

## Year 10 Curriculum Plan

In Year 10 students begin the GCSE course and study a range of different topics which focus on providing them with the skills they will need throughout their school life. Year 10 will focus on building confidence in ...

Year 10 Curriculum Overview						
Skills	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6
<b>Higher Tier</b>	<b>Equations &amp; Inequalities</b> N1 N8 A3 A4 A5 A9 A11 A18 A19 A21 A22	<b>Probability</b> N1 P1 P2 - P9 <b>Multiplicative Reasoning</b> N12 N13 A2 A9 R1 R6 R9 - R11 R13 R14 R16	<b>Similarity &amp; Congruence</b> R6 R12 G5 GG7 G17 G19 <b>Further Statistics</b> S1 S3 S4	<b>More Trigonometry</b> N16 A8 A12 A13 G20 G22 G23	<b>Equations &amp; Graphs</b> N8 A4 A11 A12 A18 - A22 <b>More Algebra</b> N8 A4 A5 A6 A7 A18	<b>Circle Theorems</b> A16 G9 G10
<b>Pearson STEP</b>	<b>6<sup>th</sup> - 12<sup>th</sup></b>	<b>5<sup>th</sup> - 12<sup>th</sup> / 6<sup>th</sup> - 9<sup>th</sup></b>	<b>6<sup>th</sup> - 12<sup>th</sup></b>	<b>9<sup>th</sup> - 12<sup>th</sup></b>	<b>6<sup>th</sup> - 12<sup>th</sup> / 8<sup>th</sup> - 12<sup>th</sup></b>	<b>7<sup>th</sup> - 11<sup>th</sup></b>
<b>Foundation Tier</b>	<b>Graphs</b> N13 A7 - A10 A12 A14 A17 R11 R14 G14	<b>Transformations</b> R6 G1 G7 G24 <b>Ratio &amp; Proportion</b> N11 N13 R1 R4 - R8 R10 - R12 R14	<b>Right Angled Triangles</b> N7 N15 R12 G6 G11 G20 G21 <b>Multiplicative Reasoning</b> N13 R1 R7 R10 R11 R13 G14	<b>Probability</b> N5 P1 - P8 <b>Percentages</b> R9 R16	<b>Constructions, Loci &amp; Bearings</b> R2 R6 G1 G2 G4 - G7 G12 G13 G15	<b>Quadratics &amp; Graphs</b> N4 A1 A3 A4 A6 A8 A11 A12 A14 A18 <b>Perimeter, Area &amp; Volume</b> N8 N14 N15 N16 G9 G14 G16 G17 G18
<b>Pearson STEP</b>	<b>2<sup>nd</sup> - 8<sup>th</sup></b>	<b>4<sup>th</sup> - 8<sup>th</sup></b>	<b>3<sup>rd</sup> - 8<sup>th</sup></b>	<b>3<sup>rd</sup> - 8<sup>th</sup></b>	<b>1<sup>st</sup> - 7<sup>th</sup></b>	<b>6<sup>th</sup> - 8<sup>th</sup> / 4<sup>th</sup> - 8<sup>th</sup></b>
<b>Assessment</b>	<b>1 x 60 min topic based, cumulative exam sat in class</b>	<b>Mock exam 1</b> 2 x 90 min papers sat in the hall	<b>1 x 60 min topic based, cumulative exam sat in class</b>	<b>1 x 60 min topic based, cumulative exam sat in class</b>	<b>Mock exam 2</b> 2 x 90 min papers sat in the hall	<b>1 x 60 min topic based, cumulative exam sat in class</b>

### How you can support your child outside of lessons:

- Read through classwork and assessment feedback with them
- Support wider learning and problem solving

### Engage with educational websites such as:

- Hegarty Maths [www.hegartymaths.com](http://www.hegartymaths.com)
- NRICH
- Dr Frost Maths

### Review Week

#### Cycle 3

Pupils complete a Trigonometry project – building and using a clinometer to measure the height of Norlington School.

#### Cycle 6

Pupils design a poster for a charity using their knowledge of constructions (foundation) and circle theorems (higher tier).

During both review weeks pupils also complete 'Memri' activities from Hegarty Maths to aid with knowledge retrieval and improve their cognitive load.

## Year 11 Curriculum Plan

In Year 11 students study a range of different topics which focus on providing them with the skills they will need throughout their school life. Year 11 will focus on building confidence in ...

Year 11 Curriculum Overview				
Skills	Cycle 1	Cycle 2	Cycle 3	Cycle 4
Higher Tier	Vectors & Geometric Proof G25	Proportion & Graphs A7 A12 - A15 R7 R10 R13 - R16	Number & Co-Ordinate Geometry Review	Revision Exam Paper Packs
Pearson STEP	9 <sup>th</sup> – 12 <sup>th</sup>	7 <sup>th</sup> - 12 <sup>th</sup>		
Foundation Tier	Fractions, Indices & Standard Form N2 N3 N6 - N9	Congruence, Similarity & Vectors R6 R12 G3 G5 G6 G7 G17 G19 G24 G25 More Algebra A2 A3 A5 A6 A12 A14 A17 A19 A21 R10 R13 R14 R16	Algebra Review	Revision Exam Paper Packs
Pearson STEP	6 <sup>th</sup> – 8 <sup>th</sup>	6 <sup>th</sup> -8 <sup>th</sup> / 4 <sup>th</sup> -8 <sup>th</sup>		
Assessment	1 x 60 min topic based, cumulative exam sat in class	Mock exam 1 3 x 90 min papers sat in the hall	Mock exam 2 3 x 90 min papers sat in the hall	Mock exam 3 2 x 90 min papers sat in the hall

### Assessment Structure

Pupils sit 3 sets of mock exams across the year. Primarily secure mock papers are used, alongside shadow and practice papers.

Pupils sit 3 x 1.5-hour exams (80 marks each).

Paper 1 – Non-Calculator  
Paper 2 – Calculator  
Paper 3 – Calculator

### How you can support your child outside of lessons:

- Read through classwork and assessment feedback with them
- Support wider learning and problem solving

### Engage with educational websites such as:

- Hegarty Maths [www.hegartymaths.com](http://www.hegartymaths.com)
- NRICH
- Dr Frost Maths

### Review Week

#### Cycle 3

In year 11 Hegarty Maths is used extensively to ensure pupils can recall, remember and apply learnt knowledge. As part of review week, pupils complete Fix Up 5 and 'Memri' activities which revisit previous learning.

# SEQUENCING AND PROGRESSION MAPPING IN MATHS

Pearson Step	Indicative Grade
1st	1
2 <sup>nd</sup>	1
3 <sup>rd</sup>	2
4 <sup>th</sup>	2
5 <sup>th</sup>	3
6 <sup>th</sup>	3
7 <sup>th</sup>	4
8 <sup>th</sup>	5
9 <sup>th</sup>	6
10 <sup>th</sup>	7
11 <sup>th</sup>	8
12 <sup>th</sup>	9

This is the 12-Step Progression Scale developed by Pearson in partnership with teachers.

Each curriculum overview above forms part of the five-year framework that outlines our view of how learning builds and develops across KS3 and KS4. They provide teachers and students with a progression route through a subject and highlight learning barriers that may be holding students back.

The curriculum has been broken down into key skills and progress descriptors so that you can see in detail the specific skills and knowledge that sit alongside the learning. Each progress descriptor in the Progression Map has been assigned a number between 1 and 12. These numbers (steps) indicate the level of challenge attributed to each topic.

\*Blue highlighted – Theta / Delta / Higher Tier only

## KEY FOR SKILLS: A – Algebra, N – Number, G – Geometry, R – Ratio & Proportion, S – Statistics, P – Probability

N1	order positive and negative integers, decimals and fractions; use the symbols =, ≠, <, >, ≤, ≥	R1	change freely between related standard units (e.g. time, length, area, volume/capacity, mass) and compound units (e.g. speed, rates of pay, prices, <u>density, pressure</u> ) in numerical and algebraic contexts
N2	apply the four operations, including formal written methods, to integers, decimals and simple fractions (proper and improper), and mixed numbers – all both positive and negative	R2	use scale factors, scale diagrams and maps
N3	recognise and use relationships between operations, including inverse operations and be able to use BIDMAS	R3	express one quantity as a fraction of another, where the fraction is less than 1 or greater than 1
N4	use the concepts and vocabulary of prime numbers, factors (divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation	R4	use ratio notation, including reduction to simplest form
N5	apply systematic listing strategies, <b>including use of the product rule for counting</b>	R5	divide a given quantity into two parts in a given part:part or part:whole ratio; express the division of a quantity into two parts as a ratio; apply ratio to real contexts and problems
N6	use positive integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5; <b>estimate powers and roots of any given positive number</b>	R6	express a multiplicative relationship between two quantities as a ratio or a fraction
N7	<u>calculate with roots, and with integer and fractional indices</u>	R7	understand and use proportion as equality of ratios
N8	calculate exactly with fractions, <u>surds and multiples of <math>\pi</math></u> ; <b>simplify surd expressions involving squares (e.g. <math>\sqrt{12} = \sqrt{4 \times 3} = \sqrt{4} \times \sqrt{3} = 2\sqrt{3}</math>) and rationalise denominators</b>	R8	relate ratios to fractions and to linear functions
N9	calculate with and interpret standard form $A \times 10^n$ , where $1 \leq A < 10$ and n is an integer	R9	interpret percentages and percentage changes as a fraction or a decimal; express one quantity as a percentage of another; compare two quantities using percentages; work with percentages greater than 100%; solve problems involving percentage change, including percentage increase/decrease and original value problems, and simple interest including in financial mathematics
N10	work interchangeably with terminating decimals and their corresponding fractions and <b>change recurring decimals into their corresponding fractions and vice versa</b>	R10	solve problems involving direct and inverse proportion, including graphical and algebraic representations
N11	identify and work with fractions in ratio problems	R11	use compound units such as speed, rates of pay, unit pricing, <u>density and pressure</u>
N12	interpret fractions and percentages as operators	R12	compare lengths, areas and volumes using ratio notation; <u>make links to similarity (including trigonometric ratios)</u> and scale factors
N13	use standard units of mass, length, time, money and other measures (including standard compound measures) using decimal quantities where appropriate	R13	<u>understand that X is inversely proportional to Y is equivalent to X is proportional to <math>1/Y</math></u> ; <b>construct and interpret equations that describe direct and inverse proportion</b>
N14	estimate answers; check calculations using approximation and estimation	R14	interpret the gradient of a straight line graph as a rate of change; recognise and interpret graphs that illustrate direct and inverse proportion
N15	round numbers and measures to an appropriate degree of accuracy (e.g. to a specified number of decimal places or significant figures)	R15	<b>interpret the gradient at a point on a curve as the instantaneous rate of change; apply the concepts of average and instantaneous rate of change (gradients of chords and tangents) in numerical, algebraic and graphical contexts (this does not include calculus)</b>
N16	<u>apply and interpret limits of accuracy, including upper and lower bounds</u>	R16	<u>set up, solve and interpret the answers in growth and decay problems, including compound interest and work with general iterative processes</u>

## KEY FOR SKILLS: A – Algebra, N – Number, G – Geometry, R – Ratio & Proportion, S – Statistics, P – Probability

<b>A1</b>	use and interpret algebraic manipulation, including: <ul style="list-style-type: none"> <li>• <math>ab</math> in place of <math>a \times b</math></li> <li>• <math>3y</math> in place of <math>y + y + y</math> and <math>3 \times y</math></li> <li>• <math>a^2</math> in place of <math>a \times a</math>, <math>a^3</math> in place of <math>a \times a \times a</math>, <math>a^2b</math> in place of <math>a \times a \times b</math></li> <li>• <math>a/b</math> in place of <math>a \div b</math></li> <li>• coefficients written as fractions rather than as decimals</li> <li>• brackets</li> </ul>	<b>A15</b>	calculate or estimate gradients of graphs and areas under graphs (including quadratic and other non-linear graphs), and interpret results in cases such as distance-time graphs, velocity-time graphs and graphs in financial contexts
<b>A2</b>	substitute numerical values into formulae and expressions, including scientific formulae	<b>A16</b>	recognise and use the equation of a circle with centre at the origin; find the equation of a tangent to a circle at a given point
<b>A3</b>	understand and use the concepts and vocabulary of expressions, equations, formulae, identities, inequalities, terms and factors	<b>A17</b>	solve linear equations in one unknown algebraically (including those with the unknown on both sides of the equation); find approximate solutions using a graph
<b>A4</b>	simplify and manipulate algebraic expressions (including those involving surds and algebraic fractions) by: <ul style="list-style-type: none"> <li>• collecting like terms</li> <li>• multiplying a single term over a bracket</li> <li>• taking out common factors</li> <li>• expanding products of two or more binomials</li> <li>• factorising quadratic expressions of the form <math>x^2 + bx + c</math>, including the difference of two squares; factorising quadratic expressions of the form <math>ax^2 + bx + c</math></li> <li>• simplifying expressions involving sums, products and powers, including the laws of indices</li> </ul>	<b>A18</b>	solve quadratic equations algebraically by factorising, by completing the square and by using the quadratic formula; find approximate solutions using a graph
<b>A5</b>	understand and use standard mathematical formulae; rearrange formulae to change the subject	<b>A19</b>	solve two simultaneous equations in two variables (linear/linear or linear/quadratic) algebraically; find approximate solutions using a graph
<b>A6</b>	know the difference between an equation and an identity and use algebra to construct proofs	<b>A20</b>	find approximate solutions to equations numerically using iteration
<b>A7</b>	where appropriate, interpret simple expressions as functions with inputs and outputs; ; interpret the reverse process as the 'inverse function'; interpret the succession of two functions as a 'composite function'	<b>A21</b>	translate simple situations or procedures into algebraic expressions or formulae; derive an equation (or two simultaneous equations), solve the equation(s) and interpret the solution
<b>A8</b>	work with coordinates in all four quadrants	<b>A22</b>	solve linear inequalities in one or two variable(s), and quadratic inequalities in one variable; represent the solution set on a number line, using set notation and on a graph
<b>A9</b>	plot graphs of equations that correspond to straight-line graphs in the coordinate plane; use the form $y = mx + c$ to identify parallel and perpendicular lines; find the equation of the line through two given points or through one point with a given gradient	<b>A23</b>	generate terms of a sequence from either a term-to-term or a position-to-term rule
<b>A10</b>	identify and interpret gradients and intercepts of linear functions graphically and algebraically	<b>A24</b>	recognise and use sequences of triangular, square and cube numbers, simple arithmetic progressions, Fibonacci type sequences, quadratic sequences, and simple geometric progressions ( $r^n$ where $n$ is an integer, and $r$ is a rational number $> 0$ or a surd) and other sequences
<b>A11</b>	identify and interpret roots, intercepts, turning points of quadratic functions graphically; deduce roots algebraically and turning points by completing the square	<b>A25</b>	deduce expressions to calculate the $n$ th term of linear and quadratic sequences
<b>A12</b>	recognise, sketch and interpret graphs of linear functions, quadratic functions, simple cubic functions, the reciprocal function $y = 1/x$ with $x \neq 0$ , exponential functions $y = k^x$ for positive values of $k$ , and the trigonometric functions (with arguments in degrees) $y = \sin x$ , $y = \cos x$ and $y = \tan x$ for angles of any size		
<b>A13</b>	sketch translations and reflections of a given function		
<b>A14</b>	plot and interpret graphs (including reciprocal graphs and exponential graphs) and graphs of non-standard functions in real contexts to find approximate solutions to problems such as simple kinematic problems involving distance, speed and acceleration		

## KEY FOR SKILLS:

A – Algebra, N – Number, G – Geometry, R – Ratio & Proportion, S – Statistics, P – Probability

<b>G1</b>	use conventional terms and notation: points, lines, vertices, edges, planes, parallel lines, perpendicular lines, right angles, polygons, regular polygons and polygons with reflection and/or rotation symmetries
<b>G2</b>	use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle)
<b>G3</b>	apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles; understand and use alternate and corresponding angles on parallel lines; derive and use the sum of angles in a triangle (e.g. to deduce and use the angle sum in any polygon, and to derive properties of regular polygons)
<b>G4</b>	derive and apply the properties and definitions of special types of quadrilaterals, including square, rectangle, parallelogram, trapezium, kite and rhombus; and triangles and other plane figures using appropriate language
<b>G5</b>	use the basic congruence criteria for triangles (SSS, SAS, ASA, RHS)
<b>G6</b>	apply angle facts, triangle congruence, similarity and properties of quadrilaterals to conjecture and derive <u>results about angles and sides, including Pythagoras' theorem and the fact that the base angles of an isosceles triangle are equal, and use known results to obtain simple proofs</u>
<b>G7</b>	identify, describe and construct congruent and similar shapes, including on coordinate axes, by considering rotation, reflection, translation and enlargement (including <u>fractional and negative scale factors</u> )
<b>G8</b>	<b>describe the changes and invariance achieved by combinations of rotations, reflections and translations</b>
<b>G9</b>	identify and apply circle definitions and properties, including: centre, radius, chord, diameter, circumference, <u>tangent, arc, sector and segment</u>
<b>G10</b>	<b>apply and prove the standard circle theorems concerning angles, radii, tangents and chords, and use them to prove related results</b>
<b>G11</b>	solve geometrical problems on coordinate axes
<b>G12</b>	identify properties of the faces, surfaces, edges and vertices of: cubes, cuboids, prisms, cylinders, pyramids, cones and spheres
<b>G13</b>	<u>construct and interpret plans and elevations of 3D shapes</u>
<b>G14</b>	use standard units of measure and related concepts (length, area, volume/capacity, mass, time, money, etc.)
<b>G15</b>	measure line segments and angles in geometric figures, including interpreting maps and scale drawings and use of bearings

<b>G16</b>	know and apply formulae to calculate: area of triangles, parallelograms, trapezia; volume of cuboids and other right prisms (including cylinders)
<b>G17</b>	know the formulae: circumference of a circle = $2\pi r = \pi d$ , area of a circle = $\pi r^2$ ; calculate: perimeters of 2D shapes, including circles; areas of circles and composite shapes; <u>surface area and volume of spheres, pyramids, cones and composite solids</u>
<b>G18</b>	calculate arc lengths, angles and areas of sectors of circles
<b>G19</b>	<b>apply the concepts of congruence and similarity, including the relationships between lengths, areas and volumes in similar figures</b>
<b>G20</b>	know the formulae for: Pythagoras' theorem $a^2 + b^2 = c^2$ , and the trigonometric ratios, $\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$ , $\cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$ and $\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$ apply them to find angles and lengths in right-angled triangles <b>and, where possible, general triangles in two and three dimensional figures</b>
<b>G21</b>	know the exact values of $\sin \theta$ and $\cos \theta$ for $\theta = 0^\circ, 30^\circ, 45^\circ, 60^\circ$ and $90^\circ$ ; know the exact value of $\tan \theta$ for $\theta = 0^\circ, 30^\circ, 45^\circ$ and $60^\circ$
<b>G22</b>	<b>know and apply the sine rule <math>\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}</math>, and cosine rule <math>a^2 = b^2 + c^2 - 2bc \cos A</math>, to find unknown lengths and angles</b>
<b>G23</b>	<b>know and apply <math>\text{Area} = \frac{1}{2} ab \sin C</math> to calculate the area, sides or angles of any triangle</b>
<b>G24</b>	describe translations as 2D vectors
<b>G25</b>	apply addition and subtraction of vectors, multiplication of vectors by a scalar, and diagrammatic and column representations of vectors; <b>use vectors to construct geometric arguments and proofs</b>

**KEY FOR SKILLS:**

A – Algebra, N – Number, G – Geometry, R – Ratio & Proportion, S – Statistics, P – Probability

<b>P1</b>	record, describe and analyse the frequency of outcomes of probability experiments using tables and frequency trees
<b>P2</b>	apply ideas of randomness, fairness and equally likely events to calculate expected outcomes of multiple future experiments
<b>P3</b>	relate relative expected frequencies to theoretical probability, using appropriate language and the 0-1 probability scale
<b>P4</b>	apply the property that the probabilities of an exhaustive set of outcomes sum to one; apply the property that the probabilities of an exhaustive set of mutually exclusive events sum to one
<b>P5</b>	understand that empirical unbiased samples tend towards theoretical probability distributions, with increasing <u>sample size</u>
<b>P6</b>	enumerate sets and combinations of sets systematically, using tables, grids, Venn diagrams <u>and tree diagrams</u>
<b>P7</b>	construct theoretical possibility spaces for single and combined experiments with equally likely outcomes and use these to calculate theoretical probabilities
<b>P8</b>	<u>calculate the probability of independent and dependent combined events, including using tree diagrams and other representations, and know the underlying assumptions</u>
<b>P9</b>	<b>calculate and interpret conditional probabilities through representation using expected frequencies with two-way tables, tree diagrams and Venn diagrams</b>

<b>S1</b>	<u>infer properties of populations or distributions from a sample, while knowing the limitations of sampling</u>
<b>S2</b>	interpret and construct tables, charts and diagrams, including frequency tables, bar charts, pie charts and pictograms, vertical line charts for ungrouped discrete numerical data, <u>tables and line graphs for time series data</u>
<b>S3</b>	<b>construct and interpret diagrams for grouped discrete data and continuous data, i.e. histograms with equal and unequal class intervals and cumulative frequency graphs, and know their appropriate use</b>
<b>S4</b>	interpret, analyse and compare the distributions of data sets from univariate empirical distributions through: <ul style="list-style-type: none"> <li>• appropriate graphical representation involving discrete, continuous and grouped data, <b>including box plots</b></li> <li>• appropriate measures of central tendency (median, mean, mode and modal class) and spread (range, including consideration of outliers, <b>quartiles and inter-quartile range</b>)</li> </ul>
<b>S5</b>	apply statistics to describe a population
<b>S6</b>	use and interpret scatter graphs of bivariate data; recognise correlation <u>and know that it does not indicate causation</u> ; draw estimated lines of best fit; <u>make predictions</u>