

KS3 Long Term Curriculum Plan: **Mathematics - Year 7**

<p>Curriculum Aim: The national curriculum for mathematics aims to ensure that all pupils:</p> <ul style="list-style-type: none"> ● become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. ● reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language ● can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Link to prior learning: See KS2 National Curriculum for Mathematics

Rationale of sequencing: In mathematics, students follow a spiral curriculum that allows them to study requisite skills before moving onto more complex concepts. Students will revisit topics in subsequent years and build on prior knowledge and connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. Decisions about progression should be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content in preparation for key stage 4.

In year 7, Autumn 1 focuses on consolidating students' numerical and mathematical capability from key stage 2 and extending their understanding of the number system and place value to include decimals, fractions, powers and roots. We follow this in Autumn 2 with two geometry based modules which require students to apply skills learnt in the previous half-term and where students begin to reason deductively in geometry, including using geometrical constructions.

In the Spring term, students develop their understanding of the number system with a focus on fractions and percentages and then extend and formalise their knowledge of ratio and proportion. In spring 2 students begin their first study of algebra with how to use algebra to generalise the structure of arithmetic, including to formulate mathematical relationships, substitute values in expressions, simplify expressions, and solve equations. In the Summer term, students explore statistics and probability and what can and cannot be inferred in statistical and probabilistic settings, and begin to express their arguments formally. Finally, students finish with modules on perimeter, area and volume which builds on their previous geometry study in the Autumn term.

Term	Focus / Topic	Knowledge & Skills (from NC/Programmes of Study)	Assessment
Autumn 1	Module 1 - Place Value & Rounding Module 2 - Four Operations Module 3 - Number Properties	Students should be able to: <ul style="list-style-type: none"> ● understand and use place value for decimals, measures and integers of any size ● order positive and negative integers, decimals and fractions; ● use the number line as a model for ordering of the real numbers; use the symbols =, ≠, <, >, ≤, ≥ ● use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property ● use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative ● use conventional notation for the priority of operations (BIDMAS), including brackets, powers, roots and reciprocals ● use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations ● round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures] 	Baseline assessment - w/c 13/09/21

Autumn 2	Module 4 - Properties of Angles Module 5 - Properties of Shapes	Students should be able to: <ul style="list-style-type: none"> ● draw and measure line segments and angles in geometric figures ● apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles ● use the sum of angles in a triangle ● describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, ● use the standard conventions for labelling the sides and angles of triangle ABC ● derive and illustrate properties of triangles, quadrilaterals, circles, and other plane figures [for example, equal lengths and angles] using appropriate language and technologies ● use the properties of faces, surfaces, edges and vertices of cubes, cuboids, prisms, cylinders, pyramids, cones and spheres to solve problems in 3-D 	End of half-term assessment on all topics covered since the start of year 7.
Spring 1	Module 6 - Fractions Module 7 - Percentages Module 8 - Ratio & Proportion	Students should be able to: <ul style="list-style-type: none"> ● define percentage as 'number of parts per hundred', interpret percentages and percentage changes as a fraction or a decimal ● interpret fractions and percentages as operators ● express one quantity as a fraction of another, where the fraction is less than 1 and greater than 1 ● use ratio notation, including reduction to simplest form ● divide a given quantity into two parts in a given part ● solve problems involving percentage increase and decrease 	Topic/skills test
Spring 2	Module 9 - Algebraic Manipulation Module 10 - Solving Equations Module 11 - Sequences & Graphs	Students should be able to: <ul style="list-style-type: none"> ● use and interpret algebraic notation, including: ab in place of $a \times b$, $3y$ in place of $y + y + y$ and $3 \times y$, a^2 in place of $a \times a$, a^3 in place of $a \times a \times a$; $a^2 b$ in place of $a \times a \times b$, a/b in place of $a \div b$, coefficients written as fractions rather than as decimals, brackets ● substitute numerical values into formulae and expressions, including scientific formulae ● understand and use the concepts and vocabulary of expressions, equations, terms and factors ● simplify and manipulate algebraic expressions to maintain equivalence by: collecting like terms multiplying a single term over a bracket ● use algebraic methods to solve linear equations in one variable ● understand and use standard mathematical formulae; ● work with coordinates in all four quadrants ● generate terms of a sequence from either a term-to-term or a position-to-term rule 	w/c 21/2/22 - Year 7 assessment week
Summer 1	Module 12 - Representing Data Module 13 - Averages & Range Module 14 - Probability	Students should be able to: <ul style="list-style-type: none"> ● describe, interpret and compare observed distributions of a single variable through: appropriate graphical representation involving discrete, continuous and grouped data; and appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers) ● construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data ● record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale ● understand that the probabilities of all possible outcomes sum to 1 ● use standard units of mass, length, time, money and other measures, including with decimal quantities 	Topic/skills test

	Module 15 - Measures	<ul style="list-style-type: none"> change freely between related standard units [for example time, length, area, volume/capacity, mass] 	
Summer 2	Module 16 - Perimeter & Area Module 17 - Volume & Surface Area	<p>Students should be able to:</p> <ul style="list-style-type: none"> derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms Calculate and solve problems involving: perimeters of 2-D shapes 	w/c 13/6/22 - Year 7 assessment week

Further Information

The exam board used for Mathematics is **Edexcel** - <http://qualifications.pearson.com/en/qualifications/edexcel-gcses/mathematics2015.html>

Maths Watch - <https://vle.mathswatch.co.uk/vle/> (All students are given individual logins and passwords to support with classwork, homework and revision)

Equipment - All students must attend lessons with pens (including a green pen), pencil, long ruler, rubber, protractor, pair of compasses, scientific calculator and exercise book.