Topic	Sub Topic	Title and content	Additional Info	Literacy/Numeracy/ICT/SMSC links	Alleyne's Skills
Electricity		Electricity basics	Define electric current, resistance and potential difference and their units in circuits, Draw series and parallel circuits, currents add where branches meet Battery and bulb ratings resistance, measured in ohms, as the ratio of potential difference (p.d.) to current Build simple circuits	SMSC - develop teamwork and practical skills	Creativity; Emp
		Conductors and insulators	Investigate differences in resistance between conducting and insulating components (quantitative) Practical investigation into conductors and insulators	SMSC - develop teamwork and practical skills	Creativity; Emp
		Energy bills	· comparing power ratings of appliances in watts (W, kW) · domestic fuel bills, fuel use and costs Efficiency		
		Static electricity	· Describe the separation of positive or negative charges when objects are rubbed together Explain that static electricity is caused by the transfer of electrons, forces between charged objects ·Explain the idea of electric fields being forces acting across the space between objects not in contact	Literacy - description of key words	Literacy
		Peer assessed task 6			
Magnets		Magnet properties	· magnetic poles, attraction and repulsion		
		Magnetic fields	· magnetic fields by plotting with compass, representation by field lines		
		Compasses	· Earth's magnetism, compass and navigation		
		Electromagnets	· the magnetic effect of a current, electromagnets, DC motors (principles only)		
		Electricity and Magnets test			
Energy		Energy types and systems	A system is an object or group of objects and there are changes in energy stores when a system changes. To describe all the changes involved in the way energy is stored when a system changes, for common situations Calculation of fuel uses and costs in the domestic context - · comparing energy values of different foods (from labels) (kJ) · comparing power ratings of appliances in watts (W, kW) · comparing amounts of energy transferred (J, kJ, kW hour) · domestic fuel bills, fuel use and costs · fuels and energy resources	SMSC - saving energy, reducing energy loss	Empathy

		Energy Transfers, Sankey diagrams, Efficiency	Conservation of energy law To describe with examples where there are energy transfers in a closed system To describe, with examples, how in all system changes energy and wasted energy To explain ways of reducing unwanted energy transfers, e.g through lubrication and the use of thermal insulation. Calculate efficiency using physical processes and mechanisms, rather than energy, to explain the intermediate steps that bring about such changes (HT only) Students should be able to describe ways to increase the efficiency of an intended energy transfer.	SMSC - reducing wasted energy, making objects more efficient	Empathy
	Scientific Literacy Task	Scientific Literacy Task	Scientific Literacy Task	Scientific Literacy Task	Literacy
		Work done	Definition of work done work done and energy changes on deformation · simple machines give bigger force but at the expense of smaller movement (and vice versa)	Numeracy - using equation to calculate work done	Numeracy
		Power	Define power An energy transfer of 1 joule per second is equal to a power of 1 watt. Calculate power using power = energy transfer / time power = work done / time To give examples that illustrate the definition of power eg comparing two electric motors that both lift the same weight through the same height but one does it faster than the other.	Numeracy - using equation to calculate power	Numeracy
		Conduction, Convection and Radiation	To explain energy transfer through conduction, convection and radiation Use examples of radiators, cavity walls, loft insulation, carpet, double glazing	Literacy - description and comparison of methods of energy transfer	Literacy
		Thermal Conductivity	Explain thermal conductivity Describe how the rate of cooling of a building is affected by the thickness and thermal conductivity	SMSC - making a house more energy efficient	Communicat
		Thermal Insulation	Investigate the effectiveness of different materials as thermal insulators		Leaderhip; Problem Solv
		Energy 1 Test			
		GPE and KE	To describe KE and GPE and when they are present Describe how and when they are increased/decreased To explain the relationship between GPE and KE Rearranging of calculations NOT needed	Literacy - description and comparison of methods of energy transfer	
		GPE to KE + prac	To describe KE and GPE and when they are present Describe how and when they are increased/decreased To explain the relationship between GPE and KE Rearranging of calculations NOT needed	Literacy - description and comparison of methods of energy transfer	Leaderhip; Problem Solv
		Peer assessed task	Energy transfers		
		Hooke's Law	· forces measured in newtons, measurements of stretch or compression as force is changed · force-extension linear relation; Hooke's Law as a special case	Literacy - describing patterns in data	Numeracy

		Elastic Potential Energy	To calculate the amount of energy in a stretched spring EPE can be calculated using the equation e.p.e = 0.5 × spring constant × extension ^{2}	Numeracy - using equation to calculate EPE	Numeracy
		Specific Heat Capacity (alternative required prac if higher groups)	Define specific heat capacity The amount of energy stored in or released from a system can be calculated using the equation energy = mass × specific heat capacity × temperature change Prac using voltmeter and ammeter for power and energy calculations	Numeracy - using equation to calculate SHC	Numeracy
		Revision			
		Energy 2 Test			
		Feedback			Independer
Light and Sound		Properties of light	Label the frequency, amplitude and wavelength on a diagram of a wave Definition of frequency as the number of waves per second Describe how light travels Describe what happens to light when it is transmitted and absorbed		
		Reflection	Describe how we see objects Describe what happens when light is reflected off a smooth surface Diagram showing incident and reflected rays, angle of incidence = angle of reflection		
		Refraction	Describe and explain* the refraction of light		
		Dispersion and colour	Describe the dispersion of white light Describe the primary and secondary colours of light Combinations of red, blue and green light to make cyan, magenta, yellow and white		
		Seeing colours	Explain why objects look different colours (including white and black) Absorbing and reflecting colours of white light that shine on the object (e.g. green objects reflect green light and absorb the other colours of white light) Explain why objects look different colours in different coloured lights		
		Peer Assessment			
		Properties of sound	Describe how sound travels Describe what happens to a sound as the frequency and amplitude of a wave changes Higher frequency = higher pitch, higher amplitude = louder		
		Speed of sound	Recall the formula for calculating speed Compare the speeds of sound and light Calculate the speed of sound using measured values Compare and explain the speed of sound in solids, liquids and gases Particle vibrations transferring sound energy, distance between particles		
		Ultrasound	Describe what ultrasound is Describe uses and applications of ultrasound - Bats, dolphins, submarines, parking sensors, fishing boats Calculate the distance away that an object is based on the speed of sound and the time taken		
		Topic Test			

Space		The Sun and Stars	Describe the Sun as a star Describe the lifecycle of a star Define a star and why it glows Explain the relative sizes of objects in the universe		Literacy
		The Planets	Describe the planets and the position in the solar system Compare properties such as size, structure, atmosphere and temperature for each planet Define and use lightyears as a unit of measurement		Literacy
		The seasons	Describe how night and day occurs Explain why we have seasons in relation to the Earth's tilt Compare the seasons in different hemispheres		Empathy
		Gravity	Describe what causes gravity Discuss the differences in gravity on different planets and stars Explain forces between stars and planets Calculate weight on different planets		Literacy
		The Big Bang	Describe what caused the Big Bang Explain the evidence that led scientists to come up with the theory of the Big Bang Discuss alternative theories to the beginning of the solar system Discuss current theories for the end of the Earth - e.g. the Big Crunch		Literacy
		Project	Additional lessons can be used to make a poster/project booklet on the topics covered in the Space unit		Resilience; Indep