Subject	Physics
Unit/Topic	Year 10 Atomic Structure

Key Vocabulary	Definition
Activity	The rate at which a source of unstable nuclei decays. Measured in becquerel (Bq).
Alpha particle	Made up of two protons and two neutrons (the same as a helium nucleus). Positively charged. Stopped by paper or skin. Has a range in air of a few cm. Highly ionising.
Alpha scattering experiment	<ul> <li>Observations from this practical led to the following conclusions:</li> <li>1) Most alpha particles travelled straight through gold foil which told them the atom was mainly empty space.</li> <li>2) Some alpha particles were deflected by small angles with a small number being deflected by large angles. This told them there was a small central nucleus which was positively charged and where most of the mass was concentrated.</li> </ul>
Atomic number	The number of protons in an atom (also the same as the number of electrons in the neutral atom but this isn't the definition - if asked what atomic number represents, mention protons!)
Background radiation	Radiation that is around us all of the time. It comes from both natural sources (e.g. rocks, cosmic rays from space) and man - made sources (e.g. fall out from nuclear weapons testing and nuclear accidents).
Beta particle	A fast moving electron given out by the nucleus (a neutron turns in to a proton and gives out an electron). Negatively charged. Stopped by a few mm of aluminium. Can travel about 1 m in air. Less ionising than alpha particles.
Contamination	The unwanted presence of radioactive atoms either on or in an object (including humans!) These atoms could decay which could cause harm.
Electron	Negatively charged particles which orbit the nucleus. Electrons are arranged at different distances from the nucleus in energy levels. If an electron absorbs electromagnetic radiation, it can move up in to a higher energy level (further from the nucleus). If an electron gives out electromagnetic radiation it moves to a lower energy level (closer to the nucleus).

Gamma ray	Electromagnetic radiation given out by the nucleus. It travels as a wave (is not a particle). Is uncharged. Has an unlimited range in air. Can be reduced by thick lead or concrete.
Half - life	The time it takes for the number of radioactive nuclei in a sample to halve or the time it takes for the count rate/activity of a sample to fall to half its initial value.
Ion	An atom becomes a positive ion if it loses one or more electrons. An atom becomes a negative ion if it gains one or more electrons.
Irradiation	Process of exposing an object to nuclear radiation. The object itself does not become radioactive e.g. sterilising surgical instruments
Isotopes	Isotopes of the same element have the same number of protons but different numbers of neutrons.
Mass number	The number of protons and neutrons in the nucleus.
Neutron	Particles found in the nucleus that have no electrical charge (they are neutral).
Nuclear Fission	The splitting of a large, unstable nucleus in to two smaller nuclei. Two or three neutrons are also given out. Energy is released by the reaction. This is what happens inside a nuclear reactor.
Nuclear Fusion	The joining together of two light nuclei to form a heavier nucleus. In this process, some of the mass may be converted in to energy. This is the process that occurs in stars.
Nucleus	Positively charged, found at the centre of the atom. Contains protons and neutrons. Most of the mass of an atom is found here.
Plum pudding model	This early model suggested that an atom was a ball of positive charge with electrons embedded in it (think chocolate chip muffin!)
Proton	Positively charged particles found in the nucleus of an atom.
Radioactive decay	A random process by which an unstable nucleus changes to become more stable. It does this through the emission (giving out) of an alpha particle, a beta particle and/or a gamma ray.