Academic Learning Plan 2023-2024

Statistics – Year 10

Intent : This qualification incorporates numerous examples of real-life data and contexts, which build skills that students will use in other subjects, such as science and geography. Based on the principles of the statistical enquiry cycle, students gain a rounded understanding of how to

	Term 1			Term 2		
Year 10 Units	1a Types of data	1b Population sampling	1c Sampling methods	1c Sampling methods	1d Planning & collecting data	Chapter 1 project
Content (National curriculum)	• Recognise that data can be obtained from primary and secondary sources; • Recognise the difference between quantitative and qualitative variables; • Recognise the difference between discrete and continuous data; • Recognise and use scales of measurement – categorical, rank, ordinal; • Categorise data through the use of well-defined, precise definitions or class boundaries; • Understand, use and define situations for grouped and ungrouped data; • Understand the meaning of bivariate data and multivariate data; • Know the difference between independent and dependent variables.	• Understand the meaning of the term population and sample; • Understand the word 'census' with regard to small scale and large scale populations; • Understand the reasons for sampling and that sample data is used to estimate values in a population; • Understand that sample size has an impact on reliability and replication; • Understand, design and use a sampling frame; • Apply and use Peterson's data capture technique to estimate population sizes and know the assumptions made.	• Understand the terms random, randomness and random sample; • Understand the use of random numbers and some of the methods of generating these: • random number tables; • random number function on the calculator; • picking random numbers from a hat; • Be able to select a random sample, or a stratified sample, by one category as a method of investigating a population; • Appreciate how bias in a sampling procedure might occur and how it might be minimised; • Know the difference between: • opportunity (convenience) sampling; • systematic sampling; • quota sampling; • judgement sampling; • stratified sampling (note this could be by more than one category).		• Understand that there are different methods to collect primary data from different sources; • Identify appropriate sources of secondary data; • Extract data from secondary sources, including those based on ICT; • Understand that data needs to be 'cleaned' before being used; • Understand the aspects of accuracy, reliability, relevance and bias as related to secondary data; • Know the purpose of pilot surveys • Know how random response is used for sensitive questions • Understand the techniques used to deal with possible problems associated with the collection of data (including issues of sensitivity); • Understand why control groups are used in questioning and testing and the system of matched pairs to avoid bias. • Form a hypothesis, and know the appropriate strategies to test this hypothesis; • Be aware of factors involved with testing a hypothesis (including time, costs, ethical issues, confidentiality and convenience); • Identify problems that may arise with the statistical enquiry cycle (e.g. non response of surveys, difficulty estimating the population or unexpected outcomes) and come up with strategies to help overcome these.	Real-world project on a problem to solve within Wadham School. Students will plan the investigation, make decisions on who to sample, design a data collection method and then go ahead & collect the data for real.
Literacy	Within knowledge organisers & displayed in classrooms					
Knowledge organiser	Within exercise books					
Assessment	End of term 1 & 2 assessment					
GCSE AO Link	Assessing all AO					
Homework	Weekly homework, combination of paper & online activities					
CEIAG	Software Engineer	Statistician	Library Technician	Nutritionist	Air Traffic Controller	Accountant
Enrichment	Weekly Maths Challenges					

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	Term 3			Term 4	
Year 10 Units	2a Qualitative & discrete data	2b Continuous data	2c Tabulation	3a Measures of central tendency	Chapter 2 project
Content	• Construct, draw, use and understand: • Pictograms; • Bar charts; • Multiple or composite bar charts for qualitative and discrete data; • Vertical line graphs; • Stem and leaf diagrams; • Venn diagrams; • Understand the distinction between well-presented and poorly presented data; • Understand the potential for visual misuse, by omission or misrepresentation; • Transform from one presentation to another; • Understand how to discover errors in data and recognise data that does not fit a general trend or pattern; • Use Comparative 2D and 3D representations; • Group data into class intervals and be aware of the advantages and implications of doing so.	• Construct, draw, use and understand: • Pie charts; • Histograms with equal and unequal class intervals and unequal class intervals. • Frequency polygons; • Cumulative frequency diagrams; • Population pyramids; • Choropleth maps; • Box plots; • Transform from one presentation to another; • Understand how to discover errors in data and recognise data that does not fit a general trend or pattern; • Group data into class intervals and be aware of the advantages and implications of doing so; • Use calculated/given summary statistics for continuous data to make estimates of population characteristics, for example, samples to estimate the population mean.	• Construct, draw, use and understand: • Two-way tables and tally charts and any other data represented in a table format.	• Calculate the mean, mode and median for a list of numbers; • Calculate the mean, mode and median for discrete data listed in a table (grouped); • Calculate the mean, mode and median for continuous data listed in a table (grouped) including linear interpolation for the median; • Understand the appropriateness, advantages and disadvantages of each of the three measures of central tendency; • Understand the effect of transformations on the mean, mode, median; • Calculate the geometric mean and weighted mean.	Real-world project on a problem chosen by students. Students will plan the investigation, collect the data and then focus on the most suitable representation of the data.
Literacy	Within knowledge organisers & displayed in classrooms				
Knowledge organiser	Within exercise books				
Assessment	End of term 3 & 4 assessment				
GCSE AO Link	Assessing all AO				
Homework	Weekly homework, combination of paper & online activities				
CEIAG	Pharmacist	Economist	Civil Engineer	Financial Analyst	Auditor
Enrichment	Weekly Maths Challenges				

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	Term 5		Term 6	
Year 10 Units	3b Measures of dispersion	3c Box plots, skewness, calculating and representing outliers	Catch up & Mock preparation	7a Interpreting index numbers in context and simple calculations
Content (National curriculum)	• Calculate the range, quartiles, percentiles and interquartile range for discrete and continuous data; • Calculate the interpercentile range and interdecile range; • Calculate the standard deviation; • Compare data samples and to 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; • To calculate outliers using the formulae Small outlier is < LQ – 1.5 × IQR Large outlier is > UQ + 1.5 × IQR Or outlier is outside $\mu \pm 3\sigma$ • 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.		• 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.
Literacy	Within knowledge organisers & displayed in classrooms			
Knowledge organiser	Within exercise books			
Assessment	End of term 5 & End of term 6 mocks			
GCSE AO Link	Assessing all AO			
Homework	Weekly homework, combination of paper & online activities			
CEIAG	Architect	Interior Designer	Bank Teller	Meteorologist
Enrichment	Weekly Maths Challenges			