Meden School Curriculum Planning							
Subject	Physics	**Year Group**	12	**Sequence No.**	2	**Topic**	3.2 Particles and Radiation

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!'
GCSE P6 EMS and ionising radiation	**3.2.2.1 The Photoelectric effect** Threshold frequency; photon explanation of threshold frequency. Work function Φ , stopping potential. Photoelectric equation: $hf = \Phi + E_k$ (max) E_k (max) is the maximum kinetic energy of the photoelectrons. The experimental determination of stopping potential is not required. **3.2.2.2 Collisions of Electrons with atoms** Ionisation and excitation; understanding of ionisation and excitation in the fluorescent tube. The electron volt. Students will be expected to be able to convert eV into J and vice versa. **3.2.2.3 Energy Levels and photon emission** Line spectra (eg of atomic hydrogen) as evidence for transitions between discrete energy	The photelectric effect is the underlying physics behind how solar panels work, light energy is used to generate a current. The increase need to move away from the reliance on fossil fuels for the generation of electricity has seen rapid development of this technology. It is also a technolgy that should provide electricity for developing countries and remote societies.

	levels in atoms. $hf = E_1 - E_2$ In questions, energy levels may be quoted in J or eV. **3.2.2.4 Wave-Particle Duality** Students should know that electron diffraction suggests that particles possess wave properties and the photoelectric effect suggests that electromagnetic waves have a particulate nature. Details of particular methods of particle diffraction are not expected. de Broglie wavelength $\lambda = h/mv$ where mv is the momentum. Students should be able to explain how and why the amount of diffraction changes when the momentum of the particle is changed. Appreciation of how knowledge and understanding of the nature of matter changes over time. Appreciation that such changes need to be evaluated through peer review and validated by the scientific community.	Development of new theories and the requirement for peer review of new evidence/ideas is essential to the scientific community. The willingness to share ideas so that all communities can benefit from it is both an ethical and moral responsibility for all scientific communities.
