O Level Physics   Tutorial 6: Energy

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1. For each of the following forms of energy, state how it can be converted from one place to another.

   (i)   mechanical energy
   (ii) electrical energy
   (iii) heat energy
   (iv) wave energy

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2. (i)   State the principle of the conservation of energy.

   (ii) A 50 g ball is raised to a height of 1 m above ground. Find its potential energy.

   (iii) It is released. Assume the air resistance is small enough to be neglected, state its kinetic energy just before hitting the ground. Give the reason for the answer.

   (iv) Find the speed of the ball just before it hits the ground.

   (v)   The ball hits the ground and stops. What happens to the kinetic energy?

(d) recall and apply the relationship work done = force × distance moved in the direction of the force to new situations or to solve related problems

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3. I pushed a trolley with a force of 10 N for a distance of 20 m. Find the work that I have done.

(e) recall and apply the relationship power = energy transfer / time taken to new situations or to solve related problems

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4. Referring to question 3, I have done the work in 40 s. Find the power I have use used on the trolley.

(f) calculate the efficiency of an energy transfer using the formula efficiency = useful energy output / total energy input

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5. Referring to question 3, the work done used up 800 J of the chemical energy from the breakfast I ate this morning. Find the efficiency of my breakfast.

(g) discuss the use of non-renewable energy resources such as fossil fuel and nuclear fuel, and renewable energy resources such as biofuel, wind, tides, hydropower, geothermal reservoirs and solar to generate electricity in terms of efficiency of energy transfer, cost, reliability and their environmental impact.

To discuss.