

Definitions and Concepts for OCR (A) Physics GCSE

Topic 8: Global Challenges

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

Definitions marked by '' are for separate sciences only*

Alternating Voltage: A continually oscillating current flow, which results in the potential difference across two points continually oscillating between a positive and negative value.

***Artificial Satellites:** Man-made satellites that have been sent into space for purposes such as satellite imaging and communications.

Big Bang Theory: The currently accepted model for the origin of the universe. It suggests that the universe has expanded from an initially very small, hot and dense point.

Braking Distance: The distance a vehicle travels under the braking force. This can be affected by adverse road and weather conditions as well as the condition of the vehicle.

***Circular Orbits:** The circular path that a satellite or planet may travel in. Since their direction is continually changing, their velocity is always changing. Gravity provides the required force for these orbits.

***CMBR:** Cosmic microwave background radiation. This is electromagnetic radiation that is found in small quantities all around us. It is suggested to have come from the high energy radiation emitted by the Big Bang.

***Constant Temperature:** Bodies at a fixed temperature radiate the same average power that they absorb.

Crumple Zone: A vehicle safety feature that compresses during a collision. It increases the time over which the momentum change occurs, and so reduces the force experienced by the occupants.

Direct Voltage: A one-directional current flow, which results in a fixed voltage polarity.

Earth Wire: The green and yellow striped safety wire connected to metal casings, that prevents an appliance from becoming live.

Human Reaction Time: The time it takes for our brain to respond to a stimulus. Typical human reaction times are in the range of 0.2-0.9 seconds. A ruler-drop experiment could be used to determine your reaction time.

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Live Wire: The brown coloured wire that carries the alternating current from the supply in a mains power supply.

***Main Sequence Star:** The stable state of all stars. The gravitational forces pulling the star together, and the pressure pushing outwards, are balanced.

Mains Electricity: An a.c supply, which in the UK has a frequency of 50Hz a value of 230V.

***Natural Satellites:** The moons that orbit planets.

***Nebula:** A cloud of dust and gas.

Neutral Wire: The blue coloured wire that completes the circuit in a mains power supply.

Non-Renewable Energy Resource: An energy resource that cannot be replenished whilst it is being used. It is a finite resource.

***Orbital Radius:** The radius of a body's orbit. For a stable orbit, a change in its orbital radius is required for the body to undergo a speed change.

***P-Waves:** Primary waves are a type of longitudinal seismic wave. They can travel through all mediums and travel faster than S-waves.

Power Cables: Metal wires that are part of the National Grid. Electricity is transported along them at very high voltages to reduce the energy loss and make the transportation more efficient.

***Protostar:** The first stage all stars go through after forming from a nebula. In this stage the star becomes hot enough for hydrogen nuclei to fuse.

***Red Giant Star:** When their hydrogen is used up and larger nuclei are produced by fusion, stars of a similar magnitude to the Sun will expand to form a red giant.

***Red-Shift:** The observed increase in the wavelength of the light emitted by distant galaxies. The more distant the galaxy, the faster it is moving and so the bigger the observed increase in wavelength.

Renewable Energy Resource: An energy resource that can be replenished whilst it is being used.

***S-Wave:** Secondary waves are a type of transverse seismic wave. They cannot travel through fluids and travel slower than P-waves.

Seat Belt: A vehicle safety device that increases the time over which the momentum change occurs during a collision, and so reduces the force experienced by the wearer.



***Seismic Waves:** Waves that are produced by earthquakes.

***Sonar:** A method of determining distances in water using the emission, reflection and detection of ultrasound waves.

***Star Life Cycle:** The stages that a star passes through in its lifetime, dependent on the size of the star relative to the sun.

***Step-Down Transformer:** A transformer that has a smaller potential difference in the secondary coil than in the primary coil. This is a result of the secondary coil having fewer turns.

***Step-Up Transformer:** A transformer that has a larger potential difference in the secondary coil than in the primary coil. This is a result of the secondary coil having more turns.

Stopping Distance: The sum of the thinking and braking distances.

***Sun:** A star formed from a cloud of dust and gas being pulled together by gravitational attraction. Fusion reactions occur in the sun.

***Supernova:** The explosion of a massive star, that distributes the elements created by the fusion reactions in the star, throughout the universe.

Thinking Distance: The distance a vehicle travels during the driver's reaction time. This reaction time may be affected by tiredness, drugs or alcohol.

***Transformer:** An iron core with a primary and secondary coil of wire wound around opposite ends. Transformers can change the magnitude of an alternating voltage.

***Turns Ratio:** The number of turns in the primary coil of a transformer over the number of turns in the secondary coil. This is equal to the voltage ratio for a 100% efficient transformer.

***Voltage Ratio:** The potential difference across the primary coil of a transformer over the potential difference across the secondary coil.

***White Dwarf:** When the fusion reactions in stars of a similar magnitude to the sun come to an end, the star will contract under gravity and cool down to form a white dwarf.

