

Year 7 – Energy HT 4

Mastery Matrix

Topic	Course	Learning statement	RAG		
Energy	All	Describe the different energy stores (thermal (internal), chemical, kinetic, gravitational potential, elastic potential, magnetic)			
Energy	All	Describe how energy is transferred from one store to another in given scenarios			
Energy	All	Define "conservation of energy"			
Energy	Ext	Use a Sankey diagram to represent energy transfers (Extension only)			
Energy	All	Calculate efficiency using $\text{efficiency} = \frac{\text{useful energy output}}{\text{total energy input}}$			
Heating and cooling	All	Define "conduction", "convection" and "radiation"			
Heating and cooling	All	Define "thermal conductor" and "thermal insulator"			
Heating and cooling	All	Describe how conduction occurs and link to real world scenarios			
Heating and cooling	All	Describe how convection occurs and link to real world scenarios			
Heating and cooling	All	Describe how radiation occurs and link to real world scenarios			
Heating and cooling	All	Compare and contrast the three ways that thermal energy can be transferred			
Heating and cooling	All	Investigate the best materials for preventing heat loss			
Heating and cooling	All	Explain how heat loss can be prevented in the real world			
Heating and cooling	All	Define "temperature" and "thermal energy"			
Energy Sources	All	Define "renewable" and "non-renewable" energy resource			
Energy Sources	All	Recall 4 examples of non-renewable and 6 examples of renewable energy resources			
Energy Sources	All	Explain the advantages and disadvantages of each energy resource			
Energy Sources	All	Define "power"			
Energy Sources	All	Calculate the cost of energy at home using the formula $\text{cost} = \text{power (kW)} \times \text{time (hours)} \times \text{price (per kWh)}$			

Knowledge organiser

	Topic:	Energy (P.7)
1	Name seven energy stores	Thermal (internal), chemical, kinetic, gravitational potential, elastic potential, electrostatic potential, magnetic
2	Define "conservation of energy"	Energy cannot be created or destroyed; it can only be transferred, stored or dissipated
3	Define "dissipated"	Spread out wastefully
4	State the equation for efficiency	$\text{Efficiency} = \frac{\text{useful energy output}}{\text{total energy input}}$
5	Define "energy transfer"	Energy being converted from one energy store to another
6	Define "kinetic energy store"	The energy of a moving object
7	Define "internal (thermal) energy store"	Total kinetic and potential energy of the particles in an object
8	Define "gravitational potential energy store"	The energy of an object at height

9	Define "elastic potential energy store"	The energy stored when an object is stretched or squashed
10	Name the diagram used to represent energy transfer (Ext)	Sankey diagram
	Topic:	Heating and cooling (P.8)
1	Define "conduction"	Transfer of thermal energy by the vibration of particles
2	Define "convection"	Transfer of thermal energy when particles in a heated fluid (liquid or gas) rise
3	Define "radiation"	Transfer of thermal energy as a wave
4	Define "thermal conductor"	Material that allows heat to move quickly through it
5	Define "thermal insulator"	Material that allows heat to travel slowly through it
6	In which states can convection occur?	Liquids and gases (fluids)
7	Define "temperature"	A measure of the motion and energy of the particles
8	State the standard unit of temperature	Degrees Celsius (oC)
9	Define "thermal (internal) energy"	Quantity of energy stored in a substance due to the vibration of its particles
10	State the standard unit of thermal (internal) energy	Joules
	Topic:	Energy Sources (P.9)
1	Define "renewable energy resource"	An energy resource that can be replaced and will not run out.
2	Define " Non renewable energy resource"	An energy resource that cannot be replaced and will be used up
3	State four examples of non-renewable energy resources	Coal, oil, natural gas, nuclear power
4	State six examples of renewable energy resources	Solar, wind, waves, hydroelectric, geothermal, biomass
5	State the three fossil fuels	Coal, oil, natural gas
6	State two disadvantages of using fossil fuels to generate electricity	Releases greenhouse gases, non-renewable
7	Define "power"	How quickly energy is transferred by a device
8	State the standard unit of power	Watt
9	State the equation to calculate the cost of energy at home	Cost=power(kw) x time(hours) x price(per kWh)
10	How do you convert watts into kilowatts?	Divide by 1000