**Little Heath Sixth Form**

**Mathematics**

**(Statistics 1)**

Personal Learning Checklist

**Student Name: ……………………….…………………………………..………**

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| **Unit Name:**  **AS Mathematics (Statistics 1B)** | **Unit Code:**  **MS1B** |
| *Minimum Target Grade:* | *Aspirational Target Grade:* |

*KEY:* ***Red =*** *with difficulty* ***Amber*** *= not sure* ***Green*** *= yes*

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| **GCSE Re-Cap (Skills and Knowledge)** | **Red** | **Amber** | **Green** |
| * Construct statistical diagrams e.g. stem and leaf, box and whisker, cumulative frequency, scatter graph, histogram |  |  |  |
| * Calculate, understand and use the terms mean, median, mode, range, interquartile range |  |  |  |
| * Understand statistical terms relating to data collection e.g. qualitative and quantitative, continuous and discrete, primary and secondary and bias |  |  |  |
| * Know how to calculate simple probability, use probability space diagrams and tree diagrams |  |  |  |

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| **Skills/Knowledge/Specification** |  |  |  |  |
| **AVERAGES, MEASURES OF LOCATION and MEASURES OF SPREAD** | **Red** | **Amber** | **Green** | **To address this before the exam I will:-** |
| * Calculate the mean of discrete data (including grouped) |  |  |  |  |
| * Calculate an estimated mean for grouped continuous data |  |  |  |  |
| * Identify the median, quartiles and percentiles for discrete data |  |  |  |  |
| * Calculate the median, quartiles and percentiles for grouped continuous data |  |  |  |  |
| * Calculate and use range, IQR and semi-IQR |  |  |  |  |
| * Calculate the standard deviation of discrete data (including grouped) |  |  |  |  |
| * Calculate an estimate of standard deviation for grouped or ungrouped continuous data |  |  |  |  |
| * Know that variance is the square of standard deviation |  |  |  |  |
| * Know and apply the rules to calculate mean and standard deviation by coding (linear scaling) |  |  |  |  |
| * Use a prescribed method to identify outliers |  |  |  |  |
| **PROBABILITY** | **Red** | **Amber** | **Green** | **To address this before the exam I will:-** |
| * Use Number Venn diagrams to solve two category number problems |  |  |  |  |
| * Use Number Venn diagrams to solve three category number problems |  |  |  |  |
| * Use Number Venn diagrams to read off probabilities |  |  |  |  |
| * Know the rule P(A U B ) = P(A) + P(B) – P(A n B) |  |  |  |  |
| * Know P(A**’**) = 1 – P(A) |  |  |  |  |
| * Use two category Probability Venn Diagrams to represent and to read probabilities |  |  |  |  |
| * Understand conditional probability |  |  |  |  |
| * Know the rule for calculating any specified conditional probability P(A/B) = P(A n B)/P(B) |  |  |  |  |
| * Recognise when best to use a probability tree diagram |  |  |  |  |
| * Understand two way tables and possibility space diagrams |  |  |  |  |
| * Know that for independent events   P(A n B) = P(A) x P(B) |  |  |  |  |
| * Understand that for mutually exclusive events,   P(A U B ) = P(A) + P(B) |  |  |  |  |
| * Know that for mutually exclusive events P(A n B) = 0 |  |  |  |  |
| **CORRELATION and REGRESSION** | **Red** | **Amber** | **Green** | **To address this before the exam I will:-** |
| * Look up and use the formulas for Sxx , Syy and Sxy |  |  |  |  |
| * Look up and use the formula for r, the PMCC, substituting in Sxx , Syy and Sxy |  |  |  |  |
| * Know that the PMCC of coded data is the same as for the original data |  |  |  |  |
| * Interpret the value of the PMCC as a measure of correlation |  |  |  |  |
| * Know the least squares regression line equation   y = a + bx |  |  |  |  |
| * Identify the response (dependent) and explanatory (independent) variables in regression |  |  |  |  |
| * Look up and use the equations for a and b to find the least squares regression line |  |  |  |  |
| * Substitute values into the least squares regression line |  |  |  |  |
| * Interpret the values of a and b in the least squares regression line |  |  |  |  |
| * Calculate residuals   i.e. residual = yactual - yestimate |  |  |  |  |
| * Identify outliers and understand their possible influence |  |  |  |  |
| **DISCRETE RANDOM VARIABLES -**  **The BINOMAL DISTRIBUTION X B(n,p)** | **Red** | **Amber** | **Green** | **To address this before the exam I will:-** |
| * Know what is meant by a discrete random variable |  |  |  |  |
| * Use factorial notation to find the number of arrangements of objects |  |  |  |  |
| * Understand and use the conditions for a Binomial distribution i.e. ***FICT*** *(it’s not a fact, it’s a FICT)* |  |  |  |  |
| * Use the binomial distribution to find probabilities by calculation   i.e. P(X=x) = px(1-p)n-x |  |  |  |  |
| * Know when the binomial distribution is a suitable model |  |  |  |  |
| * Find cumulative distribution functions of the binomial distribution from the table |  |  |  |  |
| * Find the mean and variance of the binomial distribution using the formulae |  |  |  |  |
| * Solve worded binomial distribution problems |  |  |  |  |
| **ESTIMATION** | **Red** | **Amber** | **Green** | **To address this before the exam I will:-** |
| * Understand terms relating to a population such as ‘parameter’ |  |  |  |  |
| * Understand terms relating to a sample such as ‘statistic’ |  |  |  |  |
| * Understand the concept of a simple random sample |  |  |  |  |
| Calculate unbiased estimates of a population mean and the variance S2 using |  |  |  |  |
| * Understand the sampling distribution of the mean of a random sample from a normal distribution |  |  |  |  |
| * Know and calculate the standard error of the sample mean is and its estimator is |  |  |  |  |
| * Know and apply the Central Limit Theorem |  |  |  |  |
| * Calculate confidence intervals for the mean of a normal distribution with known variance or unknown variance for a large sample |  |  |  |  |
| * Draw conclusions and inferences based on the confidence interval |  |  |  |  |
| **CONTINUOUS RANDOM VARIABLES -**  **THE NORMAL DISTRIBUTION X N(µ,σ²)** | **Red** | **Amber** | **Green** | **To address this before the exam I will:-** |
| * Understand the bell shaped curve and its link to probability |  |  |  |  |
| * Know how to calculate the value of z for any item of data in a normal distribution |  |  |  |  |
| * Use a positive z-value to read a probability from the normal distribution table |  |  |  |  |
| * Use a negative z-value to read a probability from the normal distribution table |  |  |  |  |
| * Use two z-values to find a probability within a specified range |  |  |  |  |
| * Know how to read the normal distribution table in reverse |  |  |  |  |
| * Know how and when to use the Percentage Points table |  |  |  |  |
| * Use a given piece of information to find the mean or the standard deviation |  |  |  |  |
| * Use two given pieces of information to find the mean and the standard deviation |  |  |  |  |

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| **REVISION**  **Use the information on this checklist to make revision cards and notes** |

**Grade tracking:**

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*Note: You should discuss this checklist regularly with your subject teacher/mentor*