Science - Physics Target Related Expectation (TReE) Year 7

	Pathway 1 (Target Grade 1-3)									Pathway 2 (Target Grade 4-6)									Pathway 3 (Target Grade 7-8)								
1 Forces	• classify forces into contact and non contact	• Identify a resultant force and identify if the speed and direction will change	• State the equation for speed and use it to calculate speed, with support	• Describe simply what a distance–time graph shows, use it to calculate speed with support	• Describe the difference between mass and weight, then use the formula weight = mass × *g* , with support					• Identify interaction pairs in a simple situation	• Calculate resultant forces	• Calculate speed using the speed equation and describe relative motion	• Calculate speed from a distance–time graph and convert between units	• Use a formula (weight = mass × *g*) to work out your weight on different planets, and compare it to your weight on Earth					• Make predictions about pairs of forces acting in unfamiliar situations	• Describe and explain the link between the resultant force and the motion of an object	• Choose equipment to obtain data for speed calculations, justifying their choice based on accuracy and precision	• Manipulate data appropriately to present in a distance–time graph	• Compare and contrast gravity with other forces				
	2.1.1 Potential difference	2.1.2 Resistance	2.1.3 Series and parallel	2.2.1 Current	2.2.2 Charging up					2.1.1 Potential difference	2.1.2 Resistance	2.1.3 Series and parallel	2.2.1 Current	2.2.2 Charging up					2.1.1 Potential difference	2.1.2 Resistance	2.1.3 Series and parallel	2.2.1 Current	2.2.2 Charging up				
2 Electromagnets	• Measure potential difference with a voltmeter.	• Calculate the resistance from values of p.d. and current with support, then compare the resistance of different components.	• State how potential difference varies in series and parallel circuits	• Identify the pattern of current in series and parallel circuits	• Describe what happens when you bring similarly charged object together, and when you bring differently charged objects together					• Set up a simple circuit and use appropriate equipment to measure potential difference	• calculate and describe what is meant by resistance	• Identify the pattern of potential difference in series and parallel circuits	• Describe how current changes in series and parallel circuits when components are changed	• Describe how charged objects interact					• Explain why potential difference is measured in parallel.	• Explain what factors affect the resistance of a resistor	• Explain the pattern in potential difference readings for series and parallel circuits, drawing conclusions	• Explain the pattern in current readings for series and parallel circuits, drawing conclusions	• Explain, in terms of electrons, why something becomes charged then predict how charged objects will interact				
	3.1.1 Food and fuels	3.1.2 Energy resources	3.1.3 Energy and power	3.2.1 Energy adds up	3.2.2 Energy dissipation					3.1.1 Food and fuels	3.1.2 Energy resources	3.1.3 Energy and power	3.2.1 Energy adds up	3.2.2 Energy dissipation					3.1.1 Food and fuels	3.1.2 Energy resources	3.1.3 Energy and power	3.2.1 Energy adds up	3.2.2 Energy dissipation				
3 Energy	• Identify energy values for food and fuels and describe energy requirements in different situations	• State one advantage and one disadvantage of fossil fuels and renewables	• State that power, fuel used, and cost are linked	• Present simple observations of energy transfers	• State what dissipation means and do simple calculations of wasted energy from input and useful energies					• Explain data on food intake and energy requirements for a range of activities	• Describe how electricity is generated using a fossil fuel or a renewable resource	• Describe and explain the link between power, fuel use, and cost of using domestic appliances	• Explain what brings about transfers in energy between stores	• Calculate useful energy and wasted energy from input and output energies					• Suggest different foods needed in unusual situations, for example, training for the Olympics using data to back this up	• Compare renewable and non-renewable resources then suggest actions a government or communities could take in response to rising energy demand	• Calculate and compare energy costs in different scenarios	• Present detailed observations of energy transfers, explaining changes to the physical system, and how that relates to the ways in which energy is stored	• Calculated a useful energy and wasted energy, and efficiency				
	4.1.1 Sound waves and speed	4.1.2 Loudness and amplitude	4.1.3 Frequency and pitch	4.1.4 The ear and hearing	4.2.1 Light	4.2.2 Reflection	4.2.3 Refraction	4.2.4 The eye and vision	4.2.5 Colour	4.1.1 Sound waves and speed	4.1.2 Loudness and amplitude	4.1.3 Frequency and pitch	4.1.4 The ear and hearing	4.2.1 Light	4.2.2 Reflection	4.2.3 Refraction	4.2.4 The eye and vision	4.2.5 Colour	4.1.1 Sound waves and speed	4.1.2 Loudness and amplitude	4.1.3 Frequency and pitch	4.1.4 The ear and hearing	4.2.1 Light	4.2.2 Reflection	4.2.3 Refraction	4.2.4 The eye and vision	4.2.5 Colour
4 Waves	• Name materials that sound can travel through	• Define amplitude, frequency, and wavelength	• State the difference between frequency and pitch	• Name some parts of the ear	• Describe some ways that light interacts with materials	• With guidance, construct ray diagrams to show how light reflects off mirrors and forms images	• Describe what happens when light is refracted	• Name parts of the eye	• State the difference between colours of light in terms of frequency and state what happens when light passes through a prism	• Describe how sound is produced and travels	• Describe the link between loudness and amplitude, using diagrams and from an oscilloscope trace.	• Describe the link between frequency and pitch and describe how to find the frequency of a wave from an oscilloscope trace	• Describe how the ear works, naming most structures.	• Describe what happens when light interacts with materials	• Explain how images are formed in a plane mirror using a ray diagram	• Use a ray diagram to describe how light travels through a transparent block	• Describe how the eye works	• Explain how filters and coloured materials subtract light	• Describe sound as the transfer of energy through vibrations and explain why sound cannot travel through a vacuum	• Explain how you can make measurements of the amplitude of a sound wave (using an oscilloscope on a variety of settings of p.d./division) to find the amplitude of a sound wave	• Compare and contrast waves of different frequency using a diagram	• Suggest the effects of particular ear problems on a person's hearing	• Predict how light will interact with different materials	• Predict how light will reflect from different types of surface	• Draw ray diagrams to show what happens when light goes through a convex or concave lens	• Use ideas about refraction to explain the action of lenses in glasses and contact lenses and how they correct vision	• Predict how coloured objects will appear given different coloured lights and filters