**Year 8 Energy Fundamentals Quiz 1 Revision - Answers**

1. What is Energy?

The ability to do work

1. What is another name for stored energy?

Potential energy

1. There are 3 main types of stored energy:
2. Elastic potential energy eg. a stretched rubber band, windup toy.
3. Chemical potential energy eg. candle (wax) is burning to give out light and heat
4. Gravitational Potential energy. eg.\_rock positioned on the edge of a cliff
5. What is the unit for energy?

Joules (J)

1. How many joules in a kilojoule?

1000 J in a kJ

1. Convert:
2. 6 kJ to J 6000 J
3. 40 kJ to J 40000 J
4. 0.04 kJ to J 40 J
5. 30,000 J to kJ 30 kJ
6. 400 J to kJ 0.4 kJ
7. How many joules in a mega joule?

1 000 000 J in a MJ

1. Convert:
   1. 3 MJ to J 3 000 000 J
   2. 16 MJ to J 16 000 000 J
2. How many kilojoules in a mega joule?

1000 kJ in a MJ

1. Convert:
   1. 12 MJ to kJ 12000 kJ
   2. 20 MJ to kJ 20000 kJ
   3. 14 000 kJ to MJ 14 MJ
   4. 7000 kJ to MJ 7 MJ

Efficiency = Useful Energy Output x 100

Energy Input

1. Calculate the efficiency of a torch that uses 600 J of chemical potential energy to produce 40 J of light energy.

Efficiency = = 6.67%

1. How much wasted energy is produced?

600 – 40 = 560 J

1. What is the main form of wasted energy produced?

Heat energy

1. If a petrol engine of a car is 25 %, how much kinetic energy will it produce when it uses a litre of fuel that contains 20 MJ of energy?

25% =

0.25 =

Useful energy output = 20MJ x 0.25

= 5 MJ of kinetic energy

1. State the energy transformation:
   1. Using a torch

chemical potential energy → light energy + heat energy

* 1. talking on the phone

sound energy → electrical energy → sound energy + heat energy

* 1. green plants undergo photosynthesis

light energy (solar) → chemical potential energy

* 1. Eating high energy food and drink, so that you can run faster.

chemical potential energy → movement (kinetic) energy

1. Classify the following forms of energy as potential or action energy.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| gravitational | electrical | elastic | chemical | nuclear | light | sound | kinetic |

|  |  |
| --- | --- |
| Kinetic energy (doing energy) | Potential energy (stored) |
| Electrical | Elastic |
| Light | Gravitational |
| Sound | Nuclear |
| Kinetic (movement) | Chemical |
|  |  |

Kinetic energy is the energy an object has because of its mass and velocity(speed).

Ek= ½ mv2

Ek = kinetic energy(J)

m= mass (kg)

v= velocity (m/s)

1. Calculate the kinetic energy of a 2 kg rock that has fallen off a ledge and is travelling at 20 m/s.

Ek = ?

m = 2 kg

v = 20 m/s

Ek= ½ mv2

Ek= 0.5 x 2 x 202

Ek= 400 J

1. Calculate the kinetic energy of a 20 gram bullet travelling at 115 m/s. Show full working out.

Ek = ?

m = 20 g = 0.02 kg

v = 115 m/s

Ek= ½ mv2

Ek= 0.5 x 0.02 x 1152

Ek= 0.01 x 13225

Ek= 132 J

1. Which has more kinetic energy, the Road Runner or the Coyote? Explain why.

It is not possible to answer this question without more information.

Kinetic energy is dependent on both mass and speed so unless given the mass of the Road runner and Coyote, as well as the speed of each it is not possible to deduce which has the greater kinetic energy.