

Definitions and Concepts for WJEC (Wales) Physics A-level

Unit 4 - Option D: Energy and the Environment

Archimedes' Principle: When a body is fully or partially submerged in a fluid, it experiences an upthrust equal to the weight of the fluid it has displaced.

Breeding: The idea that fissile isotopes are generated by each fission event in a nuclear reactor.

Carbon Dioxide Levels: The amount of carbon dioxide in the Earth's atmosphere.

Density: Mass per unit volume, with units kgm^{-3} .

Efficiency: The useful output (e.g. power, energy) of a system divided by the total output.

Enrichment: The process of increasing the level of a particular isotope in an element. Eg enriching uranium to increase the level of U-235, which is used in nuclear power stations and weapons.

Fuel Cells: A device that uses chemical energy from fuel in order to provide electrical energy directly.

Fusion Triple Product: The density, confinement time and plasma temperature

Hydroelectric Power: Converting the energy of the motion of water into electrical energy.

Insulation: A barrier that minimises the transfer of heat energy.

Intensity: Power per unit area.

Inverse Square Law: When a quantity is proportional to the inverse of the square of the distance from the source of said quantity.

Non-Renewable Energy: Energy from sources that will run out or not be replenished naturally at a rate that is equal to consumption.

Nuclear Fission: When an unstable nucleus with a large mass number splits into 2 smaller nuclei.

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Nuclear Fusion: When two small nuclei fuse together to create a larger nuclei.

Photovoltaic Cells: When the p-n junction diode is forward biased

Proton-Proton Chain: The process in which stars turn hydrogen into helium.

Pumped Storage: When water is pumped from the lower reservoir to the upper reservoir to store energy as gravitational potential energy.

Rate of Energy Transfer: The rate at which energy is transferred. Known as power.

Renewable Energy: Energy where the source is able to be replenished in a lifetime.

Rising Sea Levels: The increase in sea levels due to melting ice caps and melting of ice on land, but not the melting of icebergs.

Solar Power: The conversion of energy from sunlight directly into electricity using photovoltaic cells.

Stefan-Boltzman Law: The luminosity of a black body radiator is directly proportional to its surface area and its absolute temperature to the fourth power.

Sun's Power Spectrum: The part of the electromagnetic spectrum in which the Sun emits energy.

Thermal Conduction: The transfer of heat energy through solid materials.

Thermal Equilibrium: When two objects exchange no heat energy. In the context of the environment it is the balance between energy inflow from the Sun and energy re-radiated from the Earth.

Tidal Barrages: A dam-like structure that generates electricity by taking advantage of the change in tide levels.

Wien's Law: The peak wavelength of emitted radiation is inversely proportional to the absolute temperature of the black body.

Wind Power: Using wind power to turn generators to produce electrical power.

