in the context of length to the nearest whole number. Y4: Solve length problems involving fractions and decimals to two decimal places.	Round decimals with two decimal places to the nearest whole number and to one decimal place. Estimate capacity using standard units to measure liquid (l/ml) and read scales graded in different steps (eg. 0, 10, 20, 30…….0, 25, 50, 75……0, 20, 40, 60).	• Use a number line to show where a number should be rounded to. • Adjusting the calculation to make estimating easier. • Problem: What is 3.97 rounded to the nearest whole number? (look at the first number after the decimal point – 9. Because it is more than 5 you round the 3 to the left of it up to 4).
		6		Y5: Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 and 100,000.	Round any whole number to a required degree of accuracy.	• Use a number line to show where a number should be rounded to. • Adjusting the calculation to make estimating easier.

				Y5: Multiply and divide numbers mentally drawing upon known facts.	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.	• Problem: What is 3.97 rounded to the nearest whole number? (look at the first number after the decimal point – 9. Because it is more than 5 you round the 3 to the left of it up to 4).
13	07.12.2020	5	Measure (mass and capacity)	Y4: Convert between kilometres, metres, centimetres and millimetres. Y4: Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres. Y2: Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100. Y3: Compare and order numbers from zero up to 1000; using <, > and = signs. Y4: Derive, recall and use multiplication (and division) facts up to 12 x 12.	Convert between different units of metric measure (g/kg; ml/l). Use all four operations to solve problems involving measure (mass and capacity) using decimal notation including scaling.	• Link to place value understanding of place value understanding of scaling up and down by 1000 (x and ÷). • Estimate capacity using standard units to measure liquid (ml/l) and read sclaes graded in different steps (eg. 0, 10, 20, 30…….0, 25, 50, 75……0, 20, 40 60…)
		6		Y5: Convert between different units of metric	Solve problems involving the calculation and	• Link to place value understanding of scaling up and down by 1000 (x and ÷).

				measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre). Y5: Understand and use appropriate equivalences between metric units and common imperial units such as inches, pounds and pints.	conversion unity of measure (g/kg; ml/l) using decimal notation up to three decimal places. Understand and use equivalence between metric units and common imperial units such as pounds and pints. Use knowledge of the order of operation to carry out calculations involving the four operations.	• To read a scale, first work out how much each mark or division on the scale represents. • The unit of measure must be identified before measuring. • Selecting a unit will depend on the size and nature of the item to be measured and the degree of accuracy required.
14	14.12.2020	5	All Four Operations	Y4: 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.	Pupils use and explain the equals sign to indicate equivalence including missing number problems (for example, 13 + 24 = 12 + 25; 33 = 5 x ?).	• Equivalence is hugely important because representations that look different can all be linked to the same underlying idea. • The numbers and measures can be expressed in an infinite number of equivalent ways by different partitioning and factorising. • Different representations of the same quantity highlight different properties.
		6		Y5: Use all four operations to solve problems. Y5: Use rounding to check answers to calculations and determine, in the	Express missing number problems algebraically. Find pairs of numbers that satisfy pairs of numbers involving two unknowns.	• Know that distributivity can be expressed as a(b + c) = ab + ac (eg. 13 x 8 = 8(10 + 3). • Letters or symbols are used to represent unknown numbers in a symbol sentence (ie. An equation) or instruction. • Usually, but not necessarily, in any one symbol sentence (equation) or instruction,

				context of a problem, levels of accuracy.	Solve problems involving addition, subtraction, multiplication and division, deciding which operations and methods to use and why. Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.	different letters or different symbols represent different unknown numbers. • A value is said to solve a symbol sentence (or an equation) if substituting the value into the sentence (equation) satisfies it, ie. Results in a true statement. • Deciding which calculation method to use is supported by being able to take apart and combine numbers in many ways.
Holiday						