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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$$F=\frac{∆(mv)}{∆t}$$Impulse $F∆t=∆(mv)$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**ModelConstruct Meaning | Demonstrate Newton’s cradle.Demonstrate some collisions and explosions using trolleys on a flat bench or runwayModel 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 explainNumeracy – 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 |  |  |  |