**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 decimalsRounding to nearest 10,100,1000Rounding to decimal places and significant figures Multiplying and dividing with powers of 10Introduction of standard form and bounds**Written methods:**Can use written methods including with decimal numbersUnderstand factors, multiplesHCF and LCMPrime factor decompositions**Assessment:****Baseline: Early September** | **Perimeter, area and units:**Perimeter and area of all 2D shapes including circlesPerimeter and area of compound shapesProblem solving questions involving area and perimeterConversion between units**Angles and 2D shapes**Drawing and measuring anglesAngle 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 irregularIdentify the symmetries of all 2D shapes and name them**Assessment: Early Dec. 2021. Assess topics studied so far.**  | **Fractions:**Equivalent fractionsOrdering fractionsSimplifying fractionsMixed number into improper fraction and vice versaAdd and subtract fractions including mixed numbers**Fractions, decimals and percentages:**Equivalent fractions, decimals and percentagesOrdering FDPFraction of an amountPercentage of an amountPercentage increase/decrease including simple interestPercentage change**Assessment: Unit tests throughout the term** | **Introduction to Algebra:**Use function machinesSimplify expressions by collecting like terms including powers and also involving multiplication and dividingExpand single bracketsFactorise into a single bracketLinear sequences**Coordinates and graphs:**Plot and read coordinatesFind the midpoint of two pointsDraw linear graphsRead and interpret real life linear graphsUnderstand equation of line y = mx + cIdentify parallel lines**Assessment: Mid March 2022 on topics from January** | **Order of operations:**Use the order of operations to solve simple calculations including bracketsApply BIDMAS to solve a calculation including powers and rootsPut the brackets into a calculation to make it trueSolve complex BIDMAS calculations**Ratio and proportion**Equivalent ratiosSimplify ratiosIdentify the relationship between ratios and fractionsDivide in a given ratioBest value problemsSimple direct proportion including recipe questionsSimple inverse proportion**Assessment: Unit tests throughout the term** | **Working with data:**Averages from a list of data and frequency tableStem and leaf diagramsTwo way tablesBar chartsPictogramsScatter 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 divisionUnderstand factors, multiples and prime numbersHCF and LCMPrime factor decompositions**Positive and negative numbers:**Ordering positive and negative numbers+/-/x/÷ positive and negative integersBIDMAS**Rounding and Estimation:**Rounding to nearest 10,100,1000Rounding 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 circlesPerimeter and area of compound shapesFocusing on functional questions**3D shapes:**Volume and surface area of cubes, cuboids, prisms including cylindersConvert between units of area and volume**Compound Measures:**Speed distance time including graphsDensity, mass and volumeForce, pressure and area**Assessment: Early Dec. 2021. Assess topics studied so far.**  | **Calculations with fractions:**Equivalent fractionsOrdering fractionsSimplifying fractionsMixed number into improper fraction and vice versaAdd and subtract fractions including mixed numbersMultiply and divide fractions including mixed numbers**Probability**List outcomesApply the property that the probabilities of mutually exclusive outcomes sum to 1Sample spaceVenn diagrams**Assessment: Unit tests throughout the term** | **Algebraic manipulation:**Simplify expressions by collecting like terms including powers and also involving multiplication and dividingExpand and factorise into a single bracketExpand and factorise into double brackets**Solving equations:**Solve linear equationsUnderstand inequality notationSolve linear inequalitiesRearranging formulae**Assessment: Mid March 2022 on topics from January** | **Angles:**Angles around a pointVertically opposite angles Angles on a straight lineAngles in a triangleAngles in a quadrilateral and angles in polygons both regular and irregularAngles in parallel lines**Transformations:**ReflectionTranslationRotationEnlargement**Assessment: Unit tests throughout the term** | **Statistics:**Averages from a list of data and frequency tableStem and leaf diagramsTwo way tablesPie chartsScatter 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 integersProblem solving with the above**Powers and roots:**BIDMASSquare numbers, square roots, cube numbers and cube rootsIndex laws including fractional and negativeStandard formSimplifying surds**Fractions,decimals and percentages:**Equivalent fractions, ordering fractions and simplifying fractionsMixed number into improper fraction and vice versaAdd, subtract, multiply and divide fractions including mixed numbersEquivalent fractions, decimals and percentagesOrdering FDPRecurring decimals into fractions**Assessment: October** | **Algebraic manipulation:**Simplify expressions by collecting like terms including powers and also involving multiplication and dividingExpand and factorise into a single bracketExpand and factorise into double bracketsAlgebraic fractionsCompleting the square**Coordinates and graphs:**Plot and read coordinatesFind the midpoint of two pointsDraw linear graphsRead and interpret real life linear graphsUnderstand equation of line y = mx + cIdentify parallel linesIdentify perpendicular linesFind the equation given two points**Assessment: December** | **2D shapes:**Angle factsArea and perimeter for 2D shapesPythagoras theoremSohCahToa**3D shapes:**Know the 3D shapes and their netsVolume and surface area of cubes, cuboids, prisms including cylindersVolume and surface area of pyramids, Spheres, Hemispheres, frustums and conesApply Pythagoras to cone problems**Assessment: February** | **Solving equations:**Solve linear equationsForm and solve linear equationsChange the subject of the formulaSolve quadratics by factorisingSolve simultaneous equations including worded problems**Sequences:**Linear sequencesQuadratic sequences Extension: geometric sequences**Assessment: March** | **Percentages:**Percentages of an amountPercentage increase/decreasePercentage changeReverse percentagesSimple interest and compound interestGrowth and decay problems**Proportion:**Best valueRecipe questionsDirect proportion Inverse proportionCapture and recapture problemsForm an equation using variables in direct and inverse proportion and use this to solve problems (finding k)**Assessment: May** | **Constructions, loci and bearings:**Construct trianglesUse constructions to solve simple loci problemsUse scale factors, diagrams and mapsConstruct and measure bearings on diagramsFind 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 10,100,1000Rounding to decimal places and significant figures Error intervalsEstimation**Percentages:**Percentages of an amountPercentage increase/decreasePercentage changeReverse percentagesSimple interest and compound interestGrowth and decay problems**Ratio and proportion:**Equivalent ratiosSimplify ratiosIdentify the relationship between ratios and fractionsDivide in a given ratioBest value problemsSimple direct proportion including recipe questionsSimple inverse proportion**Assessment: October** | **Perimeter and area:**Perimeter and area of all 2D shapes including circlesPerimeter and area of compound shapesFocusing on functional questionsArea of sectors and length of an arc**Volume and surface area:**Volume and surface area of cubes, cuboids, prisms including cylindersVolume and surface area of pyramids, Spheres, Hemispheres and cones**Assessment: December** | **Angles and bearings:**Angles around a pointVertically opposite angles Angles on a straight lineAngles in a triangleAngles in a quadrilateral and angles in polygons both regular and irregularAngles in parallel linesUse scale factors, diagrams and mapsConstruct and measure bearings on diagramsFind bearings**Transformations:**ReflectionTranslationRotationEnlargement**Assessment: February** |  **Drawing graphs:**Plotting coordinatesDrawing linear graphsDrawing quadratic graphsPlotting cubic, reciprocal and exponential graphs**Straight line graphs:**Find the midpoint of two pointsRead and interpret real life linear graphsUnderstand equation of line y = mx + cIdentify parallel linesFind the equation given two points**Assessment: March** | **Compound measures:** Convert between unitsSpeed distance time including graphsDensity, mass and volumeForce, pressure and area**Probability:**List outcomesApply the property that the probabilities of mutually exclusive outcomes sum to 1Sample spaceVenn diagramsTree diagrams**Assessment: May** | **Averages and range:**Averages from a list of data and frequency tablesAverages 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 lawsFractional and negative indicesSimplify surdsExpand brackets with surdsRationalise surds**Solving Quadratics:**Expand double and triple bracketsSolve quadratics by factorising, quadratic formula and completing the square including questions that require rearrangingSolve quadratic inequalities**Drawing graphs and graphing inequalities:**Understand equation of line y = mx + cIdentify parallel linesIdentify perpendicular linesFind the equation given two pointsPlotting quadratic, cubic, reciprocal and exponential graphsRepresent linear inequalities on graphs**Assessment: October** | **Arcs and sectors:**Finding the area or perimeter of compound shapes including parts of circlesArea of sectorsLength of an arcFind 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 circleUse the standard circle theorems to find a missing angle including in a complex problemProve the standard circle theorems**Assessment: December** | **Similarity and congruence:**Use the basic congruence criteria for triangles (SSS, SAS, ASA, RHS)Prove two triangles are congruentFind a missing side length in two shapes that are similar in the context of a problemApply the concepts of similarity, including the relationships between lengths, areas and volumes in similar figuresProve two triangles are similar**Complex transformations of shapes:**Recap transformations of 2D shapesEnlargements including negative and fractional scale factors**Conditional probability:**Calculate probabilities from a two way table, including conditional probabilitiesComplete Venn diagrams, including when the intersection needs to be calculatedFind conditional probabilities from a Venn diagramComplete probability tree diagrams and find probabilities**Assessment: February** | **Volume and algebra:**Volume and surface area of cubes, cuboids, prisms including cylindersVolume and surface area of pyramids, Spheres, Hemispheres, cones and frustumsApply Pythagoras to cone problemsApply 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 truncationFind upper and lower boundsConvert compound unitsSpeed distance time including graphsDensity, mass and volumeForce, pressure and area**Assessment: March** | **Graphs of circles:**Recognise and interpret the equation of a circle with centre at the originCalculate whether a given point lies inside, on or outside a circleSolve problems using the equation of a circleFind the equation of a tangent to a circle at a given pointSolve 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 algebraicallyForm and solve two linear simultaneous equations in two variables algebraicallySolve two linear simultaneous equations in two variables graphicallySolve two simultaneous equations (one linear, one quadratic) algebraically and graphically**Assessment: May** | **Histograms, cumulative frequency and boxplots:**Interpret and calculate quartiles and interquartile rangeFind the interquartile range from a stem and leaf diagramConstruct, complete and interpret box plotsCompare boxplotsConstruct and interpret a cumulative frequency diagramConstruct and interpret a histogram with unequal class widthsEstimate from a histogramApply statistics to a capture and recapture problem**Revision and consolidation of the year****Assessment: End of year 10 Mock** |
| **Year 11****Foundation** | NumbersStandard formAngles in parallel lines and shapesCongruence and similar shapesAlgebra | ProportionBearingsFractionsSimultaneous equationsVenn diagramsUsing a calculator**Assessment: Mock Paper 1, 2 and 3** | Perimeter and areaStraight line graphsAveragesArea and circumference of a circleConstructions and LociPercentages | Volume of prisms and surface areaReal life graphsQuadratic graphsTransformationsRatio and proportionScatter diagramsProbability**Assessment: March Papers within the lessons** | Pythagoras and trigFormulaeRevision on all topics |  |
| **Year 11****Higher** | Direct and inverse proportionSurdsStandard formData Handling SequencesSimilar shapes | PercentagesVenn DiagramsY= mx + cSimultaneous equationsNon-linear graphsTransformations of functionsRatio and proportion**November December****Assessment: Mock Paper 1, 2 and 3** | VectorsCircle theorem proofsPythagoras and TrigIndicesCapture and recaptureCompound units | Algebra RevisionShape, space and measures revisionHandling data revisionNumber revision**Assessment: March Papers within the lessons** | Algebra RevisionShape, space and measures revisionHandling data revisionNumber revision |  |
| **Year 12:**  | Algebraic expressionsQuadraticsEquations and inequalities**Assessment Topic based** | GraphsStraight linesCirclesForces**Assessment Topic based** | Algebraic methodsBinomial expansionNewton’s laws**Assessment Topic based** | TrigonometryVectorsDifferentiationStatistics processes**Assessment Topic based** | IntegrationExponential functionsStatistics processes**Assessment Topic based** | Additional mechanics and statistics**Assessment Full mock on all topics** |
| **Year 13:**  | Algebraic functionsPartial fractionsParametric equations.SequencesForces**Assessment Topic based** | TrigonometryDifferentiationIntegrationProbability**Assessment Full mock on all topics** | Numerical methodsVectorsProofRevision**Assessment Topic based** | Revision**Assessment Full mock on all topics** | General Revision |  |