Core learning in mathematics by year

Core learning in mathematics by year

Foundation Stage

Most children learn to:

Using and applying mathematics	Counting and understanding number	Knowing and using number facts	Calculating
Use developing mathematical ideas and methods to solve practical problems	**Say and use number names in order in familiar contexts**	Observe number relationships and patterns in the environment and use these to derive facts	**Begin to relate addition to combining two groups of objects and subtraction to 'taking away'**
Match sets of objects to numerals that represent the number of objects	Know that numbers identify how many objects are in a set	**Find one more or one less than a number from 1 to 10**	**In practical activities and discussion begin to use the vocabulary involved in adding and subtracting**
Sort objects, making choices and justifying decisions	**Count reliably up to 10 everyday objects**	Select two groups of objects to make a given total of objects	Count repeated groups of the same size
Talk about, recognise and recreate simple patterns	Estimate how many objects they can see and check by counting		Share objects into equal groups and count how many in each group
Describe solutions to practical problems, drawing on experience, talking about their own ideas, methods and choices	Count aloud in ones, twos, fives or tens		
	Use language such as 'more' or 'less' to compare two numbers		
	Use ordinal numbers in different contexts		
	Recognise numerals 1 to 9		

All statements and wording in bold refer to the Early Learning Goals.

Most children learn to:

Understanding shape	Measuring	Handling data
Use familiar objects and common shapes to create and recreate patterns and build models	**Use language such as 'greater', 'smaller', 'heavier' or 'lighter' to compare quantities**	Sort familiar objects to identify their similarities and differences
Use language such as 'circle' or 'bigger' to describe the shape and size of solids and flat shapes	Use everyday language related to time; order and sequence familiar events and measure short periods of time	Count how many objects share a particular property, presenting results using pictures, drawings or numerals
Use everyday words to describe position		

Core learning in mathematics by year

Foundation Stage

Core learning in mathematics by year

Year 1

Most children learn to:

Using and applying mathematics	Counting and understanding number	Knowing and using number facts	Calculating
Solve problems involving counting, adding, subtracting, doubling or halving in the context of numbers, measures or money, for example to 'pay' and 'give change'	Count reliably at least 20 objects, recognising that when rearranged the number of objects stays the same; estimate a number of objects that can be checked by counting	**Derive and recall all pairs of numbers with a total of 10 and addition facts for totals to at least 5; work out the corresponding subtraction facts**	Relate addition to counting on; recognise that addition can be done in any order; use practical and informal written methods to support the addition of a one-digit number or a multiple of 10 to a one-digit or two-digit number
Describe a puzzle or problem using numbers, practical materials and diagrams; use these to solve the problem and set the solution in the original context	Compare and order numbers, using the related vocabulary; use the equals (=) sign	Count on or back in ones, twos, fives and tens and use this knowledge to derive the multiples of 2, 5 and 10 to the tenth multiple	Understand subtraction as 'take away' and find a 'difference' by counting up; use practical and informal written methods to support the subtraction of a one-digit number from a one-digit or two-digit number and a multiple of 10 from a two-digit number
Answer a question by selecting and using suitable equipment, and sorting information, shapes or objects; display results using tables and pictures	**Read and write numerals from 0 to 20, then beyond; use knowledge of place value to position these numbers on a number track and number line**	Recall the doubles of all numbers to at least 10	**Use the vocabulary related to addition and subtraction and symbols to describe and record addition and subtraction number sentences**
Describe simple patterns and relationships involving numbers or shapes; decide whether examples satisfy given conditions	Say the number that is 1 more or less than any given number, and 10 more or less for multiples of 10		Solve practical problems that involve combining groups of 2, 5 or 10, or sharing into equal groups
Describe ways of solving puzzles and problems, explaining choices and decisions orally or using pictures	Use the vocabulary of halves and quarters in context		

Key objectives are in bold.

Most children learn to:

Understanding shape

Visualise and name common 2-D shapes and 3-D solids and describe their features; use them to make patterns, pictures and models

Identify objects that turn about a point (e.g. scissors) or about a line (e.g. a door); recognise and make whole, half and quarter turns

Visualise and use everyday language to describe the position of objects and direction and distance when moving them, for example when placing or moving objects on a game board

Measuring

Estimate, measure, weigh and compare objects, choosing and using suitable uniform non-standard or standard units and measuring instruments (e.g. a lever balance, metre stick or measuring jug)

Use vocabulary related to time; order days of the week and months; read the time to the hour and half hour

Handling data

Answer a question by recording information in lists and tables; present outcomes using practical resources, pictures, block graphs or pictograms

Use diagrams to sort objects into groups according to a given criterion; suggest a different criterion for grouping the same objects

Core learning in mathematics by year

Year 1

Core learning in mathematics by year

Year 2

Most children learn to:

Using and applying mathematics	Counting and understanding number	Knowing and using number facts	Calculating
Solve problems involving addition, subtraction, multiplication or division in contexts of numbers, measures or pounds and pence	Read and write two-digit and three-digit numbers in figures and words; describe and extend number sequences and recognise odd and even numbers	**Derive and recall all addition and subtraction facts for each number to at least 10, all pairs with totals to 20 and all pairs of multiples of 10 with totals up to 100**	**Add or subtract mentally a one-digit number or a multiple of 10 to or from any two-digit number; use practical and informal written methods to add and subtract two-digit numbers**
Identify and record the information or calculation needed to solve a puzzle or problem; carry out the steps or calculations and check the solution in the context of the problem	**Count up to 100 objects by grouping them and counting in tens, fives or twos; explain what each digit in a two-digit number represents, including numbers where 0 is a place holder; partition two-digit numbers in different ways, including into multiples of 10 and 1**	Understand that halving is the inverse of doubling and derive and recall doubles of all numbers to 20, and the corresponding halves	Understand that subtraction is the inverse of addition and vice versa; use this to derive and record related addition and subtraction number sentences
Follow a line of enquiry; answer questions by choosing and using suitable equipment and selecting, organising and presenting information in lists, tables and simple diagrams	Order two-digit numbers and position them on a number line; use the greater than (>) and less than (<) signs	Derive and recall multiplication facts for the 2, 5 and 10 times-tables and the related division facts; recognise multiples of 2, 5 and 10	Represent repeated addition and arrays as multiplication, and sharing and repeated subtraction (grouping) as division; use practical and informal written methods and related vocabulary to support multiplication and division, including calculations with remainders
Describe patterns and relationships involving numbers or shapes, make predictions and test these with examples	Estimate a number of objects; round two-digit numbers to the nearest 10	Use knowledge of number facts and operations to estimate and check answers to calculations	**Use the symbols +, –, ×, ÷ and = to record and interpret number sentences involving all four operations; calculate the value of an unknown in a number sentence (e.g. ☐ ÷ 2 = 6, 30 – ☐ = 24)**
Present solutions to puzzles and problems in an organised way; explain decisions, methods and results in pictorial, spoken or written form, using mathematical language and number sentences	Find one half, one quarter and three quarters of shapes and sets of objects		

Key objectives are in bold.

Most children learn to:

Understanding shape

Visualise common 2-D shapes and 3-D solids; identify shapes from pictures of them in different positions and orientations; sort, make and describe shapes, referring to their properties

Identify reflective symmetry in patterns and 2-D shapes and draw lines of symmetry in shapes

Follow and give instructions involving position, direction and movement

Recognise and use whole, half and quarter turns, both clockwise and anticlockwise; know that a right angle represents a quarter turn

Measuring

Estimate, compare and measure lengths, weights and capacities, choosing and using standard units (m, cm, kg, litre) and suitable measuring instruments

Read the numbered divisions on a scale, and interpret the divisions between them (e.g. on a scale from 0 to 25 with intervals of 1 shown but only the divisions 0, 5, 10, 15 and 20 numbered); use a ruler to draw and measure lines to the nearest centimetre

Use units of time (seconds, minutes, hours, days) and know the relationships between them; read the time to the quarter hour; identify time intervals, including those that cross the hour

Handling data

Answer a question by collecting and recording data in lists and tables; represent the data as block graphs or pictograms to show results; use ICT to organise and present data

Use lists, tables and diagrams to sort objects; explain choices using appropriate language, including 'not'

Core learning in mathematics by year

Year 2

Core learning in mathematics by year

Year 3

Most children learn to:

Using and applying mathematics

Solve one-step and two-step problems involving numbers, money or measures, including time, choosing and carrying out appropriate calculations

Represent the information in a puzzle or problem using numbers, images or diagrams; use these to find a solution and present it in context, where appropriate using £.p notation or units of measure

Follow a line of enquiry by deciding what information is important; make and use lists, tables and graphs to organise and interpret the information

Identify patterns and relationships involving numbers or shapes, and use these to solve problems

Describe and explain methods, choices and solutions to puzzles and problems, orally and in writing, using pictures and diagrams

Counting and understanding number

Read, write and order whole numbers to at least 1000 and position them on a number line; count on from and back to zero in single-digit steps or multiples of 10

Partition three-digit numbers into multiples of 100, 10 and 1 in different ways

Round two-digit or three-digit numbers to the nearest 10 or 100 and give estimates for their sums and differences

Read and write proper fractions (e.g. $^3/_7$, $^9/_{10}$), interpreting the denominator as the parts of a whole and the numerator as the number of parts; identify and estimate fractions of shapes; use diagrams to compare fractions and establish equivalents

Knowing and using number facts

Derive and recall all addition and subtraction facts for each number to 20, sums and differences of multiples of 10 and number pairs that total 100

Derive and recall multiplication facts for the 2, 3, 4, 5, 6 and 10 times-tables and the corresponding division facts; recognise multiples of 2, 5 or 10 up to 1000

Use knowledge of number operations and corresponding inverses, including doubling and halving, to estimate and check calculations

Calculating

Add or subtract mentally combinations of one-digit and two-digit numbers

Develop and use written methods to record, support or explain addition and subtraction of two-digit and three-digit numbers

Multiply one-digit and two-digit numbers by 10 or 100, and describe the effect

Use practical and informal written methods to multiply and divide two-digit numbers (e.g. 13 × 3, 50 ÷ 4); round remainders up or down, depending on the context

Understand that division is the inverse of multiplication and vice versa; use this to derive and record related multiplication and division number sentences

Find unit fractions of numbers and quantities (e.g. $^1/_2$, $^1/_3$, $^1/_4$ and $^1/_6$ of 12 litres)

Key objectives are in bold.

Most children learn to:

Understanding shape

Relate 2-D shapes and 3-D solids to drawings of them; describe, visualise, classify, draw and make the shapes

Draw and complete shapes with reflective symmetry; draw the reflection of a shape in a mirror line along one side

Read and record the vocabulary of position, direction and movement, using the four compass directions to describe movement about a grid

Use a set-square to draw right angles and to identify right angles in 2-D shapes; compare angles with a right angle; recognise that a straight line is equivalent to two right angles

Measuring

Know the relationships between kilometres and metres, metres and centimetres, kilograms and grams, litres and millilitres; choose and use appropriate units to estimate, measure and record measurements

Read, to the nearest division and half-division, scales that are numbered or partially numbered; use the information to measure and draw to a suitable degree of accuracy

Read the time on a 12-hour digital clock and to the nearest 5 minutes on an analogue clock; calculate time intervals and find start or end times for a given time interval

Handling data

Answer a question by collecting, organising and interpreting data; use tally charts, frequency tables, pictograms and bar charts to represent results and illustrate observations; use ICT to create a simple bar chart

Use Venn diagrams or Carroll diagrams to sort data and objects using more than one criterion

Core learning in mathematics by year

Year 3

Core learning in mathematics by year

Year 4

Most children learn to:

Using and applying mathematics

Solve one-step and two-step problems involving numbers, money or measures, including time; choose and carry out appropriate calculations, using calculator methods where appropriate

Represent a puzzle or problem using number sentences, statements or diagrams; use these to solve the problem; present and interpret the solution in the context of the problem

Suggest a line of enquiry and the strategy needed to follow it; collect, organise and interpret selected information to find answers

Identify and use patterns, relationships and properties of numbers or shapes; investigate a statement involving numbers and test it with examples

Report solutions to puzzles and problems, giving explanations and reasoning orally and in writing, using diagrams and symbols

Counting and understanding number

Recognise and continue number sequences formed by counting on or back in steps of constant size

Partition, round and order four-digit whole numbers; use positive and negative numbers in context and position them on a number line; state inequalities using the symbols < and > (e.g. –3 > –5, –1 < +1)

Use decimal notation for tenths and hundredths and partition decimals; relate the notation to money and measurement; position one-place and two-place decimals on a number line

Recognise the equivalence between decimal and fraction forms of one half, quarters, tenths and hundredths

Use diagrams to identify equivalent fractions (e.g. $^{6}/_{8}$ and $^{3}/_{4}$, or $^{70}/_{100}$ and $^{7}/_{10}$); interpret mixed numbers and position them on a number line (e.g. $3^{1}/_{2}$)

Use the vocabulary of ratio and proportion to describe the relationship between two quantities (e.g. 'There are 2 red beads to every 3 blue beads, or 2 beads in every 5 beads are red'); estimate a proportion (e.g. 'About one quarter of the apples in the box are green')

Knowing and using number facts

Use knowledge of addition and subtraction facts and place value to derive sums and differences of pairs of multiples of 10, 100 or 1000

Identify the doubles of two-digit numbers; use these to calculate doubles of multiples of 10 and 100 and derive the corresponding halves

Derive and recall multiplication facts up to 10 × 10, the corresponding division facts and multiples of numbers to 10 up to the tenth multiple

Use knowledge of rounding, number operations and inverses to estimate and check calculations

Identify pairs of fractions that total 1

Calculating

Add or subtract mentally pairs of two-digit whole numbers (e.g. 47 + 58, 91 – 35)

Refine and use efficient written methods to add and subtract two-digit and three-digit whole numbers and £.p

Multiply and divide numbers to 1000 by 10 and then 100 (whole-number answers), understanding the effect; relate to scaling up or down

Develop and use written methods to record, support and explain multiplication and division of two-digit numbers by a one-digit number, including division with remainders (e.g. 15 × 9, 98 ÷ 6)

Find fractions of numbers, quantities or shapes (e.g. $^{1}/_{5}$ of 30 plums, $^{3}/_{8}$ of a 6 by 4 rectangle)

Use a calculator to carry out one-step and two-step calculations involving all four operations; recognise negative numbers in the display, correct mistaken entries and interpret the display correctly in the context of money

Key objectives are in bold.

Most children learn to:

Understanding shape

Draw polygons and classify them by identifying their properties, including their line symmetry

Visualise 3-D objects from 2-D drawings; make nets of common solids

Recognise horizontal and vertical lines; use the eight compass points to describe direction; describe and identify the position of a square on a grid of squares

Know that angles are measured in degrees and that one whole turn is 360°; compare and order angles less than 180°

Measuring

Choose and use standard metric units and their abbreviations when estimating, measuring and recording length, weight and capacity; know the meaning of 'kilo', 'centi' and 'milli' and, where appropriate, use decimal notation to record measurements (e.g. 1.3 m or 0.6 kg)

Interpret intervals and divisions on partially numbered scales and record readings accurately, where appropriate to the nearest tenth of a unit

Draw rectangles and measure and calculate their perimeters; find the area of rectilinear shapes drawn on a square grid by counting squares

Read time to the nearest minute; use am, pm and 12-hour clock notation; choose units of time to measure time intervals; calculate time intervals from clocks and timetables

Handling data

Answer a question by identifying what data to collect; organise, present, analyse and interpret the data in tables, diagrams, tally charts, pictograms and bar charts, using ICT where appropriate

Compare the impact of representations where scales have intervals of differing step size

Core learning in mathematics by year

Year 4

Core learning in mathematics by year

Year 5

Most children learn to:

Using and applying mathematics

Solve one-step and two-step problems involving whole numbers and decimals and all four operations, choosing and using appropriate calculation strategies, including calculator use

Represent a puzzle or problem by identifying and recording the information or calculations needed to solve it; find possible solutions and confirm them in the context of the problem

Plan and pursue an enquiry; present evidence by collecting, organising and interpreting information; suggest extensions to the enquiry

Explore patterns, properties and relationships and propose a general statement involving numbers or shapes; identify examples for which the statement is true or false

Explain reasoning using diagrams, graphs and text; refine ways of recording using images and symbols

Counting and understanding number

Count from any given number in whole-number and decimal steps, extending beyond zero when counting backwards; relate the numbers to their position on a number line

Explain what each digit represents in whole numbers and decimals with up to two places, and partition, round and order these numbers

Express a smaller whole number as a fraction of a larger one (e.g. recognise that 5 out of 8 is $^5/_8$); find equivalent fractions (e.g. $^7/_{10} = {}^{14}/_{20}$, or $^{19}/_{10} = 1\,^9/_{10}$); relate fractions to their decimal representations

Understand percentage as the number of parts in every 100 and express tenths and hundredths as percentages

Use sequences to scale numbers up or down; solve problems involving proportions of quantities (e.g. decrease quantities in a recipe designed to feed six people)

Knowing and using number facts

Use knowledge of place value and addition and subtraction of two-digit numbers to derive sums and differences and doubles and halves of decimals (e.g. 6.5 ± 2.7, half of 5.6, double 0.34)

Recall quickly multiplication facts up to 10 × 10 and use them to multiply pairs of multiples of 10 and 100; derive quickly corresponding division facts

Identify pairs of factors of two-digit whole numbers and find common multiples (e.g. for 6 and 9)

Use knowledge of rounding, place value, number facts and inverse operations to estimate and check calculations

Calculating

Extend mental methods for whole-number calculations, for example to multiply a two-digit by a one-digit number (e.g. 12 × 9), to multiply by 25 (e.g. 16 × 25), to subtract one near-multiple of 1000 from another (e.g. 6070 – 4097)

Use efficient written methods to add and subtract whole numbers and decimals with up to two places

Use understanding of place value to multiply and divide whole numbers and decimals by 10, 100 or 1000

Refine and use efficient written methods to multiply and divide HTU × U, TU × TU, U.t × U and HTU ÷ U

Find fractions using division (e.g. $^1/_{100}$ of 5 kg), and percentages of numbers and quantities (e.g. 10%, 5% and 15% of £80)

Use a calculator to solve problems, including those involving decimals or fractions (e.g. find $^3/_4$ of 150 g); interpret the display correctly in the context of measurement

Key objectives are in bold.

Most children learn to:

Understanding shape

Identify, visualise and describe properties of rectangles, triangles, regular polygons and 3-D solids; use knowledge of properties to draw 2-D shapes, and to identify and draw nets of 3-D shapes

Read and plot coordinates in the first quadrant; recognise parallel and perpendicular lines in grids and shapes; use a set-square and ruler to draw shapes with perpendicular or parallel sides

Complete patterns with up to two lines of symmetry; draw the position of a shape after a reflection or translation

Estimate, draw and measure acute and obtuse angles using an angle measurer or protractor to a suitable degree of accuracy; calculate angles in a straight line

Measuring

Read, choose, use and record standard metric units to estimate and measure length, weight and capacity to a suitable degree of accuracy (e.g. the nearest centimetre); convert larger to smaller units using decimals to one place (e.g. change 2.6 kg to 2600 g)

Interpret a reading that lies between two unnumbered divisions on a scale

Draw and measure lines to the nearest millimetre; measure and calculate the perimeter of regular and irregular polygons; use the formula for the area of a rectangle to calculate the rectangle's area

Read timetables and time using 24-hour clock notation; use a calendar to calculate time intervals

Handling data

Describe the occurrence of familiar events using the language of chance or likelihood

Answer a set of related questions by collecting, selecting and organising relevant data; draw conclusions, using ICT to present features, and identify further questions to ask

Construct frequency tables, pictograms and bar and line graphs to represent the frequencies of events and changes over time

Find and interpret the mode of a set of data

Core learning in mathematics by year

Year 5

Core learning in mathematics by year

Year 6

Most children learn to:

Using and applying mathematics

Solve multi-step problems, and problems involving fractions, decimals and percentages; choose and use appropriate calculation strategies at each stage, including calculator use

Tabulate systematically the information in a problem or puzzle; identify and record the steps or calculations needed to solve it, using symbols where appropriate; interpret solutions in the original context and check their accuracy

Suggest, plan and develop lines of enquiry; collect, organise and represent information, interpret results and review methods; identify and answer related questions

Represent and interpret sequences, patterns and relationships involving numbers and shapes; suggest and test hypotheses; construct and use simple expressions and formulae in words then symbols (e.g. the cost of c pens at 15 pence each is 15c pence)

Explain reasoning and conclusions, using words, symbols or diagrams as appropriate

Counting and understanding number

Find the difference between a positive and a negative integer, or two negative integers, in context

Use decimal notation for tenths, hundredths and thousandths; partition, round and order decimals with up to three places, and position them on the number line

Express a larger whole number as a fraction of a smaller one (e.g. recognise that 8 slices of a 5-slice pizza represents $^{8}/_{5}$ or $1^{3}/_{5}$ pizzas); simplify fractions by cancelling common factors; order a set of fractions by converting them to fractions with a common denominator

Express one quantity as a percentage of another (e.g. express £400 as a percentage of £1000); find equivalent percentages, decimals and fractions

Solve simple problems involving direct proportion by scaling quantities up or down

Knowing and using number facts

Use knowledge of place value and multiplication facts to 10 × 10 to derive related multiplication and division facts involving decimals (e.g. 0.8 × 7, 4.8 ÷ 6)

Use knowledge of multiplication facts to derive quickly squares of numbers to 12 × 12 and the corresponding squares of multiples of 10

Recognise that prime numbers have only two factors and identify prime numbers less than 100; find the prime factors of two-digit numbers

Use approximations, inverse operations and tests of divisibility to estimate and check results

Calculating

Calculate mentally with integers and decimals: U.t ± U.t, TU × U, TU ÷ U, U.t × U, U.t ÷ U

Use efficient written methods to add and subtract integers and decimals, to multiply and divide integers and decimals by a one-digit integer, and to multiply two-digit and three-digit integers by a two-digit integer

Relate fractions to multiplication and division (e.g. 6 ÷ 2 = $^{1}/_{2}$ of 6 = 6 × $^{1}/_{2}$); express a quotient as a fraction or decimal (e.g. 67 ÷ 5 = 13.4 or $13^{2}/_{5}$); find fractions and percentages of whole-number quantities (e.g. $^{5}/_{8}$ of 96, 65% of £260)

Use a calculator to solve problems involving multi-step calculations

Key objectives are in bold.

Most children learn to:

Understanding shape

Describe, identify and visualise parallel and perpendicular edges or faces; use these properties to classify 2-D shapes and 3-D solids

Make and draw shapes with increasing accuracy and apply knowledge of their properties

Visualise and draw on grids of different types where a shape will be after reflection, after translations, or after rotation through 90° or 180° about its centre or one of its vertices

Use coordinates in the first quadrant to draw, locate and complete shapes that meet given properties

Estimate angles, and use a protractor to measure and draw them, on their own and in shapes; calculate angles in a triangle or around a point

Measuring

Select and use standard metric units of measure and convert between units using decimals to two places (e.g. change 2.75 litres to 2750 ml, or vice versa)

Read and interpret scales on a range of measuring instruments, recognising that the measurement made is approximate and recording results to a required degree of accuracy; compare readings on different scales, for example when using different instruments

Calculate the perimeter and area of rectilinear shapes; estimate the area of an irregular shape by counting squares

Handling data

Describe and predict outcomes from data using the language of chance or likelihood

Solve problems by collecting, selecting, processing, presenting and interpreting data, using ICT where appropriate; draw conclusions and identify further questions to ask

Construct and interpret frequency tables, bar charts with grouped discrete data, and line graphs; interpret pie charts

Describe and interpret results and solutions to problems using the mode, range, median and mean

Core learning in mathematics by year

Year 6

Core learning in mathematics by year

Year 6 progression to Year 7

Most children learn to:

Using and applying mathematics	Counting and understanding number	Knowing and using number facts	Calculating
Solve problems by breaking down complex calculations into simpler steps; choose and use operations and calculation strategies appropriate to the numbers and context; try alternative approaches to overcome difficulties; present, interpret and compare solutions	Compare and order integers and decimals in different contexts Order a set of fractions by converting them to decimals	Consolidate rapid recall of number facts, including multiplication facts to 10 × 10 and the associated division facts Recognise the square roots of perfect squares to 12 × 12	Understand how the commutative, associative and distributive laws, and the relationships between operations, including inverse operations, can be used to calculate more efficiently; use the order of operations, including brackets
Represent information or unknown numbers in a problem, for example in a table, formula or equation; explain solutions in the context of the problem	Recognise approximate proportions of a whole and use fractions and percentages to describe and compare them, for example when interpreting pie charts	Recognise and use multiples, factors, divisors, common factors, highest common factors and lowest common multiples in simple cases	Consolidate and extend mental methods of calculation to include decimals, fractions and percentages
Develop and evaluate lines of enquiry; identify, collect, organise and analyse relevant information; decide how best to represent conclusions and what further questions to ask	**Use ratio notation, reduce a ratio to its simplest form and divide a quantity into two parts in a given ratio; solve simple problems involving ratio and direct proportion (e.g. identify the quantities needed to make a fruit drink by mixing water and juice in a given ratio)**	**Make and justify estimates and approximations to calculations**	Use standard column procedures to add and subtract integers and decimals, and to multiply two-digit and three-digit integers by a one-digit or two-digit integer; extend division to dividing three-digit integers by a two-digit integer
Generate sequences and describe the general term; use letters and symbols to represent unknown numbers or variables; represent simple relationships as graphs			Calculate percentage increases or decreases and fractions of quantities and measurements (integer answers)
Explain and justify reasoning and conclusions, using notation, symbols and diagrams; find a counter-example to disprove a conjecture; use step-by-step deductions to solve problems involving shapes			**Use bracket keys and the memory of a calculator to carry out calculations with more than one step; use the square root key**

Key objectives are in bold.

Most children learn to:

Understanding shape

Use correctly the vocabulary, notation and labelling conventions for lines, angles and shapes

Extend knowledge of properties of triangles and quadrilaterals and use these to visualise and solve problems, explaining reasoning with diagrams

Know the sum of angles on a straight line, in a triangle and at a point, and recognise vertically opposite angles

Use all four quadrants to find coordinates of points determined by geometric information

Identify all the symmetries of 2-D shapes; transform images using ICT

Construct a triangle given two sides and the included angle

Measuring

Convert between related metric units using decimals to three places (e.g. convert 1375 mm to 1.375 m, or vice versa)

Solve problems by measuring, estimating and calculating; measure and calculate using imperial units still in everyday use; know their approximate metric values

Calculate the area of right-angled triangles given the lengths of the two perpendicular sides, and the volume and surface area of cubes and cuboids

Handling data

Understand and use the probability scale from 0 to 1; find and justify probabilities based on equally likely outcomes in simple contexts

Explore hypotheses by planning surveys or experiments to collect small sets of discrete or continuous data; select, process, present and interpret the data, using ICT where appropriate; identify ways to extend the survey or experiment

Construct, interpret and compare graphs and diagrams that represent data, for example compare proportions in two pie charts that represent different totals

Write a short report of a statistical enquiry and illustrate with appropriate diagrams, graphs and charts, using ICT as appropriate; justify the choice of what is presented

Core learning in mathematics by year

Year 6 progression to Year 7