

Step	Strand 1 Energy and efficiency <i>(Equal weighting)</i>	Strand 2 Forces, motion, pressure and magnetism <i>(Equal weighting)</i>	Strand 3 Waves – light and sound <i>(Equal weighting)</i>	Strand 4 Space physics <i>(Equal weighting)</i>	Strand 5 Current and static electricity <i>(Equal weighting)</i>	Strand 6 Working scientifically <i>(Equal weighting)</i>	ESTIMATE FOKS4
9	<p>All of the below and...</p> <ul style="list-style-type: none"> can suggest ways that thermal energy transfer by conduction/ convection/radiation may be changed. can use efficiency to evaluate appliances. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can use the idea of resultant forces to make predictions on how an object will move; make moment calculations to determine the resultant moment. can apply Hooke's Law to a range of elastic objects. can use distance/time graphs to calculate the speed of an object and describe its motion. can predict whether an object will float or sink using density calculations. can use knowledge of magnetism to explain why a freely suspended magnet will point to the geographical North Pole of Earth. can use the idea of electromagnetism to describe how to make a simple motor. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can identify and explain the seven waves that make up the electromagnetic spectrum with reference to electric, magnetic fields and name some uses/ dangers associated with them. can describe similarities and differences between the seven electromagnetic waves. can explain some consequences of superposition, such as interference. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can apply knowledge of the Earth's tilt to explain why the northern hemisphere and southern hemisphere experience the four seasons at different times of the year. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can explain the difference in direction of travel between conventional current and electron flow current. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can explain and use the terms accuracy, precision, repeatability, reproducibility, range, interval and bias correctly and in any context. can use data to support or refute an argument or stated position. 	9
8	<p>All of the below and...</p> <ul style="list-style-type: none"> can use the energy levels of particles to explain the expansion of materials when heated. can use data on energy efficiencies to contrast and compare different items. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can use the formula for Hooke's Law to calculate extension. can use the correct formula to calculate moments and explain how/why levers multiply the force. can explain what causes upthrust and how to increase/decrease the pressure of a liquid. can use the formula to calculate density. can describe how, using a plotting compass, the shape of a magnetic field can be determined. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can label and describe the meaning of transverse and longitudinal waves. can explain dispersion and use the words 'rods' and 'cones' to explain colour blindness. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can apply knowledge of the Earth's orbit around the Sun to explain the existence of a leap year. can recall that the Sun provides the Earth with light and heat energy and this travels as an electromagnetic wave. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can identify which direction the current flows in circuits and in solutions. can explain electrostatic induction with or without the use of diagrams. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can present reasoned explanations, including explaining data in relation to predictions and hypotheses. 	8

Step	Strand 1 Energy and efficiency (Equal weighting)	Strand 2 Forces, motion, pressure and magnetism (Equal weighting)	Strand 3 Waves – light and sound (Equal weighting)	Strand 4 Space physics (Equal weighting)	Strand 5 Current and static electricity (Equal weighting)	Strand 6 Working scientifically (Equal weighting)	ESTIMATE FOKSA4
7	<p>All of the below and...</p> <ul style="list-style-type: none"> can use the idea of particles to describe the process of convection. can explain ways to increase/decrease the amount of energy that is wasted. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can use the formula to calculate the speed of an object. can recall that a magnetic field is produced when an electric current flows through a conductor. can use the terms 'hard' and 'soft' magnets to describe temporary/permanent magnets. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can, with the help of ray diagrams, describe how convex lenses focus light, the uses of convex lenses and describe the differences between real and virtual images. can compare the human eye to a camera and state similarities/differences. can describe white light as a mixture of colours and how our eye detects the different colours. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can use the formula to calculate weight when given a mass. can describe the term 'light years' and explain it as a unit of distance and not time. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can use a formula to calculate current when knowing the charge and the time the current is flowing for. can describe, with and without the aid of a diagram, how to connect a voltmeter in a circuit. can use a formula to calculate resistance when given the voltage and current. can use the idea of friction between two insulators causing the transfer of electrons to describe how objects become electrically charged and give some examples. 	<p>All of the below and...</p> <ul style="list-style-type: none"> understands and uses IUPAC chemical nomenclature. can identify further questions arising from the results of an investigation. can apply sampling techniques. 	7
6	<p>All of the below and...</p> <ul style="list-style-type: none"> can use the idea of particles to describe the process of conduction and describe how colour affects the rate of radiation. can use the formula to calculate efficiency. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can state what a 'moment' is; describe a lever as an example. can state how height affects atmospheric pressure. can explain factors that can alter an object's speed. can describe how the strength of a magnetic field varies with distance between the lines of magnetic field. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can describe the superposition of waves. can state and give examples of longitudinal/transverse waves. can describe the term 'frequency' and with the help of ray diagrams describe refraction. can recall that convex lenses focus light. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can state that all objects on Earth have a gravitational field and the more massive the object is the larger the field is. can recall that the gravitational field strength on Earth is 10N/kg can describe the difference between mass and weight. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can describe how in a series circuit the voltage of the cell/battery is shared across each component. If the components are identical then the voltage is shared equally. can describe how in a parallel circuit the voltage across each branch is the same as the voltage of the cell/battery. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can evaluate data showing awareness of potential sources of random and systematic error. can undertake basic data analysis including simple statistical techniques. can recognise anomalous results in data. can calculate mean data while recognising the need to exclude anomalous results from mean calculations. 	6
5	<p>All of the below and...</p> <ul style="list-style-type: none"> can describe the process of conduction, convection and radiation and explain expansion. can recognise that heat and temperature are different and use the terms correctly. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can describe how to make an electromagnet. can list uses of electromagnets including how to increase their strength and draw the field around a bar magnet/electromagnet. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can recall that some waves can be reflected, refracted, dispersed, absorbed and experience superposition. can recall 'The Law of Reflection'. can, with the use of a ray diagram, explain how a plane mirror and the human eye form an image. can describe how the secondary colours of light are formed from combining two primary colours of light. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can describe the different phases of the Moon as a direct consequence of the orbit of the Moon around the Earth. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can describe how in a series circuit the current is the same everywhere. can describe how in a parallel circuit the current in each branch adds up to the total current flowing. can describe the effect of a high/low resistance on the current flowing in a circuit and state the unit for resistance. 	<p>All of the below and...</p> <ul style="list-style-type: none"> can make and record observations and measurements using a range of methods for different investigations. can comment on the reliability of methods. can suggest possible improvements to an investigative technique. can work out appropriate axes and scales for graphs. can draw best-fit lines for appropriate data. knows that scientific theories develop as earlier explanations are modified to take into account new evidence. understands the importance of publishing results and peer review. 	5

4	<p>All of the below and...</p> <ul style="list-style-type: none"> ■ can apply the words conduction, convection and radiation to a variety of situations involving thermal energy transfers. 	<p>All of the below and...</p> <ul style="list-style-type: none"> ■ can describe forces in terms of contact/non-contact. ■ can explain how friction can be reduced/increased and draw appropriately labelled force diagrams using correct notation. ■ can describe balanced, unbalanced and resultant forces; calculate resultant forces. ■ can describe Hooke's Law and explain ways to increase/decrease drag. ■ can use a formula to calculate pressure. 	<p>All of the below and...</p> <ul style="list-style-type: none"> ■ can use the arrangement of particles in a solid, liquid and gas to explain which material sound will travel the fastest through. ■ can describe how sound waves can be used to transfer information if they are converted to electrical signals. 	<p>All of the below and...</p> <ul style="list-style-type: none"> ■ can list the planets in our Solar System in order. ■ can recall and explain why Pluto is classed as a Dwarf Planet. 	<p>All of the below and...</p> <ul style="list-style-type: none"> ■ can name the components used to measure current and voltage. ■ can describe, with and without the aid of a diagram, how to connect an ammeter in a circuit. ■ can describe the electric current as a flow of electrons and state the unit of current as the Ampere, Amps, A. 	<p>All of the below and...</p> <ul style="list-style-type: none"> ■ can use simple equations to carry out calculations from results and interpret observations to identify simple patterns. ■ can ask questions based on observations and make simple predictions. ■ can plan a simple investigation and identify independent, dependent and control variables. ■ can recognise some potential sources of error. 	4
3	<p>All of the below and...</p> <ul style="list-style-type: none"> ■ can use correct notation and apply it to a variety of energy transformations, stating what the useful and wasted energies are. ■ can recall the 'Law of Conservation of Energy'. 	<p>All of the below and...</p> <ul style="list-style-type: none"> ■ can describe how friction, air and water resistance (drag forces) all change with speed. ■ can recall what 'gravity' is. 	<p>All of the below and...</p> <ul style="list-style-type: none"> ■ can list some examples of waves. 	<p>All of the below and...</p> <ul style="list-style-type: none"> ■ can recall facts about the Earth, such as the names of the seasons, length of a day/year. ■ can, through the use of a model, describe facts about the Earth, such as day, year and the seasons. 	<p>All of the below and...</p> <ul style="list-style-type: none"> ■ can, from circuit diagrams, state which is a series circuit and which is a parallel circuit. ■ can identify and draw more complex circuit symbols, such as Ammeter, Voltmeter, fuse, resistor, variable resistor, diode, LED, LDR and thermistor. ■ can use the words current and voltage correctly. 	<p>All of the below and...</p> <ul style="list-style-type: none"> ■ can name and use some SI units. ■ can name some common chemicals such as water, hydrochloric acid, sodium chloride. ■ can identify hazards and carry out a simple risk assessment. ■ can identify simple patterns or trends from data presented in graphs. 	3
2	<p>All of the below and...</p> <ul style="list-style-type: none"> ■ can make predictions as to whether a material is a conductor or insulator. 	<p>All of the below and...</p> <ul style="list-style-type: none"> ■ can use the words 'friction', 'air- and water-resistance' correctly and state how they change with increasing/decreasing speed; state that these forces occur when objects move. ■ can recall what is meant by 'speed'. 	<p>All of the below and...</p> <ul style="list-style-type: none"> ■ can recall the primary and secondary colours of light and use the words 'transparent', 'translucent' and 'opaque'. 	<p>All of the below and...</p> <ul style="list-style-type: none"> ■ can recall that the Earth spins on its axis and use this to explain why we have day and night and why the Sun appears to move across the sky. 	<p>All of the below and...</p> <ul style="list-style-type: none"> ■ can use recognised circuit symbols for battery, wire, lamp, open switch and closed switch when drawing circuit diagrams. ■ can describe how changing the voltage of a circuit changes the current flowing and this increases/decreases the brightness of a lamp. 	<p>All of the below and...</p> <ul style="list-style-type: none"> ■ can present findings and draw simple conclusions from experimental data. ■ can present observations and data using simple tables and graphs where axes and scales are provided. 	2
1	<p>Can...</p> <ul style="list-style-type: none"> ■ use the words 'conductor' and 'insulator' correctly. ■ name some conductors and insulators. 	<p>Can...</p> <ul style="list-style-type: none"> ■ state that a force is a push or a pull and name some examples of forces. ■ describe magnets as having poles and that like poles repel, opposite poles attract. 	<p>Can...</p> <ul style="list-style-type: none"> ■ explain how the human eye sees luminous and non-luminous objects; use the idea that light travels in straight lines to explain the formation of shadows. ■ find patterns between the pitch of a sound and features of the object that produced it. ■ find patterns between the volume of a sound and the strength of the vibrations that produced it. ■ recognise that sounds get fainter the further you get from the source. 	<p>Can...</p> <ul style="list-style-type: none"> ■ describe the Sun, Moon and Earth as approximately spherical bodies. 	<p>Can...</p> <ul style="list-style-type: none"> ■ construct a simple series circuit. ■ use the term 'complete' / 'incomplete' circuit correctly. 	<p>Can...</p> <ul style="list-style-type: none"> ■ take measurements using a range of scientific equipment, including repeat readings. ■ draw simple, correctly-labelled scientific diagrams. ■ follow instructions safely. 	1