

At Ercall Wood Academy our students experience a highly personalised, challenging curriculum, rich in variety and diversity, yet underpinned by our whole academy traditional values.

Empower Respect Aspire

Our curriculum is designed to help to address social injustice by providing all our students with the essential knowledge and skills that are commonly possessed by successful citizens which will **empower** them to positively contribute to their community and the wider world. No child will be disadvantaged by our curriculum.

Our curriculum aims to engender equality and mutual **respect** in our students, their community, and the environment in which they are an integral part.

Our curriculum aims to unlock the potential of all our students and has high aspirations for everyone, regardless of their ability, gender, race, or background. Through our challenging curriculum we will instil a drive in them to **aspire** to excellence, to become the very best that they can be, thereby preparing them for success in life.

The key principles of our curriculum

- Our curriculum provides a broad, ambitious five-year curriculum journey for all students containing the essential knowledge, skills and experience that prospective employers demand from their candidates.
- Our curriculum is designed to enable accelerated progress so that all students can achieve success in literacy and numeracy.
- Our curriculum is coherently mapped and sequenced to reduce cognitive load for our students.
- Our curriculum is designed to support students in constructing rich connections and building schema, thereby deepening their understanding and their ability to remember.
- Our curriculum incorporates regular retrieval practice to strengthen memory and maximise cognitive development.
- Our curriculum provides frequent opportunities for targeted in-learning formative assessment to measure student knowledge retention and check for understanding.
- Our curriculum incorporates robust summative assessments mapped to the curriculums procedural knowledge to measure students' ability to understand, retain and recall the essential curriculum knowledge and the skills they have been taught.
- Our curriculum utilises assessment to identify key information for explicit teacher feedback and future curriculum planning to reduce identified knowledge gaps.
- Our curriculum is inclusive and is based on equality of opportunity.
- Our curriculum experts are the subject leaders who regularly review and update their curriculum through subject meetings to ensure that the curriculum mapping is constantly enhanced.

- Our curriculum explores and clarifies student beliefs and values and empowers them to learn to think and speak for themselves by developing critical and evaluative skills which enables them to be more socially mobile.
- Our curriculum develops skills for learning, life and work by making learning relevant and engaging, thereby helping students to apply lessons to their life beyond the classroom.

Enrichment Opportunities

Our intention for our curriculum is:

“I’ve always been interested in using mathematics to make the world work better.” — Alvin E. Roth

We aim for KS3 pupils at Ercall Wood Academy to become fluent in the fundamental knowledge of mathematics. Pupils are aware of real-life applications of mathematics, and can apply their skills to a range of situations. Our goal is ensure pupils are confident in their mathematical skills going into KS4

Our key stage 4 pupils build on their previous knowledge to further develop their fluency, mathematical reasoning and competence in solving increasingly difficult problems. We aim to deliver engaging, yet challenging lessons, that with the correct amount of support, allow pupils to achieve success every lesson.

By the time our students leave our department, we hope to have provided them with the skills and knowledge needed to not only support their future employment prospects, but also ensure they will go on to be able to successfully communicate and interact as a global citizen.

Curriculum Implementation

Our spiral curriculum is designed to embed learning into long-term memory and develop conceptual understanding across number, algebra, geometry, statistics, probability and ratio and proportion. We encourage pupils to break problems into smaller steps to allow them to rapidly recall and apply knowledge accurately. We provide pupils with regular challenge in lessons and opportunities to further their learning outside of the classroom. Pupils' understanding is checked throughout lessons using a range of techniques.

Key stage 4 pupils are entered onto the AQA GCSE qualification. Our curriculum is regularly assessed to ensure we provide the highest quality level of challenge, metacognition and literacy without our lessons. Pupils are assessed after each unit and high quality feedback provided with the intention of closing any gaps. Pupils' understanding is checked throughout lessons using a range of techniques. We have dedicated problem solving lessons embedded into our curriculum which allow pupils to explore the application of their mathematical skills.

Subject specialists have carefully sequenced and thought hard about the rationale of the curriculum; why we teach the content we do and in the order that we do. This is to ensure new knowledge is not detached information; but is connected to prior learning and built upon to ensure retention of learning and provide students deeper understanding, meaning and purpose.

Curriculum Implementation Overview

Subject Specific High Fives

Scaffolding – enables teachers to pitch high, supporting students in reaching ambitious goals with a view to working independently.

Live Modelling – making the implicit processes of more complex tasks explicit to students to aid understanding, through narrating procedures.

Guided Practice – provide opportunities to practise doing thing correctly in the early stages of complex process to next step to independence.

Probing Questions – enables teachers to review and repair schemas based on students understanding. Builds links between abstract and concrete ideas, also allows students to develop critical responses.

Feedback that Moves Forward – Highlights common misconceptions and gives pupils the opportunities to correct their misunderstandings, and provide challenge..

Retrieval Practice KS3

4 questions based on last lesson, last week, last month and last term.

Retrieval Practice KS4

4 questions based on last lesson, last week, last term, last year – adapted by teachers to meet the needs of students to embed prior knowledge and demonstrate the benefit of revision rehearsal needed for GCSE.

Spiral Curriculum

The curriculum follows a spiral model to support students retention of knowledge and helps them to make links that foster both their understanding of mathematics and grasp of taught skills. The spiral is designed to be taught in depth with regular checks for understanding and prior knowledge checks for the foundation knowledge needed for each new unit..

Homework

As a department we use Sparx maths as our homework platform. Homework is designed to match our curriculum so it is linked to what is being taught in lessons. Sparx will adapt to meet the needs of individual pupils by repeating some topics until the individual pupil has a full understanding of that topic. Teachers will use 'Sparx insights' to recognise either class weaknesses, or where their classes need to be challenged. We have a dedicated Sparx club for year 7 to give students the opportunity to ask for assistance if they are finding any homework challenging. Sparx homework is intended to allow each pupil to complete 100% of their homework weekly.

Assessments:

KS3 students have two assessments per half term at the end of each unit, with a further end of term assessment.

KS4 pupils also have two assessments per half term at the end of each unit with year 10 sitting and end of year mock and year 11 sitting two mocks throughout the year.

For each set of mocks, students will have a personalised QLA produced which highlights their individual strengths and weaknesses with attached Sparx codes.

Year 7 Curriculum Implementation

Students will be introduced to the foundation Mathematics skills needed to succeed in the subject, building on knowledge they have acquired at KS2.

Number and Algebra		Angles and Fractions, Decimals and Percentages		Shape and Statistics	
1	2	3	4	5	6
Number and Calculations (Autumn A) Students will build on KS2 knowledge and delve into place value, rounding and estimating, factors, multiples and prime numbers. This unit will also be their first in depth experience of using a scientific calculator.		Angles (Spring A) Students will expand on their KS2 knowledge using mathematical equipment by accurately drawing and measuring angles. Students will then explore angles on parallel lines and angles in polygons		Measures and Shape (Summer A) Students will enhance their KS2 knowledge on converting units and gain a deeper understanding of calculating with time, and the practical uses of estimation. Students will also	
Algebra (Autumn B)		Fractions, decimals and percentages (Spring A):		Statistics and Averages: (Summer B):	

Students will gain an understanding of the language of algebra, simplifying expressions, expanding and factorising before tackling solving equations.	Students will learn how to convert between factions, decimals and percentages, calculate percentages of amounts, and increase or decrease by a percentage. Students will also learn to calculate with fractions and mixed numbers.	Students will gain an understanding of bars and charts before applying their knowledge of averages to use with data in tables.
Summative Assessments: Autumn A – Number - Calculating Autumn B – Algebra 1 Algebra 2	Summative Assessments: Spring A – Angles 1 Angles 2. Spring B – Fractions, decimals and percentages - Fractions.	Summative Assessment: Summer A: Measures Shape Summer B: Statistics Averages.

Year 8 Curriculum Implementation

Students will develop skills learnt in year 7 and extend their knowledge to more abstract concepts.

Number, Algebra and Sequences		Area, Perimeter and Probability		Probability, Inequalities and Data	
1	2	3	4	5	6
Number and Ratio (Autumn A) Students will discover prime numbers and their real life uses before an introduction to indices. Students then learn how to write a regular number in standard form and vice versa before applying their new knowledge to calculating with standard form. Students will gain a deep understanding of ratio by being able to simplify, share into, and calculate or problem solve with ratio. This is then extended into best buys and compound measures Algebra and Sequences (Autumn B): Previous year 7 knowledge of algebra is then extended to solving equations with unknowns on both sides, or with fractions. Students will be able to solve equations with indices or roots. Being able to continue or find missing terms of a sequence leads to being able to calculate an nth term or generate a sequence. Students will use these new skills to apply to sequences with shapes.		Area, Perimeter and Circles (Spring A) Students will extend on their knowledge of 2D shape to be able to calculate the area or perimeter. Students will apply this knowledge with their algebra skills to calculate area or perimeter algebraically. Students will then apply these skills to compound shapes. Students will build on the previous unit to circles to be able to calculate the area or circumference. Students will need to recognise and describe parts of the circle. Probability (Spring B): Students will need to understand and learn the language of probability, and use these terms confidently. We extend this knowledge to calculating simple probabilities to more complex theoretical probabilities and expectations. Further developing these skills, students will be introduced to sample space diagrams, two-way tables and Venn diagrams		Shape and Constructions (Summer A) Students will use their KS2 knowledge of co-ordinates to problem solving before being introduced to bearings and their real life uses. Continuing with the real life theme, students learn to calculate with scale diagrams and map scales. Students will then improve their use of mathematical equipment to accurately construct triangles, bisectors and loci Inequalities and Data (Summer B): This Inequalities unit build on previous algebraic skills such as solving equations, but to include drawing and recognising inequalities on a number line. Students gain an understanding of types of data and the uses of sampling and questionnaires. Students will be introduced to dual or composite bar charts and stem and leaf diagrams.	
Summative Assessments: Autumn A – Number Ratio Autumn B –Algebra 3 Sequences		Summative Assessments: Spring A – Area and Perimeter Circles Spring B – Probability 1 Probability 2		Summative Assessment: Summer A : Shape Construction Summer B: Inequalities Data.	

Year 9 Curriculum Implementation

Students will embed the Mathematics skills introduced in Years 7 and 8 through the study of more challenging problems and concepts.

Number, Algebra and Graphs		3D Shapes, Transformations and Proportion		Probability, Simultaneous Equations and Right angled triangles	
1	2	3	4	5	6
Number and Surface area and Volume (Autumn A): Students begin the year with by building on their previous knowledge of rounding to an introduction to truncation, error intervals and bounds. Students apply their previous understanding of area to calculate surface area and volume of 3D shapes such as prisms and cylinders. Expanding, Factorising and Graphs (Autumn B): Students extend their knowledge of algebra by expanding double brackets and factorising quadratics, before rearranging formulae.		Percentages and transformations (Spring A): Students complete a unit on percentages, including simple and compound interest, and reverse percentages. Students apply their previous understanding of area to calculate surface area and volume of 3D shapes such as prisms and cylinders. Students then complete a unit on transformations, including recognising and describing transformations Real life graphs and proportion (Spring B): Students are now introduced to real life graphs such as distance-time graphs, depth-time graphs and the practical uses of conversion graphs. Students are then apply their knowledge of best buys to a unit covering proportion, similarity and congruent shapes.		Probability, Statistics and Simultaneous Equations (Summer A): In this half term, students are introduced to tree diagrams, pie charts, frequency polygons. Students then apply all previous teachings of algebra to simultaneous equations, including creating and solving simultaneous equations. Pythagoras and Trigonometry (Summer B): In the final half term of the year, students calculate with right angled triangles using Pythagoras and/or trigonometry. Students also gain an understanding of exact trigonometric values.	
Summative Assessments: Autumn A – Number 3 Percentages Autumn B – Algebra 4 Graphs		Summative Assessment: Spring A – Surface area and volume Transformations Spring B – Real life graphs Proportion		Summative Assessment: Summer A: Probability and statistics Simultaneous Equations. Summer B:Pythagoras. Trigonometry	

Year 10 Curriculum Implementation –

Our key stage 4 pupils build on their previous knowledge to further develop their fluency, mathematical reasoning and competence in solving increasingly difficult problems. We aim to deliver engaging, yet challenging lessons, that with the correct amount of support, will allow pupils to achieve success every lesson

1	2	3	4	5	6
Foundation Number and algebra (Autumn A) Students begin the year by completing a comprehensive unit on calculating with fractions and mixed numbers, including fractions of amounts and writing one quantity as a fraction of another. The algebra 1 unit covers solving linear equations, substitution, factorising and solving quadratics. Sequences and probability (Autumn B) In the second half term, students complete a unit on sequences, including sequences of shapes and nth term. The probability unit builds on previous knowledge of tree diagrams to include Venn diagrams, notation, relative frequency and expectations. Higher Number and algebra (Autumn A) Students start the year by being introduced to surds, indices, bounds and being able to convert a recurring decimal to a fraction. Students then extend their knowledge of algebra to include factorising quadratics where $a > 1$, completing the square, difference of two squares and plotting and solving quadratics. Graphs and Probability Students are introduced to histograms for the first time as well as covering cumulative frequency graphs and box plots. Students then extend their previous probability knowledge by completing a unit on conditional probability, Venn diagrams and notation and the product rule.		Foundation Shape, Surface area and volume (Spring A) Students learn how to classify shapes and calculate the perimeter and area of 2D shapes, before an in depth unit on parts of a circle and area and circumference. We then extend this knowledge into and calculating the surface area and volume of prisms and cylinders. Vectors and Transformations (Spring A) Students are introduced to vector notation for the first time and can use this knowledge to draw or calculate with vectors. We then start working on transformations including being able to recognise and describe a transformation. Higher Shape and graphs (Spring A) Students apply their knowledge of Pythagoras and trigonometry to the sine and cosine rules and 3D Pythagoras and trigonometry, and the area of non-right angled triangles. We complete a unit on equations of linear, parallel and perpendicular lines. Shape and proportion (Spring B) The new year starts with calculating the volume and surface area of prisms, compound shapes, cones, spheres and frustums. We then calculate with area and volume scale factors, congruence and similarity. The final unit of the term comprises of calculating with direct and indirect proportion, and proportion graphs.		Foundation Angles, Index laws and standard form (Summer A) Students build on their knowledge of simple angle facts to be able to calculate angle in polygons and angles on parallel lines. The second unit this half term is complied of learning and calculating with the index laws before recognising and calculating with standard form. Percentages and statistics (Summer B) Students build upon previous knowledge of percentages to be able to calculate percentage change, simple and compound interest and reverse percentages. We finish off the year with a unit on statistics to include calculating averages from a table or a statistical diagram, and justify their choice of average. Higher Algebra and Vectors (Summer A) Student begin the term with calculating with algebraic fractions, expanding triple brackets and rearranging formula with factorising. Students are then introduced to algebraic vectors, including arithmetic and vector proof. Growth and Decay, and Circles (Summer B) Recognising and sketching graphs leads into real life graphs and an introduction into iteration. Finally students are introduced to circle theorems where they'll need to recognise and calculate angles using their new knowledge. We extend this to graphs of circles.	
Summative Assessment:		Summative Assessment:		Summative Assessment:	

Foundation: Number 1 Algebra 1 Sequences Probability Higher: Number 1 Algebra 1 Graphs Probability	Foundation: Shape 1 Surface area and volume Vectors Transformations Higher: Number 1 Algebra 1 Graphs Probability	Foundation: Angles Index laws and Standard form Percentages Statistics Higher: Algebra 2 Vectors Growth and decay Circles
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Year 11 Curriculum Implementation					
In Year 11, students will complete their study of the final GCSE Mathematics by the end of the Autumn term. From January, students will work on their weaknesses from the Autumn mock, before starting a program of revision.					
1	2	3	4	5	6
Foundation Ratio, Pythagoras and Trigonometry (Autumn A) Student start the year with calculating with ratio, including simplifying, sharing into and map scales. Students will then build on previous knowledge of Pythagoras and trigonometry and apply their skills to be able to problem solve. Graphs and Simultaneous equations (Autumn B) Student will combine all knowledge of graphs to be able to problem solve with an emphasis on exam-style questions. Students combine their algebra skills to be able to create and solve simultaneous equations. We then extend this to solving graphically. Higher Quadratics and graphs (Autumn A)		Higher and foundation - Targeted revision (Spring)		Higher and foundation – Revision and exams (Summer)	

Students build on previous knowledge to solving quadratic simultaneous equations before being introduced to quadratic sequences and solving quadratic inequalities. Our graphs unit will see students draw, solve and recognise trigonometric graphs. Students will also be able to calculate graph transformations, the tangent to a graphs and the area under a graph. Algebra (Autumn B) Students finish the term by exploring functions, which includes composite, inverse and solving functions before b=being introduced to algebraic proof..		
Foundation: Pythagoras and Trigonometry Graphs Simultaneous equations Higher: Quadratics Graphs Algebra 3	Foundation and Higher Assessments based on individual class weaknesses highlighted from each mock series	

Impact of Our Curriculum:

Pupils know they can succeed in maths with the help of a dedicated and hard working team within the Mathematics department. We aim to inspire pupils to appreciate how mathematics is used daily in a variety of settings and careers.

We recognise where qualifications with mathematics can take a student which is why we currently have one of the highest uptakes of Further Mathematics in Telford.

Ultimately, we want students to be confident in maths and their ability to problem solve by applying a methodical, logical approach. Our curriculum allows copious opportunities to build on their previous knowledge and skills.