SUBJECT: Physics YEAR: 11 MTP TITLE: Forces and movement HALF TERM: 2 NO. OF LESSONS (approx): 10

Deliberate and specific retrieval of expected prior knowledge (be specific)	*Academic transformation (be specific)*	*Personal transformation (2 or 3)*
Difference between contact and non-contact forces (e.g. gravity, friction, magnetic forces). **Concept of balanced and unbalanced forces causing changes in motion.** **Simple use of force diagrams.** **Awareness that friction and air resistance oppose motion.** **Basic understanding of mass and weight (although often confused).** **Everyday examples of forces in action (e.g. pushing a trolley, gravity pulling objects down).**	**Resultant forces and how they affect motion.** **Newton's second law of motion and their application in everyday contexts.** **How mass affects acceleration.** **Stopping distances and the factors affecting them (e.g. speed, reaction time, road conditions).** **Momentum and conservation of momentum in collisions.** **Work done, energy transfer, and the relationship between force, work, and distance.**	**Real-world applications like crumple zones, seatbelts, and airbags – how physics saves lives.** **Forces acting on astronauts during take-off and re-entry – the extremes of Newton's laws.** **Exploring extreme G-forces in roller coasters, F1 racing, and fighter jets.** **Role of robotics and prosthetics and how forces and motion are applied in design.** **How sports professionals use force analysis to improve performance (e.g. sprint starts, jumping).**
Can I Learning Questions **Can I investigate how force, acceleration and mass are linked?** **Can I interpret a velocity-time graph?** **Can I Describe Simple Tests for Reaction Time?** ***Can I describe the conservation of momentum?***	***Literacy and Oracy*** **Writing Tasks:** Report: *"How physics reduces car crash injuries: The science of road safety"* Explainer article: *"Why do astronauts float in space?"* **Verbal/Group Tasks:** Debate: *"Should speed limits be lowered to reduce stopping distances?"* Group discussion: *"Which force is the most important in our daily lives?"* **Useful Websites:** BBC Bitesize Forces: https://www.bbc.co.uk/bitesize/topics/zpqqj6f Institute of Physics Forces Teaching Resources: https://www.iop.org/forces Isaac Physics – Forces Practice: https://isaacphysics.org/concepts/cp_forces	***Misconceptions (5 or 6 examples)*** **Forces are needed to keep objects moving** – students often forget Newton's 1st law. **Mass and weight are the same** – confusion between kilograms and newtons. **Faster objects always have more force** – overlooking the role of mass and acceleration. **Stopping distance is only affected by speed** – neglecting thinking distance and environmental factors. **Work is only done when moving fast** – not realising it's about force over distance regardless of speed.