

Mathematics Faculty Rationale

To make mathematics enjoyable, exciting and interesting for all students, regardless of ability, gender or ethnicity.

To create a balanced and supportive culture in which students can confidently apply logic and reasoning to mathematical problems; apply methods that are efficient and reliable without engendering a fear of failure or derision and to ensure that students can work collaboratively.

To engender in students an appreciation that mathematics is more than 'sums' so that they understand that mathematics appears all around us and how it can be used in everyday life.

To equip all students with functional mathematical tools that can be used throughout their lives, particularly to promote an interest in science, engineering and other linked areas.

National Curriculum Aims KS3

The national curriculum for mathematics aims to ensure that all pupils:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Pearson 11-19 Mathematics for Progression aims to create a new generation of numerate and confident young people who feel well equipped to progress through their Mathematics studies and beyond. The courses that build into Pearson's 11-19 Mathematics for Progression framework embed a deep and broad understanding of mathematics. They promote a can-do philosophy that prepares students in mathematical fluency, reasoning and problem-solving as well as specific key stage or qualification learning and teaching needs. These core principles - created to consistently track, build upon and promote progression - are delivered in the secondary Mathematics services at Pearson through evidence-based and best practice approaches.

YEAR 7 Unit and content	Skills (NC Spec Ref)	Rationale
2 Number skills Addition, Subtraction, Division, Multiplication, Negative numbers, Factors, Multiples and Primes. Contexts of these topics include money and finance. HT 1 Weeks 1-4	S2 S4	To work with numeracy and understand how to calculate with integers and decimals in order to apply the skill to other topics. Multiplication and divisions are the most required skills as a prerequisite for other topics. This topic is where students will vary the most as they have joined from different schools and have different mathematical experiences and learning. This topic is taught first to close that attainment gap and is taught in mixed ability groupings.
1 Analysing and displaying data Types of averages, displaying, grouping and comparing data. Interpreting graphs and using spreadsheets. HT 1 Weeks 5-7	N1 N2 N3 N4 N6 N14 N15	This was moved to the second topic as all students should now have the numeracy skills to better approach this topic. Students are required to be able to interpret tables, graphs and data in various everyday life contexts and may have to present information within their work life. They additionally may have to interpret information given to them for example in the media.

<p>3 Expressions, functions and formulae Writing formulas/expressions, simplifying and substitution HT 2 Weeks 8-11</p>	<p>A1 A2 A3 A4 A7</p>	<p>This is the introduction to algebra and students need to know what the vocabulary of algebra is and understand that symbols can represent unknown values; that they can be manipulated without knowing what they are or that there is a single numerical solution. Again, skills within unit 2 are required for this topic. They will also have STEM opportunities by substituting into specific formulas. Students need to be able to model situations/scenarios where the values are not known or vary. They also need to understand communication of modelling, and algebra creates an efficient method of doing this.</p>
<p>4 Decimals and measures Calculations, rounding, perimeter and area. HT 2 Weeks 12-15</p>	<p>N1 N2 N13 N15 A8 R2 G14 G16</p>	<p>Students are building on their skills from Unit 2 and extending to decimal calculations as a prerequisite for areas and perimeters, and using skills within a context. Units of measure from real life contexts are used within the unit. (STEM) Understanding decimals help students understand the value of the units between integers.</p>
<p>5 Fractions and percentages Calculations, simplifying, comparing, and finding fractions/percentages of amounts HT 3 Weeks 16-18</p>	<p>N1 N2 N13 N15 A8 R2 G14 G16</p>	<p>Factors and multiples from Unit 2 are prerequisites for this topic. They will need fractions knowledge and skills to be able to access units 5 and 6. Percentages are heavily used as a measuring, proportional comparison and increasing and decreasing tool as ‘parts of a hundred’ are easier to understand and communicate to others.</p>
<p>6 Probability Calculations, theoretical, experimental and expected outcomes. HT 3 Weeks 19-21</p>	<p>P3 P4</p>	<p>Fractions on Unit 5 is a prerequisite skill for this topic. Finances are used in a context within expected outcomes. Students need to understand probability to develop their understanding of risk and relative risk in everyday life.</p>
<p>7 Ratio and proportion Writing and using ratio and proportion. Converting between ratio, proportion and percentages. HT 4 Weeks 22-26</p>	<p>R3 R4 R5</p>	<p>Skills from Unit 2 are required to access the learning in this topic. Scales and measures also feature in this topic linking to Unit 4 and creating contexts for skills and knowledge. Students will require their knowledge of ratio and proportion to compare and work with differing amounts in every day contexts – examples include shopping, cooking and finances.</p>
<p>8 Lines and angles Estimating, measuring, drawing, and identifying types of angles and triangles. Identify and use properties of quadrilaterals. HT 5 Weeks 27-29</p>	<p>G1 G3 G4</p>	<p>New topic that requires some understanding of areas covered in number skills in unit 2 and decimals and measure in unit 4. Understanding and using the features of lines, angles and shapes are a great advantage in developing students’ problem solving and reasoning skills that can then be applied to all aspects of their future life.</p>
<p>9 Sequences and graphs Arithmetic sequences, rules and formulas. Plotting and identifying coordinates. Start to construct and recognise simple linear graphs. HT 5 Weeks 30-32</p>	<p>A8 A9 A23 A24</p>	<p>This follows Unit 2 number skills, Unit 4 decimals and measure and Unit 3 algebra skills. Sequences leads to understanding the nature of coordinate generation for form straight line graphs. Students can make strong links between sequence formulas – position and terms and linear functions with their gradients and Y intercepts.</p>
<p>10 Transformations Transform 2D shapes and recognise and identify shapes that have been transformed. HT 6 Weeks 33-37</p>	<p>A8 A9 A23 A24</p>	<p>This builds on knowledge of 2D shapes from KS2 to lead to better understanding of spatial awareness and manipulation of shape in preparation for skills with 3D shapes, vectors and matrices.</p>