

## The English Martyrs Catholic School and Sixth Form College

| <u>Year 10 Maths Higher</u>   | <u>Module 1</u>  | <u>Module 2</u>   | <u>Module 3</u>   |
|-------------------------------|--|---|---|
| <u>Topic Theme and Intent</u> | Within this first Module, Year 10 students will cover 5 main areas of the curriculum which are: Number, Algebra, Ratio and Proportion, and Shape.  | Within Module 2, Year 10 students will cover 5 main areas of the curriculum which are: Data, Number, Algebra, Shape and Ratio and Proportion.   | Within Module 3, Year 10 students will cover 5 of the main areas of the curriculum which are: Number Data, Algebra, Shape and Ratio and Proportion.   |
| <u>Knowledge and Skills</u>   | <p><u>Data:</u> Two-way tables, tree diagrams, independent &amp; conditional probability and Venn diagrams</p> <p><u>Number:</u> Limits of accuracy, Negative &amp; fractional indices.</p> <p><u>Algebra:</u> Factorising and solving quadratics, quadratic formula, completing the square, linear &amp; quadratic simultaneous equations</p> <p><u>Ratio and Proportion:</u> Congruent triangles, similar shapes including length, area &amp; volume</p> <p><u>Shape:</u> Transformations including negative and fractional enlargements</p>   | <p><u>Data:</u> comparing stem &amp; leaf diagrams, box plots and cumulative frequency</p> <p><u>Number:</u> percentage change, compound interest and recurring decimal to fractions.</p> <p><u>Algebra:</u> Quadratic sequences, cubic, reciprocal graphs and exponential graphs</p> <p><u>Shape:</u> 3D Pythagoras &amp; trigonometry, Sine &amp; Cosine rule and area of a triangle</p> <p><u>Ratio and Proportion:</u> Direct &amp; inverse proportion using k, combination of two proportions, speed, density, pressure, distance-time graphs, area under a graph and rates of change.</p> | <p><u>Data:</u> Histograms</p> <p><u>Number:</u> Surds, product rule for counting and standard form.</p> <p><u>Algebra:</u> Expanding triple brackets, quadratic inequalities, equation of a straight line, gradient between two points, parallel &amp; perpendicular lines and equation of a circle</p> <p><u>Shape:</u> Circle theorems and their proofs, arc length &amp; area of a sector (working backwards), volume &amp; surface area of cylinders, pyramids, cones and spheres.</p> <p><u>Ratio and Proportion:</u> Capture/recapture</p> |
| <u>Literacy Links</u>         | <p><b>Reading:</b> Be able to extract the correct information to construct a two-way table.</p> <p><b>Writing:</b> Describing transformations.</p> <p><b>Oracy:</b> Explain the difference between independent &amp; conditional probability.</p>  | <p><b>Reading:</b> Identify a quadratic sequence.</p> <p><b>Writing:</b> Comparing and interpreting data.</p> <p><b>Oracy:</b> Explain the difference between direct and inverse proportion.</p>  | <p><b>Reading:</b> Interpret histograms.</p> <p><b>Writing:</b> Give definition for each circle theorem.</p> <p><b>Oracy:</b> Articulate what assumptions are made when estimation capture/recapture.</p>   |
| <u>Essential Vocabulary</u>   | Completing the square, negative enlargement, upper & lower bounds, intersect & union, scale factor.  | Comparing data, 2 <sup>nd</sup> difference, k, $A=1/2absinc$ , exponential growth.  | Frequency density, rationalise the denominator, gradient, circle theorems   |
| <u>Catholic Values Links</u>  | <ul style="list-style-type: none"> <li>• <b>Stewardship and Responsibility</b><br/>Topics like budgeting, interest rates, and financial planning can be tied to Catholic values of stewardship. Discuss how managing finances wisely reflects responsible stewardship of resources.</li> <li>• <b>Justice and Fairness</b><br/>Equitable Solutions: In teaching ratios, proportions, and statistical analysis, discuss concepts of fairness and equity. For example, explore how mathematical models can be used to address social inequalities or ensure fair distribution of resources.</li> <li>• <b>Unity and Wholeness</b><br/>The circle is a shape with no beginning or end, symbolizing eternity and the infinite nature of God. It can represent the unity and completeness of God's love and the eternal nature of the divine.</li> <li>• <b>Order and Structure</b><br/>Catholic teachings often emphasize the importance of order and structure in life, mirroring the logical and systematic nature of algebra. Just as algebra relies on following rules and patterns to solve problems, Catholic life is guided by moral and spiritual principles that provide a framework for making decisions and understanding the world.</li> </ul> |   |   |

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- **Problem-Solving and Reflection**

Algebra teaches problem-solving skills, which can be seen as a metaphor for the reflective and contemplative aspects of Catholic life. Both involve examining a situation, considering various factors, and finding a solution or deeper understanding.

- **Symbolism and Language**

Algebra uses symbols and abstract language to represent relationships and solve equations. Similarly, Catholicism uses symbols, rituals, and language to convey spiritual truths and divine mysteries. Both systems use symbols to communicate deeper meanings and truths.

- **Creation and Order**

**Geometric Order:** Catholic teachings emphasize the order and purpose in creation. Shapes and geometric principles reflect the divine order and harmony present in the natural world, mirroring the belief that God created the universe with purpose and structure.

**Sacred Geometry:** Many religious traditions, including Catholicism, use sacred geometry to express divine truths. For example, the use of specific geometric shapes in church architecture (like the use of the pentagon, hexagon, or octagon) can symbolize spiritual truths and the divine order.

### Disciplinary Reading

### Reading for Pleasure

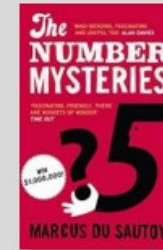


The Code Book by Simon Singh

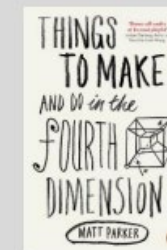
How Long is a Piece of String by Rob Eastaway



Flatland by Edwin A. Abbott



The Number Mysteries by Marcus Du Sautoy



Things to make and do in the fourth dimension by Matt Parker