



## Mathematics Curriculum Year 7 and Year 8

The KS3 Mathematics course builds on the numeracy skills learned at primary and ensures all students understand the processes and can apply it to various problem solving questions. Students are introduced to algebra and taught to be systematic with their written responses. In addition, there will also be more in-depth lessons on statistics and understanding its uses.

The Mathematics department is passionate about their subject and look forward to sharing their expertise with the students through various engaging and enriching activities.

Our programme of study has been created to suit the students' mathematical abilities and has taken into account the changes to the GCSE course. Whilst the general headings do not change whether they are in Year 7 or Year 8, the students will learn new content that builds on the previous year. The most able students start a number of new topics that are met at GCSE. Please see below for further details

### Mathematics Curriculum Overview Year 7

- 7.1- Basic numeracy skills. Perimeter, area of shapes, and introduction to Algebra.
- 7.2- Fractions, decimals, percentages, 2d shapes, basic angles to angles in polygons
- 7.3- Straight line graphs moving onto real life graphs
- 7.4- Statistics and transformations of shapes
- 7.5- Algebra focusing on solving, forming equations and constructions.
- 7.6- Ratio, proportion and probability

### Mathematics Curriculum Overview Year 8

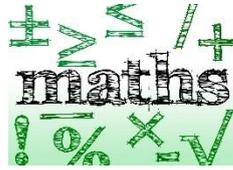
- 8.1- Prime factor decomposition, Rounding and estimation, and trial and improvement
- 8.2- Metric measures, circumference and area of circle
- 8.3- Algebra focusing on factorising, rearranging formulae, and algebraic fractions
- 8.4- Fractions, decimals and percentages, and angles of shapes
- 8.5- Graphs and transformations of shapes
- 8.6- Constructions, sequences and 3D shapes

### How can you help?

- ✓ Ensure your child puts their very best effort into their Homework.
- ✓ Encourage them to ask for help if they are stuck.
- ✓ Check your child's planner to see if they have any Homework.
- ✓ Make sure your child revises well for their tests and end of year exams.

## Assessment

All topics are assessed and Students need to revise thoroughly before each test so that they have the best opportunity for maximising their chance of exceeding their target grades.



### Year 7 Maths Curriculum Objectives TKAW Autumn 1 (1/2 termly delivery)

Understand and use place value for decimals, measures and integers of and size.
Order positive and negative integers, decimals and fractions
Multiply and divide whole numbers and those involving decimals by powers of 10
Use the 4 operations
Use a calculator to calculate results accurately and to be able to round appropriately
Use standard units of mass, length, time, money and other measures
Change freely between related standard units
Problem solving involving perimeter and area of triangles, parallelograms, trapezia and other prisms
Calculate surface area and volume of a cuboid
Substitute numerical values into formulate and expressions
Simplify and manipulate algebraic expressions
To be able to expand brackets
Factorising expressions
Model situations or procedures by translating them into algebraic expressions or formulae

**Year 7 Maths Curriculum Objectives TKAW**  
**Autumn 2 (1/2 termly delivery)**

Express one quantity as a fraction of another

Adding and subtracting fractions including proper, improper and mixed numbers

Work interchangeably with terminating decimals and their corresponding fractions

Interpret fractions and percentages as operators

Define percentages and solve problems using percentages

Draw and measure line segments and angles in geometric figures

Apply properties of angles at a point, angles at a point on a straight line and vertically opposite angles

Understand and use the relationship between parallel lines and alternate and corresponding angles

Derive and illustrate properties of triangles, quadrilaterals, circles and other plane figures


**Year 7 Maths Curriculum Objectives TKAW**  
**Spring 1 (1/2 termly delivery)**

Work with coordinates in all 4 quadrants
Recognise, sketch and produce graphs of linear and quadratic functions
Find solutions to contextual problems from given graphs of a variety of functions
Construct and interpret appropriate tables, charts and diagrams
Using frequency tables, bar charts, pie charts and pictograms for categorical data
Round numbers and measure to an appropriate degree of accuracy
Use conventional notation for the priority of operations including brackets, powers, roots and reciprocals
Substitute numerical values into formulae and expressions, including scientific formulae
Describe, interpret and compare observed distributions of a single variable
Appropriate graphical representation involving discrete, continuous and grouped data
Construct and interpret appropriate tables, charts and diagrams for ungrouped and grouped numerical data
Explore what can and cannot be inferred in statistical and probabilistic settings

**Year 7 Maths Curriculum Objectives TKAW**  
**Spring 2 (1/2 termly delivery)**

Identify properties of and describe the results of translations, rotations and reflections applied to given figures
Describe, sketch and draw using conventional terms and notations
Identify and construct congruent triangles, construct similar shapes by enlargement, with and without coordinate grids
Use algebraic methods to solve linear equations in one variable
Model situations or procedures by translating them into algebraic expressions or formulae and by using graphs

**Year 7 Maths Curriculum Objectives TKAW**  
**Summer 1 (1/2 termly delivery)**

Use integer powers and associated real roots

Distinguish between exact representations of roots and their decimal approximations

Use the concepts and vocabulary of prime numbers, factors, multiples, common factors, common multiples, highest common factor, lowest common multiple and prime factorisation

Derive and use the standard ruler and compass constructions

Perpendicular bisector of a line segment, bisecting a given angle

Identify and construct congruent triangles

Use scale factors, scale diagrams and maps and interpret scale drawings

Analyse 2D and 3D shapes

Use the properties of faces, surfaces, edges and vertices of cubes, cuboids, prisms, cylinders, pyramids, cones and spheres to solve problems in 3D

**Year 7 Maths Curriculum Objectives TKAW**  
**Summer 2 (1/2 termly delivery)**

Generate terms of a sequence from either a term to term or a position to term rule

Recognise arithmetic sequences and find the  $n$ th term

Make and test conjectures about patterns and relationships and look for proofs

Use the 4 operations including formal written methods applied to integers and decimals

Use a calculator and other technologies to calculate results accurately and then interpret them appropriately

Work interchangeably with terminating decimals and their corresponding fractions

Solve problems involving direct and inverse proportion

Use ratio notations, including reduction to simplest form

Divide a given quantity into 2 parts, express the division of a quantity into two parts as a ratio

Understand that a relationship between 2 quantities can be expressed as a ratio

Record, describe and analyse the frequency of outcomes of simple probability experiments

Use appropriate language and the 0-1 probability scale

Enumerate sets systematically using tables, grids and Venn diagrams

### Year 8 Maths Curriculum Objectives TKAW

#### Autumn 1 (1/2 termly delivery)

Use the concepts and vocabulary of prime numbers, factors, multiples, common factors, common multiples, highest common factor, lowest common multiple and prime factorisation

Use integer powers and associated real roots

Round numbers and measure to an appropriate degree of accuracy

Change freely between related standard units including time, length, area and volume

Use standard units of mass, length, time, money and other measures including decimal quantities

Derive and apply formulae to calculate and solve problems involving perimeter and area of triangles, parallelograms, trapezia, volume of cuboids and other prisms

Calculate and solve problems involving perimeter of 2D shapes including circles, area of circles and composite shapes

Substitute numerical values into formulae and expressions

Forming mathematical relationships using index laws

Simplify and manipulate algebraic expressions to maintain equivalence

Set up linear equations from worded problems

Solve linear equations, simultaneous equations and interpret mathematical relationships both algebraically and geometrically

### Year 8 Maths Curriculum Objectives TKAW

#### Autumn 2 (1/2 termly delivery)

Work interchangeably with terminating decimals and their corresponding fractions

Define percentages, express 1 quantity as a percentage of another, compare 2 quantities using percentages and work with percentages greater than 100%

Work with decimals, proper and improper fractions and mixed numbers

Solve problems using percentage change including percentage increase, decrease and original value problems and simple interest in financial mathematics

Collecting like terms, multiplying by a single term over a bracket, taking out common factors and expanding products of 2 or more brackets

Model situations or procedures by translating them into algebraic expressions or formulae and by using graphs

**Year 8 Maths Curriculum Objectives TKAW**  
**Spring 1 (1/2 termly delivery)**

Apply the properties of angles at a point, angles at a point on a straight line and vertically opposite angles
Understand and use the relationship between parallel lines and alternate and corresponding angles
Derive and illustrate properties of triangles, quadrilaterals, circles and other plane figures
Describe, sketch and draw using conventional terms and notations including points, lines, parallel lines, perpendicular lines, right angles, regular polygons and other polygons
Apply angle facts, triangle congruence, similarity and properties of quadrilaterals to derive results and about angles and sides, including Pythagoras' theorem and use results to obtain simple proofs
Recognise, sketch and produce graphs of linear and quadratic functions of 1 variable with appropriate scaling
Develop algebraic and graphical fluency, including understanding linear and simple quadratic functions
Find approximate solutions to contextual problems from given graphs of a variety of functions

**Year 8 Maths Curriculum Objectives TKAW**  
**Spring 2 (1/2 termly delivery)**

Explore what can and cannot be inferred in statistical probabilistic settings and begin to express their arguments formally
Construct and interpret appropriate tables, charts and diagrams
Using frequency tables, bar charts, pie charts and pictograms for categorical data
Using vertical line or bar charts for ungrouped and grouped numerical data
Analyse discrete, continuous and grouped data and appropriate measures of central tendency and spread
Identify properties of and describe the results of translations, rotations and reflections applied to given figures
Describe, sketch and draw using conventional terms and notations
Using points, lines, parallel lines, perpendicular lines, right angles, regular polygons and other polygons
Use of 4 operations, including calculator and non calculator methods

**Year 8 Maths Curriculum Objectives TKAW**  
**Summer 1 (1/2 termly delivery)**

Identify and construct congruent triangles and construct similar shapes by enlargement with and without coordinate grids
Derive and use the standard ruler and compass constructions
Perpendicular bisector of a line segment, constructing a perpendicular to a given line, bisecting a given angle
Recognise and use the perpendicular distance from a point to a line as the shortest distance to the line
Use scale factors, scale diagrams and maps
Generate terms of a sequence from either a term to term or a position to term rule
Recognise arithmetic sequences and find the nth term
Use and interpret 2D and 3D shapes
Use the properties of faces, surfaces, edges and vertices of cubes, cuboids, prisms, cylinders, pyramids, cones and spheres to solve problems in 3D

**Year 8 Maths Curriculum Objectives TKAW**  
**Summer 2 (1/2 termly delivery)**

Use ratio notation, including reduction to simplest form
Divide a quantity into 2 parts, express the division of a quantity into 2 parts as a ratio
Solve problems involving direct and inverse proportion, including graphical and algebraic representations
Generate theoretical sample spaces for single and combined events with equally likely, mutually exclusive outcomes and use these to calculate theoretical probabilities
Understand that the probabilities of all possible outcomes sum to 1
Using appropriate language and the 0-1 probability scale
Explore what can and cannot be inferred in statistical probabilistic settings
Begin to model situations mathematically and express the results using a range of formal mathematical representations