Science Glossary

**Physics - P2**

Science Glossary

Physics Unit 2.1 – **Motion.**

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| **Key Word** | **Definition** |
| Acceleration | The rate of change of velocity over time; measured in m/s². |
| Deceleration | Negative acceleration, that is, the rate of change of velocity over time; measured in m/s², when the object is slowing down. |
| Gradient | The slope of a graph; it shows the relationship between the two variables. For example, the gradient of a distance-time graph shows the way distance changes over time: the steeper it is the greater the speed. |
| Speed | The rate at which an object covers distance. Measured in m/s. Can be calculated using distance ÷ time. |
| Velocity | Speed in a given direction. Usually measured in m/s. |

Physics Unit 2.2 – **Forces.**

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| **Key Word** | **Definition** |
| Braking distance | The distance a vehicle travels under the braking force |
| Directly Proportional | A directly proportional relationship between two variables is a simple mathematical relationship: if one variable is doubled, for example, the other is doubled too. |
| Drag force | Also known as air resistance, the force which slow objects moving through the air down. |
| Elastic | Able to be deformed when a force is applied but to regain its original shape when released. |
| Force | A force causes a body to change its velocity or shape. |
| Gravitational Field Strength | The gravitational force per unit mass. On Earth this is 10N/kg |
| Hooke’s Law | The extension of an elastic object is directly proportional to the force applied to it. F = k × e |
| Limit of Proportionality | Also called ‘elastic limit’. Beyond the elastic limit, the spring does not return to its original length when the load is removed, i.e. it becomes permanently deformed. |
| Mass | Mass is a measure of how much matter is in an object |
| Resultant force | The overall force resulting from a combination of separate forces. |
| Stopping distance | Thinking distance + breaking distance. |
| Terminal Velocity | The velocity at which the air resistance on a falling object exactly balances the force of gravity so that the resultant force is zero and no further acceleration occurs. |
| Thinking distance | The distance a car travels in the time it takes for a driver to recognise a hazard and apply the brake. |
| Weight | The force of gravity acting on an object. W=m x g |

Physics Unit 2.3 – **Work, Energy and Movement.**

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| **Key Word** | **Definition** |
| Conservation of Momentum | If objects collide, the total momentum before the collision is the same as the total momentum after the collision (provided that no external forces - for example, friction - act on the system). |
| Elastic Potential Energy | Also called strain energy; the energy stored in an elastic object because of its shape when it is stretched or squashed. |
| Gravitational Potential Energy | The energy stored in an object because of its height above the ground. |
| Kinetic Energy | The energy an object has because it is moving. |
| Momentum | The mass of an object multiplied by its velocity. |
| Power | The amount of energy transferred per second; measured in watts (W). |
| Work | Work is a measure of energy transferred. W = F x d (J). |

Physics Unit 2.4 – **Current Electricity.**

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| **Key Word** | **Definition** |
| Electric Current | A flow of charge. |
| Electrons | A tiny particle with a single negative charge that occupies an energy level around an atom’s nucleus. |
| Ion | An **ion** is an atom or molecule in which the total number of electrons is not equal to the total number of protons, giving the atom or molecule a net positive or negative electrical charge. |
| Neutrons | A subatomic particle found in the nucleus that has the same mass as a proton, but no overall charge. |
| Ohm’s Law | The current flowing through a resistor at a constant temperature is directly proportional to the voltage **across** the resistor. So, if you double the voltage, the current also doubles. |
| Ohmic Conductor | A conductor which follows Ohm’s Law |
| Parallel Circuit | Components that are connected on separate loops are connected in parallel. Sometimes we refer to them as branches. |
| Potential Difference | The difference in the energy carried by electrons before and after they have flowed through an electrical component. Measured in volts (V). |
| Protons | A subatomic particle found within the atomic nucleus, with a single positive charge and a relative mass of 1. |
| Resistance | The degree to which a component resists a current flowing through it; the higher the resistance, the greater the potential difference necessary to make a given current flow. The unit of resistance is the ohm (Ω). |
| Series Circuit | Components that are connected one after another on the same loop of the circuit are connected in series |
| Static Electricity | A charge on an object caused by the addition or removal of electrons. |
| Volt (V) | The unit to measure potential difference and voltage. |

Physics Unit 2.5 – **Mains Electricity.**

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| **Key Word** | **Definition** |
| Alternating Current | A current which changes direction. Current supplied to UK homes is 50 Hz a.c. |
| Cables | Insulated wires having a protective casing and used for transmitting electricity or telecommunication signals. |
| Circuit Breaker | An electrical component that interrupts the current in a circuit if there is a fault and the current rises to dangerous levels. |
| Direct Current | Current flowing in one direction continuously. |
| Earth | An earth wire is a low-resistance path for electric current to flow through for safety if there is a fault in an appliance. |
| Frequency | The number of times per second that something happens, for example the number of complete waves or complete swings of a pendulum per second; measured in hertz (Hz). |
| Fuse | A small safety device containing a length of wire that is designed to melt if the current in a circuit gets too high. |
| Live Wire | A wire that carries the oscillating voltage of an a.c supply |
| Neutral Wire | A neutral wire is held at or near earth potential while the voltage in the live wire cycles between positive and negative in an a,c supply. |
| Oscilloscope | An electronic device used to show how voltage changes with time. |
| Residual Current Circuit Breaker (RCCB) | RCCBs protect some circuits. They detect a difference in the current between the live and neutral wires. RCCBs work much faster than fuses do. |
| Time Base | Tells you how many seconds each cm represents |

Physics Unit 2.6 – **Radioactivity.**

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| **Key Word** | **Definition** |
| Alpha Radiation | A type of ionizing **radiation** ejected by the nuclei of some unstable atoms. They are large subatomic fragments consisting of two protons and two neutrons. |
| Atomic Number | The number of protons in the nucleus of atoms of a particular element. |
| Beta Radiation | **Beta particles** are high-energy, high-speed electrons or positrons emitted by certain types of radioactive nuclei. The **beta particles** emitted are a form of ionizing **radiation** also known as **beta rays**. |
| Gamma Radiation | A **gamma ray** is a packet of electromagnetic energy. **Gamma** rays are the most energetic rays in the electromagnetic spectrum. **Gamma rays** are emitted from the nucleus of some unstable (radioactive) atoms. |
| Half-life | The average time it takes for something to decline by half, for example for the count rate from a sample of radioactive material to fall to half its initial level. |
| Ionisation | The removal of electrons from atoms or molecules to form ions. |
| Isotopes | Two atoms of the same element with different numbers of neutrons in the nucleus are isotopes of the element; for example, 35CI and 37CI both have 17 protons, but one has 18 neutrons and one has 20 neutrons. |
| Mass Number | The number of protons and neutrons in the nucleus of an atom. |
| Proton Number (atomic number) | The atomic number is the number of protons in an atom of an element. |
| Radioactive Activity | **Radioactive decay**, also known as **nuclear decay** or **radioactivity**, is the process by which a nucleus of an unstable atom loses energy by emitting ionizing radiation |

Physics Unit 2.7 – **Energy from the Nucleus.**

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| **Key Word** | **Definition** |
| Black Dwarf | An object expected to be formed when a white dwarf star cools to a cinder after billions of years. |
| Black Hole | A relatively small ball of dense matter. Its gravity is so strong that even light cannot escape it. |
| Chain Reaction | In physics, a nuclear reaction in which products from the first reaction go on to cause the same reaction in other nuclei, producing more products. If unchecked, a chain reaction grows exponentially, resulting in a nuclear explosion. |
| Control Rods | A rod of a material that absorbs neutrons. It is used in a nuclear reactor to control the chain reaction. |
| Main Sequence Star(s) | A star in the main part of its life cycle, when it is using hydrogen fuel. |
| Neutron Star | The final stage of the life of a star up to about three solar masses in size; it is about the size of the Earth but extremely dense. |
| Nuclear Fission | A reaction in which a large, unstable atomic nucleus splits into smaller nuclei, releasing energy. |
| Nuclear Fission Reactor | Devices designed to maintain a [chain reaction](https://www.euronuclear.org/info/encyclopedia/chainreaction.htm) producing a steady flow of [neutrons](https://www.euronuclear.org/info/encyclopedia/n/neutron.htm) generated by the [fission](https://www.euronuclear.org/info/encyclopedia/n/nuclear-fission.htm) of heavy nuclei. |
| Nuclear Fusion | The combination of atomic nuclei to form a larger nucleus and release energy. |
| Protostar | A spinning disc of hot gas in the process of condensing into a star. |
| Red Giant | A giant star late in the stellar lifecycle, which has expanded and cooled so that it has a red appearance. |
| Supergiant | An enormous star up to 70 times more massive than the Sun that has expanded near the end of its life and become red as it cools. |
| Supernova | An explosion near the end of the life of a star of more than 1.5 solar masses. |
| White Dwarf | A small, dim star that forms from stars of about one solar mass or less toward the end of the star’s life. |