Curriculum Plan – Core Maths (AQA Mathematical Studies)

Year 12	Enrichment:				Review and evaluation: July 2025	
	Topics	Assessment	Substantive Knowledge	Misconceptions	Key Vocabulary	Knowledge tracking
Term 1 Teacher 1	**Paper 1 Content** 1. Budgeting 2. Inflation 3. Percentages 4. Financial Problems 5. Exchange Rates 6. The modelling cycle 7. Fermi estimation		F7.4 Budgeting, rule of 72 F7.1 The effects of inflation, including (RPI) and (CPI) F2.1 Interpreting percentages and percentage changes as a fraction or a decimal and interpreting these multiplicatively F2.2 Expressing one quantity as a percentage of another F2.3 Comparing two quantities using percentages F2.4 Working with percentages over 100% F2.5 Solving problems involving percentage change, including percentage increase/decrease and original value problems F3.1 Simple and compound interest F7.2 Setting up, solving and interpreting the solutions to financial problems, including those that involve compound interest using iterative methods F7.3 Currency exchange rates including commission	Incorrect multipliers for % of/ increase/decrease. Using 0.7 rather than 0.07 for a calculation 7% of. 0.05, not 1.05 for 5% increase. Dividing to complete a percentage decrease. Not dividing by multipliers to find reverse percentages. Thinking the 'new' is the 'original'. Using simple interest instead of compound. Similar errors in decay and repeated percentage change problems.	Rule of 72 Income Expenditure Cash Flow Contingency Retail Price Index (RPI) Consumer Price Index (CPI) Office for National Statistics (ONS) Inflation Hyper Inflation Exchange rate Fermi Estimation	GCSE knowledge of Percentages: - Percentage of - Percentage Increase and Decrease - Percentage Change - Reverse percentages - Simple and Compound Interest - Standard Exchange rate principles
Teacher 2	**Paper 2 Content** 1. Critical analysis of data in the media (substantiating headlines' claims) 2. Combatting misconceptions of percentages and graphs 3. Critical analysis of data representation		C1.1 Criticising the arguments of others C2.1 Summarising and report writing C3.1 Comparing results from a model with real data C3.2 Critical analysis of data quoted in media, political campaigns, marketing etc R1 Compound projects: R1.1 Representing compound projects by activity networks R1.2 Activity-on-node representation will be used	Incorrect trend identification Ignoring or misinterpreting the scale Over generalisation Misidentifying outliers	Critically analyse Percentages Trends Axes Substantiate Conclusion Misleading Activity network Node Arc Precedence table Dependent	From GCSE: Statistical charts and data comprehension: - Properties of bar charts, scatter graphs, pie charts, etc - Fluency in percentages - Concepts of proof (giving conclusions)

	4. Activity networks and precedence tables					- Fluency in using and comparing averages
Term 2 **Teacher 1**	**Paper 1 Content** 1. Student loans 2. Mortgages 3. Income tax, National Insurance, Value Added Tax (VAT) 4. Savings and investments. Annual Equivalent Rate (AER) 5. Annual Percentage Rate (APR) 6. The modelling cycle 7. Fermi estimation		F4.1 Student loans – Interest added year on year. - Limits of borrowing per student and dependencies of borrowing. - Repayment conditions based on Gross salary - Calculations for various salary amounts and different bands depending on year of issue - Excel use to represent repayments F4.1 Mortgages - Types of mortgage - Repayment calculations F6.1 Income tax (IT), National Insurance (NI), Value Added Tax (VAT) - Using Gross salary, calculate tax for each to show resultant annual and monthly net pay F3.1 F3.2 savings and investments - Annual Equivalent Rate (AER) - Using the formula to find AER, Nominal Interest Rate, Compounding Interest rate F4.1 Annual Percentage Rate (APR) - Using the formula to find Amount Borrowed, Repayment amount, Nominal Interest rate for single and multiple payment strategies E1 The modelling cycle E2 Fermi estimation	Student loans are always fully repaid (most are not) Everyone gets the same amount in grants and maintenance (they don't) Repayment is based on whole Salary (forgetting that it is only above threshold value) A lower interest rate means a lower mortgage (Mortgage repayment is dependent on rate AND borrowing amount) Everyone has to pay tax (no not below the personal allowance threshold) You only need to calculate NI or IT (you need to do both) Everyone pays the same tax rate (depends on gross salary) Nominal rate is the same as APR or AER (it is not)	Tuition Fees Maintenance Loan Grants Repayment mortgage Interest Free Mortgage Variable rate Fixed Rate National Insurance (NI) Income Tax (IT) Value Added Tax (VAT) Tax Bands Gross Salary Net Salary Pension Contributions Personal Allowance Deductions Benefits Annual Equivalent Rate (AER) Annual Percentage Rate (APR) Nominal rate Overdraft Loan Pay day loan Credit Card	GCSE knowledge of Percentages: - Percentage of - Percentage Increase and Decrease - Percentage Change - Reverse percentages - Simple and Compound Interest GCSE knowledge of Rearrangement of basic and advanced equations

Teacher 2	**Paper 2 Content** 1. Drawing activity networks from precedence tables 2. Activity networks with durations 3. Early Event Times and Late Event Times 4. Floats 5. Critical activities and critical paths 6. Gantt Charts 7. Time analysis		R1 Compound projects: R1.1 Representing compound projects by activity networks R1.2 Activity-on-node representation will be used R2.1 Using early time and late time algorithms to identify critical activities and find the critical path(s) R3.1 Using Gantt charts (cascade diagrams) to present project activities	Putting activities wherever they will fit on the activity network rather than having all arrows going forwards (to represent passage of time in a single direction). Forward and backward pass errors quite common as they confuse whether they are selecting the largest option or the smallest. Including the duration as part of the float. Forgetting to add on the duration of the final activity to get the initial LET.	Activity network Precedence table Duration Early Event Time Late Event Time Float Critical activity Critical path Gantt Chart	No prior knowledge required
Term 3 **Teacher 1**	**Paper 1 Content** 1. Spreadsheets 2. Standard Mathematical operations 3. Limits of accuracy and approximation 4. Types of Data, Data collection and sampling strategies 5. The modelling cycle 6. Fermi estimation	Internal assessment in exam conditions: Single combined paper on content covered so far.	F1.1 substituting numerical values into formulae, spreadsheets and financial expressions, including bank accounts F1.2 using conventional notation for priority of operations, including brackets, powers, roots and reciprocals F1.3 applying and interpreting limits of accuracy, specifying simple error intervals due to truncation or rounding F1.4 finding approximate solutions to problems in financial contexts D1.1 appreciating the difference between qualitative and quantitative data, including the difference between discrete and continuous quantitative data D1.2 appreciating the difference between primary and secondary data, including the use of secondary data that have been processed eg grouped D1.3 collecting quantitative and qualitative primary and secondary data D2.1 inferring properties of populations or distributions from a sample, whilst knowing the limitations of sampling D2.2 appreciating the strengths and limitations of random, cluster, stratified and quota sampling methods and applying this understanding when designing sampling strategies, appreciating that improving accuracy by removing bias and increasing sample size may cost/save both time and money	Confusing rounding the decimal places and significant figures Errors on the upper bound, not accounting for more decimal places Doing the full calculation when asked to estimate. Three is only 1 correct way to model different data (there are multiple strategies)	Excel Cell Substitution Error Bounds and intervals Truncate Qualitative data Quantitative data Discrete data Continuous data Primary data Secondary data Sample Random sample Cluster sample Stratified sample Quota sample	GCSE knowledge of upper and lower bounds and limits of accuracy Basic GCSE knowledge of types of graph and their interpretation

			E1 The modelling cycle E2 Fermi estimation			

| Teacher 2 | **Paper 2 Content**
1. Experimental vs theoretical probability
2. Representations of probability: two-way tables, tree diagrams, Venn diagrams
3. Probability of combined events
4. Expected value
5. Cost-benefit analysis
6. Control measures
7. Risk analysis | | R4.1 Understanding that uncertain outcomes can be modelled as random events with estimated probabilities. Knowing that the probabilities of an exhaustive set of outcomes sum to one.

R4.2 Applying ideas of randomness, fairness and equally likely events to calculate expected outcomes

R5.1 Understanding and applying Venn diagrams and simple tree diagrams
Understanding that $P(A)$ means the probability of event A
Understanding that $P(A')$ means the probability of not event A
Understanding that $P(A \cup B)$ means the probability of event A or B or both
Understanding that $P(A \cap B)$ means the probability of event A and B

R6.1 Calculating the probability of combined events:
both A and B;
neither A nor B;
either A or B (or both)
To include independent and dependent events.

R7.1 Calculating the expected value of quantities such as financial loss or gain

R8.1 Understanding that many decisions have to be made when outcomes cannot be predicted with certainty

R9.1 Understanding that the actions that can be taken to reduce or prevent specific risks may have their own costs. Including the costs and benefits of insurance

R10.1 Using probabilities to calculate expected values of costs and benefits of decisions.
Other factors must be considered, for example
The regulatory framework (eg compulsory insurance)
Minimising the maximum possible loss | Adding probabilities instead of multiplying

Treating outcomes as equally likely when they have different probabilities

Incorrectly using the rule of probabilities adding up to 1.

Not multiplying by the probabilities to find expected values

Not laying work out clearly enough to keep track of calculations they've already done and thus completing the same calculation too many times

Not considering every possible outcome | Experimental probability
Theoretical probability
Two-way table
Tree diagram
Venn diagram
Universal set
Union
Intersection
Complement
Mutually exclusive
Independent events
Dependent events
Expected value
Random events
Control measure
Mitigation
Cost benefit analysis
Insurance | From GCSE (to be recapped and built upon throughout this term):
Basic probability rules
Tree diagrams
Venn diagrams
Set notation and vocabulary
Two-way tables
Fluency in percentages
Expected outcomes
Theoretical vs experimental probability |

			R10.2 Understanding that calculating an expected value is an important part of such decision making			

Term 4 Teacher 1	**Paper 1 Content**
	
	1. Graphical Construction, Analysis and Interpretation
	
	   - Histograms
	   - Cumulative Frequency
	   - Box Plots
	   - Stem and Leaf
	
	2. Standard Deviation
	
	3. The modelling cycle
	
	4. Fermi estimation
			D3.1 Calculating Mean, Median, Mode, Quartiles, Percentiles, Range, Interquartile range from Raw data and from graphs
			
			D3.2 Construct different types of graph from raw data including cumulative frequency diagrams, stem-and-leaf diagrams or box plots.
			
			F5.1 and D3.2 graphical representation, including plotting points to create graphs. Use these graphs to compare and contrast different scenarios and financial interpretations, reaching conclusions based on these measures
			
			D4.1 constructing and interpreting diagrams for grouped discrete data and continuous data, knowing their appropriate use and reaching conclusions based on these diagrams, including histograms with equal and unequal class intervals
			
			Calculate standard deviation from raw data. Calculate SD manually and also understand how to get the calculator to calculate SD by switching to stats mode and inputting raw data.
			
			E1 The modelling cycle
			E2 Fermi estimation
				Plotting the frequency rather than frequency density in a histogram
				
				Plotting frequency polygons at the edge of the range and cumulative frequency at the centre.
				
				Plotting bars on a cumulative frequency diagram
				
				Stating facts rather than comparing when asked to do so.
				
				Omitting a key in a stem-and-leaf diagram
				
				Not adding all the mean values in SD calculations.
				
				All calculators do the same calculation method
					Mean
					Median
					Mode
					Quartiles
					Percentiles
					Range
					Interquartile range
					Raw data
					
					Histograms
					Cumulative Frequency
					Box Plots
					Stem and Leaf
					
					Standard Deviation
					Measure of spread
					Frequency distribution
						Basic GCSE knowledge of types of graphs and their interpretation:
						
						  - Histograms
						  - Cumulative Frequency
						  - Box Plots
						  - Stem and Leaf
						  - Mean
						  - Mode
						  - Median
						  - Range
						  - IQR

Teacher 2	1. Preliminary material work 2. Exam practice	Exam papers completed in class and for homework, alternating between exam conditions and otherwise.	Going over all past exam papers Looking at this year's preliminary material and working on predicting questions and practising answers to them.			
Term 5 Teacher 1	**Paper 1 Content** 1. Critical Analysis and comparing data in context	Exam papers completed in class and for homework, alternating between exam conditions	**C1.**1 - C3.1 Criticising the arguments of others. Comparing results from a model with real data. Critical analysis of data quoted in media, political campaigns, marketing etc. C2.1 summarising and report writing techniques, strategies and presentation. How to influence others in a business and financial context			

	2. Report summarising and writing 3. The modelling cycle 4. Fermi estimation 5. Preliminary material work 6. Exam practice	and otherwise. Sit the external exam.	E1 The modelling cycle E2 Fermi estimation Going over all past exam papers Looking at this year's preliminary material and working on predicting questions and practising answers to them.		
Teacher 2	1. Preliminary material work 2. Exam practice	Sit the external exam.	Going over all past exam papers Looking at this year's preliminary material and working on predicting questions and practising answers to them.		