Telecommunication

	General Level	Presentation	Credit Level	Presentation
Communication Using Waves	• give an example which illustrates that the speed of sound in air is less than the speed of light in air, eg thunder and lightning	Telecommunication Using Waves		
	• describe a method of measuring the speed of sound in air (using the relationship between distance, time and speed)	Telecommunication Using Waves		
	• carry out calculations involving the relationship between distance, time and speed in problems on sound transmission	Telecommunication Using Waves		
	• state that waves are one way of transmitting signals	Telecommunication Using Waves		
	• use the following terms correctly in context: wave, frequency, wavelength, speed, energy (transfer), amplitude	Telecommunication Using Waves		
	• carry out calculations involving the relationship between distance, time and speed in problems on water waves	Telecommunication Using Waves		
	• carry out calculations involving the relationship between speed, wavelength and frequency for water and sound waves	Telecommunication Using Waves	• explain the equivalence of f x λ and d/t.	
Communication Using Cables	• describe a method of sending a message using code	Telecommunication Using Cables		
	• state that coded messages or signals are sent out by a transmitter and are picked up by a receiver	Telecommunication Using Cables		
	• state that the telephone is an example of long range communication between transmitter and receiver			
	• state the energy changes a) in a microphone (sound → electrical) b) in a loud speaker (electrical → sound)			
	• state that the mouthpiece of a telephone (transmitter) contains a microphone and the earpiece (receiver) contains an earphone (loudspeaker)			
	• state that electrical signals can be transmitted along wires during a telephone communication		• explain the electrical signal pattern in telephone wires in terms of loudness and frequency changes in the sound signal	

	General Level	Presentation	Credit Level	Presentation
Communication Using Cables	• State that an electrical signal is transmitted along a wire at a speed >> speed of sound (almost 300,000,000 m/s)			
	• describe the effect on the signal pattern displayed in oscilloscope due to a change in a) loudness of sound b) frequency of sound	Telecommunication Using Cables		
	• describe, with examples, how the following terms relate to sound: frequency and amplitude	Telecommunication Using Cables		
	• state what is meant by an optical fibre	Telecommunication Using Cables		
	• describe one practical example of telecommunication which uses optical fibres	Telecommunication Using Cables		
	• state that electrical cables and optical fibres are used in some telecommunication systems	Telecommunication Using Cables	• compare some of the properties of electrical cables and optical fibres, eg size, cost weight, signal speed, signal capacity, signal quality, signal reduction per km	Telecommunication Using Cables
	• state that light can be reflected	Telecommunication Using Cables	• state the principle of reversibility of ray paths	
	• describe the direction of the reflected light ray from a plane "mirror"	Telecommunication Using Cables	•	
	• state that signal transmission along an optical fibre takes place at very high speed	Telecommunication Using Cables	• describe the principle of operation of an optical fibre transmission system • carry out calculations involving the relationship between distance, time and speed in problems on light transmission.	Telecommunication Using Cables
Radio and Television	• state that the main parts of a radio receiver are: aerial, tuner, decoder, amplifier, loudspeaker, electricity supply; and identify these parts on a block diagram		• describe the general principle of radio transmission in terms of transmitter, carrier wave, amplitude modulation, receiver	Telecommunication Using Waves
	• describe in a radio receiver the function of the aerial, tuner, decoder, amplifier, loudspeaker and electricity supply			
	• state that the main parts of a television receiver are: aerial, tuner, decoders, amplifiers, tube, loudspeaker, electricity supply and identify these parts on a block diagram of a television receiver		• describe the general principle of television transmission in terms of transmitter, carrier wave, modulation, video and audio receivers	

	General Level	Presentation	Credit Level	Presentation
Radio and Television	• describe in a television receiver the function of: aerial, tuner, decoders, amplifiers, tube, loudspeaker, electricity supply			
	• describe how a picture is produced on a TV screen in terms of line build-up		• describe how a moving picture is seen on a television screen in terms of: - line build-up - image retention - brightness variation	
	• state that mixing red, green and blue lights produces all colours seen on a colour television screen		• describe the effect of colour mixing lights (red, green and blue)	
Transmission of Radio Waves	• state that mobile telephones, radio and television are examples of long range communication which do not need cables (between transmitter and receiver)	Telecommunication Using Waves		
	• state that microwaves, television and radio signals are waves which transfer energy	Telecommunication Using Waves		
	• state that microwaves, television and radio signals are transmitted at very high speed	Telecommunication Using Waves		
	• state that microwaves, television and radio signals are transmitted through air at 300,000,000 m/s		• carry out calculations involving the relationship between distance, time and speed in problems on microwaves, television and radio waves	
	• state that a radio transmitter can be identified by wavelength or frequency values		• carry out calculations involving the relationship between speed, wavelength and frequency for microwaves, television and radio waves • explain some of the differences in properties of radio bands in terms of source strength, reflection, etc • explain in terms of diffraction how wavelength affects radio and television reception	
	• state that curved reflectors on certain aerials or receivers make the received signal stronger		• explain the action of curved reflectors on certain transmitters	
	• explain why curved reflectors on certain aerials or receivers make the received signal stronger			
	• describe an application of curved reflectors used in telecommunication eg satellite TV, TV link, boosters, repeaters or satellite communication			

	General Level	Presentation	Credit Level	Presentation
Transmission of Radio Waves	• state that the period of satellite orbit depends on its height above the Earth	Telecommunication Using Waves		
	• state that a geostationary satellite stays above the same point on the Earth's surface	Telecommunication Using Waves		
	• describe the principle of transmission and reception of satellite television broadcasting using geostationary satellites and dish aerials	Telecommunication Using Waves		
	• describe the principle of intercontinental telecommunication using a geostationary satellite and ground stations	Telecommunication Using Waves		

Using Electricity

	General Level	Presentation	Credit Level	Presentation
From the Wall Socket	• describe the mains supply/battery as a supply of electrical energy and to describe the main energy transformations occurring in household appliances	Using Electricity - Useful Circuits		
	• state approximate power ratings of different household appliances	Using Electricity - Useful Circuits		
	• select an appropriate flex given the power rating of an appliance			
	• state that fuses in plugs are intended to protect flexes	Using Electricity - Useful Circuits		
	• select an appropriate fuse given the power rating of an appliance			
	• identify the live, neutral and earth wire from the colour of their insulation			
	• state to which pin each wire must be connected for plug, lampholder and extension socket	Using Electricity - Useful Circuits		
	• state that the human body is a conductor of electricity and that moisture increases its ability to conduct			
	• state that the earth wire is a safety device	Using Electricity - Useful Circuits	• explain how the earth wire acts as a safety device.	Using Electricity - Useful Circuits
	• state that electrical appliances which have the double insulation symbol do not require an earth wire	Using Electricity - Useful Circuits	• explain why fuses and switches must be in the live lead.	
	• draw the double insulation symbol	Using Electricity - Useful Circuits		
	• explain why situations involving electricity could result in accidents (to include proximity of water, wrong fuses, wrong, frayed or badly connected flexes, short circuits and misuse of multiway adaptors)			
Alternating and Direct Current	• state that the mains supply is a.c. and a battery supply is d.c.	Using Electricity - Useful Circuits		
	• explain in terms of current the terms a.c. and d.c.	Using Electricity - Useful Circuits		
	• state that the frequency of the mains supply is 50 Hz.	Using Electricity - Useful Circuits		
	• state that the declared value of the mains voltage is 230 V	Using Electricity - Useful Circuits	• state that the declared value of an alternating voltage is less than its peak value	Using Electricity - Useful Circuits

	General Level	Presentation	Credit Level	Presentation
Alternating and Direct Current	• draw and identify the circuit symbol for a battery, fuse, lamp, switch, resistor, capacitor, diode and variable resistor	Using Electricity - Current, Voltage and Resistance		
	• state that electrons are free to move in a conductor	Using Electricity - Current, Voltage and Resistance		
	• describe the electric current in terms of the movement of charges around a circuit	Using Electricity - Current, Voltage and Resistance	• carry out calculations involving the relationship between charge, current and time	
	• use correctly the units: ampere and volt	Using Electricity - Current, Voltage and Resistance	• use correctly the unit: coulomb • state that voltage of a supply is a measure of the energy given to the charges in a circuit	Using Electricity - Current, Voltage and Resistance
Resistance	• draw and identify the circuit symbols for an ammeter and voltmeter	Using Electricity - Current, Voltage and Resistance		
	• draw circuit diagrams to show the correct positions of ammeter and voltmeter in a circuit	Using Electricity - Current, Voltage and Resistance Using Electricity - Useful Circuits		
	• state that an increase in resistance of a circuit leads to a decrease in the current in that circuit	Using Electricity - Current, Voltage and Resistance		
	• carry out calculations involving the relationship between resistance, current and voltage	Using Electricity - Current, Voltage and Resistance	• state that V/I for a resistor remains approximately constant for different currents	Using Electricity - Current, Voltage and Resistance
	• use correctly the unit: ohm	Using Electricity - Current, Voltage and Resistance		
	• give two practical uses of variable resistors	Using Electricity - Current, Voltage and Resistance		
	• state that when there is an electric current in a wire, there is an energy transformation	Using Electricity - Current, Voltage and Resistance		
	• give three examples of resistive circuits in the home in which electrical energy is transformed into heat			
	• state that the electrical energy transformed each second = VI	Using Electricity - Current, Voltage and Resistance		
	• state the relationship between energy and power	Using Electricity - Current, Voltage and Resistance	• explain the equivalence of VI and I^2R	

	General Level	Presentation	Credit Level	Presentation
Resistance	• use correctly in context, the terms energy, power, joule and watt	Using Electricity - Current, Voltage and Resistance		
	• carry out calculations involving the relationship between power, current and voltage	Using Electricity - Current, Voltage and Resistance	• carry out calculations using the relationship between power, current and resistance	Using Electricity - Current, Voltage and Resistance
	• state that in a lamp, electrical energy is transformed into heat and light	Using Electricity - Current, Voltage and Resistance		
	• state that the energy transformation in an electric lamp occurs in resistance wire (filament lamp) or gas (discharge tube)	Using Electricity - Current, Voltage and Resistance		
	• state that a discharge tube lamp is more efficient than a filament lamp (ie more of the energy is transformed into light and less into heat)			
	• state that the energy transformation in an electric heater occurs in resistance wire (element)			
Useful Circuits	• state a practical application in the home which requires two or more switches used in series			
	• state that in a series circuit, the current is the same at all points	Using Electricity - Useful Circuits	• draw circuit diagrams to describe how the various car lighting requirements achieved	
	• state that the sum of currents in parallel branches is equal to the current drawn from the supply	Using Electricity - Useful Circuits		
	• explain that connecting too many appliances to one socket is dangerous because a large current could be drawn from the supply			
	• state that the voltage across components in parallel is the same for each component	Using Electricity - Useful Circuits		
	• state that the sum of voltages across components in series is equal to the voltage of the supply	Using Electricity - Useful Circuits		
	• describe how to make a simple continuity tester			
	• describe how a continuity tester may be used for fault finding		• carry out calculations involving resistors connected in series and parallel	Using Electricity - Current, Voltage and Resistance

	General Level	Presentation	Credit Level	Presentation
Behind the Wall	• state that household wiring connects appliances in parallel	Using Electricity - Useful Circuits	• describe, using a circuit diagram, a ring circuit • state advantages of using the ring circuit as a preferred method of wiring in parallel • give two differences between the lighting circuit and the power ring circuit	
	• state that mains fuses protect the mains wiring	Using Electricity - Useful Circuits		
	• state that a circuit breaker is an automatic switch which can be used instead of a fuse	Using Electricity - Useful Circuits	• state one reason why a circuit breaker may be used in preference to a fuse	
	• state that kWh is a unit of energy	Using Electricity - Useful Circuits	• explain the relationship between kilowatt-hours and joules.	
Movement From Electricity	• identify on a simple diagram of an electric motor, the rotating coil, field coil (magnet), brushes and commutator	Energy Matters - Source to Consumer	• state that the direction of force on a current-carrying wire depends upon the direction of current and of the field	Energy Matters - Source to Consumer
	• state that a magnetic field exists around a current-carrying wire	Energy Matters - Source to Consumer	• explain the operation of a d.c. electric motor in terms of forces acting on the coil and the purpose of brushes and commutator	Energy Matters - Source to Consumer
	• give two examples of practical applications which make use of the magnetic effect of a current		• state the reasons for the use in commercial motors of carbon brushes, multi-section commutators and field coils	
	• state that a current-carrying wire experiences a force when the wire is in a magnetic field	Energy Matters - Source to Consumer		

Health Physics

	General Level	Presentation	Credit Level	Presentation
The Use of Thermometers	• state that a thermometer requires some measurable physical property that changes with temperature			
	• describe the operation of a liquid in glass thermometer			
	• describe the main differences between a clinical and ordinary thermometer			
	• describe how body temperature is measured using a clinical thermometer			
	• explain the significance of body temperature in diagnosis of illness			
Using Sound	• state that a solid, a liquid or a gas is required for the transmission of sound	Health Physics - Sight and Sound		
	• explain the basic principles of a stethoscope as a "hearing aid"			
	• give one example of the use of ultrasound in medicine, eg images of an unborn baby		• explain one use of ultrasound in medicine	
	• state that high frequency vibrations beyond the range of human hearing are called ultrasounds			
	• give two examples of noise pollution	Health Physics - Sight and Sound		
	• give examples of sound levels in the range 0 dB - 120 dB	Health Physics - Sight and Sound		
	• state that excessive noise can damage hearing	Health Physics - Sight and Sound		
Light and Sound	• describe the focusing of light on the retina of the eye	Health Physics - Sight and Sound		
	• state what is meant by refraction of light	Health Physics - Sight and Sound		
	• draw diagrams to show the change of direction as light passes from air to glass and glass to air	Health Physics - Sight and Sound	• use correctly in context the terms angle of incidence, angle of refraction and normal	Health Physics - Sight and Sound
	• describe the lens shapes of convex and concave	Health Physics - Sight and Sound		
	• describe the effect of various lens shapes on the rays of light	Health Physics - Sight and Sound		
	• state that the image formed on the retina of the eye is upside down and laterally inverted	Health Physics - Sight and Sound		

	General Level	Presentation	Credit Level	Presentation
Light and Sound	• explain using a ray diagram how an inverted image can be formed on the retina		• explain using a ray diagram how the lens of the eye forms, on the retina, an image of an object a) some distance from the eye b) close to the eye	Health Physics - Sight and Sound
	• describe a simple experiment to find the focal length of a spherical convex lens		• carry out calculations on power/focal length to find either one given the other	
	• state the meaning of long and short sight	Health Physics - Sight and Sound		
	• state that long and short sight can be corrected using lenses	Health Physics - Sight and Sound	• explain the use of lenses to correct long and short sight	Health Physics - Sight and Sound
	• state that fibre optics can be used as a transmission system for 'cold light'		• explain the use of fibre optics in the endoscope (fibroscope)	
Using the Spectrum	• describe how the laser is used in one application of medicine			
	• describe one use of X-rays in medicine	Health Physics - Nuclear Radiation	• describe the advantage of computerised tomography	
	• state that photographic film can be used to detect X-rays	Health Physics - Nuclear Radiation		
	• describe the use of ultraviolet and infrared in medicine			
	• state that excessive exposure to ultraviolet radiation may produce skin cancer	Health Physics - Nuclear Radiation		
Nuclear Radiation – Humans and Medicine	• state that radiation can kill living cells or change the nature of living cells	Health Physics - Nuclear Radiation		
	• describe one medical use of radiation based on the fact that radiation can destroy cells (instrument sterilisation, treatment of cancer)	Health Physics - Nuclear Radiation		
	• describe one medical use of radiation based on the fact that radiation is easy to detect	Health Physics - Nuclear Radiation		
	• state the range and absorption of alpha, beta and gamma radiation	Health Physics - Nuclear Radiation		
	• state that radiation energy may be absorbed in the medium through which it passes	Health Physics - Nuclear Radiation		
	• describe a simple model of the atom which includes protons, neutrons and electrons	Health Physics - Nuclear Radiation		

	General Level	Presentation	Credit Level	Presentation
Nuclear Radiation – Humans and Medicine	• state that alpha rays produce much greater ionisation density than beta or gamma rays	Health Physics - Nuclear Radiation	• explain the term ionisation	Health Physics - Nuclear Radiation
	• state one example of the effect of radiation on non-living things (eg ionisation, fogging of photographic film, scintillations)	Health Physics - Nuclear Radiation	• describe how one of the effects of radiation is used in a detector of radiation (eg GM tube; film badges; scintillation counters)	Health Physics - Nuclear Radiation
	• state that the activity of a radioactive source is measured in becquerels	Health Physics - Nuclear Radiation	• describe a method of measuring the half-life of a radioactive element	Health Physics - Nuclear Radiation
	• state that the activity of a radioactive source decreases with time	Health Physics - Nuclear Radiation	• state the meaning of the term "half-life" • carry out calculations to find the half-life of a radioactive element from appropriate data	Health Physics - Nuclear Radiation
	• describe the safety precautions necessary when dealing with radioactive substances	Health Physics - Nuclear Radiation		
	• state that equivalent dose is measured in sieverts	Health Physics - Nuclear Radiation	• state that for living materials the biological effect of radiation depends on the absorbing tissue and the nature of the radiation and that equivalent dose measured in sieverts takes account of the type and energy of radiation	Health Physics - Nuclear Radiation

Electronics

	General Level	Presentation	Credit Level	Presentation
Overview	• state that an electronic system consists of three parts; input, process and output			
	• distinguish between digital and analogue outputs			
	• identify analogue and digital signals from waveforms viewed on an oscilloscope			
Output Devices	• give examples of output devices and the energy conversions involved	Electronics	• identify appropriate output devices for a given application	Electronics
	• give examples of digital output devices and of analogue output devices			
	• draw and identify the symbol for an LED	Electronics	• describe by means of a diagram a circuit which will allow an LED to light	Electronics
	• state that an LED will light only if connected one way round	Electronics		
	• explain the need for a series resistor with an LED	Electronics	• calculate the value of the series resistor for an LED	Electronics
	• state that different numbers can be produced by lighting appropriate segments of a 7-segment display	Electronics	• calculate the decimal equivalent of a binary number in the range 0000 - 1001	Electronics
Input Devices	• describe the energy transformations involved in the following devices: - microphone - thermocouple - solar cell	Electronics		
	• state that the resistance of a thermistor changes with temperature and the resistance of an LDR decreases with increasing light intensity	Electronics	• carry out calculations involving voltages and resistances in a voltage divider	
	• carry out calculations using voltage, current and resistance for the thermistor and the LDR		• state that the time to charge a capacitor depends on the values of the capacitance and the series resistance	
	• state that during charging the voltage across a capacitor increases with time			
	• identify from a list an appropriate input device for a given application	Electronics	• identify appropriate input devices for a given application	Electronics

	General Level	Presentation	Credit Level	Presentation
Input Devices	• state that a transistor can be used as a switch	Electronics		
	• state that a transistor may be conducting or non-conducting, ie ON or OFF	Electronics		
	• draw and identify the circuit symbol for an NPN transistor	Electronics	• explain the operation of a simple transistor switching circuit	Electronics
	• identify from a circuit diagram the purpose of a simple transistor switching circuit	Electronics		
	• draw and identify the symbols for two input AND and OR gates, and a NOT gate	Electronics	• identify the following gates from truth tables: - two-input AND - two-input OR - NOT (inverter)	Electronics
	• state that logic gates may have one or more inputs and that a truth table shows the output for all possible input combinations	Electronics		
	• State that high voltage = logic '1', low voltage = logic '0'	Electronics		
	• draw the truth tables for two input AND and OR gates, and a NOT gate	Electronics		
	• explain how to use combinations of digital logic gates for control in simple situations	Electronics	• complete a truth table for a simple combinational logic circuit	
	• state that a digital circuit can produce a series of clock pulses	Electronics	• explain how a simple oscillator built from a resistor, capacitor and inverter operates	
	• give an example of a device containing a counter circuit		• describe how to change the frequency of the clock.	Electronics
	• state that there are circuits which can count digital pulses			
	• state that the output of the counter circuit is in binary	Electronics		
	• state that the output of a binary counter can be converted to decimal	Electronics		
Analogue Processes	• identify from a list, devices in which amplifiers play an important part			
	• state the function of the amplifier in devices such as radios, intercoms and music centres			
	• state that the output signal of an audio amplifier has the same frequency as, but a larger amplitude than, the input signal			

	General Level	Presentation	Credit Level	Presentation
Analogue Processes	• carry out calculations involving input voltage, output voltage and voltage gain of an amplifier		• describe how to measure the voltage gain of an amplifier	
			• carry out calculations involving power, voltage and resistance (impedance)	
			• carry out calculations involving input power, output power and power gain of an amplifier.	

Transport

	General Level	Presentation	Credit Level	Presentation
On the Move	• describe how to measure an average speed	Transport - On The Move		
	• carry out calculations involving the relationship between distance, time and average speed	Transport - On The Move		
	• describe how to measure instantaneous speeds		• identify situations where average and instantaneous speeds are different	
	• define the terms speed and acceleration	Transport - On The Move	• explain how the method used to measure the time of travel can have an effect on the measured value of the instantaneous speed	
	• calculate acceleration from change of speed per unit time	Transport - On The Move		
	• draw speed-time graphs showing steady speed, slowing down and speeding up	Transport - On The Move		
	• describe the motions represented by a speed-time graph	Transport - On The Move		
	• calculate acceleration, from speed-time graphs, for motion with a single constant acceleration	Transport - On The Move	• calculate distance gone and acceleration from speed-time graphs for motion involving more than one constant acceleration • carry out calculations involving the relationship between initial speed, final speed, time and uniform acceleration	Transport - On The Move
Forces St Work	• describe the effects of forces in terms of their ability to change the shape, speed and direction of travel of an object	Transport - Forces at Work Transport - On The Move		
	• describe the use of a Newton balance to measure force	Transport - Forces at Work		
	• state that weight is a force and is the Earth's pull on the object	Transport - Forces at Work	• distinguish between mass and weight	Transport - Forces at Work
	• use the approximate value of 10 N kg-1 to calculate weight	Transport - Forces at Work	• state that the weight per unit mass is called the gravitational field strength	
	• state that the force of friction can oppose the motion of a body	Transport - Forces at Work		
	• describe and explain situations in which attempts are made to increase or decrease the force of friction	Transport - Forces at Work		
	• state that equal forces acting in opposite directions on an object are called balanced forces and are equivalent to no force at all	Transport - Forces at Work		

	General Level	Presentation	Credit Level	Presentation
Forces St Work	• state that when balanced forces or no forces act on an object its speed remains the same	Transport - Forces at Work		
	• explain, in terms of the forces required, why seat belts are used in cars	Transport - Forces at Work	• explain the movement of objects in terms of Newton's first law	Transport - Forces at Work
	• describe the qualitative effects of change of mass or of force on the acceleration of an object	Transport - Forces at Work		
	• carry out calculations involving the relationship between acceleration, unbalanced force and mass	Transport - Forces at Work	• carry out calculations using the relationship between acceleration, force and mass and involving more than one force but in one dimension only	
Movement Means Energy	• describe the main energy transformations as a vehicle accelerates, moves at constant speed, brakes and goes up or down a slope			
	• state that work done is a measure of the energy transferred	Transport - Movement Means Energy		
	• carry out calculations involving the relationship between work done, force and distance	Transport - Movement Means Energy		
	• carry out calculations involving the relationship between power, work and time	Transport - Movement Means Energy		
	• state that the change in gravitational potential energy is the work done against/by gravity	Transport - Movement Means Energy		
	• state that the greater the mass and/or the speed of a moving object, the greater is its kinetic energy	Transport - Movement Means Energy	• carry out calculations involving the relationship between kinetic energy, mass and speed	Transport - Movement Means Energy
			• carry out calculations involving energy, work, power and the principle of conservation of energy	Transport - Movement Means Energy

Energy Matters

	General Level	Presentation	Credit Level	Presentation
Supply and Demand	• state that fossil fuels are at present the main sources of energy	Energy Matters - Generating Electricity		
	• state that the reserves of fossil fuels are finite	Energy Matters - Generating Electricity		
	• explain one means of conserving energy related to the use of energy in industry, in the home and in transport			
	• carry out calculations relating to energy supply and demand			
	• classify renewable and non-renewable sources of energy	Energy Matters - Generating Electricity	• explain the advantages and disadvantages associated with at least three renewable energy sources	Energy Matters - Generating Electricity
Generation of Electricity	• identify from a diagram the energy transformation at each stage of: - a thermal power station - a hydro-electric power station - a nuclear power station	Energy Matters - Generating Electricity	• compare energy output from equal masses of coal and nuclear fuel	
			• carry out calculations involving efficiency of energy transformation	
			• state that energy is degraded in energy transformation	
	• state that radio-active waste is produced by nuclear reactors	Energy Matters - Generating Electricity	• explain in simple terms a chain reaction	
	• carry out calculations on energy transformation to include gravitational potential energy	Transport - Movement Means Energy		
	• describe the principle and give the advantages of a pumped hydro-electric scheme	Energy Matters - Generating Electricity		
Source to Consumer	• identify circumstances in which a voltage will be induced in a conductor	Energy Matters - Source to Consumer	• explain from a diagram how an a.c. generator works	Energy Matters - Source to Consumer
	• identify on a given diagram the main parts of an a.c. generator	Energy Matters - Source to Consumer	• state the main differences between a full-size generator and a simple working model	
			• state the factors which affect the size of the induced voltage, ie field strength, number of turns on the coil, relative speed of magnet and coil	Energy Matters - Source to Consumer

	General Level	Presentation	Credit Level	Presentation
Source to Consumer	• state that transformers are used to change the magnitude of an a.c. voltage	Energy Matters - Source to Consumer	• explain why a transformer is not 100% efficient	
	• describe the structure of a transformer		• carry out calculations on transformers involving input and output voltages, turns ratio, primary and secondary currents and efficiency	
	• carry out calculations involving the relationship between primary voltage, secondary voltage, number of turns on primary coil and number of turns on secondary coil			
	• state that high voltages are used in the transmission of electricity to reduce power loss		• carry out calculations involving power loss in transmission lines.	
	• describe qualitatively the transmission of electrical energy by the National Grid system	Energy Matters - Source to Consumer		
Heat in the Home	• use the following terms correctly in context: temperature, heat and degree Celsius	Energy Matters - Heat in the Home		
	• describe two ways of reducing heat loss in the home due to conduction, convection and radiation	Energy Matters - Heat in the Home		
	• state that heat loss in a given time depends upon the temperature difference between the inside and the outside of the house	Energy Matters - Heat in the Home		
	• state that the same mass of different materials requires different quantities of energy to raise their temperature of unit mass by one degree Celsius			
	• carry out calculations based on practical applications involving heat, mass, specific heat capacity and temperature change		• use the principle of conservation of energy to carry out calculations on energy transformations which involve temperature change	
	• give examples of applications which involve a change of state, eg refrigerator or picnic box cooler	Energy Matters - Heat in the Home	• carry out calculations involving heat, mass and specific latent heat	Energy Matters - Heat in the Home
	• use the following terms correctly in context: specific heat capacity, change of state, specific latent heat of fusion, and specific latent heat of vaporisation	Energy Matters - Heat in the Home		
	• state that a change of state does not involve a change of temperature	Energy Matters - Heat in the Home		
	• state that energy is gained or lost by a substance when its state is changed	Energy Matters - Heat in the Home		

Space Physics

	General Level	Presentation	Credit Level	Presentation
Signals from Space	• use correctly in context the following terms: moon, planet, sun, star, solar system, galaxy, universe	Space Physics - Signals From Space	• use correctly in context the term light-year	Space Physics - Signals From Space
	• state approximate values for the distance from the Earth to the Sun, to the next nearest star, and to the edge of our galaxy in terms of the time for light to cover these distances	Space Physics - Signals From Space		
	• draw a diagram showing the main features of a refracting telescope (objective, eyepiece, light-tight tube)		• draw a ray diagram to show the formation of an image by a magnifying glass	
	• state that the objective lens produces an image which is magnified by the eyepiece		• explain why the brightness of an image depends on the diameter of the objective	
	• state that different colours of light correspond to different wavelengths	Space Physics - Signals From Space		
	• list the following colours in order of wavelength: red, green, blue	Space Physics - Signals From Space		
	• state that white light can be split into different colours using a prism	Space Physics - Signals From Space		
	• state that the line spectrum produced by a source provides information about the atoms within the source	Space Physics - Signals From Space		
	• state that there exists a large family of waves with a wide range of wavelengths which all travel at the speed of light	Space Physics - Signals From Space	• classify as members of the electromagnetic spectrum the following radiations: gamma rays, X-rays, ultraviolet, visible light, infrared, microwaves, TV and radio	Space Physics - Signals From Space
	• state that telescopes can be designed to detect radio waves	Space Physics - Signals From Space	• list the above radiations in order of wavelength (and frequency) • give an example of a detector for each of the above radiations • explain why different kinds of telescope are used to detect signals from space	Space Physics - Signals From Space
Space Travel	• state that a rocket is pushed forward because the "propellant" is pushed back		• state that Newton's Third Law is: "If A exerts a force on B, B exerts an equal but opposite force on A"	Space Physics - Space Travel
	• explain simple situations involving the rule: A pushes B, B pushes A back	Space Physics - Space Travel	• identify "Newton pairs" in situations involving several forces	
	• carry out calculations involving thrust, mass, and acceleration			

	General Level	Presentation	Credit Level	Presentation
Space Travel	• explain why a rocket motor need not be kept on during interplanetary flight			
	• state that the force of gravity near the Earth's surface gives all objects the same acceleration (if the effects of air resistance are negligible)	Space Physics - Space Travel		
	• state that the weight of an object on the moon or on different planets is different from its weight on Earth	Space Physics - Space Travel	• carry out calculations involving the relationship between weight, mass, acceleration due to gravity and/or gravitational field strength including situations where g is not equal to 10 N kg^{-1}	Space Physics - Space Travel
	• state that objects in free fall appear weightless	Space Physics - Space Travel	• use correctly in context the following terms: mass, weight, inertia, gravitational field strength, acceleration due to gravity	Space Physics - Space Travel
			• state that the weight of a body decreases as its distance from the Earth increases	Space Physics - Space Travel
	• explain the curved path of a projectile in terms of force of gravity	Space Physics - Space Travel	• explain how projectile motion can be treated as two independent motions and solve numerical problems using this method	
			• explain satellite motion as an extension of projectile motion	