**LANGDON PARK SIXTH FORM**

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| **Subject: Mathematics** | **Year: Y13** | **Unit 6 Normal Distribution** |

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| ***What and Why*** “You have already met the Binomial Probability Distribution in year 12. In this unit you will revisit this and deepen your understanding as well as exploring other Discrete Probability Distributions. You will then move to explore the most important Continuous Probability Distribution - the Normal Distribution in a lot of detail. You will become fluent in calculating probabilities in all these distributions, as well as in using data to solve problems such as finding an unknown mean and standard deviation of a Normal distribution. You will also explore how to choose a suitable distribution in constructing mathematical models of situations, and understand the limitations of such models and when they may not be suitable. Finally you will extend the ideas on Hypothesis Testing you have already met with the Binomial Distribution to Hypothesis Tests for the mean of a population using the Normal Distribution. Probability distributions are crucial to a vast range of applications of mathematics in the world - from psychology and sociology to physics, medicine, data analysis and economics and this unit will help you enormously if you go on to do degrees in any of these areas.” |

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| **Key terms:**DistributionDiscreteContinuousVariableRandomProbabilityBinomialNormalMeanStandard DeviationApproximation Null hypothesisAlternative hypothesisCritical regionSignificance level | **Key ideas*** Recap and consolidate the work on Binomial distribution and on probability from year 12 and earlier in year 13
* Understand the idea of a Probability Distribution
* Understand the idea of a general Discrete Probability Distribution
* Understand the idea of a Continuous Probability Distribution
* Understand the characteristics and properties of the Normal Distribution
* Understand when probability distributions are suitable models for real situations and the limitations of such models
* Understand when a continuous distribution (Normal) can be used to approximate a discrete distribution (Binomial)
* Be able to find unknown means and/or standard deviations for Normal distributions given one or two probabilities.
* Be able to carry out hypothesis tests and interpret their results for the mean of a population using the Normal Distribution
 | **Applications and skills:*** Become fluent in calculations involving the Binomial Probability Distribution, including the efficient use of graphical calculators and finding the mean and standard deviation
* Be able to undertake calculations and solve problems involving general discrete probability distributions
* Be able to find probabilities related to the Normal Distribution
* Be able to solve problems involving finding the unknown mean and standard deviation of a normal distribution
* Be able to apply the Normal distribution as an approximation to the Binomial, including judging when it is or is not suitable
* Be able to construct suitable mathematical models involving both Binomial and Normal distributions, solve and interpret them, and describe the limitations of such models
* Be able to carry out hypothesis tests for the mean of a population using the Normal distribution
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| **Specification point** | **Pre-reading** | **Application and Assessment (date)** | **Independent learning** | **Extension – Cultural Capital and Reading** |
| N1 - N3 | **Topics you should be confident in prior to unit:**The material you learned in year 12 on the Binomial distribution and the work you did earlier in year 13 on probability. | * End of unit assessment, which will also include selected year 12 material
* 50% seen
* 50% unseen
* 90% pass needed or resit required.
 | Kerboodle Online LoginMy MathsExam SolutionsMaths Genie  | **VIDEOS:** Useful video on the maths of large data sets [**https://www.gresham.ac.uk/lectures-and-events/the-challenge-of-big-data**](https://www.gresham.ac.uk/lectures-and-events/the-challenge-of-big-data)Useful video on how data and statistics were key to how Florence Nightingale transformed health care:[**https://www.gresham.ac.uk/lectures-and-events/florence-nightingale-and-her-crimean-war-statistics-lessons-for-hospital-safety-**](https://www.gresham.ac.uk/lectures-and-events/florence-nightingale-and-her-crimean-war-statistics-lessons-for-hospital-safety-)**Enrichment:** Useful collections of problems that will deepen your understanding of probability distributions, especially the Normal: [**https://nrich.maths.org/search/?search=normal+distribution&tab=1&fs=111110000000111**](https://nrich.maths.org/search/?search=normal+distribution&tab=1&fs=111110000000111) |

**Pre-assessment content review**

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| I feel secure in | I need to focus on | My action plan |

**Pre-assessment skills review**

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| I feel secure in | I need to focus on | My action plan |

**Post-assessment review**

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| Weaknesses in content knowledge | Skills I need to focus on | My action plan |
| Retest / review – teacher and student comment |

**Revision planning**

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| Spec point | Notes complete | Revision materials | Past paper Qs  | Timed conditions |
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