



Ark Ayrton Maths Offer 2017/18

Overall Aims

At Ark Ayrton, our aim is to ensure that all children become highly skilled mathematicians, working at or above the National Standard, with the confidence to solve mathematical problems in a range of contexts. We follow the Maths Mastery scheme and fully support the ethos of 'depth before breadth' so that our children are able to solve, reason, apply and explain their learning in a range of ways.

Assessment of Maths

Tracking the progress through the Maths Curriculum is built around Key Performance Indicators (KPIs), which link directly to the National Curriculum expectations. KPIs are based around many dimensions of the National Curriculum including number and place value, fractions and percentages, geometry and statistics. We use a variety of approaches to teach these dimensions within both whole class maths lessons and daily maths meetings. In order to make an age related judgement of a child, teachers take into account a variety of evidence – Pre and Post unit tests, PUMA test outcomes, arithmetic outcomes, exit passes, KPI tasks and the evidence we have of daily work in class books. Teachers track what children can and can't do against the KPIs, which allow them to target children effectively to narrow gaps. Each year group's KPIs have key assessment questions for teachers to use, in order to assess all areas of maths.

Whole Class Maths

At Ark Ayrton, we follow the six-part maths approach of Maths Mastery. Within whole class Maths lessons, children are encouraged to physically represent mathematical concepts. Objects and pictures are used to demonstrate and visualise abstract ideas, alongside numbers and symbols. Mathematical concepts are explored in a variety of representations and problem-solving contexts are provided in order to give pupils a richer and deeper learning experience. Ark Ayrton understands the importance of children using the correct mathematical vocabulary within the lesson. Therefore, opportunities to use and develop mathematical language are provided in every lesson.

Arithmetic

At all ages, it is vital that children have the basic fluency skills to be able to apply their learning in a range of ways. Therefore, In addition to maths lessons, children are also taught arithmetic on a daily basis. These lessons last 15minutes and focus on many areas of the National Curriculum including all 4 operations, fractions, percentages, patterns within numbers and the order of operations in mathematical equations. We believe that daily practise of these skills increase confidence and resilience in Maths making our children strong mathematicians.

Maths across the Curriculum

At Ark Ayrton we believe that Maths should be seen in all areas of the curriculum. Therefore, in addition to daily Maths lessons and arithmetic meetings, all children have the opportunity to develop and apply skills learnt during the afternoon. Our Horizons Curriculum provides opportunities for children to solve mathematical problems within real life contexts including organising class visits, taking into account ratio and budget; using knowledge of measure and conversions when making structures; making proportional changes to recipes when cooking and showing their understanding of shape and space in design and technology.

Support for Maths

We believe that every child regardless of mathematical ability should have the opportunity explore Maths in a range of ways, otherwise the gap widens and children begin to not see themselves as mathematicians. Therefore, we will never take children out for Maths intervention during Maths time. We provide additional time for Maths interventions either after school where children attend tuition with a class teacher or through dedicated Maths interventions which are delivered by a Senior LSA at some point in the afternoon.

Homework

In addition to daily maths lessons, children will be set weekly maths homework. This will vary between arithmetic, application of learning and practise of skills that have already been taught.

Year Group Maths offer

Each year group will be taught specific content that builds throughout the Key Stage. Details of which can be seen below:

Year Six

Year 6 Programme of Study - 'Term per page overview' 2017-2018 FINAL

Term	National Curriculum requirements	
Autumn	Unit 1 Place Value	<ul style="list-style-type: none"> • 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 • solve problems involving addition and subtraction • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why • generate and describe linear number sequences
	Unit 2 Multiplication and division	<ul style="list-style-type: none"> • 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 • use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy • multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication • multiply one-digit numbers with up to two decimal places by whole 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 • use written division methods in cases where the answer has up to two decimal places • identify common factors, common multiples and prime numbers • perform mental calculations, including with mixed operations and large numbers • solve problems which require answers to be rounded to specified degrees of accuracy
	Unit 3 Calculation problems	<ul style="list-style-type: none"> • find pairs of numbers that satisfy an equation with two unknowns • use knowledge of the order of operations to carry out calculations involving the four operations • express missing number problems algebraically • solve problems involving addition, subtraction, multiplication and division
	Unit 4 Fractions	<ul style="list-style-type: none"> • use common factors to simplify fractions; use common multiples to express fractions in the same denomination • compare and order fractions, including fractions > 1 • 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 and decimals, including in different contexts • generate and describe linear number sequences (with fractions) • add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
	Unit 5 Missing angles and lengths	<ul style="list-style-type: none"> • recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. • express missing number problems algebraically • compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons

Year 6 Programme of Study - 'Term per page overview' 2017-2018

Spring	Unit 6 Coordinates and shape	<ul style="list-style-type: none"> • use negative numbers in context, and calculate intervals across zero • describe positions on the full coordinate grid (all four quadrants) • enumerate possibilities of combinations of two variables • draw 2-D shapes using given dimensions and angles • draw and translate simple shapes on the coordinate plane, and reflect them in the axes • recognise, describe and build simple 3-D shapes, including making nets • illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius • solve number and practical problems that involve all of the above
	Unit 7 Fractions	<ul style="list-style-type: none"> • 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, $\frac{1}{3} \div 2 = \frac{1}{6}$] • recall and use equivalences between simple fractions and decimals, including in different contexts
	Unit 8 Decimals and measures	<ul style="list-style-type: none"> • 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 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 • use simple formulae • 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] • generate and describe linear number sequences (with decimals)
	Unit 9 Percentages and statistics	<ul style="list-style-type: none"> • recall and use equivalences between simple fractions, decimals and percentages, including in different contexts • solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison • interpret and construct pie charts and line graphs and use these to solve problems • calculate and interpret the mean as an average
	Unit 10 Proportion problems	<ul style="list-style-type: none"> • 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 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

Year Five

Year 5 Programme of Study – ‘Term per page overview’ 2017-2018 FINAL

Term	National Curriculum requirements	
Autumn	Unit 1 Reasoning with large whole numbers	<ul style="list-style-type: none"> 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, 1000, 10 000 and 100 000 solve number problems and practical problems that involve all of the above read Roman numerals to 1000 (M) and recognise years written in Roman numerals
	Unit 2 Problem solving with integer addition and subtraction	<ul style="list-style-type: none"> add and subtract numbers mentally with increasingly large numbers add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) 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
	Unit 3 Line graphs and timetables	<ul style="list-style-type: none"> solve comparison, sum and difference problems using information presented in a line graph complete, read and interpret information in tables, including timetables solve problems involving converting between units of time
	Unit 4 Multiplication and division	<ul style="list-style-type: none"> identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers recognise and use square numbers and the notation for squared (2) 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 and divide whole numbers by 10, 100 and 1000 multiply and divide numbers mentally drawing upon known facts solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes multiply numbers up to 4 digits by a one- or two-digit number using a formal written method 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 solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
	Unit 5 Perimeter and area	<ul style="list-style-type: none"> 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 (cm^2) and square metres (m^2) and estimate the area of non-rectilinear shapes

Term	National Curriculum requirements	
Spring	Unit 6 Fractions and decimals	<ul style="list-style-type: none"> compare and order fractions whose denominators are all multiples of the same number recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents 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, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$] identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths read and write decimal numbers as fractions [for example, $0.71 = \frac{71}{100}$] 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
	Unit 7 Angles	<ul style="list-style-type: none"> know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles draw given angles, and measure them in degrees ($^{\circ}$) identify: angles at a point and one whole turn (total 360°); angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180°); other multiples of 90°
	Unit 8 Fractions, decimals and percentages	<ul style="list-style-type: none"> 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 solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates 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 $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$ and fraction and decimal equivalents of percentages that are multiples of 10 and 25 solve problems involving number up to three decimal places use all four operations to solve problems involving measure (for example length, mass, volume, money) using decimal notation, including scaling associate a fraction with division (Y6) use common factors to simplify fractions; use common multiples to express fractions in the same denomination (Y6)
	Unit 9 Transformations	<ul style="list-style-type: none"> 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 use the properties of rectangles to deduce related facts and find missing lengths and angles interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero use negative numbers in context, and calculate intervals across zero (Y6)

Summer	Unit 10 Converting units of measure	<ul style="list-style-type: none"> • convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram) • multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints
	Unit 11 Calculating with whole numbers and decimals	<ul style="list-style-type: none"> • use all four operations to solve problems involving measure (for example length, mass, volume, money) using decimal notation, including scaling • solve problems involving number up to three decimal places • 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 whole numbers and those involving decimals by 10, 100 and 1000
	Unit 12 2-D and 3-D shape	<ul style="list-style-type: none"> • 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 • identify 3-D shapes, including cubes and other cuboids, from 2-D representations • recognise, describe and build simple 3-D shapes, including making nets (Y6) • illustrate and name parts of circles, including radius, diameter and circumference and know that diameter is twice the radius. (Y6)
	Unit 13 Volume	<ul style="list-style-type: none"> • estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water] • recognise and use cube numbers and the notation for cubed (³)
	Unit 14 Problem solving	<ul style="list-style-type: none"> • consolidation and application opportunities

Year 4 Programme of Study - 'Term per page overview' 2017-2018 FINAL

Term	National Curriculum requirements	
Autumn	Unit 1 Reasoning with 4 digit numbers	<ul style="list-style-type: none"> • find 1000 more or less than a given number • recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) • order and compare numbers beyond 1000 • solve number and practical problems that involve all of the above and with increasingly large positive numbers • identify, represent and estimate numbers using different representations • round any number to the nearest 10, 100 or 1000 • count in multiples of 6, 7, 9, 25 and 1000
	Unit 2 Addition and subtraction	<ul style="list-style-type: none"> • 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
	Unit 3 Multiplication and division	<ul style="list-style-type: none"> • recall multiplication and division facts for multiplication tables up to 12×12 • 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 • recognise and use factor pairs and commutativity in mental calculations • 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 • multiply two-digit and three-digit numbers by a one-digit number using formal written layout
	Unit 4 Interpreting and presenting data	<ul style="list-style-type: none"> • solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs • interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs

Year 4 Programme of Study - 'Term per page overview' 2017-18

Spring	Unit 5 Securing multiplication facts	<ul style="list-style-type: none"> recall multiplication and division facts for multiplication tables up to 12×12
	Unit 6 Fractions	<ul style="list-style-type: none"> add and subtract fractions with the same denominator 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, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$] (Y5) 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
	Unit 7 Time	<ul style="list-style-type: none"> convert between different units of measure [for example, hour to minute] problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days write and convert time between analogue and digital 12- and 24-hour clocks
	Unit 8 Decimals	<ul style="list-style-type: none"> 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 recognise and write decimal equivalents of any number of tenths or hundredths recognise and write decimal equivalents to $\frac{1}{4}, \frac{1}{2}, \frac{3}{4}$ 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
	Unit 9 Area and perimeter	<ul style="list-style-type: none"> measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres convert between different units of measure [for example, kilometre to metre] find the area of rectilinear shapes by counting squares calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm^2) and square metres (m^2) (Y5) measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres (Y5)

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Summer	Unit 10 Solving measure and money problems	<ul style="list-style-type: none"> • convert between different units of measure [for example, kilometre to metre; hour to minute] • solve simple measure and money problems involving fractions and decimals to two decimal places • estimate, compare and calculate different measures, including money in pounds and pence
	Unit 11 2-D shape and symmetry	<ul style="list-style-type: none"> • 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
	Unit 12 Position and direction	<ul style="list-style-type: none"> • 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
	Unit 13 Reasoning with patterns and sequences	<ul style="list-style-type: none"> • 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 • count backwards through zero to include negative numbers • recognise and use square numbers, and the notation for squared (²) (Y5)
	Unit 14 3-D shape	<ul style="list-style-type: none"> • identify 3-D shapes, including cubes and other cuboids, from 2-D representations (Y5)

Year Three

Year 3 'Programme of Study - 'Term per page overview' 2017-2018 FINAL

Term	National Curriculum requirements	
Autumn 1	1. Number sense and exploring calculation strategies	<ul style="list-style-type: none"> • solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction • recognise the place value of each digit (tens, ones), compare and order numbers up to 100 • find 10 more or less than a given number • read and write numbers up to 100 in numerals and in words • solve number problems and practical problems involving these ideas • identify, represent and estimate numbers using different representations, including the number line • add and subtract amounts of money to give change, using both £ and p in practical contexts
	2. Place value	<ul style="list-style-type: none"> • identify, represent and estimate numbers using different representations • 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 • read and write numbers up to 1000 in numerals and in words • solve number problems and practical problems involving these ideas • count from 0 in multiples of 50 and 100
	3. Graphs	<ul style="list-style-type: none"> • 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
	4. Addition and subtraction	<ul style="list-style-type: none"> • add and subtract numbers mentally, including: a three-digit number and ones; a three-digit number and tens; a three-digit number and hundreds • add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction • estimate the answer to a calculation and use inverse operations to check answers • solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction
	5. Length and perimeter	<ul style="list-style-type: none"> • measure, compare, add and subtract: lengths (m/cm/mm) • solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction • measure the perimeter of simple 2-D shapes • continue to measure using the appropriate tools and units, progressing to using a wider range of measures, including comparing and using mixed ... and simple equivalents of mixed units (for example, 5m = 500cm)

Spring	6. Multiplication and division	<ul style="list-style-type: none"> recall and use multiplication and division facts for the 3 and 4 multiplication tables count from zero in multiples of 4 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
	7. Deriving multiplication and division facts	<ul style="list-style-type: none"> recall and use multiplication and division facts for the 3 and 4 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
	8. Time	<ul style="list-style-type: none"> tell and write the time using 12-hour analogue and digital clocks, including using Roman numerals from I to XII 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]
	9. Fractions	<ul style="list-style-type: none"> recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators 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 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

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Summer	10. Angles and shape	<ul style="list-style-type: none"> • 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 • draw 2-D shapes and make 3-D shapes using modelling materials • recognise 3-D shapes in different orientations and describe them • measure the perimeter of simple 2-D shapes
	11. Measures	<ul style="list-style-type: none"> • measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) • solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction • continue to measure using the appropriate tools and units, progressing to using a wider range of measures, including comparing and using mixed units (for example, 1 kg and 200g) and simple equivalents of mixed units (for example, 5m = 500cm)
	12. Securing multiplication & division	<ul style="list-style-type: none"> • 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 • recall and use multiplication and division facts for the 8 multiplication tables • count from zero in multiples of 8
	13. Exploring calculation strategies and place value	<ul style="list-style-type: none"> • add and subtract numbers mentally • find 1000 more or less than a given number; recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) (Y4) • order and compare numbers beyond 1000 (Y4) • round any number to the nearest 10, 100 or 1000 (Y4)

Year Two

Year 2 Programme of Study - 'Term per page overview' 2017-2018 FINAL

Term	National Curriculum requirements	
Autumn	1. Number within 100	<ul style="list-style-type: none"> • use place value and number facts to solve problems • recognise the place value of each digit in a two-digit number (tens, ones) • identify, represent and estimate numbers to 100 using different representations, including the number line • compare and order numbers from 0 up to 100; use $<$, $>$ and $=$ signs • read and write numbers to at least 100 in numerals and in words • count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward
	2. Addition and subtraction of 2-digit numbers	<ul style="list-style-type: none"> • 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) and subtraction of one number from another cannot • 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
	3. Addition and subtraction word problems	<ul style="list-style-type: none"> • recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems • solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities and measures; applying their increasing knowledge of mental and written methods • estimate the answer to a calculation and use inverse operations to check answers (Y3)
	4. Measures: length	<ul style="list-style-type: none"> • choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm) to the nearest appropriate unit, using rulers and scales • compare and order length and record the results using $>$, $<$ and $=$ • apply knowledge of numbers to 100 to read scales to the nearest appropriate standard unit in the context of length (m/cm)
	5. Graphs	<ul style="list-style-type: none"> • 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
	6. Multiplication and division 2, 5 and 10	<ul style="list-style-type: none"> • calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals ($=$) signs • solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts • show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot • recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers

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Spring	7. Time	<ul style="list-style-type: none"> 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 compare and sequence intervals of time
	8. Fractions	<ul style="list-style-type: none"> recognise, find, name and write fractions $\frac{1}{2}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity write simple fractions for example, $\frac{1}{2}$ of 6 = 3 recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$
	9. Addition and subtraction of 2-digit numbers (regrouping and adjusting)	<ul style="list-style-type: none"> 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) and subtraction of one number from another cannot 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 solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities and measures; applying their increasing knowledge of mental and written methods estimate the answer to a calculation and use inverse operations to check answers (Y3)
	10. Money	<ul style="list-style-type: none"> 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
	11. Faces, shapes and patterns; lines and turns	<ul style="list-style-type: none"> 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] identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line compare and sort common 2-D and 3-D shapes and everyday objects 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)

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<p>Summer</p>	<p>12. Number within 1000</p>	<ul style="list-style-type: none"> • use place value and number facts to solve problems • identify, represent and estimate numbers to 1000 using different representations (Y3) • recognise the place value of each digit in a three-digit number (hundreds, tens, ones) (Y3) • compare and order numbers up to 1000 (Y3) • read and write numbers up to 1000 in numerals and in words (Y3) • count from 0 in multiples of 100; find 10 or 100 more or less than a given number (Y3) • apply knowledge of numbers to 1000 to read scales
	<p>13. Measures: capacity and volume</p>	<ul style="list-style-type: none"> • choose and use appropriate standard units to estimate and measure capacity (litres/ml) and temperature (°C) to the nearest appropriate unit, using scales, thermometers and measuring vessels • compare and order volume and capacity and record the results using >, < and = • apply knowledge of numbers to 1000 to read scales to the nearest appropriate standard unit in the context of capacity (litres/ml) and temperature (°C) • using known facts to derive new facts (2ml + 2ml = 4ml so 200ml + 200ml = 400ml)
	<p>14. Measures: mass</p>	<ul style="list-style-type: none"> • choose and use appropriate standard units to estimate and measure mass (kg/g) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels • compare and order mass and record the results using >, < and = • apply knowledge of numbers to 1000 to read scales to the nearest appropriate standard unit in the context of mass (kg/g) • using known facts to derive new facts (2g + 2g = 4g so 200g + 200g = 400g)
	<p>15. Exploring calculation strategies</p>	<ul style="list-style-type: none"> • 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) and subtraction of one number from another cannot • add and subtract numbers mentally, including: a two-digit number and ones; a two-digit number and tens; adding three one-digit numbers • add and subtract numbers with up to two digits, using written methods
	<p>16. Multiplication and division (3x and 4x tables)</p>	<ul style="list-style-type: none"> • recall and use multiplication and division facts for the 3 and 4 multiplication tables (Y3) • calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs • solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts • show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot

Year One

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Term	National Curriculum requirements	
Autumn	1. Numbers to 10	<ul style="list-style-type: none"> • count to ten, forwards and backwards, beginning with 0 or 1, or from any given number • count, read and write numbers to 10 in numerals and words • 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 • given a number, identify one more and one less • count in multiples of twos • double and halve numbers within 10 • estimate numbers within 10
	2. Addition and subtraction within 10 (Combination and partitioning)	<ul style="list-style-type: none"> • represent and use number bonds and related subtraction facts [within 10] • add and subtract one-digit... numbers [to 10], including zero • read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems
	3. Shapes and patterns	<ul style="list-style-type: none"> • 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] • describe position, direction and movement, including whole and half turns
	4. Numbers to 20	<ul style="list-style-type: none"> • count to twenty, forwards and backwards, beginning with 0 or 1, or from any given number • count, read and write numbers from 1 to 20 in numerals and words • identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least • count in multiples of twos and fives • double and halve numbers within 20
	5. Addition and subtraction within 20 (Augmentation and reduction)	<ul style="list-style-type: none"> • represent and use number bonds and related subtraction facts within 20 • add and subtract one-digit and two-digit numbers to 20, including zero • read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$ • estimate to check answers

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Spring	6. Time	<ul style="list-style-type: none"> tell the time to the hour and half past the hour and draw the hands on a clock face to show these times recognise and use language relating to dates, including days of the week, weeks, months and years compare, describe and solve practical problems for time [for example, quicker, slower, earlier, later] and measure and begin to record time (hours, minutes, seconds) sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] describe position, direction and movement, including whole, half, quarter and three-quarter turns, with reference to the clock face
	7. Exploring calculation strategies within 20	<ul style="list-style-type: none"> represent and use number bonds and related subtraction facts within 20 add and subtract one-digit and two-digit numbers to 20, including zero read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$
	8. Numbers to 50	<ul style="list-style-type: none"> count to fifty, forwards and backwards, beginning with 0 or 1, or from any given number; count in twos, fives and tens. count, read and write numbers from 1 to 20 in numerals and words identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least given a number, identify one more and one less recognise the place value of each digit in a two-digit number (tens, ones) (Y2)
	9. Addition and subtraction within 20 (Comparison and difference)	<ul style="list-style-type: none"> represent and use number bonds and related subtraction facts within 20 add and subtract one-digit and two-digit numbers to 20, including zero add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones; adding three one-digit numbers (Y2) read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$ estimate to check answers
	10. Fractions	<ul style="list-style-type: none"> 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
	11. Measures (1): Length and mass	<ul style="list-style-type: none"> compare, describe and solve practical problems for: lengths and heights [for example, long/short, longer/shorter, tall/short, double/half]; mass/weight [for example, heavy/light, heavier than, lighter than] measure and begin to record the following: lengths and heights; mass/weight

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Summer	12. Numbers 50 to 100 and beyond	<ul style="list-style-type: none"> count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number; count on and back in twos fives and tens. count, read and write numbers from 1 to 20 in numerals and words; read and write numbers to at least 100 in numerals 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 recognise the place value of each digit in a two-digit number (tens, ones) (Y2)
	13. Addition and subtraction (Applying strategies and structures)	<ul style="list-style-type: none"> represent and use number bonds and related subtraction facts within 20 add and subtract one-digit and two-digit numbers, including zero 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 (Y2) read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$ estimate to check answers
	14. Money	<ul style="list-style-type: none"> recognise and know the value of different denominations of coins and notes solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$
	15. Multiplication and division	<ul style="list-style-type: none"> 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 recognise, find and name a half as one of two equal parts of a quantity recognise, find and name a quarter as one of four equal parts of a quantity
	16. Measures (2): Capacity and volume	<ul style="list-style-type: none"> compare, describe and solve practical problems for: 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] measure and begin to record the following: lengths and heights; mass/weight; capacity and volume

Year R

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Term	ELG and other aspects of mathematical learning in 30-50 or 40-60 month bands	
Autumn	1. Early mathematical experiences	<ul style="list-style-type: none"> • match equal sets using one-to-one correspondence • match unequal sets using one-to-one correspondence • compare objects according to size • compare sets without counting • order objects according to length or height • order sets without counting
	2. Pattern and early number	<ul style="list-style-type: none"> • recognise, create and describe patterns • describe and create patterns that are the same and different • count 1, 2 or 3 objects reliably • recognise if a number of objects is the same or different (working with numbers 1, 2 and 3) • count one, two or three objects, images or sounds reliably • recognise the numerals 1, 2 and 3 • create representations for numbers 1, 2 and 3
	3. Numbers within 6	<ul style="list-style-type: none"> • say which number is one more or one less than a given number • estimate a number of objects and check by counting • count reliably with numbers from 1 to 6 • Create representations for numbers 1- 6 • place numbers 1-6 in order • say which number from 1-6 is one more or one less than a given number • recognise the numerals 1-6 • understand the conservation of number
	4. Addition and subtraction within 6	<ul style="list-style-type: none"> • add and subtract two single-digit numbers • estimate a number of objects and check by counting up to 6 • introduce the concept of 0 as the empty set • subitise within 5 • represent and use number bonds within 5 • use quantities and objects to add and subtract two single-digit numbers
	5. Measures-length	<ul style="list-style-type: none"> • use everyday language to talk about size, weight, capacity • estimate, measure, weigh and compare and order objects • compare objects and quantities • solve size problems related to length
	6. Shape and sorting	<ul style="list-style-type: none"> • explore characteristics of everyday objects and shapes and use mathematical language to describe them • shows an interest in shape and space by playing with shapes by sustained construction activity • explore characteristics of everyday objects and shapes (focusing on 3-D shapes) • use positional language • use mathematical language associated with shape • classify and sort everyday objects

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Spring	7. Calendar and time	<ul style="list-style-type: none"> • use everyday language to talk about time, days of the week and months of the year • measures short periods of time in simple ways • orders and sequences familiar events • use ordinal numbers: 1st, 2nd...last
	8. Numbers within 10	<ul style="list-style-type: none"> • say which number is one more or one less than a given number • estimate a number of objects and check by counting • count reliably with numbers from 1 to 10 • develop an understanding of zero • create representations for numbers 0-10 • place numbers 0-10 in order • recognise the numerals 0-10 • use ordinal numbers: 1st, 2nd...last • understand the conservation of numbers
	9. Addition and subtraction within 10	<ul style="list-style-type: none"> • estimate a number of objects and check by counting up to 10 • add and subtract two single-digit numbers and count on or back to find the answer • use quantities and objects to add and subtract two single-digit numbers
	10. Numbers within 15	<ul style="list-style-type: none"> • say which number is one more or one less than a given number • estimate a number of objects and check by counting • count reliably with numbers from 0 to 15 • Create representations for numbers 0-15 • place numbers from 0-15 in order • considering equal and unequal groups
	11. Grouping and sharing	<ul style="list-style-type: none"> • solve practical problems that involve combining groups of 2, 5 or 10, or sharing into equal groups • solve practical problems that involve grouping and sharing • explore counting on in steps of 2 from zero
	12. Numbers within 20	<ul style="list-style-type: none"> • count reliably with numbers from one to 20 • place numbers from 0-20 in order • say which number is one more or one less than a given number • solve practical problems that involve grouping and sharing • Create representations for numbers 0-20 • estimate a number of objects and check by counting, considering equal and unequal groups
	13. Doubling and halving	<ul style="list-style-type: none"> • solve problems, including doubling, halving and sharing • Explore the relationship between doubling and halving

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Summer	14. Shape and pattern	<ul style="list-style-type: none"> • talk about properties of shapes • explore characteristics of everyday objects and shapes and use mathematical language to describe them • explore characteristics of everyday objects and shapes (focusing on 2-D shapes) • use mathematical language associated with shape • classify and sort shapes • recognise, create and describe patterns with shapes • use mathematical language to describe size and position
	15. Addition and subtraction within 20	<ul style="list-style-type: none"> • estimate a number of objects and check by counting up to 20 • add and subtract two single-digit numbers and count on or back to find the answer • explore the relationship between addition and subtraction • compare quantities and objects to solve problems • solve problems, including doubling, halving and sharing • say which number is one more or one less than a given number • use quantities and objects to add and subtract two single-digit numbers
	16. Money	<ul style="list-style-type: none"> • compare quantities and objects to solve problems • use everyday language to talk about money, recognise coins up to 50p and their values • compare the value of coins • use quantities and objects to count on and back to add and subtract
	17. Measures	<ul style="list-style-type: none"> • use everyday language to talk about size, weight, capacity • estimate, measure, weigh and compare and order objects • compare objects and quantities • solve size problems involving weight and capacity • explore measuring objects using non-standard units
	18. Depth of numbers within 20	<ul style="list-style-type: none"> • solve problems including grouping, sharing, doubling and halving • Records using marks that they can interpret and explain (DM 40-60+) • Begins to identify own mathematical problems based on own interests and fascinations (DM 40-60+)
	19. Numbers beyond 20	<ul style="list-style-type: none"> • say which number is one more or one less than a given number • solve problems including grouping and sharing • estimate a number of objects and check by counting • count reliably to 50 • explore counting on and back from any number within 50 • place numbers from 0-50 in order • estimate a number of objects and check by counting • solve practical problems that involve combining groups of 2, 5 or 10, or sharing into equal groups