**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** | **Data and Sampling** Types of data  Population and sampling  Sampling methods  Planning and collecting data | • 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  • Be aware of factors involved with testing hypothesis (time, costs, confidentiality) | End of chapter topic test (with peer marking)  Chapter revision exercise via textbook  End of term formal assessments |
| **Autumn Term 1B** | **Types of Data**  Qualitative and Discrete data  Continuous data  Tabulation | • 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 | End of chapter topic test (with peer marking)  Chapter revision exercise via textbook  End of term formal assessments  Trial exams |
| **Spring Term 2A** | **Averages and Central Tendency**  Mode, Median, Mean  Range, Interquartile range, Interpercentile range  Standard deviation  Skewness  Outliers | • 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 | End of chapter topic test (with peer marking)  Chapter revision exercise via textbook  End of term formal assessments |
| **Spring Term 2B** | **Correlation** Spearman’s rank correlation coefficient  Pearson’s product moment correlation coefficient  **Time series** Moving averages  Seasonal and cyclic trends | • 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 coefficiant (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. | End of chapter topic test (with peer marking)  Chapter revision exercise via textbook  End of term formal assessments |
| **Summer Term 3A** | **Probability**  Experimental Probability  Theoretical Probability  Two-way Tables  Tree diagrams  Venn diagrams  **Index Numbers**  Retail Price Index  Consumer Price Index  Gross domestic product | • Calculate estimates of proabilities  • 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 formule P(A 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. | End of chapter topic test (with peer marking)  Chapter revision exercise via textbook  End of term formal assessments |
| **Summer Term 3B** | **Distributions**  Binomial distribution  Normal distribution  Quality Assurance | • 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(μ,σ2)  • 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. | End of chapter topic test (with peer marking)  Chapter revision exercise via textbook  End of term formal assessments  Trial Exams |