

Beths Grammar School KS4 Statistics Curriculum Map

GCSE Statistics

Exam Board: Edexcel

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Term	INTENT	IMPLEMENTATION	IMPACT
	Substantive Knowledge This is the specific, factual content for the topic, which should be connected into a careful sequence of learning.	Disciplinary Knowledge (Skills) This is the action taken within a particular topic in order to gain substantive knowledge.	Assessment opportunities What assessments will be used to measure student progress? Evidence of how well students have learned the intended content.
Autumn Term 1A	<p>Data and Sampling</p> <p>Types of data Population and sampling Sampling methods Planning and collecting data</p>	<ul style="list-style-type: none"> • Obtaining data from Primary and Secondary sources • Difference between quantitative and qualitative variables • Difference between discrete and continuous data • Understand the meaning of bivariate data and multivariate data • Understand the term population and sample • Understand the reasons for sampling • Understand sample size has an impact on reliability and replication • Understand, design and use a sampling frame • Understand the terms random, randomness and random sample • Understand the use of random numbers and some of the methods of generating these e.g. random number tables, random number function on calculator, random numbers from a hat • Investigate a population by selecting a random or stratified sample • Appreciate how bias might occur in sampling • Identify and extract sources of secondary data • Understand data needs to be 'cleaned' before being used • Form a Hypothesis and know appropriate strategies to test this hypothesis 	<p>End of chapter topic test (with peer marking)</p> <p>Chapter revision exercise via textbook</p> <p>End of term formal assessments</p>

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		<ul style="list-style-type: none"> • Be aware of factors involved with testing hypothesis (time, costs, confidentiality) 	
<p>Autumn Term 1B</p>	<p><u>Types of Data</u> Qualitative and Discrete data Continuous data Tabulation</p>	<ul style="list-style-type: none"> • Construct, draw, use and understand Pictograms, bar charts, line graphs, Stem and leaf diagrams, Venn diagrams • Transform one graph/chart to another • Use comparative 2D and 3D representations • Construct, draw, use and understand Pie charts, Histograms, Frequency Polygons and Cumulative frequency diagrams • Construct, draw and use Population Pyramids, Choropleth maps, Box plots • Construct draw and use Two-way tables, tally charts 	<p>End of chapter topic test (with peer marking)</p> <p>Chapter revision exercise via textbook</p> <p>End of term formal assessments</p> <p>Trial exams</p>
<p>Spring Term 2A</p>	<p><u>Averages and Central Tendency</u> Mode, Median, Mean Range, Interquartile range, Interpercentile range Standard deviation Skewness Outliers</p>	<ul style="list-style-type: none"> • Calculate mean, mode and median for a list of numbers, discrete and continuous data • Calculate the geometric mean and weighted mean. • Calculate range, quartiles, percentiles and interquartile range for discrete and continuous data • Calculate interpercentile range and interdecile range • Calculate standard deviation • Compare data samples and compare sample data with population data when given measures of dispersion • Construct, interpret and use box plots from summary statistics • Construct, interpret and use box plots from cumulative frequency graphs • Calculate outliers using the formulae • To show outliers on box plots and comment with reference to the original data • To determine skewness by inspection and calculation • To make interpretations in context • To use box plots as a method to compare two (or more) sets of data for dispersion, measure of central tendency and skewness • Identify simple properties of the shape of distributions of data including symmetry, positive and negative skew 	<p>End of chapter topic test (with peer marking)</p> <p>Chapter revision exercise via textbook</p> <p>End of term formal assessments</p>

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<p>Spring Term 2B</p>	<p><u>Correlation</u> Spearman’s rank correlation coefficient Pearson’s product moment correlation coefficient</p> <p><u>Time series</u> Moving averages Seasonal and cyclic trends</p>	<ul style="list-style-type: none"> • Plot a scatter diagram • Recognise the different types of correlation • Understand the distinction between correlation and causality • Draw a line of best fit and find the equation of the regression line • Understand the pitfalls of interpolation and extrapolation • Interpret data presented on a scatter diagram • Calculate and interpret Spearman's rank correlation coefficient • Interpret Pearson's Product Moment Correlation coefficient (PMCC) • Understand the distinction between Spearman's and Pearson's correlation coefficient • Describe and make comparisons of the strength of correlation • Plot points as a time series; • Draw a trend line by eye and use it to make a prediction; • Interpret seasonal and cyclic trends in context; • Calculate and use a 4 point moving average or other specified appropriate moving average; • Find the mean seasonal variation and extrapolate the data to make predictions for future years. 	<p>End of chapter topic test (with peer marking)</p> <p>Chapter revision exercise via textbook</p> <p>End of term formal assessments</p>

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<p>Summer Term 3A</p>	<p><u>Probability</u> Experimental Probability Theoretical Probability Two-way Tables Tree diagrams Venn diagrams</p> <p><u>Index Numbers</u> Retail Price Index Consumer Price Index Gross domestic product</p>	<ul style="list-style-type: none"> • Calculate estimates of probabilities • Interpret probability values • Compare expected frequency and actual frequency • Recognise that experimental probability will tend towards theoretical probability as the number of trials increases • Identify bias if experimental probability does not tend towards theoretical probability • Know and apply conditional probability formulae and independent events • Produce, understand and use a sample space • Understand the term mutually exclusive and apply the formulae $P(A \text{ or } B) = P(A) + P(B)$ • Draw and use probability tree diagrams for independent events • Use Venn Diagrams and two-way tables to represent all possible outcomes • To calculate conditional probability following a tree diagram, two-way table or Venn diagram • Have an understanding of the retail price index (RPI), consumer price index (CPI) and gross domestic product (GDP) and other index numbers in context; • Calculate and interpret simple index numbers; • Calculate and interpret rates of change over time including, but not limited to, births, deaths, house prices, unemployment and percentage change. 	<p>End of chapter topic test (with peer marking)</p> <p>Chapter revision exercise via textbook</p> <p>End of term formal assessments</p>

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<p>Summer Term 3B</p>	<p><u>Distributions</u> Binomial distribution Normal distribution Quality Assurance</p>	<ul style="list-style-type: none"> • Understand the notation $B(n,p)$ • Identify when a binomial distribution should be used and the conditions needed • Calculate probabilities using any standard method including calculator • Know the calculation for the mean of a binomial distribution is np • Understand the distinction between Binomial Probability Distribution and Binomial Cumulative Distribution • Work out probabilities such as $P(X>a)$ and $P(a<X<b)$ • Know the shape of a normal distribution curve and how this occurs • Understand the notation $N(\mu,\sigma^2)$ • Know the conditions to use the Normal Distribution • Know that 68% of data lies within one standard deviation of the mean, 95% of data lies within two standard deviations of the mean • Know how to draw 2 distribution curves on the same graph • Use standardised scores to compare two samples of data • Understand the process of quality assurance and see why this is necessary in the real world; • Know how to calculate both warning limits and action limits; • Know how to draw warning limits and action limits on a sample mean, median or range versus sample number graph; • Understand how action and warning limits are used in the manufacturing process. 	<p>End of chapter topic test (with peer marking)</p> <p>Chapter revision exercise via textbook</p> <p>End of term formal assessments</p> <p>Trial Exams</p>

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