

# Phase 3 Mathematics | Yearly Overview

Students in each class will work through the subphases at a pace that is appropriate for them, therefore, some classes will be on different subphases at different points in the year.

Subphase 3.1	Subphase 3.2	Subphase 3.3	Subphase 3.4	Subphase 3.5	Subphase 3.6
<p><b>Past Explorations:</b> Previously in Maths, students have explored sequences, mean, directed numbers, HCF, indices, expanding brackets and solving equations.</p> <p>This will help students in this subphase by allowing them to explore linear sequences, plot coordinates and find midpoints, factorising linear expressions and applying inverse operations when rearranging formulae.</p>	<p><b>Past Explorations:</b> Previously in Maths, students have explored ratio and sequences, plotting coordinates, substitution, solving equations, expanding single brackets and linear factorisation.</p> <p>This will help the students in this subphase by allowing them to have an understanding of why some graphs are linear and why some are not, appreciate the continuous nature of quadratic graphs, explore the types of relationships between variables and to recognise patterns in order to manipulate expressions.</p>	<p><b>Past Explorations:</b> Previously in Maths, students have explored calculations with percentages and decimals.</p> <p>This will help the students in this subphase by allowing them to appreciate the definition of 'multiplier' and use this to find more efficient methods when calculating with percentages.</p>	<p><b>Past Explorations:</b> Previously in Maths, students have explored linear sequences, plotting linear functions, substitution, simplifying expressions, rearrange formulae and solving equations.</p> <p>This will help the students in this subphase by allowing them to explore the key features of a linear function, appreciate the existence of the y-intercept and gradient and solve simultaneous equations.</p>	<p><b>Past Explorations:</b> Previously in Maths, students have explored square numbers, properties of triangles, drawing accurate triangles, angles in triangles and quadrilaterals, plotting coordinates, linear functions, nets and area.</p> <p>This will help the students in this subphase by allowing them to solve for missing sides and angles in triangles, use a compass to complete standard constructions and solve loci problems, solve for missing angles in polygons, transform shapes and visualise surface area of 3D shapes.</p>	<p><b>Past Explorations:</b> Previously in Maths, students have explored averages and range, plotting coordinates and calculating probability.</p> <p>This will help the students in this subphase by allowing them to calculate the mean from frequency tables, plot and interpret scatter graphs and box plots and use tree diagrams to calculate probability. .</p>
<p><b>Termly Exploration Question:</b> How can using algebra help us to solve problems?</p>	<p><b>Termly Exploration Question:</b> How can using algebra help us explore the relationships between different variables?</p>	<p><b>Termly Exploration Question:</b> How is proportional thinking relevant in our lives?</p>	<p><b>Termly Exploration Question:</b> How can using algebra help us explore the features of linear functions?</p>	<p><b>Termly Exploration Question:</b> How can using geometrical reasoning help us solve problems?</p>	<p><b>Termly Exploration Question:</b> How can data be interpreted in different ways?</p>
<p><b>Termly Overview:</b> For this subphase in Maths, students will find and use the nth term of a linear sequence, plot and recognise coordinates in all four quadrants, calculate midpoints and endpoints of a line segment, factorise linear expressions and rearrange formulae to show the links between different variables in a formula.</p>	<p><b>Termly Overview:</b> For this subphase in Maths, students will explore key characteristics and graph linear, quadratic and other types of functions, use algebra to solve proportion problems, find methods to expand double and triple brackets and recognise patterns to factorise quadratic expressions.</p>	<p><b>Termly Overview:</b> For this subphase in Maths, students will explore and use multipliers to calculate percentages, study the differences between simple and compound interest and then use efficient methods to solve problems involving compound interest and compound depreciation.</p>	<p><b>Termly Overview:</b> For this subphase in Maths, students will investigate linear functions and their graphs and then use their findings to plot any linear function using the gradient-intercept method; explore what is meant by simultaneous equations and use graphical and algebraic methods to solve these equations.</p>	<p><b>Termly Overview:</b> For this subphase in Maths, students will use Pythagoras' Theorem and SOHCAHTOA to solve problems in right angled triangles, complete constructions to solve loci problems, derive angle facts to solve for missing angles in any sized polygon, explore vectors and how these and other prerequisite skills can be used to transform a shape, and derive and calculate the surface area of a cylinder using prerequisite skills.</p>	<p><b>Termly Overview:</b> For this subphase in Maths, students will find the mean from frequency tables; identify correlation, describe relationships between variables and find estimates using scatter graphs; draw and interpret tree diagrams to calculate probabilities of two or more successive events; draw and interpret box plots and recognise why the median and interquartile range are useful.</p>
<p><b>Future Explorations*:</b> Going forward in Maths, students will be able to find the nth term of a quadratic sequence and will be able to plot graphs of linear and other types of functions.</p> <p>This subphase will help them with this</p>	<p><b>Future Explorations*:</b> Going forward in Maths, students will explore other types of graphs, solve simultaneous equations, solve quadratic equations and quadratic inequalities, investigate and justify algebraic proofs and complete squares.</p>	<p><b>Future Explorations*:</b> Going forward in Maths, students will be able to compare financial investment options and understand the overall effect of repeated percentage change.</p> <p>This subphase will help them with this</p>	<p><b>Future Explorations*:</b> Going forward in Maths, students will be able to interpret real life graphs, explore parallel and perpendicular lines and solve simultaneous equations involving one linear and one non-linear equation.</p>	<p><b>Future Explorations*:</b> Going forward in Maths, students will explore solving 3D Pythagoras and 3D trigonometry problems, more advanced trigonometry, applying negative enlargement, similar shapes and graph transformations.</p>	<p><b>Future Explorations*:</b> Going forward in Maths, students will explore finding the median from frequency tables, solve problems involving probability of complex independent and conditional events and draw and interpret cumulative frequency graphs.</p>

as it will provide them with knowledge of linear functions and rearranging is a key skill in being able to make links between the different variables in given formulae.	This subphase will help them with this because students will have a solid understanding of key characteristics for different types of functions.	because it will give students the confidence to work with multipliers and understand the effects of repeated percentage change.	This subphase will help them with this because students will have gained an understanding of what a gradient of a line is and how this changes. With students having explored simultaneous equations it will mean they will be in a better position to interpret these solutions.	This subphase will help them with this because students will have explored all the necessary skills relevant to solving more complex geometrical problems.	This subphase will help them with this because they will have a foundation of understanding statistical data and can use that to decide which representation is best, depending on the problem or type of data.
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*\*Students completing the Foundation Tier Paper may not go on to learn all the topics in the Future Explorations sections, as many of them will only appear in the Higher Tier Paper.*