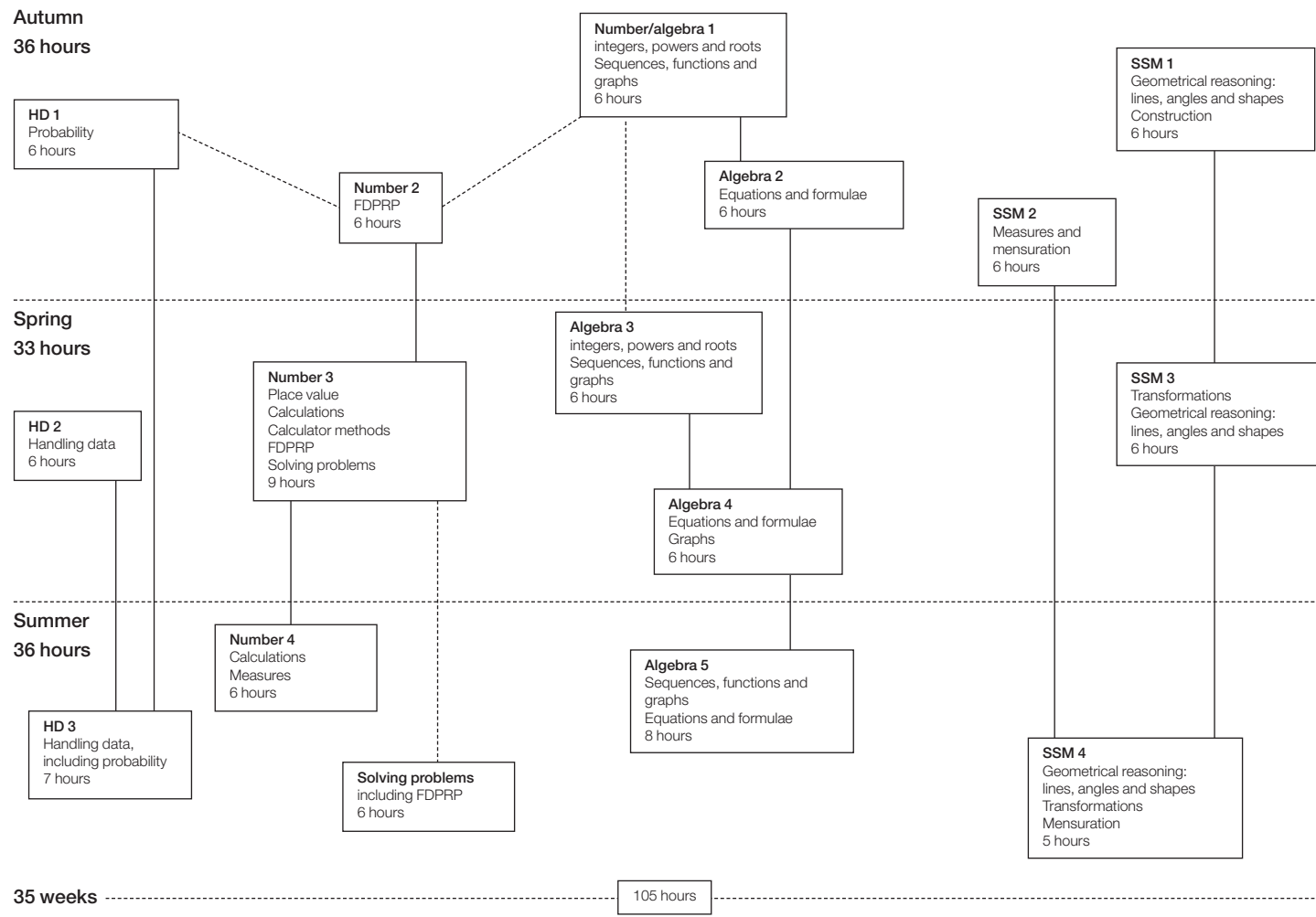


Sample medium-term plans: Year 8

Year 8 planning chart



Using and applying mathematics to solve problems should be integrated into each unit

Year 8: Autumn term

	Support	Core	Extension
	From the Y7 teaching programme	From the Y8 teaching programme	From the Y9 teaching programme
<p>Number/algebra 1 (6 hours) Integers, powers and roots (48–59)</p> <p>Sequences and functions (144–157)</p>	<ul style="list-style-type: none"> Understand negative numbers as positions on a number line; order, add and subtract positive and negative integers in context. Use simple tests of divisibility. Recognise the first few triangular numbers, squares of numbers to at least 12×12 and the corresponding roots. Generate terms of a simple sequence given a rule. Generate sequences from practical contexts and describe the general term in simple cases. 	<ul style="list-style-type: none"> Add, subtract, multiply and divide integers. Recognise and use multiples, factors (divisors), common factor, highest common factor, lowest common multiple and primes; find the prime factor decomposition of a number (e.g. $8000 = 2^6 \times 5^3$). Use squares, positive and negative square roots, cubes and cube roots, and index notation for small positive integer powers. Generate and describe integer sequences. Generate terms of a linear sequence using term-to-term and position-to-term definitions of the sequence, on paper and using a spreadsheet or graphical calculator. Begin to use linear expressions to describe the nth term of an arithmetic sequence, justifying its form by referring to the activity or practical context from which it was generated. 	<ul style="list-style-type: none"> Use the prime factor decomposition of a number. Use ICT to estimate square roots and cube roots. Use index notation for integer powers and simple instances of the index laws.

Year 8: Autumn term

	Support	Core	Extension
	From the Y7 teaching programme	From the Y8 teaching programme	From the Y9 teaching programme
Algebra 2 (6 hours) Equations and formulae (112–119, 138–143)	<ul style="list-style-type: none"> • Use letter symbols to represent unknown numbers or variables; know the meanings of the words <i>term</i>, <i>expression</i> and <i>equation</i>. • Simplify linear algebraic expressions by collecting like terms. 	<ul style="list-style-type: none"> • Begin to distinguish the different roles played by letter symbols in equations, formulae and functions; know the meanings of the words <i>formula</i> and <i>function</i>. • Know that algebraic operations follow the same conventions and order as arithmetic operations; use index notation for small positive integer powers. • Simplify or transform linear expressions by collecting like terms; multiply a single term over a bracket. • Use formulae from mathematics and other subjects; substitute integers into simple formulae, and positive integers into expressions involving small powers (e.g. $3x^2 + 4$ or $2x^3$); derive simple formulae. 	<ul style="list-style-type: none"> • Use index notation for integer powers and simple instances of the index laws. • Simplify or transform algebraic expressions by taking out single term common factors.

Year 8: Spring term

	Support	Core	Extension
	From the Y7 teaching programme	From the Y8 teaching programme	From the Y9 teaching programme
Algebra 3 (6 hours) Sequences, functions, graphs (160–177)	<ul style="list-style-type: none"> Express simple functions in words. Generate coordinate pairs that satisfy a simple linear rule; recognise straight-line graphs parallel to the x-axis or y-axis. 	<ul style="list-style-type: none"> Express simple functions in symbols; represent mappings expressed algebraically. Generate points in all four quadrants and plot the graphs of linear functions, where y is given explicitly in terms of x, on paper and using ICT; recognise that equations of the form $y = mx + c$ correspond to straight-line graphs. Construct linear functions arising from real-life problems and plot their corresponding graphs; discuss and interpret graphs arising from real situations. 	<ul style="list-style-type: none"> Find the inverse of a linear function. Plot graphs of linear functions (y given implicitly in terms of x), e.g. $ay + bx = 0$, $y + bx + c = 0$, on paper and using ICT; given values for m and c, find the gradient of lines given by equations of the form $y = mx + c$. Discuss and interpret distance–time graphs.
Algebra 4 (6 hours) Equations and formulae (112–113, 122–125, 138–143)	<ul style="list-style-type: none"> Use letter symbols to represent unknown numbers or variables; know the meanings of the words <i>term</i>, <i>expression</i> and <i>equation</i>. Construct and solve simple linear equations with integer coefficients (unknown on one side only) using an appropriate method (e.g. inverse operations). 	<ul style="list-style-type: none"> Begin to distinguish the different roles played by letter symbols in equations, formulae and functions; know the meanings of the words <i>formula</i> and <i>function</i>. Construct and solve linear equations with integer coefficients (unknown on either or both sides, without and with brackets) using appropriate methods (e.g. inverse operations, transforming both sides in the same way). Use formulae from mathematics and other subjects; substitute integers into simple formulae, including examples that lead to an equation to solve; derive simple formulae. 	<ul style="list-style-type: none"> Construct and solve linear equations with integer coefficients (with and without brackets, negative signs anywhere in the equation, positive or negative solution), using an appropriate method. Use formulae from mathematics and other subjects; substitute numbers into expressions and formulae; derive a formula and, in simple cases, change its subject.

Year 8: Summer term

	Support	Core	Extension
	From the Y7 teaching programme	From the Y8 teaching programme	From the Y9 teaching programme
<p>Algebra 5 (8 hours) Equations and formulae (116–137)</p>	<ul style="list-style-type: none"> Simplify linear algebraic expressions by collecting like terms. Construct and solve simple linear equations with integer coefficients (unknown on one side only) using an appropriate method (e.g. inverse operations). 	<ul style="list-style-type: none"> Simplify or transform linear expressions by collecting like terms; multiply a single term over a bracket. Construct and solve linear equations with integer coefficients (unknown on either or both sides, without and with brackets) using appropriate methods (e.g. inverse operations, transforming both sides in the same way). Begin to use graphs and set up equations to solve simple problems involving direct proportion. 	<ul style="list-style-type: none"> Simplify or transform algebraic expressions by taking out single term common factors. Construct and solve linear equations with integer coefficients (with and without brackets, negative signs anywhere in the equation, positive or negative solution), using an appropriate method. Use systematic trial-and-improvement methods and ICT tools to find approximate solutions of equations such as $x^3 + x = 20$. Solve problems involving direct proportion using algebraic methods, relating algebraic solutions to graphical representations of the equations; use ICT as appropriate.
<p>Sequences, functions and graphs (164–177)</p>	<ul style="list-style-type: none"> Generate coordinate pairs that satisfy a simple linear rule; recognise straight-line graphs parallel to the x-axis or y-axis. 	<ul style="list-style-type: none"> Plot the graphs of linear functions, where y is given explicitly in terms of x, on paper and using ICT. Construct linear functions arising from real-life problems and plot their corresponding graphs; discuss and interpret graphs arising from real situations. 	<ul style="list-style-type: none"> Solve problems involving direct proportion using algebraic methods, relating algebraic solutions to graphical representations of the equations; use ICT as appropriate. Plot graphs of linear functions (y given implicitly in terms of x), e.g. $ay + bx = 0$, $y + bx + c = 0$, on paper and using ICT.

Year 8: Summer term

	Support	Core	Extension
	From the Y7 teaching programme	From the Y8 teaching programme	From the Y9 teaching programme
Solving problems (6–13, 28–29)	<ul style="list-style-type: none"> • Break a complex calculation into simpler steps, choosing and using appropriate and efficient operations, methods and resources, including ICT. 	<ul style="list-style-type: none"> • Solve more demanding problems and investigate in a range of contexts: algebra. • Solve more complex problems by breaking them into smaller steps or tasks, choosing and using efficient techniques for algebraic manipulation. 	<ul style="list-style-type: none"> • Use trial and improvement methods where a more efficient method is not obvious.