GCSE and IGCSE Physics: Energy Stores and Transfers Worksheet

Year 10-11 · GCSE (AQA 4.1) and Cambridge IGCSE 0625 topic 1.7 · Exam-style questions

Name: ..... **Class:** ..... **Date:** ..... **Score:** / 51

Section A: Energy stores and transfers [13 marks]

kinetic | gravitational potential | elastic potential | thermal | chemical | nuclear | conservation of energy | dissipated

1 Use words from the box to complete the sentences. You may use a word once, more than once or not at all.

(a) Energy cannot be created or destroyed, only transferred. This is the principle of ..... . **[1]**

(b) Energy that spreads out into the surroundings and is not useful is said to be ..... . It is usually stored as ..... energy. **[2]**

(c) A moving object has ..... energy. An object lifted above the ground has ..... energy. **[2]**

2 Name the main energy transfers in each device. **[4]**

Device	Useful energy transfer
Electric kettle	
Loudspeaker	
Solar cell	
Wind turbine	

3 Describe the energy transfers when a ball is thrown upwards and then falls back down. **[4]**

Section B: Energy calculations [16 marks]

kinetic energy = ½ m v^2 | GPE = m g h | elastic energy = ½ k e^2 | work done = force × distance | power = energy ÷ time | efficiency = useful output ÷ total input

4 Calculate the kinetic energy of a 1200 kg car travelling at 15 m/s. **[3]**

5 Calculate the gravitational potential energy gained by a 60 kg climber who climbs 25 m. (g = 10 N/kg) **[2]**

6 A 0.5 kg ball is dropped from a height of 20 m. Calculate its speed just before hitting the ground, ignoring air resistance. (g = 10 N/kg) **[4]**

7 A spring with spring constant 200 N/m is stretched by 0.10 m. Calculate the elastic energy stored. **[3]**

8 A motor lifts a 20 kg load through 3.0 m in 6.0 s. Calculate the useful power output. (g = 10 N/kg) **[4]**

Section C: Efficiency and energy resources [22 marks]

9 A light bulb transfers 100 J of electrical energy and gives out 8 J of light. Calculate the efficiency, and state what happens to the other energy. **[3]**

10 Explain two ways to reduce unwanted energy transfers in a house. **[4]**

11 Complete the table about energy resources. **[8]**

Resource	Renewable or non-renewable	One advantage or problem
Coal		
Wind		
Solar		
Nuclear		

12 Explain why the efficiency of any device can never be 100%. **[2]**

13 Describe an experiment to measure the specific heat capacity of water or a metal block. **[5]**