

## Definitions and Concepts for WJEC (Eduqas) Physics A-level

### Component 3 - Option D: Energy and the Environment

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**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  $\text{kgm}^{-3}$ .

**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.

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

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**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.

