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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** | |
| Momentum and Impulse | | * 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. | | | | Newton’s cradle | |
| **To where?** | | **Levelled Success Outcomes** | | | | **Use of TAs/Other adults** | |
| Elastic and inelastic collisions | | **K – State the Principle of Linear Momentum**  **B – Describe how momentum is Conserved in Rockets**  **A – Explain how a Rocket can move in the vacuum of space** | | | |  | |
| **Learning Hook/WOW** | | | **Key Vocabulary** | | | | **Homework** | |
|  | | | Impulse, Momentum, rate of change | | | | Exam Questions | |
| **Lesson** | **Outline Plan** | | **Key(K)** | | **Booster (B)** | | **Aspire (A)** | |
| **Starter:** | Show examples of force time graphs, pupils should state how to find the area under the graph and what it means | |  | |  | |  | |
| **Activity**  Model  Construct Meaning | Demonstrate Newton’s cradle.  Demonstrate some collisions and explosions using trolleys on a flat bench or runway  Model example recoil from a gun on the board showing how momentum is conserved on each side but velocity changes | | Ask for an explanation in terms of forces.  How does velocity change? What quantity remains constant? Pupils come up with what is being conserved and state a simple explanation as well as working out Principle of Linear Momentum | | Pupils should explain how we treat a case where 2 objects move in different directions | |  | |
| **Apply:**  (knowledge and skills learnt.) | Hand out work sheets | |  | | Pupils describe how momentum is conserved inside a rocket | | Pupils use knowledge of momentum and conservation of momentum to explain how a rocket moves in space when there’s nothing to push against | |
| **Review:** | Page 15 | |  | |  | |  | |
| **Subject**  **Generic Skills**  **SMSC** | Literacy – writing to explain  Numeracy – Worksheet | |  | |  | |  | |
| **Key Questions** |  | | State the principle of conservation of momentum? | | Describe how momentum is conserved in a rocket? | | Explain why rockets can move in space? | |
| **Assessment** | Examination questions as homework | |  | |  | |  | |