Maths

Intent

The main rationale of mathematics mastery is 'everyone can', regardless of their starting point, given quality teaching and opportunities in learning. We feel the key to success is focusing on developing a secure, deep and long term understanding whilst continually repeating key basic skills that are utilised throughout. To provide all children with the best chance of mastering mathematics, learning is developed through a range of fluency practise, reasoning, problem solving, investigations and working on mathematical concepts in many variations. All mathematical concepts will be explored with a Concrete, Pictorial, Abstract approach, regardless of age or stage of mathematical development. If a pupil fails to grasp a concept or procedure, this is identified quickly and early intervention ensures the pupil is ready to move forward with the whole class in the next lesson.

We teach a mastery programme where knowledge, concepts, vocabulary and procedures are encountered in a carefully planned progression. We aim to develop a deep understanding of mathematical concepts and a secure understanding of a range of skills and strategies. Children are supported to apply their knowledge and understanding of skills and concepts in a range of situations, including across the curriculum.

The pedagogical approach at our academy is aimed at fostering an enjoyment of mathematics and developing ambitious learners who are resilient and independent in their approach to mathematics. We also believe that maths should be viewed as a collaborative subject with a shared pupil responsibility for mastering.

We will:

- Teach using a mastery approach to enable all children to make progress and achieve well
- Develop mathematical understanding and learning through collaborative learning
- Hold high expectations for all learners and encourage ambitious and aspirational thinking
- Equip all learners with mathematical skills they can use in their future

EYFS- Early Learning Goals- Mathematics. Taught through Mastering Number.

- *Have a deep understanding of number to 10, including the composition of each number.*
- *Subitise (recognise quantities without counting) up to 5.*
- *Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.*
- *Verbally count beyond 20, recognising the pattern of the counting system.*
- *Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.*
- *Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.*

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS Mastering Number	• identify when a set can be subitised and when counting is needed • • subitise different arrangements, both unstructured and structured, including using the Hungarian number frame • • make different arrangements of numbers within 5 and talk about what they can see, to develop their conceptual subitising skills • • spot smaller numbers 'hiding' inside larger numbers • connect quantities and numbers to finger patterns and explore different ways of representing numbers on their fingers • • hear and join in with the counting sequence, and connect this to the 'staircase' pattern of the counting numbers, seeing that each number is made of one more than the previous number • • develop counting skills and knowledge, including: that the last number in the count tells us 'how many' (cardinality); to be accurate in counting, each thing must be counted once and once only and in any order; the need for 1:1 correspondence; understanding that anything can be counted, including actions and sounds • • compare sets of objects by matching • • begin to develop the language of 'whole' when talking about objects which have		• continue to develop their subitising skills for numbers within and beyond 5, and increasingly connect quantities to numerals • • begin to identify missing parts for numbers within 5 • • explore the structure of the numbers 6 and 7 as '5 and a bit' and connect this to finger patterns and the Hungarian number frame • • focus on equal and unequal groups when comparing numbers • understand that two equal groups can be called a 'double' and connect this to finger patterns • • sort odd and even numbers according to their 'shape' • • continue to develop their understanding of the counting sequence and link cardinality and ordinality through the 'staircase' pattern • • order numbers and play track games • • join in with verbal counts beyond 20, hearing the repeated pattern within the		• continue to develop their counting skills, counting larger sets as well as counting actions and sounds • • explore a range of representations of numbers, including the 10-frame, and see how doubles can be arranged in a 10-frame • • compare quantities and numbers, including sets of objects which have different attributes • • continue to develop a sense of magnitude, e.g. knowing that 8 is quite a lot more than 2, but 4 is only a little bit more than 2 • begin to generalise about 'one more than' and 'one less than' numbers within 10 • • continue to identify when sets can be subitised and when counting is necessary • • develop conceptual subitising skills including when using a rekenrek	

EYFS Non Mastering Number	Positional language • To use everyday language to talk about position and direction. • Understand position through words alone – for example, "The bag is under the table," • Describe a familiar route. • Draw information from a simple map. Explore pattern Continue, copy and create repeating patterns.	2d shapes Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can. Time • Begin to develop an understanding of time and sequencing. • To talk about patterns of events. • To talk about the sequence of events in stories. • Refer to days of the week, and the day before or after as yesterday and tomorrow.	Match, sort and compare mass and capacity Compare length, weight and capacity. Length and Height Compare length, weight and capacity.	3d shapes Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can.	Spatial reasoning Select, rotate and manipulate shapes in order to develop spatial reasoning skills. Match, Rotate, Manipulate Patterns and Relationships • Identify 2d shapes within pictures. • Make shape pictures. • Look for patterns and relationships and spot connections.	Visualise and Build, Deepening understanding • Create and explore own pattern rules. • Replicate and build scenes and constructions. • Visualise form different positions. • Give instructions to build. • Explore mapping. Spatial reasoning Select, rotate and manipulate shapes in order to develop spatial reasoning skills.

Year 1	<u>Place value within 10</u> • Count to ten, forwards and backwards, beginning with 0 or 1, or from any given number. • Count, read and write numbers to 10 in numerals and words. • Given a number, identify one more or one less. • Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least.	<u>Addition and Subtraction within 10</u> • Represent and use number bonds and related subtraction facts (within 10). • Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs. • Add and subtract one digit numbers to 10, including zero. • Solve one step problems that involve addition and subtraction, using concrete objects and pictorial representations and missing number problems. <u>Shape</u> • Recognise and name common 2D shapes, including for example rectangles (including	<u>Place value within 20</u> • Count to twenty, forwards and backwards, beginning with 0 or 1, from any given number. • Count, read and write numbers to 20 in numerals and words. • Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least. • Read and write numbers from 1 to 20 in numerals and words. <u>Addition and Subtraction within 20</u> • Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs.	<u>Place value within 50</u> • Count to fifty, forwards and backwards, beginning with 0 or 1, or from any given number. • Count, read and write numbers to 50 in numerals and words. • Given a number, identify one more or one less. • Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least. • Count in multiples of two's, five's and tens. <u>Measurement- Length and Height</u> • Measure and begin to record lengths and heights. • Compare, describe and solve practical	<u>Multiplication and Division</u> • Count in multiples of twos, fives and tens. • Solve one step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher. <u>Fractions</u> • Recognise, find and name a half as one of two equal parts of an object, shape or quantity. • Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity. • Compare, describe and solve practical problems for: lengths and heights [… double/half].	<u>Place value within 100</u> • Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number. • Count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens. • Given a number, identify one more and one less. Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least. <u>Money</u> • Recognise and know the value of different denominations of coins and notes. <u>Time</u> • Sequence events in chronological

		squares), circles and triangles. • Recognise and name common 3D shapes, including for example, cuboids (including cubes), pyramids and spheres.	• Add and subtract one digit and two digit numbers to 20, including zero. • Solve one step problems that involve addition and subtraction, using concrete objects and pictorial representations and missing number problems e.g. 7=[]-9. • Represent and use number bonds and related subtraction facts within 20.	problems for: lengths and heights (for example long/short, longer/shorter, tall/short, double/half). <u>Measurement- Weight and Volume</u> • Measure and begin to record mass/ weight, capacity and volume. • Compare, describe and solve practical problems for mass/weight (e.g. heavy/light, heavier than/lighter than), capacity and volume (e.g. full/empty, more than/less than, half, half full, quarter).	• Compare, describe and solve practical problems for: mass/weight [e.g. heavy/light, heavier than, lighter than]. • Compare, describe and solve practical problems for: capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter]. <u>Position and Direction</u> • Describe position, direction and movement, including whole, half, quarter and three quarter turns.	order using language [before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]. • Recognise and use language relating to dates, including days of the week, weeks, months and years. • Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. • Compare, describe and solve practical problems for: time [e.g. quicker, slower, earlier, later]. • Measure and begin to record the following: time (hours, minutes, seconds).

Year 2	Place value • Read and write numbers to at least 100 in numerals and words. • Recognise the place value of each digit in a two-digit number (tens, ones). • Identify, represent and estimate numbers to 100 using different representations including the number line. • Compare and order numbers from 0 up to 100; use <, > and = signs. • Use place value and number facts to solve problems. • Count in steps of 2, 3 and 5 from 0 and in tens from any number, forward and backward. Addition and Subtraction • Recall and use addition and	Addition and Subtraction (continued) Shape (3 weeks) • Identify and describe the properties of 2D shapes, including the number of sides and line symmetry in a vertical line. • Identify and describe the properties of 3D shapes, including the number of edges, vertices and faces. • Identify 2D shapes on the surface of 3D shapes, [e.g. a circle on a cylinder and a triangle on a pyramid]. • Compare and sort common 2D and 3D shapes and everyday objects. Position and Direction • Use mathematical vocabulary to describe position, direction and	Money • Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value. • Find different combinations of coins that equal the same amounts of money. • Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change. Multiplication and Division • Recall and use multiplication and division facts for the 2, 5- and 10-times tables, including recognising odd and even numbers. • Calculate mathematical statements for multiplication and division	Multiplication and Division (Continued) Statistics • Interpret and construct simple pictograms, tally charts, block diagrams and simple tables. • Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity. Ask and answer questions about totalling and comparing categorical data. Time • Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times. • Know the number of minutes in an hour and number of hours in a day.	Fractions • Recognise, find, name and write fractions 1/3, ¼, 2/4 and ¾ of a length, shape, set of objects or quantity. • Write simple fractions for example, ½ of 6 = 3 and recognise the equivalence of 2/4 and ½.	Measurement- Length and Height • Choose and use appropriate standard units to estimate and measure length, height in any direction (m, cm) …using rulers. • Compare and order lengths and record the results using >, < and =. Measurement- Mass and Capacity / temperature • Choose and use appropriate standard units to estimate and measure to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels: a) length/height in any direction (m/cm). • Choose and use appropriate standard units to estimate and measure to the nearest appropriate unit,

	subtraction facts to 20 fluently. • Derive and use related facts up to 100. • Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones. • Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and tens. • Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: two 2-digit numbers. • Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: adding three one-digit numbers.	movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise). • Order and arrange combinations of mathematical objects in patterns and sequences.	within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) sign. • Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in contexts. • Show that the multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot.	• Compare and sequence intervals of time.		using rulers, scales, thermometers and measuring vessels: b) mass (kg/g). • Choose and use appropriate standard units to estimate and measure to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels: c) temperature (°C). • Choose and use appropriate standard units to estimate and measure to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels: d) Capacity (litres/ml). • Compare and order lengths, and record the results using >, < and =. • Compare and order mass, and

	• Show that the addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot. • Solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities and measures; applying their increasing knowledge of mental and written methods. • Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.					record the results using >, < and =. • Compare and order volume/capacity, and record the results using >, < and =.

Year 3	<u>Place value</u> • Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number. • Recognise the place value of each digit in a three-digit number (hundreds, tens, ones). • Compare and order numbers up to 1000. • Identify, represent and estimate numbers using different representations. • Read and write numbers up to 1000 in numerals and in words. • Solve number problems and practical problems involving these ideas. <u>Addition and Subtraction</u> • Add and subtract numbers mentally, including:	<u>Addition and Subtraction</u> Continued <u>Multiplication and Division</u> • Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables. • Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods. • Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence	<u>Multiplication and Division</u> (Continued) <u>Measurements- Length and Perimeter</u> Measure the perimeter of simple 2-D shapes.	<u>Fractions</u> • 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. • 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. • Recognise and show, using diagrams, equivalent fractions with small denominators. • Add and subtract fractions with the same denominator	<u>Fractions</u> (Continued) <u>Money</u> • Add and subtract amounts of money to give change, using both £ and p in practical contexts.	<u>Shape</u> • 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. <u>Statistics</u> • Interpret and present data using bar charts,

	• a three-digit number and ones. • a three-digit number and tens. • a three-digit number and hundreds. • add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction. • Estimate the answer to a calculation and use inverse operations to check answers. • Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.	problems in which n objects are connected to m objects.		within one whole. • Compare and order unit fractions, and fractions with the same denominators. • Solve problems that involve all of the above. <u>Measurement- Mass and Capacity</u> • Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).		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 and pictograms and tables. <u>Time</u> • 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 vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight.

						• Know the number of seconds in a minute and the number of days in each month, year and leap year. • Compare durations of events [for example to calculate the time taken by particular events or tasks]. •
Year 4	<u>Place value</u> • Count in multiples of 6, 7, 9, 25 and 1,000. • Find 1,000 more or less than a given number. • Count backwards through 0 to include negative numbers. • Recognise the place value of each digit in a four-digit number (1,000s, 100s, 10s, and 1s). • Order and compare numbers beyond 1,000.	<u>Multiplication and Division</u> • Recall multiplication and division facts for multiplication tables up to 12 × 12. • Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers. • Recognise and use factor pairs and commutativity in	<u>Multiplication and Division</u> (Continued) <u>Measurement- Length and Perimeter/Area</u> • 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. <u>Fractions</u>	<u>Fractions (Continued)</u> <u>Decimals</u> • Round decimals with 1 decimal place to the nearest whole number. • Compare numbers with the same number of decimal places up to 2 decimal places. • Solve simple measure and money problems involving fractions and decimals to 2 decimal places.	<u>Decimals (Continued)</u> <u>Money</u> • Estimate, compare and calculate different measures, including money in pounds and pence. <u>Time</u> • Read, write and convert time between analogue and digital 12- and 24-hour clocks. • Solve problems involving converting from	<u>Shape</u> • 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 2 right angles by size. • Identify lines of symmetry in 2-D shapes presented in different orientations.

	• Identify, represent and estimate numbers using different representations. • Round any number to the nearest 10, 100 or 1,000. • Solve number and practical problems that involve all of the above and with increasingly large positive numbers. • Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of 0 and place value. <u>Addition and Subtraction</u> • Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate.	mental calculations. • Multiply two-digit and three-digit numbers by a one-digit number using formal written layout. • Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects. <u>Area</u> • Find the area of rectilinear shapes by counting squares.	• Recognise and show, using diagrams, families of common equivalent fractions. • Count up and down in hundredths; recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10. • 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. • Add and subtract fractions with the same denominator. • Recognise and write decimal equivalents of any number of tenths or hundreds.		hours to minutes, minutes to seconds, years to months, weeks to days.	• Complete a simple symmetric figure with respect to a specific line of symmetry. <u>Statistics</u> • 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. <u>Position and Direction</u> • Describe positions on a 2-D grid as coordinates in the first quadrant. • Describe movements between positions as translations of a

	• Estimate and use inverse operations to check answers to a calculation. • Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.		• Recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$. • 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.			given unit to the left/right and up/down. • Plot specified points and draw sides to complete a given polygon.

Year 5	<u>Place value</u> • Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit. • Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000. • Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through 0. • Round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000. • Solve number problems and practical problems that involve all of the above. • Read Roman numerals to 1,000 (M) and	<u>Multiplication and Division</u> Continued <u>Fractions,</u> • Compare and order fractions whose denominators are all multiples of the same number • Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths • Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$] • Add and subtract fractions with the same denominator,	<u>Multiplication and Division</u> (Continued) <u>Fractions</u> (continued)	<u>Decimals and Percentages</u> • Read and write decimal numbers as fractions [for example, 0.71 = $\frac{71}{100}$]. • Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents. • Round decimals with 2 decimal places to the nearest whole number and to 1 decimal place. • Read, write, order and compare numbers with up to 3 decimal places. • Solve problems involving number up to 3 decimal places. • Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per 100', and write percentages as a fraction with	<u>Shape</u> • Identify 3-D shapes, including cubes and other cuboids, from 2-D representation. • Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles. • Draw given angles, and measure them in degrees (°). • 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	<u>Decimals</u> Continued <u>Negative numbers</u> • Understand negative numbers. • Count through zero in 1s. • Count through zero in multiples. • Compare and order negative numbers. • Find the difference. <u>Position and Direction</u> • Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed. <u>Measurement= Converting units and Volume</u> • Convert between different units of metric measure [for example,

	recognise years written in Roman numerals. <u>Addition and Subtraction</u> • Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction). • Add and subtract numbers mentally with increasingly large numbers. • Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy. • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. <u>Multiplication and Division</u>	and denominators that are multiples of the same number. • Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams		denominator 100, and as a decimal fraction. Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25. <u>Perimeter and Area</u> • Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres. • Calculate and compare the area of rectangles (including squares), including using standard units, square centimetres (cm^2) and square metres (m^2), and estimate the area of irregular shapes. <u>Statistics</u> • Solve comparison, sum	about equal sides and angles. <u>Decimals</u> (Continued)	kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre] • Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints. • 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,

	• Identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 numbers • Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers • Establish whether a number up to 100 is prime and recall prime numbers up to 19. • Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers. • Multiply and divide numbers mentally, drawing upon known facts. • Divide numbers up to 4 digits by a one-digit number using the formal written method			and difference problems using information presented in a line graph. • Complete, read and interpret information in tables, including timetables.		money] using decimal notation, including scaling.

	of short division and interpret remainders appropriately for the context. • Multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000. • Recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}). • Solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes. • Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign.					

	• Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.					
Year 6	<u>Place value</u> • 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 0. • Solve number and practical problems that involve all of the above. <u>Addition and Subtraction, Multiplication and Division</u>	<u>Fractions</u> • 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	<u>Ratio</u> • Solve problems involving the relative sizes of 2 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	<u>Fractions, decimals and percentages</u> • Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. <u>Measurements- Perimeter, Area and Volume</u> • Solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 decimal places where appropriate • Recognise that shapes with the same areas can have different	<u>Shape</u> • 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	<u>Consolidation, investigations, problem solving and themed projects</u>

	• 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	example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]. • Divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$]. • Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$]. <u>Measurements- Converting units,</u> • 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 3 decimal places.	unequal sharing and grouping using knowledge of fractions and multiples. <u>Algebra</u> • Use simple formulae. • Generate and describe linear number sequences. • Express missing number problems algebraically. • Find pairs of numbers that satisfy an equation with 2 unknowns. • Enumerate possibilities of combinations of 2 variables. <u>Decimals</u> • Identify the value of each digit in numbers given to 3 decimal places and multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3 decimal places.	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 (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3]. <u>Position and Direction</u> • Describe positions on the full coordinate grid (all 4 quadrants). • Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.	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.	

	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 4 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.	• Convert between miles and kilometres.	• Multiply one-digit numbers with up to 2 decimal places by whole numbers. • Use written division methods in cases where the answer has up to 2 decimal places. • Solve problems which require answers to be rounded to specified degrees of accuracy.	<u>Statistics</u> • Interpret and construct pie charts and line graphs and use these to solve problems. • Calculate and interpret the mean as an average.		