

Curriculum Content Map															
Subject: Maths Y10															
		Month	September	October	Term 1 November	December	January	Term 2 February	March	April	May	Term 3 June	July		
			Transformations & Constructions	Angles and Trigonometry	Equations and Inequalities	Simultaneous Equations	Bearings, Trigonometry and Shape	Area and Volume	Vectors	Interpreting and Representing Data	Surds	Surds, HCF, LCM	Sequences		
			SHAPE	SHAPE	ALGEBRA	ALGEBRA	SHAPE	SHAPE	SHAPE	DATA	NUMBER	NUMBER	NUMBER		
Cultural Transmission	Units of Work	National Curriculum area – KS4	HIGHER CONTENT IN BOLD	<ul style="list-style-type: none"><li>extend and formalise their knowledge of ratio and proportion in working with measures and geometry</li><li>compare lengths, areas and volumes using ratio notation and/or scale factors; make links to similarity</li><li>interpret and use fractional (and negative) scale factors for enlargements</li><li>apply the concepts of congruence and similarity, including the relationships between lengths, (areas and volumes) in similar figures</li><li>use mathematical language and properties precisely</li><li>make and test conjectures about the generalisations that underlie patterns and relationships; look for proofs or counter-examples</li><li>develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems</li></ul>	<ul style="list-style-type: none"><li>extend and formalise their knowledge of ratio and proportion, including trigonometric ratios</li><li>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</li><li>know the exact values of <math>\sin^{-1}</math>, <math>\cos^{-1}</math>, <math>\tan^{-1}</math> for required angles</li><li><b>(know and apply the sine rule and cosine rule to find unknown lengths and angles)</b></li><li><b>(know and apply to calculate the area, sides or angles of any triangle)</b></li><li>develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems</li><li>make and use connections between different parts of mathematics to solve problems</li><li>model situations mathematically and express the results using a range of formal mathematical representations, reflecting on how their solutions may have been affected by any modelling assumptions</li><li>select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problems; interpret their solution in the context of the given problem</li></ul>	<ul style="list-style-type: none"><li>consolidate their algebraic capability from key stage 3 and extend their understanding of algebraic simplification and manipulation to include quadratic expressions</li><li>translate simple situations or procedures into algebraic expressions or formulae; derive an equation, solve the equation and interpret the solution</li><li>select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problems; interpret their solution in the context of the given problem</li><li>recognise, sketch and interpret graphs of linear functions,</li><li>factorising quadratic expressions of the form <math>ax^2 + bx + c</math> (<b>Higher only at this stage</b>)</li><li>solve quadratic equations algebraically by factorising (<b>Higher only at this stage</b>)</li><li>solve linear inequalities in one (or two) variable(s), (<b>and quadratic inequalities in one variable</b>); represent the solution set on a number line, (<b>using set notation and on a graph</b>)</li></ul>	<ul style="list-style-type: none"><li>consolidate their algebraic capability from key stage 3 and extend their understanding of algebraic simplification and manipulation to include quadratic expressions</li><li>model situations mathematically and express the results using a range of formal mathematical representations, reflecting on how their solutions may have been affected by any modelling assumptions</li><li>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</li><li>select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problems; interpret their solution in the context of the given problem</li><li>solve two simultaneous equations in two variables (linear/linear (or linear/quadratic)) algebraically;</li><li>recognise, sketch and interpret graphs of linear functions and quadratic functions.</li></ul>	<ul style="list-style-type: none"><li>interpret and use bearings</li><li>compare lengths...using scale factors</li><li>apply Pythagoras' Theorem and trigonometric ratios to find angles and lengths in right-angled triangles (and, where possible, general triangles) in two dimensional figures</li><li><b>(know and apply the sine rule and cosine rule to find unknown lengths and angles)</b></li><li>use mathematical language and properties precisely</li><li>reason deductively in geometry, number and algebra, including using geometrical constructions</li><li>make and use connections between different parts of mathematics to solve problems</li></ul>	<ul style="list-style-type: none"><li>identify and apply circle definitions and properties, including: centre, radius, chord, diameter, circumference, tangent, arc, sector and segment</li><li>calculate arc lengths, angles and areas of sectors of circles</li><li>calculate surface areas and volumes of spheres, pyramids, cones and composite solids</li><li>apply and prove the standard circle theorems concerning angles, radii, tangents and chords, and use them to prove related results</li></ul>	<ul style="list-style-type: none"><li>describe translations as 2D vectors</li><li>apply addition and subtraction of vectors, multiplication of vectors by a scalar, and diagrammatic and column representations of vectors; (use vectors to construct geometric arguments and proofs).</li></ul>	<ul style="list-style-type: none"><li>infer properties of populations or distributions from a sample, whilst knowing the limitations of sampling</li><li>interpret and construct tables and line graphs for time series data* (<b>construct and interpret diagrams for grouped discrete data and continuous data, i.e. histograms with equal and unequal class intervals and cumulative frequency graphs, and know their appropriate use</b>)</li><li>interpret, analyse and compare the distributions of data sets from univariate empirical distributions through appropriate graphical representation involving discrete, continuous and grouped data, (<b>including box plots</b>)</li><li>apply statistics to describe a population</li><li>interpret, analyse and compare the distributions of data sets from univariate empirical distributions through appropriate measures of central tendency (<b>including modal class</b>) and spread (<b>including quartiles and inter-quartile range</b>)</li></ul>	<ul style="list-style-type: none"><li>consolidate their numerical and mathematical capability from key stage 3</li><li>calculate exactly with fractions, (surds) and multiples of <math>\frac{1}{2}</math>; (<b>simplify surd expressions involving squares and rationalise denominators</b>)</li><li><b>(change recurring decimals into their corresponding fractions and vice versa)</b></li><li>apply and interpret limits of accuracy when rounding or truncating, (<b>including upper and lower bounds</b>)</li><li>develop their use of formal mathematical knowledge to interpret and solve problems, including in financial contexts</li><li>make and use connections between different parts of mathematics to solve problems</li></ul>	<ul style="list-style-type: none"><li>recognise and use sequences of triangular, simple arithmetic progressions, Fibonacci type sequences, quadratic sequences, and simple geometric progressions (where <math>n</math> is an integer, and <math>a</math> is a positive rational number; <math>a^n</math> (or <math>\sqrt[n]{a}</math>) (<b>and other sequences</b>))</li><li>deduce expressions to calculate the <math>n</math>th term of linear (<b>and quadratic</b>) sequence*</li><li>recognise and use sequences of square and cube numbers</li><li><b>(estimate powers and roots of any given positive number)</b></li><li>calculate with roots, and with integer (<b>and fractional</b>) indices</li><li>calculate with numbers in standard form <math>\times 10^A</math>, where <math>1 \leq A &lt; 10</math> and <math>A</math> is an integer</li><li>simplifying expressions involving sums, products and powers, including the laws of indices</li></ul>	<ul style="list-style-type: none"><li>recognise and use sequences of triangular, simple arithmetic progressions, Fibonacci type sequences, quadratic sequences, and simple geometric progressions (where <math>n</math> is an integer, and <math>a</math> is a positive rational number; <math>a^n</math> (or <math>\sqrt[n]{a}</math>) (<b>and other sequences</b>))</li><li>deduce expressions to calculate the <math>n</math>th term of linear (<b>and quadratic</b>) sequence</li></ul>	
			Substantive knowledge	The What!	Enlarge a shape by a positive integer scale factor Enlarge a shape by a fractional scale factor k Enlarge a shape by a negative scale factor Identify similar shapes Work out missing sides and angles in a pair given similar shapes Use parallel line rules to work out missing angles Establish a pair of triangles are similar	Explore ratio in similar right-angled triangles Work fluently with the hypotenuse, opposite and adjacent sides Use the tangent ratio to find missing side lengths Use the sine and cosine ratio to find missing side lengths Use sine, cosine and tangent to find missing side lengths Use sine, cosine and tangent to find missing angles Calculate sides in right-angled triangles using Pythagoras' Theorem Select the appropriate method to solve right-angled triangle problems	Represent solutions to single inequalities on a graph Represent solutions to multiple inequalities on a graph Form and solve equations with unknowns on both sides Form and solve inequalities with unknowns on both sides Form and solve more complex equations and inequalities Solve quadratic equations by factorisation* (*Also Foundation tier. Higher cover now, Core will cover in Year 11) Solve quadratic inequalities in one variable	Solve a pair of linear simultaneous equations by adjusting one equation Solve a pair of linear simultaneous equations by eliminating both equations Form a pair of linear simultaneous equations from given information Form and solve pair of linear simultaneous equations from given information Determine whether a given ( , ) is a solution to both a linear and quadratic equation Solve quadratic equations (one linear, one quadratic) algebraically Solve a pair of simultaneous equations involving a third unknown	Use cardinal directions and related angles Draw and interpret scale diagrams Measure and read bearings Make scale drawings using bearings Calculate bearings using angles rules Solve bearings problems using Pythagoras and trigonometry Solve bearings problems using the sine and cosine rule	Recognise and label parts of a circle Calculate fractional parts of a circle Calculate the length of an arc Calculate the area of a sector Circle theorem: Angles at the centre and circumference Circle theorem: Angles in a semicircle Circle theorem: Angles in the same segment Circle theorem: Angles in a cyclic quadrilateral	Explore collinear points using vectors Use vectors to construct geometric arguments and proof	Construct histograms Interpret histograms Find and interpret averages from a list Find and interpret averages from a table Construct and interpret time series graphs Construct and interpret stem-and-leaf diagrams Construct and interpret cumulative frequency diagrams Use cumulative frequency diagrams to find measures	Estimating answers to calculations Understand and use limits of accuracy Upper and lower bounds Use number sense Solve financial maths problems Break down and solve multi-step problems	Find the HCF and LCM of a set of numbers Describe and continue arithmetic and geometric sequences Explore other sequences Describe and continue sequences involving surds Find the rule for the $n$ th term of a linear sequence Find the rule for the $n$ th term of a quadratic sequence Square and Cube numbers Calculate higher powers and roots Powers of ten and standard form The addition and subtraction rules for indices Work with powers of powers Calculate with numbers in standard form	Simplify algebraic expressions Use identities Add and subtract simple algebraic fractions Add and subtract complex algebraic fractions Multiply and divide simple algebraic fractions Multiply and divide complex algebraic fractions Form and solve equations and inequalities with fractions Solve equations with algebraic fractions
			Disciplinary knowledge	The How!	Understanding Enlargement Understanding ratio and proportion Using Constructions Investigating Pythagoras' Theorem Using formulae / formula triangles	Understanding Angle Rules Understanding relationship between angles in triangle and angles in other shapes (polygons) Investigating Pythagoras' Theorem Using formulae / formula triangles	Understand the meaning of a solution Form and solve one-step and two-step equations Show solutions to inequalities on a number line Interpret representations on number lines as inequalities Represent solutions to inequalities using set notation Draw straight line graphs Find solutions to equations using straight line graphs	Understand that equations can have more than one solution Determine whether a given ( , ) is a solution to a pair of linear simultaneous equations Solve a pair of linear simultaneous equations by substituting a known variable Solve a pair of linear simultaneous equations by substituting an expression (1) & (2) Solve a pair of linear simultaneous equations using graphs Solve a pair of linear simultaneous equations by subtracting equations Solve a pair of linear simultaneous equations by adding equations Use a given equation to derive related facts	Understand and represent bearings	Understand and use the volume of a cylinder and cone Understand and use the volume of a sphere Understand and use the surface area of a sphere Understand and use the surface area of a cylinder and cone Solve area and volume problems involving similar shapes	Understand and represent vectors Use and read vector notation Draw and understand vectors multiplied by a scalar Draw and understand addition of vectors Draw and understand addition and subtraction of vectors Explore vector journeys in shapes Explore quadrilaterals using vectors Understand parallel vectors	Understand populations and samples Construct a stratified sample Primary and secondary data Construct and interpret frequency tables and frequency polygons Construct and interpret two-way tables Construct and interpret line and bar charts (including composite bar charts) Construct and interpret pie charts Critique charts and graphs	Mental/written methods of integer/decimal addition and subtraction Mental/written methods of integer/decimal multiplication and division The four rules of fraction arithmetic Exact answers Rational and irrational numbers (convert recurring decimals here) Understand and use surds Calculate with surds Rounding to decimal places and significant figures	Understand the difference between factors and multiples Understand primes and express a number as a product of its prime factors Understand and use the power zero and negative indices Understand and use fractional indices	Represent numbers algebraically Algebraic arguments and proof
			Sequencing (Flow)	Retrieval & Extension	Buils from KS3: Recognise enlargement and similarity  Further develops in Y11: Perform and describe line symmetry and reflection	Buils from KS3: Angles in triangles Interior & Exterior angles Pythagoras' Theorem  Further develops in Y11: Graphs of sine, cosine and tangent functions Trigonometric graphs	Buils from KS3: Solving equations  Further develops in Y11: Quadratic Equations	Buils from KS3: Solving linear equations  Further develops in Y11: Simultaneous equations involving quadratic Equations	Buils from KS3: Area Direction  Further develops in Y11: Construction Scale Drawings	Buils from KS3: Area Volume  Further develops in Y11: Circle Theorems Geometric Proof	Buils from KS3: Area Volume  Further develops in Y11: Circle Theorems Geometric Proof	Buils from KS3: Averages Range Scatter Graphs  Further develops in Y11: Cumulative Frequency Box Plots Histograms	Buils from KS3: Mental Methods Four Operations  Further develops in Y11: Rationalise the denominator	Buils from KS3: Multiples, Factors Prime Numbers  Further develops in Y11: HCF and LCM from Venn diagrams	Buils from KS3: Linear sequences  Further develops in Y11: nth Term of Quadratic Sequences
			Summative Assessment		Deep Mark 1: Homework  End of Topic Test - Shape	Deep Mark 2: Homework  End of Topic Test - Angles and Trigonometry	Deep Mark 1: AP1 Assessment - Whole School Data Collection  End of Topic Test - Equations and Inequalities	Deep Mark 2: Homework  End of Topic Test - Simultaneous equations	Deep Mark 1: Homework  End of Topic Test - Bearings	Deep Mark 2: Homework  End of Topic Test - Circle Theorems  Homework	Deep Mark 1: AP2 Assessment - Whole School Data Collection  End of Topic Test - Interpreting and Representing data	Deep Mark 2: Homework  End of Topic Test - Surds  Homework	Deep Mark 1: Homework  End of Topic Test - Surds	Deep Mark 2: AP3 Assessment - Whole School Data Collection  End of Topic Test - HCF, LCM, Indices  Homework	End of Topic Test - Sequences
Personal Empowerment	Virtue	The opportunity to reflect, think deeply and critically about an issue.	Friendliness & Civility	Justice & Truthfulness	Courage	Generosity	Gratitude	Good Speech	Good Temper & Humour	Self-Mastery		Compassion	Good Sense		
	Link to Virtue		Students will need to ensure they demonstrate friendliness and civility as they support each other in consolidating and extending their shape knowledge.	Students will look at the truthfulness of trigonometry. Students will also look at how angles 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 equations and inequalities.	Students will need to be generous with their time in terms of retrieval as this will need to be secure in order to link linear equations and simultaneous equations.	Students will need to demonstrate their gratitude for the time spent securing their knowledge in bearings.	Students will need to demonstrate good speech as they explain their working and also explain how to find angles in circles.	Students will need to demonstrate good temper and humour	Students have learned data analysis skills in KS3 so this topic is about mastering these skills and developing them further.	Students have learned how to use upper and lower bounds, 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 number skills.	Students will need to use good sense to ensure that their sequences answers make sense – and that they remember to check the answers!		
Preparation for Work	Skill	Transferable skills	Listening	Leadership	Problem-Solving	Creativity	Staying Positive	Speaking	Staying Positive	Aiming High		Speaking	Teamwork		
	Link to Skill		Students will need to listen to each other and be able to explain another student's 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 photography computers, phone screens and in optometry.	Students will lead their learning to ensure they are secure in building on previous knowledge. This unit links to careers in architecture and jobs in construction.	Students will need to use their problem-solving skills to be able to draw conclusions from data. This unit links to careers in software development.	Students will demonstrate creativity as they look at the different ways of solving simultaneous equations. This unit links to careers in banking with mortgage rates and in HR with calculating salaries.	Students will need to stay positive as they encounter bearings 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 how to use the formulae. This unit links to careers as a pilot and the military.	Students will need to stay positive as theyas they encounter vectors for the first time and ensure they feel secure in their knowledge. This unit links to careers in life science.	Students will need to stay positive as they extend their data knowledge to develop to several different types of diagrams and how to interpret these. This unit continues to look at careers in statistics.	Students will need to aim high when using upper and lower bounds in problem solving. This unit links to careers in statistics and science for maximum and minimum values.	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 art and technology.		
Preparation for Citizenship	SVSC & British Values	Developing opinions on current issues	Social  Mutual Respect	Social Moral  Rule of Law	Social Moral  Democracy	Social  Tolerance	Social Cultural  Rule of Law	Social  Democracy	Social Cultural  Democracy	Social Cultural  Individual Liberty	Social Cultural  Mutual Respect	Social  Rule of Law	Social Moral  Individual Liberty		
	Link to SVSC & British Values		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 consequences 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 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 need to 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 formula for volume and surface area.	Students will use their social skills to investigate representation of data. Students will look at how different cultures use representing data and religion.  Students will demonstrate individual liberty by developing the confidence in their freedom to select the correct averages for the question.	Students will need to use their social skills as they complete paired and group work. Students will understand the 'laws' surrounding methods and processes to fill in the venn diagram and use the information from there.  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' of probability in terms of information gained from sequences to predict events.  Students will use their individual liberty to choose the appropriate method of offinding the nth term for each problem.				