Describe what a system is.	a What is the equation linking kinetic energy, mass and speed? c	What is the equation linking change in thermal energy, mass, specific heat capacity and temperature change?
Describe energy store changes for the following objects:	b Write the units for the following: kinetic energy:	Write the units for the following:
	mass:	change in thermal energy:
A football that has been kicked upwards.	List some examples of objects with kinetic energy stores.	Write a definition for specific heat capacity.
	What is the equation linking elastic potential energy, spring constant and extension?	
		Define Power.
A squash ball hitting a wall.	Write the units for the following: elastic potential energy:	
	<pre> spring constant: extension:</pre>	Write a definition for specific heat capacity.
A car accelerating.	List some examples of objects with elastic potential energy stores.	
		Write the units for the following:
	What is the equation linking gravitational potential energy, mass, gravitational field strength and height?	power: energy transferred:
A car decelerating.		time: work done:
	Write the units for the following: gravitational potential energy:	An LED bulb has a power rating of 8W, a halogen bulb has a power rating of 28W but they both have a similar brightness. What is the difference?
Bringing water to the boil.	gravitational field strength:	
	List some examples of objects that have gravitational potential energy stores.	The power output of a hairdryer is 2000W. How much energy is transferred pe second?



visit twinkl.com



AQA Physics Unit 4.1- Energy - Higher				(2
What is the law of conservation of energy?	a How is energy lost fro	om a building? What factors affect this?	List the main energy resources.	h
Define dissipation.				
	- What is the equation - input energy transfer	linking efficiency, useful output energy transfer and total $igvee f$?	Define renewable and non-renewable energy	resources.
For the following situations, name the useful energy transfers and the type of energy that is dissipated to the surroundings (wasted):	b What is the equation l	inking efficiency, useful power output and total power input?		
	When energy is train amount of energy?	nsferred in a closed system, what happens to the total	For the energy resources that you have listed renewable and N next to those that are non-r	, write an R next to those that are virenewable.
picture on a television screen.	How can the efficien	cy of an energy transfer be increased?	Except for oil, all energy resources are used for used for heating?	or electricity generation. Which are
useful:	_			
energy dissipated as:	- Which laws is many	g		
printer	which lorry is more e	energy efficient and why?		
useful:	_		My main areas for improvement are:	k
energy dissipated as:				
mobile phone				
useful:				
energy dissipated as:				
For the following situations, suggest methods to reduce unwanted energy	C Energy Resource	Enviromental Imr	nact	Reliability of Output
transfers and what the unwanted energy transfers are.	Coal			Reliability of Output
Hot water stored in a tank.	Oil			
	Gas			
Moving parts in a car.	Nuclear			
	Biofuel			
	- Wind			
	Hydroelectricity			
Describe how thermal conductivity of a material affects how it transfers energy b conduction.	d Geothermal			
	Tidal			
	- Waves			
	- Solar			







Bringing water to the boil.

The electrical energy from the mains is transferred and the thermal energy store of the water increases, which increases the kinetic energy stores of the particles that make up the water.

gravitational field strength and height? gravitational potential energy = mass x gravitational field strength x height

Write the units for the following: gravitational potential energy: (E_), joules, J mass: (m), kilograms, kg gravitational field strength: (g), newtons per kilogram, N/kg height: (h), metres, m

List some examples of objects that have gravitational potential energy stores. (These are just a few examples. There will be many more.) Apple on a tree. Plant pot on a windowsill. Aeroplane in the sky.

The power output of a hairdryer is 2000W. How much energy is transferred per second?

2000 joules per second.

time: (t), seconds, s



What is the equation linking change in thermal energy, mass, specific heat = mass x specific heat capacity x temperature change

specific heat capacity: (c), joules per kilogram per degree Celsius, J/kg °C

Write a definition for specific heat capacity.

The amount of energy needed to increase the temperature of a 1kg material

What is the equation linking power, energy transferred and time?

What is the equation linking power, work done and time?

work done: (E), joules, J

An LED bulb has a power rating of 8W, a halogen bulb has a power rating of 28W but they both have a similar brightness. What is the difference?

The LED bulb transfers less energy per second than the halogen bulb.



visit twinkl.com

What is the law of passarvation of ourse; It the sub or passarvation of ours	AQA Physics Unit 4.1- Energy - Higher Answers				2
Energy bing transferred to the surroundings. When is the equation intring efficiency, useful actour every transfer on total of the energy event to the surroundings (words): Image: elevation intring efficiency, useful actour every transfer on total of the energy event to the surroundings (words): when is the equation intring efficiency, useful actour every transfer on total of the energy event to the surroundings (words): Image: elevation intring efficiency, useful actour every transfer on total of the energy event on the energy is the surroundings (words): Image: elevation intring efficiency, useful actour every transfer on total of the energy event on the energy is the surroundings (words): Image: elevation intring efficiency, useful actour every transfer on total of the energy event on the energy is the surroundings (words): Image: elevation intring efficiency, useful actour every transfer on total of the energy event on the energy is the energ	What is the law of conservation of energy? Energy cannot be created or destroyed. It can be transferred, stored or dissipated. Define dissipation.	How is energy lost from a building? What factors affect this? Energy is transferred to thermal energy stores of the surroundings. The factors that affect this are the thermal conductivity of the walls and the thickness of them.		List the main energy resources. Fossil fuels (coal, oil and gas) N Nuc Wind R Hydroelectricity R Tidal R Waves R Sun	clear fuel N Biofuel R Geothermal R 1 R
for the following situations, starts the usided energy transform and the type of wrings bit to disuption to the surroundings (control). for the following situations, starts the usided energy transform and the type of wrings bit to disuption to the surroundings. energy disspected as: thermal energy stores and some is carried by sound works to the surroundings. energy disspected as: thermal energy stores and some is carried by sound works to the surroundings. unjuit: chemical energy stores + thermal energy stores and ight and sound waves carry the energy stores and ispat to a subcomplex. Which lear energy efficient is an one higher useful output energy efficient. It wastes less energy disspected as: thermal energy stores and ispat and sound waves carry the energy stores and ispat and sound waves carry the energy stores and the surroundings. which lear energy efficient is an one higher useful output and with " which lear energy stores and ispat to a subcomp statutions, staggest methods to reduce unwasted energy to the surroundings. which lear energy efficient is an one energy efficient is an one higher useful output and with " which lear energy stores and the surroundings. which lear energy efficient is an one in the analyse is an one one provide the surroundings. the wates and energy stores of the surroundings. which lear energy efficient is an one higher useful output energy. which lear energy efficient is an one higher useful output energy. which lear energy stores and the water than energy stores and the surroundings. the water and energy stores and the water than energy stores and energy stores and the water than energy stores and en	Energy being transferred to the surroundings.	What is the equation input energy transfer?	linking efficiency, useful output energy transfer and total $\bigvee_{i=1}^{n}$	Define renewable and non-renewable energy	resources.
picture on a television screen. unduit - chemical energy stores - thermal energy stores, and light and sourd energy distrandings. energy distra	For the following situations, name the useful energy transfers and the type of energy that is dissipated to the surroundings (wasted):	efficiency = useful o What is the equation li efficiency = useful p	utput energy ÷ total imput energy transfer nking efficiency, useful power output and total power input? ower output ÷ total power output	A renewable energy resource can be repler A non-renewable energy resource will eve	nished. ntually run out.
energy dissipated as: thermal energy stores and some is carried by sound waves to the surroundings. mobile phone useful: chemical energy stores > thermal energy stores and light and sound waves carry the energy to the surroundings energy dissipated as: thermal energy stores of the surroundings energy dissipated as: thermal energy stores of the surroundings For the following situations, suggest methods to reduce unwanted energy transfers and what the unwanted energy transfers are. How water stores in a tank. Insulation around the water tank. Reduces dissipation of energy to the surroundings into thermal energy stores. Moving parts in a car. Lubricating the moving parts. Reduces dissipation of energy to the surroundings into thermal energy stores. Moving parts in a car. Lubricating the moving parts. Reduces dissipation of energy to the surroundings into thermal energy stores. Moving parts in a car. Lubricating the moving parts. Reduces dissipation of energy to the surroundings into thermal energy stores. Moving parts in a car. Lubricating the moving parts. Reduces dissipation of energy to the surroundings into thermal energy stores. Moving parts in a car. Lubricating the moving parts. Reduces dissipation of energy to the surroundings into thermal energy stores. Judices are monitoriated in a needed for growing the fuel. Mind Can be noisy and the turbines are dangerous for birds. Moving areas of land is needed for growing the fuel. Mind Can be noisy and the turbines are dangerous for birds. Moving Can affect habitats. Moving Can affect habitats. Moves Can affect ha	<pre>picture on a television screen. useful: chemical energy stores → thermal energy stores, and light and sound carry energy to the surroundings. energy dissipated as: thermal energy stores of the surroundings printer useful: chemical energy stores → kinetic energy stores</pre>	When energy is transferred in a closed system, what happens to the total amount of energy? Total energy does not change. How can the efficiency of an energy transfer be increased? By increasing the useful output by reducing the wasted energy. Which lorry is more energy efficient and why?			ed, write an R next to those that are n-renewable. l for electricity generation. Which are and gas)
For the following situations, suggest methods to reduce unwanted energy transfers are. Insulation around the water tank. Reduces dissipation of energy to the surroundings into thermal energy stores. Energy Resource Environental Impact Reliability of Output Moving parts in a car. Lubricating the moving parts. Reduces dissipation of energy to the surroundings into thermal energy stores. Reliable. Reliable. Describe how thermal conductivity of a material affects how it transfers energy by conduction. None. Reliable. Notelable. If a material has a high thermal conductivity, it will transfer heat via conduction at a much quicker rate. None. None. None.	energy dissipated as: thermal energy stores and some is carried by sound waves to the surroundings. mobile phone useful: chemical energy stores → thermal energy stores and light and sound waves carry the energy to the surroundings energy dissipated as: thermal energy stores of the surroundings	The red lorry is stre energy due to air res	amlined and so is more energy efficient . It wastes less sistance and so has a higher useful output energy.	My main areas for improvement are:	
transfers and what the unwanted energy transfers are. The lay resource Insultion around the water tank. Reduces dissipation of energy to the surroundings into thermal energy stores. Coal Produces carbon dioxide, a greenhouse gas and sulphur dioxide which contributes to acid rain. Reliable. Moving parts in a car. Lubricating the moving parts. Reduces dissipation of energy to the surroundings into thermal energy stores. Reliable. Nuclear Produces ration dioxide. If it is split there can be disastrous environmental consequences. Reliable. Nuclear Produces carbon dioxide. Nuclear Reliable. Reliable. Nuclear Produces ration dioxide. Reliable. Reliable. Wind Can be noisy and the turbines are dangerous for birds. Reliable. Reliable. Wind Can be noisy and the turbines are dangerous for birds. Wind Reliable. Hydroelectricity Large areas of land is needed and can cause disruption to ecosystems. Reliable. Geothermal Moves Coan affect habitats. None. Maxes Solar None. Maxes Solar Solar Solar Solar More. Solar Solar Solar	For the following situations, suggest methods to reduce unwanted energy	Energy Resource Environmental Impact		nact	Reliability of Output
Insulation around the water tank. Reduces dissipation of energy to the surroundings into thermal energy stores.OilProduces carbon dioxide, nitrogen dioxide, nitrogen dioxide. If it is split there can be disastrous environmental consequences.Reliable.Moving parts in a car. Lubricating the moving parts. Reduces dissipation of energy to the surroundings into thermal energy stores.NuclearProduces carbon dioxide, nitrogen dioxide. If it is split there can be disastrous environmental consequences.Reliable.Describe how thermal conductivity of a material affects how it transfers energy by conduction.None.Reliable.Reliable.If a material has a high thermal conductivity, it will transfer heat two conduction at a much quicker rate.None.Reliable.None.WavesCan affect habitats.WavesCan affect habitats.None.None.SolarNone.SolarNone.None.None.None.SolarNone.None.None.None.None.SolarNone.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.None.N	transfers and what the unwanted energy transfers are.	Coal	Produces carbon dioxide, a greenhouse gas and sulphur dioxide which contributes to acid rain.		Reliable.
surroundings into thermal energy stores.GasProduces carbon dioxide.Reliable.Moving parts in a car.NuclearProduces radioactive waste.Reliable.Lubricating the moving parts. Reduces dissipation of energy to the surroundings into thermal energy stores.GasProduces radioactive waste.Reliable.Describe how thermal conductivity of a material has a high thermal conductivity, it will transfer heat via conduction.A lot of land is needed for growing the fuel.More.If a material has a high thermal conductivity, it will transfer heat via conduction.Gas an affect habitats.Reliable.WavesCan affect habitats.More.More.WavesCan affect habitats.WavesSolarWavesSolarNone.More.More.WavesCan affect habitats.More.More.WavesCan affect habitats.More.More.WavesSolarNone.More.WavesSolarMore.More.WavesSolarMore.More.WavesSolarMore.More.WavesSolarMore.More.WavesSolarMore.Mo	Insulation around the water tank. Reduces dissipation of energy to the	Oil	Produces carbon dioxide, nitrogen dioxide and sulphur dioxide. If it is spilt t	here can be disastrous environmental consequences.	Reliable.
Moving parts in a car. Nuclear Produces radioactive waste. Reliable. Lubricating the moving parts. Reduces dissipation of energy to the surround is income the moving parts. Reduces dissipation of energy to the surround is income the moving parts. Nuclear Produces radioactive waste. Reliable. Describe how thermal conductivity of a material affects how it transfer heat via conduction. Mind Can be noisy and the turbines are dangerous for birds. Reliable. Gothermal None. Reliable. Motalways reliable due to changing tides. Waves Can affect habitats. Waves Can affect habitats. None. Waves Can affect habitats. Waves Solar None. Solar None. Unreliable. Unreliable.	surroundings into thermal energy stores.	Gas	Produces carbon dioxide.		Reliable.
Lubricating the moving parts. Reduces dissipation of energy to the surrounding into thermal energy stores. Biofuel A lot of land is needed for growing the fuel. Reliable. Wind Can be noisy and the turbines are dangerous for birds. Unreliable. Pescribe how thermal conductivity of a material affects how it transfers energy by conduction. Hydroelectricity Large areas of land is needed and can cause disruption to ecosystems. Reliable. If a material has a high thermal conductivity, it will transfer heat via conduction at a much quicker rate. None. None. None. Solar None. Solar None. Unreliable. Unreliable.	Moving parts in a car.	Nuclear	Produces radioactive waste.		Reliable.
into thermal energy stores.WindCan be noisy and the turbines are dangerous for birds.Unreliable.Describe how thermal conductivity of a material affects how it transfers energy by conduction.WindCan be noisy and the turbines are dangerous for birds.Reliable.If a material has a high thermal conductivity, it will transfer heat via conduction.None.Reliable.Not always reliable due to changing tides.WindCan affect habitats.WindCan affect habitats.Not always reliable due to changing tides.WavesCan affect habitats.WindUnreliable.SolarNone.SolarUnreliable.SolarNone.Unreliable.SolarNone.Unreliable.SolarNone.Unreliable.SolarNone.Unreliable.SolarNone.Unreliable.SolarNone.Unreliable.SolarNone.Unreliable.SolarNone.Unreliable.SolarNone.Unreliable.SolarNone.Unreliable.SolarNone.Unreliable.SolarNone.Unreliable.SolarNone.Unreliable.SolarNone.Unreliable.SolarNone.Unreliable.SolarNone.Unreliable.SolarNone.Unreliable.SolarNone.Unreliable.SolarNone.Unreliable.SolarNone.Unreliable.SolarNone.Unreliable.S	Lubricating the moving parts. Reduces dissipation of energy to the surroundings	Biofuel	A lot of land is needed for growing the fuel.		Reliable.
Pescribe how thermal conductivity of a material affects how it transfers energy by conduction. Hydroelectricity Large areas of land is needed and can cause disruption to ecosystems. Reliable. If a material has a high thermal conductivity, it will transfer heat via conduction. Vialue Can affect habitats. Note. Waves Can affect habitats. Vialues Vineliable. Vineliable. Solar None. Vineliable. Vineliable.	into thermal energy stores.	Wind Can be noisy and the turbines are dangerous for birds.		Unreliable.	
Describe how thermal conductivity of a material affects how it transfers energy by conduction. describe how for a material has a high thermal conductivity, it will transfer heat via conduction. None. Reliable. If a material has a high thermal conductivity, it will transfer heat via conduction. Variable due to changing tides. Waves Can affect habitats. Waves Unreliable. Solar None. Solar None. Unreliable. Unreliable.		Hydroelectricity Large areas of land is needed and can cause disruption to ecosystems.		Reliable.	
conduction.TidalCan affect habitats.Not always reliable due to changing tides.If a material has a high thermal conductivity, it will transfer heat via conductionVialwaysCan affect habitats.Unreliable.at a much quicker rate.SolarNone.Unreliable.Unreliable.	Describe how thermal conductivity of a material affects how it transfers energy by d	Geothermal	Geothermal None.		Reliable.
If a material has a high thermal conductivity, it will transfer heat via conduction Waves Can affect habitats. at a much quicker rate. Solar None. Unreliable.	conduction.	Tidal	Tidal Can affect habitats.		Not always reliable due to changing tides.
at a much quicker rate. Solar None. Unreliable.	If a material has a high thermal conductivity, it will transfer heat via conduction	Waves	Can affect habitats.		Unreliable.
	at a much quicker rate.	Solar	None.		Unreliable.



Reliable.	
Reliable.	
Not always reliable due to changing tides.	
Unreliable.	
Unreliable.	

