YEAR 10 Scheme of Work

- ## Rationale:

The curriculum ensures that all pupils become fluent in the fundamentals of mathematics, including through varied and frequent practise with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. All pupils will reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language. In addition, all pupils will 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.

Intent	Implementation	Impact
• The Mathematics Department aims to provide an engaging, challenging curriculum where students, regardless of age, background, gender or ability develop an enthusiasm for and deep theoretical understanding of Mathematics and its relevance to the world around them. Our goal is to provide breadth, stretch and depth in the curriculum to encourage students to become independent thinkers as well as creative and strategic problem solvers, with the skills required to be financially and numerically literate to make sound mathematical decisions in their personal life and the ever-changing world of work. • At UAH we foster positive can do attitudes and we promote the fact that 'We can all do maths!' We believe all children can achieve in mathematics, and teach for secure and deep understanding of mathematical concepts through manageable steps. We use mistakes and misconceptions as an essential part of learning and provide challenge through rich and sophisticated problems.	• Our Scheme of work is split into 4 key sections: 1. Number 2. Algebra 3. Shape, Space and Measure 4. Handling Data • Importance is given to Number topics and it underpins the first half Term for all KS3 years. We feel that our students often have weaker number skills which require refreshing/developing before seeing some of the Algebra/Shape topics. In the past 2 years since the pandemic, there has been a real focus on Key number skills with lower groups completing specific catch up books once a week. Although other SOW have Algebra as the first concept for Y7 students as a department we feel that the number topic underpins all future Maths and is fundamental to the journey students enter at UAH. • We ensure that the majority of pupils will move through the curriculum at broadly the same pace. However, our teachers make decisions about when to progress children, based on the security of pupils' understanding and their readiness to progress to the next stage. This does not mean that 'we hold children back' or that all children access the same questions and same activities all of the time. Pupils who grasp concepts rapidly are challenged by 'going deeper', being offered rich	• The impact will be: • All students study Mathematics in Key Stage 3 and Key Stage 4, who are taught by passionate teachers who have the knowledge and understanding to demonstrate a love of their subject. Through the setting of high standards we aim to have Students who have a **confident and positive attitude towards Mathematics.** Who recognise the importance of Mathematics to everyday life. • Students are able to tackle problem solving questions in a variety of contexts. • Students **make good progress** as measured by the Positive P8 of the department in recent years. • The department is responsible for the ongoing development of the curriculum and it is all members of the department's responsibility. Future changes to the sequencing and devilry of certain topics can improve learning. Through collaborative planning our teaching can only improve. This is improving but more work is needed on this in the future.

• Following on from the National Curriculum guidance we have 3 key aims for our students to achieve: • become fluent in the fundamentals of mathematics so that they develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. • be able to solve problems by applying their mathematics to a variety of problems with increasing sophistication, including in unfamiliar contexts and to model real-life scenarios • reason mathematically by following a line of enquiry and develop and present a justification, argument or proof using mathematical language • Our curriculum goes far beyond what is taught in lessons, for whilst we want students to achieve the very best examination results possible, we believe our curriculum goes beyond what is examinable. As a department we offer opportunities for individual and team competition through the UKMT in years 7-10. Whilst offering STEM days at Oundle School for our most able students. We also offer a GCSE revision trip which is held at Lincoln University to raise aspirations Maths inspiration events through our sponsor University. We build the Cultural Capital of our students by whole year group events such as our Curriculum Day. Through our curriculum we introduce students to the stories of some of the most influential Mathematicians throughout history and the impact that their work has had on the world we live in. Real	and more sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material, consolidate their understanding, including through additional practice, before moving on. A ceiling is not put on children's learning and flexible grouping is adopted based on pre-assessments. The curriculum is designed to give Maths staff freedom to move between topics which means a child is not restricted by which group he/she is in. • Our strength as a department is regular marking and feedback given in student's homework books. Students complete weekly pieces of homework which are timely marked, with feedback given including : • What has gone well? • How to improve? • Something to Improve on Students will then complete a feedback task during the first 10 minutes of lesson. This also underpins students understanding and helps to plan future teaching. • Whilst we teach Maths in progressive distinct domains (units of work) we recognise that Maths is an interconnected subject. Therefore, we encourage children to make connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. Links are always made to prior learning and key skills checked through a number of assessment methods before starting a new topic. Children also apply their mathematical knowledge across the curriculum, and particularly in Science, where relevant. • Throughout each level of KS3, mathematical projects are embedded into the curriculum to further promote a love of mathematics and aspirations. This also helps to promote the	

life applications of Mathematical ideas are made explicit to students whenever possible	understanding that Maths is used all time in everyday life. • Each member of the department is a mathematical specialist and has a unique pedagogy, so teaching does not follow a uniform approach. However, resources are available as a link to the SOW for staff to use as a base. Most lessons will feature an explanation of a concept, modelling of a correct approach, having a class discussion and activities provided for students to tackle. All lessons have a clear starter activity which develops prior mathematics learning and the objective of the lesson is shared with students. Students are challenged to build on fundamental concepts by structured extension activities. • Assessment points throughout the year are written papers which are teacher marked. KS4 use Merit Maths to find areas of weakness which will need revisiting. • Consolidation lessons are built into the curriculum to allow for further differentiated tailored teaching to review areas of challenge in prior learning or explore topics in further depth. The curriculum map throughout years 7-11 supports students to build on prior skills as well as reviewing their key skills throughout the year to increase their numeracy skills. • A regular QA process is completed of the department with Regular Learning Walks, homework checks and books scrutinises. As well as the introduction of a Pupil Voice with the department review which has brought about positive feedback showing the majority of students(82%) enjoying Maths.	

SEND Provision

As a department we look to provide an inclusive environment for all our learners to thrive. We look to plan inclusive lessons and use a variety of strategies to ensure all students make significant progress. These measure might include:

- Getting to know our learners and having a sound understanding of the KS2 Curriculum. This might mean staff plan numerous activities to practice prior learning and ensure all students have firm foundations before moving on.
- Staff have access to Provision Map and view students passports as to help support students in the classroom
- Staff plan engaging activities and allow students a range of activities to provide opportunities for students to apply their skills and reason. Where possible links are made to careers and real life examples.
- Staff gradually increase the challenge of activities in lessons to increase confidence of students. Staff often use intelligent variations of questions with slightly different challenges
- Staff aware of exam concessions in class and ensure they are reflected in classroom environment
- All learners have access to correct equipment by using a borrow box in each Maths classroom and a set of Scientific calculators
- Use of larger squares in exercise books for some of our learners as well as printing out information for some learners
- Especially at KS4 staff are aware of the literacy demands and use strategies to break down worded problems in particular exam questions

Different Strategies outlined

Dyscalculia Students	• Talk or write out the problem • Break down tasks into subsets • Use real life objects • Draw the problem

Type of need	Possible differentiation strategies (this list is not exhaustive but gives some ideas; all will depend upon the individual pupil and their strengths and needs)
Reading difficulties, including dyslexia	• Reduce the amount of reading required – this could be done by summarising, or by using text to speech software, or using diagrams etc instead of text • Simplify any reading – use bullet points instead of paragraphs, shorten sentences, use simple vocabulary • Make reading material easier to read – use a larger font, use a different font, use colour to highlight or categorise; avoid italics, use bold instead
Writing difficulties, including dyslexia	• Reduce the amount of writing required – ask for oral presentations, or use of pictures/diagrams/video etc • Use IT packages such as mind mapping, speech to text, planning tools etc • Review any written work for its content rather than accuracy • Offer support for spell-checking, grammar checking etc
Speech and language difficulties	• Be aware that this could include speech sound production, understanding of language, the ability to express yourself in language and the social use of language • With a speech production difficulty – don't speak for the person, listen to the message rather than the presentation • With understanding – simplify the language you use, try to avoid metaphors, sarcasm etc • With expressive language – provide time to prepare and practise, listen to the message content • Understand the issues that some pupils have with using language appropriately in a social context and make allowances
Autistic spectrum conditions	• Prepare pupils in advance for new things or people or changes to routine • Be aware that their social preferences may be different e.g. they are happier on their own whilst also wishing to make friends, but are not sure how to build and maintain friendships • Provide software and resources that support the way they work • Be aware that higher level language skills may be challenging e.g. metaphor, idiom etc; avoid sarcasm as it may be taken literally • Give very clear and precise directions/instructions

Memory and attention difficulties, including ADHD	• Provide written notes as well as giving instructions etc verbally • Present information in different ways e.g. using pictures, diagrams etc

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	• Build in regular short breaks • Provide clear structure for the pupil's tasks and offer regular support
Organisational difficulties, including dyslexia	• Provide written notes as well as giving instructions etc verbally • Present information in different ways e.g. using pictures, diagrams etc • Provide clear structure for the person's tasks and offer regular support • Offer software/resources that help with organisation e.g. alarms, reminders etc

Autumn Term 1

Foundation

Geometry and Measures- Transformations 6
Geometry and measures: Right-angled triangles 4 6
Revision
Progress Test-Non Calculator

Higher

Transformations, constructions and Loci 6
Algebra: Equations and inequalities 4
Revision
Progress Test-Non Calculator

Spring Term 1

Foundation

Number: Powers and standard form 4 2
Geometry and measures: Curved shapes and pyramids 6
Revision
Progress Test Calculator

Higher

Algebra: Quadratic equations 4
Revision
Progress Test-Non Calculator

Summer Term 1

Foundation

Review of topics answered poorly in the end of year exam
Ratio and proportion and rates of change: Percentages and variation 4 1
Probability: Combined events 6

Higher

Review of topics answered poorly in the end of year exam 6
Geometry and measures: Properties of circles
Probability: Combined events 6

Autumn Term 2

Foundation

Algebra: Linear equations 4
Algebra: Number and sequences 4
Revision
Progress Test Calculator

Higher

Probability: Exploring and applying probability 4
Number: Counting, accuracy, powers and surds 6 2
Revision
Progress Test Calculator

Spring Term 2

Foundation

Statistics: More complex statistics 4 8
Revision
End of year exams

Higher

Sampling and more complex diagrams 8
Revision
End of year exams

Summer Term 3

Foundation

Algebra: Simultaneous equations and linear inequalities 6
Curriculum Week
Review of the year 7 8

Higher

Geometry and measures: Triangles 6
Curriculum Week
Review of the year 7 8

No.	• Cross Curricular Link • Literacy • Numeracy highlighted in topics	Examples
1	Literacy and Oracy	Reading and understanding worded questions, particularly ratio, volume and percentages
2	Numeracy	Underpins all Mathematics topics as a continuing thread.
3	RSE **	
4	SMSC /CITIZENSHIP*	Introduction of Famous Mathematicians and how their findings have shaped the way we live our lives today. (Pythagoras/Fibonacci/ Bernoulli) Examples of Maths used in every day life
5	Digital Competency	
6	Careers	Numerous link made throughout topics- Pythagoras to builders, Probability in forecast modelling and Transformations for design jobs
7	Enterprise	Stock Market challenge allows for teamwork and ability to problem solve
8	Economic Understanding	Stock Market challenge and Statistics show real life examples of how data is represented
9	Appreciation of Sports and the Arts	

Week 1	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Geometry and Measures- Transformations(Foundation) Transformations, constructions and Loci(Higher)	• Properties of 2D Shapes • Plotting Coordinates in all 4 Quadrants • Plotting Straight Line Graphs including x=4/y=-3.	• Rotation • Reflection • Translation • Enlargement	• Transform a Shape using Reflection, Rotation and Translation • Combine transformations • Enlarge 2D Shapes with a Negative Enlargement	• Translate a 2D Shape • Recognise • Rotate a 2D Shape • Reflect a 2D Shape in a Mirror Line	• Interpret and use fractional {and negative} scale factors for enlargements • describe the changes and invariance achieved by combinations of rotations, reflections and translations}

Week 2	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Geometry and Measures- Transformations(Foundation) Transformations, constructions and Loci(Higher)	• Properties of 2D Shapes • Plotting Coordinates in all 4 Quadrants • Plotting Straight Line Graphs including x=4/y=-3.	• Enlargement • Loci • Bisector • Magnitude	• **Construct the bisectors of lines and angles** • **Draw a locus for a given rule** • **Solve practical problems using loci**	• enlarge a 2D shape by a scale factor (Positive only) • Use more than one transformation. • • represent vectors • add and subtract vectors.	• Interpret and use fractional {and **negative**} scale factors for enlargements • describe the changes and invariance achieved by combinations of rotations, reflections and translations} • apply addition and subtraction of vectors, multiplication of vectors by a scalar, and diagrammatic and column representations of vectors

Week 3	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Geometry and measures: Right-angled triangles (Foundation) **2 Algebra: Equations and inequalities** (Higher)	• Angles in a Triangle • **Simple Two Step Linear Equations**	• Hypotenuse • Adjacent • Opposite • Inverse • Coefficent	• **Solve equations where the variable appears on both sides of the equals sign.** • **Set up equations from given information and then solve them.**	• Know what Pythagoras' theorem is and calculate the length of the hypotenuse and Shorter side in a right-angled triangle. • Solve problems using Pythagoras' theorem.	• apply Pythagoras' Theorem and trigonometric ratios to find angles and lengths in right-angled triangles • 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

Week 4	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Geometry and measures: Right-angled triangles (Foundation) **2 Algebra: Equations and inequalities** (Higher)	• Angles in a Triangle • Cancelling Fractions • Solving Linear Equations • Substitution	• Hypotenuse • Adjacent • Opposite • Inverse • Coefficient • Inequality	• **Solve simultaneous linear equations in two variables using the elimination method.** • Solve simultaneous linear equations in two variables using the substitution method. • **Solve simultaneous linear equations by balancing coefficients.**	• define, understand and use the three trigonometric ratios. • use trigonometric ratios to calculate a length in a right-angled triangle. • use the trigonometric ratios to calculate an angle.	• apply Pythagoras' Theorem and trigonometric ratios to find angles and lengths in right-angled triangles • 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

Week 5	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Geometry and measures: Right-angled triangles (Foundation) **2 Algebra: Equations and inequalities** (Higher)	• Angles in a Triangle • Properties of special traingles • Measure Angles • Bearings • **Simple Two Step Linear Equations** • Cancelling Fractions • Solving Linear Equations • Substitution	• Hypotenuse • Adjacent • Opposite • Inverse • Coefficent	• **Solve problems using simultaneous linear equations.**	• use trigonometry to solve problems involving isosceles triangles. • solve bearing problems using trigonometry.	• apply Pythagoras' Theorem and trigonometric ratios to find angles and lengths in right-angled triangles • 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
Week 6	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**
	Revision for Progress test in Week 7					
Week 7	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**
	Progress Test for all students-Non Calculator					

Week 8	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Algebra: Linear equations (Foundation) **Probability: Exploring and applying probability (Higher)**	• Collecting like terms • Substitution • Inverse operations • Expanding Brackets • Probability Scale • 4 operations of Fractions	• Inverse • Solution • Event • Outcome • Trial • Relative Frequency	**Calculate experimental probabilities and relative frequencies.** **Estimate probabilities from experiments.** **Predict the likely number of successful events, given the number of trials and the probability of any one outcome.** Read two-way tables and use them to work out probabilities.	• solve linear equations such as $3x - 1 = 11$ where the variable only appears on one side • use inverse operations and inverse flow diagrams • solve equations by balancing	know the difference between an equation and an identity; 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 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
Week 9	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**

	Algebra: Linear equations (Foundation) **Probability: Exploring and applying probability (Higher)**	• Collecting like terms • Substitution • Inverse operations • Expanding Brackets • Probability Scale • 4 operations of Fractions	• Inverse • Solution • Event • Outcome • Trial • Relative Frequency	• **Use Venn diagrams to solve probability questions.** • **Work out the number of choices, arrangements or outcomes when choosing from lists or sets.**	• • solve equations in which the variable (the letter) appears in the numerator of a fraction.	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 apply systematic listing strategies, {including use of the product rule for counting}

Week 10	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Algebra: Linear equations (Foundation) **Number: Counting, accuracy, powers and surds (Higher)**	• Collecting like terms • Substitution • Inverse operations • Expanding Brackets • Rounding • Converting between decimal and fractions • Square and Cube Numbers	• Inverse • Solution • Expand • Rational • Recurring • Terminating	**Recognise rational numbers, reciprocals, terminating decimals and recurring decimals.** **Convert terminal decimals to fractions.** **Convert fractions to recurring decimals.** **Find reciprocals of numbers or fractions.**	Solve equations where you have to first expand brackets.	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 Estimate powers and roots of any given positive number Change recurring decimals into their corresponding fractions and vice versa}

Week 11	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Algebra: Number and sequences(Foundation) **Number: Counting, accuracy, powers and surds (Higher)**	• Factorise expressions • Substitute • State a rule for a linear sequence in words • Rounding • Converting between decimal and fractions • Square and Cube Numbers	• Pattern • Sequence • Term • Arithmetic • Geometric • Rational • Recurring • Terminating •	**Apply the rules of powers to negative and fractional powers.** **Simplify surds.**	Recognise patterns in number sequences. Recognise how number sequences are built up Generate sequences, given the *n*th term .	Deduce expressions to calculate the nth term of linear sequences. calculate with roots, and with integer {and fractional} indices calculate exactly with fractions, {surds} and multiples of π; {simplify surd expressions involving squares [for example 12 4 3 4 3 2 3 = ×= × = ×] and rationalise denominators}

Week 12	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Algebra: Number and sequences(Foundation) **Number: Counting, accuracy, powers and surds (Higher)**	• Factorise expressions • Substitute • State a rule for a linear sequence in words • Rounding • Converting between decimal and fractions • Square and Cube Numbers	• Pattern • Sequence • Term • Arithmetic • Geometric • Fibonacci • Rational • Recurring • Terminating	**Calculate and manipulate surds, including rationalising a denominator.** **Find the error interval or limits of accuracy of numbers that have been rounded to different degrees of accuracy.** **Combine limits of two or more variables together to solve problems.**	Find the ***n***th term of a linear sequence. Find the ***n***th term from practical problems involving sequences.	Deduce expressions to calculate the nth term of linear sequences. recognise and use sequences of triangular, square and cube numbers, simple arithmetic progressions, Fibonacci type sequences, quadratic sequences, and simple geometric progressions Apply and interpret limits of accuracy when rounding or truncating, {including upper and lower bounds}.

Week 13	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Revision for Progress test in Week 14					

Week 14	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**
	Progress Test for all students Calculator					
Week 15	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**
	Review of the progress tests done so far and data entered onto Merit Maths					
Week 16	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**
	Number: Powers and standard form (Foundation) **Algebra: Quadratic equations (Higher)**	• Square and Cube Numbers • Multiply and Divide by powers of 10 • Substitution • Plot Linear Graphs • Find the Equation of a line • Solve Linear equations and inequalities	Power Index Root Parabola Roots Quadratic Discriminant Roots Minimum Point	**Draw and read values from quadratic graphs.** **Solve a quadratic equation by factorisation.** **Rearrange a quadratic equation so that it can be factorised.**	Write a number as a power of another number Use powers (also known as indices) Multiply and divide by powers of 10. Use rules for multiplying and dividing powers	Calculate with roots, and with integer indices Factorising quadratic expressions of the form 2 x bx c + + 2 ax bx c + + , including the difference of two squares; {factorising quadratic expressions of the form }

Week 17	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Number: Powers and standard form (Foundation) **Algebra: Quadratic equations (Higher)**	• Square and Cube Numbers • Multiply and Divide by powers of 10 • Substitution • Plot Linear Graphs • Find the Equation of a line • Solve Linear equations and inequalities	Power Index Root Parabola Roots Quadratic Discriminant Roots Minimum Point	**Solve a quadratic equation by using the quadratic formula.** **Recognise why some quadratic equations cannot be solved.**	• write a number in standard form • calculate with numbers in standard form.	calculate with numbers in standard form A 10n , where 1 ≤ A < 10 and n is an integer 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 identify and interpret roots, intercepts and turning points of quadratic functions graphically; deduce roots algebraically {and turning points by completing the square}

Week 18	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Geometry and measures: Curved shapes and pyramids (Foundation) **Algebra: Quadratic equations (Higher)**	• Find the Area of common 2D Shapes • Find the Volume and Surface Area of prisms • Substitution • Plot Linear Graphs • Find the Equation of a line • Solve Linear equations and inequalities	Arc Sector Circumference Cross Section Subtend Parabola Roots Quadratic Discriminant Roots Minimum Point	**Solve a quadratic equation by completing the square.** **Identify the roots of a quadratic function by solving a quadratic equation.** **Identify the turning point of a quadratic function by using symmetry or completing the square.**	• calculate the length of an arc • calculate the area and angle of a sector.	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 Identify and interpret roots, intercepts and turning points of quadratic functions graphically; deduce roots algebraically {and turning points by completing the square}

Week 19	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**
	Geometry and measures: Curved shapes and pyramids (Foundation) **Algebra: Quadratic equations (Higher)**	• Find the Area of common 2D Shapes • Find the Volume and Surface Area of prisms • Substitution • Plot Linear Graphs • Find the Equation of a line • Solve Linear equations and inequalities	Arc Sector Circumference Cross Section Subtend Parabola Roots Quadratic Discriminant Roots Minimum Point	**Solve simultaneous equations where one equation is linear and the other is non-linear.** **Solve quadratic inequalities.**	• calculate the volume and surface area of a pyramid. • calculate the volume and surface area of a cone. • calculate the volume and surface area of a sphere.	Calculate surface areas and volumes of spheres, pyramids, cones and composite solids Solve two simultaneous equations in two variables (linear/linear {or linear/quadratic}) algebraically; find approximate solutions using a graph Solve linear inequalities in one {or two} variable{s}, {and quadratic inequalities in one variable}; represent the solution set on a number line, {using set notation and on a graph}
Week 20	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**
	Revision for Progress test in Week 21					
Week 21	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**

	Progress Test for all students Calculator					
Week 22	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**
	Statistics: More complex statistics (Foundation) **Sampling and more complex diagrams (Higher)**	Find averages from Raw data Plot Co ordinates Draw and Measure Angles Interpret Bar Charts and Pictograms Understand the difference between secrete and continuous data	Bias Sample Size Hypothesis Correlation Line of best fit Modal Class Quartile Cumulative Class Interval Frequency Density	Understand sampling. Collect unbiased reliable data for a sample. Draw and interpret frequency polygons.	obtain a random sample from a population • collect unbiased and reliable data for a sample.	infer properties of populations or distributions from a sample, whilst knowing the limitations of sampling Interpret and construct tables and line graphs for time series data
Week 23	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**
	Statistics: More complex statistics (Foundation) **Sampling and more complex diagrams (Higher)**	Find averages from Raw data Plot Co ordinates Draw and Measure Angles Interpret Bar Charts and Pictograms Understand the difference between secrete and continuous data	Bias Sample Size Hypothesis Correlation Line of best fit Modal Class Quartile Cumulative	**Draw and interpret cumulative frequency graphs.** **Draw and interpret box plots.**	• draw, interpret and use scatter diagrams • draw and use a line of best fit. **Draw and Interpret Pie Charts**	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

			Class Interval Frequency Density			trends whilst knowing the dangers of so doing. appropriate graphical representation involving discrete, continuous and grouped data, {including box plots} 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}
Week 24	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**
	Statistics: More complex statistics (Foundation) **Sampling and more complex diagrams (Higher)**	Find averages from Raw data Plot Co ordinates Draw and Measure Angles Interpret Bar Charts and Pictograms Understand the difference between secrete and continuous data	Bias Sample Size Hypothesis Correlation Line of best fit Modal Class Quartile Cumulative Class Interval Frequency Density	**Draw and interpret histograms where the bars are of equal width.** **Draw and interpret histograms where the bars are of unequal width. Calculate the median, quartiles and interquartile range from a histogram.**	identify the modal group • calculate an estimate of the mean from a grouped table.	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}
Week 25	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**
	Revision for End of Year exams in Week 26/27.					
Week 26/27	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**
	End of Year exams for all students. Exams to take place in the Hall.					
Week 28/29	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**
	Review of end of year exams and re teaching of topics that students struggled with					

Week 30	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Ratio and proportion and rates of change: Percentages and variation (Foundation) **Geometry and measures: Properties of circles (Higher)**	• Converting between FDP • Multiplication and Division • Solve simple Equations • Substitution • Angle Facts • Parts of a Circle	• Compound • Simple Interest • Multiplier • Direct Proportion • Inverse Proportion • Cyclic Quadrilateral • Theorem • Alternate Segment	**Prove and use circle theorems to work out angles created in a circle from points on a circumference.** **Find the size of angles in cyclic quadrilaterals.**	calculate simple interest • calculate compound interest • solve problems involving repeated percentage change. Calculate the original amount, given the final amount, after a known percentage increase or decrease.	Set up, solve and interpret the answers in growth and decay problems, including compound interest convert between related compound units (speed, rates of pay, prices, density, pressure) in numerical and algebraic contexts Apply and prove the standard circle theorems concerning angles, radii, tangents and chords, and use them to prove related results}
Week 31	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**

	Ratio and proportion and rates of change: Percentages and variation (Foundation) **Geometry and measures: Properties of circles (Higher)**	• Converting between FDP • Multiplication and Division • Solve simple Equations • Substitution • Angle Facts • Parts of a Circle	• Compound • Simple Interest • Multiplier • Direct Proportion • Inverse Proportion • Cyclic Quadrilateral • Theorem • Alternate Segment	**Use tangents and chords to find the size of angles in circles.** **Use the alternate segment theorem to find the size of angles in circles**	solve problems in which two variables have a directly proportional relationship (direct variation) solve problems in which two variables have an inversely proportional relationship (inverse variation)	understand that X is inversely proportional to Y is equivalent to X is proportional to 1 Y ; interpret equations that describe direct and inverse proportion convert between related compound units (speed, rates of pay, prices, density, pressure) in numerical and algebraic contexts Apply and prove the standard circle theorems concerning angles, radii, tangents and chords, and use them to prove related results}
Week 32	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**
	Probability: Combined events (Foundation) **Probability: Combined events (Higher)**	• Probability Scale • Expectation of one event happening	• Sample Space • Set • Union • Intersection • Venn Diagram • Conditional • Independent events	**Work out the probability of different outcomes of combined events.** **Work out the probability of two outcomes or events occurring at the same time.** **Use tree diagrams to work out the probability of combined events.** **Work out the probability of combined events when the probabilities change after each event.**	• work out the probabilities when two or more events occur at the same time. read two-way tables and use them to work out probabilities. use Venn diagrams to solve probability questions. understand frequency tree diagrams and probability tree diagrams • use probability tree diagrams to work out the probabilities involved in combined events.	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}.
Week 33	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**

	Algebra: Simultaneous equations and linear inequalities (Foundation) **Geometry and measures: Triangles(Higher)**	• Collect like terms • Solve linear equations • Substitution • Pythagoras Theorem • Trigonometry in Right Angled triangles • Bearings • Circle Theorems	Eliminate Coefficient Inequality Periodic	**Use trigonometric ratios and Pythagoras' theorem to solve more complex three-dimensional problems.** **Find the sine, cosine and tangent of any angle from 0° to 360°.**	Solve simultaneous linear equations in two variables using the elimination method.	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 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 Sketch trigonometric functions (with arguments in degrees) , and y x = tan for angles of any size}
Week 34	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**
	Algebra: Simultaneous equations and linear inequalities (Foundation) **Geometry and measures: Triangles(Higher)**	• Collect like terms • Solve linear equations • Substitution • Pythagoras Theorem • Trigonometry in Right Angled triangles • Bearings • Circle Theorems	Eliminate Coefficient Inequality Periodic	**Use the sine rule and the cosine rule to find sides and angles in any triangle.**	Solve simultaneous linear equations by balancing coefficients. Solve problems using simultaneous linear equations.	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 Know and apply the sine rule, , and cosine rule, , to find unknown lengths and angles}
Week 35	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**

	Algebra: Simultaneous equations and linear inequalities (Foundation) **Geometry and measures: Triangles(Higher)**	• Collect like terms • Solve linear equations • Substitution • Pythagoras Theorem • Trigonometry in Right Angled triangles • Bearings • Circle Theorems	Eliminate Coefficient Inequality Periodic	**Work out the area of a triangle if you know two sides and the included angle.**	Solve a simple linear inequality and represent it on a number line.	solve linear inequalities in one variable and represent the solution set on a number line, {using set notation and on a graph {know and apply to calculate the area, sides or angles of any triangle}
Week 36	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**
	Enrichment week whole school alternative curriculum.					
Week 37-39	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**
	Review of topics in the year which need revisiting and stretching. **Chance for teachers to represent topics in different contexts.**					

YEAR 11 Scheme of Work

Autumn Term 1	Spring Term 1	Summer Term 1
Foundation Geometry and measures: Constructions and loci 6 Geometry and measures: Congruency and similarity 6 Revision Progress Test-Non Calculator **Higher** Ratio, proportion and rates of change: Variation 4 Algebra: Algebraic fractions and functions 6 Revision Progress Test-Non Calculator	Revisiting topics which were answered poorly in the Mock examinations using QLA and Merit Maths. Key topics to given outlined in SOW 2	GCSE Examinations
Autumn Term 2	**Spring Term 2**	**Summer Term 3**
Foundation Algebra: Non-linear graphs 6 Revision Mock examination in the Hall **Higher** **Algebra: Graphs** 4 8 **Geometry and measures: Vector geometry** 6 Revision Mock examination in the Hall	Use of past papers to improve fluency at exam style questions 1	

No.	• Cross Curricular Link • Literacy • Numeracy highlighted in topics	Examples
1	Literacy and Oracy	Reading and understanding worded questions, particularly ratio, volume and percentages.
2	Numeracy	Underpins all Mathematics topics as a continuing thread. Fluency now required to calculate using key number skills
3	RSE **	
4	SMSC /CITIZENSHIP*	Direct and Inverse Proportion. Real life link to be made. Direct- Temperature and demand for Ice creams. Inverse- Number of Miles driven by a car and its value
5	Digital Competency	
6	Careers	Links made to careers in Astronomy, Engineering and Transport planning
7	Enterprise	
8	Economic Understanding	Understanding of functions and turning points and the importance they have on Business decisions
9	Appreciation of Sports and the Arts	

Week 1	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Geometry and measures: Constructions and loci (Foundation) **Ratio, proportion and rates of change: Variation (Higher)**	Measure angles and lines Interpret Scale Drawings Solve Equations Square and Cube Numbers/Roots Substitute	Construct Equidistant Loci Constant of Proportionality Inverse Proportion/variation Direct Proportion/variation	**Solve problems where two variables have a directly proportional relationship** **Work out the constant of proportionality.**	Construct accurate drawings of triangles, using a pair of compasses, a protractor and a straight edge. construct the bisectors of lines and angles	Construct and interpret plans and elevations of 3D and 2D shapes Understand that X is inversely proportional to Y is equivalent to X is proportional to 1 Y ; {construct and} interpret equations that describe direct and inverse proportion

Week 2	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Geometry and measures: Constructions and loci (Foundation) **Ratio, proportion and rates of change: Variation (Higher)**	Measure angles and lines Interpret Scale Drawings Solve Equations Square and Cube Numbers/Roots Substitute	Construct Equidistant Loci Constant of Proportionality Inverse Proportion/variation Direct Proportion/variation	**Solve problems where two variables have an inversely proportional relationship.** **Work out the constant of proportionality.**	Draw a locus for a given rule. Solve practical problems using loci.	Construct and interpret plans and elevations of 3D and 2D shapes Understand that X is inversely proportional to Y is equivalent to X is proportional to 1 Y ; {construct and} interpret equations that describe direct and inverse proportion interpret the gradient of a straight line graph as a rate of change; recognise and interpret graphs that illustrate direct and inverse proportion

Week 3	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Geometry and measures: Congruency and similarity (Foundation) **Algebra: Algebraic fractions and functions (Higher)**	Enlarge a shape by a scale factor Solve linear equations Substitution Factorise linear and quadratic expressions Expand single and double brackets	Congruent Similar Inverse Inverse Function Algebraic fraction Composite Iteration	**Simplify algebraic fractions** **Solve equations containing algebraic fractions.** **Change the subject of a formula where the subject occurs more than once.**	• demonstrate that two triangles are congruent. Recognise similarity in any two shapes	Apply the concepts of congruence and similarity, including the relationships between lengths simplify and manipulate algebraic expressions (including those involving surds {and algebraic fractions})

Week 4	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Geometry and measures: Congruency and similarity (Foundation) **Algebra: Algebraic fractions and functions (Higher)**	Enlarge a shape by a scale factor Solve linear equations Substitution Factorise linear and quadratic expressions Expand single and double brackets	Congruent Similar Inverse Inverse Function Algebraic fraction Composite Iteration	**Find the output of a function.** **Find the inverse function.** **Find the composite of two functions.**	Show that two shapes are similar Work out the scale factor between similar shapes.	apply the concepts of congruence and similarity, including the relationships between lengths where appropriate, interpret simple expressions as functions with inputs and outputs; {interpret the reverse process as the 'inverse function'; interpret the succession of two functions as a 'composite function'}

Week 5	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Revision for Mock Paper 1 in Week 7 **Algebra: Algebraic fractions and functions (Higher)**	Substitution Factorise linear and quadratic expressions Expand single and double brackets	Inverse Inverse Function Algebraic fraction Composite Iteration	**Find an approximate solution for an equation using the process of iteration.**	Revision for Mock Paper 1	find approximate solutions to equations numerically using iteration}

Week 6	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Revision for Progress test in Week 7					

Week 7	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Progress Test for all students-Non Calculator **Paper 1 of Mock exam**					

Week 8	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Algebra: Non-linear graphs (Foundation) **Algebra: Graphs (Higher)**	**Solve linear equations** **Substitution** **Draw Linear Graphs** **Plot graphs** **Speed Distance Time** **Gradient of a line** **Transform and Translate a shape by a Vector**	**Gradient** **Parabola** **Quadratic** **Minimum Point** **Intercept** **Roots** **Cubic** **Velocity Time Graph** **Acceleration** **Deceleration** **Tangent** **Function** **Reciprocal**	**Interpret distance–time graphs** **Read information from a velocity–time graph.** **Work out the distance travelled from a velocity–time graph.** **Work out the acceleration from a velocity–time graph.**	Answer Speed, Distance , Time problems Interpret distance–time graphs	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 {calculate or estimate gradients of graphs and areas under graphs (including quadratic and other non-linear graphs), and interpret results in cases such as distance-time graphs, velocity-time graphs and graphs in financial contexts}

Week 9	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Algebra: Non-linear graphs (Foundation) **Algebra: Graphs (Higher)**	**Solve linear equations** **Substitution** **Draw Linear Graphs** **Plot graphs** **Speed Distance Time** **Gradient of a line** **Transform and Translate a shape by a Vector**	**Gradient** **Parabola** **Quadratic** **Minimum Point** **Intercept** **Roots** **Cubic** **Velocity Time Graph** **Acceleration** **Deceleration** **Tangent** **Function** **Reciprocal**	**Use areas of rectangles, triangles and trapeziums to estimate the area under a curve.** **Interpret the meaning of the area under a curve.** **Draw a tangent at a point on a curve and use it to work out the gradient at a point on a curve** **Interpret the gradient at a point on a curve.**	draw and read values from quadratic graphs. solve a quadratic equation by factorisation.	factorisingquadratic expressions of the form 2 x bx c + + 2 ax bx c + + , including the difference of two squares; {interpret the gradient at a point on a curve as the instantaneous rate of change; apply the concepts of instantaneous and average rate of change (gradients of tangents and chords) in numerical, algebraic and graphical contexts}

Week 10	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Algebra: Non-linear graphs (Foundation) **Algebra: Graphs (Higher)**	**Solve linear equations** **Substitution** **Draw Linear Graphs** **Plot graphs** **Speed Distance Time** **Gradient of a line** **Transform and Translate a shape by a Vector**	**Gradient** **Parabola** **Quadratic** **Minimum Point** **Intercept** **Roots** **Cubic** **Velocity Time Graph** **Acceleration** **Deceleration** **Tangent** **Function** **Reciprocal**	**Find the equation of a tangent to a circle.** **Recognise and plot cubic, exponential and reciprocal graphs.** **Transform a graph.**	**• identify the significant points of a quadratic function graphically** **• identify the roots of a quadratic function by solving a quadratic equation** **• identify the turning point of a quadratic function.** Recognise and plot cubic and reciprocal graphs.	dentify and interpret roots, intercepts and turning points of quadratic functions graphically; deduce roots algebraically sketch translations and reflections of the graph of a given function} plot and interpret graphs

Week 11	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Begin revision for Mock Exams-Focus week on worded problem solving questions (Foundation) **Geometry and measures: Vector geometry (Higher)**	**Describe Translations using Vectors**	**Direction** **Magnitude** **Scalar** **Vector**	**Add and subtract vectors.** **Use vectors to solve geometric problems.**		describe translations as 2D vectors 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}.

Week 12	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Revision for Mock Exams for all students					

Week 13-15	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	GCSE Mock Examinations in the Hall. Students to complete Paper 2 and Paper 3.					

Week 16-20	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	Teachers to take time revisiting topics of weakness from the Mock exams as identified from QLA on Merit Maths. **Opposite are some topics that from experience students would benefit from revisiting.**			**Surds and Negative Indices** **Circle Theorems** **Direct and Inverse Proportion** **Trigonometry in Non Right Angled Triangles**	**Fractions** **Linear Equations** **Ratio and Proportion** **Pythagoras and Trigonometry**	

Week 21	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	GCSE Mock Examinations in the Hall. Students to complete Paper 1 (Non Calculator)					
Week 22-26	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**
	Teachers to take time revisiting topics of weakness from the Mock exams as identified from QLA on Merit Maths. Opposite are some topics that from experience students would benefit from revisiting Teachers should now start to begin using Past Papers to aid with revision. All available from department resources.			**Constructions and Loci** **Probability Trees** **Quadratic Equations** **Bounds and Error Intervals**	**Constructions and Loci** **Algebra-Advanced** **Volume including Spheres and Cones** **Averages including from Tables**	
Week 27	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**
	GCSE Mock Examinations in the Hall. Students to complete Paper 2 (Calculator)					
Week 28	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**
	Continued Revision in classroom with focus on topics from Paper 2					

Week 29	Topic	Prior Learning	Key vocabulary/grammar	Higher Tier	Foundation Tier	National Curriculum Statement
	GCSE Mock Examinations in the Hall. Students to complete Paper 3 (Calculator)					
Week 30	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**
	Continued Revision in classroom with focus on topics from Paper 3					
Week 31	**Topic**	**Prior Learning**	**Key vocabulary/grammar**	**Higher Tier**	**Foundation Tier**	**National Curriculum Statement**
	Collapsed timetable begins to allow for final preparations for the GCSE Exams					