

Curriculum Planning

Subject: Statistics

1 Year Plan

Subject: Edexcel GSCE Statistics

Enrichment Opportunities

Investigations into how statistics are presents in the media

Students should use this time to carry out an independent statistical 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. In the investigation 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

Highlighted in blue – Higher Tier content only

Year 1

Time	Key Subject Content	Sequencing	Rationale	Careers, Industry Links and Cultural Capital	Reading	SEMH
Half Term 1: Sep – Oct	Processing, representing and analysing data	<p>2. Processing, representing and analysing data</p> <p>2(a) Tabulation</p> <ul style="list-style-type: none"> • Tally, tabulation, two-way tables • Frequency tables <p>2(a) Representing data</p> <ul style="list-style-type: none"> • Pictogram • 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 	<p>Students should be able to interpret and construct tables, charts and diagrams, including frequency tables, bar 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</p> <p>They should be confident in constructing and interpret diagrams for grouped discrete data and continuous data, i.e. histograms with equal and unequal class intervals and cumulative</p>	<p>During the introduction to GCSE Statistics we will explore and research jobs who rely on statistics and statistical modelling.</p> <p>Such as; marketing, economics, healthcare etc Understanding how to interpret graphs and charts enables students to make sense of data presented in other subjects,</p>	<p>Students will be introduced to subject specific vocabulary linked to variation of date analysis and representation.</p>	<p>This allows for students to connect up experiences and give purposeful attention.</p> <p><i>Boxall strand A/C.</i></p>

		<ul style="list-style-type: none"> • Line graphs • Bar line (vertical line) charts • Frequency polygons • Cumulative frequency (discrete and grouped) charts • Histograms (equal class width) • Box plots <p>Interpret and compare data sets represented graphically</p>	<p>frequency graphs, and know their appropriate use</p>	<p>geography, history, science etc, journals, newspapers, tv etc</p>		
Half Term 2: Oct – Dec	Processing, representing and analysing data	<p>2(b) Measures of central tendency</p> <ul style="list-style-type: none"> • Averages from raw or grouped data <ul style="list-style-type: none"> ◦ Mean, median, mode • Weighted mean • Geometric mean • Justify appropriate average to use in context <p>2(c) Measures of dispersion</p> <ul style="list-style-type: none"> • 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 	<p>Students should be able to 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</p>	<p>Students can develop their own research around a topic of personal interest including a careers task. Such as finding the average earning of those in their ideal career.</p>	<p>Students will have increased independent reading opportunities to allow for whole class discussions around the decoding and understanding of exam style questions.</p>	<p>This allows for students to connect up experiences and show insightful involvement through collaborative/ teacher lead discussion.</p> <p><i>Boxall strand C/D.</i></p>

- Compare data sets using appropriate measure of central tendency and measure of dispersion

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)

		<p>2(f) Time series</p> <ul style="list-style-type: none"> • Moving averages • Identifying trends • Interpreting seasonal and cyclical trends in context • Mean seasonal variation <ul style="list-style-type: none"> ◦ Predictions using average seasonal effect 			
Half Term 3: Jan – Feb	The collection of data	<p>1. The collection of data</p> <p>1(a) Planning</p> <ul style="list-style-type: none"> • Hypotheses • Designing investigations • Strategies to deal with potential problems <p>1(b) Types of data</p> <ul style="list-style-type: none"> • Describing data <ul style="list-style-type: none"> ◦ Raw data, quantitative, qualitative, categorical, ordinal, discrete, continuous, ungrouped, grouped, bivariate and multivariate • Advantages and implications of merging/grouping data • Primary/secondary data 	<p>Students should be able to apply statistics to describe a population, being able to infer properties of populations or distributions from a sample, while knowing the limitations of sampling.</p>	<p>Use of logic and a systematic approach essential in problem solving</p>	<p>Handling data questions may involve formulating simple hypotheses and using their data analysis to interpret and explain their findings.</p> <p><i>(Boxall stand C).</i></p>

		<ul style="list-style-type: none"> ○ Advantages and disadvantages <p>1(c) Population and sampling</p> <ul style="list-style-type: none"> • Population, sample frame and sample <p>Judgment, opportunity (convenience) and quota sampling</p>			
Enrichment	Last 2 lessons of half term (or to fit with industry week)		<p>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.</p>	<p>This will allow students to explore any career/ industry of personal interest.</p>	<p>Students will carry out independent reading as part of their research.</p>
Half Term 4: Feb – April	Probability	<p>3. Experimental and theoretical probability</p> <ul style="list-style-type: none"> • Independent events • Conditional probability • Difference in terms of bias <p>3 (b). Probability distributions</p> <ul style="list-style-type: none"> • Binomial distribution <ul style="list-style-type: none"> ○ Notation $B(n, p)$ ○ Conditions that make binomial model suitable ○ Mean (np) 	<p>Students should use appropriate language and the 0–1 probability scale.</p> <p>Apply ideas of randomness to calculate expected outcomes of multiple future experiments</p> <p>Relate relative expected frequencies to theoretical probability</p>	<p>When working on the probability topic area we will discuss a wide variety of financial professionals such as asset managers, traders and economic policy makers and how they use probability to</p>	<p>Students need to carefully read and follow instructions to perform accurate assess the meaning of the question and the subtle difference between independent and dependent events and link that to the</p> <p>(Boxall stand A).</p>

		<ul style="list-style-type: none"> ○ 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 <p>2(c) Measures of dispersion</p> <ul style="list-style-type: none"> ● Standardised scores <p>2(g) Quality assurance</p> <ul style="list-style-type: none"> ● Know that a set of sample means are more closely distributed than individual values from the same population. ● Control charts <p>Use action and warning lines in quality assurance sampling applications.</p>	model and prepare for different scenarios.	relevant rules which apply in each situation.	
Half Term 5: April – May	Probability	<p>3. Probability</p> <p>3. Experimental and theoretical probability</p> <ul style="list-style-type: none"> ● Likelihood 	<p>Revisit the concept of 0-1 Probability scaling.</p> <p>Deepen the links between probability language and finding the</p>	<p>Look at industry specific data as part of in class lesson structure.</p>	<p>Students need to recognise and interpret the requirements of the questions, looking for key</p> <p>Modelling of the new mathematical and statistical concepts gives students the opportunity to</p>

		<ul style="list-style-type: none"> • 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. • Use two-way tables, sample space diagrams, tree diagrams and Venn diagrams to represent all the different outcomes possible for at most three events. • Independent events • Conditional probability 	<p>alternative probability, ie the probability of an event happening is 0.2, therefore the probability of an event not happening is 0.8.</p> <p>Students should be able to enumerate sets and combinations of sets systematically, using tables, grids, Venn diagrams and tree diagrams</p>		<p>indicator worked such as 'not happening' or 'replaced' as this impacts the functions the student needs to be able to recall and perform.</p>	<p>apply purposeful attention. <i>(Boxall strand A).</i></p>
Half Term 6: June - July		Revision, Practice, Addressing 'Gaps'	Create an exam ready cohort.	Open discussion around careers in relation to exam style questions.	Building opportunities to close any gaps around subject vocabulary.	Implement tasks that address the whole class Boxall strand.