# Maths

**Key Stage 2 Curriculum includes**
**Number:** negative numbers, rounding, fractions, percentages, multiples, factors and primes, basic ratio, conversions
**Algebra:** Use simple formula, generate a linear number sequence, simple equations
**Shape:** Area of triangles, rectangles and parallelograms, volume of cubes and cuboids, 2d and 3d shapes, name parts of circles, angles (triangle, on a straight line, around a point, vertically opposite).
**Date:** Averages from a list, bar charts, line graphs, pie charts, plotting coordinates

| | Year 7 | Year 8 | Year 9 | Year 10 | Year 11 | Year 12 | Year 13 |
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| Autumn 1 | **Manipulating Algebra**<br>- Substitution involving fractions and decimals<br>- Collect like terms<br>- Factorise complex expressions involving multiple letters and powers<br>- Write algebraic expressions including brackets and powers<br>- Expand double brackets<br>- Problem solving with algebra and shape<br><br>**Angles**<br>- Draw and measure | **Manipulating Algebra**<br>- Revise previous year<br>- Factorise simple quadratics with no coefficient of $x^2$<br><br>**Angles**<br>- Revise previous year | **Manipulating Algebra**<br>- Revise previous year<br>- factorise quadratics including the difference of 2 squares<br>- expand polynomials<br>- simplify algebraic fractions<br>- basic poof<br>- functions<br><br>**Angles**<br>- Revise previous year | **Manipulating Algebra**<br>- Revise previous year<br>- Iteration<br>- Complex proof<br>- Further functions<br>- Complete the square – no coefficient of $x^{''}$<br>- Factorise quadratics with a coefficient of $x^2$<br><br>**Angles**<br>- Revise previous year | **Manipulating Algebra**<br>- Revise previous<br>- Complete the square with a coefficient of $x^2$<br>- Make links between algebraic forms of an expression and graphs<br>- Hard algebraic manipulation<br>- Hard algebraic proof<br><br>**Angles**<br>- Revise previous | **Algebraic manipulation, quadratic equations and simultaneous equations**<br><br>**Graphs, linear and quadratic inequalities**<br><br>**Straight lines and circles** | **Trigonometry and circular measure**<br><br>**Functions and transformations**<br><br>**Further differentiation** |

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| | angles<br>- Notation for parallel and perpendicular sides<br>- Complex problems with angle sums<br>- Form and solve equations with angles<br>- Parallel lines (alternate angles, allied, corresponding<br>- Properties of quadrilaterals<br>- Bearings | - Complex problems with parallel lines<br>- Complex bearings questions<br>- Basic trigonometry<br>- Form and solve equations with angles where there are 2 unknowns<br>- Basic angles in polygons | - Circle theorems (first 4)<br>- Trigonometry (problem solving)<br>- Complex angles in polygons<br>- More bearings | - All circle theorems with problem solving<br>- Sine and cosine rule<br>- 3d Trigonometry<br>- Vector geometry<br>- Know exact trig values between 0-360 | year<br>- Circle theorem proof<br>- Complex vector geometry<br>- Sketch and find values from trig graphs | | |
| Autumn 2 | **Equations**<br>- Equations with brackets and where the unknown appears twice.<br>- Equations with fractions<br>- 2 sided inequalities<br>- Form and solve equations involving geometry<br>- Rearrange simple formula<br>- Solve equations with $y^2$ (e.g. $3y^2$ = | **Equations**<br>- Revise last year<br>- Solve equations with fractions on both sides<br>- Simultaneous equations (including negatives)<br>- Worded simultaneous equations<br>- Rearrange formula including brackets and powers<br>- Draw inequalities on | **Equations**<br>- Revise last year<br>- Rearrange formula where the unknown appears twice<br>- Solve quadratic equations by factorising<br>- Form and solve quadratic equations from worded scenarios<br>- Name inequalities from graphs to give a feasible region. | **Equations**<br>- Revise last year<br>- Solve quadratic equations using the formula and problem solving with this<br>- Solve quadratic inequalities<br>- Solve quadratic simultaneous equations | **Equations**<br>- Revise last year<br>- End of paper exam questions related to this topic<br>- Further maths questions on this topic | **Differentiation**<br>**Integration**<br>**Trigonometry** | **Further integration**<br><br>**Numerical methods**<br><br>**Parametric equations** |

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| | 27)<br><br>**Number Properties**<br>- Rounding to significant figures<br>- HCF and LCM problems<br>- Product of primes factors<br>- BIDMAS<br>- Upper and lower bounds (simple)<br>- Problem solving with estimates<br>- Venn diagrams and set notation<br>- Standard from<br>- More complex rules of indices | a graph and find the feasible region<br><br>**Number properties**<br>- Revise last year<br>- Worded problems with upper and lower bounds<br>- Fractional and negative indices<br>- Harder problem solving with standard from<br>- Choices and outcomes | **Number Properties**<br>- Revise last year<br>- Problem solving with indices<br>- Simplify surds Harder calculations in standard form (+, - X ÷) Choices and outcomes | **Number Properties**<br>- Revise last year<br>- Add, subtract, multiple and divide surds<br>- Rationalise the denominator<br>- Multiply brackets with surds and simplify<br>- Complex bounds questions | **Number Properties**<br>- Revise last year<br>- Surds, rationalise the denominator, including using the conjugate<br>- Problem solving with surds | | |
| Spring 1 | **Area, Perimeter Volume**<br>- 2d and 3d shapes<br>- Area trapeziums<br>- Volume of prisms<br>- Area and circumference of circles<br>- Pythagoras | **Area, Perimeter Volume**<br>- Revise last year<br>- Find the volume and surface area of 3d shapes including cylinders<br>- Problem solving with and Pythagoras | **Area, Perimeter Volume**<br>- Revise last year<br>- Volume and surface area of spheres, cones and pyramids<br>- Problem solving with cones, spheres including working | **Area, Perimeter Volume**<br>- Revise last year<br>- Area of a triangle using 1/2absineC<br>- Arc, segments and sectors (problems using the sine rule)<br>- 3d Pythagoras<br>- Volume of a | **Area, Perimeter Volume**<br>- Revise last year<br>- To be able to solve complex surface area and volume questions<br>- End of paper exam | **Vectors**<br>**Proof**<br>**Exponentials and Logs** | **Partial fractions and integration**<br><br>**Trigonometry**<br><br>**Differential equations**<br><br>**Kinematics in two dimensions** |

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| | - Tilling<br>- Form and solve equations with shape<br>- Mass density volume<br><br>**Charts and Graphs**<br>- Speed distance time graphs<br>- Pie charts<br>- Calculate average speed<br>- Compare sets of data using average and range<br>- Stem and Leaf diagrams with decimals and 3-digit numbers<br>- Scatter graphs<br>- Frequency diagrams and polygons<br>- Discreet and continuous data | - Area and perimeter of sectors<br><br>**Charts and Graphs**<br>- Revise last year<br>- Calculate averages and range from a frequency table<br>- Back to back stem and leaf diagrams<br>- Limitations of predictions from scatter graphs<br>- Convert between units of speed<br>- Complex interpretation from pie charts | backwards to find a missing dimension<br>- Area and perimeter of Arcs, segments and sectors including working backwards<br><br>**Charts and Graphs**<br>- Revise last year<br>- Box plots<br>- Cumulative frequency<br>- Compare data using box plots and cumulative frequency | frustum<br><br>**Charts and Graphs**<br>- Revise last year<br>- Draw and interpret histograms | questions and further maths questions<br><br>**Charts and Graphs**<br>- Revise last year<br>- Estimating gradients from Distance time graphs and velocity time graphs<br>- Estimate the area under a curve with velocity time graphs<br>- Equation of a circle | | **Equilibrium and resolving**<br><br>**Further probability** |
| Spring 2 | **Sequences and Graphs**<br>- Fibonacci sequences<br>- Nth term of a | **Sequences and Graphs**<br>- Revise last year<br>- Find the nth term of a | **Sequences and Graphs**<br>- Revise last year<br>- Parallel and perpendicular | **Sequences and Graphs**<br>- Revise last year<br>- Problem solving with parallel | **Revision and GCSE exams** | **Statistical sampling**<br><br>**Data** | **Statistical distributions (normal)** |

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| | linear sequence<br>- Find a given term using the nth term rule<br>- Determine whether a number will appear in a sequence given the nth term rule.<br>- Draw horizontal and vertical lines (y=, x=, y=x)<br>- Draw linear graphs from a table of values not in the form y=mx+c<br>- Find the midpoint of a line segment<br><br>**Fractions Decimals and Percentages**<br><br>- Order fractions decimals and percentages<br>- Problem solving with fractions decimals and percentages | nonlinear sequence using a related sequence<br>- Find missing terms in algebraic sequences<br>- Draw linear graphs using the y-intercept method<br>- Draw nonlinear graphs by finding a table of values<br><br>**Fractions Decimals and Percentages**<br>- Revise last year<br>- Use a decimal multiplier<br>- Compound interest<br>- Reverse percentages<br>- Percentage change | lines<br>- Sketch quadratics<br>- Recognise reciprocal and exponential graphs<br>- Solve simultaneous equations graphically<br><br>**Fractions Decimals and Percentages**<br>- Revise last year<br>- Convert recurring decimals to fractions<br>- Complex algebraic fractions | and perpendicular lines<br>- Transforming graphs<br>- Sketch quadratics<br>- Recognise reciprocal and exponential graphs<br>- Sketch trig graphs<br>- Sketch quadratics<br><br>**Fractions Decimals and Percentages**<br>- Revise last year<br>- End of paper exam questions and further maths questions related to this topic | | **presentation and interpretation**<br><br>**Kinematics in one dimension** | **Statistical hypothesis testing (normal)**<br><br>**Statics and dynamics**<br><br>**Moments** |

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| | - Add, subtract, multiply and divide fractions with mixed numbers<br>- Manipulative reasoning | - Simple algebraic fractions | | | | | |
| Summer 1 | **Transformations**<br>- Reflect in the lines y =, x = y=x and y=-x<br>- Enlarge by a positive scale factor from a coordinate<br>- Translate a shape by a vector<br>- Rotate a shape from a coordinate<br>- Identify congruent and similar shapes<br><br>**Probability**<br>- Revise last year<br>- Frequency trees<br>- Expectation<br>- Venn diagrams | **Transformations**<br>- Revise last year<br>- Enlarge by a fractional scale factor<br>- Describe transformations<br>- Draw to scale and interpret scale drawing and maps<br>- Solve problems with similar shapes<br>- Vector arithmetic<br>- Constructions<br>- Loci<br><br>**Probability**<br>- Revise last year<br>- Relative frequency<br>- Sampling<br>- Stratified sample<br>- Basic tree diagrams | **Transformations**<br>- Revise last year<br>- Solve problems with similar shapes including area and volume scale factors<br>- Determine whether a regular polygon tessellates<br>- Enlarge from a coordinate by a negative scale factor<br>- Vector geometry<br><br>**Probability**<br>- Revise last year<br>- Tree diagrams for dependent events<br>- Complex problems involving ratios | **Transformations**<br>- Revise last year<br>- Complex similar shape problems<br>- Complex vector geometry<br>- Graph transformations<br><br>**Probability**<br>- Revise last year<br>- Combinations<br>- Complex probability exam questions | | **Probability and Statistical Distributions**<br><br>**Statistical hypothesis testing**<br><br>**Analysis of data using statistical packages**<br><br>**Forces and Newton's laws** | **Revision** |

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| | | | - Complex Venn diagram problems<br>- Capture recapture | | | | |
| Summer 2 | **Arithmetic Ratio and Proportion**<br>-<br>- Direct and inverse proportion<br>- Problems with ratio<br>- Problems with ration fractions and percentages | **Arithmetic Ratio and Proportion**<br>- Revise last year<br>- Multiply and divide decimals<br>- Exchange rates<br>- Complex ratio proportion questions | **Arithmetic Ratio and Proportion**<br>- Revise last year<br>- Direct and inverse proportion formal method | **Arithmetic Ratio and Proportion**<br>- Revise last year<br>- 2 step direct and inverse proportion (exam questions)<br>- Direct and inverse proportion graphs | | **Revision**<br><br>**Mocks**<br><br>**Start year 13**<br><br>**Algebraic manipulation (inc extra factor theorem and functions)** | |