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**LANGDON PARK SIXTH FORM**

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| **Subject: Physics** | **Year: Y12** | **Topic: 3.4.1 Vectors and Equations of Motion** |

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| ***What and Why*** “What are Newton’s equations of motion? How did Galileo measure the acceleration due to gravity? This is the study of kinematics. Isaac Newton, born Christmas Day 1642 derived the equations of motion using the newly invented mathematical technique of calculus.” |

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| **Key terms**  Acceleration  Acceleration due to Gravity  Air Resistance  Displacement  Distance-time graph | Equilibrium  Galileo  Gradient  Instantaneous Velocity  Newton  Parabolic Motion | Projectile Motion  Pythagoras’ Theorem  Resultant  Scalar  Tangent  Time | Trigonometry  Vector  Velocity  Velocity-time graph |

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| **Specification point** | **Pre-reading** | **Application and Assessment (date)** | **Home learning** | **Extension – Cultural Capital and Reading** |
| **3.4.1.1:** I can give examples of vectors and scalars. Add vectors mathematically and by scale diagram. Resolve vectors into components and determine resultants.  **3.4.1.3:** I can apply the equations of motion.  I can use distance-time and velocity-time graphs.  Use of uniform and non-uniform acceleration.  Perform calculations involving motion under gravity.  I understand the concept of projectile motion including factors such as lift and drag forces | Use the Oxford AQA AS textbook p.96 to 99 and 118 to 135. Look at other textbooks in the library for alternative ideas, explanations and diagrams.  **YouTube Videos:**  (1) Vectors and 2D Motion: Crash Course Physics  (2) [Equations of Motion (Physics)](https://www.youtube.com/watch?v=GX5zToM_Vvg)    **Websites:**  [Galileo's Famous Gravity Experiment | Brian Cox | BBC Two](https://www.youtube.com/watch?v=QyeF-_QPSbk)  <https://isaacphysics.org/concepts/cp_eq_of_motion>  [**https://isaacphysics.org/concepts/cp\_eq\_of\_motion**](https://isaacphysics.org/concepts/cp_eq_of_motion) | **Practicals:**  (1) Required Practical 3: Determination of the acceleration due to gravity using a free-fall method  (2) Investigate acceleration down an inclined plane  **Assessment**:  Minitest Motion (3rd week Nov) | (1) Research the work of Galileo and gravity  (2) Produce a PowerPoint relating to projectile motion  (3) Interpret distance-time and velocity-time graphs for various situations  Make notes on each topic and complete the exam style practice questions | (1) Visit the Royal Society  And find out about the work of  Isaac Newton  **Reading:**  Galileo: And the Science Deniers.  By Mario Livio |

**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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