Islip Manor High School
Scheme of Learning Overview

Islip Manor
HIGH SCHOOL

Year group: 11	**Term**: Autumn	**Unit duration: 3-4 weeks**	**Number of lessons: 6-8**	**Unit title: Force and Motion part 2**

Unit assessment: End of topic test	**Fertile question**: 20 mph vs. 30 mph: Is the impact meaningful?

Key skills/ concepts/ prior knowledge that students should have when starting this unit:	**Start RAG**	**End RAG**
1. A force is a push or pull that acts on an object due to its interaction with another object. 2. Newton's First Law: An object remains at rest or in uniform motion unless acted upon by a resultant force. 3. Speed is a scalar quantity, while velocity is a vector quantity 4. The weight of an object is the force acting on it due to gravity. 5. Distance-time graphs can be used to represent the motion of an object.		
Key skills/concepts/knowledge that students should cover	**Start RAG**	**End RAG**
1. **Acceleration Calculations:** Use the equation: **a=Δv÷t** (acceleration = change in velocity ÷ time). 2. **Velocity-Time Graphs:** Calculate acceleration from the gradient of the line and distance travelled from the area under the graph. 3. **Newton's Second Law:** Use F= m x a to explain how the acceleration of an object is proportional to the resultant force and inversely proportional to its mass. 4. **Inertia:** Define inertia as the tendency of objects to continue in their state of rest or uniform motion. 5. **Newton's Third Law:** Explain that whenever two objects interact, the forces they exert on each other are equal and opposite. 6. **Stopping Distance:** Define stopping distance as the sum of thinking distance (reaction time) and braking distance. 7. **Reaction Time Factors:** Identify factors affecting thinking distance, such as tiredness, drugs, alcohol, and distractions. 8. **Braking Factors:** Identify factors affecting braking distance, such as road and weather conditions (icy/wet) and the condition of the vehicle (brakes/tyres). 9. **Momentum (HT Only):** Use the equation p= m x v to calculate momentum and explain the principle of conservation of momentum in collisions.		

Literacy. Key vocabulary/subject terminology that students should cover

Acceleration, Resultant Force, Momentum, Inertia, Braking Distance, Thinking Distance, Stopping Distance, Conservation.

Suggested materials teachers could/should use:

AQA Combined Science textbook Oxford University Press Kerboodle

Key home learning tasks students should complete:

Kerboodle Learning checkpoint assessments and knowledge organisers

10. **Force and Momentum Change (HT Only):** Explain how the force of an impact is related to the rate of change of momentum (linking to car safety features like airbags).			
Stretch. Key skills/concepts/knowledge that students should cover			