Year 11 Revision Checklist - Statistics			
	RAG	**Revised?**	**Comments**
1. The collection of data			
(a) Planning			
Understand a hypothesis		☐	
Understand factors involved in planning an investigation (eg: time, costs, ethical issues, confidentiality, convenience)		☐	
Develop stratagies to mitigate issues		☐	
(b) Types of data			
Know and apply the terms to describe the different data types:			
- raw data		☐	
- quantatative		☐	
- qualitative		☐	
- catagorical		☐	
- ordinal		☐	
- discrete		☐	
- continuous		☐	
- ungrouped		☐	
- bivariate		☐	
- **multivariate (Higher Tier Only)**		☐	
Know the advantages and implications of merging data into more general categories, and of grouping numerical data into class intervals.		☐	
Know and apply the terms explanatory (independent) variables and response (dependent) varia		☐	
Know the difference between primary and secondary data.		☐	
(c) Population and sampling			
Know the difference between population, sample frame and sample.		☐	
Know reasons for using convenience sampling, and the associated risks of bias when this technique is used.		☐	
a. Know appropriate sampling techniques in the context of the problem to avoid bias.		☐	
b. Understand random, systematic, and quota sampling.		☐	
Know the key features of a simple random sample and understand different techniques used to select a random sample: including dice, cards, random number lists, and calculator functions.		☐	
Understand stratified samples		☐	
(d) Collecting data			

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Understand the different sources of data (experimental, questionnaires, observation, reference, census, population and sampling.)		☐	
Know the importance of reliability and validity with regards to collected data		☐	
Determine factors that may lead to bias, including issues of sensitivity of the content matter and **level of control (Higher Tier Only)**		☐	
Know the key features to be considered when planning data collection:		☐	
- Leading Questions		☐	
- Biased Sources		☐	
- Time Factors		☐	
- Open/Closed Questions		☐	
- Interview Techniques		☐	
Problems that might arise with data		☐	
Know why data might need to be cleaned		☐	
Know the importance of identifying and controlling extraneous variables and the **use of control groups including matched pairs (Higher Tier Only)**		☐	
2. Processing, representing and analysing data			
(a) Tables, diagrams and representation			
Represent and compare data sets using:		☐	
- Tables		☐	
- Tally Charts		☐	
- Pictograms		☐	
- Pie Charts		☐	
- Stem and Leaf Diagrams		☐	
- Venn Diagrams		☐	
- Population Pyramids		☐	
- Choropleth Maps		☐	
- Comparative Pie Charts (Higher Tier Only)		☐	
Calculate key values, draw and compare data in:		☐	
- Bar Charts		☐	
- Line Graphs		☐	
- Time Seriers Graphs		☐	
- Scatter Diagrams		☐	
- Frequence Polygons		☐	

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- Cumulative Frequency Charts		☐	
- Histograms with equal class widths		☐	
- Box Plots		☐	
Calculate and use frequency density to draw all histograms (Higher Tier Only)		☐	
Interpret and compare any Histograms (Higher Tier Only)		☐	
Justify the appropriate format and produce accurate diagrams for data		☐	
Recognise where errors in graphs and charts such as:		☐	
- incorrect scales		☐	
- truncated axis		☐	
- distorted sizing		☐	
- the misuse of formula when calculating the frequency densities of histograms (Higher Tier Only)		☐	
Change the format of data to make it easier to use		☐	
Use the most appropriate form of any data		☐	
Determine skewness from data by inspection		☐	
Use of: Skew = $\dfrac{3(\text{mean} - \text{median})}{\text{standard deviation}}$ {Formula will be given in the formulae sheet} (Higher Tier Only)		☐	
Understand what positive and negative skew mean		☐	
(b) Measures of central tendency			
Calculate averages for discrete and grouped data:		☐	
- Mode		☐	
- Median		☐	
- Mean		☐	
- Weighted mean (Higher Tier Only)		☐	
- Geometric mean (Higher Tier Only)		☐	
- Mean Seasonal Variation (Higher Tier Only)		☐	
Know the benefits and drawbacks of the mean, median and mode		☐	
Compare data sets using mean, median and mode		☐	
(c) Measures of dispersion			
Calculate different measures of spread:		☐	
- range		☐	

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- quartiles		☐	
- Interquartile Range (IQR)		☐	
- Percentiles		☐	
- Interpercentile Range (Higher Tier Only)		☐	
- Interdecile Range (Higher Tier Only)		☐	
- Standard deviation {Formulae given on formulae sheet} (Higher Tier Only)		☐	
Standard deviation = $\sqrt{\frac{1}{n}\sum(x-\bar{x})^2}$ **or** **Standard deviation** = $\sqrt{\frac{\sum x^2}{n}-\left(\frac{\sum x}{n}\right)^2}$ (Higher Tier Only)		☐	
Identify outliers by inspection		☐	
Identify outliers by calculation (Higher Tier Only):		☐	
Small Outlier is **< LQ - 1.5 x IQR** (Higher Tier Only)		☐	
Large Outlier is **> UQ + 1.5 x IQR** (Higher Tier Only)		☐	
Outlier is outside μ ± 3σ (Higher Tier Only)		☐	
Compare different data sets using measure of spread:		☐	
- range		☐	
- interquartile range (IQR)		☐	
- percentiles		☐	
- standard deviation (Higher Tier Only)		☐	
Calculate standardised scores using the formula {not given in paper}: **Standardised score = score - mean** **standard deviation (Higher Tier Only)**		☐	
Use standardised scores to compare data sets (Higher Tier Only)		☐	
(d) Further summary statistics			
Use different types of index and numbers in context		☐	
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		☐	
(e) Scatter diagrams and correlation			

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Know and apply vocabulary of correlation: positive, negative, zero, causation, association, interpolation and extrapolation.		☐	
Describe and make comparisons of correlation by inspection: strong or weak.		☐	
Determine line of best fit by eye, by drawing through a calculated double mean point ($\bar{x}$, $\bar{y}$)		☐	
Draw a line of best fit using a regression line (Higher Tier Only)		☐	
Understand and use regression lines (Higher Tier Only)		☐	
Apply formula to determine Spearman's rank correlation coefficient (Higher Tier Only)		☐	
Interpret Spearman's rank correlation coefficient in context		☐	
Interpret given Pearson's product moment correlation coefficient (PMCC) in context (Higher Tier Only)		☐	
Understand the distinction between Spearman's rank correlation coefficient and Pearson's product moment correlation coefficient (PMCC) (Higher Tier Only)		☐	
(f) Time series			
Identify trends in data through inspection and by calculation of 4 point moving averages		☐	
Use other moving averages (such as 3 point or 5 point) (Higher Tier Only)		☐	
Interpret seasonal and cyclic trends in context		☐	
Use such trends to make predictions (Higher Tier Only)		☐	
(g) Quality assurance			
Know that a set of sample means are more closely distributed than individual values from the same population (Higher Tier Only)		☐	
Use action and warning lines in quality assurance sampling applications (Higher Tier On		☐	
(h) Estimation			
Use calculated or given summary statistical data to make estimates of population characteristics		☐	
Use samples to estimate population mean		☐	
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 (Higher Tier Only)		☐	
3. Probability			
Use collected data to calculate estimates of probabilities		☐	

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Compare the probability of different possible outcomes using the 0–1 or 0–100% scale and statements of likelihood		☐	
Use probability values to calculate expected frequency of a specified characteristic within a sample or population		☐	
Calculate and interpret relative risk using the formula: relative risk = <u> risk for those in the group </u> risk for those not in the group (not given in exam)		☐	
Compare experimental data with theoretical predictions to identify possible bias within the experimental design		☐	
Recognise that experimental probability will tend towards theoretical probability as the number of trials increases when all variables are random		☐	
Use two-way tables, sample space diagrams, tree diagrams and Venn diagrams to represent all the different outcomes possible for at most three events		☐	
Know and apply the formal notation for independent events		☐	
Know and apply the formal notation for conditional probability		☐	
Comment on the differences between experimental and theoretical values in terms of possible bias (Higher Tier Only)		☐	
Know and interpret the characteristics of a binomial distribution (Higher Tier Only)		☐	
Know and interpret the characteristics of a normal distribution (Higher Tier Only)		☐	
Know that, for a normal distribution, values more than three standard deviations from the mean are very unusual (Higher Tier Only)		☐	
Know that 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 (Higher Tier Only)		☐	