Meden School Curriculum Planning							
Subject	Physics	**Year Group**	12	**Sequence No.**		**Topic**	Mechanics part 2: Momentum and energy

Retrieval	Core Knowledge	Student Thinking
What do teachers need **retrieve** from students before they start teaching **new content**?	What **specific ambitious knowledge** do teachers need teach students in this sequence of learning?	What real life examples can be applied to this sequence of learning to **development of our students thinking, encouraging them to see the inequalities around them** and 'do something about them!'
AQA GCSE Physics P5 Forces and motion AQA GCSE Physics P1 Energy	**3.4.1.6 Momentum** *momentum = mass × velocity* Conservation of linear momentum. Principle applied quantitatively to problems in one dimension. Force as the rate of change of momentum, $F = \frac{\Delta mv}{\Delta t}$ Impulse = change in momentum $F\Delta t = \Delta mv$, where F is constant. Significance of the area under a force–time graph. Quantitative questions may be set on forces that vary with time. Impact forces are related to contact times (eg kicking a football, crumple zones, packaging).	Car safety devices are all based on the concept of changing momentum eg airbags, seatbelts crumplezones, These Crashes Show the Difference 20 Years Has Made to Car Safety | WIRED - YouTube

	Elastic and inelastic collisions; explosions. Appreciation of momentum conservation issues in the context of ethical transport design. **3.4.1.7 Work, energy and power** Energy transferred, $W = Fs\cos\theta$ *rate of doing work = rate of energy transfer*, $P = \frac{\Delta W}{\Delta t} = Fv$ Quantitative questions may be set on variable forces. Significance of the area under a force–displacement graph. $efficiency = \frac{useful\ output\ power}{input\ power}$ Efficiency can be expressed as a percentage. **3.4.1.8 Conservation of energy** Principle of conservation of energy. $\Delta E_p = mg\Delta h$ and $E_k = \frac{1}{2}mv^2$ Quantitative and qualitative application of energy conservation to examples involving gravitational potential energy, kinetic energy, and work done against resistive forces.	The increasing need to make machines, devices and vehicles more energy efficient to reduce the amount of fossil fuels burnt and to reduce the energy bills for households is driving development. It is the scientific community that will help to solve these problems.