

<div>T1</div> <div>energy</div>	<div>T1</div> <div>Physics Equations Sheet</div>	<div>T1</div> <div>system</div>
<div>T1</div> <div>energy stores</div>	<div>T1</div> <div>heating</div>	<div>T1</div> <div>work done by forces</div>
<div>T1</div> <div>work done when a current flows</div>	<div>T1</div> <div>Sankey diagram</div>	<div>T1</div> <div>kinetic energy</div>

<p>T1</p> <p>The object or collection of objects chosen for analysis, separated conceptually from its surroundings.</p>	<p>T1</p> <p>The official reference sheet of physics equations supplied for the relevant examination series; check that series' sheet and practise selecting and rearranging its equations.</p>	<p>T1</p> <p>The capacity to do work or cause change.</p>
<p>T1</p> <p>Energy transferred by a force acting through a displacement; for a constant force along the displacement, $W = Fs$.</p>	<p>T1</p> <p>Energy transfer from a hotter to a colder object.</p>	<p>T1</p> <p>Ways energy is stored in a system: kinetic, gravitational potential, elastic potential, thermal, chemical, magnetic, electrostatic and nuclear.</p>
<p>T1</p> <p>The energy an object has because of its motion.</p>	<p>T1</p> <p>An energy-flow diagram with arrow widths proportional to the amounts transferred.</p>	<p>T1</p> <p>Energy transferred electrically; $W = VIt$ when potential difference V and current I remain constant for time t.</p>

<div>T1</div> <div>elastic potential energy</div>	<div>T1</div> <div>gravitational potential energy</div>	<div>T1</div> <div>spring constant</div>
<div>T1</div> <div>extension</div>	<div>T1</div> <div>gravitational field strength</div>	<div>T1</div> <div>limit of proportionality</div>
<div>T1</div> <div>specific heat capacity</div>	<div>T1</div> <div>powerful</div>	<div>T1</div> <div>power</div>

<p>T1</p> <p>The force required per unit extension of a spring in its linear range.</p>	<p>T1</p> <p>Energy stored because of an object's position in a gravitational field.</p>	<p>T1</p> <p>Energy stored when an elastic object is stretched or compressed.</p>
<p>T1</p> <p>The point beyond which extension is no longer directly proportional to applied force.</p>	<p>T1</p> <p>The gravitational force per unit mass at a point.</p>	<p>T1</p> <p>The increase in length of an object.</p>
<p>T1</p> <p>The rate of energy transfer or work done.</p>	<p>T1</p> <p>Having high power: transferring a lot of energy per second.</p>	<p>T1</p> <p>The energy needed to raise the temperature of one kilogram of a substance by one kelvin or one degree Celsius.</p>

<div>T1</div> <div>work done</div>	<div>T1</div> <div>watt</div>	<div>T1</div> <div>dissipated</div>
<div>T1</div> <div>closed system</div>	<div>T1</div> <div>Lubrication</div>	<div>T1</div> <div>Thermal insulation</div>
<div>T1</div> <div>thermal conductivity</div>	<div>T1</div> <div>efficiency</div>	<div>T1</div> <div>fossil fuels</div>

<p>T1</p> <p>Describes energy spread into less useful stores, usually thermal stores of the surroundings; the energy is conserved rather than destroyed.</p>	<p>T1</p> <p>The SI unit of power, equal to one joule per second.</p>	<p>T1</p> <p>Energy transferred by a force acting through a displacement; $W = Fs$ for a constant force along that displacement.</p>
<p>T1</p> <p>Material that slows the transfer of thermal energy, reducing heat loss from a building.</p>	<p>T1</p> <p>Oil or grease between surfaces, reducing friction and the energy dissipated as heat.</p>	<p>T1</p> <p>In this energy-balance model, a chosen system across whose boundary no energy is transferred.</p>
<p>T1</p> <p>Coal, oil and natural gas formed from ancient organic matter over millions of years.</p>	<p>T1</p> <p>The fraction of total energy or power input converted to useful output.</p>	<p>T1</p> <p>How well a material conducts heat, in $W/(m \cdot K)$; low values make good insulators.</p>

<div>T1</div> <div>nuclear fuel</div>	<div>T1</div> <div>renewable</div>	<div>T1</div> <div>non-renewable</div>
<div>T2</div> <div>Physics Equations Sheet</div>	<div>T2</div> <div>potential difference</div>	<div>T2</div> <div>circuit symbols</div>
<div>T2</div> <div>in series</div>	<div>T2</div> <div>in parallel</div>	<div>T2</div> <div>Electric current</div>

<p>T1</p> <p>Describing a resource used faster than natural processes replace it on a human timescale.</p>	<p>T1</p> <p>Describing a resource that can be replenished naturally on a timescale relevant to its use.</p>	<p>T1</p> <p>Uranium or plutonium used in reactors, releasing energy by fission.</p>
<p>T2</p> <p>The standard drawn symbols for cells, resistors, lamps, diodes and meters.</p>	<p>T2</p> <p>The energy transferred per unit charge between two points.</p>	<p>T2</p> <p>The official reference sheet of physics equations supplied for the relevant examination series; check that series' sheet and practise selecting and rearranging its equations.</p>
<p>T2</p> <p>The rate of flow of electric charge.</p>	<p>T2</p> <p>Components connected on separate branches, sharing the same voltage.</p>	<p>T2</p> <p>Components connected one after another, so the same current passes through each.</p>

<div>T2</div> <div>charge</div>	<div>T2</div> <div>resistance</div>	<div>T2</div> <div>Ohmic conductor</div>
<div>T2</div> <div>Filament lamp</div>	<div>T2</div> <div>Diode</div>	<div>T2</div> <div>Thermistor</div>
<div>T2</div> <div>LDR</div>	<div>T2</div> <div>alternating</div>	<div>T2</div> <div>direct</div>

<p>T2</p> <p>A conductor whose current is proportional to potential difference, with constant resistance while temperature and other physical conditions remain fixed.</p>	<p>T2</p> <p>The ratio of potential difference to electric current.</p>	<p>T2</p> <p>An electrical property that causes attraction or repulsion.</p>
<p>T2</p> <p>In the type required here, resistance falls as temperature rises – used as a temperature sensor in a thermostat.</p>	<p>T2</p> <p>A component that conducts current much more readily in one direction than the other.</p>	<p>T2</p> <p>A lamp whose heated wire emits light; its resistance increases as the wire gets hotter.</p>
<p>T2</p> <p>Describes current flowing in one direction only, as from a battery.</p>	<p>T2</p> <p>Describes current that repeatedly reverses direction, as in the mains supply.</p>	<p>T2</p> <p>Resistance falls as light intensity rises – used as a light sensor in an automatic lighting circuit.</p>

<div>T2</div> <div>National Grid</div>	<div>T2</div> <div>step-up transformer</div>	<div>T2</div> <div>step-down transformer</div>
<div>T2</div> <div>electric field</div>	<div>T3</div> <div>density</div>	<div>T3</div> <div>internal energy</div>
<div>T3</div> <div>latent heat</div>	<div>T3</div> <div>specific latent heat</div>	<div>T3</div> <div>Fusion</div>

<p>T2</p> <p>A transformer that lowers alternating potential difference, for example from transmission voltage to a supply suitable for consumers; the lower voltage can still be dangerous.</p>	<p>T2</p> <p>A transformer that raises alternating potential difference; at the same transmitted power, a higher line voltage allows lower current and smaller I^2R losses in the same cables.</p>	<p>T2</p> <p>The network of cables and transformers distributing electricity across the country.</p>
<p>T3</p> <p>The total microscopic kinetic and potential energy of a system's particles, excluding its overall motion and position as a whole.</p>	<p>T3</p> <p>Mass per unit volume.</p>	<p>T2</p> <p>A region in which an electric charge experiences an electric force.</p>
<p>T3</p> <p>The change of state from solid to liquid.</p>	<p>T3</p> <p>The energy needed to change the state of one kilogram of a substance with no change of temperature.</p>	<p>T3</p> <p>Energy transferred during a change of state without a temperature change.</p>

<div>T3</div> <div>Vaporisation</div>	<div>T3</div> <div>physical changes</div>	<div>T3</div> <div>sublimates</div>
<div>T3</div> <div>specific heat capacity</div>	<div>T4</div> <div>isotopes</div>	<div>T4</div> <div>radioactive decay</div>
<div>T4</div> <div>Activity</div>	<div>T4</div> <div>becquerel</div>	<div>T4</div> <div>Count-rate</div>

<p>T3</p> <p>Changes directly from solid to gas without melting, as solid carbon dioxide does.</p>	<p>T3</p> <p>A change in form or physical state that does not change a substance's chemical identity.</p>	<p>T3</p> <p>The change of state from liquid to gas.</p>
<p>T4</p> <p>The spontaneous, random change of an unstable nucleus with the emission of radiation.</p>	<p>T4</p> <p>Atoms with the same proton number but different neutron numbers.</p>	<p>T3</p> <p>The energy needed to raise the temperature of one kilogram of a substance by one kelvin or one degree Celsius.</p>
<p>T4</p> <p>Detector counts per second, after allowing for background where needed. A detector usually records only some emissions: its count rate is not automatically the source activity in Bq.</p>	<p>T4</p> <p>The SI unit of radioactive activity, equal to one nuclear decay per second.</p>	<p>T4</p> <p>The number of nuclear decays in a radioactive source per second, measured in becquerels.</p>

<div>T4</div> <div>Half-life</div>	<div>T4</div> <div>Contamination</div>	<div>T4</div> <div>Irradiation</div>
<div>T4</div> <div>background radiation</div>	<div>T4</div> <div>fission</div>	<div>T4</div> <div>fusion</div>
<div>T5</div> <div>scalar</div>	<div>T5</div> <div>vector</div>	<div>T5</div> <div>contact</div>

<p>T4</p> <p>Exposure to radiation from a source, without radioactive material being transferred onto or into the object.</p>	<p>T4</p> <p>Unwanted radioactive atoms on or inside an object or person. The hazard lasts as long as the atoms are there, decaying on or in the body.</p>	<p>T4</p> <p>The time for the number of undecayed nuclei in a radioactive sample to halve.</p>
<p>T4</p> <p>Joining light nuclei to form heavier nuclei, releasing energy in the stellar reactions studied here.</p>	<p>T4</p> <p>The splitting of a heavy nucleus into smaller nuclei plus neutrons, releasing energy.</p>	<p>T4</p> <p>Ionising radiation present in the surroundings from natural and artificial sources.</p>
<p>T5</p> <p>Describes a force between touching objects, such as friction or tension.</p>	<p>T5</p> <p>A quantity with both magnitude and direction.</p>	<p>T5</p> <p>A quantity described by magnitude alone, with no direction.</p>

<p>T5</p> <p>non-contact</p>	<p>T5</p> <p>weight</p>	<p>T5</p> <p>centre of mass</p>
<p>T5</p> <p>resultant force</p>	<p>T5</p> <p>free-body diagrams</p>	<p>T5</p> <p>Elastic</p>
<p>T5</p> <p>inelastic</p>	<p>T5</p> <p>moment</p>	<p>T5</p> <p>upthrust</p>

<p>T5</p> <p>The point representing an object's or system's mass-weighted average position.</p>	<p>T5</p> <p>The gravitational force acting on an object.</p>	<p>T5</p> <p>Describes a force acting at a distance: gravitational, electrostatic or magnetic.</p>
<p>T5</p> <p>Describing a change in shape that is fully reversed when the deforming forces are removed.</p>	<p>T5</p> <p>Diagrams showing all the forces acting on a single object, as arrows.</p>	<p>T5</p> <p>The single force equivalent to all the forces acting together.</p>
<p>T5</p> <p>The upward buoyant force exerted by a fluid on an object immersed in it.</p>	<p>T5</p> <p>The turning effect of a force about a pivot.</p>	<p>T5</p> <p>Here, describing a change in shape that is not fully reversed when the load is removed.</p>

<div>T5</div> <div>Distance</div>	<div>T5</div> <div>Displacement</div>	<div>T5</div> <div>Speed</div>
<div>T5</div> <div>Velocity</div>	<div>T5</div> <div>Acceleration</div>	<div>T5</div> <div>terminal velocity</div>
<div>T5</div> <div>Inertia</div>	<div>T5</div> <div>drag</div>	<div>T6</div> <div>transverse</div>

<p>T5</p> <p>The distance travelled per unit time.</p>	<p>T5</p> <p>The change in position from an initial point to a final point, including direction.</p>	<p>T5</p> <p>The total length of the route travelled by an object; a scalar quantity.</p>
<p>T5</p> <p>A constant falling velocity reached when weight is balanced by resistance.</p>	<p>T5</p> <p>The rate of change of velocity.</p>	<p>T5</p> <p>The rate of change of displacement.</p>
<p>T6</p> <p>Describing a wave whose oscillations are perpendicular to the direction in which the disturbance travels.</p>	<p>T5</p> <p>A resistive force exerted by a fluid on an object moving relative to it.</p>	<p>T5</p> <p>An object's resistance to changes in its state of motion, measured by its mass in translational motion.</p>

<div>T6</div> <div>longitudinal</div>	<div>T6</div> <div>compressions</div>	<div>T6</div> <div>rarefactions</div>
<div>T6</div> <div>amplitude</div>	<div>T6</div> <div>wavelength</div>	<div>T6</div> <div>frequency</div>
<div>T6</div> <div>period</div>	<div>T6</div> <div>specular reflection</div>	<div>T6</div> <div>diffuse reflection</div>

<p>T6</p> <p>Regions of a longitudinal wave where particles are farther apart; in sound in a gas, they have lower density and pressure than compressions.</p>	<p>T6</p> <p>Regions of a longitudinal wave where particles are closer together and pressure or density is higher than the equilibrium value.</p>	<p>T6</p> <p>Describing a wave in which particle oscillations are parallel to the direction of energy transfer.</p>
<p>T6</p> <p>The number of complete cycles per unit time.</p>	<p>T6</p> <p>The distance between corresponding points on successive waves.</p>	<p>T6</p> <p>The maximum displacement from an equilibrium position.</p>
<p>T6</p> <p>Reflection from a rough surface, which sends parallel incident rays in different directions.</p>	<p>T6</p> <p>Reflection from a smooth surface, where parallel incident rays remain parallel after reflection.</p>	<p>T6</p> <p>The time taken for one complete oscillation or cycle.</p>

<div>T6</div> <div>convex</div>	<div>T6</div> <div>concave</div>	<div>T7</div> <div>poles</div>
<div>T7</div> <div>permanent magnet</div>	<div>T7</div> <div>induced magnet</div>	<div>T7</div> <div>magnetic field</div>
<div>T7</div> <div>solenoid</div>	<div>T7</div> <div>electromagnet</div>	<div>T7</div> <div>magnetic flux density</div>

T7	T6	T6
The north and south regions of a magnet, where its magnetic effects are strongest.	A lens thinner in the middle than at its edges, which spreads parallel rays in air.	A lens thicker in the middle than at its edges, which converges parallel rays in air.
T7	T7	T7
A region in which magnetic materials, moving charges or currents experience magnetic forces.	A magnetic material magnetised by an external field; it may lose most or all of the induced magnetism when the field is removed, depending on the material.	An object that retains its magnetisation and produces a magnetic field without an external current or field being maintained.
T7	T7	T7
The strength of a magnetic field B , in tesla.	A magnet produced by an electric current, often using a coil around an iron core.	A coil of wire that produces a magnetic field when an electric current flows through it.

<div>T7</div> <div>transformer</div>	<div>T8</div> <div>red-shift</div>	<div>T8</div> <div>nebula</div>
<div>T8</div> <div>supernova</div>		

<p>T8</p> <p>A cloud of gas and dust in space.</p>	<p>T8</p> <p>An increase in the wavelengths of matching spectral lines compared with their laboratory wavelengths.</p>	<p>T7</p> <p>A device that changes alternating potential difference using electromagnetic induction between coils.</p>
		<p>T8</p> <p>An extremely energetic stellar explosion, caused by the collapse of a massive star or runaway nuclear reactions in a white dwarf.</p>