

YEAR 12 | A LEVEL CORE MATHS

The curriculum and assessment of students at this stage of education has been carefully designed to promote deep learning of mathematics and develop students into analytical and logical problem solvers.

The aims are to:

- » Consolidate and build on students' mathematical knowledge and understanding from their GCSE studies to develop further mathematical understanding and competence in the application of mathematics to real life problems.
- » Develop confidence in representing and analysing authentic situations mathematically, and in applying mathematics to address related questions and issues.
- » Build skills in mathematical thinking, reasoning and communication.
- » To support the mathematical content in other Level 3 qualifications, for example GCE A Level Biology, Business Studies, Computing, Geography, Psychology, BTEC Business, Health and Social Care, IT.
- » To prepare students for the range of varied contexts that they are likely to encounter in vocational and academic study, future employment and life.

Students will consider twelve context-led topics which have been chosen to show the wide range of applications of mathematics. These topics cover the mathematics required to cover the course specification. Skills are revisited during the topics to demonstrate their relevance and consolidate required knowledge.

HALF TERM 1

All students will know:

Statistics

- » Methods and limitations of different sampling techniques
- » How to construct and interpret diagrams for discrete and continuous data including box plots, cumulative frequency and histograms.
- » How to compare distributions by calculating measures of central tendency, quartiles, percentiles, IQR, variance and standard deviation.
- » Scatter graphs and correlation, calculate, use and interpret the ~~point~~ moment correlation coefficient.

All students will be assessed:

Class assessments on all the topics covered during this half term.

Reading skills needed for this unit:

Pearson Edexcel Maths in Context Project Book

Edexcel AS/A Level Mathematics Statistics Year 1 (e - Book).

Key vocabulary:

Discrete, continuous, grouped, systematic, simple random, convenience, independent, mean, median, mode, range, standard deviation, correlation, line of best fit, outliers, frequency density, stem and leaf, census, statistic, parameter, central tendency, distribution, standard deviation, variance, percentiles, regression.

HALF TERM 2

All students will know:

Statistics

- » Interpret and construct tables and graphs for time series data
- » Extrapolate and interpolate trends and understand the limitations of doing so.

Algebra

- » Calculate and use moving averages.
- » Writing and using expressions, equations and formulae.
- » Drawing and using straight line graphs.
- » Solving simultaneous equations.
- » Solve linear inequalities in 1 and 2 variables.

All students will be assessed:

Class assessments on all the topics covered during this half term.

Reading skills needed for this unit:

Pearson Edexcel Maths in Context Project Book

Edexcel AS/A Level Mathematics Statistics Year 1 (e - Book).

Key vocabulary:

Extrapolate, interpolate, expression, equation, formulae, gradient, intercept, variable, independent, explanatory, dependent, response.

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HALF TERM 3

All students will know:

Algebra

- » Arithmetic, geometric and Fibonacci sequences.
- » Iterative formula for sequences.
- » Graphical inequalities and linear programming techniques.

Number

- » How to calculate the costs of borrowing money and calculate compound interest. Ways to maximise profit, assess risk, compare and analyse sales, assurance and budgeting.

Statistics

- » Calculate, apply and interpret Spearman's Rank Correlation Coefficient.
- » Probability of dependent and independent events using tree diagrams, Venn diagrams, sum and product laws.
- » Calculate conditional probabilities from two-way tables, Venn diagrams and tree diagrams.

All students will be assessed:

Class assessments on all the topics covered during this half term.

Reading skills needed for this unit:

Pearson Edexcel Maths in Context Project

Edexcel AS/A Level Mathematics Statistics Year 1 (e - Book).

Key vocabulary:

Common difference, series, common ratio, term, iteration, compound, depreciation, appreciation, profit, loss, risk, correlation, dependent, independent, conditional probability, replacement, expected frequency, exclusive, complementary.

HALF TERM 4

All students will know:

Statistics

- » Understand and use set notation for probability.

Algebra

- » Solve linear simultaneous equations algebraically and graphically.
- » Set up, solve and interpret growth and decay problems including compound interest.
- » Graphs of quadratic, polynomial, exponential and reciprocal functions.
- » Sigma notation and sum to n terms of a geometric series.
- » Sum to infinity of a convergent geometric series.
- » Sum to n terms of an arithmetic series.

Number

- » Calculate with roots and integer and fractional indices.

All students will be assessed:

Class assessments on all the topics covered to date.

Reading skills needed for this unit:

Pearson Edexcel Maths in Context Project Book

Edexcel AS/A Level Mathematics Statistics Year 1 (e - Book).

Key vocabulary:

Union, intercept, complement, independent, mutually exclusive, exponential, reciprocal, polynomial, quadratic, sigma, convergent, divergent.

HALF TERM 5

All students will know:

Statistics

- » Calculate, apply and interpret Spearman's Rank Correlation Coefficient.

Algebra

- » Solve linear simultaneous equations algebraically and graphically.
- » Coordinate geometry of straight-line graphs, parallel lines, equation through two points or through one point with a given gradient.
- » Arithmetic and geometric series.
- » Sigma notation and sum to n terms of a geometric series.
- » Sum to infinity of a convergent geometric series.

All students will be assessed:

Class assessments on all the topics covered to date.

Reading skills needed for this unit:

Pearson Edexcel Maths in Context Project Book

Edexcel AS/A Level Mathematics Statistics Year 1 (e - Book).

Key vocabulary:

Common difference, series, common ratio, term, iteration, correlation, positive, negative, strong, weak, gradient, intercept, parallel, intersection, sigma, convergent, divergent.

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HALF TERM 6

All students will know:

Probability

- » Probability of dependent and independent events using tree diagrams, Venn diagrams, sum and product laws.
- » Calculate conditional probabilities from two-way tables, Venn diagrams and tree diagrams.
- » Understand and use set notation for probability.
- » Enumerate sets and combinations of sets systematically
- » Understand and interpret risk.

Number / Algebra

- » Set up, solve and interpret the answers to growth and decay problems.

All students will be assessed:

Mock Examination: on all topics covered in class to date.

Reading skills needed for this unit:

Pearson Edexcel Maths in Context Project.

Edexcel AS/A Level Mathematics Statistics Year 1 (e - Book).

Key vocabulary:

Union, intercept, complement, independent, mutually exclusive, compound, depreciation, appreciation, profit, loss, risk, correlation, dependent, independent, conditional probability, replacement, expected frequency, exclusive, complementary

HOW STUDENTS CAN BE SUPPORTED AT HOME

Pearson Active Learn e-books, videos of class assessment model answers, independent study guide with suggested websites, videos and reading lists. Researching current affairs or topics they are interested in and linking this to the mathematics involved.

HOW THIS LEARNING WILL BE EMBEDDED ELSEWHERE IN THE CURRICULUM

A Level Biology, Business Studies, Computing, Geography, Psychology, Sociology, BTEC Business, Health and Social Care, IT.

ENRICHMENT OPPORTUNITIES

Links to many opportunities via PADLET "Getting Started with Core Maths" such as QUIBBANS, AMSP resources and exam board resources.

The course can be tailored to include student interests and current affairs so news articles etc. can be incorporated into teaching resources.