Learning Aims and Curriculum Intent:

The aims of the mathematics programme at GCSE are to develop fluent knowledge, skills and understanding of mathematical methods and concepts. To acquire, select and apply mathematical techniques to solve problems. Use mathematical reasoning to make deductions and inferences and draw conclusions. To comprehend, interpret and communicate mathematical information in a variety of forms appropriate to the information and context.

Term	Content, Key Questions and Knowledge	Skills	Assessment
Michaelmas	**How are some complicated real-life problems that can be modelled and solved using Mathematics?** 1. **What are some mathematical tools we use to describe quantities related to motions? (e.g., Cars speeding up, trajectory of a bullet, etc.)** • Vectors • Converting metric units • Compound measure- velocity and acceleration • Convert recurring decimals to fractions. • Distance-time graphs • Velocity-time graphs • Quadratic equation real life problems • Draw quadratic graphs • Gradients of curves • Draw cubic graphs • Interpret real life graphs 2. **What are some tools used to evaluate and make predictions of different quantities to inform decision making? (Loans, taxes, investments, etc.)** • Compound percentage • Reverse percentages • Differentiation • Maximum and minimum points • Cumulative frequency • Histograms 3. **How are mathematical proofs carried out and presented in academic researches?** • Sequences and series • Algebraic proofs	- Using vector notations - Adding and subtracting vectors - Metric unit conversion between dimensions - Stating the difference between velocity and acceleration - Calculating velocity and accelerations - Interpreting velocity-time graphs - Producing velocity-time graphs - Converting recurring decimals to fractions - Writing quadratic equations - Sketching quadratic graphs - Sketching cubic graphs - Interpreting nature of solutions to a quadratic equation. - Drawing tangent to a curve - Finding the gradient at a point of a curve - Calculating the amount and interest of a principal amount under compound interest - Calculating the time needed to for a principal amount to compoundly increased or decreased to a certain threshold - Calculating the rate of interest at which a principal amount increasing/decreasing compoundly to reach a certain amount in a certain time - Differentiating a polynomial - Finding the maximum and minimum point - Finding the maximum or minimum amount - Filling in cumulative frequency tables - Producing cumulative graphs - Interpreting cumulative graphs - Calculating the total frequency in a period - Producing histograms - Interpreting histograms - Finding the frequency density in a class - Finding the general term of a sequence - Finding the sum of a series - Solving equations related to sequences or series - Carrying out proofs for algebraic relationships	Retrieval quizzes to build knowledge acquisition and understanding. Centralised homework's. Regular department assessments. Exam style questions to prepare for external examinations.
Lent	Review Mock analysis and targeted revision	Recap previously taught skills	Past papers and targeted revision
Trinity	Exam preparation and practice	Recap previously taught skills	Past papers and targeted revision

What consolidation looks like in this subject	Centralised interleaved homework's, regular CDA's to create a culture of regular low stakes testing to encourage spaced memory retrieval, access to sharepoint; online resources with the schemes of work and revision tasks.
Examples of Homework	Questions to complete from the textbook (CGP), centralised homeworks online homework's from online portal's such as mymaths and mathswatch.
Key terminology	**Geometric proofs:** Vector, Scalar, Constant, Magnitude, Collinear, **Notation $\underline{a}$ or $\boldsymbol{a}$** (print) and $\underline{a}$ (written) notation for vectors, $\overrightarrow{AB}$ notation for vectors, Column vector notation $\binom{p}{q}$, p = movement right and q = movement up Function, equation, Linear, non-linear, Quadratic, cubic, reciprocal, Parabola, Asymptote , Maximum, minimum, period, Gradient, y-intercept, x-intercept, root, Sketch, plot, Arguments
Super-curricular enrichment and scholarly extension	**Problem solving:** Nrich Vector Problems What's That Graph? (maths.org) **Read:** how ants use vectors **Watch: Numberphile: Numbers and free will The opposite of infinity** TED talks **Maths in unexpected places,** Good Will Hunting, **Listen (and watch): Radio 4 mathematics collection,** **Visit:** The Science museum, **The Winton Gallery Mathematics vectors in art**
Useful websites	DrFrostMaths.com Sample Questions Higher Tiers **Maths Genie** **BBC Bitesize Mathematics** Physics & Maths Tutor (physicsandmathstutor.com)

Who can I contact?	**Head of Mathematics**	**Aqeel Ashiq - aas@forest.org.uk**
	Teachers	