# Review P2.5 Radioactive decay: uses and risks

| Can you…? | ☺ | 😐 | ☹ |
|---|---|---|---|
| **P2.5.1 Atomic structure** | | | |
| Describe, recognise and draw the basic structure of an atom | | | |
| Explain how results from the Rutherford and Marsden scattering experiments led to the 'plum pudding' model being replaced by the nuclear model | | | |
| Appreciate that new evidence can cause theories to be re-evaluated | | | |
| Appreciate that, according to the nuclear model, most of the atom (and therefore most of any form of matter) is empty space | | | |
| Compare the relative masses and relative electric charges of protons, neutrons and electrons | | | |
| Describe the numbers of protons and electrons in atoms, and explain why they have no overall electrical charge | | | |
| Describe how atoms may lose or gain electrons to become ions | | | |
| Define 'isotope' | | | |
| Define 'atomic number' | | | |
| Define 'mass number' | | | |
| **P2.5.2 Atoms and radiation** | | | |
| Describe how radioactive substances randomly give out radiation from the nuclei of their atoms all of the time, whatever happens to them. | | | |
| Describe the origins of background radiation from rocks, cosmic rays, nuclear weapons tests and nuclear accidents | | | |
| Evaluate the effect of different jobs and/or locations on the level of background radiation and radiation dose | | | |
| Evaluate measures that can be taken to reduce exposure to nuclear radiations | | | |
| Identify an alpha particle, a beta particle and a gamma ray | | | |
| **(HT) Write nuclear equations to show single alpha and beta decay** | | | |
| Compare the properties of alpha, beta and gamma radiations in terms of their ionising power, penetration through materials, and their range in air | | | |
| Compare how alpha, beta and gamma radiations are affected by electric and magnetic fields **(HT) and explain in terms of their relative mass and charge** | | | |
| Describe the uses and evaluate the dangers associated with each type | | | |
| Define 'half-life' for a radioactive isotope, in terms of the number of nuclei of the isotope in a sample, or in terms of the count rate from a sample | | | |
| Evaluate how appropriate different radioactive sources are for different users, including tracers, in terms of the type of radiation and half life | | | |