**Little Heath Sixth Form**

**Mathematics** Personal Learning Checklist

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

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| **Unit Name:****Mathematics (Statistics 2)** | **Unit Code:****MS2B** |
| *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) from S1** | **Red** | **Amber** | **Green** |
| * Know and use the Binomial Theorem
 |  |  |  |
| * Know and use the Normal Distribution
 |  |  |  |
| * Calculate confidence intervals for the mean
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|  |  |  |  |

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| **Skills/Knowledge/Specification** | **Red** | **Amber** | **Green** | **To address this before the exam I will:-** |
| * **DISCRETE RANDOM VARIABLES**
 |  |  |  |  |
| * Know what is meant by a discrete random variable
 |  |  |  |  |
| * Understand and use the distributions P(X=x) and F(X)
 |  |  |  |  |
| * Know and use the formula E(X) = Σ xP(x)
 |  |  |  |  |
| * Know and use the formula VAR(X) = Σ x2P(x) - (E(X))2
 |  |  |  |  |
| * Know and use the formula E(aX + b) = aE(X) + b
 |  |  |  |  |
| * Know and use the formula VAR(aX + b) = a2VAR(X)
 |  |  |  |  |
| * Know what is meant by a discrete uniform distribution
 |  |  |  |  |
| * Know and use the E(X) and VAR(X) formulas for a discrete uniform distribution
 |  |  |  |  |
| * **POISSON DISTRIBUTION**
 | **Red** | **Amber** | **Green** | **To address this before the exam I will:-** |
| * Use the Poisson distribution formula in finding probabilities
 |  |  |  |  |
| * Use the tables of Poisson cumulative distribution functions to find probabilities
 |  |  |  |  |
| * Know when the Poisson distribution is a suitable model
 |  |  |  |  |
| * Approximate a binomial distribution to a Poisson distribution
 |  |  |  |  |
| * Decide which distribution is an appropriate model
 |  |  |  |  |

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| **Knowledge/Specification (continued)** | **Red** | **Amber** | **Green** | **To address this before the exam I will:-** |
| **CONTINUOUS RANDOM VARIABLES** |  |  |  |  |
| * Use the properties of a c.r.v to sketch it's probability density function
 |  |  |  |  |
|  |  |  |  |  |
| * Sketch a cumulative distribution function for a given c.r.v ie F(x)
 |  |  |  |  |
| * Use integration to find the mean and variance for a given p.d.f
 |  |  |  |  |
| * Find the mode, median and quartiles of a c.r.v using F(x)
 |  |  |  |  |
| **CONTINUOUS UNIFORM DISTRIBUTION** | **Red** | **Amber** | **Green** | **To address this before the exam I will:-** |
| * Sketch a continuous uniform distribution from given information
 |  |  |  |  |
| * Find the expectation and variance for a given continuous uniform distribution
 |  |  |  |  |
| * Find the cumulative distribution function for a continuous uniform distribution
 |  |  |  |  |
| * Choosing the correct model for a given scenario
 |  |  |  |  |
| **NORMAL APPROXIMATIONS** | **Red** | **Amber** | **Green** | **To address this before the exam I will:-** |
| * Use continuity correction to go from a discrete distribution to a continuous one
 |  |  |  |  |
| * Approximate a binomial distribution by a normal distribution
 |  |  |  |  |
| * Approximate a Poisson distribution by a normal distribution
 |  |  |  |  |
| * Choose the correct approximation of the normal distribution for a given problem
 |  |  |  |  |
| **POPULATIONS AND SAMPLES** | **Red** | **Amber** | **Green** | **To address this before the exam I will:-** |
| * Understand the difference between populations, censuses and samples
 |  |  |  |  |
| * To explain the advantages and disadvantages of taking a census
 |  |  |  |  |
| * To explain the advantages and disadvantages of sampling
 |  |  |  |  |
| * To understand the concept of a simple random sample
 |  |  |  |  |
| * To understand the concept of a statistic
 |  |  |  |  |
| * To express the sampling distribution for a given population
 |  |  |  |  |
| **HYPOTHESIS TESTING** | **Red** | **Amber** | **Green** | **To address this before the exam I will:-** |
| * State the null and alternative hypothesis
 |  |  |  |  |
| * Use given significance levels
 |  |  |  |  |
| * Decide if a hypothesis test is a one or two tailed test
 |  |  |  |  |
| * Use a hypothesis test for the MEAN for a given level of significance
 |  |  |  |  |
| * Use a hypothesis test for the SAMPLE MEAN for a given level of significance
 |  |  |  |  |
| * Find critical regions for a hypothesis test for the Poisson distribution
 |  |  |  |  |
| * Find critical regions for a hypothesis test for the mean and sample mean distribution
 |  |  |  |  |
| * Find the actual level of significance of a hypothesis test
 |  |  |  |  |
| * Identify Type 1 and Type 2 errors
 |  |  |  |  |

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

**Grade tracking:**

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| *Grade* | *Date* | *Grade* | *Date* | *Grade* | *Date* |
|  |  |  |  |  |  |
| *Grade* | *Date* | *Grade* | *Date* | *Grade* | *Date* |
|  |  |  |  |  |  |

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