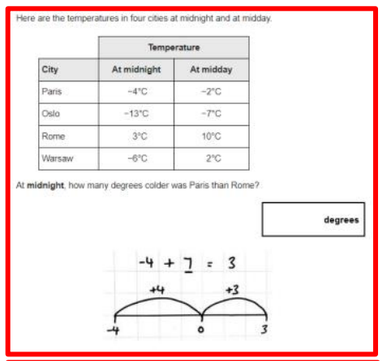
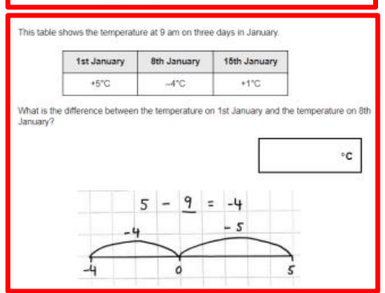
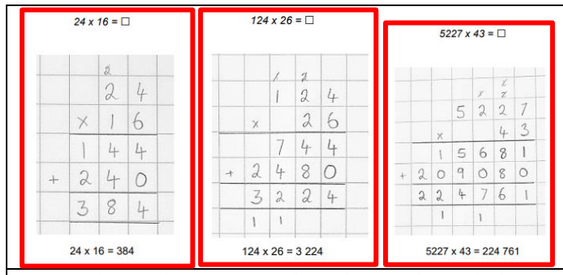
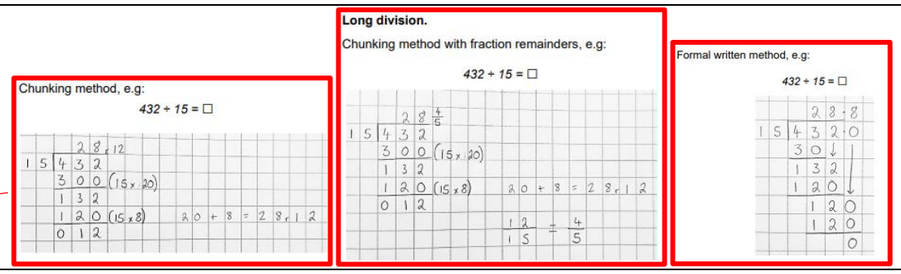
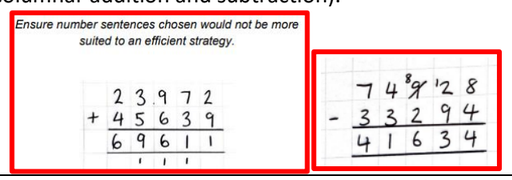
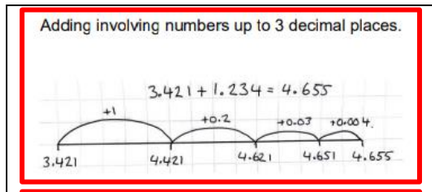
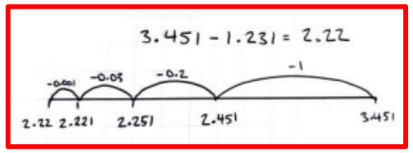
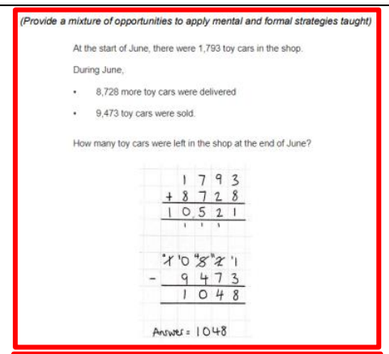
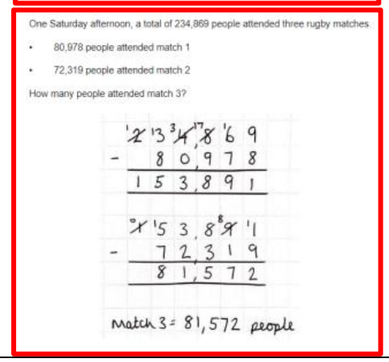
Year 6 Maths Milestones

<table>
<tr><th>Milestone 1</th><th>Milestone 2</th><th>Milestone 3</th><th>End of year</th></tr>
<tr><td colspan="4">Number: Number and place value</td></tr>
<tr><td>6.1 Solve number and practical problems involving:
• Read, write, order and compare numbers to at least 10,000,000 and determine the value of each digit.
Partition numbers flexibly
Count forwards and backwards from a range of given numbers in multiples of 10, 100, 1000
Estimate the position of numbers on a number line
Position and compare numbers on a number line
Recall key facts about 1000 and 10,000 (1/2, 2/4, 1/4, 3/4 and 1/10 of 1000 compared to 10,000)</td><td colspan="2"></td><td>6.15 Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit.</td></tr>
<tr><td>6.1 Solve number and practical problems involving:
• Round any whole number to a required degree of accuracy
Round to nearest 10, 100, 1000, 10000, 100000</td><td>6.5 Round any whole number to a required degree of accuracy
Round to nearest 10, 100, 1000, 10000, 100000 within the context of mass</td><td colspan="2"></td></tr>
<tr><td></td><td>6.8 Use negative numbers in context and calculate intervals across zero.
Problem solve in relation to temperature and managing money



</td><td></td><td>6.15 Use negative numbers in context and calculate intervals across zero.
Solve problems involving negative numbers</td></tr>
<tr><td colspan="4">Number: Addition, subtraction, multiplication and division</td></tr>
<tr><td>6.2 Multiply multi-digit numbers up to 4-digits by a 2-digit whole number using a formal written method of long multiplication (see NC appendix for methods).
(multiply by 1 digit number first, then 2 digit)
Solve problems in the context of multiplication</td><td colspan="2"></td><td>6.17 Y5: Multiply up to 4-digit numbers by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers.
Use estimation and adjusting numbers to make sensible estimations.</td></tr>
</table>

		
6.2 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 remainder, fraction or by rounding as appropriate for the context. (divide by 1 digit number first, then 2 digit) Solve problems in the context of division			6.17 Divide up to 4-digit numbers by a 2-digit whole number using a formal written method of long division and interpret remainders as whole number remainders, fractions or by rounding as appropriate for the context. Use estimation and adjusting numbers to make sensible estimations. Interpret remainders appropriately for the context
Divide numbers up to 4 digits by a two-digit number using the formal written methods of short division where appropriate, interpreting remainders according to the context			
6.1Y5: Add and subtract numbers mentally with increasingly larger numbers. 6.1/6.2 Perform mental calculations, including with mixed operations and large numbers. Decide which methods to use and why	6.7 Perform mental calculations, including with mixed operations and large numbers.		6.15 Perform mental calculations, including with mixed operations and large numbers. Use mental strategies including rounding and adjusting, application of number bonds, partitioning, knowledge of factors/multiples/prime numbers
6.1 Y5: Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction). 			
6.2 Identify common factors, common multiples, and prime numbers.	6.5 Identify common factors, common multiples, and prime numbers. Carry out investigations using all of these concepts	6.10 Identify common factors, common multiples, and prime numbers. Identify factors, multiples, square, cube and prime numbers 6.12 Identify common factors, common multiples, and prime numbers. 6.12 Y5: Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.	6.15 Identify common factors, common multiples and prime numbers.
6.1 Use knowledge of the order of operations to carry out calculations involving the four operations.		6.10 Use knowledge of the order of operations to carry out calculations involving the four operations.	6.15 Use knowledge of the order of operations to carry out calculation involving the four operations.
6.1 Solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why.	6.5 Solve problems involving addition, subtraction, multiplication, and division, deciding which operations and methods to use and why. Use mathematical reasoning to solve problems including the four operations	6.10 Solve problems involving addition, subtraction, multiplication, and division, deciding which operations and methods to use and why.	

 	6.7 Solve problems involving addition, subtraction, multiplication, and division, deciding which operations and methods to use and why.	 	
6.1/6.2 Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.	6.7 Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.	6.10 Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.	6.15/6.17 Use estimation to check answers to calculations and determine, in the context of the problem, levels of accuracy.
6.2 Y5: Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. (including missing number problems)			
6.2 Y5: Multiply and divide numbers mentally, drawing upon known facts Calculate the area of rectangles drawing upon known multiplication facts Use related facts when dividing Understand division as grouping to make efficient use of multiplication facts when dividing			
	6.5 Y5: Solve problems involving ~~addition, subtraction,~~ multiplication, ~~and division~~, including using their knowledge of factors~~ and multiples, squares and cubes.~~ 6.6: Y5: Solve problems ~~involving addition, subtraction, multiplication, and division~~, including using their knowledge of factors and multiples~~, squares and cubes~~	6.12 Y5: Solve problems involving all four operations including using their knowledge of factors and multiples, squares and cubes. Identify factors, multiples, square, cube and prime numbers Solve problems relating to all of the above	
		6.12 Y5: Recognise and use square numbers and cube numbers and the notation for squared (2) and cubed (3).	
		6.12 Solve problems involving ~~addition, subtraction~~, multiplication and division. Solve problems involving multiplication and division using a range of strategies Find different ways to solve a problem	

			6.15 Y5: Solve addition and subtraction multistep problems in context, deciding which operation and method to use and why. Solve addition and subtraction problems using efficient methods
Number: Fractions (including decimals and percentages) **Key Number Facts:** 12.5% = 0.125 = $\frac{1}{8}$ 25% = 0.25 = $\frac{2}{8}$ = $\frac{1}{4}$ 37.5% = 0.375 = $\frac{3}{8}$ 50% = 0.5 = $\frac{4}{8}$ = $\frac{1}{2}$ 62.5% = 0.625 = $\frac{5}{8}$ 75% = 0.75 = $\frac{6}{8}$ = $\frac{3}{4}$ 82.5% = 0.825 = $\frac{7}{8}$ 100% = 1.0 = $\frac{8}{8}$ 112.5% = 1.125 = $\frac{9}{8}$ 125% = 1.25 = $\frac{10}{8}$ 33.$\dot{3}$% = 0.333… = $\frac{1}{3}$ 66.$\dot{6}$% = 0.666… = $\frac{2}{3}$ 100 % = 1.0 = $\frac{3}{3}$ 133.$\dot{3}$% = 1.333… = $\frac{4}{3}$ 266.$\dot{6}$% = 2.666… = $\frac{8}{3}$ 0.$\dot{3}$ = 0.3333333…… a recurring decimal continually repeats and does not terminate			
6.3 Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.			6.16 Use common factors to simplify fractions; Use common multiples to express fraction in the same denomination.
6.3 Compare and order fractions, including fractions > 1 Represent fractions using bar models/number lines Compare and order fractions using common factors and multiples to find equivalent fractions, including fractions >1			6.16 Compare and order fractions >1.
6.3 Y5: add and subtract fractions with the same denominator and multiples of the same number. 6.3 Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.	6.7 Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions. Include: use known facts to solve problems when appropriate e.g. 1 ½ - ¾ =		6.14 Add and subtract fractions with different denominators and mixed numbers using the concept of equivalent fractions. Find equivalent fractions Add and subtract fractions with different denominators 6.16 Add and subtract fractions with different denominators and mixed numbers using the concept of equivalent fractions.
		6.11 Multiply simple pairs of proper fractions, writing the answer in its simplest form e.g. 1/4 x 1/2 = 1/8	6.14/6.16 Multiply simple pairs of proper fractions, writing the answer in its simplest form e.g. 1/4 x 1/2 = 1/8
		6.11 Divide proper fractions by whole numbers e.g. 1/3 ÷ 2 = 1/6	6.14/6.16 Divide proper fractions by whole numbers e.g. 1/3 ÷ 2 = 1/6
	6.6 Associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3/8)		6.16 Associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3/8)
	6.5/6.6 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.		
		6.10 Multiply one-digit numbers with up to two decimal places by whole numbers	
		6.10 Use written division methods in cases where the answer has up to two decimal places. Use short division where there is a decimal answer	

	6.7 Solve problems which require answers to be rounded to specified degrees of accuracy.		
6.3 Recall and use equivalences between simple fractions~~, decimals,~~ and percentages, including in different contexts. Recall and use equivalences between simple fractions and percentages	6.6 Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. Compare fractions, decimals and percentages		6.16 Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.
6.4 Y5: 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 hundred, and as a decimal fraction. Understand that per cent relate to "number of parts per hundred" Calculate percentages of amounts Solve problems involving the calculation of percentages			
6.4 Y5: Solve problems which require knowing percentage and decimal equivalents of 1/2,1/4, 1/5, 2/5 and 4/5 and those with a denominator of a multiple of 10 or 25.			
Ratio and Proportion			
Key Number Facts: Derive new % facts from known facts: For example: 1% doubled will give 2% of a quantity; 10% halved will give 5% of a quantity; 100% is the whole amount, so twice as much is the same as 200% Fluency with multiplication and division facts up to 12 x 12 and derive others beyond known facts. Simplify ratios such as 2:6 to their simplest form (1:3 in this case) using common factors (in this case 2)			
	6.6 Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.		6.16 Solve problems involving the relative sizes of two quantities where the missing values can be found using integer multiplication and division facts. Solve recipe problems using scaling
			6.16 Solve problems involving the calculation of percentages, (e.g. of measures) such as 15% of 360 and the use of percentages for comparison.
			6.16 Solve problems involving similar shapes where the scale factor is known or can be found. Draw 2-D shapes according to ratio
	6.6 Solve problems involving unequal sharing and grouping using knowledge of factors and multiples.		6.16 Solve problems involving unequal sharing or grouping using knowledge of factors and multiples.
Algebra			
		6.9 Use simple formulae. Use simple formulae e.g. 2x + 5 = y. If x=3, what is the value of y? Use simple formula to complete number sequences	6.15 Use simple formulae.
	6.7 Generate and describe linear number sequences		
	6.5 Express missing number problems algebraically. (using simple equations to understand that numbers can be replaced with letters)	6.9/6.10 Express missing number problems algebraically.	6.15/6.17 Express missing number problems algebraically.
	6.5 Find pairs of numbers that satisfy equations involving two unknowns.	6.10 Find pairs of numbers that satisfy number sentences involving two unknowns.	6.15 Find pairs of numbers that satisfy number sentences involving two unknowns.
	6.5 Enumerate all possibilities of combinations of two variables.	6.9 Enumerate all possibilities of combinations of two variables.	
Measurement			
Key Number Facts:			

	1 km ≈ $\frac{5}{8}$ mile 1 mile ≈ $\frac{8}{5}$ km (or 1.6 km) Area of a triangle = $\frac{1}{2}$ x base x height Area of a rectangle = length x width Area of a parallelogram = length x perpendicular height Volume of a cuboid = length x width x height	≈ means 'approximately equal to'	
	6.5 Solve problems involving the calculation and conversion units of measure, using decimal notation up to three decimal places where appropriate. Solve problems involving mass Solve problems involving capacity 6.7 Solve problems involving the calculation and conversion units of measure, using decimal notation up to three decimal places where appropriate. Addition/subtraction problems	6.9 Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate. Read scales 6.10 Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate. Estimate their answers using knowledge of numbers and rounding Solve rich tasks that require conversion of measurements as well as using a range of operations.	6.18 Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate.
	6.5 Use, read, write and convert between standard units, converting measurements of mass and capacity from a smaller unit of measure to a larger unit and vice versa. Use, read, write and convert between grams and kilograms Use, read, write and convert between litres and millilitres		6.18 Use, read, write, and convert between standard units, converting measurements of length, mass, volume and time from smaller units of measure to larger units of measure and vice versa using decimal notation up to three decimal places.
	6.5 Y5: Understand and use equivalences between metric units and common imperial units such as inches, pounds and pints.	6.9 Y5: Understand and use equivalences between metric units and common imperial units such as pounds and pints.	6.16 Y5: Understand and use equivalences between metric units and common imperial units such as inches, pounds and pints.
		6.9 Convert between miles and kilometres.	6.18 Convert between miles and kilometres.
6.1 Y5: Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres.			
6.1/6.2 Y5: Calculate and compare the area of rectangles (including squares) and including the standard units, square centimetres (cm2) and square meters (m2) and estimate the area of irregular shapes.			
6.1 Y5: Use the properties of rectangles to deduce related facts and find missing lengths.			
6.1 Recognise that shapes with the same area can have different perimeters and vice versa.			6.18 Recognise that shapes with the same areas can have different perimeters and vice versa.
		6.9 Recognise when it is possible to use formulae for area and volume of shapes.	6.18 Recognise when it is possible to use formulae for the area and volume of shapes.
			6.18 Calculate the area of parallelograms and triangles.
6.4 Y5: Solve problems involving converting between units of time Use a number line to calculate duration of time Solve problems involving time			
		6.9 Calculate, estimate and compare volume of cubes and cuboids using standard units including centimetre cubed (cm3) and cubic metres (m3) and extending to other units such as mm3 and km3.	6.18 Calculate, estimate, and compare volume of cubes and cuboids using standard units including centimetre cubed (cm3) and cubic metres (m3) and extending to other units such as mm3 and km3.

Geometry – Properties of shape			
Key Number Facts: Diameter = 2 x radius Radius = ½ x diameter			
6.4 Draw 2-D shapes using given dimensions and angles.			6.16 Draw 2-D shapes using given dimensions and angles.
6.4 Recognise, describe and build simple 3-D shapes, including making nets.			6.16 Recognise, describe and build simple 3-D shapes, including making nets.
	6.6 Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons. Find missing angles using known facts	6.11 Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons. Find unknown angles using knowledge of properties of shapes	6.16 Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons. Find unknown angles using facts about shapes as well as using a protractor
6.4 Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.			
6.4 Y5: Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles.			
6.4 Recognise angles where they meet at a point, are on a straight line or are vertically opposite and find missing angles.			6.16 Recognise angles at a point, on a straight line, vertically opposite and find missing angles.
	6.6 Y5: Draw given angles, and measure them in degrees (º) Draw angles using a protractor		
Geometry – Position and direction			
6.4 Describe positions on the full coordinate grid (all four quadrants).		6.11 Describe positions on the full coordinate grid (all four quadrants).	
6.4 Draw and translate simple shapes in the coordinate plane ~~and reflect them in the axes.~~		6.11 Draw and translate simple shapes on a coordinate plane and reflect them in the axes.	
Statistics			
	6.6 Interpret and construct pie charts and line graphs and use these to solve problems. Interpret pie charts and use these to solve problems 6.8 Interpret and construct pie charts and line graphs and use these to solve problems. Interpret line graphs and use these to solve problems, including negative numbers	6.10 Interpret and construct pie charts and line graphs and use these to solve problems.	6.16 Interpret and construct pie charts and line graphs and use these to solve problems.
	6.8 Calculate and interpret the mean as an average.	6.10 Calculate and interpret the mean as an average.	6.16 Calculate and interpret the mean as average.
6.4 Y5: Complete, read and interpret information in tables, including timetables.		6.10 Y5: Complete, read and interpret information in tables, including timetables	