

Name _____ Class _____ Date _____

	Aiming for 4 (Foundation / Intermediate)		Aiming for 6 (Intermediate / Higher)		Aiming for 8 (Higher / Exceptional)	
P2.1 Energy transfer by particles	I can describe materials as good or poor thermal conductors.		I can analyse temperature change data to compare the thermal conductivity of materials.		I can explain the different thermal conductivities of materials using the free electron and lattice vibration explanations of conduction.	
	I can compare the thermal conductivities of materials in simple terms.		I can describe the changes in the behaviour of the particles in a material as the temperature of the material increases.		I can evaluate the results of an experiment into thermal conductivity in terms of repeatability and reproducibility of data, and the validity of conclusions drawn from the data.	
	I can relate the thermal conductivities of a material to the uses of that material in familiar contexts.		I can apply understanding of thermal conductivity in reducing energy dissipation through the choice of appropriate insulating materials.		I can justify the choices of material involved in insulation or conduction using the concept of thermal conductivity and other data.	
P2.2 Energy transfer by radiation	I can compare the cooling and heating of different coloured surfaces.		I can describe the cooling of objects in terms of the rate of emission of radiation.		I can explain why objects stop cooling in terms of the rate of absorption and emission of radiation.	
	I can state that an object cools by emitting IR radiation and heats by absorbing IR radiation.		I can describe the heating of objects in terms of the rate of absorption of radiation.		I can apply the concepts of absorption and emission of IR radiation to explain why an object maintains a constant temperature.	
	I can measure the difference in cooling of objects of different colours.		I can describe the cooling of an object over a period of time.		I can describe the changes in the rate of cooling of objects of different colours and temperatures.	

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P2.3 Radiation and the greenhouse effect	I can state that infrared radiation is electromagnetic radiation with a wavelength shorter than red light.		I can compare the emission of infrared radiation with a wavelength shorter than red light.		I can describe factors that affect the rate of emission of infrared radiation, including temperature and surface area.	
	I can state that an object cools by emitting infrared radiation and heats by absorbing infrared radiation.		I can outline the evidence that changes in the concentration of atmospheric gases are the likely cause of global warming.		I can apply the concepts of absorption and emission of infrared radiation to explain why an object maintains a constant temperature.	
	I can describe the greenhouse effect in simple terms.		I can describe the greenhouse effect in terms of absorption and emission of radiation.		I can fully explain the greenhouse effect in terms of absorption, emission, and wavelengths of electromagnetic radiation.	
P2.4 Specific heat capacity	I can describe materials in terms of being difficult or easy to heat up (increase the temperature of).		I can describe the effects of changing the factors involved in the equation.		I can evaluate materials used for transferring energy in terms of their specific heat capacity.	
	I can state the factors that affect the amount of energy required to increase the temperature of an object.		I can calculate the energy required to change the temperature of an object.		I can use the specific heat capacity equation to perform a wide range of calculations in unfamiliar contexts.	
	I can, with some support, measure the specific heat capacity of a material.		I can measure the specific heat capacity of a material and find a mean value.		I can evaluate in detail the results of an experiment to measure specific heat capacity.	
P2.5 Heating and insulating buildings	I can state some design features used to prevent energy transfer to the surroundings in the home.		I can describe how some design features used to reduce energy dissipation from a home work.		I can evaluate in detail design features used to reduce energy loss from the home.	
	I can calculate the payback time of a simple home improvement feature.		I can compare home improvement features in terms of payback time.		I can decide on home improvement features using payback time and savings beyond the payback time.	