

Definitions and Concepts for WJEC (Wales) Physics GCSE

Topic 2.7: Types of Radiation

*Definitions in **bold** are for higher tier only*

Definitions marked by '' are for separate sciences only*

Alpha Particle: A positively charged particle consisting of two protons and two neutrons. They are highly ionising, but can be stopped by a few centimetres of air.

Atomic Number: The number of protons found in an atom of a specific element. Each element has a different atomic number.

Background Radiation: Radiation that is found in small quantities all around us and originates from natural sources such as rocks and cosmic rays, as well as from man-made sources such as nuclear weapons testing and accidents.

Beta Particle: A high speed electron that a nucleus emits when a neutron converts into a proton. They are ionising but can be stopped by a thin sheet of aluminium.

Electrons: A negatively charged constituent of the atom, that are found in different energy levels, around the nucleus.

Element: A substance that cannot be chemically broken down into other substances. Each element has a characteristic number of protons in its nucleus.

Energy Levels: The stable states in which electrons are found in around a nucleus. Electrons can transition to a higher energy level through the absorption of electromagnetic radiation and can transition to a lower energy level through the emission of electromagnetic radiation.

Gamma Ray: Electromagnetic radiation emitted from a nucleus. They have a very high penetrating power and require several centimetre of lead to absorb them.

Ions: Atoms with a resultant charge due to the loss or gain of electrons.

Irradiation: The process of an object being exposed to nuclear radiation. The object doesn't become radioactive.

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Isotopes: Atoms with the same number of protons but different numbers of neutrons. The atomic number is the same, but the mass number is different.

Mass Number: The number of protons and neutrons in an atom.

Negative Ions: Atoms that gained electrons and so have a resultant negative charge.

Neutrons: A neutrally charged constituent of the nucleus.

Nucleus: The positively charged centre of an atom, containing protons and neutrons.

Nuclear Equations: Equations representing the decay of radioactive isotopes.

Positive Ions: Atoms that have lost electrons and so have a resultant positive charge.

Protons: A positively charged constituent of the nucleus.

Radioactive Contamination: The unwanted presence of radioactive atoms on other materials. It is hazardous due to the decay of the contaminating atoms.

Radioactive Decay: The random process involving unstable nuclei emitting radiation to become more stable.

Radioactive Dosage: A measure of the amount of radiation that someone has been subject to. It is measured in Sieverts.

Radioactive Waste: Waste materials produced by nuclear power stations and nuclear medicine that can remain radioactive for thousands of years.

Random Nature of Radioactive Decay: You cannot predict which nuclei in a radioactive sample will decay next, or when the next decay will occur - it is a random process.

Radon Levels: A measure of the quantity of radon present in an area. Radon is a radioactive gas that originates from rocks and soil, and makes up part of the background radiation that is found all around us.

