Maths Framework - Milestone 2

Intent		
• An understanding of the important concepts and an ability to make connections within mathematics. • A broad range of skills in using and applying mathematics. • Fluent knowledge and recall of number facts and the number system. • The ability to show initiative in solving problems in a wide range of contexts, including the new or unusual. • The ability to think independently and to persevere when faced with challenges, showing a confidence of success. • The ability to embrace the value of learning from mistakes and false starts. • The ability to reason, generalise and make sense of solutions. • Fluency in performing written and mental calculations and mathematical techniques. • A wide range of mathematical vocabulary. • A commitment to and passion for the subject.		
Threshold Concepts	**Skills**	
Know and use numbers This concept involves understanding the number system and how they are used in a wide variety of mathematical ways.	Counting	• Count in multiples of 2 to 9, 25, 50, 100 and 1000. • Find 1000 more or less than a given number. • Count backwards through zero to include negative numbers.
	Representing	• Identify, represent and estimate numbers using different representations. • Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.
	Comparing	• Order and compare numbers beyond 1000.
	Place value	• Recognise the place value of each digit in a four-digit number. (thousands, hundreds, tens, and ones) • Round any number to the nearest 10, 100 or 1000.
	Solving problems	• Solve number and practical problems with increasingly large positive numbers.

Add and subtract This concept involves understanding both the concepts and processes of addition and subtraction.	Complexity	• Solve two-step addition and subtraction problems in contexts, deciding which operations and methods to use and why.
	Methods	• Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate. • Add and subtract numbers mentally, including: • A three-digit number and ones. • A three-digit number and tens. • A three-digit number and hundreds.
	Checking	• Estimate and use inverse operations to check answers to a calculation.
	Using number facts	• Solve problems, including missing number problems, using number facts, place value and more complex addition and subtraction.
Multiply and divide This concept involves understanding both the concepts and processes of multiplication and division.	Complexity	• Solve problems involving multiplying and dividing, 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).
	Methods	• Multiply two-digit and three-digit numbers by a one-digit number using formal written layout. • Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers. • Recognise and use factor pairs and commutativity in mental calculations.
	Checking	• Recognise and use the inverse relationship between multiplication and division and use this to check calculations and solve missing number problems.
	Using multiplication and division facts	• Recall multiplication and division facts for multiplication tables up to 12 × 12.

Fractions This concept involves understanding the concept of part and whole and ways of calculating using it.	Recognising fractions	• Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators. • Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators. • Round decimals with one decimal place to the nearest whole number. • Compare numbers with the same number of decimal places up to two decimal places. • Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10. • Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten. • Compare and order unit fractions and fractions with the same denominators.
	Equivalence	• Recognise and show, using diagrams, families of common equivalent fractions. • Recognise and write decimal equivalents of any number of tenths or hundredths. • Recognise and write decimal equivalents to 1/4, 1/2, 3/4.
	Solving problems	• Add and subtract fractions with the same denominator within one whole. • Solve problems involving increasingly harder fractions. • Calculate quantities and fractions to divide quantities (including non-unit fractions where the answer is a whole number). • Add and subtract fractions with the same denominator. • Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths. • Solve simple measure and money problems involving fractions and decimals to two decimal places.

Understand the properties of shapes This concept involves recognising the names and properties of geometric shapes and angles.		• Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them. • Recognise angles as a property of shape or a description of a turn. • Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle. • Identify horizontal and vertical lines and pairs of perpendicular and parallel lines. • Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes. • Identify acute and obtuse angles and compare and order angles up to two right angles by size. • Identify lines of symmetry in 2-D shapes presented in different orientations. • Complete a simple symmetric figure with respect to a specific line of symmetry.
Describe position, direction and movement This concept involves recognising various types of mathematical movements.		• Recognise angles as a property of shape and as an amount of rotation. • Identify right angles, recognise that 2 right angles make a half turn and 4 make a whole turn. • Identify angles that are greater than a right angle. • Describe positions on a 2-D grid as coordinates in the first quadrant. • Describe movements between positions as translations of a given unit to the left/right and up/down. • Plot specified points and draw sides to complete a given polygon.
Use measures This concept involves becoming familiar with a range of measures, devices used for measuring and calculations.		• Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml). • Measure the perimeter of simple 2-D shapes. • Add and subtract amounts of money to give change. (£ and p) • Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks.

		• Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use appropriate vocabulary. • Know the number of seconds in a minute and the number of days in each month, year and leap year. • Compare durations of events. • Convert between different units of measure. (for example, kilometre to metre; hour to minute) • Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres. • Find the area of rectilinear shapes by counting squares. • Estimate, compare and calculate different measures, including money in pounds and pence. • Read, write and convert time between analogue and digital 12- and 24-hour clocks. • Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.
Use statistics This concept involves interpreting, manipulating and presenting data in various ways.		• Interpret and present data using bar charts, pictograms and tables. • Solve one-step and two-step questions (for example, 'How many more?' and 'How many fewer?') using information presented in scaled bar charts, pictograms and tables. • Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. • Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.
Use algebra This concept involves		• Solve addition and subtraction, multiplication and division problems that involve missing numbers.

recognising mathematical properties and relationships using symbolic representations.		