

## What are the aims and intentions of this curriculum?

Students are taught how to work with numbers, algebra, ratio, proportions and rates of change, geometry and measures, probabilities and statistics. The skills attained in year 7 and 8 are consolidated and students are exposed to the format in which mathematical reasoning will be expected to be evidenced in KS4. At the end of each topic, a closing-the-gap-questionnaire in the form of a review sheet is required to be completed by the students. Homework is given on a weekly basis and is expected to be completed online. To provide students with a holistic experience, prepare them for future success, help them aspire and value mathematics, **Personal Social Health and Economic (PSHE)** education and **Careers Education (CE)** are incorporated into the curriculum. Ambitiously, students are enriched by exploring the origins of numbers and receive exposure to current limits within mathematics.

Term	Topics	Knowledge and Key Terms	Skills Developed	Assessment
Autumn 1	<i>Multiplicative reasoning</i>	Similarity, enlargement, scale factor, percentage change, speed/distance/time, compound measures, convert, mass/density/volume, pressure/area/force	Use multiplication to find and use the relationships between the sides of similar shapes; find and use the scale factor of fractional and negative enlargements of shapes on a cartesian plane; use a multiplier to find percentage change as well as calculating original amounts before a given percentage change was applied; do calculations with compound measures; convert between units of compound measures  <b>CE: Forklift operator, assembly, bond technician, baker, electronics engineer/technician, program support, wastewater plant operator, steamfitter plumber</b>	End of topic review Homework Bookmarking Classroom feedback Half-term formal assessment
	<i>Constructions</i>	Scale factor, ratio, map scale, image and object, perpendicular, bisector, point, line, congruency, special angles	Convert between scales of those represented as a ratio and those represent as a measure of distance; apply scales to convert between the dimensions of an object and its image; draw accurate nets, draw loci of a point, points, a line, line, but not a point and line  <b>CE: CAD drafter, Framer, driver, painter, receiver, material handler</b>	
Autumn 2	<i>Equations, inequalities and proportionality</i>	Solve, expand, simplify, convert, decimal, fraction, trial and improvement, quadratic, cubic, round, inequality, number line, substitute, eliminate	Solve equations with brackets or fractions; convert recurring decimals without a calculator; use trial and improvement to solve equations containing quadratic or cubic expressions; interpret, represent and apply inequalities; solve simultaneous equations via substitution and via elimination  <b>CE: Boiler maker, meteorologist, geologist, chemist, mathematician</b>	End of topic review Homework Bookmarking Classroom feedback Half-term formal assessment
	<i>Circles, Pythagoras and prisms</i>	Radius, diameter, circumference, chord, segment, sector, area, perimeter, Pythagoras, volume, surface area, bounds, error interval	Use the proper circle vocabulary in a variety of contexts; calculate circumferences and areas of circles and circle sectors; apply Pythagoras' theorem to find the longest, and shorter sides of right-angled triangles and apply this to solve real life problems; find the distance and midpoints between two points on a cartesian plane; calculate the volume and surface area of prisms and cylinders; determine bounds of estimates and express	

			<p>bounds and answers as error intervals</p> <p>CE: Navigator, pilot, traffic controller, militant, computer programmer</p> <p>PSHE: Use trial and improvement to develop respect for one another.</p>	
Spring 1	<i>Sequences and graphs</i>	Arithmetic, geometric, term-to-term, position-to-term, straight-lines, parallel lines, gradient-intercept, dual-intercept, draw, sketch, graph, solve, linear, quadratic, cubic	<p>Express a linear sequence as an expression/equation; identify and continue quadratic and geometric sequences; interpret graphs that express rates of change; find equations of straight-line graphs; identify parallel lines and find equations of these; draw and sketch graphs using the gradient-intercept of dual-intercept methods; solve linear-linear and linear-quadratic equations graphically; draw cubic graphs</p> <p>CE: Maintenance worker, furnace operator, warehouse operator, structures technician, server</p> <p>PSHE: Express rates of online information being shared as a geometric sequence to promote care for sharing harmful content.</p>	<p>End of topic review</p> <p>Homework</p> <p>Bookmarking</p> <p>Classroom feedback</p> <p>Half-term formal assessment</p>
Spring 2	<i>Probability</i>	Exhaustive, exclusive; complementary; theoretical, experimental, frequency, sample space, two-way table, Venn diagram, tree diagram	<p>Identify and use mutually exclusive and exhaustive events to find respective probabilities; calculate theoretical and experimental probability/relative frequency and expected frequency; construct and use space diagrams and two-way tables to determine probability; use Venn diagrams to represent frequency and probabilities; use tree diagrams to represent independent events in order to calculate probabilities of outcomes</p> <p>CE: Data scientist, director of analytics, geneticist, investment analyst, machine learning engineer</p>	<p>End of topic review</p> <p>Homework</p> <p>Bookmarking</p> <p>Classroom feedback</p> <p>Half-term formal assessment</p>
Summer 1	<i>Comparing shapes</i>	Similar, congruent, Sine, Cosine, Tangent, angle, adjacent, opposite, hypotenuse	<p>Compare and identify the similarities and differences of similar and congruent shapes; find missing angles or sides of similar and congruent shapes; know why there are 3 different ratios to express the sides of right-angled triangles; find missing sides of right-angled triangles using the Sine, Cosine and Tangent ratios</p> <p>CE: Robotics engineer, mathematician, architect, game developer</p> <p>PSHE: Use similarities and congruence in relationships to help students evaluate their different levels of connectivity with others and the impact this has on their happiness.</p>	<p>End of topic review</p> <p>Homework</p> <p>Bookmarking</p> <p>Classroom feedback</p> <p>End of year formal assessment</p>