

Curriculum Intent

Our intent is to deliver a curriculum that is rich in skills and knowledge, and allows scholars to gain fluency and a deeper understanding of mathematics. Our mathematics curriculum prepares scholars for everyday life through a tapestry of skills-based learning, critical thinking, and problem solving.

Through our carefully crafted curriculum we strive to ensure our scholars achieve fluency in mathematics. We believe that a curriculum that makes use of deliberate practice, retrieval practice and increasingly complex mathematical problems will allow scholars to develop a deep conceptual understanding of the subject. Topics are sequenced well and atomised to allow for deeper understanding through appropriate scaffolding. We make use of procedural variation to ensure fluency is achieved, before moving on to higher order questions to ensure scholars are suitably challenged.

We believe to succeed in mathematics scholars must experience a curriculum that challenges them and allows them to reason mathematically. We promote depth of knowledge within the curriculum through differentiation, well-resourced lessons that make use of higher order questioning, and regular exam practice at key stage 4. To celebrate mathematical reasoning through problem solving, we offer the UKMT maths challenge, as well as problem solving week to afford our scholars a challenging and rewarding mathematical experience. Financial education is being introduced into our curriculum so our scholars can improve their financial literacy and important real world financial skills.

We believe learning to be a change in long term memory, and thus research and cognitive science has informed our curriculum, which makes particular use of retrieval practice as an aid to learning. We utilise regular low stakes quizzes and formative assessment to enable our scholars to retrieve information on a daily basis, as we believe retrieval practice underpins academic success. Our curriculum is dynamic and mercurial, and we use evidence from retrieval practice to adapt where necessary the sequencing of learning.

The 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 are revisited in more depth at key stage 4 to ensure understanding is met. At key stage 3 our curriculum is differentiated to allow every scholar to experience success in mathematics. Through quality first teaching, and teaching from the 'top-down', we feel scholars are able to maximise their learning potential. We offer an evidence based direct instruction program for scholars who require support with numeracy to give these scholars the tools to make greater progress over time and into key stage 4. At key stage 4 the curriculum prepares the scholars for their GCSE's, as well as furthering their critical thinking and problem solving skills, preparing them for success outside of academia. Our key stage 4 curriculum equips the scholars with the knowledge and understanding to progress onto further mathematical study at key stage 5.

How does maths help with your other subjects?

Maths can help you in many subjects, here are just some of the subjects that benefit from having an understanding of mathematics.

- * Science: Working with graphs; estimations; using standard form; negative numbers.
- * PE: Working with speed, distance and time; Using compasses for map skills; understand symmetry.
- * DT: Working with measurements; constructions and angles.
- * Music: Understanding patterns and rhythm.
- * Geography: Working with graphs and handling data.
- * Art: Working with geometry; measurements and angles.

How are you assessed in maths?

- * Weekly recall quizzes.
- * Low stakes assessments in our booklets.
- * AFL in the lesson through whiteboards, questioning.
- * Summative assessments (2 per year in KS3 and KS4).

How can maths help with your future?

- * Maths is extremely important for your future. Beyond GCSE many A-levels include mathematical content, and use mathematical skills. Numeracy tests may be used in future for job applications and thus it is incredibly important for our scholars to develop numerical literacy throughout their time spent with us. Mathematics also teaches invaluable problem solving skills which are important for future careers as many prospective employers look for problem-solvers to hire.

What extra-curricular opportunities are there in maths?

- * Curriculum Catch-up.
- * KS4 Maths club.
- * UKMT Maths Challenge.
- * Problem Solving Week.

Below shows the knowledge that is studied in Mathematics at different points throughout a scholar's time at Astrea Academy Sheffield.

September 2022 – July 2023								
Year	Half-term 1	Half-term 2	Half-term 3	Half-term 4	Half-term 5	Half-term 6	What will a successful scholar look like at this stage?	
7	<ul style="list-style-type: none"> * Positive Integers. * Negative Integers. 	<ul style="list-style-type: none"> * Fractions. * Decimals. 	<ul style="list-style-type: none"> * Percentages. * Introduction to Algebra. 	<ul style="list-style-type: none"> * Simple Equations. * Angles in triangles and quadrilaterals. 	<ul style="list-style-type: none"> * Transformations. 	<ul style="list-style-type: none"> * Perimeter and Area. * Volume and surface area. 	<p>A successful scholar will have a firm knowledge of the four operations, as well as an understanding of 3 of the main strands of mathematics: Number; Algebra and Geometry.</p> <p>They will be able to recall facts about the topics studied and have made good progress throughout the year.</p>	
8	<ul style="list-style-type: none"> * Factors and Multiples. * Approximation and estimation. 	<ul style="list-style-type: none"> * More percentages. * Statistical Graphs + Collecting Data. 	<ul style="list-style-type: none"> * Angles in Parallelograms and Polygons. * Circumference and Area of circles. 	<ul style="list-style-type: none"> * Volume and surface area of prisms and cylinders. * Algebraic Expressions. 	<ul style="list-style-type: none"> * Equations and inequalities. * Coordinates and Lines. 	<ul style="list-style-type: none"> * Sequences. * Ratio, Rate and Speed. 	<p>A successful scholar will have a firm knowledge of the four operations, as well as an understanding of 4 of the main strands of mathematics: Number; Algebra; Geometry and Statistics.</p> <p>They will be able to recall facts about the topics studied and have made good progress throughout the year.</p> <p>Scholars will be able to reason mathematically and problem solve.</p>	
9	<ul style="list-style-type: none"> * Ratio, rates and speed. * Indices and Standard form. 	<ul style="list-style-type: none"> * Factorisation and Quadratic Expressions. * Linear Equations in two variables. 	<ul style="list-style-type: none"> * Pythagoras & Bearings. * Congruence, Similarity and Enlargements. 	<ul style="list-style-type: none"> * Data Analysis. * Probability. 	<ul style="list-style-type: none"> * Non-linear graphs. * Construction and Loci. * Trigonometry. 	<ul style="list-style-type: none"> * Surface Area of pyramids and cones. * Proportion. 	<p>A successful scholar will have a firm knowledge of the four operations, as well as an understanding of the 5 main strands of mathematics: Number; Algebra; Geometry; Statistics and Probability.</p> <p>They will be able to recall facts about the topics studied and have made good progress throughout the year.</p> <p>Scholars will be able to reason mathematically and problem solve.</p>	
10	<ul style="list-style-type: none"> * Positive Integers. * Negative Integers * Approximation and estimation. * Bounds * Indices and Standard Form * Factors, multiples and Primes. * Statistical Representation. 	<ul style="list-style-type: none"> * Statistical Representation. * Angles. * Circle Theorems (HIGHER TIER). 	<ul style="list-style-type: none"> * Fractions. * Probability. * Linear Expressions. * Linear Equations. 	<ul style="list-style-type: none"> * Surds (HIGHER TIER). * Pythagoras. * Trigonometry. 	<ul style="list-style-type: none"> * Perimeter and Area. * Transformations. * Number Sequences. * Percentages. 	<ul style="list-style-type: none"> * Ratio and Proportion. * Measure and Scale. 	<p>A successful scholar at this stage will have a firm grasp of KS3 topics and KS4 topics taught during the year. They should be able to recall facts, reason mathematically, and answer exam style questions in preparation for their GCSE examinations. Scholars will be capable and have a rich understanding in the 5 main strands of mathematics taught over their 4 years of study.</p>	
11	<ul style="list-style-type: none"> * Constructions. * Similarity and Congruence. * Volume and Surface Area. * Linear Graphs. 	<ul style="list-style-type: none"> * Quadratic Expressions. * Quadratic Equations. * Sampling. * Combined Events. 	<ul style="list-style-type: none"> * Simultaneous Equations. * Other Graphs. * Vectors. 	<ul style="list-style-type: none"> * Further Algebra (HIGHER TIER). 	<ul style="list-style-type: none"> * Revision and Examinations. 			<p>A successful scholar will have completed their GCSE course with results showing they have made expected or above expected progress. They will be well-rounded individuals with an appreciation for mathematics and a firm understanding of mathematics to be used in further education and beyond.</p>