NAME _____ CLASS _____

ENERGY IS EVERYWHERE

Energy is the ability to do **work** – to make something move, heat up, light up or make a sound. Engineers measure energy in **joules (J)**.

Energy cannot be created or destroyed. It can only be **converted** from one form to another. Every device you use is an energy converter.

1 Match each form of energy to the best description. Write the correct letter in each box. 6 marks

FORM OF ENERGY	LETTER	DESCRIPTIONS
Kinetic		A Energy stored in fuels, food and batteries
Gravitational potential		B Energy carried by vibrations travelling through the air
Chemical		C Energy an object has because it is moving
Thermal (heat)		D Energy carried by moving electric charge in a circuit
Sound		E Energy an object has because of its height above the ground
Electrical		F Energy that makes things hotter

2 Every device converts energy. Complete the table. The first one has been done for you. 8 marks

DEVICE	ENERGY IN	USEFUL ENERGY OUT	WASTED ENERGY OUT
Torch	Chemical (battery)	Light	Heat
Electric kettle			
Wind turbine			
Loudspeaker			
Electric motor			

3 A ball is held at the top of a hill, then rolls down. Describe the energy change as it rolls. 2 marks

WASTED ENERGY AND EFFICIENCY

No device is perfect. Some of the energy put in is always converted into forms we do not want, usually **heat** and **sound**. This is called **wasted energy**.

Engineers try to design products that waste as little energy as possible. A product that wastes less energy is more **efficient**.

4 Complete the sentences. Use the word bank. 5 marks

WORD BANK converted | joules | destroyed | heat | efficient

Energy is measured in _____. Energy cannot be created or _____, it can only be _____ from one form to another. Most wasted energy ends up as _____. A device that wastes less energy is more _____.

5 Two bulbs are each given **100 J** of electrical energy. Work out how much energy each one wastes as heat. 4 marks

FILAMENT BULB



Energy in: 100 J
Light out: 10 J
Heat out: _____

LED



Energy in: 100 J
Light out: 40 J
Heat out: _____

6 Which bulb is more efficient? Explain your answer. 2 marks

7 **CHALLENGE** Efficiency can be worked out as a percentage: **efficiency = useful energy out ÷ energy in × 100**. 4 marks
Calculate the efficiency of each bulb, then explain why LED torches run for longer on the same battery.

REMEMBER Total energy out always equals total energy in. Useful + wasted = energy in.