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| **What will we be learning?**   * **Biomechanics** | **Why this? Why now?**  This unit is a compulsory for the A level course which will be examined through the H555/01 paper at the end of year 13. | **Key Words:**  Balanced  Net force  Momentum  Inertia  Velocity  Action  Reaction  Friction  Weight  Streamlining  Fulcrum  Effort  Load  Mechanical advantage  Axis of rotation  Drag  Parabolic  Non-parabolic  Lift force  Magnus effect  Hook  Slice  Top spin  Back spin |
| **What will we learn? Year 1**  **3.1 Biomechanical principles:**  **- Newtons laws of motion**  **- Calculating linear motion and net force**  **- The use of technology**  **3.2 Stability and lever systems** | |
| **Year 2**  **9.1 Linear motion**  **9.2 Angular motion**  **9.3 Fluid mechanics and projectile motion** | |
| **What opportunities are there for wider study?**  **Optional Booster sessions**  **Careers/degree courses**   * Sports science * Physiotherapy * PE teacher * Sports analysis * Biomechanistic | |
| **How will I be assessed?**   * Everlearner set assignments/check points * Topic tests * End of unit tests * Mock Exams | |

**A level - Biomechanics**

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| **What will we learn?**  **3.1 Biomechanical principles**   * Newtons 3 laws of motion & Links to sporting examples * Calculations: Momentum, Velocity, acceleration, Force * Force and its effects * Net force * Vertical forces * Horizontal forces * Freebody diagrams * Limb Kinematics * Force plates * Wind tunnels | Newtons Laws of Motion - TeachPE.com |
| * 1. **Stability and lever systems** * Factors affecting stability * Lever systems * Mechanical advantage of second-class lever system |  |
| * 1. **Linear motion** * Measurements and calculations for Distance, Displacement, Speed, Velocity * Measuring Acceleration/deceleration * Interpreting graphs of linear motion and velocity time graphs |  |
| * 1. **Angular motion** * Torque * Axis of rotation * Angular Velocity * Moment of inertia * Angular momentum * Conservation of Angular momentum | Law of Conservation of Angular Momentum | Statement | nuclear-power.comLaw of Conservation of Angular Momentum | Statement | nuclear-power.com |
| * 1. **Fluid mechanics and projectile motion** * How Drag and air resistance can impact performance * Projectile release * Projectile in flight * Free body diagrams of projectiles in motion * Bernoulli principle * Spin and Magnus Force | 10 Ways to Reduce Frontal Drag in Swimming |