Physics KS Curriculum Map

Lesson	Year 7	Year 8	Year 9
1.1.1 Introduction to forces	I can describe what forces do. ☐		
	I can define what is meant by 'contact force', 'non-contact force', and 'newton'. ☐	I can categorise everyday forces as being 'contact' or 'non-contact' forces. ☐	I can explain the link between non-contact forces, contact forces, and interaction pairs. ☐
	I can use a newtonmeter to make predictions about sizes of forces. ☐	I can make predictions about forces in familiar situations. ☐	I can make predictions about pairs of forces acting in unfamiliar situations. ☐
		I can identify interaction pairs in simple situations. ☐	I can identify interaction pairs in complex situations. ☐
		I can describe what the term 'interaction pair' means. ☐	
1.1.2 Balanced and unbalanced forces	I can identify familiar situations involving balanced and unbalanced forces. ☐	I can describe the difference between balanced and unbalanced forces. ☐	I can explain the difference between balanced and unbalanced forces. ☐
	I can define the term 'equilibrium'. ☐	I can describe situations that are in equilibrium. ☐	I can describe a range of situations that are in equilibrium. ☐
	I can define the term 'resultant force'. ☐	I can calculate resultant forces. ☐	I can describe the link between the resultant force and the motion of an object. ☐
	I can identify when the speed or direction of motion of an object changes. ☐	I can explain why the speed or direction of motion of an object can change. ☐	I can use force arrows to explain why the speed or direction of motion of objects can change. ☐
	I can present my observations in a table, with help. ☐	I can present my observations in a table, including force arrow drawings. ☐	I can predict and present changes in observations for unfamiliar situations. ☐
1.1.3 Speed	I can state the equation for speed. ☐	I can calculate speed using the speed equation. ☐	I can use the speed equation to explain unfamiliar situations. ☐
	I can define what is meant by relative motion. ☐	I can describe relative motion. ☐	I can describe and explain how a moving object appears to a stationary observer and to a moving observer. ☐

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	I can use appropriate techniques and equipment to measure time and distance in practical experiments. ☐	I can choose equipment to make appropriate measurements of time and distance in order to calculate speed. ☐	I can choose equipment to obtain data for speed calculations and justify my choices based on their accuracy and precision. ☐
1.1.4 Distance–time graphs	I can describe what a distance–time graph shows. ☐	I can interpret distance–time graphs. ☐	I can draw distance–time graphs for a range of journeys. ☐
	I can use a distance–time graph to describe a journey qualitatively (without making calculations). ☐	I can calculate speed from a distance–time graph. ☐	I can analyse journeys using distance–time graphs. ☐
	I can present data given on a distance–time graph with support. ☐	I can plot data on a distance–time graph accurately. ☐	I can manipulate data to present on a distance–time graph. ☐

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1.2.1 Forces at a distance	I can identify that gravity is a force that acts at a distance. ☐		
	I can state how gravity changes with distance. ☐	I can describe the effect of a field using force diagrams. ☐	I can explain how the effect of gravity changes when moving away from Earth, and in keeping objects in orbit. ☐
	I can draw a table and present results, with help. ☐	I can present my results in a simple table. ☐	I can present results in a table and ensure they are reliable. ☐
	I can define the term 'gravitational field strength'. ☐	I can describe the effect of gravitational forces on Earth and on objects in orbit. ☐	I can analyse data about orbits in terms of the variation of gravity with mass and distance. ☐
		I can calculate weight using the equation 'weight = mass × gravitational field strength'. ☐	
			I can compare and contrast gravity with other forces. ☐

Lesson	Year 7 Know	Year 8 Apply	Year 9 Extend

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1.3.1 Friction and drag	I can identify examples of drag forces and friction. ☐	I can describe the effect of drag forces and friction. ☐	I can explain the effect of drag forces and friction in terms of forces. ☐
	I can describe how drag forces and friction arise. ☐	I can explain why drag forces and friction arise. ☐	I can explain why drag forces and friction slow things down in terms of forces. ☐
	I can write down two things an object can do when the resultant force on it is zero. ☐	I can describe what happens to a moving object when the resultant force acting on it is zero. ☐	I can interpret the motion of objects subject to drag forces and friction. ☐
	I can carry out an experiment to test a prediction of friction caused by different surfaces. ☐	I can plan and carry out an experiment to investigate friction, selecting suitable equipment. ☐	I can plan and carry out an experiment, stating the independent, dependent, and control variables. ☐
1.3.2 Squashing and stretching	I can state an example of a force deforming an object. ☐	I can describe how forces deform objects. ☐	I can explain how forces deform objects in a range of situations. ☐
	I can recognise a support force. ☐	I can explain how solid surfaces provide a support force. ☐	I can explain how solid surfaces provide a support force, using scientific terminology and bonding. ☐
	I can use Hooke's Law to identify proportional stretching. ☐	I can use Hooke's Law to predict the extension of a spring. ☐	I can apply Hooke's Law to make quantitative predictions with unfamiliar materials. ☐
	I can state how you know from a graph that a relationship is linear, present data in a line graph, and identify a pattern. ☐	I can present data in a graph and identify a quantitative relationship in the pattern. ☐	I can present data in a graph and recognise quantitative patterns and errors. ☐
1.3.3 Turning forces	I can state the law of moments. ☐	I can describe what is meant by a moment. ☐	I can apply the concept of moments to everyday situations. ☐
	I can state the equation to calculate a turning force. ☐	I can calculate the moment of a force. ☐	I can use calculations to explain situations involving moments. ☐
	I can identify questions from results with help. ☐	I can independently identify scientific questions from results. ☐	I can suggest relevant, testable questions. ☐

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1.4.1 Pressure in gases	I can describe the motion of particles in a fluid. ☐	I can explain why fluids exert a pressure. ☐	I can explain a range of observations in terms of fluid pressure. ☐
	I can calculate fluid pressure with support. ☐	I can calculate fluid pressure. ☐	I can calculate fluid pressure in a range of situations. ☐
	I can state the cause of atmospheric pressure. ☐	I can describe how atmospheric pressure changes with height. ☐	I can predict the changes to the effects of atmospheric pressure at different altitudes or temperature. ☐
1.4.2 Pressure in liquids	I can state simplywhat happens to pressure with depth. ☐	I can describe how liquid pressure changes with depth. ☐	I can explain why liquid pressure changes with depth. ☐
	I can describe characteristics of some objects that float and some that sink. ☐	I can explain why some things float and some things sink, using force diagrams. ☐	I can explain why an object will float or sink in terms of forces or density. ☐
	I can write down the equation for calculating fluid pressure. ☐	I can use the equation for calculating fluid pressure. ☐	I can use the equation for calculating fluid pressure to explain how hydraulic machines work. ☐
1.4.3 Stress on solids	I can state the equation of stress. ☐	I can calculate stress. ☐	I can calculate stress in multistep problems. ☐
	I can use ideas of stress to qualitatively describe familiar situations. ☐	I can apply ideas of stress to different situations. ☐	I can compare stress in different situations, explaining the differences in pressure using scientific knowledge. ☐
	I can predict qualitatively the effect of changing area and/or force on stress. ☐	I can predict qualitatively the effect of changing area and/or force on stress. ☐	I can predict quantitatively the effect of changing area and/or force on stress in a range of situations. ☐

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2.1.1 Potential difference	I can state the unit of potential difference. ☐	I can describe what is meant by potential difference. ☐	I can explain why potential difference is measured in parallel. ☐

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	I can name the equipment used to measure potential difference. ☐	I can describe how to measure potential difference. ☐	I can predict the effect of changing the rating of a battery or bulb in a circuit. ☐
	I can describe the effect of a larger potential difference. ☐	I can describe what is meant by the rating of a battery or bulb. ☐	I can set up and measure potential difference across various components in a circuit. ☐
	I can use appropriate equipment to measure potential difference. ☐	I can set up a simple circuit and use appropriate equipment to measure potential difference. ☐	I can explain the difference between potential difference and current. ☐
2.1.2 Resistance	I can calculate the resistance from values of p.d. and current with support. ☐	I can describe what is meant by resistance. ☐	I can explain the causes of resistance. ☐
	I can compare simply the resistance of conductors and insulators. ☐	I can calculate resistance of a circuit. ☐	I can explain what factors affect the resistance of a resistor. ☐
	I can list examples of conductors and insulators. ☐	I can describe the difference between conductors and insulators in terms of resistance. ☐	I can compare the effect of resistance in different materials. ☐
	I can identify some of the variables in the investigation. ☐	I can identify independent, dependent, and control variables. ☐	I can independently select and control all the variables in the investigation, considering accuracy and precision. ☐
2.1.3 Series and parallel circuits	I can state one difference between series and parallel circuits. ☐	I can describe the difference between series and parallel circuits. ☐	I can predict the effect of changing the resistance of a circuit component on the resistance of the circuit. ☐
	I can state how potential difference varies in series and parallel circuits. ☐	I can describe how potential difference varies in series and parallel circuits. ☐	I can explain why potential difference varies in series and parallel circuits. ☐
		I can identify the pattern of potential difference in series and parallel circuits. ☐	I can explain the pattern in potential difference readings for series and parallel circuits, and draw conclusions. ☐

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2.2.1 Current	I can state what current is. ☐	I can describe how current changes in series and parallel circuits when components are changed. ☐	I can use a model to explain how current flows in a circuit. ☐
	I can use an ammeter to measure current. ☐	I can describe how to measure current. ☐	I can predict the current in different circuits. ☐
	I can identify the pattern of current in series and parallel circuits. ☐	I can set up a circuit including an ammeter to measure current. ☐	I can measure current accurately in a number of places in a series circuit. ☐
			I can explain the pattern in current readings for series and parallel circuits, and draw conclusions. ☐
2.2.2 Charging up	I can describe how to charge insulators. ☐	I can use a sketch to explain how objects can become charged. ☐	I can explain, in terms of electrons, why something becomes charged. ☐
	I can state the two types of charge. ☐	I can describe how charged objects interact. ☐	I can predict how charged objects will interact. ☐
	I can state what surrounds charged objects. ☐	I can describe what is meant by an electric field. ☐	I can suggest ways to reduce the risk of getting electrostatic shocks. ☐
	I can describe what happens when you bring similarly charged objects together, and when you bring differently charged objects together. ☐	I can interpret observations, and identify patterns linked to charge. ☐	I can use observations to make predictions. ☐

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2.3.1 Magnets and magnetic fields	I can describe features of a magnet. ☐	I can describe how magnets interact. ☐	I can explain how magnets can be used. ☐
	I can draw the magnetic field lines around a bar magnet. ☐	I can describe how to represent magnetic fields. ☐	I can compare magnetic field lines and a magnetic field. ☐
	I can state that the Earth has a magnetic field. ☐	I can describe the Earth's magnetic field. ☐	I can explain how a compass works. ☐
	I can record the shape of field lines round a magnet. ☐	I can draw field lines round a magnet in detail. ☐	I can suggest improvements to an experiment to observe field lines around a magnet. ☐

Lesson	Year 7 Know	Year 8 Apply	Year 9 Extend
2.4.1 Electromagnets	I can state the main features of an electromagnet. ☐	I can describe how to make an electromagnet. ☐	I can explain how an electromagnet works. ☐
	I can state one difference between permanent magnets and electromagnets. ☐	I can describe how to change the strength of an electromagnet. ☐	I can predict the effect of changes on the strength of different electromagnets. ☐
	I can state where the magnetic field due to a wire or solenoid is strongest. ☐	I can describe how the magnetic field strength due to a current carrying wire varies with distance from the wire. ☐	I can suggest how two wires both carrying currents placed next to each other might behave. ☐
	I can test the effect of changing an electromagnet. ☐	I can predict and test the effect of changes made to an electromagnet. ☐	I can predict the effect of changes made to an electromagnet, using scientific knowledge to justify the claim. ☐
2.4.2 Using electromagnets	I can state some uses of electromagnets. ☐	I can describe some uses of electromagnets. ☐	I can apply existing knowledge about electromagnets to design a circuit. ☐
	I can state the main parts of an electric bell, circuit breaker, or loudspeaker. ☐	I can describe how an electric bell, circuit breaker, or loudspeaker works. ☐	I can compare and contrast electric bells, circuit breakers, and loudspeakers. ☐
	I can ask simple questions about electric bells, circuit breakers, or loudspeakers. ☐	I can pose scientific questions to be investigated from my experiment. ☐	I can suggest investigations about electromagnets used in different applications. ☐

Lesson	Year 7	Year 8	Year 9
3.1.1 Food and fuels	I can identify energy values for food and fuels. ☐	I can compare the energy values of food and fuels. ☐	I can calculate energy requirements for various situations, considering diet and exercise. ☐
	I can describe energy requirements in different situations. ☐	I can compare the energy in food and fuels with the energy needed for different activities. ☐	I can suggest different foods needed in unusual situations, for example, training for the Olympics. ☐

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	I can interpret data on food intake for some activities. ☐	I can explain data on food intake and energy requirements for a range of activities. ☐	I can explain why an athlete needs more energy from food using data provided. ☐
3.1.2 Energy resources	I can name renewable and non-renewable energy resources. ☐	I can describe the difference between a renewable and a non-renewable energy resource. ☐	I can compare renewable and non-renewable resources. ☐
	I can state one advantage and one disadvantage of fossil fuels. ☐	I can describe how electricity is generated using a fossil fuel or a renewable resource. ☐	I can explain how a range of resources generate electricity, drawing on scientific concepts. ☐
	I can use one source of information. ☐	I can choose an appropriate source of secondary information. ☐	I can justify the choice of secondary information. ☐
	I can name a renewable resource used to generate electricity. ☐	I can explain the advantages and disadvantages of different energy resources. ☐	I can suggest actions a government or communities could take in response to rising energy demand. ☐
3.1.3 Energy and power	I can state the definitions of energy and power. ☐	I can explain the difference between energy and power. ☐	I can compare the power consumption of different appliances. ☐
	I can state that power, fuel used, and cost are linked. ☐	I can describe the link between power, fuel used, and cost of using domestic appliances. ☐	I can calculate and compare energy costs in diffeerent scenarios. ☐
	I can predict which equipment is more powerful when given a selection of appliances. ☐	I can predict the power requirements of different home devices, and compare their energy usage and how much they cost to run. ☐	I can predict the effect on energy bills of changing the power of equipment. ☐

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3.2.1 Energy adds up	I can state the definition of the conservation of energy. ☐	I can describe energy stores before and after a change, including stores relating to an object's speed, temperature, height or shape. ☐	I can apply ideas about stores and transfers to a range of unfamiliar situations. ☐

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	I can state how energy is transferred. ☐	I can explain what brings about transfers in energy between stores. ☐	I can compare energy transfers to energy conservation. ☐
	I can present simple observations of many transfers. ☐	I can present observations of energy transfers in a table. ☐	I can present detailed observations of energy transfers in a table, explaining changes to the physical system, and how that relates to the ways in which energy is stored. ☐
3.2.2 Energy dissipation	I can state what dissipation means. ☐	I can explain how energy is dissipated in a range of situations. ☐	I can account for all energy transfers in a range of situations. ☐
	I can do simple calculations of wasted energy from input and useful energies. ☐	I can calculate useful energy and wasted energy from input and output energies. ☐	I can calculate a useful and wasted energy, and efficiency. ☐
	I can state what lubrication and streamlining mean. ☐	I can describe how dissipated energy can be reduced. ☐	I can evaluate methods of reducing energy dissipation. ☐

Lesson	Year 7 Know	Year 8 Apply	Year 9 Extend
3.3.1 Work, energy, and machines	I can state how work is calculated. ☐	I can calculate work done. ☐	I can compare the work done in different scenarios and by different machines. ☐
	I can state that machines change the size of forces or distances. ☐	I can apply the conservation of energy to simple machines. ☐	I can explain how conservation of energy applies in one example. ☐
	I can state one way the experiment can be improved. ☐	I can evaluate results from the practical. ☐	I can evaluate results (including random and systematic errors) and suggest how the experiment can be improved. ☐

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3.4.1 Energy and temperature	I can state how energy and temperature are measured. ☐	I can state the difference between energy and temperature. ☐	I can give an example to show that energy and temperature are different. ☐

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	I can describe how energy is transferred through solids, liquids, and in air. ☐	I can describe what happens when you heat up solids, liquids, and gases. ☐	I can explain, in terms of particles, how energy is transferred. ☐
	I can state what is meant by the term equilibrium. ☐	I can explain what is meant by equilibrium. ☐	I can give examples of equilibrium. ☐
	I can identify a source of error. ☐	I can describe how to reduce error in experimental apparatus. ☐	I can describe sources of error as systemic or random, and suggest ways to minimise these. ☐
3.4.2 Energy transfer: particles	I can describe simply what happens in conduction and convection. ☐	I can describe how energy is transferred by particles in conduction and convection. ☐	I can explain in detail the processes involved during heat transfers. ☐
	I can state that thermal insulators reduce energy loss compared to thermal conductors. ☐	I can describe how a thermal insulator can reduce energy transfer. ☐	I can explain why certain materials are good thermal insulators. ☐
	I can state the pattern in conduction shown in results. ☐	I can describe the pattern in conduction shown by results, using numerical data to inform a conclusion. ☐	I can explain the pattern in conduction shown by experimental results. ☐
3.4.3 Energy transfer: radiation and insulation	I can state some sources of infrared radiation. ☐	I can describe some sources of infrared radiation, and how energy is transferred. ☐	I can explain how thermal equilibrium can be established. ☐
	I can state some properties of infrared radiation. ☐	I can describe different ways to insulate in terms of conduction, convection and radiation. ☐	I can compare the different ways that energy is transferred. ☐
	I can identify some risks in an experiment. ☐	I can identify risks and explain why it is important to reduce them. ☐	I can explain in detail how to reduce risks. ☐

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4.1.1 Sound waves and speed	I can name some sources of sound. ☐	I can describe how sound is produced and travels. ☐	I can explain what is meant by supersonic travel. ☐
	I can name materials that sound can travel through. ☐	I can explain observations where sound in transmitted by different media. ☐	I can describe sound as the transfer of energy through vibrations and explain why sound cannot travel through a vacuum. ☐

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	I can state that sound travels at 330m/s in air, a million times more slowly that light. ☐	I can contrast the speed of sound and the speed of light. ☐	I can compare the time taken for sound and light to travel the same distance. ☐
	I can use data to compare the speed of sound in different materials. ☐	I can compare the time for sound to travel in different materials using data given. ☐	I can explain whether sound waves from the Sun can reach the Earth. ☐
4.1.2 Loudness and amplitude	I can define amplitude, frequency, and wavelength. ☐	I can explain observations of how sound travels using the idea of a longitudinal wave. ☐	I can explain how you can make measurements of the amplitude of a sound wave. ☐
	I can state the link between loudness and amplitude. ☐	I can describe the link between loudness and amplitude, using diagrams. ☐	I can compare and contrast waves of different loudness using a diagram. ☐
	I can state two things that can happen when sound goes through matter or hits a boundary. ☐	I can explain what happens when sound goes through matter or hits a boundary. ☐	I can describe in detail the behaviour of sound as it travels in matter or hits a boundary. ☐
	I can label amplitude on a diagram of an oscilloscope trace of a wave. ☐	I can describe how to find the amplitude of a wave from an oscilloscope trace. ☐	I can use an oscilloscope on a variety of settings of p.d./division to find the amplitude of a sound wave. ☐
4.1.3 Frequency and pitch	I can define auditory range. ☐	I can describe the auditory range of humans. ☐	I can present a reasoned prediction using data of how sounds will be differently heard by different animals. ☐
	I can state the difference between frequency and pitch. ☐	I can describe the link between frequency and pitch. ☐	I can compare and contrast waves of different frequency using a digram. ☐
	I can label time period on a diagram of a sound wave on an oscilloscope. ☐	I can describe how to find the frequency of a wave from an oscilloscope trace. ☐	I can use an oscilloscope on a variety of settings of s/div to find the period and frequency of a sound wave. ☐
4.1.4 The ear and hearing	I can name some parts of the ear. ☐	I can describe how the ear works. ☐	I can evaluate the data behind a claim for a sound creation or blocking device, using the properties of sound waves. ☐

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	I can state some ways that hearing can be damaged. ☐	I can describe how your hearing can be damaged. ☐	I can suggest the effects of particular ear problems on a person's hearing. ☐
	I can describe some risks of loud music. ☐	I can explain some risks of loud music. ☐	I can explain, in detail, risks of hearing damage linked to sound level and time of exposure. ☐

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4.2.1 Light	I can describe some ways that light interacts with materials. ☐	I can describe what happens when light interacts with materials. ☐	I can predict how light will interact with different materials. ☐
	I can state the speed of light. ☐	I can explain how ray diagrams can explain the formation of shadows. ☐	I can use ray diagrams to explain what observers see during an eclipse. ☐
	I can state the positions of the Earth, Moon, and Sun during a solar eclipse. ☐	I can use ray diagrams to describe what observers see during an eclipse. ☐	
4.2.2 Reflection	I can, with guidance, construct ray diagrams to show how light reflects off mirrors and forms images. ☐	I can explain how images are formed in a plane mirror using a ray diagram. ☐	I can use a ray diagram to explain how an image in a mirror changes as you move the mirror/object, or to explain the formation of images in multiple mirrors. ☐
	I can identify examples of specular and diffuse reflection. ☐	I can explain the difference between specular and diffuse reflection. ☐	I can predict how light will reflect from different types of surface. ☐
	I can use appropriate equipment safely with guidance. ☐	I can use appropriate equipment and take readings safely without help. ☐	I can take accurate readings using appropriate equipment and working safely. ☐
4.2.3 Refraction	I can describe what happens when light is refracted. ☐	I can use a ray diagram to describe how light travels through a transparent block. ☐	I can predict whether light will refract when it hits a hard surface. ☐
	I can state a difference between what happens to light when it goes through a convex lens and a concave lens. ☐	I can use a ray diagram to describe what happens when light travels through a convex or concave lens. ☐	I can draw ray diagrams to show what happens when light goes through a convex or concave lens. ☐

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	I can record some observations as a diagram with help. ☐	I can record observations using a labelled diagram. ☐	I can record observations using labelled diagrams, and apply this to other situations. ☐
4.2.4 The eye and vision	I can name parts of the eye. ☐	I can describe how the eye works. ☐	I can explain how the eye forms an image. ☐
	I can name two problems that people can have with their vision. ☐	I can name the lens used to correct short sight, and the lens used to corret long sight. ☐	I can explain how lenses correct vision. ☐
	I can describe problems people have with their eyesight. ☐	I can describe how lenses correct short-sight and long-sight. ☐	I can use ideas about refraction to explain the action of lenses in glasses and contact lenses. ☐
4.2.5 Colour	I can state what happens to light when it passes through a prism. ☐	I can explain what happens when light passes through a prism. ☐	I can explain why a prism forms a spectrum. ☐
	I can state the difference between colours of light in terms of frequency. ☐	I can describe how primary colours add to make secondary colours. ☐	I can explain the formation of secondary colours. ☐
	I can state the effect of coloured filters on light. ☐	I can explain how filters and coloured materials subtratc light. ☐	I can predict how coloured objects will appear given different coloured lights and filters. ☐
	I can predict how red light will appear on a white surface. ☐	I can predict the colour of objects in red light and the colour of light through different filters. ☐	I can predict the colour of objects in lights of secondary colours, giving a reason for the prediction. ☐

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4.3.1 Sound waves, water waves, and energy	I can define frequency and amplitude. ☐	I can describe the link between amplitude or frequency and energy. ☐	I can explain, in terms of frequency, why we use ultrasound for cleaning and physiotherapy. ☐
	I can name two parts of a microphone or loudspeaker. ☐	I can describe how a microphone and a loudspeaker work. ☐	I can explain the link between a microphone and a loudspeaker. ☐
	I can state what a sound wave transfers, and what it does not transfer. ☐	I can describe how sound transfers energy, and how this is linked to generating electricity. ☐	I can evaluate locations for the use of waves to generate electricity. ☐

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4.3.2 Radiation and energy	I can name some waves of the electromagnetic spectrum. ☐	I can describe the electromagnetic spectrum. ☐	I can describe all the waves of the electromagnetic spectrum in terms of increasing wavelength or increasing frequency. ☐
	I can name the electromagnetic wave with the biggest wavelength. ☐	I can describe the link between frequency and energy. ☐	I can explain why only some electromagnetic waves cause ionisation. ☐
	I can name an electromagnetic wave that can be harmful to living cells. ☐	I can describe the effect of radiation on living cells. ☐	I can explain why ionisation can be harmful to living cells. ☐

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4.4.1 Modelling waves	I can define 'transverse'. ☐	I can compare transverse and longitudinal waves. ☐	I can compare transverse and longitudinal waves with examples. ☐
	I can describe a model of a light wave. ☐	I can describe how to use a wave model to explain observations of the reflection, absorption, and transmission of waves. ☐	I can evaluate different models of waves. ☐
	I can define 'superpose'. ☐	I can describe what happens when waves superpose. ☐	I can explain why you can add sound waves and light waves and get less than you started with. ☐