

Physics Key Stage 3 Assessment Criteria

	Year 7	Year 8
<u>“Exceeding”</u> Evaluating Judging Hypothesising Creating	Energy I can use scientific principles to suggest and justify which energy resources may be most suitable. Electricity I can link electric current as the flow of charge with the structure of atoms. I can suggest some applications for materials of higher or lower resistance. I can explain how a fuse works and choose an appropriate fuse for a given appliance. I can discuss resistance in terms of electrical conductors and insulators. I can explain what the peaks and troughs on an oscilloscope trace represent. Forces I can interpret distance-time graphs to describe changes in motion and calculate speed. I can calculate a resultant force. I can apply Hooke's Law to the measurement of forces using a force meter. I can explain what is meant by elastic limit and limit of proportionality. I can discuss applications of changing pressure. I can use calculations of density to predict whether an object will float or sink. Sound I can describe how sound waves can be used to transfer information if they are converted to electrical signals. I can compare and contrast longitudinal and transverse waves.	Fluids I can suggest why thermal insulators reduce thermal energy transfer. Light I can explain light as a transverse electromagnetic wave, with reference to oscillations and energy (transverse waves) and magnetic and electric fields (electromagnetic wave). I can apply my knowledge of light waves to explaining why refraction occurs, with reference to particles and the speed of light. I can apply my knowledge of light waves to explain how colour blindness occurs, with reference to rods and cones. I can link my knowledge to light waves to explain how light and heat energy travels to Earth from the Sun as an electromagnetic wave. Energy transfers I can calculate electrical power, current and potential difference. I can calculate the energy transferred, power and time. I can calculate cost of electricity in domestic fuel bills when given energy transferred and cost per unit. I can compare and contrast energy efficiencies and I can evaluate appliances in terms of their energy efficiency. Earth and Space I can explain how the different seasons occur in the northern hemisphere, with reference to the tilt of the Earth and proximity to the Sun.
<u>“Securing”</u> Analysing Differentiating Organising Attributing	Energy I can use scientific principles to suggest which energy resources may be most suitable. Electricity I can calculate current when given charge and time. I can describe how in a parallel circuit the potential difference is the same for each branch as the battery or cell. I can calculate resistance when given potential difference and current. I can describe that objects of increased resistance allow less current to flow. Forces I can describe friction. I can explain ways of reducing or increasing friction and discuss some applications of friction. I can describe what balanced forces are and explain when a force is balanced or unbalanced. I can describe what a resultant force is. I can interpret resultant forces to predict the effect on an object's motion. I can calculate extension of springs using Hooke's Law. I can explain some applications of increasing or decreasing pressure and I can explain the effects of pressure on an object in terms of particles. Sound I can describe the reflection of a sound wave as an echo and describe some applications of echoes, including sonar, ultrasound and echolocation. I can explain what it means to describe sound as a longitudinal wave, with reference to the direction of vibrations and energy.	Fluids I can suggest how thermal energy transfer by convection, conduction and radiation may be changed. Light I can explain how a prism may be used to diffuse the different colours of light, with reference to refraction and wave speed. I can describe how a pinhole camera works using a ray diagram. I can explain how we see different colours, with reference to the colour of the object and the colour of the light available. I can describe the superposition of observed waves in water. Energy transfers I can calculate energy efficiency. I can interpret block and Sankey energy diagrams. Earth and Space I can calculate weight when given mass and gravitational field strength. I can explain that the movement of light is measured in light years, and that this is how far light travels in one year. I can describe that this is a measurement of distance and not time. I can explain the existence of a leap year, with reference to the fact that an Earth year is actually 365.25 days.

“Achieving” Applying Executing Inferring Implementing	Energy I can explain how almost all energy on Earth comes from the Sun. I can describe how coal, oil and gas were formed. I can compare and contrast energy resources. I can describe ways in which energy is stored, including describing chemical, gravitational and elastic as forms of potential energy. Electricity I can calculate current in series and parallel circuits. I can state that resistance is a measurement of how easy or hard it is for current to flow through an object. I can describe how to correctly connect an ammeter and a voltmeter to a circuit. I can describe electrical current as the flow of charge in a circuit. I can label the components of a plug. Forces I can calculate the average speed of an object. I can calculate pressure when given the force and area. I can calculate density when given the mass and volume of an object. I can describe air and water resistance and explain ways of reducing or increasing air and water resistance. I can describe Hooke's Law. I can describe how floating or sinking is dependent on density. Sound I can describe the function of parts of the ear. I can recognise and label a diagram of a longitudinal wave, including compressions and rarefactions. I can describe how sound requires matter to travel, and I can explain which material sound will travel fastest through with reference to particle arrangement.	Fluids I can describe and explain how thermal energy is transferred by convection, in terms of particles. I can describe and explain the expansion of heated materials. I can describe and explain how thermal energy is transferred by radiation, in terms of particles. Light I can describe how white light is a mixture of colours with reference to frequency. I can label and state the functions of the main parts of the human eye: cornea, pupil, iris, lens, retina, optic nerve. I can give some examples of when light is absorbed or reflected, and describe what is meant by absorbing and reflecting light. I can describe refraction using a ray model diagram. I can describe the formation of an image from specular reflection in a plane mirror using a ray model diagram. I can describe how the human eye forms an image using ray diagrams. I can describe how energy may be wasted and/or dissipated, and I can explain situations that may change the amount of energy wasted. I can describe the reflection of an observed wave in water. Energy transfers I can describe how power ratings relate to energy transfer and explain the effect of a higher power rating on the cost of running an appliance. I can calculate and compare energy values of different foods in kJ (using food labels). Earth and Space I can describe weight as the force an object experiences due to a gravitational field pulling on it. I can describe how the seasons are due to the orbit of the Earth around the Sun and the fact the Earth is tilted on its axis.
“Developing” Interpreting Classifying Summarising Explaining	Energy I can name the energy type that is stored in food and fuel. I can name different energy stores. I can describe how the energy in different energy resources can be used. Electricity I can identify series and parallel circuits. I can state that electrical current is the same in all parts of a series circuit and that potential difference is shared. I can draw the circuit symbols of some common components of electrical circuits. I can name the components used to measure potential difference and current. I can state that the potential difference of a battery or cell is what causes the current to flow, and that a battery or cell of higher potential difference will cause more current to flow. I can construct simple electrical circuits. Forces I can explain factors that may affect an object's speed. I can describe forces using force arrow diagrams. I can identify if a particular force is contact or non-contact (including gravity, magnetism and static electricity). I can state that pressure in liquids increases with a depth. Sound I can label parts of the ear. I can describe what frequency is and state that it is measured in hertz. I can state the auditory range of humans and name some animals that have different auditory ranges to humans. I can state that sound is produced by vibrations and name some devices that detect sound, including microphones and ear drums.	Fluids I can state that thermal energy is transferred by conduction in solids, convection in liquids and radiation in vacuums and transparent objects. I can state that thermal energy is transferred from hotter objects to colder objects. I can describe several situations where energy is transferred. I can describe and explain how thermal energy is transferred by conduction, in terms of particles. Light I can list the colours of the spectrum of light in order. I can label the main parts of the human eye. I can state that in a vacuum, light waves have a maximum speed, the speed of light. I can state that light waves may be absorbed, reflected (diffuse and specular), refracted and diffused. I can state that different types of waves can travel through matter and vacuums, and I can name some types of waves including water waves, sound waves, pressure waves and light waves. Energy Transfers I can state that electrical appliances have power ratings (W, kW). I can state the units for energy. Earth and Space I can state that gravity is a non-contact force that affects objects within a gravitational field. I can state that all objects have a gravitational field, that this varies in strength and that the gravitational field strength of Earth is 10 N. I can describe celestial bodies in order of magnitude. I can define a day, a lunar month and a year with reference to Earth, and I can state how long each of these are on Earth. I can describe a solar system as a collection of planets and other objects orbiting a star.

<u>“Emerging”</u> Remembering Recognising Recalling Describing	Energy I can state that energy is stored in food and fuel. I can list some energy resources. Electricity I can draw a circuit that includes at least one bulb and one cell. I can state that an electrical circuit must be complete and include a power source, wires and a component for electricity to flow. Forces I can list some forces. I can state that speed is a measurement of how fast an object is moving. I can state that forces act as a push or a pull, are either contact or non-contact, forces may occur when two objects interact and they are measured in Newtons. I can state that a force may affect the speed, direction or shape of an object and that motion may change depending on the size of the force. Sound I can state that sound waves are longitudinal. I can state that sound cannot travel through a vacuum.	Fluids I can draw particles in solid, liquid and gas. Light I can state that white light is a mixture of colours. I can state that light waves are able to travel through a vacuum. I can state that light waves are transverse. I can state that during specular reflection in a plane mirror, the angle of incidence is always equal to the angle of reflection. I can state that pinhole cameras, cameras with lenses and the human eye form images from light. I can simply state the function of the human eye. I can state that waves transfer energy. I can state that waves may be reflected, refracted, dispersed or experience superposition. Energy transfers I can state that energy is always conserved. I can name different energy stores. Earth and Space I can state that gravity always pulls towards the centre of an object. I can identify gravity as the force which exists between the Moon and the Earth and between the Sun and the Earth. I can list planets in our solar system in order. I can list the seasons of the Earth in order.
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