Year 6 Maths Medium Term Plan

National Curriculum

Number - Number and Place Value
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
Use negative numbers in context, and calculate intervals across zero
Solve number and practical problems that involve all of the above.

Number – Addition, Subtraction, Multiplication and Division
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 long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
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
Perform mental calculations, including with mixed operations and large numbers
Identify common factors, common multiples and prime numbers
Use their knowledge of the order of operations to carry out calculations involving the four operations
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
Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

Number – Fractions (including decimals and percentages)
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
Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, ¼ x ½ = 1/8]
Divide proper fractions by whole numbers [for example, 1/3 ÷ 2 = 1/6]
Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8]
Identify the value of each digit in numbers given to three decimal places and 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
Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts

Number – 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 [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

Number - Algebra
Use simple formulae
Generate and describe linear number sequences
Express missing number problems algebraically
Find pairs of numbers that satisfy an equation with two unknowns
Enumerate possibilities of combinations of two variables

Measurement
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
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]

Geometry – Properties of Shape
Draw 2-D shapes using given dimensions and angles
Recognise, describe and build simple 3-D shapes, including making nets
Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons
Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
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 positions on the full coordinate grid (all four quadrants)
Draw and translate simple shapes on the coordinate plane, and reflect them in the axes

Statistics
Interpret and construct pie charts and line graphs and use these to solve problems
Calculate and interpret the mean as an average

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Term 1 Problem Solving: Reasoning Logically							
PA Maths	Number and Place Value To understand the place value of digits (up to 7 digits) To partition numbers To read, write and say numbers up to 10,000,000 To read numbers on a number line.	Number and Place Value (KENT TEST DAY) To order and compare numbers up to 10,000,000 To round any whole number to a required degree of accuracy To use negative (and positive) numbers in context To calculate intervals across 0 To solve number and practical problems (including + and -) involving all of the above	Addition To solve any addition calculations with numbers to 2 decimal places. To solve multi step word problems. To use estimation to check answers to calculations.	Subtraction To solve subtraction calculations with numbers to 2 decimal places. To solve multi step word problems. To use estimation to check answers to calculations	Multiplication To know what prime, square and cube numbers are To identify prime factors To multiply multi digit numbers up to 4 digits by a two digit whole number To multiply decimals	Division To divide numbers up to 4 digits by 1 digit then 2 digit whole number using short division To interpret remainders as whole number remainders, fractions or rounding To use the distributive property strategy to divide 'friendly' numbers To use long division	Multiplication and Division To multiply and divide by 10, 100 and 1000 To identify multiples and factors To use number bonds for factor and products to identify missing factors To double and halve numbers (including decimals)
Fact of the Week	3x6=18 6x3=18	4x6=24 6x4=24	6x6=36	7x6=42 6x7=42	8x6=48 6x8=48	9x6=54 6x9=54	12x6=72 6x12=72
Term 2 Problem Solving: Working Systematically							
PA Maths	Measurement – Time To tell the time (recap) To solve time duration problems using the four operations	Fractions Decimals and Percentages To find fractions of shapes and quantities To convert between proper, improper and mixed numbers To use common factors To simplify fractions To find equivalent fractions	Fractions Decimals and Percentages To compare and order fractions To add and subtract fractions with denominators that are multiples of the same number To add and subtract fractions with different denominators	Geometry - Properties of Shape To identify different types of lines To know the properties of 2D shapes, including types of triangles and circles To draw 2D shapes given dimensions and angles To compare and classify geometric shapes	Geometry - Properties of Shape) Measure – Volume To recognise, describe and build simple 3D shapes. To make nets To visualise a 3-D shape from it's net To visualise where patterns drawn on a 3-D shape will occur on its net To understand when to use a formula to calculate volume To calculate, estimate and compare the volume of cubes and cuboids To read scales (MOS)	Statistics To calculate and interpret the mean (mode and range) To interpret line and bar graphs To construct line and bar graphs To solve problems involving line and bar graphs	Measure –length To convert measures using decimal notation (to 3 decimal places) To convert between miles and kilometres To connect conversion of measures to a graphical representation To solve problems involving conversion of units of measure
Fact of the Week	3x7=21 7x3=21	4x7=28 7x4=28	7x7=49	8x7=56 7x8=56	9x7=63 7x9=63	12x7=84 7x12=84	

Term 3
Problem Solving: Visualising

PA Maths	Fractions Decimals and Percentages To multiply simple pairs of proper fractions (writing the answer in its simplest form) To divide proper fractions by whole numbers To calculate decimal fraction equivalents (by dividing using a simple fraction)	Fractions Decimals and Percentages To add and subtract fractions with different denominators and mixed numbers To convert between fractions and decimals.	Fractions Decimals and Percentages To convert between fractions, decimals and percentages To find percentages of amounts	Measurement - Money To solve problems involving money using the four operations Four Operations To solve multi-step, mixed operation word problem. To multiply one digit numbers with up to two decimal places by whole numbers.	Algebra & BIDMAS To understand the order of operations using brackets To use simple formula to generate, express and describe: -Linear number sequences -Mathematical formula -Missing number, lengths, coordinates and angles problems -equivalent expressions (a+b = b + a) To find pairs of numbers that satisfy an equation with two unknowns To find all possibilities of combinations of two variables	Geometry –position and direction To describe positions on all four quadrants To draw and translate simple shapes on the coordinate plane To reflect simple shapes in the axes To draw and label all four quadrants with equal scaling. To use the properties of shapes to predict missing coordinates To express translations algebraically	
Fact of the Week	3x8=24 8x3=24	4x8=32 8x4=32	8x8=64	9x8=72 8x9=72	12x8=96 8x12=96	3x9=27 9x3=27	

Term 4
Problem Solving: Working Backwards

PA Maths	Geometry – Properties of Shape To identify angles and find missing 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 (NC) To illustrate and name parts of a circle, including radius, diameter and circumference To know how to find the diameter of a circle	Geometry – Properties of Shape To understand when to use a formula to calculate area (count squares of rectilinear and then using formula) To calculate the area of triangles To calculate the area of parallelograms To prove that shapes with the same area can have different perimeters.	Statistics To interpret pie charts To construct pie charts (using a computer programme) To solve problems using pie charts To connect angles and pie charts To connect fractions and percentages with pie charts To calculate and interpret the mean as the average (recap)	Measure –Volume/Capacity To convert measures using decimal notation (to 3 decimal places) To solve problems involving conversion of units of measure Measure – Mass To convert measures using decimal notation (to 3 decimal places) To solve problems involving conversion of units of measure	Ratio and Proportion To use ratio to compare two things To find equivalent ratios To compare three quantities using ratios To follow simple recipes involving basic proportions To read a simple scale on a map e.g. 1cm = 100cm , 250:1 means 1cm = 2.5m. To solve problems involving missing values. (using integer multiplication and division facts) To solve problems involving percentages To use percentages for comparison To use the scale factor to solve problems involving shapes To use knowledge of fractions and multiples to	Geometry – Properties of Shape To describe properties of shapes (2D and 3D) To describe and make nets of shapes	

					solve problems involving unequal sharing		
Fact of the Week	4x9=36 9x4=36	12x9=108 9x12=108	11x11=121	12x11=132 11x12=132	2x12=24 12x2=24	3x12=36 12x3=36	
Term 5 Problem Solving: Trial and Improvement							
PA Maths	Number and place value To find the term-to-term rule To read scales	Revision	Revision	KS2 SATs week	Algebra To understand the order of operations using brackets To use simple formula to generate, express and describe: -Linear number sequences -Mathematical formula -Missing number, lengths, coordinates and angles problems -equivalent expressions (a+b = b + a) To find pairs of numbers that satisfy an equation with two unknowns To find all possibilities of combinations of two variables		
Fact of the Week	4x12=48 12x4=48	5x12=60 12x5=60	6x12=72 12x6=72	7x12=84 12x7=84	8x12=96 12x8=96	9x12=108 12x9=108	
Term 6 Problem Solving: Looking for Patterns and Conjecturing							
PA Maths	Four Operations To solve multi-step word problems for addition, subtraction, multiplication and division in context	Geometry-position and direction To use reflection and translation To understand and use coordinates in all 4 quadrants	Geometry-properties of shape To names, describe and classify 2D and 3D shapes	Measurement-money To convert units of measure To solve problems involving measure	Measurement-length To convert units of measure To solve problems involving measure	Measurement-capacity and mass To convert units of measure To solve problems involving measure	Transition activities
Fact of the Week	12x12=144	Recap the facts found tricky	Recap the facts found tricky	Recap the facts found tricky	Recap the facts found tricky	Recap the facts found tricky	Recap the facts found tricky

Year 6 - Mental Maths	
Number and Place Value	To count in multiples of any number up to x12 forwards and backwards from any given number To count in steps of powers of 10 up to 1,000,000 To count in 11s, 15s, 19s, 21s, 25s then back - can you go past zero? To count in steps of 0.1, 0.5, 0.25 to 10 then back To multiply and divide whole numbers by 10, 100, 1000 To multiply and divide decimal numbers by 10, 100 and 1000

	Count forwards and backwards with positive and negative whole numbers including through zero Know the value of every digit in six digit+ numbers To compare two numbers (which is less 4 thousands or 41 hundreds?) To make the biggest/ smallest integer possible with a range of digits (i.e. 8 3 0 7 6 0 2). To know 1000, 10,000, 100,000 more/less than any six digit number To round any whole number to the nearest multiple of 10, 100 or 1000 To put integers in order from smallest to largest crossing zero (-37, 4, 29, -4, -28) To make statements about identification of odd and even numbers To find all the prime factors of any number to 1000 (the prime factors of 60 are 2,2,3 and 5, since 60= 2x30 = 2x2x15 = 2x2x3x5) Use factors for finding products mentally (32x24 = 32 x 3 x 8 = 96 x 8 = 800 – (4 x 8) = 768) Identify numbers with an odd number of factors (squares) Identify two digit numbers with only two factors (primes) Recognise prime numbers
Addition Perform mental calculations, including with mixed operations and large numbers	Identify near doubles: 421 + 387 = 808 (double 400 plus 21 minus 13) Add or subtract the nearest multiple of 10, 100 or 1000 adjust: add 0.9, 1.9, 2.9 or 1.1, 2.1, 3.1 etc by adding 1,2,3 and adjusting by 0.1 Add or subtract four digit multiples of 100 Find what to add to a decimal with units, 10th and 100ths to make the next higher whole number or 10th - what must be added to 7.78 to make 8? Add a pair of decimal fractions each less than 1 and with up to 2 decimal places
Subtraction Perform mental calculations, including with mixed operations and large numbers	To find the difference by counting up through the next multiple (count up from the smaller to larger number mentally: 8000-2785 is 5 +10+ 200+ 5000 = 5215 Subtract 0.9, 1.9, 2.9 or 1.1, 2.1, 3.1 by subtracting 1,2,3 then adjusting by 0.1 Work out mentally one fact 4.97-1.58 and then state three other related facts Subtract four digit+ multiples of 100 (570,000 + 250,000= □) Subtract a pair of decimal fractions each less than 1 and with up to two decimal places Subtract numbers with different numbers of digits (find the difference between 4387 and 782,175)
Multiplication Perform mental calculations, including with mixed operations and large numbers Identify common factors, multiples and prime numbers	Rapid recall of all multiplication tables up to 12 x 12 (and derive corresponding division facts) Know the squares of all numbers from 1x1 to 12x12 Derive quickly squares of multiples of 10 to 100, such as 20^2, 80^2 To double decimal numbers Double all multiples of 10 up to 1000 Double all multiples of 100 up to 10,000 Use related facts to double (double 277 = 400 + 140 + 14 = 554) Double a number ending in 5 and halve the other number (14x5 = 7x10= 70) Halve/double one number in the calculation, find the product then double/halve it To multiply by 15 (multiply by 10, halve the result then add the two parts together: 22x15 = 22x10=220+110=330) To multiply by 25 (multiply by 100 and then divide by 4) To know the 24 times table (six times table, double and double again – or double 12x) To calculate 17 times table (add seven times table and ten times table) To multiply a number by 49 or 51 (multiply it by 50 and add or subtract the number) To multiply a number by 99 or 101 (multiply by 100 and add or subtract the number)
Division Perform mental calculations, including with mixed operations and large numbers Identify common factors, multiples and prime numbers	Rapid recall of all multiplication tables (and related number families) To divide any number by 10, 100, 1000 (knowing that the place value changes) To find one hundredth or one thousandth of an amount by dividing by 100 or 1000 To relate fractions to division (dividing by the denominator) To know doubles of numbers including decimals and corresponding halves To recognise that if 5x60 = 300 then 1/5 of 300=60 and of 1/6 of 300 = 50 To halve a decimal fraction less than 1 with one or two decimal places (half of 0.7) Use knowledge that in exact multiples of (and prove): 100: the last two digits are 00; 10: the ones digit is zero; 5: the ones digit is 0 or 5; 25: the last two digits are 00, 25, 50 or 75; 2: the ones digit is 0,2,4,6,8; 3: the sum of the digits is divisible by 3; 4: the last two digits are divisible by 4; 6: the number is even and divisible by 3; 8: the last 3 digits are divisible by 8; 9: the sum of the digits is divisible by 9
Fractions, Decimals and Percentages Identify the value of each digit in numbers given to three decimal places	Suggest a fraction that is greater than one quarter and less than one third Identify a number that is halfway between for example: 5 ¼ and 5 ½ To understand that finding one tenth is equivalent to dividing by 10 To know how many halves in 1 ½, 3 ½, 9 ½, quarters in 1 ¼ , 2 ¾ , 5 ½ , etc

Multiply and divide numbers by 10, 100 and 1000 (giving answers to three decimal places) Recall and use equivalences between simple fractions, decimals and percentages	Suggest a decimal fraction between 4.17 and 4.18 (etc) To know that 33% and 67 % are roughly one third and two thirds To match decimals, fractions and percentages
Ratio and Proportion	To discuss and complete statements linked to ratio/proportion: -In every week I spend 5 days at school. In every 2 weeks I spend X days at school and in every 3 weeks I spend Y days at school -For every 2 bags of crisps you buy you get 1 sticker. How many stickers do you get for 6bags? -John has 1 stamp for every 2 that Mark has. What other statement s can you make? Solve simple problems involving 'in every' or 'for every': -Chicken must be cooked for 50 mins for every kg. How long does it take to cook a 3kg chicken? -At the gym there are 2 boys for every 3 girls. There are 15 girls at the club. How many boys are there? Use multiplicative reasoning to solve simple ratio and proportion questions: -Kate shares out 12 sweets. She gives Jim 1 sweet for every 3 sweets she takes. How many sweets does Jim get? -Dee mixes 1 tin of red paint with 2 tins of white. She needs 9 tins altogether. How many tins of red paint does she need?
Algebra	To express a relationship in symbols to start to use simple formulae: -use symbols to write a formula for the number of months m in years y -write a formula for the cost of c chews at 4p each -write a formula for the nth term of this sequence 3, 6, 9, 12, 15… -the perimeter of a rectangle is 2 x (l+w) where l is the length and w is the width. What is the perimeter if 1=8cm and w=5cm? -the number of bean sticks needed for a row which is m metres long is 2m+1. How many bean sticks do you need for a row which is 60m long?
Statistics	To count up and down a scale in intervals of any number Test the hypothesis about the frequency of an event by collecting data quickly: reading paper, voting, internet… To know the percentage equivalent to common fractions and vice versa (1/4, 1/2, 1/5, 3/4 etc) To look at a pie chart and answer questions such as: - What fraction (percentage) of the population is 16 or under? 60 or over? -Why do you think there are more people aged 16 or under living here than aged 60 or over? To use mental addition and division skills to find the mean
Measurement To convert a larger metric unit to a smaller unit	To solve problems involving money: -What is the total of £110, £3.43 and £11.07? -Three people won £363 630 on the lottery. If this is shared equally how much would each get? To convert to a currency: there are $1.5 for every £1. How many dollars would I get for £10, £20, £60? To calculate fractions and percentages: There is a 15% discount in a sale (divide by ten, halve and add to result)… To solve problems involving measures: I cut 65m of a 3.5m rope. How much is left? To calculate time durations: lamb must be cooked for 60 minutes for every kg. How long would it need to be cooked for if the lamb was 1kg, 1.5kg, 2kg, 2.5kg, 3kg, 3.5kg To know the relationships fluently: 1 kilometre= 1000 metres, 1 metre= 100cm or 1000millimetres, 1 centimetre= 10 millimetres, 1 kilogram= 1000 grams, 1 litre = 1000 millimetres To extend to: 1 tonne = 1000 kilograms, 1 litre = 100 centimetres, 1 centimetre = 10 millimetres For conversion make use of rhymes: -A metre is just 3 foot three. It's longer than a yard, you see. -2 and a quarter pounds of jam. It's round about 1kg -A litre of water's a pint and 3/4 To know the equivalent of one thousandth of 1km, 1kg, 1 litre in m, g and ml respectively To suggest items that could be measured using: kilometres, metres, centimetres, kilograms, grams, litres, millilitres To understand: Greenwich mean time, British Summer time, international date line To know that: 1 millennium = 1000 years, 1 century = 100 years and 1 decade = 10 years To recite the rhyme 30 days hath September
Geometry – Properties of shape	Picturing shapes, moving, reflecting, rotating and growing Imagine a square: place an equilateral triangle on each side. How many sides does the new shape have? Imagine a triangle place a square on each side. Imagine two dots 10m apart. Imagine walking so that you are the same distance from each dot. Can you describe the path? What if we had two crossing lines? What if we had a vertical line and a dot? What would the path look like? Imagine a line of length 3m on the floor. I wish to walk around so I am always 1m away - describe the path. Imagine a cube. Place a blob of paint on each corner. How many edges have one blob? Put two blobs on the cube, on adjacent vertices. How many edges have one blob? How many have two? Put a blob on opposite corners etc. Imagine a tetrahedron. Put a blob on one vertex. How many edges have two blobs? Same idea, try different shapes, more blobs.
Geometry – Position and Direction	Practise pointing and chanting negative and positive numbers on a scale, using a 'counting stick' (forwards and backwards) Hold stick both horizontally and vertically to link to both the x and the y axes To count along (x-axis) and up (y-axis) a counting stick as a scale in intervals of 1 To count around a clock face in quarter turn, half turn, three quarter turn, full turn and in 90', 180', 270' and 360' To have rapid recall of positions of the compass– north, south, east, west and N, NE, E, SE, S, SW, W, NW Refer to the 'symmetrical' quality of the numbers with 0 as the middle value To sketch the position of a simple shape after it has been translated, ie. 3 units to the right and 2 units down Respond to questions such as: -the points (-1,1), (2,5) and (6,2) are three of the four vertices of a square. What are the coordinates of the fourth vertex?

	-draw a polygon with each vertex lying in the first quadrant. Plot its reflection in the y axis and name the coordinates of the reflected shape. -identify parallel and perpendicular lines in quadrilaterals -to know that two lines that cross each other are intersecting lines and the point at which they cross is an intersection