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| **Scheme of Learning** | | | | | | | | |
| **Subject** | Science (Physics) | **Key stage** | KS5 | **Topic** | | **Momentum Concepts** | **Unit** | 4 |
| **Big Picture** | **From where?** | | **Learning Objectives** | | | | **Resources** | |
| Knowledge of momentum from GCSE as p=mv | | * Momentum Concepts   Force as the rate of change momentum  Impulse  Significance of area under a force-time graph.  Principle of conservation of linear momentum applied to problems in one dimension.  Elastic and inelastic collisions; explosions. | | | | Air track | |
| **To where?** | | **Levelled Success Outcomes** | | | | **Use of TAs/Other adults** | |
| Force-time graph | | **K – Describe and calculate Momentum and impulse**  **B – Derive equation for impulse from Newton’s Second law**  **A – Apply to tennis players** | | | |  | |
| **Learning Hook/WOW** | | | **Key Vocabulary** | | | | **Homework** | |
|  | | | Impulse, Momentum, rate of change | | | | Exam Questions | |
| **Lesson** | **Outline Plan** | | **Key(K)** | | **Booster (B)** | | **Aspire (A)** | |
| **Starter:** | Pupils describe why it takes a bigger force to move a stationary object which is 3kg than one which is 1kg, to 3m/s over 10 seconds | |  | |  | |  | |
| **Activity**  Model  Construct Meaning | Demonstrate Newton’s second law on the air track  Using Newton’s second law, derive  Then | | Pupils should state that unless another forces acts on it won’t stop. Students recall momentum equations  Pupils should state what acceleration is  Using this equation, pupils should state Newton’s second law accurately | | Pupils should identify the forces which act on the object to stop it  Using Netwons second law, pupils should derive an equation for    Then | |  | |
| **Apply:**  (knowledge and skills learnt.) | Display image of a cricket ball and egg | | Pupils describe fully how they catch the egg without breaking it and how to catch the ball without hurting their hands | | Pupils use mock figures to qualify explanations | | Suggest how a tennis player could increase their serving speed, and how fast the ball travels | |
| **Review:** | Page 10, summary questions | |  | |  | |  | |
| **Subject**  **Generic Skills**  **SMSC** | Literacy – Writing to explain  Numeracy – Calculations of momentum | | Describe the difference between Impulse and Momentum? | | Explain how we derive an each equation? | | Suggest how a tennis player could increase their serving speed, and how fast the ball travels? | |
| **Key Questions** |  | |  | |  | |  | |
| **Assessment** | Exam questions as homework | |  | |  | |  | |