

# KS3 Maths –Mapping Overview

## Triangle Pathway

A student following a triangle pathway will study these curriculum goals throughout Y7, 8 & 9.

These are extracts from the Scheme of Work and show the key content that is taught in each unit. Each unit of study is not limited to these curriculum goals.

Students are able to 'change lanes' onto a different pathway if they require a different speed & challenge.

### N1

- Y7** - Understand place value. Round to nearest whole, 10, 100 & 1000.
- Y8** - Calculate with integers. Round to nearest whole, 10, 100 & 1000.
- Y9** - Perform calculations with integers & decimals, with and without a calculator. Begin to round to significant figures.

### N2

- Y7** - Identify odd, even and prime numbers. Recognise simple powers of 2, 5 and 10.
- Y8** - Identify types of number including prime numbers. Recognise simple powers.
- Y9** - Find HCF & LCM by listing. Write a number as a product of its prime factors. Calculate powers and roots.

### GM1

- Y7** - Classify triangles based on their properties. Identify types of angles
- Y8** - Classify triangles and quadrilaterals using their properties. Know basic angle facts.
- Y9** - Classify 2D shapes from their properties. Calculate interior and exterior angles of regular polygons.

### A1

- Y7** - Simplify simple expressions by collecting like terms.
- Y8** - Collect like terms to simplify expressions. Substitute positive numbers into algebraic expressions.
- Y9** - Work with algebraic expressions including those with a single bracket. Substitute into expressions with powers.

### N3

- Y7** - Simplify fractions. Find basic fractions of an amount.
- Y8** - Order fractions. Add, subtract and multiply fractions.
- Y9** - Convert between mixed numbers & improper fractions. Add, subtract, multiply & divide fractions.

### S1

- Y7** - Calculate the mode, median and range for a data set. Record information in a tally chart.
- Y8** - Find the mean, median, mode and range for a set of data. Collect and represent data using charts and diagrams.
- Y9** - Compare simple data sets using averages. Represent data using a variety of charts and diagrams.

### GM2

- Y7** - Calculate perimeter & area of rectangles.
- Y8** - Calculate perimeter & area of rectangles, triangles & parallelograms.
- Y9** - Calculate perimeter & area of 2D shapes including circles and composite shapes.

### N4

- Y7** - Calculate the percentage of an amount using a calculator. Begin to use ratio notation.
- Y8** - Calculate the percentages of quantities. Split a quantity into a ratio.
- Y9** - Calculate percentage increase & decrease of quantities using a calculator. Divide quantities into given ratios.

### A2

- Y7** - Understand and use function machines.
- Y8** - Solve one and two step linear equations. Use  $<$ ,  $\leq$ ,  $\geq$ ,  $>$  symbols appropriately.
- Y9** - Solve one and two step linear equations, including those with brackets. Solve simple inequalities.

### GM3

- Y7** - Recognise and know the properties of the cube and cuboid. Calculate the volume of cuboids.
- Y8** - Recognise properties of simple 3D shapes. Calculate surface area and volume of cubes & cuboids.
- Y9** - Interpret plans & elevations. Solve problems involving volume and surface area of cubes, cuboids & triangular prisms.

### A3

- Y7** - Generate a sequence by spotting a pattern or using a term-to-term rule given in words. Plot and read co-ordinates.
- Y8** - Generate a sequence by spotting a pattern or using a term-to-term rule. Name & plot graphs of horizontal & vertical lines.
- Y9** - Understand the nth term of a sequence. Plot graphs of simple straight line functions. Identify the gradient and intercept of straight line graphs.

### GM4

- Y7**  
Translate, Rotate and Reflect simple shapes.

### S3

- Y8**  
Use the probability scale and language of probability.  
List outcomes of events.

### GM5

- Y9**  
Perform calculations with time.  
Use map scales and other scales to create accurate plans.  
State the angles of compass directions.

# KS3 Maths –Mapping Overview

## Square Pathway

A student following a square pathway will study these curriculum goals throughout Y7, 8 & 9.

These are extracts from the Scheme of Work and show the key content that is taught in each unit. Each unit of study is not limited to these curriculum goals.

Students are able to 'change lanes' onto a different pathway if they require a different speed & challenge.

### N1

**Y7** - Understand place value and calculate with integers. Round to nearest whole, 10, 100 & 1000.  
**Y8** - Calculate with integers & decimals. Round to decimal places.  
**Y9** - Perform complex calculations with negatives & decimals. Round to appropriate levels of accuracy.

### N2

**Y7** - Identify types of number. Recognise simple powers.  
**Y8** - Know types of number. Find HCF & LCM. Calculate powers and roots.  
**Y9** - Express a number as a product of its prime factors using power notation. Convert large & small numbers to and from standard form.

### GM1

**Y7** - Identify properties of simple 2D shapes. Know basic angle facts.  
**Y8** - Know properties of polygons. Find interior and exterior angles of polygons.  
**Y9** - Use geometrical reasoning with properties of polygons. Identify congruent triangles. Find angles on parallel lines.

### A1

**Y7** - Simplify expressions. Substitute with positive numbers.  
**Y8** - Form and simplify expressions including expanding brackets & factorising. Substitute into expressions with powers.  
**Y9** - Recognise a quadratic expression. Factorise and expand expressions. Formulate simple formulae and expressions from real-world contexts. Change the subject of a given formula.

### N3

**Y7** - Simplify and find equivalent fractions. Find a fractions of an amount.  
**Y8** - Convert between improper fractions & mixed numbers. Add, subtract, multiply & divide fractions.  
**Y9** - Add, subtract, multiply & divide mixed numbers. Convert between FDP.

### S1

**Y7** - Find the mean, median, mode and range for a set of data. Represent data through the use of tally charts & bar charts.  
**Y8** - Make comparisons about data using averages & range. Represent data through the use of pictograms, dual bar charts & line charts.  
**Y9** - Find the mean, mode and range from a frequency table. Recognise how graphs can be misleading.

### GM2

**Y7** - Calculate perimeter & area of rectangles & triangles.  
**Y8** - Calculate perimeter & area of 2D shapes including circles.  
**Y9** - Solve problems involving perimeter & area of 2D shapes, including circles & composite shapes. Use Pythagoras' Theorem to find missing sides in triangles.

### N4

**Y7** - Calculate the percentages of quantities. Simplify and find equivalent ratios.  
**Y8** - Calculate percentage increase & decrease of quantities. Divide quantities into given ratios. Use the unitary method to solve problems.  
**Y9** - Calculate percentage change between two amounts. Use percentage multipliers for calculations. Solve ratio problems.

### A2

**Y7** - Solve simple linear equations.  
**Y8** - Solve linear equations, including those with brackets. Solve simple inequalities.  
**Y9** - Solve linear equations and inequalities, including those with unknowns on both sides. Represent inequalities on a number line.

### GM3

**Y7** - Identify properties of simple 3D shapes. Calculate volume and surface area of cubes & cuboids.  
**Y8** - Know properties of 3D shapes. Interpret plans & elevations. Calculate volume and surface area of cubes, cuboids & triangular prisms.  
**Y9** - Construct plans & elevations. Calculate volume and surface area of cylinders. Find missing lengths when given volume.

### A3

**Y7** - Find missing terms in sequences from identifying the term-to-term rule. Identify & plot graphs of horizontal & vertical lines.  
**Y8** - Find the nth term of a linear sequence. Generate a sequence given the nth term. Plot graphs of straight line equations. Identify the gradient and intercept of straight line graphs.  
**Y9** - Find the nth term of an arithmetic sequence. Use the form  $y=mx+c$  to plot straight line graphs. Recognise & plot quadratic graphs.

### GM4

**Y7**  
 Perform simple transformations and enlargements.

### S3

**Y8**  
 Find the probability of events happening. Use tables & grids to list outcomes of events.

### GM5

**Y9**  
 Perform calculations with time. Construct and interpret scale drawings. State the bearings of compass directions. Know and apply the speed, distance, time formula

# KS3 Maths –Mapping Overview

## Pentagon Pathway

A student following a pentagon pathway will study these curriculum goals throughout Y7, 8 & 9.

These are extracts from the Scheme of Work and show the key content that is taught in each unit.

Each unit of study is not limited to these curriculum goals.

Students are able to 'change lanes' onto a different pathway if they require a different speed & challenge.

### N1

- Y7** - Calculate with integers & decimals. Round to decimal places.
- Y8** - Perform complex calculations with negatives & decimals. Round to significant figures.
- Y9** - Estimate, without a calculator, complex calculations including powers and decimals.

### N2

- Y7** - Know types of number. Find HCF & LCM. Calculate powers and roots.
- Y8** - Use prime factors to find HCF & LCM. Calculate more complex powers & roots. Convert large & small numbers to and from standard form..
- Y9** - Use prime factors to find HCF & LCM and express answers using correct power notation. Know and apply the laws of indices. Multiply & divide with numbers in standard form.

### GM1

- Y7** - Identify types of quadrilaterals and know properties of polygons. Find missing angles.
- Y8** - Use geometrical reasoning with properties of polygons. Find angles on parallel lines.
- Y9** - Give geometrical reasons to justify the properties of triangles and quadrilaterals. Begin to understand the formal proofs of congruent triangles. Know and use angles facts on parallel lines.

### A1

- Y7** - Form and simplify expressions including expanding brackets. Substitute into expressions with powers.
- Y8** - Factorise and expand expressions. Substitute with positive & negative numbers. Change the subject of a given formula.
- Y9** - Expand double brackets and factorise expressions. Change the subject of a given formula that include powers or fractions.

### N3

- Y7** - Convert between improper fractions & mixed numbers. Add, subtract & multiply fractions.
- Y8** - Add, subtract, multiply & divide mixed numbers. Convert between FDP.
- Y9** - Solve worded problems that rely on the use of calculating with mixed numbers. Convert a recurring decimal to an exact fraction.

### S1

- Y7** - Compare data using the mean, median, mode and range. Represent data through the use of pictograms & dual bar charts.
- Y8** - Find the mean, mode and range from a frequency table. Represent data through the use of dual bar charts, pie charts and stem & leaf diagrams.
- Y9** - Find the modal class and calculate estimates of mean, median & range from a frequency table. Represent data through the use of pie charts, stem & leaf diagrams and frequency polygons.

### GM2

- Y7** - Calculate perimeter & area of parallelograms & trapeziums.
- Y8** - Solve problems involving perimeter & area of 2D shapes. Use Pythagoras' Theorem to find missing sides in triangles.
- Y9** - Solve problems involving perimeter & area of 2D shapes, including composite shapes & those expressed algebraically. Find arc length and sector area. Use & apply Pythagoras' Theorem.

### N4

- Y7** - Calculate percentage increase & decrease of quantities. Divide quantities into given ratios.
- Y8** - Calculate percentage change between two amounts. Begin to use percentage multipliers. Solve ratio problems.
- Y9** - Solve percentage problems in context including the use of multipliers. Solve ratio problems. Solve formal problems involving direct proportion.

### A2

- Y7** - Solve linear equations, including those with brackets.
- Y8** - Solve linear equations and inequalities, including those with unknowns on both sides. Represent inequalities on a number line.
- Y9** - Set up and solve linear equations for perimeter & angle problems. Solve inequalities and represent solutions on a number line. Solve simultaneous equations algebraically and graphically.

### GM3

- Y7** - Identify properties of 3D shapes. Calculate volume and surface area of cubes, cuboids & triangular prisms.
- Y8** - Classify 3D shapes from their properties. Construct plans & elevations. Calculate volume and surface area of cylinders.
- Y9** - Find the missing height or radius of a cylinder given the volume. Find the volume & surface area of pyramids, cones & spheres.

### A3

- Y7** - Generate a sequence given the term-to-term rule. Identify & plot graphs of simple straight line equations.
- Y8** - Find the nth term of a linear sequence. Use the form  $y=mx+c$  to plot straight line graphs.
- Y9** - Generate a quadratic sequence from the nth term. Use the form  $y=mx+c$  to plot straight line graphs and state gradients. Calculate the gradient of a line segment. Recognise & plot quadratic graphs.

### GM4

- Y7**
- Perform transformations and enlargements.

### S3

- Y8**
- Find the probability of events happening. Use sample space diagrams & Venn diagrams.

### GM5

- Y9**
- Calculate bearings on diagrams using angle facts.
- Construct and interpret scale drawings.
- Know and apply the formulas for speed, distance, time and mass, density, volume

# KS3 Maths –Mapping Overview

## Heptagon Pathway

A student following a heptagon pathway will study these curriculum goals throughout Y7, 8 & 9.

These are extracts from the Scheme of Work and show the key content that is taught in each unit. Each unit of study is not limited to these curriculum goals.

Students are able to 'change lanes' onto a different pathway if they require a different speed & challenge.

### N1

- Y7** - Perform complex calculations with negatives & decimals. Round to significant figures.
- Y8** - Find upper and lower bounds of previously rounded numbers.
- Y9** - Apply and interpret limits of accuracy to solve problems.

### N2

- Y7** - Use prime factors to find HCF & LCM. Calculate more complex powers & roots.
- Y8** - Use prime factors to find HCF & LCM and express answers using correct power notation. Know and apply the laws of indices. Multiply & divide with numbers in standard form.
- Y9** - Know and apply the laws of indices with coefficients. Use surd notation to represent irrational numbers.

### GM1

- Y7** - Know and use properties of polygons. Find angles on parallel lines.
- Y8** - Find interior and exterior angles of regular & irregular polygons. Know and use angles facts on parallel lines.
- Y9** - Use the formal proofs to prove two triangles are congruent. Introduction to circle theorems.

### A1

- Y7** - Factorise and expand expressions. Substitute with positive & negative numbers.
- Y8** - Factorise and expand simple quadratics. Change the subject of a given formula that include powers or fractions.
- Y9** - Factorise, expand and solve quadratics. Change the subject of a given formula where the subject appears twice.

### N3

- Y7** - Add, subtract, multiply & divide mixed numbers. Convert between FDP.
- Y8** - Solve worded problems that rely on the use of calculating with mixed numbers. Order and compare mixed numbers.
- Y9** - Solve worded problems that rely on the use of calculating with mixed numbers. Convert between recurring decimals and fractions.

### S1

- Y7** - Find the mean, mode and range from a frequency table. Represent data through the use of dual bar charts & pie charts.
- Y8** - Find the mean, mode and range from a grouped frequency table. Represent data through the use of pie charts, stem & leaf diagrams and frequency polygons.
- Y9** - Construct and interpret box plots & cumulative frequency graphs. Compare data sets using averages.

### GM2

- Y7** - Calculate perimeter & area of 2D shapes including circles.
- Y8** - Solve problems involving perimeter & area of 2D shapes, including those expressed algebraically. Use & apply Pythagoras' Theorem.
- Y9** - Find arc length and sector area. Use & apply Pythagoras' Theorem in 2D & 3D. An introduction to Trigonometry.

### N4

- Y7** - Calculate percentage change between two amounts. Solve ratio problems.
- Y8** - Use multipliers to calculate percentage change. Calculate interests in financial contexts. Solve ratio problems. Solve formal problems involving direct proportion.
- Y9** - Calculate reverse percentages using both non-calculator and calculator methods. Solve ratio problems. Solve formal problems involving direct & inverse proportion.

### A2

- Y7** - Solve linear equations, including those with unknowns on both sides.
- Y8** - Solve linear equations and inequalities, including those with unknowns on both sides. Represent inequalities on a number line. Solve simultaneous equations.
- Y9** - Set up and solve linear equations for perimeter & angle problems. Represent linear inequalities on a graph and shade regions. Solve simultaneous equations algebraically and graphically.

### GM3

- Y7** - Classify 3D shapes from their properties. Find missing lengths given the volume of cubes & cuboids.
- Y8** - Represent solids from plans and elevations, using isometric paper. Find the missing height or radius of a cylinder given the volume.
- Y9** - Find the volume & surface area of composite 3D shapes, including those made from pyramids, cones & spheres. Use multiples of pi in exact calculations.

### A3

- Y7** - Find the nth term of a linear sequence. Identify gradients of straight line graphs.
- Y8** - Recognise quadratic sequences. Use the form  $y=mx+c$  to plot straight line graphs. Calculate the gradient of a line segment.
- Y9** - Find an nth term of a quadratic sequence. State the equation of straight lines that pass through points. Plot quadratic graphs & identify the roots.

### GM4

- Y7**
- Perform and describe transformations and enlargements.
- Find missing lengths in similar shapes.

### S3

- Y8**
- Find the probability of events happening.
- Construct Venn diagrams & tree diagrams to classify outcomes.

### GM5 Y9

- Solve bearing problems that involve sketching right angled triangles and using Pythagoras' Theorem.
- Know and apply the formulas for speed, distance, time and mass, density, volume in context.

