

Our Vision:

We aim to ensure all pupils

- become fluent in the fundamentals of mathematics, by developing pupils conceptual understanding as well as being able to recall and apply knowledge rapidly and accurately.
- develop a broad range of skills in using and applying mathematics.
- 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 difficulty, including breaking down problems into a series of simpler steps and persevering in seeking solutions.
- Understand how Mathematics is an interconnected subject and are able to move fluently between representations of mathematical ideas. Cross-curricular links are integrated within the scheme of learning.
- Embrace the value of learning and feel confident to be able to take risks and comfortable making mistakes and learning from them
- Are independent and think for themselves and are prepared to persevere when faced with challenges, showing a confidence that they will succeed.
- Use Mathematical language and symbols accurately in their work and in discussions.
- Have a broad curriculum which also looks at the history and development of mathematics throughout the years as well as the use of maths in real-life.
- develop a sense of curiosity, passion and commitment to the subject

Exam boards: GCSE - AQA. A-level - Edexcel.

Springwood High School Maths Curriculum Plan

Brief overview of topics, themes, skills or key questions for each term:

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
7	Consolidation of KS2 Sequences intro Place value Addition and subtraction	Multiplication and Division, Factors & Multiples, Order of operations	Geometry: properties of shapes and angles	Fractions Algebraic expressions	Fractions and Percentages of amounts Primes and indices	Percentages Statistics (used for Smoothie Super learning day) Ratio and proportion (used for smoothie Super learning day)
8	Consolidation of Yr 7 Rounding Algebraic expressions	Linear equations Angles	Area and perimeter Percentage s	Ratio and proportion	Fractions 3D Geometry	Statistics
9	Consolidation of yr 7 and 8 work Integers and place value Indices Fractions	Percentages Probability Algebra – the basics	Expanding and factorising single brackets Expression s and substitution into formula	Ratio Proportion Standard form	Straight line graphs Real life graphs Sequences Transformations	Inequalities Quadratic Expanding and factorising Quadratic equations Graphs + cubic, reciprocal and exponential

Springwood High School Maths Curriculum Plan

			Equations			
10	<p><u>Foundation</u> Sampling. Averages. Charts and Graphs</p> <p><u>Higher</u> Sampling. Averages. Charts and Graphs Pie charts</p>	<p><u>Foundation</u> Pie charts. Scatter graphs. Properties of shapes, parallel lines and angle facts. Interior and exterior angles of polygons</p> <p><u>Higher</u> Scatter graphs. Properties of shapes, parallel lines and angle facts. Interior and exterior angles of polygons</p>	<p><u>Foundatio n</u> Quadratic equations: expanding and factorising and graphs Pythagoras' Theorem. Perimeter and area</p> <p><u>Higher</u></p>	<p><u>Foundation</u> Surface area and volume. Probability Compound measures.</p> <p><u>Higher</u> Constructions, loci and bearings. Probability</p>	<p><u>Foundation</u> Constructions and loci Perimeter, area and volume.</p> <p><u>Higher</u> Compound measures. Similarity and congruency. Cumulative frequency and boxplots. Further trigonometry</p>	<p><u>Foundation</u> Similarity and congruency</p> <p><u>Higher</u> Further trigonometry Vectors Quadratic inequalities Quadratic sequences</p>

Springwood High School Maths Curriculum Plan

		<p>Pythagoras' Theorem and trigonometry in right angled triangles. Perimeter and area.</p>	<p>Perimeter and area. Surface area and volume. Accuracy and bounds</p>			
11	<p><u>Foundation</u> Similarity and congruency. Vectors Simultaneous equations. Proof</p> <p><u>Higher</u> Further trigonometry. Circle Theorems.</p>	<p><u>Foundation</u> Revision</p> <p><u>Higher</u> Transformations of graphs. Algebraic fractions. Changing the subject where the subject occurs more than once. Proof Functions. Vectors Gradient and area under a curve.</p>	Revision	Revision	Revision	

	Pure lessons	Pure and Mechanics lessons	Pure and Statistics lessons
12	<p>Quadratic functions – factorising, solving, graphs and the discriminants</p> <p>Equations – quadratic/linear simultaneous</p> <p>The intersection of a line and a curve</p> <p>Inequalities – linear and quadratic (including graphical solutions)</p> <p>Graphs – cubic, quartic, factorised polynomials and reciprocal</p> <p>Transformations – transforming graphs – $f(x)$ notation</p> <p>Circles – equation of a circle, geometric problems</p> <p>Algebraic division, factor theorem and proof</p> <p>Examples including proof by deduction and proof by contradiction</p> <p>The binomial expansion</p> <p>Trigonometric ratios and graphs</p> <p>Trigonometric identities and equations</p> <p>Radians (exact values), arcs and sectors</p> <p>Use of trigonometry in triangles</p>	<p>Algebraic expressions – basic algebraic manipulation, indices and surds</p> <p>Introduction to mathematical modelling and standard S.I. units of length, time and mass</p> <p>Definitions of force, velocity, speed, acceleration and weight and displacement; Vector and scalar quantities</p> <p>Graphical representation of velocity, acceleration and displacement</p> <p>Motion in a straight line under constant acceleration; suvat formulae for constant acceleration; Vertical motion under gravity</p> <p>Newton's first law, force diagrams, equilibrium, introduction to i, j system</p> <p>Newton's second law, '$F = ma$', connected particles; Newton's third law:</p>	<p>Straight-line graphs, parallel/perpendicular, length and area problems</p> <p>Introduction to sampling terminology; Advantages and disadvantages of sampling</p> <p>Understand and use sampling techniques; Compare sampling techniques in context</p> <p>Calculation and interpretation of measures of location; Calculation and interpretation of measures of variation; Understand and use coding</p> <p>Interpret diagrams for single-variable data; Interpret scatter diagrams and regression lines; Recognise and interpret outliers; Draw simple conclusions from statistical problems</p> <p>Interpret diagrams for single-variable data; Interpret scatter diagrams and regression lines; Recognise and interpret outliers;</p>

Springwood High School Maths Curriculum Plan

<p>Definitions, magnitude/direction, addition and scalar multiplication</p> <p>Position vectors, distance between two points, geometric problems</p> <p>Definition, differentiating polynomials, second derivatives</p> <p>Gradients, tangents, normals, maxima and minima</p> <p>Definition as opposite of differentiation, indefinite integrals of x^n</p> <p>Definite integrals and areas under curves</p> <p>Exponential functions and natural logarithms</p> <p>Secant, cosecant and cotangent (definitions, identities and graphs); and inverse trig functions</p> <p>Compound (including proof) and double (and half) angle formulae *geometric proofs expected</p> <p>Proving trigonometric identities</p> <p>The form $R\cos(x+a)$, $R\sin(x+a)$ etc</p> <p>Proof by contradiction</p> <p>Simplifying algebraic fractions</p> <p>Partial fractions</p> <p>Modulus function</p> <p>Composite and inverse functions</p> <p>Transformations</p> <p>Modelling with functions - may be Trigonometric, exponential, reciprocal etc.</p>	<p>equilibrium, problems involving smooth pulleys</p> <p>Resolving forces</p> <p>Friction forces (including coefficient of friction μ)</p> <p>Variable force; Calculus to determine rates of change for kinematics</p> <p>Use of integration for kinematics problems</p>	<p>Draw simple conclusions from statistical problems</p> <p>Probability: Mutually exclusive events; Independent events</p> <p>Using set notation for probability</p> <p>Questioning assumptions in probability</p> <p>Statistical distributions: Use discrete distributions to model real-world situations; Identify the discrete uniform distribution; Calculate probabilities using the binomial distribution (calculator use expected)</p> <p>Language of hypothesis testing; Significance levels</p> <p>Carry out hypothesis tests involving the binomial distribution</p>
---	---	--

13	<p>Expanding $(a + bx)^n$ for rational n; knowledge of range of validity</p> <p>Expansion of functions by first using partial fractions</p> <p>Arithmetic and geometric progressions (proofs of 'sum formulae')</p> <p>Sigma notation</p> <p>Recurrence and iterations</p> <p>Differentiating $\sin x$ and $\cos x$ from first principles</p> <p>Chain Rule</p> <p>Differentiating exponentials and logarithms</p> <p>Differentiating products, quotients, implicit differentiation</p> <p>Second derivatives (rates of change of gradient, inflections)</p> <p>Rates of change problems (including growth and kinematics)</p> <p>Integrating x^n (including when $n = -1$), exponentials and trigonometric functions</p> <p>Using the reverse of differentiation, and using trigonometric identities to manipulate integrals</p> <p>Integration by substitution</p> <p>Integration by parts</p> <p>Use of partial fractions</p> <p>Areas under graphs or between two curves, including understanding the area is the limit of a sum (using sigma notation)</p> <p>The trapezium rule</p> <p>Differential equations (including knowledge of the family of solution curves)</p>	<p>Forces' turning effect</p> <p>Applications of kinematics: Projectiles</p> <p>Applications of kinematics: Projectiles</p> <p>Equilibrium and statics of a particle (including ladder problems)</p> <p>Dynamics of a particle</p> <p>Constant acceleration (equations of motion in 2D; the i, j system)</p> <p>Variable acceleration (use of calculus and finding vectors r and r' at a given time)</p>	<p>Change of variable</p> <p>Understand and use the Normal distribution</p> <p>Use the Normal distribution as an approximation to the binomial distribution</p> <p>Statistical hypothesis testing for the mean of the Normal distribution</p>
----	--	---	---

<p>Definition and converting between parametric and Cartesian forms and Curve sketching and modelling</p> <p>Differentiating parametric functions</p> <p>Integrating parametric functions</p> <p>Use of vectors in three dimensions; knowledge of column vectors and i, j and k unit vectors</p> <p>Location of roots</p> <p>Solving by iterative methods (knowledge of 'staircase and cobweb' diagrams)</p> <p>Newton-Raphson method</p> <p>Numerical methods: Problem solving</p>		
---	--	--

Enrichment Activities:

Additional Learning: Year 7 - Smoothie making. Year 8 - Bridge building.

Competitions: Senior Maths challenge (November), Intermediate maths challenge, Junior Maths challenge. Team Maths challenges. The Michaelmas Symposium (Year 12 in November). Trust maths competitions. Year 6 maths competition (July). Year 10 Maths feast and year 9 summer snacks with AMSP.

Trips: Disneyland Paris.

Clubs & Support: After school revision on Tuesdays, Wednesdays and Thursdays in B8. Stem club at lunchtimes. Hegarty maths, Corbett Maths, Pixl maths app