Maths CURRICULUM MAP: Y10-11

Astrea Academy Trust
INSPIRING BEYOND MEASURE

Curriculum aims and intent	*Astrea's maths curriculum is rich in declarative, procedural and conditional knowledge. The curriculum allows scholars to gain fluency, build confidence and develop a deeper understanding of mathematics. Through its hierarchical nature, we:* *• Ensure fluency is achieved, as well as the ability to recall and apply knowledge rapidly and accurately. This is developed through carefully atomising component knowledge (**declarative and procedural**) using:* *o Procedural variation* *o Deliberate practice* *o Frequent retrieval practice* *• Allow scholars to see that mathematics is an interconnected subject by:* *o Building on prior knowledge to make explicit links and rich connections between topics* *o Providing opportunities for cumulative practice, with interconnecting ideas to allow scholars to work flexibly between different areas of mathematics.* *• Develop **conditional knowledge**, building competency to solve increasingly sophisticated problems by:* *o Decodifying a problem to identify the mathematics within it* *o Reasoning and justifying conclusions, through the use of calculations* *o Developing resilience in unfamiliar contexts, using pre-requisite known facts, without necessarily knowing the final answer* *Learning is a change in long term memory, and thus research and cognitive science has informed our curriculum, which makes use of retrieval practice as an aid to learning. We utilise regular low stakes quizzes and formative assessment to enable scholars to retrieve information.* *Our curriculum builds on previous knowledge learned at Key Stage 2, and is sequenced such that new learning is introduced and then consolidated with previous learning being interweaved throughout. Topics that are introduced in Key Stage 3 will be revisited in more depth at Key Stage 4 to ensure understanding is met. Forward-facing methods are considered at all levels to ensure that teaching approaches throughout the key stages contribute to a coherent curriculum.*
Curriculum rationale and design	This 5 year curriculum has been developed by the Astrea Maths Central Team, in conjunction with Heads of Maths and the wider Astrea Maths Subject Community. As a team, we have looked at the best practice of several maths curricula, including those used across a variety of MATs (White Rose, United Learning, Ark, OAT maths, Inspiration Trust, Discovering Mathematics, Mercia Learning Trust) and developed our curriculum based on each of the best features of these. The Astrea 5-year curriculum has been divided into five overarching strands: Number (N), Algebra (A), Geometry & Measures (G), Proportional Reasoning (P) and Statistics & Probability (S). Complete coverage would take a student from the start of Year 7 to full coverage of all content at Higher GCSE by the end of Year 11. The curriculum starts to diverge slightly in the second half of the Y10 Spring Term, then more notably towards the end of Y10 and into Y11. This is to ensure all scholars can access all areas of maths and have time to develop their skills before limiting their entitlement to Higher maths.

In KS3, there are 12-13 weeks per term allocated to allow for 3 flex weeks per year. These flex weeks can be used at any time and the placement of these is for individual schools or teachers to decide, based on their school holidays, calendared events or an identified need for consolidation.

The bullet points below gives an insight into the specific sequencing of topics within a Key Stage. This is an exemplar, and this process has been followed for all sequences throughout the 5 year SOL:

- The first unit in Y7, Applications of Numeracy, is placed here to ensure that scholars have solid foundational knowledge from KS2 and to build on this knowledge for scholars to understand the structure of number. In this unit, we explore applications of place value - median, powers of 10, standard form and working with different bases. We have also included rounding here, to emphasise how rounding relates to place value. Rounding is then revisited in Y8 to include estimation and error intervals.
- Within this unit, 'Addition and Subtraction' topics explore applications of this KS2 strand, including perimeter, frequency trees and addition and subtraction in standard form. We want our scholars to see mathematics as a series of interconnected ideas. Bringing in geometry and statistics strands of mathematics into the addition and subtraction unit allows this to happen.
- Similarly, 'Multiplication and Division' also explores applications of this KS2 strand, such as area, mean, primes, order of operations, squares and cubes. Within order of operations, we build in decimals (as four operations with decimals has been covered prior to this subtopic). Note that multiplication and division in standard form isn't included at this stage, as scholars have not yet been taught laws of indices. Standard form is revisited again in Y9 in further depth, to review the standard form subtopics covered in Y7 and build on these to include multiplication and division.
- As the subtopic 'Order of operations' has been covered prior to the 'Addition and Subtraction of Fractions' topic in Y7, order of operations can be interwoven into the addition and subtraction of fractions (questions such as 2/3 + 4 x 5). Questions involving multiplication and division of fractions are not explored at this stage, as this is yet to be taught. However, this allows for great retrieval practice of order of operations again in Y8, when multiplication and division of fractions is introduced.
- Introducing scholars to algebra at the end of the Spring Term allows for all previous content covered to be interwoven into this booklet. For example: algebra with fractions; algebra with order of operations; factors and multiples for expanding and factorising (up to cube powers, as this is all that has been taught up to this point). We do not go as far as solving at this stage, as we want scholars to master algebraic manipulation first in its entirety, reducing cognitive overload when it comes to solving in Y8. Sequences directly follows algebraic manipulation, to build on the newly acquired substitution knowledge. Notice that question types such as 'is this number in the sequence' aren't included here, as some of these questions require knowledge of solving equations. As we explore solving equations in Y8, these types of sequence questions are fed into this booklet, to retrieve prior knowledge of sequences and build on this with the skills scholars have just developed around solving equations.
- Y7 Probability directly follows FDP, so that probabilities can be expressed as fractions, decimals or percentages and scholars can practice working flexibly between these within a different context.
- Once we reach Y8, the first booklet 'Developing Number Sense' follows directly on from Venn diagrams pre-Summer. Scholars will explore HCF and LCM using prime factorisation in Venn diagrams, again retrieving then building on prior knowledge. This booklet has been placed before 'Equations and Inequalities', so that knowledge of squares and roots can be incorporated into solving equations and laws of indices can be applied to expanding and factorising with more complex powers.
- The Y8 'Equations and Inequalities' booklet incorporates applications of solving. This allows scholars to see mathematics as a series of connected ideas, and allows opportunities for retrieval of Y7 content such as angle properties, polygons and sequences.
- We have placed rounding, estimation and use of a calculator prior to area and circumference of circles, so that answers can be correctly rounded to a number of decimal places or significant figures and so that students can practise using a calculator before exploring new content with circles, to reduce cognitive load.

	• An example of where there is no explicit hierarchy is between solving equations and angles on parallel lines. As scholars learned about angle properties and angles in polygons in Y7, we decided to place 'Equations and Inequalities' in Y8 before angles in parallel lines. This is so the Y7 angle knowledge can be fed into solving equations within 'Equations and Inequalities', then solving equations knowledge can be fed-forward to 'Angles in Parallel Lines' for two different retrieval opportunities and spaced practice. The curriculum has been developed and sequenced to work for all - building seamlessly on previous knowledge to guarantee long-term learning. Scholars should attain proficiency, familiarity, and increased confidence through the interleaved recall of useful facts and methods throughout.
Assessment	Teachers use formative assessment strategies daily to determine the topic depth. Since curriculum materials are provided to complement the scheme, there is confidence that pupils are receiving lessons that provide opportunities for fluency, reasoning and problem solving. Opportunities for interweaving are regularly provided to retrieve information from other topic areas to place it solidly into long-term memory, enabling connections to be made between different parts of the curriculum. On-going evaluation of scholars' knowledge and understanding is undertaken through regular live marking and frequent low stakes assessments. These provide the teacher with responsive teaching opportunities to unpick misconceptions should they arise, or better still, prevent them from forming in the first place. End of booklet quizzes completed to allow scholars the opportunity to demonstrate the learning that has taken place, provide teachers with information on the current understanding of students and identify whether there are gaps or misconceptions present. Formal summative assessments take place twice a year in KS3, at the end of Y10 and in Autumn and Spring of Y11.

Year	Autumn		Spring		Summer	
Year 10 Core	Algebra Essentials and Applications Deepening Number Sense	Angles	FDP Essentials Ratio and Proportion	Sequences and Graphs	Perimeter, Circumference and Pythagoras Probability	Constructions and Loci
Year 11 Core Legacy (including 2026/27)	Further algebra: Simultaneous equations, inequalities	Core angle skills Vectors and trigonometry Core probability	Transformations Statistics including tables, sampling	Consolidation and revision		
Year 11 Core (2027 start)	Extending Algebra Averages and Diagrams	Areas and 3D Shape	Transformations	Geometric Proportion Vectors and Trigonometry	Revision	
Year 10 Higher	Advanced Algebra and Quadratics Deepening Number Sense	Linear Graphs, Inequalities and Regions Surds	Advanced FDP Angles	Ratio and Proportion	Sequences and Non-linear Graphs Pythagoras and Trigonometry	Probability Constructions and Loci
Year 11 Higher Legacy (including 2026/27)	Advanced algebra: functions, proof, iteration Further statistics	Constructions, Transformations; Interpreting advanced graphs	Vectors, congruence, trigonometric graphs	Consolidation and revision		
Year 11 Higher (2027 start)	Algebra - Higher Concepts Statistical Tables and Diagrams	3D Shape and Circle Theorems	Advanced Graphs	Vectors, Congruency and Further Trigonometry	Revision	

“Core” Pathway (Foundation and Crossover)

Year 10 Core	Subject: Maths	Unit title: Algebra Essentials and Applications	Term: Autumn
Procedural knowledge: • Use and interpret algebraic notation, including variables, terms, expressions, coefficients, products and quotients. • Collect like terms involving single and multiple variables, negative coefficients and non-linear terms. • Simplify multiplicative algebra. • Expand and simplify single brackets. • Solve one-step and two-step equations, including negative and non-integer solutions. • Form expressions and equations from words, diagrams and contexts. • Form and solve equations involving perimeter, angles and area. • Solve equations involving brackets and unknowns on both sides. • Complete tables of values and plot quadratic graphs. • Expand double brackets. • Factorise expressions into a single bracket and factorise monic quadratics. • Solve simple quadratic equations by factorisation.	**Vocabulary** Variable Term Expression Coefficient Like terms Equation Expand Factorise Quadratic Solution	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	
Links to other units: Why this and why now? How does this speak to what came before it and what will come after it? • This unit revisits and extends high-leverage algebra from KS3. • The knowledge supports later Year 10 work in graphs, geometry and proportion, and provides the foundation for Extending Algebra in Year 11.			
Links to the national curriculum:			

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The Higher pathway fully covers all content from the programme of study.

Year 10 Core	Subject: Maths	Unit title: Deepening Number Sense	Term: Autumn
Procedural knowledge: • Compare and order integers, decimals and negative numbers. • Round to decimal places and significant figures. • Estimate calculations and use the four operations. • Apply the correct order of operations and calculate with negative numbers. • Multiply and divide decimals and use a calculator efficiently. • Identify multiples, factors, prime numbers, squares, cubes and roots. • Calculate LCM and HCF using listing and prime factorisation. • Apply positive, zero and negative index laws. • Convert between ordinary numbers and standard form and calculate in standard form. • Identify bounds, write error intervals and solve limits-of-accuracy problems.	**Vocabulary** Integer Place value Rounding Significant figures Estimate Factor Multiple Prime Index Standard form Bound Error interval	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit consolidates and deepens the number knowledge required across the Core pathway.
- The skills are applied throughout later work in FDP, proportion, geometry, statistics and probability.

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Year 10 Core	Subject: Maths	Unit title: Angles	Term: Autumn
Procedural knowledge: • Recall and apply angle facts on lines, around a point and at vertically opposite angles. • Calculate missing angles in triangles and quadrilaterals. • Use properties of special quadrilaterals. • Calculate interior and exterior angles in polygons. • Use corresponding, alternate and co-interior angle relationships. • Form and solve algebraic angle problems. • Measure, draw and calculate bearings where appropriate.	**Vocabulary** Angle Vertically opposite Triangle Quadrilateral Polygon Parallel Transversal Corresponding Alternate Co-interior Bearing	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit consolidates KS3 angle knowledge and applies it in GCSE-style contexts.
- The knowledge supports later work in constructions, Pythagoras, trigonometry and transformations.

Links to the national curriculum:

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Year 10 Core	Subject: Maths	Unit title: FDP Essentials	Term: Spring
Procedural knowledge: • Simplify fractions and convert between improper fractions and mixed numbers. • Add, subtract, multiply and divide fractions, including mixed numbers. • Use a calculator with fractions. • Convert between fractions, decimals and percentages. • Order fractions, decimals and percentages. • Calculate percentages of amounts and percentage increases and decreases. • Express one quantity as a percentage of another and calculate percentage change. • Calculate simple and compound interest. • Solve reverse-percentage problems.	**Vocabulary** Fraction Numerator Denominator Improper fraction Mixed number Reciprocal Decimal Percentage Multiplier Simple interest Compound interest	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:

Why this and why now? How does this speak to what came before it and what will come after it?

- This unit consolidates essential FDP knowledge from KS3.
- The knowledge supports subsequent work in proportion, probability and statistics.

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Year 10 Core	Subject: Maths	Unit title: Ratio and Proportion	Term: Spring
Procedural knowledge: • Simplify ratios and write ratios in unit form. • Represent ratios using fractions and bar models. • Share amounts in a ratio. • Solve recipe, exchange-rate and best-buy problems. • Solve direct and inverse proportion problems. • Convert metric units and use scale drawings. • Calculate speed, density and pressure where appropriate.	**Vocabulary** Ratio Equivalent Unitary Proportion Direct proportion Inverse proportion Scale Scale factor Rate Speed Density Pressure	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit builds on multiplicative reasoning and FDP.
- Geometrical applications of proportion are developed further in Geometric Proportion in Year 11.

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Year 10 Core	Subject: Maths	Unit title: Sequences and Graphs	Term: Spring/Summer
Procedural knowledge: • Continue and generate sequences from term-to-term rules. • Generate sequences from an nth-term rule. • Find the nth term of a linear sequence. • Recognise common sequences. • Plot coordinates and find midpoints. • Plot straight-line graphs. • Calculate and interpret gradient. • Identify equations of straight lines, including horizontal and vertical lines.	**Vocabulary** Sequence Linear sequence Term-to-term rule nth term Coordinate Midpoint Linear graph Gradient Equation	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit connects earlier number and algebra knowledge.
- The graph and sequence knowledge supports later algebra and contextual problem solving.

Links to the national curriculum:

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Year 10 Core	Subject: Maths	Unit title: Perimeter, Circumference and Pythagoras	Term: Summer
Procedural knowledge: • Calculate perimeters of regular, irregular and compound polygons. • Calculate the circumference of a circle. • Find a radius or diameter from a circumference. • Use Pythagoras' Theorem to find a hypotenuse. • Use Pythagoras' Theorem to find a shorter side. • Apply Pythagoras' Theorem in contextual problems.	**Vocabulary** Perimeter Polygon Compound shape Radius Diameter Circumference Right-angled triangle Hypotenuse Pythagoras' Theorem	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit brings together linear measure, circles and right-angled triangles.
- The knowledge supports Vectors and Trigonometry in Year 11.

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Year 10 Core	Subject: Maths	Unit title: Probability	Term: Summer
Procedural knowledge: • Calculate theoretical probabilities. • Use relative frequency and experimental probability. • List outcomes and construct sample-space diagrams. • Complete and interpret two-way tables and frequency trees. • Complete and interpret Venn diagrams. • Apply the product rule for counting. • Use probability trees where appropriate.	**Vocabulary** Probability Outcome Event Relative frequency Sample space Two-way table Frequency tree Venn diagram Product rule Tree diagram	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit consolidates KS3 probability and develops GCSE applications.
- FDP and ratio knowledge support accurate probability calculation.

Links to the national curriculum:

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Year 10 Core	Subject: Maths	Unit title: Constructions and Loci	Term: Summer
Procedural knowledge: • Use a compass and protractor accurately. • Construct perpendicular and angle bisectors. • Construct triangles. • Construct and interpret loci. • Solve problems involving loci and constructions.	**Vocabulary** Construction Compass Bisect Perpendicular bisector Angle bisector Locus Equidistant	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit applies angle, scale and geometrical reasoning.
- The unit is deliberately concise because end-of-year assessment and consolidation occur during the same period.

Links to the national curriculum:

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Year 11 Core (2027 start)

Year 11 Core (2027 start)	Subject: Maths	Unit title: Extending Algebra	Term: Autumn
Procedural knowledge: • Solve linear equations, including equations with unknowns on both sides. • Use inequality notation and solve linear inequalities. • Rearrange formulae. • Solve simultaneous equations graphically and algebraically. • Form and solve simultaneous equations.	**Vocabulary** Variable Equation Inequality Formula Subject Simultaneous equations Elimination Substitution	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit extends the algebra taught in Year 10 Algebra Essentials and Applications.

Links to the national curriculum:

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Year 11 Core (2027 start)	Subject: Maths	Unit title: Averages and Diagrams	Term: Autumn
Procedural knowledge: • Calculate mean, median, mode and range. • Calculate averages from lists and frequency tables. • Solve problems involving averages. • Construct and interpret statistical diagrams, including stem-and-leaf diagrams.	**Vocabulary** Mean Median Mode Range Frequency Discrete data Continuous data Stem-and-leaf diagram	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit develops the statistical knowledge introduced at KS3.

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Year 11 Core (2027 start)	Subject: Maths	Unit title: Areas and 3D Shape	Term: Autumn
Procedural knowledge: • Calculate areas of rectangles, parallelograms, triangles, trapezia and compound shapes. • Calculate areas of circles and sectors. • Identify and describe 3D shapes. • Interpret plans and elevations. • Calculate volume and surface area of cubes, cuboids, prisms and cylinders. • Calculate volume and surface area of other 3D shapes where included.	**Vocabulary** Area Perpendicular height Circle Sector Volume Surface area Prism Cross-section Cylinder Pyramid Cone Sphere	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	
Links to other units: Why this and why now? How does this speak to what came before it and what will come after it? • This unit applies Year 10 algebra and number knowledge to area, volume and surface area.			
Links to the national curriculum: Astrea's KS4 Aligned Curriculum meets closely the content of the national curriculum. The Core pathway covers content that the programme of study states should be taught to all pupils. It also includes content that is considered a 'crossover' with Higher-tier content. The Higher pathway fully covers all content from the programme of study.			

Year 11 Core (2027 start)	Subject: Maths	Unit title: Transformations	Term: Spring
Procedural knowledge: • Complete and describe reflections. • Complete and describe translations. • Complete and describe rotations. • Complete and describe positive and fractional enlargements. • Complete and describe combined transformations.	**Vocabulary** Object Image Transformation Rotation Reflection Translation Enlargement Centre Scale factor	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit develops transformation knowledge from KS3.

Links to the national curriculum:

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Year 11 Core (2027 start)	Subject: Maths	Unit title: Geometric Proportion	Term: Spring
Procedural knowledge: • Identify congruent and similar shapes. • Use linear scale factors. • Use proportional reasoning in geometrical contexts. • Use area and volume scale factors where included.	**Vocabulary** Congruent Similar Corresponding sides Scale factor Area scale factor Volume scale factor Proportion	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit develops the geometric applications of Year 10 Ratio and Proportion.

Links to the national curriculum:

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Year 11 Core (2027 start)	Subject: Maths	Unit title: Vectors and Trigonometry	Term: Spring
Procedural knowledge: • Use vector notation and column vectors. • Add and subtract vectors. • Multiply vectors by scalars. • Apply vectors in geometrical contexts. • Identify the hypotenuse, adjacent and opposite sides in right-angled triangles. • Calculate missing lengths and angles using trigonometry. • Choose between Pythagoras' Theorem and trigonometry. • Apply Pythagoras and trigonometry in contextual problems.	**Vocabulary** Vector Column vector Scalar Magnitude Direction Hypotenuse Adjacent Opposite Sine Cosine Tangent	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit builds on Year 10 Angles and Perimeter, Circumference and Pythagoras.

Links to the national curriculum:

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Year 11 Core Legacy (including 2026/27)

This sequence applies to cohorts completing Year 11 in 2026/27 or earlier.

<table>
<tr><th>Year 11 Core Legacy (including 2026/27)</th><th>Subject: Maths</th><th>Unit title: Further Algebra</th><th>Term: Autumn 1</th></tr>
<tr><td rowspan="2">Procedural knowledge:

• Solving linear equations including unknowns on boths sides
• Inequality notation and mapping on a number line
• Solving linear inequalities
• Rearranging formulae
• Solving simultaneous equations graphically and algebraically
• Forming and solving simultaneous equations</td><td>Vocabulary</td><td colspan="2" rowspan="2">Teaching Sequence:
• Core Knowledge Takeaway
• Unit booklets</td></tr>
<tr><td>Constant
Variable
Equation
Inequality
Formula
Subject
Solve
Balancing
Simultaneous Equations
Elimination Method
Substitution Method</td></tr>
<tr><td colspan="4">Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?
• This unit covers the remainder of algebraic topics from the programme of study up to and including crossover topics such as solving of linear simultaneous equations.
• Success in this unit relies fundamentally on the strong building blocks in algebra in KS3 and Unit 1 of Year 10. Appropriate time has passed for the recap and consolidation of key foundational topics to be worthwhile and this is more likely to lead to a permanent change in long term memory for pupils.
• The rearranging of formulae links with many of the higher end Foundation topics such as ‘working backwards’ to missing dimensions in shape, or substitution and solving into problems involving compound measures.</td></tr>
<tr><td colspan="4">Links to the national curriculum:

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</table>

Year 11 Core Legacy (including 2026/27)	Subject: Maths	Unit title: Core angle skills Vectors and trigonometry; Core probability	Term: Autumn 2
Procedural knowledge: • Angles in a Right Angle • Angles on a Straight Line • Angles around a Point • Vertically Opposite Angles • Angles in a Triangle • Angles in a Quadrilateral • Sum of Angles in a Quadrilateral • Angle Rules for Special Quadrilaterals • Angles in Parallel Lines • Corresponding Angles • Alternate Angles • Co-interior Angles • Algebraic Problems • Measuring Bearings • Drawing Bearings • Calculating Bearings • Vectors: Definition & Notation • Multiplying Vectors • Adding and Subtracting Vectors • Parallel Vectors • Vector Geometry • Trigonometry - Building Blocks • Calculating a missing length • Calculating a missing angle • Applications of Trigonometry • Choosing between Pythagoras and Trigonometry • Solving Problems with Pythagoras and Trigonometry • Bearings with Pythagoras' Theorem & Trigonometry • Theoretical Probability	**Vocabulary** Angles on a straight line Angles around a point Interior Angle Exterior Angle Triangle Quadrilateral Regular Polygon Irregular Polygon Parallel Perpendicular Transversal Vertically opposite Alternate Corresponding Co-interior Bearings Direction Magnitude Vector Column Vector Resultant vector Scalar Parallel Trigonometry Hypotenuse Adjacent side Opposite side Probability Events Outcomes Trial Random	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

• Relative Frequency (Experimental Probability) • Listing Outcomes and Sample Space diagrams • Two-Way Tables • Frequency Trees • Venn Diagrams • Combinations (Product Rule for Counting) • Probability Trees	Biased Mutually Exclusive Experimental Probability Expected Probability Venn Diagram Set Notation Union & Intersection	

Links to other units:

Why this and why now? How does this speak to what came before it and what will come after it?

- This unit consolidates foundational angles knowledge from KS3 before building on it in linking with applications such as bearings and trigonometry. Trigonometry is re-covered since mainly the basic procedural elements will have been the focus when covered in Year 9.
- Basic vectors knowledge links with the final unit (transformations).
- Probability is another area not consolidated since Key Stage 3 so it is important to do so now. This unit recaps all key procedural and declarative knowledge from Key Stage 3 before stretching pupils understanding in application, for example constructing and interpreting tree diagrams.

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Year 11 Core Legacy (including 2026/27)	Subject: Maths	Unit title: Transformations; Statistics including tables, sampling	Term: Spring 1
Procedural knowledge: • Constructing and interpreting frequency polygons • Constructing and interpreting scatter graphs • Completing and describing reflection • Completing and describing Translation • Completing and describing Rotation • Completing and describing Combined Transformations • Completing and describing Positive and Fractional Enlargements	**Vocabulary** Line of Best Fit Correlation Object Image Transformation Rotation Centre of rotation Reflection Line of reflection Translation Enlargement Centre of Enlargement Ray Length (Linear) Scale Factor	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- Transformations are linked to the prior unit of vectors. They are low leverage and therefore taught towards the end of the course.
- The final statistics knowledge has been decoupled from that taught in Year 10 and this allows spaced retrieval of the concepts and knowledge taught then, alongside the new content.

Links to the national curriculum:

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The Higher pathway fully covers all content from the programme of study.

Higher Tier Pathway

Year 10 Higher	Subject: Maths	Unit title: Advanced Algebra and Quadratics	Term: Autumn
Procedural knowledge: • Solve linear equations, including equations with brackets, fractions and unknowns on both sides. • Plot and interpret quadratic graphs. • Expand and simplify double and triple brackets. • Factorise monic and non-monic quadratics. • Factorise a difference of two squares. • Solve quadratic equations by factorisation and using the quadratic formula. • Solve disguised quadratic equations. • Complete the square and sketch quadratic curves. • Solve quadratic inequalities where appropriate.	**Vocabulary** Quadratic Parabola Factorise Difference of two squares Quadratic formula Complete the square Root Inequality	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	
Links to other units: Why this and why now? How does this speak to what came before it and what will come after it? • This unit extends the algebraic manipulation and equation solving developed at KS3. • Quadratic knowledge is revisited throughout the Higher pathway in graphs, geometry and advanced algebra.			
Links to the national curriculum: Astrea's KS4 Aligned Curriculum meets closely the content of the national curriculum. The Core pathway covers content that the programme of study states should be taught to all pupils. It also includes content that is considered a 'crossover' with Higher-tier content. The Higher pathway fully covers all content from the programme of study.			

Year 10 Higher	Subject: Maths	Unit title: Deepening Number Sense	Term: Autumn
Procedural knowledge: • Round to significant figures and estimate calculations. • Multiply and divide decimals and use a calculator efficiently. • Calculate HCF and LCM, including through prime decomposition. • Apply positive, zero, negative and fractional index laws. • Solve equations involving indices. • Convert between ordinary numbers and standard form and calculate in standard form. • Use bounds, error intervals and limits of accuracy in problem solving.	**Vocabulary** Rounding Significant figures Estimate Prime factorisation Index Fractional index Standard form Mantissa Bound Error interval	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit deepens the number knowledge required across the Higher pathway.

Links to the national curriculum:

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Year 10 Higher	Subject: Maths	Unit title: Linear Graphs, Inequalities and Regions	Term: Autumn
Procedural knowledge: • Plot and interpret straight-line graphs. • Calculate and interpret gradients and intercepts. • Find equations of straight lines. • Use parallel and perpendicular gradients. • Represent and solve linear inequalities. • Represent inequalities and regions graphically.	**Vocabulary** Linear graph Gradient Intercept Equation Parallel Perpendicular Inequality Region	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit links algebraic equations with graphical representation.
- The knowledge supports Sequences and Non-linear Graphs and Advanced Graphs.

Links to the national curriculum:

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Year 10 Higher	Subject: Maths	Unit title: Surds	Term: Autumn
Procedural knowledge: • Understand and simplify surds. • Multiply and divide surds. • Add and subtract surds. • Expand brackets involving surds. • Rationalise denominators, including using a conjugate where appropriate.	**Vocabulary** Surd Irrational number Rational number Simplify Rationalise Conjugate	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit builds on powers, roots and algebraic manipulation.
- Surds support exact work in trigonometry and later algebra.

Links to the national curriculum:

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The Higher pathway fully covers all content from the programme of study.

Year 10 Higher	Subject: Maths	Unit title: Advanced FDP	Term: Spring
Procedural knowledge: • Convert between fractions, decimals and percentages, including recurring decimals and fractions. • Order fractions, decimals and percentages. • Calculate percentages of amounts and percentage change. • Calculate percentage increases and decreases. • Calculate simple and compound interest. • Solve reverse-percentage problems.	**Vocabulary** Fraction Recurring decimal Percentage Percentage change Multiplier Simple interest Compound interest Reverse percentage	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit secures FDP fluency for later proportion, probability and statistics.

Links to the national curriculum:

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The Higher pathway fully covers all content from the programme of study.

Year 10 Higher	Subject: Maths	Unit title: Angles	Term: Spring
Procedural knowledge: • Recall and apply angle facts in triangles, quadrilaterals and polygons. • Use corresponding, alternate and co-interior angles. • Form and solve algebraic angle problems. • Measure, draw and calculate bearings.	**Vocabulary** Angle Polygon Parallel Transversal Corresponding Alternate Co-interior Bearing	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit consolidates geometric reasoning before later work in trigonometry, circle theorems and constructions.

Links to the national curriculum:

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The Higher pathway fully covers all content from the programme of study.

Year 10 Higher	Subject: Maths	Unit title: Ratio and Proportion	Term: Spring
Procedural knowledge: • Simplify and share ratios, including ratios in unit form. • Solve compound-ratio problems. • Solve direct and inverse proportion problems numerically and algebraically. • Solve best-buy and compound-measure problems. • Use scale factors and proportional reasoning.	**Vocabulary** Ratio Unitary Compound ratio Direct proportion Inverse proportion Constant of proportionality Rate Scale factor	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit builds on FDP and algebra.
- Proportional reasoning supports similarity, trigonometry and vectors.

Links to the national curriculum:

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The Higher pathway fully covers all content from the programme of study.

Year 10 Higher	Subject: Maths	Unit title: Sequences and Non-linear Graphs	Term: Summer
Procedural knowledge: • Find nth terms of linear and quadratic sequences. • Recognise and continue arithmetic and geometric sequences. • Plot and interpret non-linear graphs. • Use equations of straight lines and circles. • Use parallel and perpendicular lines where appropriate.	**Vocabulary** Sequence Arithmetic sequence Geometric sequence nth term Quadratic sequence Non-linear graph Circle equation	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit extends KS3 sequences and Cartesian-plane work.
- The knowledge provides a foundation for Advanced Graphs in Year 11.

Links to the national curriculum:

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The Higher pathway fully covers all content from the programme of study.

Year 10 Higher	Subject: Maths	Unit title: Pythagoras and Trigonometry	Term: Summer
Procedural knowledge: • Apply Pythagoras' Theorem in two and three dimensions. • Use right-angled trigonometry to find missing lengths and angles. • Apply the sine rule and cosine rule. • Calculate the area of a triangle using trigonometry. • Choose and apply appropriate methods in multi-step problems.	**Vocabulary** Pythagoras' Theorem Hypotenuse Sine Cosine Tangent Sine rule Cosine rule Area formula	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit develops right-angled triangle knowledge from KS3.
- The knowledge supports Vectors, Congruency and Further Trigonometry in Year 11.

Links to the national curriculum:

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The Higher pathway fully covers all content from the programme of study.

Year 10 Higher	Subject: Maths	Unit title: Probability	Term: Summer
Procedural knowledge: • Calculate theoretical and experimental probabilities. • Use sample spaces, two-way tables and Venn diagrams. • Apply the product rule for counting. • Use tree diagrams for independent and dependent events. • Solve conditional and algebraic probability problems where appropriate.	**Vocabulary** Probability Relative frequency Sample space Venn diagram Product rule Independent event Dependent event Conditional probability Tree diagram	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit extends KS3 probability and applies algebraic and proportional reasoning.

Links to the national curriculum:

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The Higher pathway fully covers all content from the programme of study.

Year 10 Higher	Subject: Maths	Unit title: Constructions and Loci	Term: Summer
Procedural knowledge: • Use a compass and protractor accurately. • Construct perpendicular and angle bisectors. • Construct triangles and other geometrical figures. • Construct and interpret loci. • Solve problems involving constructions and loci.	**Vocabulary** Construction Compass Bisect Perpendicular bisector Angle bisector Locus Equidistant	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit applies angle, scale and geometrical reasoning.

Links to the national curriculum:

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The Higher pathway fully covers all content from the programme of study.

Year 11 Higher (2027 start)

Year 11 Higher (2027 start)	Subject: Maths	Unit title: Algebra - Higher Concepts	Term: Autumn
Procedural knowledge: • Rearrange formulae and solve advanced equations. • Solve simultaneous equations, including quadratic simultaneous equations where appropriate. • Manipulate and solve equations involving algebraic fractions. • Use functions, including inverse and composite functions. • Use iteration and recurrence relationships. • Construct algebraic proofs.	**Vocabulary** Formula Simultaneous equations Algebraic fraction Function Inverse function Composite function Iteration Recurrence Proof	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit extends Year 10 Advanced Algebra and Quadratics.

Links to the national curriculum:

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The Higher pathway fully covers all content from the programme of study.

Year 11 Higher (2027 start)	Subject: Maths	Unit title: Statistical Tables and Diagrams	Term: Autumn
Procedural knowledge: • Calculate and interpret averages and measures of spread. • Construct and interpret frequency polygons and scatter graphs. • Use quartiles and box plots. • Construct and interpret cumulative-frequency graphs. • Construct and interpret histograms where included.	**Vocabulary** Median Quartile Interquartile range Frequency polygon Correlation Box plot Cumulative frequency Frequency density Histogram	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit develops statistics from KS3 and earlier KS4 work.

Links to the national curriculum:

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The Higher pathway fully covers all content from the programme of study.

Year 11 Higher (2027 start)	Subject: Maths	Unit title: 3D Shape and Circle Theorems	Term: Autumn
Procedural knowledge: • Calculate volume and surface area of prisms, cylinders, pyramids, cones and spheres. • Interpret plans and elevations. • Apply circle theorems to calculate angles. • Use tangent, chord and cyclic-quadrilateral properties. • Construct geometrical proofs using circle theorems.	**Vocabulary** Volume Surface area Prism Cylinder Pyramid Cone Sphere Chord Tangent Cyclic quadrilateral Circle theorem	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit applies algebra, trigonometry and geometrical reasoning.

Links to the national curriculum:

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The Higher pathway fully covers all content from the programme of study.

Year 11 Higher (2027 start)	Subject: Maths	Unit title: Advanced Graphs	Term: Spring
Procedural knowledge: • Interpret gradients of curves as rates of change. • Estimate gradients of curves. • Estimate areas under curves using the trapezium rule. • Sketch and interpret exponential and reciprocal graphs. • Recognise and apply graph transformations using function notation. • Solve equations graphically where appropriate.	**Vocabulary** Gradient Rate of change Tangent Area under a curve Trapezium rule Exponential graph Reciprocal graph Graph transformation	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit builds on Year 10 linear and non-linear graph work.

Links to the national curriculum:

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The Higher pathway fully covers all content from the programme of study.

Year 11 Higher (2027 start)	Subject: Maths	Unit title: Vectors, Congruency and Further Trigonometry	Term: Spring
Procedural knowledge: • Add, subtract and multiply vectors by scalars. • Use parallel vectors and vector geometry. • Construct proofs using vectors. • Use congruence criteria in geometrical reasoning. • Sketch and interpret trigonometric graphs. • Solve trigonometric equations graphically. • Apply further trigonometry in geometrical problems.	**Vocabulary** Vector Column vector Scalar Magnitude Direction Congruent Proof Trigonometric graph Period	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- This unit builds on Year 10 ratio, geometry and trigonometry.

Links to the national curriculum:

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Year 11 Higher **Legacy** (including 2026/27)

This sequence applies to cohorts completing Year 11 in 2026/27 or earlier.

Year 11 Higher Legacy (including 2026/27)	Subject: Maths	Unit title: Advanced algebra: functions, proof, iteration Further statistics	Term: Autumn 1
Procedural knowledge: • Rearranging Formulae/ Changing the Subject • Recap/ Prior Knowledge Quiz: Solving Quadratic Equations • Simultaneous Equations – elimination and graphical solving • Recap: Solving Simultaneous Equations by Elimination • Worded Simultaneous Equations • Solving Simultaneous Equations using Substitution • Quadratic Simultaneous Equations • Algebraic Fractions – Manipulation and Simplifying • Algebraic Fractions – Solving (including Quadratics) • Functions • Iteration 1: Recurrence Relationships • Iteration 2: Estimating Solutions • Algebraic Proof • Capture Recapture • Frequency Polygons • Scatter Graphs • Quartiles • Box Plots • Cumulative Frequency Graphs • Histograms	**Vocabulary** • Fraction • Numerator • Denominator • Function • Inverse Function • Composite Function • Formula • Iteration • Solve • Quadratic simultaneous equations • Constant • Variable • Linear Function • Simultaneous Equations • Elimination Method • Substitution Method • Median • Upper/Lower Quartile • Interquartile Range • Line of Best Fit • Correlation • Cumulative • Frequency Density • Histogram	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:

Why this and why now? How does this speak to what came before it and what will come after it?

- Extends prior KS3 and KS4 algebraic manipulation and equation solving.
- Proof builds on earlier work with identities and factorisation, and prepares for formal reasoning in geometry and number.
- Functions and iteration link forward to sequences, graph interpretation, and problem-solving in real-world contexts.

Links to the national curriculum:

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The Higher pathway fully covers all content from the programme of study.

Year 11 Higher Legacy (including 2026/27)	Subject: Maths	Unit title: Constructions, Transformations; Interpreting advanced graphs	Term: Autumn 2
Procedural knowledge: • Completing and describing reflection • Completing and describing Translation • Completing and describing Rotation • Completing and describing Combined Transformations • Completing and describing Positive and Fractional Enlargements • Completing and describing negative enlargements • Identifying invariant points • Estimating gradients of curves • Interpreting gradients of curves as rates of change • Estimating areas under curves using trapezium rule	**Vocabulary** Object Image Transformation Rotation Centre of rotation Reflection Line of reflection Translation Enlargement Centre of Enlargement Ray Length (Linear) Scale Factor	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	

Links to other units:
Why this and why now? How does this speak to what came before it and what will come after it?

- Connects to earlier KS3 work on symmetry and basic transformations, and KS4 units on coordinates and linear graphs.
- Supports topics in loci, congruence, and trigonometric graphs, as well as underpinning problem-solving in geometry and algebraic modelling.

Links to the national curriculum:

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The Higher pathway fully covers all content from the programme of study.

Year 11 Higher Legacy (including 2026/27)	Subject: Maths	Unit title: Vectors, congruence, trigonometric graphs; graph transformations, exponential graphs	Term: Spring 1
Procedural knowledge: • Vectors: Definition & Notation • Multiplying Vectors • Adding and Subtracting Vectors • Parallel vectors as a scalar multiple of another vector • Vector geometry • Proof with vectors • Trigonometric graphs – shape, magnitude and period • Solving trig equations with graphs • Sketching and interpreting exponential graphs • Recognising and plotting reciprocal graphs • Understanding and identifying the main graph transformations (with function notation)	**Vocabulary** Direction Magnitude Vector Column Vector Resultant vector Scalar	**Teaching Sequence:** • Core Knowledge Takeaway • Unit booklets	
Links to other units: Why this and why now? How does this speak to what came before it and what will come after it? • Builds on KS3 and KS4 work on coordinates, transformations, and ratio. • Vectors link to previous units on scale factors and similarity, while congruence connects to earlier geometric reasoning and proofs. • Trigonometric graphs extend prior trigonometry and prepare for advanced graph interpretation and modelling.			
Links to the national curriculum: Astrea's KS4 Aligned Curriculum meets closely the content of the national curriculum. The Core pathway covers content that the programme of study states should be taught to all pupils. It also includes content that is considered a 'crossover' with Higher-tier content. The Higher pathway fully covers all content from the programme of study.			