Key stage 3 (Mathematics)

**Specification Summary**

**Year 7**

**1 Using numbers**
1.1 Charts and financial mathematics
1.2 Positive and negative numbers
1.3 Simple arithmetic with negative numbers
1.4 Subtracting negative numbers
1.5 Multiplying negative numbers

**2 Sequences**
2.1 Function machines
2.2 Sequences and rules
2.3 Working out missing terms
2.4 Working out the nth term
2.5 Other sequences

**3 Perimeter, area and volume**
3.1 Perimeter and area of rectangles
3.2 Perimeter and area of compound shapes
3.3 Areas of some other 2D shapes
3.4 Surface area and volume of cubes and cuboids
4 Decimal numbers
4.1 Multiplying and dividing by 10, 100, 1000 and 10 000
4.2 Ordering decimals
4.3 Estimates
4.4 Adding and subtracting decimals
4.5 Multiplying and dividing decimals
4.6 Dividing decimals

5 Working with numbers
5.1 Square numbers and square roots
5.2 Rounding
5.3 Order of operations
5.4 Multiplication problems without a calculator
5.5 Division problems without a calculator
5.6 Calculations with measurements

6 Statistics
6.1 Mode, median and range
6.2 The mean
6.3 Statistical diagrams
6.4 Collecting and using discrete data
6.5 Collecting and using continuous data
6.6 Data collection

7 Algebra
7.1 Expressions and substitution
7.2 Simplifying expressions
7.3 Using formulae
7.4 Writing formulae

8 Fractions
8.1 Equivalent fractions
8.2 Comparing fractions
8.3 Adding and subtracting fractions
8.4 Mixed numbers and improper fractions
8.5 Calculations with mixed numbers

9 Angles
9.1 Measuring and drawing angles
9.2 Calculating angles
9.3 Corresponding and alternate angles
9.4 Angles in a triangle
9.5 Angles in a quadrilateral
9.6 Properties of triangles and quadrilaterals

10 Coordinates and graphs
10.1 Coordinates in four quadrants
10.2 Graphs from relationships
10.3 Predicting graphs from relationships
10.4 Graphs of the form y = ax
10.5 Graphs of the form x + y = a
10.6 Graphs from the real world

11 Percentages
11.1 Fractions, decimals and percentages
11.2 Fractions of a quantity
11.3 Calculating simple percentages
11.4 Percentages with a calculator
11.5 Percentage increases and decreases

12 Probability
12.1 Probability scales
12.2 combined events
12.3 Experimental probability

13 Symmetry
13.1 Line symmetry and rotational symmetry
13.2 Reflections
13.3 Rotations
13.4 Tessellations

14 Equations
14.1 Finding unknown numbers
14.2 Solving equations
14.3 Solving more complex equations
14.4 Setting up and solving equations
15 Interpreting data
15.1 Pie charts
15.2 Comparing range and averages of data
15.3 Statistical surveys

16 3D shapes
16.1 Naming and drawing 3D shapes
16.2 Using nets to construct 3D shapes
16.3 3D investigations

17 Ratio
17.1 Introduction to ratios
17.2 Simplifying ratios
17.3 Ratios and sharing
17.4 Solving problems

Year 8

1 Working with numbers
1.1 Multiplying and dividing negative numbers
1.2 Factors and highest common factor (HCF)
1.3 Multiples and lowest common multiple (LCM)
1.4 Powers and roots

2 Geometry
2.1 Parallel lines
2.2 The geometric properties of quadrilaterals
2.3 Translations
2.4 Enlargements
2.5 Constructions

3 Probability
3.1 Mutually exclusive outcomes and exhaustive outcomes
3.2 Using a sample space to calculate probabilities
3.3 Estimates of probability

4 Percentages
4.1 Calculating percentages
4.2 Calculating percentage increases and decreases
4.3 Calculating a percentage change

5 Congruent shapes
5.1 Congruent shapes
5.2 Congruent triangles
5.3 Using congruent triangles to solve problems

6 Surface area and volume of prisms
6.1 Metric units for area and volume
6.2 Surface area of prisms
6.3 Volume of prisms

7 Graphs
7.1 Graphs from linear equations
7.2 Gradient (steepness) of a straight line
7.3 Graphs from quadratic equations
7.4 Real-life graphs
8 Number
8.1 Powers of 10
8.2 Significant figures
8.3 Standard form with large numbers
8.4 Multiplying with numbers in standard form

9 Interpreting data
9.1 Interpreting graphs and diagrams
9.2 Relative sized pie charts
9.3 Scatter graphs and correlation
9.4 Creating scatter graphs

10 Algebra
10.1 Algebraic notation
10.2 Like terms
10.3 Expanding brackets
10.4 Using algebraic expressions
10.5 Using index notation

11 Shape and ratio
11.1 Ratio of lengths, areas and volumes
11.2 Fractional enlargement
11.3 Map scales
12 Fractions and decimals
12.1 Adding and subtracting fractions
12.2 Multiplying fractions and integers
12.3 Dividing with integers and fractions
12.4 Multiplication with large and small numbers
12.5 Division with large and small numbers

13 Proportion
13.1 Direct proportion
13.2 Graphs and direct proportion
13.3 Inverse proportion
13.4 Comparing direct proportion and inverse proportion

14 Circles
14.1 The circumference of a circle
14.2 Formula for the circumference of a circle
14.3 Formula for the area of a circle

15 Equations and formulae
15.1 Equations with brackets
15.2 Equations with the variable on both sides
15.3 More complex equations
15.4 Rearranging formulae

16 Comparing data
16.1 Grouped frequency tables
16.2 Drawing frequency diagrams
16.3 Comparing sets of data
16.4 Misleading charts

Year 9
1 Percentages
1.1 Simple interest
1.2 Percentage increases and decreases
1.3 Calculating the original value
1.4 Repeated percentage changes

2 Equations and formulae
2.1 Multiplying out brackets
2.2 Factorising algebraic expressions
2.3 Expressions with several variables
2.4 Equations with fractions

3 Polygons
3.1 Properties of polygons
3.2 Interior and exterior angles of regular polygons
3.3 Tessellations and regular polygons

4 Using data
4.1 Scatter graphs and correlation
4.2 Two-way tables
4.3 Estimation of a mean from grouped data
4.4 Cumulative frequency diagrams
4.5 Statistical investigations

5 Applications of graphs
5.1 Step graphs
5.2 Time graphs
5.3 Exponential growth graphs

6 Pythagoras’ theorem
6.1 Introducing Pythagoras’ theorem
6.2 Using Pythagoras’ theorem to solve problems
6.3 The converse of Pythagoras’ theorem

7 Fractions
7.1 Adding and subtracting fractions
7.2 Multiplying fractions and mixed numbers
7.3 Dividing fractions and mixed numbers
7.4 Algebraic fractions

8 Algebra
8.1 Expanding the product of two brackets
8.2 Expanding expressions with more than two brackets
8.3 Factorising quadratic expressions with positive coefficients
8.4 Factorising quadratic expressions with negative coefficients
8.5 The difference of two squares

9 Decimal numbers
9.1 Powers of 10
9.2 Standard form
9.3 Multiplying with numbers in standard form
9.4 Dividing with numbers in standard form
9.5 Upper and lower bounds

10 Surface area and volume of cylinders
10.1 Volume of a cylinder
10.2 Surface area of a cylinder
10.3 Composite shapes

11 Solving equations graphically
11.1 Graphs from equations in the form $ay \pm bx = c$
11.2 Solving simultaneous equations by drawing graphs
11.3 Solving quadratic equations by drawing graphs
11.4 Solving cubic equations by drawing graphs

12 Compound units
12.1 Speed
12.2 More compound units
12.3 Unit costs

13 Right-angled triangles
13.1 Introduction to trigonometric ratios
13.2 How to find trigonometric ratios of angles
13.3 Using trigonometric ratios to find angles
13.4 Using trigonometric ratios to find lengths