

# 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  $n$ th 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**