Year 9 P2 Energy Fact Sheet

Energy resources	
1. List 3 general uses of energy sources	Transport, generating electricity, heating
2. What is a non-renewable energy resource?	Cannot be replenished
3. What is a renewable energy resource?	Can be replenished as it is used
4. List 2 non-renewable energy resources available on Earth	Fossil fuels, nuclear fuel
5. List 7 renewable energy resources available on Earth	Bio-fuel, wind, hydroelectric, geothermal, tides, Sun, water waves
6. Name 3 fossil fuels	Coal, oil, gas
7. Name 2 nuclear fuels	Uranium, plutonium
8. Name 3 biofuels	Wood, straw, nut shells, ethanol
9. List 3 energy resources which use water	Hydroelectric, waves, tidal
10. Which energy resource uses energy from the Sun?	Solar
11. Which energy resource is using heat from the ground?	Geothermal
12. Which energy resource uses water flowing down a mountain?	Hydroelectric
13. Which energy resource uses a dam to hold back water?	Tidal
14. Which energy resources produce carbon dioxide as they are used?	Fossil fuels
15. Which energy resources cause visual pollution?	All can
16. Which energy resources destroy habitats?	All can, but especially hydroelectric and tidal as they interfere with rivers
17. 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
Energy transfers	
18. State the units for energy	Joules (J)
19. Energy cannot be _____ or _____	Created or destroyed
20. Describe the changes in energy when water is boiled in an electric kettle	Electrical→ thermal + sound
21. Describe the energy changes for a TV	Electrical → sound + light + thermal

22. Describe the energy changes for a washing machine	**Electrical → kinetic + sound + thermal**
23. Describe the energy changes for an electric drill	**Electrical → kinetic + sound + thermal**
24. In a closed system, the total energy before the change =	The total energy after the change
25. Describe the changes in energy when an object moves upwards	Kinetic → gravitational potential + thermal
26. Describe the changes in energy when a moving object hits an obstacle	Kinetic → elastic + sound + thermal
27. Describe the changes in energy when a vehicle slows down	Kinetic → thermal
Efficiency	
28. **What happens to energy which is not usefully transferred?**	**Wasted**
29. **State the useful and wasted energy from an electric drill**	**Useful: kinetic** **Wasted: thermal, (sound-radiation)**
30. State the useful and wasted energy from a washing machine	Useful: kinetic, thermal Wasted: thermal, (sound-radiation)
31. **Which form of energy is wasted by all electrical devices?**	**Thermal (heat)**
32. **If a device doesn't waste much energy, we say it is very …….**	**Efficient**
33. **How do you calculate efficiency if you know energy values?**	**Efficiency = useful output energy ÷ total input energy**
34. **How do you calculate efficiency if you know power values?**	**Efficiency = useful power output ÷ total power input**
Reducing energy loss	
35. What can we do to reduce the heat loss from an object?	Insulate it
36. What can we do to reduce heat loss due to friction?	Lubricate the moving parts
37. A material which transfers heat quickly is described as a good ……	Conductor of heat
38. The higher the thermal conductivity, the ….. energy is transferred	faster
39. The higher the thermal conductivity of house walls, the …. house will cool down	faster

Calculating energy transferred	
40. What 2 factors determine how much energy an appliance transfers? ÷	• Time it is used for • Its power
41. How do you calculate energy transferred?	**Energy transferred = power x time**
42. What are the units for power?	**Watts (W)**
Power and work	
43. What is power?	**Rate at which energy is transferred or Rate at which work is done**
44. How do you calculate power? (2 equations)	**Power = energy transferred ÷ time** **Power = work done ÷ time**
45. What are the units for work?	**Joules (J)**
46. An energy transfer of 1J per second =	1 Watt
47. 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
SKILLS SECTION. **4marks per question:** - Equation written down - Substitution of numbers into the equation - Number answer - Units	
48. 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 %
49. 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
50. An electrical device has a power of 10W and is used for 300 seconds. Calculate the energy which it has transferred (4)	**Energy = power x time** **10 x 300 = 3,000 J**
51. An electrical device uses 150J of energy in 3 seconds. Calculate the power of the appliance (4)	Power = energy ÷ time 150/3 = 50 W
52. If 600J of work are done in 100 seconds, what is the power? (4)	Power = work done ÷ time 600/100 = 6W