

Physics PPE Revision tasks

Task 1 - Energy

Resources

AQA Specification (available online):

6.1.1 Energy changes in a system, and the ways energy is stored before and after such changes

6.1.2 Conservation and dissipation of energy

Collins Revision Guide

BBC Bitesize - <https://www.bbc.com/bitesize/topics/z89ddxs>

Changes in energy stores– Energy stores, energy transfers, energy dissipation, energy conservation and energy changes

1. What is energy and what units is energy measured in?
2. What are the main forms in which energy can be stored or transferred?
3. What are the main energy transfers that take place when an object falls to the ground?
4. What are the main energy transfers that take place in a coal fired power station?
5. What is the 'Law of Conservation of Energy'?
6. What is a 'closed energy system'?
7. What are the energy transfers that take place in a pendulum swing?
8. What are the main energy transfers that take place in a bungee jump?

Work, power and efficiency – Work, energy transfer, power and efficiency calculations

1. What is the scientific definition of 'work done' and how is it calculated?
2. How much 'work' is done in lifting a 5kg bowling ball and placing it onto a 2m high shelf?
3. How much gravitational energy (E_p) is stored in a bowling ball on a 2m high shelf?
4. How much kinetic energy (E_k) is stored in a 2×10^3 Kg car travelling at 20m/s?
5. What force of friction must the brakes of a car provide to stop a car that has 2.1×10^5 J of kinetic energy in a distance of exactly 20m? (Higher only).
6. If a car has 2.1×10^5 J of kinetic energy and has a mass of 2000kg, what is its velocity? (Higher only).
7. If the elastic in a catapult has a spring constant (k) of 500N/m and it is stretched by 500mm, how much elastic potential energy does it have stored?
8. If the catapult in Q15 is used to fire a 200g rock vertically into the air, how high will the rock go (ignoring air resistance)? (Higher Only)
9. What will the velocity of the rock in Q16 be just before it hits the ground? (Ignore air resistance) (Higher Only).
10. How is energy usually lost (dissipated) or wasted during energy transfers and how can it be reduced?
11. If a television transfers 300KJ of electrical energy into 150, 000J of light energy, 60,000J of heat energy and 90,000J of sound energy, what is the efficiency of the television?
12. If a gas boiler has an efficiency of 85% and has a useful power output of 5KW, what is the total energy being input to the boiler per second?