Roundwood Park School

Maths

Skills descriptors

Number

Ratio/Proportion

Algebra

Geometry and Measures

Probability and Statistics

Year 7

Mastering	Securing/Developing	Developing/Acquiring

Sequences

- Generate terms of a sequence from term-to-term and position to term rules
- Plot sequences on cartesian graphs
- Find the nth term for an increasing and decreasing sequences

Place Value

Mastering	Securing/Developing	Developing/Acquiring
• Integers and decimals, ordering positive numbers, using symbols =, ≠, <, >, ≤, ≥ • Using powers of 10 • Rounding to decimal points and significant figures		• Understand and use place value in four-digit numbers • Know Roman numerals from I to C • Read numbers written in Roman numerals up to 100 • Count forwards and backwards in whole number steps • Understand place value in numbers with up to seven digits • Read and write numbers up to and including those with seven digits Multiply and divide whole numbers by 10, 100, 1000 • Multiply and divide numbers with one decimal place by 10, 100, 1000 • Approximate any number by rounding to the nearest whole number 10, 100 or 1000 • Approximate any number with one or two decimal places by rounding to the nearest whole number • Approximate any number with two decimal places by rounding to the one decimal place • Estimate addition (subtraction) calculations with up to four digits

Negative Numbers

- Calculations with negative numbers
- Ordering negative numbers
- Indices of negative numbers

- Count backwards in whole number steps when negative numbers are included
- Count forwards in whole number steps when negative numbers are included
- Understand and use negative numbers in context, including temperatures below 0°C

Order of Operations

- Use inverse of operations

- BIDMAS
- Use of negative numbers
- Use of brackets

- Understand square numbers
- Recall multiplication facts for multiplication tables up to 12 × 12
- Recall division facts for multiplication tables up to 12 × 12

Algebraic Expressions

- Use and understand algebraic notation for multiplication and powers
- Collect like terms
- Substitution into formula

- Use symbols to represent variables in a formula
- Use symbols (including letters) to represent missing numbers
- Substitute numbers into worded formulae

Number Theory

- Applications of HCF and LCM

- Multiples and LCM
- Factors and HCF
- Prime numbers and product of primes
- Squares to 15^2 and cubes to 10^3

- Know the meaning of 'factor' and 'multiple' and 'prime'
- Recognise and use factor pairs and commutativity in mental calculations

- Fractions

• Order of operation with fractions	• Equivalent fractions, proper and improper • Adding and subtracting fractions Including mixed numbers • Fraction of an amount, one quantity as a fraction of another • Find the original amount when given a fraction of it	• Understand the concept of a fraction as a proportion, visual representations • Understand the concept of equivalent fractions • Order fractions whose denominators are multiples of the same number • Identify equivalent fractions represented using tenths and hundredths • Know that $\frac{1}{4} = 0.25$, $\frac{1}{2} = 0.5$ and $\frac{3}{4} = 0.75$ • Convert a mixed number into an improper fraction (and vice versa) • Multiply a proper fraction by a whole number • Multiply a mixed number by a whole number

Area and Perimeter

• Forming expressions for perimeter and area • Use of fractional lengths	• Separate out Perimeter and Area • Rectilinear area, area of triangles and quadrilaterals (incl. kite, parallelogram, trapezium) • Convert between square centimetres (cm²) and square metres (m²)	• Understand the concept of area • Understand the concept of perimeter • Calculate the perimeter of 2D shapes when dimensions are known • Find the area of rectilinear shapes by counting squares • Calculate the perimeter of composite rectilinear shapes • Calculate the area of a rectangles, including squares

Percentages

• Calculate Percentage of an amount (use multipliers) • Equivalence of FDP, techniques to convert percentages greater than 100 • Express one quantity as a percentage of another		• Understand that per cent relates to number of parts per hundred • Understand that a percentage can be written as a fraction with a denominator of 100 • Write any percentage as a decimal • Know percentage equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and fractions with a denominator of 10 and 100

Single Brackets

- Expand using letter terms and powers
- Expand using fractions

- Simplifying expressions with more than 1 single bracket

- Expanding a single bracket including
- Link to substitution but extending with brackets and fractions

Algebra Form and Solve

- Solving area and perimeter problems
- Applied problem solving

- Solve worded equations
- Simple one-step solutions (four rules)
- Two-step solutions (four rules) including brackets
- Solve 3 step equations
- Writing formulae in words and letters
- Substitution, including inputs and outputs

- Use symbols to represent variables in a formula
- Recognise a simple formula written in words
- Interpret the information given in a written formula
- Substitute numbers into a one-step formula written in words
- Substitute numbers into a two-step formula written in words
- Create a one-step formula from given information
- Create a two-step formula from given information

Shapes and Angles

- Angle question with forming and solving equations

- Angles on a straight line, around a point, vertically opposite
- Naming, labelling and recognising the features of triangles
- Angles in a triangle exterior and interior
- Naming, labelling and recognising the features of quadrilaterals
- Angles in quadrilaterals angle sum, parallelograms and rectangles
- Naming and recognising the features of other polygons
- Using a compass

- Know that angles are measured in degrees
- Identify acute, obtuse, reflex and right angles
- Use a protractor to measure and draw angles acute, reflex and obtuse
- Identify right angles
- Know that angles in a full turn total 360°, and angle in half a turn must total 180°
- Use a ruler to draw lines to the nearest millimetre

		• Use the properties of rectangles to find missing lengths and angles • Know the difference between a regular and an irregular polygon

Ratio and Scale

• Ratio notation, expressing relationship as ratios • Simplifying ratios • Unit ratios, fractions from ratios • Dividing a quantity into a ratio • Metric and imperial units • Convert between Imperial units; e.g. feet and inches, pounds and ounces, pints and gallons • Know rough equivalents between inches and cm, feet and cm, kg and lb, pint and ml • Scale drawings, maps	• Convert between kilometres and metres, centimetres and millimetres • Convert between litres and millilitres • Convert between hours and minutes, minutes and seconds • Convert between kilograms and grams

Charts and Averages

• Graphical representations of categorical data - bar charts, pictograms, pie charts • Graphical representations of discrete numerical data - vertical line, bar charts, pie charts • Measures of central tendency of ungrouped data - mean, mode and median, including from a frequency table • Measures of spread – range	• Interpret and construct a simple bar chart • Understand the difference between a line graph and a bar-line chart • Identify when a line graph is an appropriate way to show data • Read values from a line graph • Answer one-step questions about data in line graphs (e.g. 'How much?') • Answer two-step questions about data in line graphs (e.g. 'How much more?') • Solve problems using information presented in a line graph • Measure and construct angles using a protractor

Transformations and the coordinate grid

- Combinations of transformations, including successive translations
- Translation (as a vector)

- Plotting 2D coordinates in four quadrants
- Symmetry, rotation, translation, reflection over lines y=x, y=k x=k
- Tessellating shapes

- Use coordinates in the first quadrant
- Use the properties of regular polygons to find points on a coordinate grid
- Describe a translation using mathematical language
- Describe a translation using mirror lines parallel to the axes
- Carry out a reflection using a mirror line parallel to the axes
- Carry out a reflection using a mirror line parallel to the axes and touching the object
- Carry out a reflection using a mirror line parallel to the axes and crossing the object
- Describe a reflection using mirror lines parallel to the axes
- Understand that a translations and reflections produce a congruent image
- Know the meaning of 'congruent', 'congruence', 'object', 'image'
- Complete tessellations of given shapes

Nets and Volumes

- Nets - construct and interpret
- Construct 3D shapes from given nets
- Draw accurate nets for common 3D shapes
- Find all the nets for a cube
- Volumes and surface area of Cuboids
- Volumes of composite cuboids

- Know the names of common 3D shapes
- Identify 3D-shapes from photographs and sketches
- Identify 3D-shapes from nets
- Identify 3D-shapes from diagrams on isometric paper
- Use 'Polydron' to construct nets for common 3D shapes
- Construct diagrams of 3D-shapes on isometric paper
- Know that volume is measured in cubes

Year 8

Mastering/Securing	Securing/Developing	Developing/Acquiring

Place Value and Standard Form

• Write and read large and small numbers in standard form • Order numbers in standard form • Convert a 'near miss' into standard form; e.g. 23×10^7 • Adding and subtracting in standard form, including distributivity (not multiply and divide)		• Multiply and divide numbers by powers of 10 • Know how to identify the first significant figure in any number • Approximate by rounding to the first significant figure in any number

Algebra - Factorise single bracket and solving

• Solve linear equations with the unknown on both sides when the solution is a whole number, fraction, negative • Solving equations involving single brackets • Factorising into a single bracket • Identify common factors (numerical and algebraic) of terms in an expression • Factorise an expression by taking out common factors		• Simplify an expression involving terms with combinations of variables • Simplify an expression by collecting like terms • Know how to multiply a single term over a bracket including simplifying expressions with more than 1 single bracket

Fractions

• Identify if a fraction is terminating or recurring • Multiplying and dividing fractions • Fraction of an amount (incl. fractions of fractions) with link to multiplying • Reciprocals • Use more complex order of operations questions too, especially where division is presented with a fraction		• Recall some decimal and fraction equivalents (e.g. tenths, fifths, eighths) • Write a decimal as a fraction • Write a fraction as a decimal (use scaling where appropriate) • Use a calculator to change any fraction to a decimal • Write a fraction in its lowest terms by cancelling common factors • Convert between mixed numbers and top-heavy fractions • Write one quantity as a fraction of another

		• Equivalent fractions, proper and improper fractions, complement of a fraction
		• Adding and subtracting fractions
		• Inc mixed
		• Calculate a Fraction of an amount Find original amount if you know a fraction of it
		• Multiples and LCM
		• Factors and HCF

Indices - Positive

• Use indices with fractions and decimals • Power of zero • Multiplying coefficients with multiplying rule	• Calculating other powers, evaluating numerical expressions with powers • Addition and subtraction rules with positive indices, power of zero • Simplifying indices when multiplying, dividing and with brackets • Roots as inverses of powers	• Squares to 15^2 and cubes to 10^3

Change the Subject

• Change the subject including when expanding brackets is required	• Know the meaning of the 'subject' of a formula • Change the subject of a formula when one step is required • Change the subject of a formula when a two steps are required	• BIDMAS • Associativity and non-associativity (practice with brackets) • order of operations use negatives • Identify the correct order of undoing the operations in an equation • Solve worded equations • Solve linear equations with the unknown on one side when the solution is a negative number one step and two step equations

Angles – parallel, polygons, bearings

- Use bearings to solve geometrical problems

- Calculate Interior and exterior angles in polygons
- Angles in parallel lines (alternate, corresponding, cointerior)
- Bearings
- Measure and state a specified bearing
- Construct a scale diagram involving bearings

- Know and understand the vocabulary of plans and elevations
- Interpret plans and elevations
- Use the concept of scaling in diagrams
- Use a protractor to measure angles to the nearest degree
- Use a ruler to measure lengths to the nearest millimetre
- Use angles at a point, angles at a point on a line and vertically opposite angles to calculate missing angles in geometrical diagrams
- Know that the angles in a triangle total 180° and calculate angles in special triangles
- Know angles in quadrilaterals total 360 and calculate angles in special quadrilaterals
- Naming and recognising the features of other polygons

Constructions and Congruence

- Use known facts to derive further information in geometrical situations
- Test conjectures using known facts
- Know the structure of a simple mathematical proof
- Use known facts to create simple proofs

- Identifying congruent shapes by sight
- Use ruler and compasses to construct the perpendicular bisector of a line segment
- Use ruler and compasses to bisect an angle
- Use a ruler and compasses to construct a perpendicular to a line from a point (at a point)
- Choose techniques to construct 2D shapes; e.g. rhombus
- Choose techniques to draw triangles leading to SSS,SAS,ASA,RHS
- Use known facts to form conjectures about lines and angles in geometrical situations

- Using a compass to draw circles and arcs (e.g. construct a hexagon)

Percentages

- Identify the multiplier for a percentage increase or decrease when the percentage is greater than 100%
- Use calculators to increase an amount by a percentage greater than 100%
- Solve problems involving percentage change
- Solve original value problems when working with percentages
- Solve financial problems including simple interest

- Use calculators to find a Percentage of an amount using multiplicative methods
- Equivalence of fractions, decimasl and percentages
- Techniques to convert percentages greater than 100
- Express one quantity as a percentage of another

Probability

- Record, describe and analyse the frequency of outcomes of simple probability experiments
- Language of probability
- Theoretical probability - calculating
- Sum of probabilities of all mutually exclusive events = 1
- Generate theoretical sample spaces, including systematic listing of combinations and outcomes, tables and use these to calculate probabilities
- Experimental probability

- Understand the equivalence between fractions, decimals and percentages
- Compare fractions, decimals or percentages
- Simplify a fraction by cancelling common factors
- Understand the use of the 0-1 scale to measure probability
- Assess likeliness and place events on a probability scale

Charts and Averages

- Numerical data - discrete and continuous, Ungrouped and grouped frequency tables calculating Mean, Mode, Median and range
- Analyse and compare 2 or more data sets
- Justify and choose appropriate statistical average
- Plot a scatter diagram of bivariate data
- Understand the meaning of 'correlation'
- Interpret a scatter diagram using understanding of correlation

- Know the meaning of discrete data
- Interpret and construct frequency tables
- Construct and interpret pictograms, bar charts, pie charts, tables and vertical line charts
- Find the mean, median, mode and range of a set of data
- Find the mean, median, mode and range from a frequency table

Quadratics: Expand and Factorise

- Expand the expression $(x \pm a)^2$

- Expanding 2 brackets leading to a = 1
- Multiply two linear expressions of the form $(x + a)(x + b)$
- Multiply two linear expressions of the form $(x \pm a)(x \pm b)$
- Understand the meaning of an identity
- Simplify an expression involving 'x^2' by collecting like terms
- Factorise a quadratic expression of the form $x^2 + bx + c$

- Manipulate expressions by collecting like terms
- Know that $x \times x = x^2$
- Calculate with negative numbers
- Know the grid method for multiplying two two-digit numbers
- Know the difference between an expression, an equation and a formula

Ratio and Scale

- Identify when it is necessary to convert quantities in order to use a sensible unit of measure Which is the faster speed: 60 km/h or 10 m/s? Explain why.

- Comparing quantities (value for money, exchange rates, etc)
- Scaling up/down - recipes
- Find a relevant multiplier in a situation involving proportion
- Use fractions fluently in situations involving ratio or proportion
- Understand the connections between ratios and fractions
- Understand the meaning of a compound unit
- Know the connection between speed, distance and time
- Solve problems involving speed
- Changing between units (time, length)

- Understand and use ratio notation
- Divide an amount in a given ratio
- Identify ratio in a real-life context
- Write a ratio to describe a situation
- Simplifying ratios
- Unit ratios, fractions from ratios
- Convert between Imperial units; e.g. feet and inches, pounds and ounces, pints and gallons
- Know rough equivalents between inches and cm, feet and cm, kg and lb, pint and ml
- Scale drawings, maps

Circles

- Writing expressions for areas algebraically.
- Problems with circumference and area of part of a circle - Including semicircles, quarter-circles, compound shapes with circular part (no segments or sectors)
- Problem solving questions involving areas of pavements etc

- Circle parts and properties (radii, diameter, chord, pi)
- Recall pi to 2 dp
- Circumference of a circle
- Area of a circle, always give answers in exact form and rounded

- Know how to use formulae to find the area of rectangles, parallelograms, triangles and trapezia
- Know how to find the area of compound shapes
- Lots of triangles oriented differently, incl where the vertex goes past the end of the base
- Convert between square centimetres (cm²) and square metres (m²)

Volume – Prisms and Cylinders

- Volume of prisms and cylinders
- Surface area of prisms and cylinders
- Calculate exactly with multiples of π or round to a specified amount

- Nets - construct and interpret
- Construct 3D shapes from given nets
- Draw accurate nets for common 3D shapes
- Find all the nets for a cube
- Volumes and surface area of Cuboids
- Volumes of composite cuboids
- *Plans and elevations*

Pythagoras Theorem

- Explain and use Pythagorean triples

- Pythagoras' Theorem in 2D
- Identify the hypotenuse in a right-angled triangle
- Know when to apply Pythagoras' theorem
- Calculate the hypotenuse of a right-angled triangle using Pythagoras' theorem
- Calculate one of the shorter sides in a right-angled triangle using Pythagoras' theorem

- Square numbers up to 15^2
- Inverse of squaring is square root

Transformations – Enlargement

- Explore how the scale factor changes the area of shapes

- Know the vocabulary of enlargement
- Combinations of transformations, including successive translations
- Find the centre of enlargement
- Find the scale factor of an enlargement
- Use the centre and scale factor to carry out an enlargement with positive integer, fractional and negative scale factor

- Understand coordinates in all four quadrants
- Work out a multiplier given two numbers
- Understand the concept of an enlargement (no scale factor)
- Symmetry of 2d Shapes
- Rotational order of 2d Shapes
- Translation (as a vector) on a coordinate grid, reflection over lines y=x, y=k x=k
- Tessellating shapes

Year 9

Mastering/Securing	Securing/Developing	Developing/Acquiring
Place Value and Standard Form		
• SI prefixes and engineering form	• Multiplying and dividing in standard form, including associativity • Problems and applications, including order of operations	• Write and read large and small numbers in standard form • Order numbers in standard form • Convert a 'near miss' into standard form; e.g. 23×10^7 • Adding and subtracting in standard form, including distributivity
Algebra Sequences		
• Establish the first and second differences of a quadratic sequence to find nth term	• Recognise Fibonacci numbers and sequence • Generate Fibonacci type sequences • Find the next three terms in any Fibonacci type sequence • Substitute numbers into formulae including terms in x^2 • Generate terms of a quadratic sequence from a written rule and nth term • Identify quadratic sequences • Find the next three terms in any quadratic sequence	• Generate terms of a sequence from term-to-term and position to term rules • Plot sequences on cartesian graphs • Find the nth term for an increasing linear sequence • Find the nth term for an decreasing linear sequence
Linear Inequalities		
• Understand the meaning of the four inequality symbols • Choose the correct inequality symbol for a particular situation • Represent practical situations as inequalities • Recognise a simple linear inequality • Find the set of integers that are solutions to an inequality • Use set notation to list a set of integers		• Solve linear equations with the unknown on both sides when the solution is a whole number, fraction, negative • Solving equations involving single brackets

- Use a formal method to solve an inequality
- Know how to deal with negative number terms in an inequality
- Know how to show a range of values that solve an inequality on a number line
- Know when to use an open circle or closed circle at the end of a range of values shown on a number line
- Use a number line to find the set of values that are true for two inequalities

Rearranging Formula

- Rearranging non-linear formulae (involving powers and roots)

- Know the meaning of the 'subject' of a formula
- Change the subject of a formula when one step is required
- Change the subject of a formula when a two steps are required
- Including expanding using single bracket to rearrang

y = mx+c

- Interpret the gradient of a straight line graph as a rate of change

- Calculate the gradient of a line using change in y/change in x
- Use the form y = mx + c to identify parallel lines
- Rearrange an equation into the form y = mx + c
- Find the equation of a line through one point with a given gradient
- Find the equation of a line through two given points

- Representing equations in the form y = mx + c on a Cartesian grid
- Read gradient using 1 across, 'm' up/down and find y-intercept from a given graph, use these to give the equation in the form y = mx + c.
- Sketch a graph given the gradient and y-intercept (without plotting a table of values)

Indices – Negative and Fractional

- Change of base problems

- Completing the number line - introduction of irrational numbers
- Negative and fractional indices
- Addition and subtraction rules with indices

- Calculating other powers, evaluating numerical expressions with powers. Include type $(0.03)^3$
- Addition and subtraction rules with positive indices, power of zero
- Simplifying indices and coefficients when multiplying and dividing for multiplication rule, division and brackets

	Roots as inverses of powers

Fractions

- Algebraic Fraction arithmetic
- Simplifying algebraic fractions, including numerical factors, single letter factors

- Multiplying and dividing fractions
- Fraction of an amount (incl. fractions of fractions) with link to multiplying
- Reciprocals (multiplicative inverse)
- Use more complex order of operations questions too, especially where division is presented with a fraction

Angles – parallel, polygons and bearings

- Calculate Interior and exterior angles in polygons
- Angles in parallel lines (alternate, corresponding, cointerior)
- Bearings
- Measure and state a specified bearing
- Construct a scale diagram involving bearings
- Use bearings to solve geometrical problems

Constructions and Loci

- Contextual problems - drawing and reading scale drawings
- Combine techniques to solve more complex loci problems

- Understand the meaning of locus (loci)
- Know how to construct the locus of points a fixed distance from a point (from a line)
- Identify when a perpendicular bisector is needed to solve a loci problem
- Identify when an angle bisector is needed to solve a loci problem
- Know that the shortest distance from a point to a line is the perpendicular

- Use ruler and compasses to construct the perpendicular bisector of a line segment
- Use ruler and compasses to bisect an angle
- Use a ruler and compasses to construct a perpendicular to a line from a point (at a point)
- Choose techniques to construct 2D shapes; e.g. rhombus
- Choose techniques to draw triangles leading to SSS,SAS,ASA,RHS
- Use known facts to form conjectures about lines and angles in geometrical situations
- Use known facts to derive further information in geometrical situations
- Test conjectures using known facts
- Know the structure of a simple mathematical proof
- Use known facts to create simple proofs
- Explain why the base angles in an isosceles triangle must be equal

Rounding

- Calculations with upper and lower bounds, percentage error of these calculations

- Rounding errors and error intervals (upper and lower bounds of a rounded number) using inequalities
- Truncating vs. rounding
- Approximations to calculations

- Integers and decimals, ordering positive numbers, using symbols =, ≠, <, >, ≤, ≥
- Using powers of 10
- Rounding to decimal points and significant figures

Simultaneous Equations

- Understand that there are an infinite number of solutions to the equation ax + by = c (a ≠ 0, b ≠ 0)
- Find approximate solutions to simultaneous equations using a graph
- Solve simultaneous equations by elimination including multipliers for both equations
- Derive and solve two simultaneous equations
- Interpret the solution to a pair of simultaneous equations

- Solve worded equations
- Simple one-step solutions (four rules)
- Two-step solutions (four rules) including brackets
- Solve 3 step equations
- Writing formulae in words and letters
- Substitution, including inputs and outputs

Ratio and Proportion

- GCSE problems and applications, including fractions in problems
- Equations in ratio (e.g. x:x+5 = 4:5)
- Know the difference between direct and inverse proportion
- Recognise direct (inverse) proportion in a situation
- Know the features of a graph that represents a direct (inverse) proportion situation
- Know the features of an expression (or formula) that represents a direct (inverse) proportion situation
- Understand the connection between the multiplier, the expression and the graph

- Find a relevant multiplier in a situation involving proportion
- Use fractions fluently in situations involving ratio or proportion
- Understand the connections between ratios and fractions
- Understand the meaning of a compound unit
- Know the connection between speed, distance and time
- Solve problems involving speed
- Identify when it is necessary to convert quantities in order to use a sensible unit of measure Which is the faster speed: 60 km/h or 10 m/s? Explain why.
- Changing between units (time, length)

Percentages

- Identify the multiplier for a percentage increase or decrease when the percentage is greater than 100%
- Use calculators to increase an amount by a percentage greater than 100%
- Solve problems involving percentage change
- Solve original value problems when working with percentages
- Solve financial problems including simple interest

Units and Graphing

- Real-life graphs (including distance-time and velocity-time)

- Compound units - density, pressure, speed, including conversions between compound units

- Understand the meaning of a compound unit
- Know the connection between speed, distance and time
- Solve problems involving speed
- Changing between units (time, length)

Probability

- Understand that relative frequency tends towards theoretical probability as sample size increases

- Recording outcomes and possibilities using frequency trees, two-way tables and simple Venn diagrams. Use these diagrams to calculate probabilities
- Draw and interpret tree diagrams and associated probabilities for independent events
- Use a tree diagram to calculate probabilities of independent combined events
- Label a tree diagram with probabilities when events are dependent
- Use a tree diagram to calculate probabilities of dependent combined events

- Record, describe and analyse the frequency of outcomes of simple probability experiments
- Language of probability
- Theoretical probability - calculating
- Sum of probabilities of all mutually exclusive events = 1
- Generate theoretical sample spaces, including systematic listing of combinations and outcomes, tables and use these to calculate probabilities
- Experimental probability

Quadratics – Factorising and Expanding

- Factorising the difference of two squares
- Factorising a quadratic where a > 1

- Know how to set up a mathematical argument
- Pupils should be taught to use the equivalency symbol '≡'
- Expanding more than two binomials
- Identify when it is necessary to remove factors to factorise a quadratic expression to simplify to a =1

- Factorising into a single bracket
- Identify common factors (numerical and algebraic) of terms in an expression
- Factorise an expression by taking out common factors
- Expanding 2 brackets leading to a = 1
- factorising a quadratic where a = 1
- Multiply two linear expressions of the form $(x + a)(x + b)$
- Multiply two linear expressions of the form $(x \pm a)(x \pm b)$
- Understand the meaning of an identity
- Expand the expression $(x \pm a)^2$
- Simplify an expression involving 'x^2' by collecting like terms
- Factorise a quadratic expression of the form $x^2 + bx + c$

Area Segments and Sectors

- Know how to find arc length
- Calculate the arc length of a sector when radius is given
- Know how to find the area of a sector
- Calculate the area of a sector when radius is given
- Calculate the angle of a sector when the arc length and radius are known
- Know the vocabulary of circles

- Circle parts and properties (radii,diameter, chord, pi)
- Recall pi to 2 dp
- Circumference of a circle
- Area of a circle, always give answers in exact form and rounded
- Problems with circumference and area of part of a circle - Including semicircles, quarter-circles, compound shapes with circular part (no segments or sectors)
- Volume of prisms and cylinders
- Surface area of prisms and cylinders
- Calculate exactly with multiples of π or round to a specified amount

Enlargement and Similarity

- Similarity of length and area, including conversions between square and cube units

- Enlargement (including negative and fractional enlargements)
- Multiple Transformations and invariance
- Similarity – triangles missing sides

- Know the vocabulary of enlargement
- Use the centre and scale factor to carry out an enlargement with positive integer, fractional and negative scale factor
- Find the centre of enlargement
- Find the scale factor of an enlargement
- Explore how the scale factor changes the area of shapes

Charts and Averages

- Numerical data - discrete and continuous, Ungrouped and grouped frequency tables calculating Mean, Mode, Median and range
- Analyse and compare 2 or more data sets
- Justify and choose appropriate statistical average
- Plot a scatter diagram of bivariate data
- Understand the meaning of 'correlation'
- Interpret a scatter diagram using understanding of correlation

Similarity and Trigonometry

• Unit circle	• Similarity – triangles relate to angles • Know exact ratios • Using trig ratios to calculate sides • Using trig to calculate angles	• Pythagoras' Theorem in 2D • Identify the hypotenuse in a right-angled triangle • Know when to apply Pythagoras' theorem • Calculate the hypotenuse of a right-angled triangle using Pythagoras' theorem • Calculate one of the shorter sides in a right-angled triangle using Pythagoras' theorem • Explain and use Pythagorean triples