Energy

GCSE Science • **Combined and Triple** • Grades 3–6

Name: _____ Class: _____ Total: _____ / 55

Show all your working. Marks are given for correct method as well as the final answer.

1. Name the energy store of a moving car. **[1 mark]**

Answer: _____

2. Name the energy store of a book on a high shelf. **[1 mark]**

Answer: _____

3. Name the energy store of a stretched spring. **[1 mark]**

Answer: _____

4. Describe the energy transfer when a ball is dropped. **[2 marks]**

Answer: _____

5. State the principle of conservation of energy. **[2 marks]**

Answer: _____

6. Write down the equation for kinetic energy. **[1 mark]**

Answer: _____

7. A 1 200 kg car travels at 20 m/s. Work out its kinetic energy. **[3 marks]**

Answer: _____ **J**

8. The same car doubles its speed to 40 m/s. Explain what happens to its kinetic energy. **[3 marks]**

Answer: _____

9. A cyclist has 900 J of kinetic energy and a mass of 72 kg. Work out their speed. **[4 marks]**

Answer: _____ **m/s**

10. Write down the equation for gravitational potential energy. **[1 mark]**

Answer: _____

11. A 3 kg bag is lifted 1.5 m. Take $g = 9.8$ N/kg. Work out the energy transferred. **[3 marks]**

Answer: _____ **J**

12. A 60 kg climber gains 2 000 J of gravitational potential energy. Take $g = 10$ N/kg. Work out the height climbed. **[3 marks]**

Answer: _____ **m**

13. Write down the equation for work done. **[1 mark]**

Answer: _____

14. A force of 250 N pushes a crate 6 m. Work out the work done. **[2 marks]**

Answer: _____ **J**

15. That work is done in 10 s. Work out the power. **[3 marks]**

Answer: _____ **W**

16. A motor is rated at 2 kW. Work out the energy it transfers in 5 minutes. **[4 marks]**

Answer: _____ **J**

17. Write down the equation for efficiency. **[1 mark]**

Answer: _____

18. A lamp takes in 60 J and gives out 9 J of light. Work out its efficiency as a percentage. **[3 marks]**

Answer: _____ %

19. Explain why no device can be 100% efficient. **[2 marks]**

Answer: _____

20. A kettle transfers 250 000 J to water and wastes 50 000 J.

(a) Work out the total energy supplied. **[2 marks]**

(b) Work out the efficiency as a percentage. **[3 marks]**

Answer: _____

21. A student heats 0.5 kg of water. The specific heat capacity of water is 4 200 J/kg°C.

(a) Write down the equation linking energy, mass, specific heat capacity and temperature change. **[1 mark]**

(b) Work out the energy needed to raise it by 20°C. **[3 marks]**

Answer: _____

22. A house loses heat through its walls.

(a) Name two ways to reduce unwanted energy transfer from a house. **[2 marks]**

(b) Explain how cavity wall insulation reduces heat loss. **[3 marks]**

Answer: _____

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