

YEAR 12 CORE MATHS CONTENT (ONE YEAR COURSE)

Fermi Estimation Introducing ideas - piano tuner example	Application of Statistics Population project
Fermi Estimation Try estimations. Refine estimates - real data to improve answer	Application of Statistics Population project
Fermi Estimation Horse manure project	Application of Statistics Population project
Linear Programming Introduce problem - students to attempt solution . Set up constraints - representing inequalities on graphs	Probability Introductory concepts - simple dice games. Expected number. Dice game - champion of the world
Linear Programming Set up and solve linear equations	Probability Relative frequency - convergence to true probability. Experiment: eg which way does pin drop? Buffon's Needle
Linear Programming Set up equations to describe real-life problems. Space problem - linear graphs	Probability Investigate conditional probability - use tree diagrams with practical system (Marbles). Deal or no deal.
Application of Statistics Identify scams: use statistics to demonstrate scams. Human brain investigation	Series and Growth Using percentages. Multipliers and repeated changes. Experiment with Excel. Compound interest vs simple interest
Application of Statistics Correlation vs causation: introduce examples of spurious causation. Define "correlation": pmcc, sigma notation (A Level)	Series and Growth Exponential growth and decay files
Application of Statistics Best fitting straight lines - how to use, GCSE type examples. Regression lines - calculations	Series and Growth Hyperinflation - history cross-curricular link
Linear Programming Quadratic equations - set up and use quadratic equations to solve problems. Nasa example.	Probability Experiment: eg use observations to predict content of bag. Effect of increasing numbers
Linear Programming Combine inequalities to construct the feasible region - integer and non-integer solutions	Probability Predicting football scores: ten games - how likely? How do we estimate probability? How can we do better?

<p>Linear Programming Investigating objective function within the feasible region. Apply to range of problems - eg business decisions</p>	<p>Probability Betting: accumulators? each way? AND /OR. Introduce notation. Develop notation with Venn diagrams as concept.</p>
<p>Which factory shall we close - ASSESSMENT</p>	<p>Which factory shall we close - ASSESSMENT</p>
<p>Which factory shall we close - ASSESSMENT</p>	<p>Which factory shall we close - ASSESSMENT</p>
<p>Application of Statistics Mini-project: make a hypothesis and test using correlation (pmcc or spearman's rank). Use regression to make predictions.</p>	<p>Series and Growth Fibonacci series: original problem. Construct Fibonacci spirals, research in nature.</p>
<p>Application of Statistics Using lines of regression - interpolation</p>	<p>Series and Growth Construct Fibonacci spirals, research in nature. Investigate Golden Ratio</p>
<p>Application of Statistics Mini-project: make a hypothesis and test using correlation (pmcc or spearman's rank). Use regression to make predictions.</p>	<p>Series and Growth Standard sequences, notation, linear and quadratic</p>
<p>Linear Programming Look at LP problem - develop idea for the graphical method to solve</p>	<p>Series and Growth Using formulae for terms and sums of series</p>
<p>Linear Programming Combine inequalities to construct the feasible region - integer and non-integer solutions</p>	<p>Ebola Project Revision of statistical methods</p>
<p>Linear Programming Investigating objective function within the feasible region. Apply to range of problems - eg business decisions</p>	<p>Ebola ASSESSMENT</p>
<p>Series and Growth Exponential Growth - Vampire populations. Polynomial growth function x^n</p>	<p>Application of Statistics Patriotic design activity (reinforce spearman rank)</p>
<p>Series and Growth Exponential Growth - Research other examples. Identify underlying cause. Finance and Stock Markets - Shares introduction</p>	<p>Application of Statistics Climate change activity/Gambling Maths</p>

Series and Growth Finance and Stock Markets - Shares introduction	Application of Statistics Biodiversity Project - using moving averages to obtain trendline
Series and Growth Begin more realistic shares simulation: students "buy" a fixed portfolio of shares. Follow stock market.	Application of Statistics Biodiversity Project: which measure should I use? PMCC vs Spearman Rank
Series and Growth Geometric series: real life examples - compound interest and others. Repeat %	Probability Crop risk game - further reinforce idea of risk. financial risk game: http://www.risksandrewards.org.uk/invest/index.php?f=new
Series and Growth Sums of GS - use A-level resources. Zeno's paradox. Students to try to resolve - lead to investigation of infinite sums.	Probability Insurance Project - using probability to assess risk