

## Paper 1 Content

P1 Conservation and Dissipation of Energy	Analysis	Revised?
Can describe all the changes involved in the way energy is stored when a system changes, for common situations.		
Can calculate the amount of energy associated with a moving object, a stretched spring and an object raised above ground level.		
Can give examples that illustrate the definition of power e.g. comparing two electric motors that both lift the same weight through the same height but one does it faster than the other.		
Can describe with examples where there are energy transfers in a closed system, that there is no net change to the total energy.		
Can describe, with examples, how in all system changes energy is dissipated, so that it is stored in less useful ways. This energy is often described as being 'wasted'.		
Can explain ways of reducing unwanted energy transfers, for example through lubrication and the use of thermal insulation.		
<i>RP1: Can give details of how to determine the specific heat capacity of a material.</i>		
P2 Energy Transfer by Heating	Analysis	Revised?
Can describe how the rate of cooling of a building is affected by the thickness and thermal conductivity of its walls.		
Can give a definition of thermal conductivity.		
<b>Can describe ways to increase the efficiency of an intended energy transfer.</b>		
<i>PHYS RP2: Can give details of how to investigate thermal insulators.</i>		
P3 Energy Resources	Analysis	Revised?
Can describe the main energy sources available.		
Can distinguish between energy resources that are renewable and energy resources that are non-renewable.		
Can compare ways that different energy resources are used, the uses to include transport, electricity generation and heating.		
Can explain why some energy resources are more reliable than others.		
Can describe the environmental impact arising from the use of different energy resources.		
Can explain patterns and trends in the use of energy resources.		
Can consider the environmental issues that may arise from the use of different energy resources.		
Can show that science has the ability to identify environmental issues arising from the use of energy resources but not always the power to deal with the issues because of political, social, ethical or economic considerations.		
P4 Electric Circuits	Analysis	Revised?
Can explain that, for some resistors, the value of R remains constant but that in others it can change as the current changes.		
Can explain the design and use of a circuit to measure the resistance of a component by measuring the current through, and potential difference across, the component.		
Can draw an appropriate circuit diagram using correct circuit symbols.		
Can use graphs to explore whether circuit elements are linear or non-linear and relate the curves produced to their function and properties.		
Can use circuit diagrams to construct and check series and parallel circuits that include a variety of common circuit components.		
Can describe the difference between series and parallel circuits.		
Can explain qualitatively why adding resistors in series increases the total resistance whilst adding resistors in parallel decreases the total resistance.		
Can explain the design and use of dc series circuits for measurement and testing purposes.		
Can calculate the currents, potential differences and resistances in dc series circuits.		
Can solve problems for circuits which include resistors in series using the concept of equivalent resistance.		
<i>RP3: Can give details of how to investigate factors that affect electrical resistance.</i>		
<i>RP4: Can give details of how to investigate I-V characteristics of a filament lamp, diode and resistor.</i>		
P5 Electricity in the home	Analysis	Revised?
Can explain the difference between direct and alternating potential difference.		
Can explain that a live wire may be dangerous even when a switch in the mains circuit is open.		
Can recognise the dangers of providing any connection between the live wire and earth.		
Can explain how the power transfer in any circuit device is related to the potential difference across it and the current through it, and to the energy changes over time.		
Can describe how different domestic appliances transfer energy from batteries or ac mains to the kinetic energy of electric motors or the energy of heating devices.		
Can explain how the power of a circuit device is related to the potential difference across it and the current through it.		

Can explain how the power of a circuit device is related to the energy transferred over a given time.		
Can describe, with examples, the relationship between the power ratings for domestic electrical appliances and the changes in stored energy when they are in use.		
Can explain why the National Grid system is an efficient way to transfer energy.		
<b>Can describe the production of static electricity, and sparking, by rubbing surfaces.</b>		
<b>Can describe evidence that charged objects exert forces of attraction or repulsion on one another when not in contact.</b>		
<b>Can explain how the transfer of electrons between objects can explain the phenomena of static electricity.</b>		
<b>Can draw the electric field pattern for an isolated charged sphere.</b>		
<b>Can explain the concept of an electric field.</b>		
<b>Can explain how the concept of an electric field helps to explain the noncontact force between charged objects as well as other electrostatic phenomena such as sparking.</b>		
<b>P6 Molecules and Matter</b>	<b>Analysis</b>	<b>Revised?</b>
Can recognise/draw simple diagrams to model the difference between solids, liquids and gases.		
Can explain the differences in density between the different states of matter in terms of the arrangement of atoms or molecules.		
Can describe how, when substances change state (melt, freeze, boil, evaporate, condense or sublimate), mass is conserved.		
Can interpret heating and cooling graphs that include changes of state.		
Can distinguish between specific heat capacity and specific latent heat.		
Can explain how the motion of the molecules in a gas is related to both its temperature and its pressure.		
Can explain qualitatively the relation between the temperature of a gas and its pressure at constant volume.		
<i>RP5: Can give details on how to determine the density of regularly and irregularly shaped objects</i>		
Can use the particle model to explain how increasing the volume in which a gas is contained, at constant temperature, can lead to a decrease in pressure.		
Can calculate the change in the pressure of a gas or the volume of a gas (a fixed mass held at constant temperature) when either the pressure or volume is increased or decreased.		
<b>Can explain how, in a given situation e.g. a bicycle pump, doing work on an enclosed gas leads to an increase in the temperature of the gas.</b>		
<b>P7 Radioactivity</b>	<b>Analysis</b>	<b>Revised?</b>
Can recognise expressions given in standard form.		
Can relate differences between isotopes to differences in conventional representations of their identities, charges and masses.		
Can describe why the new evidence from the scattering experiment led to a change in the atomic model.		
Can describe the difference between the plum pudding model of the atom and the nuclear model of the atom.		
Can apply their knowledge to the uses of radiation and evaluate the best sources of radiation to use in a given situation.		
Can use the names and symbols of common nuclei and particles to write balanced equations that show single alpha ( $\alpha$ ) and beta ( $\beta$ ) decay.		
Can explain the concept of half-life and how it is related to the random nature of radioactive decay.		
Can determine the half-life of a radioactive isotope from given information.		
<b>Can calculate the net decline, expressed as a ratio, in a radioactive emission after a given number of half-lives.</b>		
Can compare the hazards associated with contamination and irradiation.		
Can explain why the hazards associated with radioactive material differ according to the half-life involved.		
Can describe and evaluate the uses of nuclear radiations for exploration of internal organs, and for control or destruction of unwanted tissue.		
Can evaluate the perceived risks of using nuclear radiations in relation to given data and consequences		
Can draw/interpret diagrams representing nuclear fission and how a chain reaction may occur.		