Castleward Spencer Academy – Mathematics Progression Map

Aims

The national curriculum for mathematics aims to ensure that all pupils:

- become *fluent* in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately
- *reason mathematically*, by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can *solve problems* by applying their mathematics to a variety of routine and non- routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Statutory Content (Early Years Framework/National Curriculum)

Early Years Foundation Stage	Key Stage 1	Key Stage 2
Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is	The principal focus of mathematics teaching in KS1 is to ensure that all pupils: - develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including practical resources. - Develop their ability to recognise, describe, draw, compare and sort different shapes and use the related	Lower Key Stage 2 The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils: - become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform

important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

Early Learning Goal

<u>Number</u>

Children at the expected level of development will:

- 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.

<u>Numerical Patterns</u>

Children at the expected level of development will:

- 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.

vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity, time and money.

- Know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.
- Should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

calculations accurately with increasingly large whole numbers.

- develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.
- should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.
- should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

<u>Upper Key Stage 2</u>

The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils:

		• extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.
		• should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.
		• should be fluent in written methods for all four operations, including long multiplication and division, and in working with

| | | | fractions, decimals and percentages. |
| | | | • should read, spell and pronounce mathematical vocabulary correctly. |

Early Years Foundation Stage and Key Stage One Mathematicians

Nursery Mathematician	Reception Mathematician	Year 1 Mathematician	Year 2 Mathematician
• Develop fast recognition of up to 3 objects, without having to count them individually • Recite numbers past 5 in order • Say one number for each item in order • Know that the last number reached when counting a small set of objects tells you how many there are in total • Show 'finger numbers' up to 5 • Link numerals and amounts: for example, showing the right number of objects to match the numeral up to 5 • Experiment with their own symbols and marks as well as numerals • Solve real world mathematical problems with numbers up to 5 • Compare quantities using language: 'more than', 'fewer than' • Tal about and explore 2D and 3D shapes (for example, circle,	• Count objects, actions and sound s • Subitise (look at a group of objects and realise how many there are without counting) • Link number symbol (numeral) to its cardinal number value • Count beyond ten • Compare numbers • Understand the 'one more than/one less than' relationship between consecutive numbers • Explore the composition of numbers to 10 • Automatically recall number bonds for numbers 0 – 5 and some to 10 • Select, rotate and manipulate shapes to develop spatial reasoning skills • Compose and decompose shapes so that children recognise a shape can have other shapes within it • Continue, copy and create repeating patterns	**Number – number and place value** • 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 • read and write numbers from 1 to 20 in numerals and words. **Number – addition and subtraction** • read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs	**Number – number and place value** • count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward • recognise the place value of each digit in a two-digit number (tens, ones) • identify, represent and estimate numbers using different representations, including the number line • compare and order numbers from 0 up to 100; use <, > and = signs • read and write numbers to at least 100 in numerals and in words • use place value and number facts to solve problems. **Number – addition and subtraction** • solve problems with addition and subtraction:

rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners', 'straight' • Understand position through words alone – for example, "The bag is under the table" • Describe a familiar route • Discuss routes and locations, using words like 'in front of' and 'behind' • Make comparisons between objects relating to size, length, weight and capacity • Select shapes appropriately: flat surfaces for building, a triangular prism for a roof, etc • Combine shapes to make new ones – an arch, a bigger triangle • Talk about and identify the patterns around them • Extend and create ABAB patterns – stick, leaf, stick. leaf • Notice and correct an error in a repeating pattern • Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then'	• Compare length, weight and capacity	• represent and use number bonds and related subtraction facts within 20 • 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 such as 7 = ☐ – 9. **Number – multiplication and division** • 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. **Number – fractions** • 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. **Measurement** • compare, describe and solve practical problems for:	-using concrete objects and pictorial representations, including those involving numbers, quantities and measures - applying their increasing knowledge of mental and written methods • recall and use addition and subtraction facts to 20 fluently, and 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 - a two-digit number and tens - two two-digit numbers - adding three one-digit numbers • show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot • recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. Number – multiplication and division • recall and use multiplication and division facts for the 2, 5 and 10
Enabling Environments (Across Nursery and Reception)			

• Count while engaging in everyday tasks and moving around • Regularly sing songs with counting objects for support • Provide buckets and bags for children to create collections of objects which they can count • Design outdoors where children can learn through a variety of spatial experiences • Provide a range of insert and jigsaw puzzles of increasing complexity • Provide a numeral rich environment • Provide numerals that can pick up and use within all aspects of their play • Explore different arrangements of the same number • Provide spaces for children to display their ongoing mathematical thinking • Estimation station (record guesses, order guess, give benchmarks) • Involve children in voting		- lengths and heights [for example, long/short, longer/shorter, tall/short, double/half] - mass/weight [for example, heavy/light, heavier than, lighter than] - capacity and volume [for example, full/empty, more than, less than, half, half full, quarter] - time [for example, quicker, slower, earlier, later] • measure and begin to record the following: -lengths and heights - mass/weight - capacity and volume - time (hours, minutes, seconds) • recognise and know the value of different denominations of coins and notes • sequence events in chronological order using language (for example, 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, years • tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.	multiplication tables, including recognising odd and even numbers • calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs • show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot • solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts. **Number – fractions** • recognise, find, name and write fractions 1/3, 1/4, 2/4 and 3/4 of a length, shape, set of objects or quantity • write simple fractions for example, 1/2 of 6 = 3 and recognise the equivalence of 2/4 and ½. **Measurement** • choose and use appropriate standard units to estimate and measure length/height in any

• Play subitising games which involve quickly revealing and hiding number objects • Provide numeral cards for children to order on a washing line • Play games focusing on the properties of shapes • Provide opportunities for printing patterns • Provide objects in a range of contexts varying in length, capacity or weight • Model using measuring tools (tape measures, scales, etc)		**Geometry – properties of shapes** • recognise and name common 2D and 3D shapes **Geometry – position and direction** • describe position, direction and movement, including whole, half, quarter and three quarter turns	direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels • compare and order lengths, mass, volume/capacity and record the results using >, < and = • 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 • compare and sequence intervals of 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 the number of hours in a day. **Geometry – properties of shapes** • identify and describe the properties of 2-D shapes, including

			the number of sides and line symmetry in a vertical line • identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces • identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid] • compare and sort common 2-D and 3-D shapes and everyday objects.
			Geometry – position and direction • order and arrange combinations of mathematical objects in patterns and sequences • use mathematical vocabulary to describe position, direction and 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 anticlockwise).
			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. |

<u>Key Stage 2 Mathematicians</u>

Year 3 Mathematician	Year 4 Mathematician	Year 5 Mathematician	Year 6 Mathematician
Number – number & place value • 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.	**Number – number & place value** • count in multiples of 6, 7, 9, 25 and 1000 • find 1000 more or less than a given number • count backwards through zero to include negative numbers • recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) • order and compare numbers beyond 1000 • identify, represent and estimate numbers using different representations • round any number to the nearest 10, 100 or 1000 • solve number and practical problems that involve all of the	**Number – number and place value** • 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 zero • round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 • solve number problems and practical problems that involve all of the above	**Number – number & 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 & division** • multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication

Number – addition & subtraction
- add and subtract numbers mentally, including:
- 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.

Number – multiplication & division
- 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

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 zero and place value.

Number – addition & subtraction
- add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate
- 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.

Number – multiplication & division
- 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 three numbers

- read Roman numerals to 1000 (M) and recognise years written in Roman numerals.

Number – addition & subtraction
- 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.

Number – multiplication & division
- identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers
- know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers

- 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

multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.

Number – fractions
- 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 within one whole [for example, 5/7 + 1/7 = 6/7]
- compare and order unit fractions, and fractions with the same denominators
- solve problems that involve all of the above.

- recognise and use factor pairs and commutativity in 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 one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.

Number – fractions (including decimals)
- 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 one hundred and dividing tenths by ten.
- 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

- 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 of short division and interpret remainders appropriately for the context
- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- 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 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 & 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, 1/4 × 1/2 = 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]

Measurement
- 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, using both £ and p in practical contexts
- 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].

Geometry – properties of shapes
- draw 2-D shapes and make 3-D shapes using modelling materials;

- add and subtract fractions with the same denominator
- recognise and write decimal equivalents of any number of tenths or hundredths
- recognise and write decimal equivalents to
- solve simple measure and money problems involving fractions and decimals to two decimal places. 1/4 , 1/2 , 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
- 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

Measurement
- 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

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- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

Number – fractions (including decimals & percentages)
- 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, 2/5 + 4/5 = 6/5 = 1 1/5]
- add and subtract fractions with the same denominator and denominators that are multiples of the same number
- multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
- read and write decimal numbers as fractions [for example, 0.71 = 71/100]

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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.

Ratio & 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

- 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.

Statistics
- 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 and pictograms and tables.

- 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

Geometry – properties of shapes
- 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.

Geometry – position & direction
- describe positions on a 2-D grid as coordinates in the first quadrant

- recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
- round decimals with two decimal places to the nearest whole number and to one decimal place
- read, write, order and compare numbers with up to three decimal places ▢ solve problems involving number up to three decimal places
- 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 100, and as a decimal
- solve problems which require knowing percentage and decimal equivalents of 1/2, 1/4, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25.

Measurement
- convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)
- understand and use approximate equivalences between metric units

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.

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

- 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.

Statistics
- 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.

and common imperial units such as inches, pounds and pints
- measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres
- calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes
- estimate volume [for example, using 1 cm3 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.

Geometry – properties of shapes
- identify 3-D shapes, including cubes and other cuboids, from 2-D representations
- know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
- draw given angles, and measure them in degrees (o)

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 shapes
- 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

identify:
-angles at a point and one whole turn (total 360o)
- angles at a point on a straight line and 2 1 a turn (total 180o)
- other multiples of 90o

- 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.

Geometry – position & direction
- 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

Statistics
- solve comparison, sum and difference problems using information presented in a line graph
- complete, read and interpret information tables, including timetables

- 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 & 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

White Rose Maths Schemes of Learning Overview (Reception – Year 6)

Reception

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14
Autumn	Getting to Know You			Just Like Me!			It's Me 1 2 3!			Light and Dark			Consolidation	
Spring	Alive in 5!			Growing 6, 7, 8			Building 9 and 10			Consolidation				
Summer	To 20 and Beyond			First Then Now			Find My Pattern			On The Move				

Year 1

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number Place value (within 10)				Number Addition and subtraction (within 10)						Geometry Shape	Consolidation
Spring	Number Place value (within 20)		Number Addition and subtraction (within 20)			Number Place value (within 50)		Measurement Length and height		Measurement Mass and volume		
Summer	Number Multiplication and division			Number Fractions		Geometry Position and direction	Number Place value (within 100)		Measurement Money	Measurement Time		Consolidation

Year 2

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number Place value				Number Addition and subtraction					Geometry Shape		
Spring	Measurement Money		Number Multiplication and division				Measurement Length and height		Measurement Mass, capacity and temperature			
Summer	Statistics		Number Fractions			Geometry Position and direction		Problem solving		Measurement Time		

Year 3

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number Place value			Number Addition and subtraction					Number Multiplication and division A			
Spring	Number Multiplication and division B			Measurement Length and perimeter			Number Fractions A			Measurement Mass and capacity		
Summer	Number Fractions B		Measurement Money		Measurement Time			Geometry Shape		Statistics		Consolidation

Year 4

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number **Place value**				Number **Addition and subtraction**			Measurement **Area**	Number **Multiplication and division A**			Consolidation
Spring	Number **Multiplication and division B**			Measurement **Length and perimeter**		Number **Fractions**			Number **Decimals A**			
Summer	Number **Decimals B**		Measurement **Money**		Measurement **Time**		Consolidation	Geometry **Shape**		Statistics	Geometry **Position and direction**	

Year 5

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number **Place value**			Number **Addition and subtraction**		Number **Multiplication and division A**			Number **Fractions A**			
Spring	Number **Multiplication and division B**			Number **Fractions B**		Number **Decimals and percentages**			Measurement **Perimeter and area**		Statistics	
Summer	Geometry **Shape**			Geometry **Position and direction**		Number **Decimals**			Number **Negative numbers**	Measurement **Converting units**		Measurement **Volume**

Year 6

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number **Place value**		Number **Addition, subtraction, multiplication and division**					Number **Fractions A**		Number **Fractions B**		Measurement **Converting units**
Spring	**Ratio**		**Algebra**		Number **Decimals**		Number **Fractions, decimals and percentages**	Measurement **Area, perimeter and volume**		**Statistics**		
Summer	Geometry **Shape**		Geometry **Position and direction**	Themed projects, consolidation and problem solving								

Coverage for each term

Reception Mathematician

Number	Shape
Autumn • Match and sort • Compare amounts • Representing 1, 2 & 3 • Comparing 1, 2 & 3 • Composition of 1, 2 & 3 • Representing numbers to 5 • One more or less	**Autumn** • Compare size, mass & capacity • Exploring patterns • Circles and triangles • Positional language • Shapes with 4 sides • Time
Spring • Introducing zero • Comparing numbers to 5 • Composition of numbers to 5 • 6,7 & 8 • Combining 2 amounts • Making pairs • Counting to 9 & 10 • Comparing numbers to 10 • Number bonds to 10	**Spring** • Compare mass • Compare capacity • Length & Height • Time • 3D shapes • Spatial awareness • Patterns
Summer • Building numbers beyond 10 • Counting patterns beyond 10 • Adding more	**Summer** • Spatial reasoning • Match, rotate, manipulate • Compose and decompose

• Taking away • Doubling • Sharing and grouping • Even and odd • Deepening understanding • Patterns and relationships	• Visualise and build • Mapping

Year 1 – Year 6 Mathematicians

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Place Value: *Counting* Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number Count numbers to 100 in numerals; count in multiples of twos, fives, tens *Autumn* *Spring* *Summer*	**Place Value:** *Counting* Count in steps of 2,3 and 5 from 0, and in tens from any number, forward and backward *Autumn*	**Place Value:** *Counting* Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number *Autumn*	**Place Value:** *Counting* Count in multiples of 6,7,9,25 and 1000 Count backwards through zero to include negative numbers *Autumn*	**Place Value:** *Counting* Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000 Count forwards and backwards with positive and negative whole numbers, including through zero *Autumn*	

Place Value: Represent	Place Value: Represent	Place Value: Represent	Place Value: Represent	Place Value: Represent	Place Value: Represent
Identify and represent numbers using objects and pictorial representations

Read and write numbers to 100 in numerals

Read and write numbers from 1 to 20 in numerals and words | Read and write numbers to at least 100 in numerals and in words

Identify, represent and estimate numbers using different representations, including the number line | Identify, represent and estimate numbers using different representations

Read and write numbers up to 1000 in numerals and in words | 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 | Read, write (order & compare) numbers to at least 1,000,000 and determine the value of each digit

Read Roman numerals to 1000 (M) and recognise years written in Roman numerals. | Read, write (order and compare) numbers up to 1,000,000 and determine the value of each digit |
| *Autumn* *Spring* *Summer* | *Autumn* | *Autumn* | *Autumn* | *Autumn* | *Autumn* |
| Place Value: PV & Compare | Place Value: PV & Compare | Place Value: PV & Compare | Place Value: PV & Compare | Place Value: PV & Compare | Place Value: PV & Compare |
| Given a number, identify one more and one less | Recognise the place value of each digit in two-digit number (tens and ones)

Compare and order numbers from 0 up to 100; use <, > and = signs | Recognise the place value of each digit in a three digit number (H, T, O)

Compare and order numbers up to 1000 | Find 1000 more or less than a given number

Recognise the place value of each digit in a four-digit number (Th, H, T, O)

Order and compare numbers beyond 1000 | (read and write) Order and compare numbers to at least 1,000,000 and determine the value of each digit | (read and write) Order and compare numbers to at least 1,000,000 and determine the value of each digit |

Autumn *Spring* *Summer*	*Autumn*	*Autumn*	*Autumn*	*Autumn*	*Autumn*
Place Value: Problems & Rounding	**Place Value: Problems & Rounding** Use place value and number facts to solve problems	**Place Value: Problems & Rounding** Solve number problems and practical problems involving these ideas	**Place Value: Problems & Rounding** Round any number to the nearest 10, 100 or 1000 Solve number and practical problems that involve all the above and with increasingly large positive numbers	**Place Value: Problems & Rounding** Interpret negative numbers in context Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 or 100,000 Solve number problems and practical problems that involve all of the above	**Place Value: Problems & Rounding** 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
	Autumn	*Autumn*	*Autumn*	*Autumn*	*Autumn*
Addition & Subtraction: Recall, Representation, Use Read, write and interpret mathematical statements involving +, - and = Represent and use number bonds and related subtraction facts within 20	**Addition & Subtraction: Recall, Representation, Use** Recall and use addition and subtraction facts to 20 fluently and derive and use related facts up to 100 Show that addition of two numbers can be done in any order (commutative)	**Addition & Subtraction: Recall, Representation, Use** Estimate the answer to a calculation and use inverse operations to check answers	**Addition & Subtraction: Recall, Representation, Use** Estimate and use inverse operations to check answers to a calculation	**Addition & Subtraction: Recall, Representation, Use** Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	**Addition & Subtraction: Recall, Representation, Use**

	and subtraction of one number from another can't Recognise and use the inverse relationship between + and – and use this to check calculations and solve missing numbers *Autumn*				
Autumn *Spring*	*Autumn*	*Autumn*	*Autumn*	*Autumn*	
Addition & Subtraction: Calculations Add and subtract one-digit and two-digit numbers to 20, including zero	**Addition & Subtraction: Calculations** Add and subtract numbers using concrete objects, pictorial representations and mentally, including: -two-digit number & ones - two-digit number & tens - two two-digit numbers - adding three one-digit numbers	**Addition & Subtraction: Calculations** Add and subtract numbers mentally, including -a three digit number & ones - a three digit numbers & tens - a three digit number & hundreds Add and subtract numbers with up to 3 digits, using formal written methods or columnar addition & subtraction	**Addition & Subtraction: Calculations** Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	**Addition & Subtraction: Calculations** Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition & subtraction) Add and subtract numbers mentally with increasingly large numbers	**Addition & Subtraction: Calculations** Perform mental calculations, including with mixed operation and large numbers Use their knowledge of the order of operations to carry out calculations involving the four operations
Autumn *Spring*	*Autumn*	*Autumn*	*Autumn*	*Autumn*	*Autumn*

Addition & Subtraction: Solve Problems	Addition & Subtraction: Solve Problems	Addition & Subtraction: Solve Problems	Addition & Subtraction: Solve Problems	Addition & Subtraction: Solve Problems	Addition & Subtraction: Solve Problems
Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, & missing number problems such as 7 = _ - 9	Solve problems with addition and subtraction: -using concrete objects & pictorial representations, including those involving numbers, quantities and measures - applying their increasing knowledge of mental and written methods	Solve problems, including missing number problems, using number facts, place value and more complex addition and subtraction	Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	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 and a combination of these, including understanding the meaning of the equals sign	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
Autumn *Spring*	*Autumn*	*Autumn*	*Autumn*	*Autumn*	*Autumn*
	Multiplication & Division: Recall, Represent, Use Recall and use multiplication & division facts for the 2,5 and 10 multiplication tables, including recognising odd and even numbers	**Multiplication & Division: Recall, Represent, Use** Recall and use multiplication and division facts for the 3,4 and 8 multiplication tables	**Multiplication & Division: Recall, Represent, Use** Recall multiplication & division facts for multiplication tables up to 12x12 Use place value, known and derived facts to multiply and divide mentally,	**Multiplication & Division: Recall, Represent, Use** Identify multiplies and factors, including finding all factor pairs of a number and common factors of two numbers Know and use the vocabulary of prime	**Multiplication & Division: Recall, Represent, Use** Identify common factors, common multiples and prime numbers Use estimation to check answers to calculations and determine, in the context of a problem an

	Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot		including multiplying by 0 and 1; dividing by 1; multiplying together three numbers Recognise and use factor pairs and commutativity in mental calculations	numbers, prime factors and composite (non-prime) numbers Establish whether a number up to 100 is prime and recall prime numbers up to 19 Recognise and use square numbers and cube numbers, and the notation for squared and cubed	appropriate degree of accuracy
	Autumn *Spring*	*Autumn* *Spring*	*Autumn* *Spring*	*Autumn* *Spring*	*Autumn*
	Multiplication & Division: Calculations Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication, division and equals signs	**Multiplication & Division: Calculations** 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	**Multiplication & Division: Calculations** Multiply two-digit and three-digit numbers by a one-digit number using formal written layout	**Multiplication & Division: Calculations** 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	**Multiplication & Division: Calculations** 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 reminders as whole

| | | | | number using the formal written method of short division and interpret remainders appropriately for the context

Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 | 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 |
|---|---|---|---|---|---|
| | *Autumn*
Spring | *Autumn*
Spring | *Autumn*
Spring | *Autumn*
Spring | *Autumn* |
| **Multiplication & Division: Solve Problems**

Solve on-step problems involving multiplication and division by calculating the answer using concrete objects, pictorial representations and | **Multiplication & Division: Solve Problems**

solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division | **Multiplication & Division: Solve Problems**

Solve problems including missing numbers problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n | **Multiplication & Division: Solve Problems**

Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one-digit, integer scaling problems and harder | **Multiplication & Division: Solve Problems**

Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes | **Multiplication & Division: Solve Problems**

Solve problems involving addition, subtraction, multiplication and division |

arrays with the support of the teacher	facts, including problems in contexts	objects are connected to m objects	correspondence problems in which n objects are connected to m objects	Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates	
Summer	*Autumn* *Spring*	*Spring*	*Spring*	*Autumn* *Spring*	*Autumn*
				Multiplication & Division: Combined Operations Solve problems involving addition, subtraction, multiplication & division and a combination of these, including understanding the meaning of the equals sign *Spring*	**Multiplication & Division: Combined Operations** Use their knowledge of the order of operations to carry out calculations involving the four operations *Autumn*
Fractions: Recognise and Write 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	**Fractions: Recognise and Write** Recognise, find, name and write fractions, 1/2, 1/4, 2/4, ¾ of a length, shape, set of objects or quantity	**Fractions: Recognise and Write** 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	**Fractions: Recognise and Write** Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten	**Fractions: Recognise and Write** Identify, names and write equivalent fractions of a given fraction represented visually, including tenths and hundredths Recognise mixed numbers and improper fractions	

equal parts of an object, shape or quantity		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		and convert them from one form to the other and write mathematical statements >1 as mixed number (for example – 2/5 +4/5 = 6/5 = 1 1/5)	
Summer	*Summer*	*Spring*	*Spring*	*Spring*	
	Fractions: Compare Recognise the equivalence of 2/4 and ½	**Fractions: Compare** Recognise and show, using diagrams, equivalent fractions with small denominators Compare and order unit fractions and fractions with the same denominator	**Fractions: Compare** Recognise and show using diagrams, families of common equivalent fractions	**Fractions: Compare** Compare and order fractions whose denominators are all multiples of the same number	**Fractions: Compare** Use common factors to simplify fractions, use common multiples to express fractions in the same denomination Compare and order fractions, including fraction >1
	Spring	*Summer*	*Spring*	*Spring*	*Autumn*
	Fractions: Calculations	**Fractions: Calculations**	**Fractions: Calculations**	**Fractions: Calculations**	**Fractions: Calculations**

	Write simple fractions (for example, ½ of 6 = 3)	Add and subtract fractions with the same denominator within one whole (for example, 5/7 + 1/7 = 6/7)	Add and subtract fractions with the same denominator	Add and subtract fractions with the same denominator and denominators that are multiples of the same number Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	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)
	Summer	*Summer*	*Spring*	*Spring*	*Autumn*
		Fractions: **Solve Problems** Solve problems that involve all the above	**Fractions:** **Solve Problems** 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		
		Spring *Summer*	*Spring*		

			Decimals: **Recognise and Write** Recognise and write decimal equivalents of any number of tenths or hundredths Recognise and write decimal equivalents to ¼, ½, ¾ *Spring* *Summer*	Decimals: **Recognise and Write** Read and write decimal numbers as fractions (for example, 0.71 = 71/100) Recognise and use thousandths and relate them to tenths, hundredth and decimal equivalents. *Spring*	Decimals: **Recognise and Write** Identify the value of each digit in numbers given to three decimal places *Spring*
			Decimals: **Compare** 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 *Summer*	Decimals: **Compare** Round decimals with two decimal places to the nearest whole number and to one decimal place Read, write, order and compare numbers with up to three decimal places *Spring*	Decimals: **Compare**
			Decimals: **Calculations & Problems**	Decimals: **Calculations & Problems**	Decimals **Calculations & Problems**

			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 problems involving number up to three decimal places	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
			Spring	*Summer*	*Spring*
			Fractions, Decimals and Percentages Solve simple measure and money problems involving fractions and decimals to two decimals places	**Fractions, Decimals and Percentages** Recognise the percent symbol (%) and understand that percent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100 and as a decimal	**Fractions, Decimals and Percentages** Associate a fraction with division and calculate decimal fraction equivalents (for example, 0.375) For a simple fraction (for example, 3/8)

				Solve problems which require knowing percentage and decimal equivalents of ½, ½, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25	Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts
			Spring *Summer*	*Spring* *Summer*	*Spring*
					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 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 *Spring*
Algebra Although algebraic notion is not introduced until Y6, algebraic thinking starts much earlier as exemplified by the 'missing number' objectives from Yr 1/2/3	**Algebra** Although algebraic notion is not introduced until Y6, algebraic thinking starts much earlier as exemplified by the 'missing number' objectives from Yr 1/2/3	**Algebra** Although algebraic notion is not introduced until Y6, algebraic thinking starts much earlier as exemplified by the 'missing number' objectives from Yr 1/2/3			**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 *Spring*
Measurement: **Using measures**	**Measurement:** **Using measures**	**Measurement:** **Using measures**	**Measurement:** **Using measures**	**Measurement:** **Using measures**	**Measurement:** **Using measures**

Compare describe and solve practical problems for: -lengths & heights (for example, long/short, longer/shorter, tall/short, double/half) - mass/weight (for example, heavy/light, heavier than/lighter than) - capacity & volume (for example, full/empty, more than, less than, half, half full, quarter) - time (for example, quicker slower, earlier, later) Measure and begin to record the following: -lengths and heights - mass/weight -capacity & volume - time (hours, minutes, seconds) *Spring* *Summer*	Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature; capacity (l/ml) to the neatest appropriate unit, using rulers, scalers, thermometers and measuring vessels Compare and order lengths, mass, volume/capacity and record the results using <, > or = *Spring*	Measure, compare, add & subtract; lengths (m/cm/mm); mass (kg/g); volume (l/ml) *Spring*	Convert between different units of measure (for example, kilometre to metre, hour to minute) Estimate compare and calculate different measures *Autumn* *Spring* *Summer*	Convert between different units of metric measure (for example, kilometre & metre/ cm & m/ c & mm/ g & kg/ l & ml) Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints Use all four operations to solve problems involving measure (for example, length, mass, volume, money) using decimal notation, including scaling *Summer*	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 & 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 *Autumn* *Spring*
Measurement: **Money**	**Measurement:** **Money**	**Measurement:** **Money**	**Measurement:** **Money**	**Measurement:** **Money**	

Recognise and know the value of different denominations of coins and notes	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 the practical context involving addition and subtraction of money of the same unit, including giving change	Add and subtract amounts of money to give change, using both £ and p in practical contexts	Estimate, compare and calculate different measures, including money in £ and p	Use all four operations to solve problems involving measure (for example, money)	
Summer	*Autumn*	*Summer*	*Summer*	*Summer*	
Measurement: Time Sequence events in chronological order using language (for example, before & after, next, first, today, yesterday, tomorrow, morning, afternoon & evening) Recognise and use language relating to dates,	**Measurement: Time** Compare and sequence intervals of 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	**Measurement: Time** 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;	**Measurement: Time** 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	**Measurement: Time** Solve problems involving converting between units of time	**Measurement: Time** Use, read, write and convert between standard units, converting measurements of time from a smaller unit of measure to a larger unit, and vice versa

including days of the week, weeks, months and years	Know the number of minutes in an hour and the number of hours in a day	record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, am/pm, morning, afternoon, noon and midnight			
Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times					
		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)			
Summer	*Summer*	*Summer*	*Summer*	*Summer*	*Summer*
		Measurement: Perimeter, Area, Volume	**Measurement: Perimeter, Area, Volume**	**Measurement: Perimeter, Area, Volume**	**Measurement: Perimeter, Area, Volume**
		Measure the perimeter of simple 2D shapes	Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres	Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres	Recognise that shapes with the same areas can have different perimeters and vice versa
				Calculate and compare the area of rectangles	Recognise when it is possible to use formulae

| | | | Find the area of rectilinear shapes by counting shapes | (including squares), and including using standard units, square centimetres and square metres and estimate the area of irregular shapes

Estimate volume (for example, using 1cm3 blocks to build cuboids (including cubes) and capacity (for example, using water) | 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 and cubic metres and extending to other units |
|---|---|---|---|---|---|
| | | *Spring* | *Autumn* *Spring* | *Spring* | *Spring* |
| **Geometry: 2D shapes**

Recognise and name common 2D shapes (for example, rectangles including squares, circles and triangles) | **Geometry: 2D shapes**

Identify and describe the properties of 2D shapes, including the number of sides and line of symmetry in a vertical line

Identify 2-D shapes in the surface of 3-D shapes (for example, a circle on a cylinder and a triangle on a pyramid) | **Geometry: 2D shapes**

Draw 2D shapes | **Geometry: 2D shapes**

Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes

Identify lines of symmetry in 2D shapes presented in different orientations | **Geometry: 2D shapes**

Distinguish between regular and irregular polygons based on reasoning about equal sides and angles

Use the properties of rectangles to deduce related facts and find missing lengths and angles | **Geometry: 2D shapes**

Draw 2D shapes using given dimensions and angles

Compare and classify geometric shapes based on their properties and sizes

Illustrate and name parts of circles, including radius, diameter and |

	Compare and sort common 2D shapes and everyday objects				circumference and know that the diameter is twice the radius
Autumn	*Autumn*	*Summer*	*Summer*	*Summer*	*Summer*
Geometry: 3D shapes Recognise and name common 3D shapes	**Geometry: 3D shapes** Recognise and name common 3D shapes Compare and sort common 3D shapes and everyday objects	**Geometry: 3D shapes** Make 3D shapes using modelling materials, recognise 3D shapes in different orientations and describe them		**Geometry: 3D shapes** Identify 3D shapes, including cubes and other cuboids, from 2D representations	**Geometry: 3D shapes** Recognise, describe and build simple 3D shapes, including making nets
Autumn	*Autumn*	*Summer*		*Summer*	*Summer*
		Geometry: Angles 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	**Geometry: Angles** Identify acute and obtuse angles and compare and order angles up to two right angles by size Identify lines of symmetry in 2D shapes presented in different orientations	**Geometry: Angles** Know angles are measured in degrees; estimate and compare acute, obtuse and reflex angles Draw given angles, and measure them in agrees Identify: -angles at a point and one whole turn	**Geometry: Angles** Find unknown 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 and find missing angles

			greater than or less than a right angle Identify horizontal and vertical lines and parts of perpendicular and parallel lines *Summer*	Complete a simple symmetric figure with respect to a specific line of symmetry *Summer*	-angles at a point on a straight line and ½ a turn total 180 degrees -other multiples of 90 degrees *Summer*	*Summer*
Geometry: **Position & Direction** Describe position, direction and movement, including whole, half, quarter, and three-quarter turns	**Geometry:** **Position & Direction** Order and arrange combinations of mathematical objects in patterns and sequences Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)		**Geometry:** **Position & Direction** Describe positions on a 2D 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	**Geometry:** **Position & Direction** 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	**Geometry:** **Position & 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
Summer	*Summer*		*Summer*	*Summer*	*Summer*

	Statistics: **Present and Interpret** Interpret and construct simple pictograms, tally charts, block diagrams and simple tables *Summer*	Statistics: **Present and Interpret** Interpret and present data using bar charts, pictograms and tables *Summer*	Statistics: **Present and Interpret** Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs *Summer*	Statistics: **Present and Interpret** Complete, read and interpret information in tables, including timetables *Spring*	Statistics: **Present and Interpret** Interpret and construct pie charts and line graphs and use these to solve problems *Spring*
	Statistics: **Solve Problems** 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 *Summer*	Statistics: **Solve Problems** 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 *Summer*	Statistics: **Solve Problems** Solve comparison sum and difference problems using information presented in bar charts, pictograms, tables and other graphs *Summer*	Statistics: **Solve Problems** Solve comparison, sum and difference problems using information presented in a line graph *Spring*	Statistics: **Solve Problems** Calculate and interpret the mean as an average *Spring*

Key Vocabulary