**Energy Revision**

**Gravitational Potential Energy:**

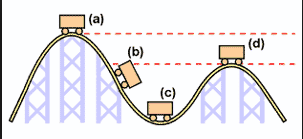
This is the energy an object has because of its mass, height above the ground and the force of gravity.

Ep = m x g x h

m = mass of object (kg)

g = acceleration due to gravity( g=10 m/s2 on earth)

h = height above the ground(m)

Q1. 

In which position will the potential energy of the rollercoaster

1. be the greatest\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. be the least\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Q2. In which position will the kinetic energy of the rollercoaster

1. be the greatest\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. be the least\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Q3. Explain why the rollercoaster track has to be the highest at the start of the ride.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Q4. Write down the energy transfers that occur from {a d}

{a c } \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

{c d } \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What forms of energy will the object possess at b?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Q5. List two ways of increasing the potential energy of the rollercoaster.

a)

b)

Q6. Calculate the potential energy of a passenger in the rollercoaster at the

start of the ride, if the passenger has a mass of 50 kg and he is 10 m above the ground.(Extension question#)

**Kinetic Energy**

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

Ek= ½ mv2

Ek = kinetic energy(J)

m= mass (kg)

v= velocity (m/s)

Q7. Calculate the kinetic energy of a 2 kg rock that has fallen off a ledge and is travelling

at 20 m/s.

Q8.



Which has more kinetic energy, the Road Runner or the Coyote?

Explain why.

**Energy Revision**

1. What is Energy?  
     
   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What is another name for stored energy? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. There are 3 main types of stored energy:  
   (a) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ eg. a stretched rubber band, windup toy.  
     
   (b) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ eg. candle (wax) is burning to give out light and heat  
     
   (c) Gravitational Potential energy. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. What is the unit for energy? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. How many joules in a kilojoule?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Convert:
   1. 6 kJ to J\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. 40 kJ to J\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. 0.04 kJ to J\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Convert

* 1. 30,000 J to kJ\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  2. 400 J to kJ\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. How many joules in a mega joule?

\_\_\_\_\_\_\_\_\_\_\_\_

1. Convert:
   1. 3 MJ to J\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. 16 MJ to J\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. How many kilojoules in a mega joule?
3. Convert:
   1. 12 MJ to kJ\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. 20 MJ to kJ\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. 14 000 kJ to MJ\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   4. 7000 kJ to MJ\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Efficiency

Efficiency = Useful Energy Output x 100

Energy Input

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

(b) How much wasted energy is produced?

(c) What is the main form of wasted energy produced?

12. 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.

Energy Transformations

13. State the changing energy:  
a) flashlight’s batteries

C \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ energy

L \_\_ \_\_ \_\_ \_\_ energy

H \_\_ \_\_ \_\_ energy

) b) talking on the phone

H \_\_ \_\_ \_\_ \_\_ energy

S \_\_ \_\_ \_\_ \_\_ energy

E \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ energy

c) green plants undergo photosynthesis

S \_\_ \_\_ \_\_ \_\_ energy

C \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ energy

d) Eating high energy food and drink, so that you can run faster.