GCSE Statistics Scheme of Learning

Autumn Term (Year 10)

Students are introduced to time series analysis to begin their Statistics GCSE. This draws on their experience from KS3 graphing, averages and extends students to spot more complex patterns. Our aim is to allow learners to engage with Statistics in the real world, examples of stock markets and share prices are used to enforce the importance of Statistics.

Following this, students will look at different types of data and will be required to engage with the vocabulary of Statistics. This will underpin the entire course and will ensure students have a strong foundation to build upon. Students will need to consider different methods of sampling, and explore the advantages and disadvantages of each.

Higher Attaining students will take their analysis of time series graphs further by finding the mean seasonal variation; this will enable them to extrapolate the data and make predictions for future years. Depth will be provided by looking at stratified sampling, control groups and techniques to estimate population sizes.

Spring Term (Year 10)

In the spring term students will build upon their knowledge by looking at representing, processing and analysing data. This connects with the Statistics units presented in GCSE Mathematics, and introduces other techniques to provide a breadth of strategies when analysing data.

Students will finish the term by developing an understanding of central tendency. This will enable students to start drawing conclusions about the data they have collected and will introduce them to the idea of being able to make predictions about the outcomes of future events. Students will be challenged to calculate both geometric and weighted means in order to further analyse the data they are faced with.

Throughout this term, higher attaining students will look to question their findings by comparing one set of data with another and by looking at how to discover errors. They will also be challenged to transform one representation of data to another.

Summer Term (Year 10)

During the summer term students will encounter the formal idea of distributions for the first time. They will investigate an example of a continuous distribution before building an understanding of normal distribution and the conditions that make this type of distribution suitable. If students choose to study Statistics beyond GCSE, this idea will become very important.

Students will then move on to looking at measures of dispersion in data. This builds upon their KS3 data work and acts as a platform to deepen their understanding. In addition to this they will be introduced to the idea of skew to describe the shape of data. Higher attaining students will be expected to take their learning further by formalising the identification of outliers and through calculations of skew.

Students will be challenged to extend their understanding through the application of their skills to quality assurance which further builds upon the importance of Statistics in the real world.

Autumn Term (Year 11)

In the first term of Year 11 students will look at how bivariate data correlates, first by inspection and then going on to use lines of best fit and two different correlation coefficients - Spearman's and Pearson's. A significant learning point will be to ensure that students understand that a correlation does not imply causation.

Following this, students will work on the idea of simple and theoretical probability; this will reinforce work covered in Year 10 in their GCSE Mathematics lessons on probability. Students will be looking at different structures to help calculate probability such as tree diagrams and Venn diagrams. Students will also learn how to calculate conditional probability both intuitively and using a formula.

Through the use of Pearson's product moment correlation coefficient, higher attaining students will be able to test for linear correlation as opposed to just any correlation. This helps students to analyse their data and understand how far data points lie from a regression line.

Spring Term (Year 11)

Students will start the spring term of year 11 by encountering an example of a discrete distribution and by looking at how to calculate probabilities using a binomial distribution. They will also build an understanding of the conditions in which binomial distributions can be used as a suitable model.

Their journey through GCSE Statistics will finish by understanding that we live in an ever changing world. They will look at the changes that occur within populations of countries as well as looking at the changes that occur within age, gender, ethnicity and geographic distribution. On top of this, students will be expected to challenge their understanding by considering that the same could be said of the financial world with average incomes, and cost of living fluctuating all the time.

Students will be expected to work with and use index numbers as well as rates of change formula to make sense of the changes happening around them.

Higher attaining students will be challenged to investigate our world further through the calculation of birth and death rates. On top of this, they will deepen their understanding of index numbers through the study of weighted index numbers and chain base index numbers.

Summer Term (Year 11)

This Scheme of Learning is designed to be complete by the end of Spring Term so that our focus can turn to exam preparation and revision of key topics. Topics are identified on a class by class basis and through thorough analysis of previous assessments, (such as mocks) to identify strengths and weaknesses of both individuals and the class as a whole.

Model answers to past exam questions are developed and used to emphasise good exam technique, and opportunities to implement examiner mark schemes are incorporated. Students will be encouraged to work under a degree of time pressure and scrutiny to develop the necessary focus under pressure.

Walking/talking mocks will be offered to further hone exam technique. Mathematics Genie and Hegarty Mathematics, as well as a variety of free online resources and revision guides are available to facilitate individual revision. Time will be put aside to allow students themselves to suggest topics for further revision based on their self-analysis and individual efforts.