

## P1.2 Energy Fact Sheet

<b>Energy resources</b>	
1. List 2 non-renewable energy resources available on Earth	Fossil fuels, nuclear fuel
2. List 7 renewable energy resources available on Earth	Bio-fuel, wind, hydroelectric, geothermal, tides, Sun, water waves
3. Name 3 fossil fuels	Coal, oil, gas
4. Name 2 nuclear fuels	Uranium, plutonium
5. Name 3 biofuels	Wood, straw, nut shells, ethanol
6. Which energy resource is using heat from the ground?	Geothermal
7. Which energy resource uses water flowing down a mountain?	Hydroelectric
8. What is a renewable energy resource?	Can be replenished as it is used
9. List 3 general uses of energy sources	Transport, generating electricity, heating
10. List reasons why science doesn't have the power to deal with the environmental problems of using energy resources	Need to consider cost (economic), politics, social issues and ethical issues
<b>Energy transfers</b>	
11. State the units for energy	Joules (J)
12. Energy cannot be _____ or _____	Created or destroyed
13. State 3 'things' that can happen to energy	Transferred, stored, dissipated (spread out)
14. What do we call an object or group of objects?	System
15. How do we describe a system if nothing is added or taken away from it?	Closed
16. In a closed system, the total energy before the change = _____	The total energy after the change
17. Describe the changes in energy when an object moves upwards	Kinetic → gravitational potential + thermal
18. Describe the changes in energy when a moving object hits an obstacle	Kinetic → elastic + sound + thermal
19. Describe the changes in energy when a vehicle slows down	Kinetic → thermal

<b>Electrical devices</b>	
20. Describe the changes in energy when water is boiled in an electric kettle	Electrical → thermal + sound
21. What 2 factors determine how much energy an appliance transfers?	<ul style="list-style-type: none"> <li>• Time it is used for</li> <li>• Its power</li> </ul>
<b>Efficiency</b>	
22. How do you calculate energy transferred?	<i>Energy transferred = power x time</i>
23. What are the units for power?	Watts (W)
24. What happens to energy which is not usefully transferred?	Wasted
25. State the useful and wasted energy from an electric drill	Useful: kinetic Wasted: thermal, sound
26. State the useful and wasted energy from a washing machine	Useful: kinetic, thermal Wasted: thermal, sound
27. Which form of energy is wasted by all electrical devices?	Thermal (heat)
28. If a device doesn't waste much energy, we say it is very .....	efficient
29. How do you calculate efficiency if you know energy values?	<i>Efficiency = useful output energy / total input energy</i>
30. How do you calculate efficiency if you know power values?	<i>Efficiency = useful power output / total power input</i>
31. What can we do to reduce the heat loss from an object?	Insulate it
32. What can we do to reduce heat loss due to friction?	Lubricate the moving parts
<b>Power and work</b>	
33. What is power?	Rate at which energy is transferred or rate at which work is done
34. How do you calculate power? (2 formulae)	<i>Power = energy transferred / time</i> <i>Power = work done / time</i>
35. What are the units for work?	Joules (J)
36. An energy transfer of 1J per second =	1 Watt
37. Motor A lifts 10N 3m in 30 seconds. Motor B lifts 10N 3m in 60 seconds. Which motor is more powerful? Explain	Motor A, because it does the same work but faster
<b>Types of energy</b>	
38. When do objects have gravitational potential energy?	When they are above the ground
39. What are the units for gravitational potential energy?	Joules (J)

<b>40. How do you calculate gravitational potential energy?</b>	= mass x gravitational field strength x height
41. What are the units for gravitational field strength?	N/kg
<b>42. When do objects have kinetic energy?</b>	<b>When they are moving</b>
<b>43. What are the units for kinetic energy?</b>	<b>Joules (J)</b>
44. How do you calculate kinetic energy?	= $\frac{1}{2}$ x mass x velocity <sup>2</sup>
45. What are the units for speed?	m/s
<b>46. When do objects have elastic potential energy?</b>	<b>When it is stretched</b>
<b>47. What are the units for elastic potential energy?</b>	<b>Joules (J)</b>
48. What are the units for the spring constant?	N/m
<b>SKILLS SECTION.</b>	
<b>4marks per question:</b>	
<ul style="list-style-type: none"> <li>- Equation written down</li> <li>- Substitution of numbers into the equation</li> <li>- Number answer</li> <li>- Units on the</li> </ul>	
1. An electric drill has a power input of 200W. Its useful power output is 50W. Calculate its efficiency as a percentage. (4)	Efficiency = useful power out/ total power input (50/200) x 100 =25%
2. A TV converts 800J of electrical energy into 400J heat, 200J light and 200J sound. Calculate its efficiency as a decimal (4)	Efficiency= useful energy out/ total energy in 400/800 =0.5
<b>3. An electrical device has a power of 10W and is used for 300 seconds. Calculate the energy which it has transferred (4)</b>	<b>Energy = power x time</b> <b>10 x 300 = 3,000 J</b>
4. An electrical device uses 150J of energy in 3 seconds. Calculate the power of the appliance (4)	Power = energy/ time 150/3 = 50 W
5. If 600J of work are done in 100 seconds, what is the power? (4)	Power = work down/ time 600/100 = 6W
6. A fish of 1kg mass is moving at 3m/s. Calculate the kinetic energy of the fish (4)	$K_E = \frac{1}{2} \times \text{mass} \times \text{velocity}^2$ $= \frac{1}{2} \times 1 \times 3^2$ $= 4.5 \text{ J}$
<b>7. A person is 60kg and is lifted 2m up from the ground. Calculate the gravitational potential energy (4)</b>	<b>GP = mass x gravity x height</b> <b>= 60 x 10 x 2</b> <b>= 1200J</b>
8. Calculate the elastic potential energy of a bungee rope when it is stretched 3m. The spring constant for the rope is 7.	$E_e = \frac{1}{2} k e^2$ $= \frac{1}{2} \times 7 \times 3^2$ $= 13.5\text{J}$

**Higher Tier / Triple**

*There are no additional facts for higher tier or for triple for this unit*