

Option 1: Two-year course planner

Topics in bold type are Higher tier only.

Year 1

Year 1	Statistics specification content	Co-teaching opportunity with GCSE Mathematics	Statistical enquiry cycle opportunity
Autumn 1	1. The collection of data 1(a) Planning - Hypotheses - Designing investigations - Strategies to deal with potential problems 1(b) Types of data - Describing data - Raw data, quantitative, qualitative, categorical, ordinal, discrete, continuous, ungrouped, grouped, bivariate and multivariate - Advantages and implications of merging/grouping data - Primary/secondary data - Advantages and disadvantages 1(c) Population and sampling - Population, sample frame and sample - Judgment, opportunity (convenience) and quota sampling	S5 apply statistics to describe a population	<i>Defining a question or hypothesis to investigate.</i> <i>Developing a strategy for how to process and represent data.</i> <i>Designing methods for collecting primary data.</i>
Autumn 2	1(c) Population and sampling - Random, systematic and quota sampling - Advantages of each method - Techniques to avoid bias - Stratified sampling	S1 infer properties of populations or distributions from a sample, while knowing the limitations of sampling	<i>Deciding what data to collect and how to collect and record it, giving reasons.</i>

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	2(h) Estimation - Use summary statistics to make estimates of population characteristics - Use sample data to predict population proportions - Know that sample size has an impact on reliability and replication Apply Petersen capture recapture formula to calculate an estimate of the size of a population 1(d) Collecting data - Collection of data - Experimental (laboratory, field and natural), simulation, questionnaires, observation, reference, census, population and sampling - Reliability and validity - Collecting sensitive content matter Random response - Questionnaires and interviews - Leading questions, avoiding biased sources, time factors, open/closed questions, different types of interview technique - Problems with collected data - Missing data, non-response, 'cleaning' data - Controlling extraneous variables Control groups		<i>Making inferences and/or predictions.</i> <i>Organising, processing and 'cleaning' data, using technology.</i>
Spring 1	2. Processing, representing and analysing data 2(a) Tabulation - Tally, tabulation, two-way tables - Frequency tables 2(a) Representing data - Pictogram	S2 interpret and construct tables, charts and diagrams, including frequency tables, bar	

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	- Pie chart - Bar charts - Stem and leaf diagram - Population pyramid - Choropleth map Comparative pie chart Comparative 2D representations/comparative 3D representations. - Interpret and compare data sets represented pictorially - Line graphs - Bar line (vertical line) charts - Frequency polygons - Cumulative frequency (discrete and grouped) charts - Histograms (equal class width) - Box plots - Interpret and compare data sets represented graphically	charts, pie charts and pictograms for categorical data, vertical line charts for ungrouped discrete numerical data, tables and line graphs for time series data and know their appropriate use	<i>Generating diagrams and visualisations to represent the data, including an understanding of outputs generated by appropriate technology.</i>
Spring 2	2(a) Representing data Histograms unequal class widths Frequency density Interpret and compare data sets displayed in histograms 2(a) Representing data - Justify appropriate form to represent data - Graphical misrepresentation - Determine skewness by inspection - Interpreting a distribution of data with reference to skewness Calculating skewness - Comparing data sets represented in different formats	S3 construct and interpret diagrams for grouped discrete data and continuous data, i.e. histograms with equal and unequal class intervals and cumulative frequency graphs, and know their appropriate use	
Summer 1	2(b) Measures of central tendency - Averages from raw or grouped data - Mean, median, mode	S4 interpret, analyse and compare the	<i>Generating statistical measures to compare data,</i>

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	Weighted mean Geometric mean - Justify appropriate average to use in context 2(c) Measures of dispersion - Range, quartiles, interquartile range (IQR), percentiles Interpercentile range, interdecile range Standard deviation - Identifying outliers by inspection Identifying outliers by calculation - Comment on outliers in context - Compare data sets using appropriate measure of central tendency and measure of dispersion	distributions of data sets from univariate empirical distributions	<i>understanding the advantages of using technology to automate processing.</i> <i>Analysing and interpreting diagrams and calculations.</i>
Summer 2	2(e) Scatter diagrams and correlation - Explanatory (independent) variables and response (dependent) variables - Correlation - Positive, negative, zero, weak, strong - Distinction between correlation and causation - Line of best fit Using the regression equation $y = a + bx$ Calculate Spearman's rank correlation coefficient - Interpret Spearman's rank in context Interpret Pearson's product moment correlation coefficient (PMCC) in context Understand the distinction between Spearman's rank correlation coefficient and Pearson's product moment correlation coefficient (PMCC)	S6 use and interpret scatter graphs of bivariate data; recognise correlation and know that it does not indicate causation; draw estimated lines of best fit; make predictions; interpolate and extrapolate apparent trends while knowing the dangers of so doing	<i>Reaching conclusions that relate to the questions and hypotheses addressed.</i>

Year 2

Year 2	Statistics specification content	Co-teaching opportunity with GCSE Mathematics	Statistical enquiry cycle opportunity
Autumn 1	2(f) Time series - Moving averages - Identifying trends - Interpreting seasonal and cyclical trends in context - Mean seasonal variation Predictions using average seasonal effect 3. Probability 3. 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	P3 use appropriate language and the 0–1 probability scale P2 apply ideas of randomness to calculate expected outcomes of multiple future experiments P3 relate relative expected frequencies to theoretical probability P5 understand that empirical unbiased samples tend towards theoretical probability distributions, with increasing sample size	<i>Making predictions.</i> <i>Making inferences and/or predictions.</i>

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	Use two-way tables, sample space diagrams, tree diagrams and Venn diagrams to represent all the different outcomes possible for at most three events	P6 enumerate sets and combinations of sets systematically, using tables, grids, Venn diagrams and tree diagrams	
Autumn 2	3. Experimental and theoretical probability - Independent events - Conditional probability Difference in terms of bias	P8 calculate the probability of independent and dependent combined events, including using tree diagrams and other representations, and know the underlying assumptions P9 calculate and interpret conditional probabilities through representation using expected frequencies with two-way tables, tree diagrams and Venn diagrams	

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	2. Processing, representing and analysing data 2(d) 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 and interpret rates of change over time from tables using context specific formula		<i>Interpreting the diagrams and calculations.</i>
Spring 1	3. Probability distributions Binomial distribution Notation $B(n, p)$ Conditions that make binomial model suitable Mean (np) Calculation of binomial probabilities Normal distribution Notation $N(\mu, \sigma^2)$ 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 2(c) Measures of dispersion Standardised scores 2(g) Quality assurance Know that a set of sample means are more closely distributed than individual		

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	values from the same population. • Control charts ○ Use action and warning lines in quality assurance sampling applications.		
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 ○ Make refinements		
Summer 1	Revision for Paper 1 and Paper 2		