FOUNDATION	INTERMEDIATE	HIGHER
USING AND APPLYING HANDLING DATA		
Problem Solving		
• Carrying out each of the four aspects of the handling data cycle to solve problems. • Specify the problem and plan: formulate questions in terms of the data needed, and consider what inferences can be drawn from the data. • Decide what data to collect (including sample size and data format) and what statistical analysis is needed. • Collect data from a variety of suitable sources, including experiments and surveys, and primary and secondary sources. • Process and represent data; turn the raw data into useable information that gives insight into the problem. • Interpret and discuss; answer the initial questions by drawing conclusions from the data. • Identify what further information is needed to pursue a particular line of enquiry. • Select and organise the appropriate mathematics and resources to use for a task. • Review progress while working; check and evaluate solutions.	• **Select the problem solving strategies to use in statistical work and monitor their effectiveness (these strategies should address the scale and manageability of the tasks and consider whether the mathematics and approach used are delivering the most appropriate solutions).**	
Communicating		
• Interpret, discuss and synthesise information presented in a variety of forms. • Communicate mathematically, including using ICT, making use of diagrams and related explanatory text.	• Communicate mathematically **with emphasis on the use of an increasing range of diagrams and related explanatory text, on the selection of their mathematical presentation, explaining its purpose and approach, and on the use of symbols to convey statistical meaning.**	

FOUNDATION	INTERMEDIATE	HIGHER
USING AND APPLYING HANDLING DATA		
Reasoning		
• Apply mathematical reasoning explaining inferences and deductions.	• Apply mathematic reasoning explaining **and justifying** inferences and deductions, **justifying arguments and solutions.**	
	• **Identify exceptional or unexpected cases when solving statistical problems.**	
• Explore connections in mathematics and look for cause and effect when analysing data.	• Explore connections in mathematics **and look for relationships between variables when analysing data.**	
	• **Recognise the limitations of any assumptions and the effects that varying the assumptions could have on the conclusion drawn from the data analysis.**	

FOUNDATION	INTERMEDIATE	HIGHER
SPECIFYING THE PROBLEM AND PLANNING		
• See that random processes are unpredictable. • Identify questions that can be addressed by statistical methods. • Discuss how data relate to a problem. • Identify which primary data they need to collect and in what format, including grouped data, considering appropriate equal class intervals. • Design an experiment or survey. • Decide what secondary data to use.	• Identify **key** questions that can be addressed by statistical methods. • **Identify possible sources of bias and plan to minimise it.** ***random and stratified sampling.*** • Decide what **primary and** secondary data to use.	• ***Select and justify a sampling scheme and a method to investigate a population, including***
COLLECTING DATA		
• Design and use data collection sheets for grouped discrete data and continuous data. • Collect data using various methods, including observation, controlled experiment, data logging, questionnaires and surveys. • Gather data from secondary sources including printed tables and lists from ICT based sources. • Design and use two-way tables for discrete and grouped data.	• **Deal with practical problems such as non-response or missing data.**	

FOUNDATION	INTERMEDIATE	HIGHER
PROCESSING AND REPRESENTING DATA		
• Draw and produce, using paper and ICT, pie charts for categorical data and diagrams for continuous data, including line graphs for time series, scatter graphs, frequency diagrams and stem and leaf diagrams. • Draw lines of best fit by eye, understanding what these represent. • Calculate mean, range and median of small sets with discrete and then continuous data. • Identify the modal class from grouped data.	• Draw and produce, using paper and ICT, pie charts for categorical data and diagrams for continuous data, including line graphs (time series), scatter graphs, frequency diagrams, stem and leaf diagrams, **cumulative frequency tables and diagrams and box plots.** • **Find the median, quartiles and interquartile range for large data sets and calculate the mean for large data sets with grouped data.** • **Calculate an appropriate moving average.** • **Use relevant statistical functions on a calculator or spreadsheet.**	• Draw and produce, using paper and ICT, ***cumulative frequency tables and diagrams, box plots and histograms for grouped continuous data.***

FOUNDATION	INTERMEDIATE	HIGHER
INTERPRETING AND DISCUSSING DATA		
• Relate summarised data to the initial questions. • Interpret a wide range of graphs and diagrams and draw conclusions. • Look at the data to find patterns and exceptions.		
• Compare distributions and make inferences, using the shapes of distributions and measures of average and range.	• Compare distributions and make inferences, using the shapes of distributions and measures of average **and spread, including median and quartiles.**	• ***Understand frequency density*.**
• Consider and check results and modify approach if necessary.		
• Have a basic understanding of correlation as a measure of the strength of the association between variables.	• **Appreciate** that correlation is a measure of the strength of association between two variables.	
• Identify correlation or no correlation using lines of best fit.	• **Distinguish between positive, negative and zero correlation** using lines of best fit.	
• Compare experimental data. • Understand that if they repeat an experiment, they may - and usually will - get different outcomes, and that increasing sample size generally leads to better estimates of population characteristics. • Discuss implications of findings in the context of the problem.		
• Interpret social statistics including index numbers, time series and survey data.	• **Identify seasonality and trends in time series.**	

FOUNDATION	INTERMEDIATE	HIGHER
PROBABILITY		
• Understand and use the probability scale. • Understand and use estimates or measures of probability from theoretical models (including equally likely outcomes). • List all outcomes from single events and from two successive events, in a systematic way. • Identify different mutually exclusive outcomes and know that the sum of the probabilities of all these outcomes is 1.	• Understand and use estimates or measures of probability from theoretical models **or from relative frequency.**	
	• **Use tree diagrams to represent outcomes of compound events, recognising which events are independent.**	• ***Know when to add or multiply two probabilities: if A and B are mutually exclusive, then the probability of A or B occurring is*** $p(A) + p(B)$***, whereas if A and B are independent events, the probability of A and B occurring is*** $p(A) \times p(B)$**.**
• Use the vocabulary of probability to interpret results involving uncertainty and prediction. • Compare theoretical probabilities. • Understand that if they repeat an experiment, they may - and usually will - get different outcomes, and that increasing sample size generally leads to better estimates of probability and population characteristics.		