STATISTICS

Year 11

What are the aims and intentions of this curriculum?

The aim of our Key Stage 4 Curriculum in Statistics is to ensure that students are engaged by recognising how frequently they use Statistics and how their Statistics understanding feeds into other areas, and to comprehend, interpret and communicate mathematical information in a variety of forms appropriate to the information and context.

Term	Topics	Knowledge and key terms	Skills developed	Assessment
Autumn 1	Time Series Probability	Time series • Moving averages • Identifying trends • Interpreting seasonal and cyclical trends in context • Mean seasonal variation Experimental and theoretical probability • Likelihood • Expected frequency of a specified characteristic within a sample or population • Use collected data and calculated probabilities to determine and interpret risk • Compare experimental data with theoretical predictions • Understand that increasing sample size generally leads to better estimates of probability and population parameters • Use two-way tables, sample space diagrams, tree diagrams and Venn diagrams to represent all the different outcomes possible for at most three events	Use appropriate language and the 0–1 probability scale Apply ideas of randomness to calculate expected outcomes of multiple future experiments Relate relative expected frequencies to theoretical probability Understand that empirical unbiased samples tend towards theoretical probability distributions, with increasing sample size Enumerate sets and combinations of sets systematically, using tables, grids, Venn diagrams and tree diagrams Make predictions using average seasonal effect	• Tests • Homework • Research and presentation.

Autumn 2	Probability
	
	Processing, representing and analysing data
		Experimental and theoretical probability
		• Independent events
		• Conditional probability
		• Difference in terms of bias
		Further summary statistics
		• Index numbers / weighted index numbers
		  ○ Retail price index (RPI)
		  ○ Consumer price index (CPI)
		  ○ Gross domestic product (GDP)
		• Interpret data related to rates of change over time when given in graphical form
			Calculate the probability of independent and dependent combined events, including using tree diagrams and other representations, and know the underlying assumptions
			
			Calculate and interpret conditional probabilities through representation using expected frequencies with two-way tables, tree diagrams and Venn diagrams
			
			Calculate and interpret rates of change over time from tables using context specific formula
				• Tests
				• Homework
				• Group work
				• Presentations

Spring 1	Probability distributions	Probability distributions
		• Binomial distribution
		  ○ Notation B(n, p)
		  ○ Conditions that make binomial model suitable
		  ○ Mean (np)
		  ○ Calculation of binomial probabilities
		• Normal distribution
		  ○ Notation N(μ, σ^2)
		  ○ Characteristics of Normal distribution
		  ○ Conditions that make Normal model suitable
		  ○ Approximately 95% of the data lie within two standard deviations of the mean and that 68% (just over two thirds) lie within one standard deviation of the mean
		Measures of dispersion
		• Standardised scores
		Quality assurance
		• Know that a set of sample means are more closely distributed than individual values from
			Calculate binomial probability
			
			Use action and warning lines in quality assurance sampling applications.
			
			Calculating standardised scores
				• Tests
				• Homework
				• Group work
				• Presentations

		the same population. • Control charts		

Spring 2	Statistical Enquiry Cycle/A03 Practice
	
	Mini-investigation
		Use this time to carry out an investigation. Students should have the opportunity to work with real world data sets. They may choose to investigate a problem from the sciences, geography, business, economics or other relevant field. Students should:
		• Define a hypothesis to be investigated
		• Decide data to collect
		• Plan a strategy on how to process and represent data
		• Generate diagrams to represent data
		• Generate statistical measures
		• Analyse diagrams and calculations
		• Draw conclusions relating to hypotheses
		  ○ Discuss reliability
		  ○ Identify weaknesses
		  ○ Suggest improvements
			Carry out an investigation using the knowledge obtained during the course of the year.	Proof reading and suggesting corrections.

Summer 1	Revision and Exam Preparation			