Our Lady Queen of Peace
Catholic Engineering College

Curriculum Overview

Year 9 Mathematics

	Knowledge & Understanding			Subject Specific Literacy Development		Cultural Capital / Enrichment Opportunities
	Composites (Bigger Picture)	**Components (Key Concepts)**	**Recall & Retrieval Focus**	**Read Like A... Focus**	**Key Vocabulary**	
Half Term 1	**Integers Place Value and Rounding**	Add, subtract, multiply and divide decimals and integers Use one calculation to find the answer to another Use the product rule for counting to determine numbers of outcomes Round to the nearest integer, to a given number of decimal places and to a given number of significant figures Estimate answers to calculations	Key skills from Y8 HT6 Class specific based on Y8 AC3 QLA	Multi-step reasoning problems. Draw and interpret mathematical diagrams.	Product Significant figures	Astronomy and space exploration: distances in space are ideal for standard form and scale of particles from the LHC.
	Indices, Roots, Reciprocals and BIDMAS	Work out the value of n in equations such as $40 = 5 \times 2^n$. Use index notation for integer powers of 10, including negative powers Estimate powers and roots of any given positive number, by considering the values it must lie between Find the value of calculations using positive, fractional and negative indices Solve problems using index laws Use brackets and the hierarchy of operations up to and including with powers and roots inside the brackets, or raising brackets to powers or taking roots of brackets			Indices Inverse	
	Factors, Multiples and Primes	Identify factors, multiples and prime numbers Find the prime factor decomposition of positive integers Find common factors and common multiples of two numbers. Find the LCM and HCF of two numbers Solve problems using HCF and LCM, and prime numbers			Factor Multiple Prime Factorisation	
	Standard Form and Surds	Convert large and small numbers into standard form and vice versa Add, subtract, multiply & divide numbers in standard form Understand surd notation Simplify surd expressions involving squares			Surd Standard Form	

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Half Term 2	**Algebra Skills**	Select an expression/equation/formula/identity from a list Simplify algebraic expressions by collecting 'like' terms. Substitute positive and negative numbers into a formula (use links here to science equation sheet) Multiply together two simple algebraic expressions Simplify expressions by cancelling Use index laws in algebra Expand & factorise simple expressions Expand the product of two linear expressions Factorise quadratic expressions	Calculations and Rounding Factors, Multiple and Primes Indices Standard Form and Surds	Multi-step reasoning problems. Draw and interpret mathematical diagrams.	Expression Factorising Expand	Expressing real-life scenarios using algebra and sequences, i.e. mobile phone contracts, delivery costs, bills, streaming plans.
	Rearranging and Solving Equations	Set up simple equations from word problems Solve linear equations, including when the unknown appears on both sides of the equation Derive a formula and solve these equations, interpreting the solution in the context of the problem Change the subject of a simple formula, including cases where the subject is on both sides of the original formula, or involving fractions and small powers of the subject			Change of subject Iteration Coefficient	
	Sequences	Generate specific terms in a sequence using the position-to-term rule and term-to-term rule Find and use the nth term of an arithmetic sequence; Use the nth term of an arithmetic sequence to decide if a given number is a term in the sequence Continue a quadratic sequence and use the nth term to generate terms Continue geometric progression and find term to term rule, including negative, fraction and decimal terms Solve problems involving sequences from real life situations.			Term Quadratic	
	Averages and the Range	Complete and interpret two-way tables Calculate mean & range, find median & mode from small data set. Recognise the advantages and disadvantages between measures of average. Construct and interpret stem and leaf diagrams Calculate the mean, mode, median and range from a frequency table Construct and interpret grouped frequency tables (modal class, mean and median) Compare the mean and range of two distributions, or median or mode as appropriate:			Quantitative Mean Median Mode Discrete	

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Half Term 3	**Representing and Interpreting Data**	Produce and interpret composite and dual bar charts Produce and interpret pie charts Produce and interpret frequency polygons for grouped data Produce and interpret histograms with equal class intervals Produce line graphs Construct and interpret time–series graphs Compare the mean and range of two distributions, or median or mode as appropriate	Key skills from HT1 & 2 Class specific based on QLA	Multi-step reasoning problems. Draw and interpret mathematical diagrams.	Histogram Class Interval	Data science: digital marketing, sports analysis.
	Scatter Graphs	Draw and interpret scatter graphs Interpret scatter graphs in terms of the relationship between two variables Use a line of best fit to predict values of a variable given values of the other variable Interpret correlation in terms of the problem			Correlation Causality Line of Best Fit	
	Fractions	Convert a fraction to a recurring decimal and vice versa Express a given number as a fraction of another Find equivalent fractions Find a fraction of a quantity, including within a context Convert a fraction to a decimal Convert between mixed numbers and improper fractions Add, subtract, multiply and divide fractions, including mixed numbers Understand and use reciprocal of an integer, decimal or fraction			Recurring Terminating Reciprocal	

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Half Term 4	**Percentages**	Convert between fractions, decimals and percentages Express a given number as a percentage of another number Find a percentage of a quantity Calculate percentage increase and decrease including: simple interest and percentage profit or loss Use a multiplier to increase or decrease by a percentage Find the original amount Describe percentage increase/decrease with fractions	Key skills from HT2 & 3 Class specific based on QLA	Multi-step reasoning problems. Draw and interpret mathematical diagrams.	Multiplier Profit	Wages, taxes, and inequality.
	Ratio and Proportion	Write a ratio as a linear function Identify direct proportion from a table of values, by comparing ratios of values Use a ratio to compare a scale model to real-life object			Ratio	
	Polygons, Angles and Parallel Lines	Recall and use basic angle facts (on a straight line, around a point, in a triangle) Understand and use the angle properties of parallel lines and find missing angles using the properties of corresponding and alternate angles, giving reasons Calculate and use the sums of the interior angles of regular and irregular polygons Use the sum of the exterior angles of any polygon is 360° Use the sum of the interior angles of an n-sided polygon Use the sum of the interior angle and the exterior angle is 180° Calculate the angles of regular polygons and use these to solve problems				

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Half Term 5	**Pythagoras' Theorem and Trigonometry**	Understand, recall and use Pythagoras' Theorem in 2D Justify if a tringle is right-angled or not; Calculate the length of a line segments Understand, use and recall the trigonometric ratios sine, cosine and tan, and apply them to find angles and lengths in general triangles in 2D Use the trigonometric ratios to solve 2D problems Find angles of elevation and depression	Key skills from HT3 & 4 Class specific based on QLA	P Multi-step reasoning problems. Draw and interpret mathematical diagrams.	Hypotenuse Elevation Depression Opposite Adjacent	Land surveying: Use the angle of elevation and trigonometry to calculate the height of mountains and buildings. Could use a clinometer to test this practically.
	Perimeter, Area and Circles	Recall and use the formulae for the area of a triangle, rectangle, trapezium and parallelogram Calculate the area of compound shapes Find the perimeter of the 2D shapes above, including compound shapes Recall and use formulae for the circumference of a circle and the area enclosed by a circle Calculate perimeters and areas of composite shapes made from circles and parts of circles Calculate arc lengths, angles and areas of sectors of circles; Form equations involving more complex shapes and solve these equations.			Composites Arc Sector	
Half Term 6	**Constructions, Loci and Bearings**	Understand and draw front and side elevations and plans of shapes made from simple solids and given the elevations draw the 3D solid. Read and construct scale drawings Understand, draw and measure bearings Calculate bearings and solve bearings problems, including on scaled maps Bisect a given angle, construct a perpendicular to a given line from/at a given point; perpendicular bisector of a line segment Use constructions to solve loci problems including with bearings	Key skills from HT4 & 5 Class specific based on QLA	Multi-step reasoning problems. Draw and interpret mathematical diagrams.	Elevation Perpendicular Loci Bearing	Navigation, maps and orienteering (DoE link).

Key Assessments			
When	**What will be assessed?**	**Why is this being assessed?**	**How will results be stored & students receive feedback?**
HT1	Integers, rounding, estimating, powers, multiples, factors and primes.	To assess the students understanding of and their retention of the topics taught. This information will be used to inform the topics that make up the recall and retention starter activities to help aid student progression.	Scores will be stored on SIMS and student feedback will be through action feedback questions. Class based understanding will be monitored through a QLA to compare outcomes for classes.
HT2	Algebra, solving equations, and sequences.		
HT3	Data and scatter graphs. Mid-Year Assessment		
HT4	Fractions, percentages, ratio and proportion.		
HT5	Polygons, Pythagoras' theorem, SOHCAHTOA, area and perimeter.		
HT6	End of Year Assessment – will assess content from across the Scheme of Work delivered in Y7.		