**Curriculum Map for: Maths Curriculum Lead: Rachel Lynch**

**Curriculum Aim & Scope:**

Key Stage 3: We will build on the work that has been covered in the primary schools as well as beginning to introduce some lower level GCSE topics as part of the higher end challenging curriculum. Those working below the expected level will continue to build on their numeracy skills whilst following an appropriate curriculum designed to improve proficiency in shape, data and algebra so students are prepared for the start of GCSE in year 9. Homework will be set weekly and will include questions designed to master essential skills each term. Development of problem solving and reasoning skills will be enhanced alongside the teaching of the main curriculum. Students will be encouraged to become more independent learners as they will have access to on-line mathematical learning resources which they will use in school and for homework. Links to literacy will include the spelling and definitions of new words associated with mathematics. Students work will be checked for spelling, punctuation and grammar. There will be three assessment points throughout the year.

Key Stage 4: We teach GCSE at two tiers ‘Higher’ and ‘Foundation’. The content is prescribed but our aim is to develop problem solving skills and relate mathematics to real life needs.

Key Stage 5: A level Mathematics and Further Mathematics are taught together with Core Mathematics level 3. All content is prescribed.

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|  | **Autumn 1** | **Autumn 2** | **Spring 1** | **Spring 2** | **Summer 1** | **Summer 2** |
| **Year 7** | **Place Value:**  Understanding place value including decimals  Rounding to nearest 10,100,1000  Rounding to decimal places and significant figures  Multiplying and dividing with powers of 10  Introduction of standard form and bounds  **Written methods:**  Can use written methods including with decimal numbers  Understand factors, multiples  HCF and LCM  Prime factor decompositions  **Assessment:**  **Baseline: Early September** | **Perimeter, area and units:**  Perimeter and area of all 2D shapes including circles  Perimeter and area of compound shapes  Problem solving questions involving area and perimeter  Conversion between units  **Angles and 2D shapes**  Drawing and measuring angles  Angle facts: Angles around a point, vertically opposite angles angles on a straight line, angles in a triangle, angles in a quadrilateral and angles in polygons both regular and irregular  Identify the symmetries of all 2D shapes and name them  **Assessment: Early Dec. 2021. Assess topics studied so far.** | **Fractions:**  Equivalent fractions  Ordering fractions  Simplifying fractions  Mixed number into improper fraction and vice versa  Add and subtract fractions including mixed numbers  **Fractions, decimals and percentages:**  Equivalent fractions, decimals and percentages  Ordering FDP  Fraction of an amount  Percentage of an amount  Percentage increase/decrease including simple interest  Percentage change  **Assessment: Unit tests throughout the term** | **Introduction to Algebra:**  Use function machines  Simplify expressions by collecting like terms including powers and also involving multiplication and dividing  Expand single brackets  Factorise into a single bracket  Linear sequences  **Coordinates and graphs:**  Plot and read coordinates  Find the midpoint of two points  Draw linear graphs  Read and interpret real life linear graphs  Understand equation of line y = mx + c  Identify parallel lines  **Assessment: Mid March 2022 on topics from January** | **Order of operations:**  Use the order of operations to solve simple calculations including brackets  Apply BIDMAS to solve a calculation including powers and roots  Put the brackets into a calculation to make it true  Solve complex BIDMAS calculations  **Ratio and proportion**  Equivalent ratios  Simplify ratios  Identify the relationship between ratios and fractions  Divide in a given ratio  Best value problems  Simple direct proportion including recipe questions  Simple inverse proportion  **Assessment: Unit tests throughout the term** | **Working with data:**  Averages from a list of data and frequency table  Stem and leaf diagrams  Two way tables  Bar charts  Pictograms  Scatter graphs  **Revision and consolidation of the year**  **Assessment: June 2022. Assessment of ALL topics studied this year.** |
| **Year 8** | **Number Properties:**  Index laws for multiplication and division  Understand factors, multiples and prime numbers  HCF and LCM  Prime factor decompositions  **Positive and negative numbers:**  Ordering positive and negative numbers  +/-/x/÷ positive and negative integers  BIDMAS  **Rounding and Estimation:**  Rounding to nearest 10,100,1000  Rounding to decimal places and significant figures  Error intervals  **Assessment: Unit tests throughout the term** | **Length and area:**  Perimeter and area of all 2D shapes including circles  Perimeter and area of compound shapes  Focusing on functional questions  **3D shapes:**  Volume and surface area of cubes, cuboids, prisms including cylinders  Convert between units of area and volume  **Compound Measures:**  Speed distance time including graphs  Density, mass and volume  Force, pressure and area  **Assessment: Early Dec. 2021. Assess topics studied so far.** | **Calculations with fractions:**  Equivalent fractions  Ordering fractions  Simplifying fractions  Mixed number into improper fraction and vice versa  Add and subtract fractions including mixed numbers  Multiply and divide fractions including mixed numbers  **Probability**  List outcomes  Apply the property that the probabilities of mutually exclusive outcomes sum to 1  Sample space  Venn diagrams  **Assessment: Unit tests throughout the term** | **Algebraic manipulation:**  Simplify expressions by collecting like terms including powers and also involving multiplication and dividing  Expand and factorise into a single bracket  Expand and factorise into double brackets  **Solving equations:**  Solve linear equations  Understand inequality notation  Solve linear inequalities  Rearranging formulae  **Assessment: Mid March 2022 on topics from January** | **Angles:**  Angles around a point  Vertically opposite angles  Angles on a straight line  Angles in a triangle  Angles in a quadrilateral and angles in polygons both regular and irregular  Angles in parallel lines  **Transformations:**  Reflection  Translation  Rotation  Enlargement  **Assessment: Unit tests throughout the term** | **Statistics:**  Averages from a list of data and frequency table  Stem and leaf diagrams  Two way tables  Pie charts  Scatter graphs  **Revision and consolidation of the year**  **Assessment: June 2022. Assessment of ALL topics studied this year.** |
| **Year 9** | **Arithmetic:**  Written methods for +/-/x/÷ involving decimals  +/-/x/÷ positive and negative integers  Problem solving with the above  **Powers and roots:**  BIDMAS  Square numbers, square roots, cube numbers and cube roots  Index laws including fractional and negative  Standard form  Simplifying surds  **Fractions,decimals and percentages:**  Equivalent fractions, ordering fractions and simplifying fractions  Mixed number into improper fraction and vice versa  Add, subtract, multiply and divide fractions including mixed numbers  Equivalent fractions, decimals and percentages  Ordering FDP  Recurring decimals into fractions  **Assessment: October** | **Algebraic manipulation:**  Simplify expressions by collecting like terms including powers and also involving multiplication and dividing  Expand and factorise into a single bracket  Expand and factorise into double brackets  Algebraic fractions  Completing the square  **Coordinates and graphs:**  Plot and read coordinates  Find the midpoint of two points  Draw linear graphs  Read and interpret real life linear graphs  Understand equation of line y = mx + c  Identify parallel lines  Identify perpendicular lines  Find the equation given two points  **Assessment: December** | **2D shapes:**  Angle facts  Area and perimeter for 2D shapes  Pythagoras theorem  SohCahToa  **3D shapes:**  Know the 3D shapes and their nets  Volume and surface area of cubes, cuboids, prisms including cylinders  Volume and surface area of pyramids, Spheres, Hemispheres, frustums and cones  Apply Pythagoras to cone problems  **Assessment: February** | **Solving equations:**  Solve linear equations  Form and solve linear equations  Change the subject of the formula  Solve quadratics by factorising  Solve simultaneous equations including worded problems  **Sequences:**  Linear sequences  Quadratic sequences  Extension: geometric sequences  **Assessment: March** | **Percentages:**  Percentages of an amount  Percentage increase/decrease  Percentage change  Reverse percentages  Simple interest and compound interest  Growth and decay problems  **Proportion:**  Best value  Recipe questions  Direct proportion  Inverse proportion  Capture and recapture problems  Form an equation using variables in direct and inverse proportion and use this to solve problems (finding k)  **Assessment: May** | **Constructions, loci and bearings:**  Construct triangles  Use constructions to solve simple loci problems  Use scale factors, diagrams and maps  Construct and measure bearings on diagrams  Find bearings  **Revision and consolidation of the year**  **Assessment: June**  **End of year assessment on all topics.** |
| **Year 10**  **Foundation** | **Rounding and error intervals:**  Rounding to nearest 10,100,1000  Rounding to decimal places and significant figures  Error intervals  Estimation  **Percentages:**  Percentages of an amount  Percentage increase/decrease  Percentage change  Reverse percentages  Simple interest and compound interest  Growth and decay problems  **Ratio and proportion:**  Equivalent ratios  Simplify ratios  Identify the relationship between ratios and fractions  Divide in a given ratio  Best value problems  Simple direct proportion including recipe questions  Simple inverse proportion  **Assessment: October** | **Perimeter and area:**  Perimeter and area of all 2D shapes including circles  Perimeter and area of compound shapes  Focusing on functional questions  Area of sectors and length of an arc  **Volume and surface area:**  Volume and surface area of cubes, cuboids, prisms including cylinders  Volume and surface area of pyramids, Spheres, Hemispheres and cones  **Assessment: December** | **Angles and bearings:**  Angles around a point  Vertically opposite angles  Angles on a straight line  Angles in a triangle  Angles in a quadrilateral and angles in polygons both regular and irregular  Angles in parallel lines  Use scale factors, diagrams and maps  Construct and measure bearings on diagrams  Find bearings  **Transformations:**  Reflection  Translation  Rotation  Enlargement  **Assessment: February** | **Drawing graphs:**  Plotting coordinates  Drawing linear graphs  Drawing quadratic graphs  Plotting cubic, reciprocal and exponential graphs  **Straight line graphs:**  Find the midpoint of two points  Read and interpret real life linear graphs  Understand equation of line y = mx + c  Identify parallel lines  Find the equation given two points  **Assessment: March** | **Compound measures:**  Convert between units  Speed distance time including graphs  Density, mass and volume  Force, pressure and area  **Probability:**  List outcomes  Apply the property that the probabilities of mutually exclusive outcomes sum to 1  Sample space  Venn diagrams  Tree diagrams  **Assessment: May** | **Averages and range:**  Averages from a list of data and frequency tables  Averages from a stem and leaf diagram  **Revision and consolidation of the year**  **Assessment: End of year 10 Mock** |
| **Year 10**  **Higher** | **Surds and indices:**  Simplify expressions involving sums, products and powers, including using index laws  Fractional and negative indices  Simplify surds  Expand brackets with surds  Rationalise surds  **Solving Quadratics:**  Expand double and triple brackets  Solve quadratics by factorising, quadratic formula and completing the square including questions that require rearranging  Solve quadratic inequalities  **Drawing graphs and graphing inequalities:**  Understand equation of line y = mx + c  Identify parallel lines  Identify perpendicular lines  Find the equation given two points  Plotting quadratic, cubic, reciprocal and exponential graphs  Represent linear inequalities on graphs  **Assessment: October** | **Arcs and sectors:**  Finding the area or perimeter of compound shapes including parts of circles  Area of sectors  Length of an arc  Find the perimeter of a sector when given the area or the area when given the perimeter  **Circle theorems:**  Recognise and name the parts of a circle  Use the standard circle theorems to find a missing angle including in a complex problem  Prove the standard circle theorems  **Assessment: December** | **Similarity and congruence:**  Use the basic congruence criteria for triangles (SSS, SAS, ASA, RHS)  Prove two triangles are congruent  Find a missing side length in two shapes that are similar in the context of a problem  Apply the concepts of similarity, including the relationships between lengths, areas and volumes in similar figures  Prove two triangles are similar  **Complex transformations of shapes:**  Recap transformations of 2D shapes  Enlargements including negative and fractional scale factors  **Conditional probability:**  Calculate probabilities from a two way table, including conditional probabilities  Complete Venn diagrams, including when the intersection needs to be calculated  Find conditional probabilities from a Venn diagram  Complete probability tree diagrams and find probabilities  **Assessment: February** | **Volume and algebra:**  Volume and surface area of cubes, cuboids, prisms including cylinders  Volume and surface area of pyramids, Spheres, Hemispheres, cones and frustums  Apply Pythagoras to cone problems  Apply algebra to the formulae for volume and surface area of a complex solids to solve problems  **Bounds and compound measures:**  Use inequality notation to specify simple error intervals due to rounding and truncation  Find upper and lower bounds  Convert compound units  Speed distance time including graphs  Density, mass and volume  Force, pressure and area  **Assessment: March** | **Graphs of circles:**  Recognise and interpret the equation of a circle with centre at the origin  Calculate whether a given point lies inside, on or outside a circle  Solve problems using the equation of a circle  Find the equation of a tangent to a circle at a given point  Solve problems including find the equation of a tangent to a circle at a given point  **Linear and quadratic simultaneous equations:**  Solve two linear simultaneous equations in two variables algebraically  Form and solve two linear simultaneous equations in two variables algebraically  Solve two linear simultaneous equations in two variables graphically  Solve two simultaneous equations (one linear, one quadratic) algebraically and graphically  **Assessment: May** | **Histograms, cumulative frequency and boxplots:**  Interpret and calculate quartiles and interquartile range  Find the interquartile range from a stem and leaf diagram  Construct, complete and interpret box plots  Compare boxplots  Construct and interpret a cumulative frequency diagram  Construct and interpret a histogram with unequal class widths  Estimate from a histogram  Apply statistics to a capture and recapture problem  **Revision and consolidation of the year**  **Assessment: End of year 10 Mock** |
| **Year 11**  **Foundation** | Numbers  Standard form  Angles in parallel lines and shapes  Congruence and similar shapes  Algebra | Proportion  Bearings  Fractions  Simultaneous equations  Venn diagrams  Using a calculator  **Assessment: Mock Paper 1, 2 and 3** | Perimeter and area  Straight line graphs  Averages  Area and circumference of a circle  Constructions and Loci  Percentages | Volume of prisms and surface area  Real life graphs  Quadratic graphs  Transformations  Ratio and proportion  Scatter diagrams  Probability  **Assessment: March Papers within the lessons** | Pythagoras and trig  Formulae  Revision on all topics |  |
| **Year 11**  **Higher** | Direct and inverse proportion  Surds  Standard form  Data Handling  Sequences  Similar shapes | Percentages  Venn Diagrams  Y= mx + c  Simultaneous equations  Non-linear graphs  Transformations of functions  Ratio and proportion  **November December**  **Assessment: Mock Paper 1, 2 and 3** | Vectors  Circle theorem proofs  Pythagoras and Trig  Indices  Capture and recapture  Compound units | Algebra Revision  Shape, space and measures revision  Handling data revision  Number revision  **Assessment: March Papers within the lessons** | Algebra Revision  Shape, space and measures revision  Handling data revision  Number revision |  |
| **Year 12:** | Algebraic expressions  Quadratics  Equations and inequalities  **Assessment Topic based** | Graphs  Straight lines  Circles  Forces  **Assessment Topic based** | Algebraic methods  Binomial expansion  Newton’s laws  **Assessment Topic based** | Trigonometry  Vectors  Differentiation  Statistics processes  **Assessment Topic based** | Integration  Exponential functions  Statistics processes  **Assessment Topic based** | Additional mechanics and statistics  **Assessment Full mock on all topics** |
| **Year 13:** | Algebraic functions  Partial fractions  Parametric equations.  Sequences  Forces  **Assessment Topic based** | Trigonometry  Differentiation  Integration  Probability  **Assessment Full mock on all topics** | Numerical methods  Vectors  Proof  Revision  **Assessment Topic based** | Revision  **Assessment Full mock on all topics** | General Revision |  |