

Obtained from food we eat

Cannot be created or destroyed

Non-living things need it to work

Living things need it to survive

Can be changed from one form to another

Energy

Electrical energy

Sound energy

Solar energy

Heat energy

Light energy

Forms of energy

Kinetic energy

(when in motion)

$$KE = \text{mass} \times 0.5 \times \text{velocity} \times \text{velocity}$$

Potential energy

Gravitational potential energy

$$GPE = \text{mass} \times \text{gravity} \times \text{height}$$

Chemical potential energy

Elastic potential energy

Speed

Mass

Mass

Height

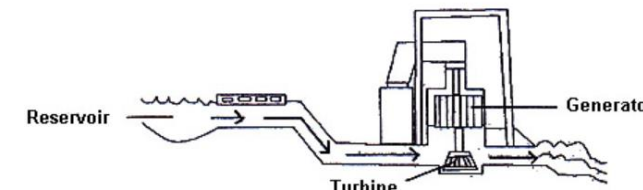
From battery, food we eat, coal

From stretched rubber band, compressed spring, bow and arrow

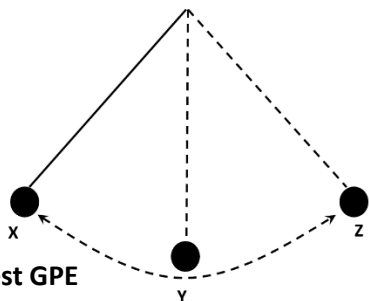
300g

100g

Both balls dropped from the same height, at the same time, the ball that has mass 300g will make a deeper dent on the ground.



The GPE of the water in the reservoir is converted to KE of the water flowing down towards the turbine. The KE of the water in the turbine is then converted to KE of the turbine. The KE of the turbine is then converted to the electrical energy.

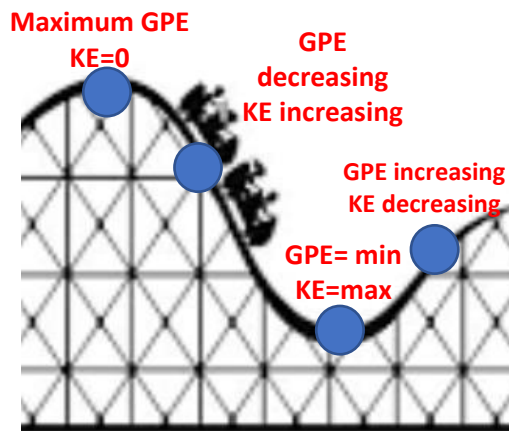


Highest GPE
KE=0

GPE= min
KE=max

Qn: The bob was let go at X. As it moves from X to Y to Z, why the height at Z would be **lower** than the height at X?

Ans: Some of the GPE has been converted to heat and sound energy.



****Tends to confuse gravitational force (gravity) with gravitational potential energy. Gravity is constant, does not change according to height.**

NUCLEAR ENERGY



Nuclear fission uses uranium to create energy.



Nuclear energy is a nonrenewable resource because once the uranium is used, it is gone!

Potential energy

Pollutes the environment when burnt

One of the harmful effects is the acid rain

Fuel like coal, petrol, oil and natural gas

Will run out one day

Non-renewable sources

Sources of energy

Cause respiratory problem to human, corrosion of metals, plants take in toxic substances

Biomass is the burning of wood, animal dung, food waste to generate energy which results in the emission of carbon dioxide, resulting in global warming.



Renewable sources

Does not pollute environment

Will never run out

Disadvantage: Only available in the day. Machines etc cannot operate at night.

Sun

Wind

Running water

Heat energy

Light energy

Kinetic energy

Hydroelectric Power: Pros Vs Cons

Pros	Cons
Once the dam is built, the energy is virtually free.	The dams are very expensive to build. However, many dams are also used for flood control or irrigation, so building costs can be shared.
No waste or pollution produced.	Building a large dam will flood a very large area upstream, causing problems for animals that used to live there.
Much more reliable than wind, solar or wave power.	Finding a suitable site can be difficult - the impact on residents and the environment may be unacceptable.
Water can be stored above the dam ready to cope with peaks in demand.	Water quality and quantity downstream can be affected, which can have an impact on plant life.
Hydro-electric power stations can increase to full power very quickly, unlike other power stations.	
Electricity can be generated constantly.	