

Year 11 - Statistics

Curriculum intent	Statistics are widely used in everyday life from all areas from medicine, business, science, teaching to politics. The study of GCSE Statistics allows learners to develop a deep understanding of how to handle and interpret statistics to help them question information given to them and to help find answers to questions raised. GCSE Statistics encourages learners to be critical thinkers, able to interpret, evaluate and critically question data. Students learn to question the source of the data, the validity of diagrams used to present data and how to use it to find answers to problems. Using many skills already gained from GCSE Mathematics, learners will study probabilities, manipulate datasets, explore sampling methods, and form hypotheses. The three main areas of statistics: the collection of data; processing, representing, and analysing data; and probability are covered in eight units of study. Building on the study completed in Year 10, learners will discover further ways in which to represent data. They will learn how to spot correlations and trends and judge when to use these to make predictions and assess the validity of the data. When studying time series data, learners will consider trends, and consider whether seasonal variation is causing this. Through calculation of moving averages, they will critically evaluate any predictions made using the data presented. As Year 11 continues, probability is studied in greater depth, gaining further understanding of the different terminology used, questioning whether there have been enough trials of an experiment for it to be considered fair and if it can be used to make future predictions. They will read, interpret, and create diagrams such as probability trees and Venn diagrams to calculate probability and use probability notation. Index numbers allow for further links with real life and the study of trends. Those learners on the higher tier will study advanced probability when looking at binomial and normal distributions and discover how statistics is used in quality control within manufacturing. Following completion of the curriculum content, learners will complete in class revision to prepare for the final GCSE assessments based on topics identified from careful analysis of previous performance in assessments.			
Term	Autumn 1	Autumn 2	Spring 1	Spring 2 to GCSE Examinations
Knowledge	Unit 4 Scatter Diagrams - Scatter diagrams - Correlation - Causal relationships - Line of best fit - Interpolation and extrapolation - Spearman's rank correlation coefficient - Pearson's product moment correlation coefficient (HT) Unit 5 Time Series - Time series - Trend lines - Moving averages	Unit 6 Probability - The meaning of probability - Experimental probability - Using probability to assess risk - Sample space diagrams - Venn diagrams - Mutually exclusive and exhaustive events - General addition law - Tree diagrams - Conditional probability	Unit 7 Index Numbers - Index numbers - RPI, CPI and GDP - Chain base index numbers Unit 8 Probability Distributions - Binomial distributions (HT) - Normal distributions (HT) - Standardised scores (HT) - Quality assurance and control charts (HT)	Revision In preparation for the final exams, learners will complete revision of selected topics covered in Year 10 and 11 based on their performance in mock exams. Learners should also be completing independent revision in preparation for their final exams.



Skills	Autumn 1	Autumn 2	Spring 1	Spring 2 to GCSE Examinations
	Unit 4 Scatter Diagrams and Correlation • Read and draw scatter diagrams. • Describe and make comparisons of correlation. • Draw a line of best fit and use a line of best fit to make predictions. • Understand and comment on the reliability of values found through interpolation and extrapolation. • Find the equation of a line of best fit. (HT) Draw a regression line on a scatter diagram (HT) • Interpret Spearman's rank correlation coefficient. • Calculate and understand Spearman's rank correlation coefficient and Pearson's product moment correlation coefficient (HT) Unit 5 Time Series • Draw and interpret line graphs and time series. • Draw trend lines on time series graphs and use inspection to identify trends. • Interpret rising, falling and level trends on a time series graph. • Identify seasonal variation on a time series graph. • Draw a trend line through moving averages by eye. • Calculate the estimated mean seasonal variation. (HT) • Know the predicted value = trendline + seasonal variation. (HT)	Unit 6 Probability • Read and draw scatter diagrams. • Understand the meaning of the keywords used in probability, e.g., certain, likely etc. • Use fractions, decimals, and percentages to represent probability. • Calculate expected frequencies and compare them with actual frequencies. • Use probability to assess risk. • Use sample space diagrams, Venn diagrams and tree diagrams to represent all the different outcomes possible for up to three events. • Understand the terms mutually exclusive and exhaustive. • Use the addition law $P(A \text{ or } B) = P(A) + P(B)$ for two mutually exclusive events. • Understand what it means for two events to be independent. • Use the multiplication law for independent events. • Understand what it means for two events to be conditional. • Calculate conditional probability using a tree diagram, two-way table, or Venn diagram. • Use the formula for conditional probability. • Know that for independent events A and B, $P(A) = P(A B)$	Unit 7 Index Numbers • Calculate and interpret index numbers, including retail price index (RPI) and consumer price index (CPI) • Interpret GDP values. • Calculate rates of change over time including crude birth and death rates. • Calculate standardised birth and death rates (HT) • Calculate and interpret weighted and chain base index numbers (HT) Unit 8 Probability Distributions All Higher Tier topics • Know the conditions for a binomial or a normal distribution to be a suitable model. • Calculate probabilities using a binomial distribution. • Use and understand the notation used for a binomial distribution. • Know the shape of a normal distribution and how this occurs. • Use and understand the notation used for a normal distribution. • Use standardised scores to compare two samples of data. • Understand the process of quality assurance and why it is necessary in the real world. • Calculate warning and action limits for means. Understand how these are used in the manufacturing process.	• Revision topics will be selected based on performance in the mock exams. • Using detailed analysis of assessments completed, areas of weakness will be identified. These will be topics of focus during in class revision. • To ensure that gaps are being identified and addressed, learners will complete regular in-class assessments which will be used to inform planning and monitor progress. It is essential to complement in class revision that all learners are completing independent revision and attending after school revision in addition to the revision that will be completed in class.



Assessments	• Low stakes assessments at the end of each unit. Unit 4 Scatter Diagrams Unit 5 Time Series • Past GCSE paper – calculator.	• Low stakes assessments at the end of each unit. Unit 6 Probability	• Low stakes assessments at the end of each unit. Unit 7 Index Numbers Unit 8 Probability Distributions • Year 11 Mocks Full GCSE series 2 x calculator papers	• Regular low stakes assessments at the end of each revision topic. • Regular in-class assessments to aid revision and retrieval and to build exam skills. • Final GCSE papers.
Enrichment	• Make sure that you are attending after school revision! • Where can you find statistics being used to convince you of something or to encourage you to buy something? Use your analytical skills to test the data they are using. Consider if there misleading diagrams, what is the source, how reliable is it? Write a report to demonstrate if they are being misleading and why. Use statistical reasoning to justify your findings.	• Prepare for your mock examinations by watching videos, completing exam style questions and past papers using the Statistics Genie website. • Find the data handling and probability topics in Statistics that overlap with Maths and use Corbettmaths to find more practice questions. Visit https://corbettmaths.com/	• Make some flash cards of the key definitions and formulae that you will need for the exam. • Take part in 10 Mark March. Can you achieve an extra 10 marks on each paper? Go through your past assessments to find where you can get those extra marks and see if you can boost your grade.	• Make sure you are attending school revision! • Remember the best way to revise Statistics is to do past questions – lots of them! Use Statistics Genie, Corbettmaths and MathsWatch. Use the resources you have been given by your teacher to help you revise.