Area of Curriculum	Mathematical Stories:	
	Disciplinary	**Substantive**
Number and Place Value	• Read and write numbers up to one million. • Be able to identify the value of any digit up to one million, including being able to label the columns of such a number. • Order and compare numbers up to one million. • Count forwards or backwards by powers of 10 up to 100000 (10, 100, 1000, 10000, 100000). • Count forwards and backwards in positive integers, including through 0. • Interpret negative numbers in context, such as temperature or debt. • Be able to find the difference between a negative integer and a positive integer. • Round any number up to one million to the nearest 10, 100, 1000, 10000, 100000. • Read and write Roman Numerals up to M, using a systematic method. • Solve written, numerical, and practical problems involving the information and knowledge included in this unit.	**Knowledge** • Know that each column increases by a power of 10. • Know that number have the following columns: Millions, Hundred Thousands, Ten Thousands, Thousands, Hundreds, Tens, Ones. • Know that negative numbers are less than 0. • Know that rounding can help us to estimate quantity. • Dates and clocks are common uses of Roman Numerals. **Vocabulary** • Powers of 10 • Columns • Greater than • Less than • Zero • Negative (minus) numbers. • Positive numbers • Integer • Roman Numerals •

Area of Curriculum	Mathematical Stories:	
	Disciplinary	**Substantive**

Addition and Subtraction	• Add integers involving more than four digits, using column addition.
	• Identify missing numbers in given column addition of the type mentioned above.
	• Subtract integers involving more than four digits, using column subtraction.
	• Identify missing numbers in given column subtraction of the type mentioned above.
	• Add and subtract numbers mentally using the follow methods:
	  ○ Partitioning the smaller number,
	  ○ Compensating,
	  ○ Bridging.
	NB: For assistance in these methods, please refer to the video: https://www.youtube.com/watch?v=-18qLbg1Gmk
	• Use rounding (in unit 1) to approximate answers and check.
	• Be able to solve addition and subtraction problems in a range of ways, including two-step word problems.
		Knowledge
		• Know that there are different words for addition and subtraction.
		• Know that addition is commutative, but subtraction is not.
		• Know that addition is associative.
		Vocabulary
		• Integer,
		• Difference,
		• Subtract,
		• Minus,
		• Total,
		• Sum,
		• In addition,

Area of Curriculum	Mathematical Stories:	
	Disciplinary	**Substantive**
Multiplication and Division	• Identify multiples of integers and be able to identify if a large integer is a multiple of 2, 3, 5, or 10 using the knowledge that even numbers are multiples of 2; numbers ending in a 5 or 0 are multiples of 5; and multiples ending in a 0 are multiples of 10. • Find the factors of an integer, including factor pairs. • Be able to find the common factors between two integers, and identify the highest common factor. • Be able to find out whether an integer up to 100 is prime, composite or neither. • Multiply numbers up to 5 digits by a single-digit, using a formal written method. • Multiply numbers up to 4 digits by a double-digit number, using a formal written method. • Multiply and divide numbers within the 12x12 grid mentally. • Divide two-digit number using times tables facts, including finding the remainder. • Divide numbers up to 4 digits by a single-digit using bus-stop division, answering in an integer with a remainder (decimal answers to be taught in a later unit). • Multiple and divide integers by 10, 100, or 1000 without the use of decimals (decimal answers and questions to be taught in a later unit). • Be able to square and cube numbers. • Balance sides of the equals sign (showing knowledge of its meaning), using the four operations, for example: 9 x ____ = 33 + 12. • Solve one and multi-step problems involving the four operations.	**Knowledge** • Know that factors often come in pairs, but that this isn't necessarily true. • Know that prime numbers contain exactly 2 factors: 1 and itself. • Know that composite numbers contain more than two factors. • Know that 1 is not prime or composite as it has only a single factor. • Recall prime numbers up to 19. • Know that multiplication is commutative, but division is not. • Know that the integer answer to a division is called the quotient, and represents the whole number of groups made. • Know that the remaining numbers after a division is called the remainder and refers to what is left that could not be equally divided. • Know the notation for squared and cubed. • Know that multiplication and division are inverses of each other. **Vocabulary** • Multiple, • Factor, • Factor pair, • Integer, • Prime, • Composite, • Quotient, • Remainder, • Divisor, • Squared, • Cubed, • Inverse

Area of Curriculum	Mathematical Stories:	
	Disciplinary	**Substantive**
Fractions, decimals, and Percentages	• Compare and order fractions with the same denominator. • Identify and write equivalence fractions of a given fraction, by noting that the numerator and denominator are multiples of the given fraction. • Be able to find a fraction of an amount. • Be able to count forwards and backwards in simple fractions. • Compare equivalent fractions when represented visually, especially in a fraction wall. • Recognise mixed fractions and improper fractions are fractions that are greater than one whole. • Be able to confidently covert between mixed fractions and improper fractions. • Add and subtract fractions of the same denominator, and fractions of different denominators where one denominator is a multiple of the other. • Multiply both fractions and mixed numbers by an integer. • Read and write any fraction involving tenths and hundredths into their decimal equivalence. • Recognise thousandths and relate these to decimals. • Round any number to the nearest integer. • Round any number to the nearest one or two decimal places. • Read, write, order and compare numbers with up to 3 decimal places. • Solve problems involving number up to 3 decimal places. • Write percentages as a fraction with denominator 100, and as a decimal fraction. • Mentally add and subtract tenths, and one-digit whole numbers and tenths. • Be able to apply column methods to add and subtract numbers involving decimals, including recognising the need for a 'place holder'. • Be able to multiply numbers involving up to decimal places by a single digit number. • Be able to use bus-stop division to divide an integer, finding a decimal answer.	**Knowledge** • Know that the top of a fraction is referred to as a numerator, and tells us how many parts of the whole the fraction refers to. • Know that the bottom of a fraction is referred to as a denominator, and tells us how many parts the whole the fraction has been divided into. • Know that different fractions can represent the same amount (equivalent fractions). • Know that mixed numbers and improper fractions are two ways of representing the same amount. • Know the following fraction to decimal to percentage equivalencies: $0.1 = \frac{1}{10} = 10\%$ $0.01 = \frac{1}{100} = 1\%$ $0.5 = \frac{5}{10} = \frac{1}{2} = 50\%$ $0.25 = \frac{25}{100} = \frac{1}{4} = 25\%$ $0.75 = \frac{75}{100} = \frac{3}{4} = 75\%$ $0.2 = \frac{2}{10} = \frac{1}{5} = 20\%$ • Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per 100'. **Vocabulary** • Numerator, • Denominator, • Whole, • Mixed numbers, • Improper fractions, • Decimal places, • Percentage • Equivalency

Area of Curriculum	Mathematical Stories:	
	Disciplinary	**Substantive**
Measure	• Be able to covert between different units of metric measurement including: grams and kilograms; millilitres and litres; millimetre to centimetre, to metre, to kilometre. • Be able to approximately convert between some metric and imperial measures: centimetres and inches (taking 2.5 cm = 1 inch); pints and litres (taking 1 litre = 2 pints); pounds and kilograms (taking 1 pound = 0.5 kilogram). These conversions do not need to be memorised. • Read scales with different increments, including 5s, 20s, 25s, and 50s. • Measure the perimeter of any shape to an accuracy of +- 0.2mm. • Calculate the perimeter of any shape when given the lengths of the edges. • Calculate the perimeter of any composite, rectilinear shape by also working out the lengths of some unknown edges. • Calculate the area of any rectangle when given the length and width, or given squares to count. • Use knowledge of perimeter and area to answer a range of problems, including comparing or working out missing edges. • Estimate the area of an irregular shapes. • Estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water]. • Solve problems involving converting between units of time. • Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.	**Knowledge** • Know that there are 1000 grams in a kilogram. • Know that there are 1000 ml in a litre. • Know that there are 10 mm in a cm. • Know that there are 100 cm in a m. • Know that there are 1000m in a km. • Know that the perimeter of a shape is the sum of the length of the outside edges. • Know that the area of the shape is the space inside. • Know that the area of a rectangle can be calculated by length times width. • Know that volume relates to the space inside a 3-D shape. **Vocabulary** • grams/ kilograms • millilitres/ litres • millimetre/ centimetre/ metre/ kilometre • conversion • ruler • perimeter • area • scale • weight/ mass • capacity • volume

Area of Curriculum	Mathematical Stories:	
	Disciplinary	**Substantive**

Geometry	• Identify the following 3-D shapes, including from 2-D drawings: cube, cuboid, cylinder, sphere, tetrahedron and square-based pyramid.
	• Identify, including from 2-D drawings any prisms.
	• Be able to estimate whether an angle is acute, obtuse, or reflex.
	• Be able to use a protractor to measure an angle to within a single degree of accuracy.
	• Be able to use a protractor and a ruler to draw an angle within a single degree of accuracy.
	• Be able to identify:
	  ○ angles at a point and 1 whole turn (total 360°),
	  ○ angles at a point on a straight line and half a turn (total 180°),
	  ○ other multiples of 90°.
	• 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.
	• Use angle sum facts to identify missing angles.
	• Be able to plot and read cartesian co-ordinates in both the first quadrant and in all four quadrants.
	• Plot specified points and join these to complete a polygon.
	• Describe movements (up, down, left, right) as translations, and be able to complete these for points and shapes.
		Knowledge
		• Know that a prism contains two 2-D polygons, connected in a tube-like fashion.
		• Know that angles are measured in degrees.
		• Know that an acute angle in less than 90^0.
		• Know that a right angle is exactly 90^0.
		• Know that an obtuse angle is between 90^0 and 180^0.
		• Know that a straight line is measured at 180^0.
		• Know that a reflex angle is between 180^0 and 360^0.
		• Know that a full turn is measured at 360^0.
		• Know that cartesian co-ordinates contain an x-value and y-value, and that the x-value (across) is read first.
		• Know that translations do not change the shape, size, or orientation of a shape.
		
		Vocabulary
		• angle,
		• degrees,
		• acute,
		• right-angle,
		• obtuse,
		• reflex,
		• protractor,
		• quadrant,
		• co-ordinates,
		• x-axis,
		• y-axis,
		• translation,

Area of Curriculum	Mathematical Stories:	
	Disciplinary	**Substantive**
Statistics	• Read, interpret, and answer questions from a bar chart or pictogram. • Read and interpret line graphs, linking their knowledge to coordinates. • Solve comparison, sum and difference problems using information presented in a line graph. • Complete, read and interpret information in tables, including timetables. • Be able to present information in a bar chart or line graph, using an appropriate scale.	**Knowledge** **Vocabulary** • Bar chart, • Line graph, • Timetables