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**LANGDON PARK SIXTH FORM**

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| **Subject: Physics** | **Year: Y12** | **Topic: 3.4.1 Forces** |

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| ***What and Why*** “How do forces affect the natural world? We use Newton’s laws of motion to explain the behavior of bodies when they experience forces. This is the study of dynamics.” |

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| **Key terms**  Acceleration  Braking distance  Centre of Mass  Component of a force  Conservation of momentum  Couple  Drag | Effort  Elastic collision  Equilibrium  Impact force  Impact time  Impulse  Inelastic collision  Inertia | Lever  Load  Mass  Moment  Momentum  Newton’s laws of motion  Pivot  Principle of Moments | Resistive force  Resultant force  Stability  Stopping distance  Tension  Terminal speed  Thinking distance  Velocity  Weight |

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| **Specification point** | **Pre-reading** | **Application and Assessment (date)** | **Home learning** | **Extension – Cultural Capital and Reading** |
| **3.4.1.5:** I can apply Newton’s laws of motion to various dynamic situations and draw a free-body diagram of forces. Apply the equation  I can resolve forces when a body is in equilibrium.  **3.4.1.2:** I can apply the moments equation and use the principle of moments in calculations  I understand the concept of Centre of Mass and a Couple  **3.4.1.6:** I can use the equation for momentum and apply the conservation of momentum to collisions and explosion situations.  Use the force as a rate of change of momentum and apply it to the impulse equation. | Use the Oxford AQA AS textbook p.105-115, p138-151, and p154-167. Look at other textbooks in the library for alternative ideas, explanations and diagrams.  **YouTube Videos:**  (1) [Newton's Laws: Crash Course Physics #5](https://www.youtube.com/watch?v=kKKM8Y-u7ds)  (2) [AS Physics Solving Moments Problems](https://www.youtube.com/watch?v=DoZEV8-PQS4)  (3) [Introduction to Impulse & Momentum - Physics](https://www.youtube.com/watch?v=hODlmGK7pl8)  **Websites:**  <https://www.alevelphysicsonline.com/forces>  <https://interestingengineering.com/momentum-in-physics-newtons-laws-of-motion-collisions-and-more> | **Practicals:**  (1) Investigate forces in equilibrium  (2) Observe and obtain data for terminal velocity experiment  (3) use a linear air track and light-gates to investigate the conservation of momentum  **Assessment**:  Minitest on Forces (2nd week Dec) | (1) Investigate moments and the idea of a force multiplier  (2) Write about vehicle stopping distances and safety features of vehicles  Make notes on each topic and complete the exam style practice questions | (1) Present a short talk on  reducing impact forces in  various situations  **Reading:**  Isaac Newton Paperback  by James Gleick |

**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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