St Mary's CE High School Curriculum Map 2023 - 24
Mathematics Year 10 Higher tier

Mathematics is an interconnected subject in which students need to be able to move fluently between representations of mathematical ideas. The programme of study is organised into apparently distinct domains, but students should build on key stage 3 and connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge in science, geography, computing and other subjects.

The curriculum is taught through the mathematical strands of: Number and Ratio, Algebra, Geometry and Measures, Statistics and Probability

	Autumn 1a	Autumn 1b	Spring 2a	Spring 2b	Summer 3a	Summer 3b
CONTENT *Declarative / core / powerful Knowledge – 'Know What'*	**Solve quadratics** **Functions** **Algebraic Fractions**	**Surds** **Percentage Growth and Decay**	**Iteration** **3D Trigonometry** **Construction and Loci** **Congruency**	**3D Shape**	**Advanced Statistics**	**Similarity and Non Right Angled Trigonometry**
Intent	These topics will allow students to problem solve with situations involving quadratics	Answers as surds will start to appear more frequently now that more complex material is starting to be explored. Being familiar with surds early will open up working with these in future topics.	Topics involving the use of compass constructions are placed together to allow students to practice the key skills before employing them to loci problems	Having studied 3d Pythagoras and trigonometry earlier in the year, students have the skills to find surface areas and volumes of 3D shapes with missing information	After some recapping of averages, students will be able to extend their understanding of representing data with new graphs.	Having studied volumes and surface areas in the previous half term, students will now have the opportunity to study the effects of scaling the lengths of a shape/solid on the shapes area/volume.

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Skills *Procedural Knowledge – 'Know How'*	Students will be able to: Solve complex linear equations Rearrange formula Solve complex linear simultaneous equations Interpret and evaluate functions, composite functions and inverse functions Solve quadratics by completing the square Solve equations involving algebraic fractions	Students will be able to: Convert recurring decimals to fractions Use surds in different contexts Find reverse percentages, evaluate an amount after a repeated appreciation or depreciation	Students will be able to: Construct key diagrams using a pair of compasses Use constructions to solve loci problems Prove triangles are congruent Use and solve problems with iterative formula Use trigonometry in 2d with and without a calculator Use trigonometry in 3d contexts Solve problems involving bearings	Students will be able to: Draw the nets of 3d shapes Find the surface area of prisms, cones, pyramids and spheres Find the volume of prisms and cylinders Find the volume of pyramids, cones and spheres Find the volume and surface areas of frustums Convert units of area/volume	Students will be able to: Find the averages from grouped frequency tables Use interquartile range and apply to box plots Use box plots to compare data Draw and interpret cumulative frequency diagrams Draw and solve problems with histograms	Students will be able to: Use the four transformations on shapes and make conclusions about combined transformations Apply similarity to area and volume Find the area of triangles using trigonometry. Use the cosine rule
Key Questions	Is there more than one way to solve this equation?	Why should we not evaluate surds until the end of a calculation?	Can an iterative formula solve any equation?	Why might drawing the net of a shape assist in finding its surface area?	What are the advantages and disadvantages of using each graph?	Which trigonometric function should I use to start

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	How many equations do you need to solve for 2 unknown variables? What is the difference in solving an equation and rearranging a formula When would we solve a quadratic by completing the square?		Why do these arcs help make the construction? What construction should I use to show all the places equidistant from two points?	Can you show why the conversion facts for area/volume units are different to length units?		answering this question?
Assessment	Students will be assessed on a Diagnostic quiz at the end of each unit and a retest to improve any gaps in learning. A half termly assessment will be completed in class covering content covered this half	Students will be assessed on a Diagnostic quiz at the end of each unit and a retest to improve any gaps in learning. A half termly assessment will be completed in class covering content covered this half	Students will be assessed on a Diagnostic quiz at the end of each unit and a retest to improve any gaps in learning. A half termly assessment will be completed in class covering content covered this half	Students will be assessed on a Diagnostic quiz at the end of each unit and a retest to improve any gaps in learning. A half termly assessment will be completed in class covering content covered this half	Students will be assessed on a Diagnostic quiz at the end of each unit and a retest to improve any gaps in learning. A half termly assessment will be completed in class covering content covered this half	Students will be assessed on a Diagnostic quiz at the end of each unit and a retest to improve any gaps in learning. A half termly assessment will be completed in class covering content covered this half

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	term, and previous topics covered at St. Mary's	term, and previous topics covered at St. Mary's	term, and previous topics covered at St. Mary's	term, and previous topics covered at St. Mary's	term, and previous topics covered at St. Mary's	term, and previous topics covered at St. Mary's
Links to careers/wider world			Science modelling Astronomy	Architecture City planning Calculating capacities of objects	Understanding and interpreting "real world" statistics	Understanding that x2 8 inch pizzas are not the same size as x1 16 inch pizza