SUBJECT: Physics YEAR: 10 MTP TITLE: Atomic Structure HALF TERM: 2 NO. OF LESSONS (approx): 7

Deliberate and specific retrieval of expected prior knowledge (be specific)	***Academic transformation (be specific)***	***Personal transformation (2 or 3)***
The basic structure of an atom (protons, neutrons, electrons). The concept of charge and mass of subatomic particles. How electrons occupy energy levels (shells). The historical development of the atomic model (Dalton, Thomson, Rutherford, Bohr). The basic idea that nuclear radiation exists and can be harmful. Conservation of energy in physical processes	**Students will understand:** The nucleus as a small, dense, positively charged region. Electrons and energy levels – electrons move between energy levels when absorbing/emitting radiation. Ionisation and why it is detrimental to our health How experimental evidence (Rutherford's gold foil experiment) led to changes in atomic theory. Why Bohr's model was necessary to explain electron orbits. Half-life as a measure of radioactive decay. The random nature of decay and why large samples are used for reliable data. How to interpret half-life graphs. The difference between contamination and irradiation. Safety precautions for working with radioactive materials.	**Chernobyl and Fukushima – real-world case studies on radiation exposure.** **Space exploration and radiation – How astronauts are protected from cosmic radiation.** **How we use radiation safely in everyday life (smoke detectors, food sterilisation).** **Ethical considerations: Is nuclear power the future of energy?**
Can I Learning Questions	***Literacy and Oracy***	***Misconceptions (5 or 6 examples)***
Can I describe key points on the structure of atoms and their components? Can I describe how our model of the atom progressed over time? Can I explain how the gold foil experiment lead to the nuclear model? Can I describe how we measure radiation? Can I describe the difference between irradiation and contamination? Can I explain how to be safe around radioactive substances?	**Report Writing:** **Research task:** Write a news report on the impact of a nuclear disaster (Chernobyl/Fukushima). **Verbal Discussion & Debate:** **Ethical debate:** Should we ban nuclear power? **Website Links for Research & Engagement:** Radiation in everyday life	**All radiation is dangerous** – Some forms (e.g., radio waves) are harmless, while ionising radiation (X-rays, gamma) poses risks. **Half-life is when half of a radioactive substance disappears** – It actually means half the nuclei decay, but the material itself may still exist. **You become radioactive if exposed to radiation** – **Irradiation** does not make objects radioactive, but **contamination** can. **Nuclear radiation is only artificial** – Background radiation occurs naturally (e.g., from radon gas and cosmic rays). **All nuclear waste is highly dangerous** – Some types, like low-level waste, can be handled with simple precautions.