

Topic	Student Checklist	R	A	G
6.1.1 Energy changes in a system, and the ways energy is stored before and after such changes	Define a system as an object or group of objects and state examples of changes in the way energy is stored in a system			
	Describe how all the energy changes involved in an energy transfer and calculate relative changes in energy when the heat, work done or flow of charge in a system changes			
	Use calculations to show on a common scale how energy in a system is redistributed			
	Calculate the kinetic energy of an object by recalling and applying the equation: $[ E_k = \frac{1}{2}mv^2 ]$			
	Calculate the amount of elastic potential energy stored in a stretched spring by applying, but not recalling, the equation: $[ E_e = \frac{1}{2}ke^2 ]$			
	Calculate the amount of gravitational potential energy gained by an object raised above ground level by recalling and applying, the equation: $[ E_g = mgh ]$			
	Calculate the amount of energy stored in or released from a system as its temperature changes by applying, but not recalling, the equation: $[ \Delta E = mc\Delta\theta ]$			
	Define the term 'specific heat capacity'			
	<b>Required practical 14:</b> investigation to determine the specific heat capacity of one or more materials.			
	Define power as the rate at which energy is transferred or the rate at which work is done and the watt as an energy transfer of 1 joule per second			
	Calculate power by recalling and applying the <b>equations:</b> $[ P = E/t \text{ \& } P = W/t ]$			
Explain, using examples, how two systems transferring the same amount of energy can differ in power output due to the time taken				
6.1.2 Conservation and dissipation of energy	State that energy can be transferred usefully, stored or dissipated, but cannot be created or destroyed and so the total energy in a system does not change			
	Explain that only some of the energy in a system is usefully transferred, with the rest 'wasted', giving examples of how this wasted energy can be reduced			
	Explain ways of reducing unwanted energy transfers and the relationship between thermal conductivity and energy transferred			
	Describe how the rate of cooling of a building is affected by the thickness and thermal conductivity of its walls			
	Calculate efficiency by recalling and applying the equation: $[ \text{efficiency} = \text{useful power output} / \text{total power input} ]$			
<b>HT ONLY: Suggest and explain ways to increase the efficiency of an intended energy transfer</b>				
6.1.3 National and global energy resources	List the main renewable and non-renewable energy resources and define what a renewable energy resource is			
	Compare ways that different energy resources are used, including uses in transport, electricity generation and heating			
	Explain why some energy resources are more reliable than others, explaining patterns and trends in their use			
	Evaluate the use of different energy resources, taking into account any ethical and environmental issues which may arise			
	Justify the use of energy resources, with reference to both environmental issues and the limitations imposed by political, social, ethical or economic considerations			