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**LANGDON PARK SIXTH FORM**

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| **Subject: Mathematics** | **Year: Y12** | **Topic: 2 Everything Binomial**  |

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| ***What and Why*:** The word binomial simply means “two numbers”. This unit begins with this simple concept, and develop a great deal of sophisticated mathematical ideas from there. You will touch on statistics, combinatorics, expansions and even the concept of limits! This will prepare you for several topics, both later in year 12 and in year 13. |

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| **Key terms****Binomial Distribution*** Know the criteria for when the binomial distribution can be used.
* Define a distribution in the form X~B(n,p)
* Find the individual probabilities using the distribution
* Find the cumulative probabilities
* Know how to use a calculator
 | **Combinations and Permutations*** Use factorials (!)
* Understand how the calculator uses factorials to find combinations with the nCr button
* Understand what is meant by a permutation and how it is found on a calculator
 | **Binomial Series and Theorem*** Define what a series is
* Explore Pascal’s triangle for natural numbers
* Use Pascal’s triangle to form a more general form of the binomial theorem
* Know and find the range of validity for any given series expansion.
 | **Binomial Expansion*** Use Pascal’s triangle or binomial theorem to expand expressions in the form (1+x)n or (a+b)n for n=1,2,3,4,....
* Use Pascal’s triangle or binomial theorem to expand expressions in the form (1+x)n or (a+b)n for integer powers
* Use Pascal’s triangle or binomial theorem to expand expressions in the form (1+x)n or (a+b)n for non- integer powers.
* Find the expansion of algebraic fractions using partial fractions.
 | **Limits:** * Understand the difference between diverge and converge
* Understand what the modulus of a number means $\left|x\right|$
* Understand the restrictions in the binomial expansion
* Use the binomial series expansion to approximate solutions
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| **Specification point** | **Pre-reading** | **Application and Assessment (date)** | **Independent learning** | **Extension – Cultural Capital and Reading** |
| D1N1N3 | **Topics you should be confident in prior to unit:** * Probability including Cumulative probability
* Index Laws
* Expanding brackets up to and including three and four brackets
* Partial fractions

**Websites****Binomial Series/Theorem:** * <https://revisionmaths.com/advanced-level-maths-revision/pure-maths/algebra/binomial-series>
* <https://medium.com/i-math/the-binomial-theorem-explained-6464f41e5268>

**Binomial Probability**<https://www.intmath.com/counting-probability/12-binomial-probability-distributions.php> | * End of unit assessment
* 50% seen
* 50% unseen
* 90% pass needed or resit required.
 | * Kerboodle Online Login
* My Maths
* Exam Solutions
* Maths Genie
 | **Online Mathematical articles and content can be found here:** * <https://plus.maths.org/content/>

**Recommended Reading:*** Why Do Buses Come in Threes?: The Hidden Maths of Everyday Life **-** Rob Eastaway
* The Millennium Problems – Rob Devlin

**Enrichment** * <https://undergroundmathematics.org/counting-and-binomials/r5563>
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**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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