Foundation Stage (objectives in bold type are taken directly from the Early Learning Goals)

Children learn to:

Use and apply mathematics

- **Use developing mathematical, ideas and methods to solve practical problems**
- Match sets of objects to numerals that represent the number of objects
- Sort objects, making choices and justifying decisions
- **Talk about, recognise and recreate simple patterns**
- Describe solutions to practical problems, drawing on experience, talking about own ideas, methods and choices

Count, compare and order numbers, and describe relationships between them

- **Say and use the number names in order in familiar contexts**
- Know that numbers identify how many objects are in a set
- **Count reliably up to 10 everyday objects**
- Estimate how many objects they can see and check by counting
- Count aloud in ones, twos, fives or tens
- Match then compare the number of objects in two sets
- **Use language such as 'more' or 'less' to compare two numbers**
- Use ordinal numbers in different contexts
- **Recognise numerals 1 - 9**

Secure knowledge of number facts that can be recalled quickly and used and applied appropriately

- Observe number relationships and patterns in the environment and use these to derive facts
- **Find one more or one less than a number from one to 10**
- Select two groups of objects to make a given total of objects

Calculate efficiently and accurately

- **Begin to relate addition to combining two groups of objects and subtraction to 'taking away'**
- **In practical activities and discussion begin to use the vocabulary involved in adding and subtracting**
- Count repeated groups of the same size
- Share objects into equal groups and count how many in each group

Position and transform shapes, recognise and use their properties to visualise and construct

- Use familiar objects and common shapes to create and recreate patterns and build models

- **Use language such as ‘circle’ or ‘bigger’ to describe the shape and size of solids and flat shapes**
- **Use everyday words to describe position**

Measure accurately using appropriate units, interpret and compare scales

- **Use language such as ‘greater’, ‘smaller, ‘heavier’ or ‘lighter’ to compare quantities**
- Use everyday language related to time; order and sequence familiar events and measure short periods of time with a non-standard unit

Process, present and interpret data to pose and answer questions

- **Use developing mathematical ideas and methods to solve practical problems**
- **Talk about, recognise and recreate simple patterns**
- Sort familiar objects and count how many objects share a particular property, presenting results using pictures, drawings or numerals

Year 1

Children learn to:

Use and apply mathematics

- Solve problems involving counting, adding, subtracting, doubling or halving in the context of numbers, measures or money; recognise the value of coins
- Describe a problem using numbers, practical materials and diagrams; use these to solve the problem and set the solution back in the original context
- Answer a question by selecting and using suitable equipment, and sorting information, shapes or objects; display results using tables and pictures
- Describe simple patterns and relationships involving numbers or shapes; decide whether examples satisfy given conditions
- Describe ways of solving problems and explain choices and decisions orally or using pictures

Count, compare and order numbers, and describe relationships between them

- Count reliably at least 20 objects, recognising that when rearranged the number of objects stays the same; relate addition to counting on and count on or back in ones, twos, fives and tens; estimate a number of objects that can be checked by counting
- Compare and order numbers, using the related vocabulary; use the equals (=) sign
- Read and write numerals, numbers from 0 to at least 20 and the multiples of 10, and position these numbers on a number track and number line
- Say the number that is one more or less than any given number, and ten more or less for multiples of ten
- Use the vocabulary of halves and quarters in context

Secure knowledge of number facts that can be recalled quickly and used and applied appropriately

- 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
- Use knowledge of counting in twos, fives and tens to derive the multiples of 2, 5 and 10 to the tenth multiple
- Recall the doubles of all numbers to at least 10

Calculate efficiently and accurately

- Recognise that addition can be done in any order and use this to add mentally a one-digit number or a multiple of 10 to a one-digit or two-digit number
- Subtract one-digit numbers from one-digit and two-digit numbers and a multiple of 10 from a two-digit number; apply addition and subtraction strategies, e.g. counting on to find the difference
- Understand subtraction as both ‘take away’ and ‘difference’ and use the related vocabulary and symbols to describe and record addition and subtraction number sentences
- Solve practical problems that involve combining groups of 2, 5 or 10, or sharing into equal groups

Position and transform shapes, recognise and use their properties to visualise and construct

- 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 rotate; recognise and make whole, half and quarter turns
- Visualise and describe the position of objects and direction and distance when moving them, e.g. when placing or moving objects on a games board

Measure accurately using appropriate units, interpret and compare scales

- 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

Process, present and interpret data to pose and answer questions

- 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

Year 2

Children learn to:

Use and apply mathematics

- Solve problems involving addition, subtraction, multiplication or division in contexts of numbers, measures or pounds and pence
- Identify and record the number sentences involved in a problem, carry out the calculations and check that the solution makes sense in the context of the problem
- Follow a line of enquiry; answer questions by selecting and using suitable equipment and information, and organising and presenting the information in lists, tables and simple diagrams
- Describe patterns and relationships involving numbers or shapes, make predictions and test these with examples
- Present solutions to problems in an organised way; explain decisions, methods and results in spoken, pictorial and written form, using mathematical language and symbols

Count, compare and order numbers, and describe relationships between them

- Read and write two- and three-digit numbers in figures and words; describe and extend number sequences and recognise odd and even numbers
- 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 ten and one
- Order two-digit numbers and position them on a number line; use the greater than (>), less than (<) signs
- Estimate a number of objects and round two-digit numbers to the nearest 10
- Find one half, one quarter and three quarters of shapes and sets of objects

Secure knowledge of number facts that can be recalled quickly and used and applied appropriately

- 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
- Understand that halving is the inverse of doubling and derive and recall doubles of all numbers to 20, and the corresponding halves
- 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
- Use knowledge of number facts and operations to check answers to calculations

Calculate efficiently and accurately

- Add or subtract mentally a single-digit number or a multiple of 10 to or from any two-digit number; use practical and informal written methods to support addition and subtraction of two-digit numbers
- Understand that subtraction reverses addition and vice versa and use this to derive and record related addition and subtraction number sentences

- Represent repeated addition and arrays as multiplication, and sharing and repeated subtraction (grouping) as division; use practical and informal written methods to support multiplication and division calculations, including those with remainders
- 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. 30 – □ = 24, □ ÷ 2 = 6

Position and transform shapes, recognise and use their properties to visualise and construct

- Visualise common 2-D shapes and 3-D solids and identify them 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 anti-clockwise; know that a right angle represents a quarter turn

Measure accurately using appropriate units, interpret and compare scales

- Estimate, compare and measure lengths, masses 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 and identify time intervals, including those that cross the hour boundary

Process, present and interpret data to pose and answer questions

- Answer a question by 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 against one or two criteria; explain choices using appropriate language, including *not*

Year 3

Children learn to:

Use and apply mathematics

- Solve one- and two-step problems involving numbers, money or measures, including time, choosing and carrying out appropriate calculations
- Represent the information in a problem using numbers and images; 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
- Use patterns, properties of and relationships between numbers or shapes to identify similarities and differences, and to solve puzzles
- Describe and explain methods, choices and solutions to problems, orally and in writing, using pictures and diagrams

Count, compare and order numbers, and describe relationships between them

- Order whole numbers to at least 1000 and position them on a number line
- Partition three-digit numbers in different ways, including into multiples of one hundred, ten and one
- Round two- or three-digit numbers to the nearest 10 or 100 and give estimates and approximations to 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 fractions of shapes and use diagrams to compare fractions and establish equivalents

Secure knowledge of number facts that can be recalled quickly and used and applied appropriately

- 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
- Use knowledge of number operations and corresponding inverses to check calculations

Calculate efficiently and accurately

- Add or subtract mentally combinations of one-digit and two-digit numbers
- Develop and refine written methods to support, record or explain the addition and subtraction of two-digit and three-digit numbers
- Multiply one- and two-digit numbers by 10 or 100, and describe the effect
- Use practical and informal written methods to support multiplication and division of two-digit numbers (e.g. 13 × 3, 30 ÷ 4); round remainders up or down, depending on the context
- Understand that division reverses multiplication and vice versa and use to derive and record related multiplication and division number sentences
- Find unit fractions of numbers and quantities, e.g. ½, ⅓, ¼ and $^{1}/_{6}$ of 12 litres

Position and transform shapes, recognise and use their properties to visualise and construct

- Relate 2-D shapes and 3-D solids to drawings of them, and describe, classify, draw and make the shapes
- Draw and complete shapes with reflective symmetry and 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 two right angles can form a straight line

Measure accurately using appropriate units, interpret and compare scales

- 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 five minutes on an analogue clock; calculate time intervals and find start or end times for a given time interval

Process, present and interpret data to pose and answer questions

- Answer a question by organising, representing and interpreting data; use tally charts, frequency tables, pictograms and bar charts to highlight results and 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

Year 4

Children learn to:

Use and apply mathematics

- Solve one- and two-step problems involving numbers, money or measures, including time; choose and carry out appropriate calculations, using calculator methods where appropriate
- Represent a problem using number sentences and diagrams, use these to find a strategy to solve the problem and present the solution in the context of the problem
- Suggest a line of enquiry and the strategy needed to pursue it; collect, organise and interpret selected information to find answers
- Use knowledge of numbers and shapes to identify patterns, properties and relationships, and apply them to unfamiliar situations; investigate a statement involving numbers and test it with examples
- Report solutions to problems, explanations and reasoning orally and in writing

Count, compare and order numbers, and describe relationships between them

- Use positive and negative numbers in context; position them on a number line and state inequalities using the symbols < and >, e.g. –3 > –5, –1 < +1
- Use decimal notation for tenths and hundredths, relating the notation to money and measurement; position one- and two-place decimals on a number line
- Recognise the equivalence between decimal and fraction forms of tenths and hundredths
- Use fractions to identify subsets of a set of objects; 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. $3\frac{1}{2}$
- Use the vocabulary of ratio and proportion to describe the relationship between two quantities, e.g. 2 to every 3, and between part and whole, e.g. 2 in every 5; estimate proportion, e.g. ‘for every 1 red car there are about 4 silver cars’, or ‘I’m asleep for about ⅓ of the day’

Secure knowledge of number facts that can be recalled quickly and used and applied appropriately

- 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 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 check calculations
- Identify pairs of fractions that total 1

Calculate efficiently and accurately

- Add or subtract mentally pairs of two-digit whole numbers, e.g. 47 + 58, 91 – 35
- Use the standard written methods for addition and subtraction of two-digit and three-digit whole numbers and calculations with £.p

- Multiply or divide numbers to 1000 by 10 and then 100 (whole number answers), understanding the effect; relate to scaling up or down
- Develop and refine written methods for multiplying and dividing a two-digit number by a one-digit number, to include division with remainders, e.g. 15 × 9, 98 ÷ 6
- Find fractions of numbers, quantities or shapes, e.g. $\frac{1}{5}$ of 30 plums, $\frac{3}{8}$ of a 6 by 4 rectangle
- Use a calculator to carry out one- 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

Position and transform shapes, recognise and use their properties to visualise and construct

- Draw polygons and classify them by identifying their properties
- Visualise 3-D objects from 2-D drawings and 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°

Measure accurately using appropriate units, interpret and compare scales

- Use standard metric units and their abbreviations when estimating, measuring and recording length, mass 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; calculate time intervals from clocks and timetables

Process, present and interpret data to pose and answer questions

- Determine the data needed to answer a specific question; 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

Year 5

Children learn to:

Use and apply mathematics

- Solve one and two-step problems involving whole numbers and decimals and all four operations, choosing and using appropriate methods, including calculator use
- Represent a problem by identifying and recording the 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

Count, compare and order numbers, and describe relationships between them

- Count from any given number in whole number steps and decimal number 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 numbers with up to two decimal places, and partition these numbers
- Use sequences to scale numbers up or down; solve problems involving proportions of quantities and measurements, e.g. decrease quantities in a recipe designed to feed six people
- Express a smaller whole number as a fraction of a larger one; find equivalent fractions, including equivalent improper fractions and mixed numbers; relate fractions to their decimal representations
- Understand percentage as the number of parts in every 100 and express tenths and hundredths as percentages

Secure knowledge of number facts that can be recalled quickly and used and applied appropriately

- Use knowledge of place value and addition and subtraction of two-digit numbers to derive sums and differences, doubles and halves of decimals, e.g. 6.5 ± 2.7, halve 5.6, double 0.34
- Recall quickly multiplication facts up to 10 × 10, use to multiply pairs of multiples of 10 and 100 and 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 number facts, place value and rounding to estimate and to check calculations

Calculate efficiently and accurately

- Multiply mentally TU × U; use mental methods in special cases, e.g. to subtract 1995 from 6007, to multiply 18 by 25

- Use the standard written methods for addition and subtraction of whole numbers and decimals with one or two places
- Use understanding of place value to multiply and divide whole numbers and decimals by 10, 100 or 1000
- Use the standard written methods for multiplication and division calculations of HTU × U, U.t × U, TU × TU and HTU ÷ U
- Find fractions using division, e.g. $\frac{1}{100}$ 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. to find $\frac{3}{4}$ of 150 g; interpret the display correctly in the context of measurement

Position and transform shapes, recognise and use their properties to visualise and construct

- Identify, visualise and describe properties of rectangles, triangles, regular polygons and 3-D solids; use knowledge of properties to draw 2-D shapes and identify and draw nets of 3-D shapes
- Read and plot co-ordinates in the first quadrant and recognise parallel and perpendicular lines in grids and shapes; use a set-square and ruler to draw perpendicular and parallel lines
- Complete patterns with up to two lines of symmetry and 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

Measure accurately using appropriate units, interpret and compare scales

- Read, use and record standard metric units to estimate and measure length, mass and capacity; convert larger to smaller units using decimals to one place, e.g. change 2.6 kg to 2600 g
- Estimate measurements of length, mass and capacity to a required degree of accuracy, e.g. the nearest centimetre; 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 its area
- Read timetables and time using 24-hour clock notation; use a calendar to calculate time intervals

Process, present and interpret data to pose and answer questions

- Describe the occurrence of familiar events using the language of chance or likelihood
- Determine the data needed to answer a set of related questions; select and organise relevant data using frequency tables; construct pictograms and bar graphs, and line graphs that represent the frequencies of events and changes over time; use ICT to present and highlight features that lead to further questions
- Find and interpret the mode of a set of data

Year 6

Children learn to:

Use and apply mathematics

- Solve multi-step problems, and problems involving fractions, decimals and percentages, choosing and using appropriate and efficient methods at each stage, including calculator use
- Represent a problem by identifying and recording the calculations needed to solve it, using symbols for unknown quantities where appropriate; set 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
- Recognise and use sequences, patterns and relationships involving numbers and shapes; suggest hypotheses and test them systematically
- Explain reasoning and conclusions, using symbols where appropriate

Count, compare and order numbers, and describe relationships between them

- 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 and order numbers with up to three decimal places, and position them on the number line
- Round numbers, including those with up to three decimal places
- Use fractions, percentages and the vocabulary of ratio and proportion to describe the relationships between two quantities and solve problems, e.g. identify the quantities needed to make a fruit drink by mixing water and juice in a given ratio
- Express a larger whole number as a fraction of a smaller one; simplify fractions; 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

Secure knowledge of number facts that can be recalled quickly and used and applied appropriately

- Use knowledge of place value and multiplication facts to 10 × 10 to derive related multiplication and division facts involving decimal numbers, 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 whole numbers
- Use approximations and apply tests of divisibility to check results

Calculate efficiently and accurately

- Calculate mentally with whole numbers and decimals, e.g. U.t ± U.t, TU × U, U.t × U, HTU ÷ U, U.t ÷ U

- Consolidate the use of standard written methods to add, subtract, multiply and divide integers and decimal numbers; calculate the answer to HTU ÷ U and U.t ÷ U to one or two decimal places
- Find fractions and percentages of whole-number quantities, e.g. $\frac{5}{8}$ of 96, 65% of £260
- Use a calculator to solve problems involving multi-step calculations; carry out calculations involving time by converting hours and minutes to minutes

Position and transform shapes, recognise and use their properties to visualise and construct

- Describe, identify and visualise parallel and perpendicular edges or faces and 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 and locate shapes
- Use a protractor to estimate, measure and draw angles, on their own and in shapes; calculate angles in a triangle or around a point

Measure accurately using appropriate units, interpret and compare scales

- Use standard metric units of measure and convert between units using decimals to two places notation, e.g. change 2.75 litres to 2750 ml, or vice versa
- Measure and calculate using imperials units still in everyday use; know their approximate equivalent metric values
- Read scales and record results to a required degree of accuracy, recognising that the measurement made is approximate
- Calculate the perimeter and area of rectilinear shapes; estimate the area of an irregular shape by counting squares

Process, present and interpret data to pose and answer questions

- Describe and predict outcomes from data using the language of chance or likelihood
- Solve problems involving selecting, processing, presenting and interpreting data, using ICT where appropriate; construct and interpret frequency tables, bar charts with grouped discrete data, and line graphs; interpret pie charts; identify further questions to ask
- Describe and interpret results and solutions to problems using the mode, range, median and mean

Year 6 progression to Year 7

Children learn to:

Use and apply mathematics

- Solve numerical problems, present, interpret and compare solutions in the context of the problem
- Interpret and use simple formulae from mathematics and other subjects; represent numbers in a problem with symbols, construct and solve simple linear equations and set the solution back in the context of the problem
- 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
- Generate sequences and describe the general term in simple cases; use letters and symbols to represent unknown numbers or variables; find counter-examples to disprove a conjecture
- Use step-by-step deductions to solve problems involving properties of shapes; explain and justify reasoning and conclusions

Count, compare and order numbers, and describe relationships between them

- Compare and order integers and decimals in different contexts
- Order a set of fractions by converting them to decimals
- Understand the relationship between ratio and proportion, solve problems involving proportions; use ratio notation, reduce a ratio to its simplest form and divide a quantity into two parts in a given ratio
- Recognise approximate proportions and use percentages to identify and compare proportions, e.g. when interpreting pie charts

Secure knowledge of number facts that can be recalled quickly and used and applied appropriately

- Consolidate the 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
- Recognise and use multiples, factors, divisors, common factors, highest common factors and lowest common multiples in simple cases
- Make and justify estimates and approximations of calculations

Calculate efficiently and accurately

- Use the order of operations, including brackets
- Consolidate and extend mental methods of calculation to include decimals, fractions and percentages
- Use standard written methods to add and subtract whole numbers and decimals, and to multiply and divide three-digit by two-digit whole numbers; extend to multiplying and dividing decimals with one or two places by single-digit whole numbers
- Calculate percentage increases or decreases and fractions of quantities and measurements (whole-number answers)

- Use bracket keys and the memory of a calculator to carry out calculations with more than one step; use the square root key

Position and transform shapes, recognise and use their properties to visualise and construct

- Extend knowledge of properties of triangles and quadrilaterals and use these to solve problems, explaining reasoning with diagrams
- Use correctly the vocabulary, notation and labelling conventions for lines, angles and shapes
- Find coordinates of points determined by geometric information
- Know the sum of angles at a point, on a straight line and in a triangle, and recognise vertically opposite angles
- Construct a triangle given two sides and the included angle

Measure accurately using appropriate units, interpret and compare scales

- Convert between related metric units using decimals to three places, e.g. convert 1375 mm to 1.375 m, or vice versa
- Read and interpret scales on a range of measuring instruments; compare readings on different scales, e.g. when using different instruments
- 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

Process, present and interpret data to pose and answer questions

- Understand and use the probability scale from 0 to 1; find and justify probabilities based on equally likely outcomes in simple contexts
- Analyse data from surveys and practical experiments by selecting, processing, presenting and interpreting data; plan how to collect and organise small sets of data; construct, on paper and using ICT, graphs and diagrams to represent data; compare proportions in two pie charts with different totals; identify ways of extending the survey or experiment
- 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