

Guidance of skills and knowledge to cover within each unit of work, taken directly from the National Curriculum.

The intent of our Maths Curriculum at Waltham Leas Primary Academy:

Mathematics is a creative and highly interconnected subject that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and all forms of employment. A high-quality education in maths therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject. Through our maths curriculum, we ensure that all pupils **belong** and see themselves as capable and confident mathematicians. Our policy and planning for maths is based on the statutory expectations of the EYFS (2021) and National Curriculum (2014).

Our purpose is to develop lively, enquiring minds, enabling pupils to **grow** into self-motivated, confident and capable learners who can solve mathematical problems that will become an integral part of their future. We **empower** pupils by using a range of high-quality resources to support learning and progression, including the White Rose Maths scheme and NCETM materials. We set maths in exciting contexts using a variety of practical, concrete resources and plan lessons to include variation, a range of representations and structures, mathematical thinking and fluency development, ensuring that all learners can access learning. We are part of the Maths Hub Teacher Research Group in our local area and work with different schools to develop our maths teaching.

We follow the key principles of a mastery approach to teaching which include the following ideas: lessons are taught through whole class teaching to enable all children to coherently understand mathematical concepts; automaticity is a priority for key number facts; time is spent on deepening knowledge of key mathematical ideas before moving on; children are prevented from falling behind due to quick and systematic intervention; precise mathematical language is modelled and used in stem sentences alongside carefully chosen concrete, pictorial and abstract representations and models.

Our lessons are structured to start with a retrieval warm up, guided learning through a 'my turn your turn' teaching style and independent practice through star challenges.

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 have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems
- 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.
- are set appropriate learning challenges
- are taught well and be given the opportunity to learn in ways that maximise the chances of success.
- have adults working with them to tackle the specific barriers they face to progress.

Year Foundation Stage

Over the course of the year children in Foundation Stage will develop the following knowledge and skills:

Autumn Topic	Spring Topic	Summer Topic
Autumn 1 • subitise 1 and 2. • subitise within 3 • make and describe spatial patterns with 3 dots. • represent quantities on their fingers in different ways. • identify sub-groups of 1, 2 and 3 within larger arrangements. • hear and join in with the counting sequence to 5, including using songs and rhymes • see that counting is useful because it tells us 'how many' • see that the last number in the count tells us 'how many altogether' (cardinality). • practise counting each object, action or sound once and only once. • experience counting sounds • record the results of their count • know that 2 is made of 1 and 'another 1' • make their own collections of 2 objects and identify the '1 and another 1' within them.	Spring 1 • use their fingers to quickly show quantities on 1 hand • recognise the numerals 1–5 • begin to develop their conceptual subitising skills with linear and paired arrangements of up to 5 dots. • subitise linear and paired arrangements of 2, 3 and 4 dots • visualise and recreate arrangements of 3, 4 and 5 dots • match arrangements of 3, 4 and 5 dots to the correct numerals. • match numerals to quantities for 1–5 • recognise die arrangements • visualise and describe arrangements of dots on a die • use dice to link subitised amounts with 1-to-1 counting actions. • recognise die patterns to 6 • link die patterns to numbers shown on their fingers • use die patterns to play track games. • recognise numerals 1–5	Summer 1 • count things that cannot be seen – sounds • revisit rules for how to count • discuss and practise strategies for counting larger sets. • count things that cannot be seen – actions • discuss and practise strategies for counting larger sets by moving objects. • count things that cannot be seen – periods of time • discuss and practise strategies for counting larger sets by moving images • make or represent their own collections of larger amounts. • practise counting on from a given number • discuss and practise strategies for counting larger amounts that cannot be moved. • visualise, make and describe spatial arrangements of 6. • practise subitising to 6 • make and describe arrangements of 6. • listen to rhythmic patterns of up to 5 sounds and determine the quantity

- identify when a collection is composed of 3 objects
- produce their own collection of 3.
- identify when a collection is composed of 3 or NOT 3
- see that 4 can be made with four 1s.
- subitise arrangements of 2 and 3
- practise making 2s and 3s with their fingers
- subitise auditory patterns up to 3.
- subitise auditory patterns up to 3
- identify when a small collection is rearranged or the quantity changed.
- show small quantities on their fingers
- use positional language to describe patterns of 4.
- use positional language to describe patterns of 4
- make patterns showing 4.
- represent a given number on their fingers without looking
- compare 2 sets of objects and say which is 'more than'.
- compare 2 sets of objects and say which is 'more than' or 'fewer than'.

Autumn 2

- practise counting each object, action or sound once
- hear and join in with the counting sequence to 5
- tag each object with 1 number word (1:1 correspondence)

- order numbers from 1–5.
- match numerals to quantities in order
- help to build towers in order from 1–5 squares
- see the staircase pattern and recognise that each number is 1 more.
- order towers of 1–5 interlocking cubes
- notice when we have '1 more' and when we do NOT have '1 more'.
- match numerals to representations
- represent staircase patterns in different ways, knowing that each new 'step' is 1 more than the last.
- show numbers to 5 using their fingers
- see that 5 can be partitioned into 4 and 1.
- show ways of making 5 on their fingers
- see that 5 can be partitioned into 3 and 2.
- find ways to partition a set of 5.
- understand that 5 can be partitioned (split) into different parts
- be able to explain what the parts are
- use what they know about 5 to work out a hidden number.
- see that there are 5 dots on a die pattern
- represent 4 in different ways on a die frame.
- use their fingers to represent 6 as '5 and a bit'
- use double dice frames to represent 6 as 5 and 1 more.
- match die representations of numbers 1–6 to representations on their fingers
- see that 5 and '2 more' make 7.
- count out 6 blocks from a collection

- recognise Numberblocks and related doubles patterns on their fingers without counting.
- subitise doubles amounts shown on 10-frames.
- use their fingers to make doubles patterns
- consolidate their use of finger patterns to represent numbers within 5.
- use their fingers to represent numbers within 5, understanding that the 'whole' has not changed
- use their own models and/or drawings to explore and represent the numbers within 5.
- use die frames as a different structure with which to represent the same numbers within 5
- use spatial language to describe their arrangements.
- match die frames to ways of making 5
- explore ways of representing numbers within 5 using 10-frames
- make links between different representations of numbers within 5.
- visualise and use spatial language to describe numbers of dots
- represent the same quantities to 10 using 10-frames and double dice frames.
- match 10-frames with finger patterns and numerals
- use structured arrangements to show 10 and 9.
- begin to explore ways to make 10
- represent ways to make 10 using structured arrangements.
- decide when to subitise and when to count quantities

• see that they have 5 fingers on one hand. • say and make numbers to 5 on their fingers • practise counting each object, action or sound once and only once • make collections of 5 in different ways. • practise counting each object once and only once • use counters to represent 5 objects • use a die frame to represent 5. • count each object, action or sound once • count 5 and 5 to make 10 altogether. • practise subitising amounts to 4 • revisit 'more than' or 'fewer than' by looking. • compare groups of up to 3 objects by matching them 1:1 • say when they have an equal number. • compare groups of up to 3 objects by matching them 1:1 • say when there is an equal number, too many or not enough. • build towers with an equal number of squares • match the squares in the towers 1:1 • say when there is an equal number, too many or not enough. • identify the 'whole' when shown 1 part of a familiar object • identify that the parts are still visible when they are assembled to make the whole • hear the language of 'whole' and 'parts'. • identify parts of their own body • recognise that some whole objects have parts that cannot be removed.	• replace 1 block and know that there are still 6 • add another block to make 7. • use 'more than' and 'fewer than' to describe quantities • say when they can see that someone has more or fewer of the same kind of object • know that it is quantity – not colour, size or type of object – that determines if 1 set has more or fewer items than another. • use the words 'an equal number' to say when there is the same number of items in 2 sets • say when they can see an equal number. Spring 2 • practise counting aloud • revisit the principles of counting. • explore '5 and a bit' ways to make numbers between 6 and 10 • use generalised statements to describe the '5 and a bit' composition of the numbers 6–8. • investigate the '1 more/1 less' pattern of the base-10 counting system • begin to order numbers between 1 and 10, noticing the '5 and a bit' structure. • describe the '1 more/1 less' relationship of numbers to 10 • work together to order numbers between 1 and 10, noticing the '5 and a bit' structure. • subitise arrangements of 6 and NOT 6 • order Numberblock images to 8. • represent 8 as '5 and 3 more'	• represent ways to make 10 using structured arrangements • say the different ways that 10 can be made. • identify missing numbers in the counting sequence to 5 • order towers of cubes or number plates from 1–10 on a class number track. • identify missing numbers in the counting sequence to 10 • match different representations of number to towers (or number plates) on a number track • use language to describe positions on a number track. • use the language of 'more than' and 'less than' when describing positions on a number track • begin to understand the rules for simple linear track games. • describe and follow the rules for simple, linear track games. Summer 2 • subitise quantities to 5 • say which set of up to 10 objects contains more than the other. • use their fingers to show 'more than' numbers to 10 • use rekenreks to push amounts of beads that are equal to, more than and fewer than a given number. • subitise '1 more' amounts to 5 • order towers to 10 – recognising the '1 more' pattern of number.
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• identify parts of some animals' bodies • recognise that some whole objects have parts that cannot be removed. • investigate ways to compose and de-compose sets of 2 and 3 • know that 1 and 2 are parts of 3. • investigate ways to compose and de-compose sets of 3 • explore how 1 and 2 are parts of 3. • investigate ways to compose and de-compose 4. • investigate ways to compose and de-compose 4 • use spatial language to describe the shapes • explain that different parts can make the same whole. • investigate ways to compose and de-compose 5 • use spatial language to describe the shapes • explain that different parts can make the same whole. • hear and join in with the counting sequence to 10, including using songs and rhymes • use their fingers to represent quantities to 5 and to begin to represent quantities to 10 • match different representations of quantities to 5 with amounts shown on their fingers. • remember that the 'stopping number' tells us how many we need altogether • begin to recognise numerals to 5 • develop their understanding of equal amounts.	• describe how to place the numbers 1 to 8 in order. • explain how to order quantities to 10 • reason about which numbers are 'more than' others. • consolidate their understanding of 8 as '5 and 3 more' • notice when numbers are increased or decreased and explain their thinking. • use skills of conceptual subitising to describe parts of a whole set • visualise arrangements and use gestures to describe the numbers within a whole set. • investigate ways of making 7 with two parts • use their fingers to make and describe 7 as '5 and 2 more'. • notice when towers are made of 7 or NOT 7 interlocking cubes • work out the missing part of 7 using the '5 and a bit' structure. • see that 7 can be composed in different ways • explain their understanding of the composition of 7. • use conceptual subitising strategies to derive dice patterns to 8 • use their fingers to show 2 and 4 as doubles. • use the language of doubles to describe die/dice patterns • see when a pattern is and when it is NOT a double. • make doubles patterns using their fingers	• explore the order and magnitude of numbers to 10. • subitise numbers to 5 and make equivalent amounts with their rekenreks • count out 6 or 8 objects from a larger group and check by counting 1-to-1 • arrange 6 or 8 objects into groups that can be subitised. • join in with the counting sequence to 10 • recognise and show numbers from 5 to 10 in '5 and a bit' arrangements • remember to stop when they count to the end of a set of up to 10 jumps/claps/hops. • count 20 objects • practise saying the tricky 'teen' numbers. • practise counting to 100 • share strategies for counting larger amounts that can't be moved. • discuss their understanding of equivalence • make and describe doubles arrangements on their fingers. • distribute collections of objects into equal and unequal groups • sort numbers to 10 according to whether each number is a double / is not a double. • use their fingers to make matching doubles amounts • make and describe doubles patterns on a rekenrek. • recognise an odd and an even number when arranged in a 'doubles' pattern
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- remember that the 'stopping number' tells us how many we need altogether - begin to recognise numerals to 5 - represent quantities in more abstract ways, such as by clapping or jumping. - remember that the 'stopping number' tells us how many we need altogether - begin to recognise numerals to 5 - begin to understand that when a set of objects is rearranged, its quantity remains the same.	- use objects to make doubles patterns and describe where they can see the pattern of doubles. - use positional language to describe spatial arrangements of objects - visualise doubles patterns to 5 and 5. - recognise ways in which objects are similar to or different from each other - talk about some of the different attributes they notice (colour, size, function, shape, etc.) - sort objects according to attributes described by an adult. - use their fingers to represent doubles and NOT doubles - describe attributes that they notice for a group of objects - sort and re-sort objects according to their own attributes. - use their fingers to show numbers to 8 - describe attributes of the Numberblocks - sort the Numberblocks using the criteria 'odd blocks' or 'even tops'. - use their fingers to show doubles patterns - investigate patterns of doubles in interlocking cube models of the Numberblocks.	- sort models into those that contain odd and those that contain even numbers of interlocking cubes. - find ways to partition (split) a set of 5 - understand that 5 can be partitioned in different ways. - understand that 5 can be partitioned (split) in different ways - use what they know about 5 to work out a hidden number. - use their fingers to represent numbers within 5 - use dice frames as a different structure with which to represent the same numbers within 5 - use spatial language to describe their arrangements. - use positional language to describe spatial arrangements of objects - visualise and describe doubles patterns up to '5 and 5'. - use their fingers to make and describe doubles facts - explore and represent the composition of 5 on die frames - explore the commutativity of addition facts. - explore and represent the composition of 5 on rekenreks - use fingers and dice frames to explore and represent '5 and a bit' numbers to 10. - use their fingers to represent '1 more than/1 less than' a given number - use 10-frames to explore '5 and a bit' numbers to 10.
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		• use what they know about the number sequence to work out missing numbers to 10 • use rekenreks to explore and make '5 and a bit' numbers to 10. • subitise numbers up to 5 represented by finger patterns • orientate a rekenrek correctly and push a number of beads with one finger. • subitise numbers up to 5 using linear dot patterns • use 'one finger, one push' to move a number of beads on the top row ALL AT ONCE to the far left of the rekenrek. • subitise numbers up to 5 using standard and non-standard dot patterns • use 'one finger, one push' to subitise and explore '1 more' patterns of beads on the rekenrek. • subitise numbers up to 5 represented on dice frames • use 'one finger, one push' to subitise and explore '1 fewer' patterns of beads on the rekenrek.
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Year 1

Over the course of the year children in Year 1 will develop the following knowledge and skills:

Autumn Topic	Spring Topic	Summer Topic
Number - Place Value	Number - Place Value	Number - 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 2s, 5s and 10s - given a number, identify 1 more and 1 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 - represent and use number bonds and related subtraction facts within 20 - add and subtract one-digit and two-digit numbers to 20, including 0 - solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = ? - 9$	- 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 2s, 5s and 10s - given a number, identify 1 more and 1 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 - represent and use number bonds and related subtraction facts within 20 - add and subtract one-digit and two-digit numbers to 20, including 0 - solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = ? - 9$ Measurement - Length and Height - compare, describe and solve practical problems for:	- 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 2s, 5s and 10s - given a number, identify 1 more and 1 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 - 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 1 of 2 equal parts of an object, shape or quantity - recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity
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Geometry - Shape - recognise and name common 2-D and 3-D shapes, including: 2-D shapes [for example, rectangles (including squares), circles and triangles] 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]	- lengths and heights [for example, long/short, longer/shorter, tall/short, double/half] - measure and begin to record the following: - lengths and heights Measurement - Weight and Volume - compare, describe and solve practical problems for: - 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: - mass/weight - capacity and volume	Geometry - Position and Direction - describe position, direction and movement, including whole, half, quarter and three-quarter turns Measurement - Money - recognise and know the value of different denominations of coins and notes Measurement - Time - 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 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
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Year 2

Over the course of the year children in Year 2 will develop the following knowledge and skills:

Autumn Topic	Spring Topic	Summer Topic
Place Value - Ordering numbers to 20 - Making and recognising amounts using base ten, part whole model. - Drawing amounts and interpreting pictures representing amounts (base 10 and part whole models) Money Maths week Addition and Subtraction - Counting on in 10's - number patterns, adding tens using calculations, representing amounts and solving problems. - Counting back in 10's - number patterns, adding tens using calculations, representing amounts and solving problems. - More and less - recognising greater than and less than symbols to compare objects and amounts - Problem solving involving addition and subtraction (problems involving 2 step using greater than and less than symbols)	Addition and Subtraction - Adding 2 digit numbers using concrete and drawing base ten to support - Column addition and subtraction (not carrying or borrowing) - Three digit addition (using doubles and number bond knowledge) Time - Recop O'clock - Recognise and make half past - Problems involving time Shape 2D shape (number of sides, vertices) - Pattens using shape (including patterns of number) - Symmetry Multiplication and Division - Recognising symbol X - Drawing//making equal groups involving 2, 5 and 10 - Problem solving using multiplication - Introducing division symbol - Sharing practically and by drawing - Problem solving using division Money	Fractions - Recognise symbol - Recognise $\frac{1}{4}$ of a shape - Recognise $\frac{1}{4}$ of an array - Fractions of amounts - Drawing to share - Problems - Mixed halves and quarters. Measure and Capacity - Recognise and matching standard measure Statistics - Interpreting data (bar charts, tally and block graphs. - Collecting and making bar charts, tallies and block graphs - Problems involving data collection (missing data and finding the difference) YEAR 2 SATs Shape 3d Shape - naming and sorting based on properties Time - Quarter to and past - making and recognising - Time to ever 5 minutes - Problems involving time

- Addition and subtraction by finding the difference - including missing number problems.
- Doubles (understanding same amount)
- Introduction of x sign (making links to multiplication)
- Number fact families
- Inverse

Multiplication and Division

- Recognising x symbol (link to doubles)

Fractions

- Looking at $\frac{1}{2}$ - recognising symbol
- Half of shapes
- Half of array
- Half of amounts
- Half of numbers to 20
- Sharing amounts practically and drawing to share.

Time

- O 'Clock - making, recognising and problems linked

- Looking at values and identifying greatest value
- Adding amounts (using mini answers)
- Word problems

Year 3

Over the course of the year children in Year 3 will develop the following knowledge and skills:

Autumn Topic	Spring Topic:	Summer Topic
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 3-digit number (100s, 10s, 1s) - compare and order numbers up to 1,000 - identify, represent and estimate numbers using different representations - read and write numbers up to 1,000 in numerals and in words - solve number problems and practical problems involving these ideas Number - Addition and Subtraction - add and subtract numbers mentally, including: - a three-digit number and 1s - a three-digit number and 10s - a three-digit number and 100s - add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction - estimate the answer to a calculation and	Number - Multiplication and 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 multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects Measurement - Length and Perimeter - measure, compare, add and subtract: lengths (m/cm/mm) - measure the perimeter of simple 2-D shapes	Number - Fractions Measurement - Money - add and subtract amounts of money to give change, using both £ and p in practical contexts 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; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, am/pm, 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

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 and 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 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, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$] • compare and order unit fractions, and fractions with the same denominators • solve problems that involve all of the above Measurement - Mass and Capacity • measure, compare, add and subtract: mass (kg/g); volume/capacity (l/ml)	events or tasks] Geometry - Shape • 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 2 right angles make a half-turn, 3 make three-quarters of a turn and 4 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
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Year 4

Over the course of the year children in Year 4 will develop the following knowledge and skills:

Autumn Topic	Spring Topic	Summer Topic
Number - Place Value - 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 - 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 Number - Addition and Subtraction - add and subtract numbers with up to 4 digits using the formal written methods of	Measurement - Length and Perimeter - measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres - convert between different units of measure Number - Fractions - 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 - solve simple measure and money problems involving fractions and decimals to 2 decimal places	Number - Decimals - recognise and write decimal equivalents of any number of tenths or hundreds - recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ - 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 - find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths - solve simple measure and money problems involving fractions and decimals to 2 decimal places Measurement - Money - estimate, compare and calculate different measures, including money in pounds and pence - convert between different units of measure

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 Measurement - Area - find the area of rectilinear shapes by counting squares Number - Multiplication and 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 3 numbers - 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 1 digit, integer scaling problems and harder correspondence problems such as n	Number - Decimals - recognise and write decimal equivalents of any number of tenths or hundreds - recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ - 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 - find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths - solve simple measure and money problems involving fractions and decimals to 2 decimal places	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 - convert between different units of measure Geometry - Shape - 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 - complete a simple symmetric figure with respect to a specific line of symmetry 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
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objects are connected to m objects		Geometry - Position and Direction • describe positions on a 2-D grid as coordinates in the first quadrant • describe movements between positions as translations of a given unit to the left/right and up/down • plot specified points and draw sides to complete a given polygon
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Year 5 Over the course of the year children in Year 5 will develop the following knowledge and skills:		
Autumn Topic	Spring Topic	Summer Topic

Number - 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 • 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 recognise years written in Roman numerals Number - Addition and 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 and Division	Number - Multiplication and Division • 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 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	Geometry - Shape • 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 (°) • identify: ○ angles at a point and 1 whole turn (total 360°) ○ angles at a point on a straight line and half a turn (total 180°) ○ other multiples of 90° ○ use the properties of rectangles to deduce related facts and find missing lengths and angles ○ distinguish between regular and irregular polygons based on reasoning about equal sides and angles Geometry - Position and 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 Number - Decimals
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- 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 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

- 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

Number - Fractions

- 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, and denominators that are multiples of the same number
- multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams

Number - Decimals and Percentages

- 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 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

Number - Negative Numbers

- interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through

understanding the meaning of the equals sign • solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates Number - Fractions • 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, 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, $0.71 = \frac{71}{100}$] • 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 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 Measurement - Perimeter and Area • measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres • calculate and compare the area of	0 Measurement - Converting Units • 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 and common imperial units such as inches, pounds and pints • 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 Measurement - Volume • estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water] • use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling
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	rectangles (including squares), including using standard units, square centimetres (cm²) and square metres (m²), and estimate the area of irregular shapes • use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling Statistics • solve comparison, sum and difference problems using information presented in a line graph • complete, read and interpret information in tables, including timetables	
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Year 6

Over the course of the year children in Year 6 will develop the following knowledge and skills:

Autumn	Spring	Summer
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	Number - Fractions. Decimals and 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	Reconsolidate learning revisiting topics.

intervals across 0

- solve number and practical problems that involve all of the above

Number - Addition, Subtraction, Multiplication and Division

- 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 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

and mixed numbers, using the concept of equivalent fractions

- multiply simple pairs of proper fractions, writing the answer in its simplest form [for 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, $\frac{3}{8}$]
- 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
- 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
- recall and use equivalences between simple fractions, decimals and percentages, including in different contexts

Geometry - Position and Direction

- describe positions on the full coordinate grid (all 4 quadrants)
- draw and translate simple shapes on the coordinate

appropriate degree of accuracy Number - Fractions • 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, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$] • 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, $\frac{3}{8}$] • recall and use equivalences between simple fractions, decimals and percentages, including in different contexts •	plane, and reflect them in the axes Measurement - Area, Perimeter and Volume • 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 - Shape • 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 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 Number - Ratio	
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- 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 unequal sharing and grouping using knowledge of fractions and multiples

Number - Algebra

- 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

Statistics

- interpret and construct pie charts and line graphs and use these to solve problems
- calculate and interpret the mean as an average

Measurement - Converting Units

	• solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 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 larger unit, and vice versa, using decimal notation to up to 3 decimal places • convert between miles and kilometres	
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SEND Adaptations for MATHS

“Instead of differentiating through tasks, those who require extra support should have additional input prior to the lesson, be part of more focused group work to go through an activity, and/or additional opportunities to practice.” “The best maths learning happens when learners talk through their ideas with a teacher or partner.”

Cognition and Learning	Communication and Interaction	Social, Emotional and Mental Health	Sensory and/or Physical
• Promoting conversation around Maths and scaffolding these conversations. • Concrete resources are key – this often works best if concrete resources/manipulatives are used for whole class teaching alongside introducing a new concept. Then children can decide whether they want to continue using the resources or are ready to try without. Some children may need adult encouragement to begin trying without resources due to confidence levels. • Key Stage 1 children should have 1:1 correspondence when counting and develop automaticity in addition and subtraction facts to and within 10.	• When modelling, ask children to make jottings or copy step by step stages onto a whiteboard at the same time. • Flexibility with delivering can also work well, children do not have to all be sat on the carpet at the same time. Some children can be completing an accessible activity independently at the table while others have an input. This means that inputs are short and focused, giving support to children who struggle to focus for long periods of time. • Give children target numbers of questions to achieve which are realistic.	• Sometimes children can lack resilience with Maths as the answer is right or wrong, especially if they get numerous answers wrong in a row. This can be supported by children being given equal opportunities to learn core knowledge. • Mistakes need to be encouraged so that children feel comfortable in making mistakes and do not over-react if they do make a mistake. • It may also be helpful to point out carefully, what a ‘wrong answer’ is as it helps support the child’s confidence and develop their reasoning and understanding. • Giving behaviour specific praise commenting on what the child has	• Ensure all images are large enough and accessible. • Consider where children with a hearing, sensory or other impairment are sitting in relation to the whiteboard or resources. • Use of an iPad to support children with a visual impairment where screen sharing can occur. • Additional ways of recording, i.e. videos, verbal commentary etc rather than always writing. White Rose Maths workbooks can be accessed via an iPad and the child will need to be trained in how to access the ‘mark-up’ facility on the iPad to edit their answers onto the screen.

They should be able to explain the place value or 10s and 1s. ● They should also have a concept of more than and less than and describe relative sizing of number. ● Children should be able to represent numbers in many different ways – in pictures, words or calculations and they should be able to use manipulatives such as Numicon confidently to support their learning. ● Key Stage 2 children should be confident with all times tables by the end of Year 4 as this is the foundation for other Maths concepts. ● They should also have secure understanding of place value up to 10,000 and beyond and be able to apply their knowledge of number and written methods to reasoning problems. ● Children benefit from Mastery where knowledge is built upon gradually and strategically building on prior learning through constantly re-visiting. ● There are often numerous words for the same operations in Maths and children will need these new words to be defined and revisited – working walls can support new vocabulary. ● Pre-learning and over learning to support understanding including topic related vocabulary tick sheets so children can tick off when they feel confident in using the word verbally or in writing. ● Use of visuals and actions can help to explain the meaning of words. ● Where children find reading Maths questions a challenge, deploy an adult to support or pair the child with a confident reader to relieve the pressure of having to decode the question.	● Incorporate children's interests into Maths questions/problems helps keep focus. ● Establishing routines and expectations early in the year ensures that transitions etc become very familiar, therefore lowering the likelihood of children dysregulating. ● Talk to the child at the end of a lesson/concept and see how they are feeling. ● Give time reminders after you have set a reasonable amount of time to complete a task. Bear in mind that the child may still need some extra time to complete. ● Create a calm and simple working classroom with clear routines, expectations and organised, labelled workspaces. ● Consider carefully where children are seated to maximise their focus and attention and minimise background noise/distraction. ● Plan movement breaks and classroom jobs to allow children to move within a lesson. ● The Maths lesson may need breaking it down for them into manageable chunks and explaining this in advance of the learning. Now and Next boards could be useful for this. ● Visual words/cues/phrases. ● Repetition and reinforcement. ● Giving a processing prompt that a question will be coming, give the question before moving onto a few other children, before coming back for the answer. ● Simple, step by step instructions verbally and then in a prompt sheet. ● Use of appropriate modelling to support understanding.	done well to motivate and encourage. ● Send home examples of the child's good learning as positive reinforcement. ● Mark children's learning 'in the moment' which will help them keep on track and also motivate them to keep on going and boost their confidence. This can also deal with misconceptions early on if needed and does not allow children to embed misconceptions. ● Encourage children to support with the preparation for the Maths lesson by setting up resources and making them feel more comfortable. Informal Maths conversations could also happen at this time. ● Ensure that the learning environment is calm and not too stimulating, that resources are clearly labelled and organised for independent use, therefore not encouraging frustration. ● Ensure that instructions are clear and tasks are broken down to be achievable. ● Children can be given a role within a group which does not involve them being highly active or speaking out to not heighten arousal. ● Providing fidgets to allow children to concentrate and listen despite not necessarily looking like they are listening. ● Using IT to support where necessary either for whole class learning or for recording their learning. ● Providing a safe space for children within the lesson if needed – this can be accessed through an adult directed or child-initiated time out card.	● Consider the Maths equipment which is being used – does the child have a fine motor control difficulty which makes using equipment such as flat counters or small manipulatives difficult. ● Working within mixed ability groups to support. ● Pencil grips, tripod pencils, left handed pens etc to support. ● Use of IT to support access beyond screen sharing.
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• Some children may benefit from 'drawing' the word problem once the question has been read – sometimes this visual helps them understand what is being asked. • Ensure that questions are not overwhelming, with pages of questions. • Some children may need additional support through enlarged squared paper or extra working out paper. • Maths intervention time could involve playing some Maths games with an adult (either practically or on an iPad) to consolidate new concepts. (Cambridge University's NRICH Project has some good games.) • Have some worked out examples ready to share with the child. • Scaffold the tasks so that where needed, children who struggle to focus do not have to write the date and LO etc and can get straight onto the task being asked. • Use previous manipulatives used in earlier year groups which the children are familiar with i.e. Numicon. • Where number fluency is a concern, allow children to practise outside of Maths lessons i.e. counting in 5s as they move from the carpet to their tables etc. • Allowing children to also practise at the start of a Maths lesson may also help. Providing visuals such as times table squares etc may also help. • Use of small groups to scaffold SEND children where needed. • Ensure that parents are aware of the vocabulary of the Maths curriculum and can support with the learning of terminology at home through research. Where this does not take		• Use of positive language to encourage good choice and higher self-esteem. • Teaching with empathy and understanding of the child's needs. • Allow movement breaks within the classroom for example giving out equipment or books etc. • Allow sensory/brain breaks as a break from learning. • Think about cognitive overload and the child's ability to cope with this.	
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place, allow the child time with an adult before the learning begins to research the Maths vocabulary. • Sending relevant links home to support parents with different Maths calculations may also support the parents understanding which will also have a positive impact on the child when doing home learning.			
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