Curriculum Content Map

Subject: Year 10 Maths - Higher

		Term 1				Term 2				Term 3		
Month		September	October	November	December	January	February	March	April	May	June	July

Cultural Transmission

Units of Work

	September	October	November	December	January	February	March	April	May	June	July
	Number	Algebra	Interpreting and Representing Data	Fractions, Ratio and Percentages	Angles and Trigonometry	Graphs		Area and Volume	Transformations & Constructions	Equations and Inequalities	Probability
	NUMBER	ALGEBRA	DATA	NUMBER	SHAPE	ALGEBRA		SHAPE	SHAPE	ALGEBRA	DATA

Under December: "During December students were re-taught content that was identified as not being secure, on Q by Q analysis documents, following AP1 assessments. Year group gaps were identified and re-visited."

National Curriculum area – KS4

September (Number):
"estimate powers and roots of any given positive number"
"calculate with roots, and with integer and fractional indices"
"calculate exactly with fractions, surds and multiples of π; simplify surd expressions involving squares and rationalise denominators"
"calculate with numbers in standard form A x 10^n, where 1 ≤ A < 10 and n is an integer"

October (Algebra):
"simplify and manipulate algebraic expressions"
"know the difference between an equation and an identity; argue mathematically to show algebraic expressions are equivalent, and use algebra to support and construct arguments and proofs"
"where appropriate, interpret simple expressions as functions with inputs and outputs; interpret the reverse process as the 'inverse function'"
"translate simple situations or procedures into algebraic expressions or formulae; derive an equation (or two simultaneous equations), solve the equation(s) and interpret the solution"
"recognise and use sequences of triangular, square and cube numbers, simple arithmetic progressions, Fibonacci type sequences, quadratic sequences, and simple geometric progressions (r n where n is an integer, and r is a positive rational number or a surd) and other sequences"

November (Interpreting and Representing Data):
"interpret and construct tables and line graphs for time series data"
"use and interpret scatter graphs of bivariate data; recognise correlation and know that it does not indicate causation; draw estimated lines of best fit; make predictions; interpolate and extrapolate apparent trends whilst knowing the dangers of so doing."

December (Fractions, Ratio and Percentages):
"calculate exactly with fractions, (surds) and multiples of π"
"identify and work with fractions in ratio problems"
"convert between related compound units (speed, rates of pay, prices, density, pressure) in numerical and algebraic contexts"

January (Angles and Trigonometry):
"apply Pythagoras' Theorem and trigonometric ratios to find angles and lengths in right-angled triangles (and, where possible, general triangles) in two (and three) dimensional figures"
"know the exact values of sine and cosine at 0, 30, 45, 60, 90 and know the exact value of tangent at 0, 30, 45, 60"

February (Graphs):
"use the form y mx c = + to identify parallel (and perpendicular) lines; find the equation of the line through two given points, or through one point with a given gradient"
"identify and interpret roots, intercepts and turning points of quadratic functions graphically; deduce roots algebraically and turning points by completing the square"
"recognise, sketch and interpret graphs of linear functions, quadratic functions, simple cubic functions, the reciprocal function, the exponential function, and the trigonometric functions (with arguments in degrees)"
"plot and interpret graphs (including reciprocal graphs (and exponential graphs)) and graphs of non-standard functions in real contexts, to find approximate solutions to problems such as simple kinematic problems involving distance, speed and acceleration"

April (Area and Volume):
"identify and apply circle definitions and properties, including: centre, radius, chord, diameter, circumference, tangent, arc, sector and segment"
"calculate arc lengths, angles and areas of sectors of circles"
"calculate surface areas and volumes of spheres, pyramids, cones and composite solids"

May (Transformations & Constructions):
"interpret and use fractional and negative scale factors for enlargements"
"describe the changes and invariance achieved by combinations of rotations, reflections and translations"
"construct and interpret plans and elevations of 3D shapes"
"interpret and use bearings"
"describe translations as 2D vectors"

June (Equations and Inequalities):
"solve quadratic equations, including those that require rearrangement algebraically, by factorising, by completing the square and by using the quadratic formula; find approximate solutions using a graph"
"solve two simultaneous equations in two variables (linear/linear or linear/quadratic) algebraically; find approximate solutions using a graph"
"translate simple situations or procedures into algebraic expressions or formulae; derive an equation (or two simultaneous equations), solve the equation(s) and interpret the solution"
"solve linear inequalities in one or two variables"

July (Probability):
"apply the property that the probabilities of an exhaustive set of mutually exclusive events sum to one"
"use a probability model to predict the outcomes of future experiments; understand that empirical unbiased samples tend towards theoretical probability distributions, with increasing sample size"
"calculate the probability of independent and dependent combined events, including using tree diagrams and other representations, and know the underlying assumptions"
"calculate and interpret conditional probabilities through representation using expected frequencies with two-way tables, tree diagrams and Venn diagrams"

Substantive Knowledge — The What!

September	October	November	December	January	February	March	April	May	June	July
Indices, including negative and fractional; Standard Form; Surds	Algebraic Indices; Non-linear sequences; More expanding and factorising	Time Series; Line of Best Fit	Ratio & Proportion; Fractions, Decimals, Percentages	Angles in Special Triangles; Angles in Polygons; Pythagoras' Theorem; Trigonometry in right-angled triangles; Angles of Elevation and Depression; Exact values - Sine, Cosine, Tangent	Graphing rates of change; Real-life graphs; Line Segments; Quadratic Graphs; Cubic & Reciprocal Graphs		Units and accuracy; Sectors of circles; Spheres; Pyramids; Cones	Combining transformations; Bearings; Scale Drawings; Loci	Solve inequalities; Solve quadratic equations; Completing the square; Solve simultaneous equations, including those with linear and quadratic	Combined Events; Mutually exclusive events; Experimental probability; Tree Diagrams; Conditional probability; Venn diagrams

Disciplinary knowledge — The How!

September	October	November	December	January	February	March	April	May	June	July
Using Laws of Indices; Understanding how to Multiply and Divide by powers of 10; Using Square roots; Using Factors	Linking between laws of indices in number and algebra; Understanding Term-to-term rule	Drawing & Plotting Graphs; Using a Line of best fit (maths vs. science)	Understanding proportion; Understanding place value	Understanding Angle Rules; Understanding relationship between angles in triangle and angles in other shapes (polygons); Investigating Pythagoras' Theorem; Using formula / formula triangles	Plotting & Drawing graphs; Using Substitution; Understanding y=mx+c		Understanding metric units; Understanding relationships between area and volume; Using formulae	Understanding Rotation, Reflection, Translation, Enlargement; Understanding angle rules, including parallel; Understanding ratio and proportion; Using Constructions	Using Inverse operations; Using Substitution	Understanding probability as part of a whole; Drawing & completing diagrams

Sequencing (Flow) — Retrieval & Extension

September	October	November	December	January	February	March	April	May	June	July
Builds from KS3: Place Value; Estimation; HCF & LCM. Further develops in Y11: Percentages; Compound Measures	Builds from KS3: Expand and Factorise expressions; Formulae; Sequences. Further develops in Y11: Simultaneous Equations; Quadratic Equations	Builds from KS3: Averages; Range; Scatter Graphs. Further develops in Y11: Cumulative Frequency; Box Plots; Histograms	Builds from KS3: Fractions; Ratio; Percentages. Further develops in Y11: Direct and Inverse Proportion	Builds from KS3: Angles in triangles; Interior & Exterior angles; Pythagoras' Theorem. Further develops in Y11: Graphs of sine, cosine and tangent functions; Trigonometric graphs	Builds from KS3: Plotting linear graphs. Further develops in Y11: Quadratic Graphs		Builds from KS3: Area; Volume. Further develops in Y11: Circle Theorems; Geometric Proof	Builds from KS3: Reflect; Rotate; Translate; Enlarge. Further develops in Y11: Similarity	Builds from KS3: Solving equations. Further develops in Y11: Quadratic Equations	Builds from KS3: Outcomes. Further develops in Y11: Revision of all probability skills

Summative Assessment

September	October	November	December	January	February	March	April	May	June	July
Deep Mark 1: Homework; End of Topic Test - Number	Deep Mark 2: Homework; End of Topic Test - Algebra	Deep Mark 1: AP1 Assessment - Whole School Data Collection; End of Topic Test - Interpreting and Representing Data; Homework	Deep Mark 2: Homework; End of Topic Test - Fractions, Ratio & Percentages	Deep Mark 1: Homework; End of Topic Test - Angles and Trigonometry	Deep Mark 2: Homework	Deep Mark 1: AP2 Assessment - Whole School Data Collection; End of Topic Test - Graphs; Homework	Deep Mark 2: Homework; End of Topic Test - Area & Volume	Deep Mark 1: Homework; End of Topic Test - Transformations & Constructions	Deep Mark 2: AP3 Assessment - Whole School Data Collection; End of Topic Test - Equations and Inequalities; Homework	End of Topic Test - Probability

Personal Empowerment

Virtue — Link to Virtue

The opportunity to demonstrate friendliness and civility as they support each other in consolidating and extending their number knowledge.

September	October	November	December	January	February	March	April	May	June	July
Friendliness & Civility	Justice & Truthfulness	Courage	Generosity	Gratitude	Good Speech	Good Temper & Humour	Self-Mastery		Compassion	Good Sense
Students will need to ensure they demonstrate friendliness and civility as they support each other in consolidating and extending their number knowledge.	Students will look at the truthfulness of expressions. Students will also look at how sequences are used to hide the truth.	Students will need to demonstrate courage to extend their knowledge of data and build upon this to tackle new and more difficult representation of data.	Students will need to be generous with their time in terms of retrieval as this will need to be secure in order to link fractions and ratios.	Students will need to demonstrate their gratitude for the time spent securing their knowledge in trigonometry.	Students will need to demonstrate good speech as they explain their working and also explain conclusions from their graphs.	Students will need to demonstrate good temper and humour as they extend their graphs knowledge to develop to several different types of graph and how to interpret these.	Students have learned basic area and volume skills in KS3 so this topic is about mastering these skills and developing them further.	Students have learned how to reflect, rotate, translate and enlarge shapes, but will now be mastering these skills and learning to describe them.	Students will need to show compassion for each other as they help and support each other in tackling more difficult algebraic skills.	Students will need to use good sense to ensure that their probability answers make sense – and that they remember to check the answers!

Preparation for Work

Skill — Link to Skill (Transferable skills)

September	October	November	December	January	February	March	April	May	June	July
Listening	Leadership	Problem-Solving	Creativity	Staying Positive	Speaking	Staying Positive	Aiming High		Speaking	Teamwork
Students will need to listen to each other and be able to explain another students' opinion. Students will also need to be listen to the teacher to pull out consistency underlying themes or use of previous skills. This unit links to careers in data analysis and software development.	Students will lead their learning to ensure they are secure in building on previous knowledge. This unit links to careers in business and government.	Students will need to use their problem-solving skills to be able to draw conclusions from data. This unit links to careers in data analysis and intelligence.	Students will demonstrate creativity as they look at the different ways of interpreting ratios and fractions, especially using bar models where appropriate. This unit links to careers in banking and finance.	Students will need to stay positive as they encounter trigonometry for the first time and ensure they feel secure in their knowledge. This unit links to careers in architecture and construction.	Students will need to use their speaking skills as they explain their working and also explain conclusions from their graphs. This unit links to careers in computer programming, finance analysis and engineeering.	Students will need to stay positive as they explain their working and also explain conclusions from their graphs. This unit links to careers in computer programming, finance analysis and engineering.	Students will need to aim high as they develop their area of circle knowledge to look at arcs and sectors. This unit links to careers in construction and game development.	Students will need to aim high when enlargement using negative and fractional scale factors as well as using loci in construction. This unit continues to look at careers in construction and planning.	Students will need to use their speaking skills as they explain their working and also explain the mistakes others have made. This unit links to careers in engineering, architecture and healthcare.	Students will work together and use teamwork to solve probability problems in various forms. This unit links to careers in risk management and insurance.

Preparation for Citizenship

SMSC & British Values — Link to SMSC & British Values (Developing opinions on current issues)

September	October	November	December	January	February	March	April	May	June	July
Social; Mutual Respect	Social; Moral; Rule of Law	Social; Moral; Democracy	Social; Tolerance	Social; Cultural; Rule of Law	Social; Democracy		Social; Cultural; Individual Liberty	Social; Cultural; Mutual Respect	Social; Rule of Law	Social; Moral; Individual Liberty
Students will use their social skills during paired and group work, with a particular focus on the virtue of friendliness & civility as they interact. Mutual respect goes hand-in-hand with friendliness & civility so students will practice both the british value and virtue as they progress through this topic.	Students will look at the social skills they need in order to work together in pairs and grouped work. Students will look at the moral repercussions of manipulation to hide information. Students will understand the 'rules of law' in terms of processes and methods linked to algebraic manipulation and solution.	Students will use social skills to work together in pairs and groups. Students will look at the moral repercussions of manipulating data or graphs to misrepresent the information. Students will demonstrate democracy as they debate, discuss and decide on the most appropriate statistical diagram for their data.	Students will need to use their social skills to retrieve and extend their learning in paired and group activities. Students will need to demonstrate tolerance for each other and support each other rather than get frustrated when peers find work more difficult.	Students will use their social skills as they work together in group activities. Students will look at different cultures and their contribution to mathematics (e.g. Pythagoras). Students will need to understand the rules and processes associated with using a formula, particularly with Pythagoras' Theorem and trigonometry.	Students will use their social skills as they work together in pairs and groups. Students will discuss, debate and make decisions in a democratic way in order to ensure they use the appropriate graph for the appropriate equation or data.		Students will use their social skills to investigate 3D shapes and their volume links with area. Students will look at how different cultures use different shapes in architecture and religion. Students will demonstrate individual liberty by developing the confidence in their freedom to select the correct formulae for the question.	Students will use their social skills as they work together to combine transformations. Students will understand the 'laws' surrounding methods and processes for solving quadratic equations. Students will look at how different cultures use shapes and transformations in their art. Students will need to show mutual respect as they help each other to make progress throughout this topic.	Students will need to use their social skills as they complete paired and group work. Students will understand the 'laws' surrounding methods and processes for solving quadratic equations.	Students will use their social skills as they demonstrate the skill of teamwork and solve probability problems in pairs and groups. Students will discuss the moral repercussions of probability in terms of gambling. Students will use their individual liberty to choose the appropriate method of measuring probability for each problem.