Curriculum Progression Pathway for Mathematics

Subject Intent: To give students the opportunity to become mathematical problem-solvers.

Why is the study of mathematics important?

The study of mathematics is important as it provides us with a way of building our problem-solving skills and resilience. Mathematics also enables learners to develop their critical thinking and logical skills - both of which are useful in real life.
Although many aspects of mathematics are abstract, all aspects require application of knowledge to familiar and sometimes unfamiliar problems.

What skills will the study of mathematics teach you?

- Problem-solving
- Resilience
- Independent study skills
- Retention
- Application of formulae

What will you know and understand from your study of mathematics?

- Number - money skills, four operations
- Algebra - substitution, use of formulae
- Probability - likeliness of events and risk-taking
- Statistics - data handling and displaying data
- Geometry - shapes and spatial awareness
- Ratio and proportion - recipes and percentages

How does your study of mathematics support your learning in other subjects?

In geography, students need to be able to calculate averages and the range, they also need a strong knowledge of representing data.

In science, students need to be able to substitute values into formulae, rearrange equations and display data.

In technology, students need to be able to calculate the area and perimeter of 2D shapes. They also need to be able to calculate the volume of 3D shapes and use this to calculate how much of each material is needed to develop their project.

In art, students need spatial awareness.

How can you deepen your understanding of mathematics?

- Read mathematical books in the maths library (E21).
- Take part in the UKMT maths challenge.
- Mathswatch.
- Hegarty Maths
- Participation in AMSP events or other cultural capital experiences.

How can mathematics support your future?

Mathematics can support your future by helping you to develop your problem-solving skills. On a daily basis, we solve problems and often the solutions to these problems are not straightforward. This means that we need to be resilient and that we need to take the time to assess the problem and then determine the solution to the problem. Sometimes, we may be in a situation that requires a quicker decision - the logical thinking that we develop through studying mathematics will support us in being able to make decisions under pressure when needed.

At post-16 options, students can opt to take an A Level in Mathematics or Further Mathematics. There is also the option of Core Maths. Our GCSE curriculum aims to prepare students to be able to take these courses (where they meet the prerequisites).

Exam board used in Y10 & Y11
Pearson Edexcel

CURRICULUM PROGRESSION PATHWAY

	Year 7	Year 8	Year 9	Year 10	Year 11
Autumn 1	**Analysing and displaying data** 1.Mode,Median and range 2. Displaying data 3. Grouping Data 4.Averages and comparing data 5. Line graphs and more bar charts **Number** 1.Calculations 2.Divisibility and division 3.Calculating with negative integers 4.Powers and roots 5.Powers ,root and brackets 6.Multiples and factors	**Number** 1.Calculations 2.Divisibility and division 3.Calculating with negative integers 4.Powers and roots 5.Powers ,root and brackets 6.Multiples and factors **Area and Volume** 1.Area of triangles 2.Area of a parallelogram and trapezium 3.Volume of cubes and cuboids 4.2D representation of 3D solids 5. Surface area of cubes and cuboids 6. Measures	**Indices and standard form** 1.Indices 2.Calculating and estimate 3.Standard form **Expression and formulae** 1.Solving equations 2.Substituting with expressions 3.Writing and using formulae 4.Index laws and brackets 5.Expanding double brackets	**Number** 1.Calculations (F) 2.Decimal numbers (F) 3.Place value (F) 4.Factors and multiples (F) 5.Squares.cubes and roots (F) 6.Prime factors (F) 7.Number problems and reasoning (H) 8.Estimating (H) 9.HCF and LCM (H) 10.Calculating with powers(Indices) (H) 11.Zero,negative and fractional indices (H) 12.Powers of 10 and standard form (H) **Algebra** 1.Algebraic expressions (F) 2.Simplifying expression (F) 3.Substitution (F) 4.Formulae (F) 5.Expanding and factorising (F) 6.Using expression and formulae (F)	**Multiplicative reasoning (F/H)** 1. Percentages 2. Growth and decay 3. Compound measure 4. Distance, speed and time 5. Direct and inverse proportion **Congruence, similarity and vectors (H)** 1. Similarity and enlargement 2. Using similarity 3. Congruence 4. Vectors **Trigonometry (H)** 1. Accuracy 2. Graphs of the sine function 3. Graphs of the cosine function 4. Graphs of the tangent function 5. Calculating area and the sine rule 6. The cosine rule and 2D trigonometric problems **Construction, loci and bearings (F/H)** 1. 3D solids 2. Plans and elevations

	Expressions, functions and formulae	Statistics, graphs and charts	Dealing with Data	7.Algebraic indices (H) 8.Equations (H) 9.Linear sequences (H) 10.Non-linear sequences(H)	3. Accurate drawings 4. Scale drawing and maps 5. Construction 6. Loci and region 7. Bearings **Quadratic equations and graphs (F/H)** 1. Expanding double brackets 2. Plotting quadratic graphs 3. Using quadratic graphs 4. Factorising quadratic expressions 5. Solving quadratic equations algebraically
	1.Simplifying expression 2.Writing expressions 3.Substituting into formulae 4.Writing formulae	1.Pie charts 2. Using Tables 3.Stem and leaf diagrams 4.Comparing data 5.Scatter graphs 6.Misleading graphs	1.Planning a survey 2.Collecting data 3.Calculating averages 4.Displaying and analysing data 5.Presenting and comparing data		
Autumn 2	**Decimals and measure** 1. Decimals and rounding 2. Length,mass and capacity 3. Scales and	**Expression and equations** 1.Algebraic power 2.Expressions and brackets 3. Factorising expressions 4.One-step equations	**Multiplicative Reasoning** 1.Enlargement 2.Negative and fractional scale factors 3.Percentage change 4.Compound	**Graphs and tables (F)** 1.Frequency tables 2.two way tables 3.Representing data 4. Stem and leaf diagram 5.Pie charts 6.Scatter graphs 7.Lines of best fit	**Perimeter, area and volume (F)** 1. Circumference of a circle 2. Area of a circle 3. Semi circle and sector 4. Composite 2 D shape and cylinder 5. Pyramids and cone 6. Sphere and composite solids

measure 4. Working with decimals mentally 5. Working with decimal 6. Working with decimals 7. Perimeter 8. Area 9. More units of measure **Fractions and Percentages** 1.Comparing fractions 2.Simplifying fractions 3.Working with fractions 4.Fractions and decimals 5.Understanding percentages 6.Percentages of an amount	5. Two - step equations **Real-life Graphs** 1.Conversion graphs 2.Distance -time graphs 3.Line graphs 4.Real life graphs 5.Curved Graphs 6.Solving geometric problems	measures 4.Direct and inverse proportion **Construction** 1.Using scales 2.Basic construction 3.Constructing triangles 4.Using accurate scale diagrams **Sequences,Inequalities,equations and proportion** 1.Nth term of arithmetic sequences 2.Non-linear sequences Inequalities 3.Inequalities 4.Solving equations 5.Proportion	**Fractions and Percentages(F)** 1.Working with fractions 2. Operations with fractions 3.multiplying with fractions 4.dividing with fractions 5.Fractional decimal 6.Fractions and decimals 7.Fractions and percentages 8.Calculating percentages **Equation, inequalities and sequences (F)** 1.Solving equations 2.Solving equations with brackets 3. Inequalities 4.Using formulae 5.Generating sequences 6.Using the Nth term of a sequence **Interpreting and representing data (H)** 1.Statistical diagrams 2.Time series 3.Scatter graphs 4.Line of best fit 5.Average and range **Fractions, ratio and percentages (H)**	**Fractions, indices and Standard form (F)** 1. Multiplying and dividing fractions 2. The laws of indices 3. Writing large numbers in standard form 4. Writing small numbers in standard form 5. Calculating with standard form **Statistics (H)** 1. Sampling 2. Cumulative frequency 3. Box plots 4. Drawing histograms 5. Interpreting histograms 6. Comparing and describing distribution

				1.Fractions 2.Ratio 3.Ratio proportion 4.Percentages 5.Fractions,decimals and percentages	
Spring 1	**Probability** 1.The language of probability 2.Calculating probability 3.Experimental probability 4.Expected outcomes **Ratio and Proportion** 1. Direct proportion 2. Writing ratio 3. Using ration 4. Ratio,proportion and fractions 5. Proportion	**Decimals and ratio** 1.Ordering decimals and rounding 2.Place value calculations 3.Calculations with decimals 4.Ratio and proportion with decimals **Lines and angles**	**Sequences, Inequalities, equations and proportion** 1.Nth term of arithmetic sequences 2.Non-linear sequences Inequalities 3.Inequalities 4.Solving equations 5.Proportion	**Angles (F)** 1.Properties of shapes 2.Angles in parallel lines 3. Angles in triangles 4.Exterior and interior angles 5.Geometrical problems **Averages and range (F)** 1.Mean and Range 2.Mode,median and range 3.Types of Averages 4.Estimating the mean 5.Sampling **Perimeter, area and volume (F)**	**Congruence, similarity and vectors (F)** 1. Similarity and enlargement 2. Using similarity 3. Congruence 4. Vectors **Algebra (F)** 1. Graphs of cubic and reciprocal functions 2. Non linear graphs 3. Solving simultaneous equations graphically 4. Rearranging formula 5. Proof **Quadratics and Graphs** 1. Solving simultaneous equations

	and percentages	1.Quadrilaterals 2.Alternate angles and proof 3.Angles in parallel lines 4.Exterior and		1.Rectangles, parallelograms and triangles 2.Trapezia and changing units 3.Area of compound shapes 4.Surface area of 3D solids 5.Volume of prisms **Angles and Trigonometry (H)** 1.Angles and properties of triangles and quadrilaterals 2. Interior angles of a polygon 3.Exterior angles of a polygon 4.Pythagoras Theorem 5.Trigonometry	graphically 2. Representing inequalities graphically 3. Question equations 4. Using quadratic graphs 5. Cubic graphs 6. Using iteration to solve equations **Circle Theorems (H)** 1. Radii and chords 2. Tangents 3. Angles in circles 4. Applying circle theorem 5. Algebra 6. Rearranging formulae **Algebraic fractions** 1. Simplifying algebraic fractions 2. Proof 3. Surds 4. Solving algebraic fractions
Spring 2		**Calculating with Fractions** 1.Ordering	**Circles, Pythagoras and Prisms**	**Graphs** 1.Linear graphs (F/H) 2.Graphing rates of change (F/H) 3.Real Life graphs (F/H)	**Vectors and geometric Proof (H)** 1. Vectors and vector notation 2. Vector arithmetic

		fractions 2.Adding and subtracting fractions 3.multiplying fractions 4.Dividing fractions 5.Calculating with mixed fractions	1.Circumference of a circle 2.Area of a circle 3.Pythagoras' theorem 4.Prism and cylinders 5.Error intervals and bounds	4.Line segments (F/H) 5.Quadratic graphs (F/H) Cubic and reciprocal graphs(F/H) **Transformations** 1.3D solid (F/H) 2.Reflection and rotation (F/H) 3.Enlargement (F/H) 4.Combination of different transformations (F/H) 5.Scale drawings (F/H) and bearings (H) 6.Construction (F/H) 7.Loci (F) **Area and Volume (H)** 1.Perimeter and area 2.Units and accuracy 3.Prisms 4.Circles 5.Sector of a circle 6.Cylinders and spheres	3. Parallel vectors and collinear points 4. Solving geometric problems
Summer 1	**Lines and angles** 1.Measuring and drawing angles 2.Lines,angles and triangles	**Straight line graphs** 1.Direct proportion graphs 2.Gradients	**Graphs** 1.Using y=mx+c 2.straight line graphs 3.Simultaneous	**Ratio and Proportion (F)** 1.Writing ratios 2.Using ratio 3.Ratio and measure 4.Comparing using ratio	

3.Drawing triangles accurately 4. Calculating angles 5.Angles in a triangle 6.Quadrilaterals **Sequences and Graphs** 1.Sequences 2.Patterns and sequences 3.Coordinates and Midpoints 4.Extending sequences 5.Straight-line graphs 6.Position-to-term rules	3.Equations of a straight line	equation 4.Graphs of quadratic graphs 5.Non-linear graphs **Probability** 1.Mutually exclusive events 2.Experimental and theoretical probability 3.Sample space diagrams 4.Two way tables 5.Venn diagrams	5.Using proportion 6.Proportion and graphs **Right-angles triangles (F)** 1.Pythagoras 2.Trigonometry-The sine ratio 3.Trigonometry -The cosine ratio 4.Trigonometry -The tangent ratio 5.Finding lengths and angles using trigonometry **Equations and inequalities(H)** 1. Solving inequalities 2. Solving quadratic equations 3. Completing the square 4. Solving simple linear equations 5. Solving simultaneous equations graphically 6. Solving linear and quadratic simultaneous equations **Probability (H)** 1. Combined events 2. Mutually exclusive events 3. Experimental probability 4. Independent events and tree diagrams	

				5. Conditional probability 6. Venn Diagram and set notation	
Summer 2	**Transformations** 1.Congruence and enlargement 2.symmetry 3.Reflection 4.Rotation 5.Translating and combined transformations	**Percentages, decimals and fractions** 1.Fractions and decimals 2.Equivalent proportion 3.Writing percentages 4.Percentages of an amount	**Comparing shape and trigonometry** 1.Congruent and similar shapes 2.Ratio in a triangle 3.The tangent ratio 4.The sine ratio 5.The cosine ratio 6.Using trigonometry to find angles	**Probability (F)** 1. Calculating probability 2. Two events 3. Experimental probability 4. Venn diagrams 5. Tree diagrams	