Energy

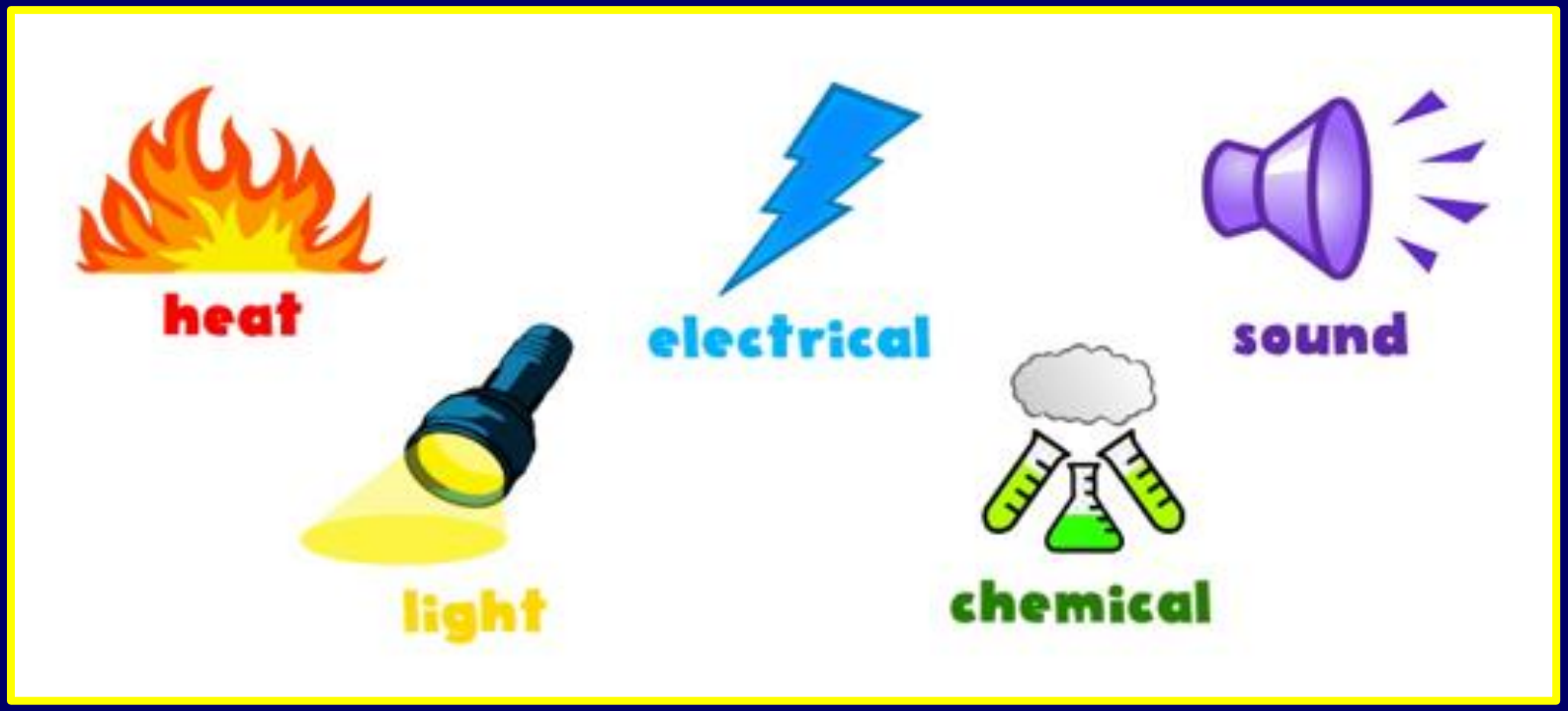
Energy

Energy is the ability to cause change.

Any change that takes place requires energy.

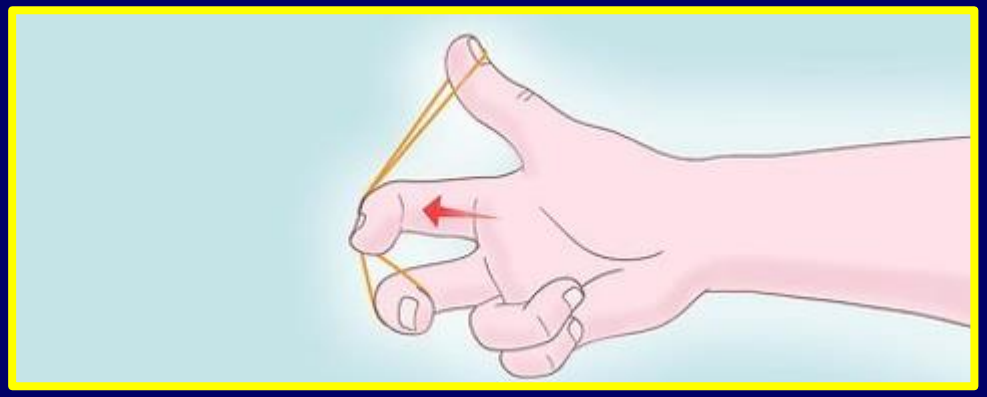
Forms of Energy

There are several different forms of energy.



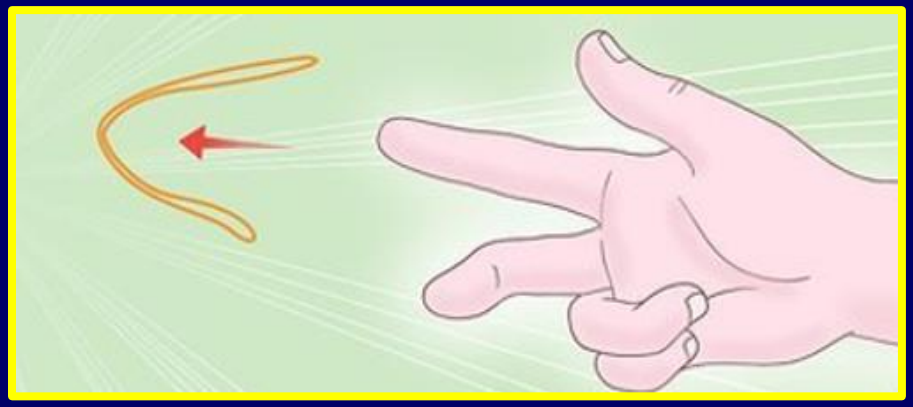
Storing and Using Energy

Energy can also be stored or used.



Stored energy is called potential energy.

Energy in use is called kinetic energy.



Kinetic Energy

The falling water is an example of kinetic energy.

The amount of kinetic energy present is based on mass and velocity.

Joules (J)

The unit for energy is joules, named after the English scientist, James Prescott Joules.

Joules was the first to discover that all forms of energy are basically the same and can be changed from one form into another.

Joules (J)

1 joule (J) is equal to the energy required to raise 1 liter of water, 1 meter high, within one second.

Potential Energy

The water in the reservoir has potential energy due to its height and gravitational force.

Amount of gravitational potential energy depends upon mass, height, and gravity.

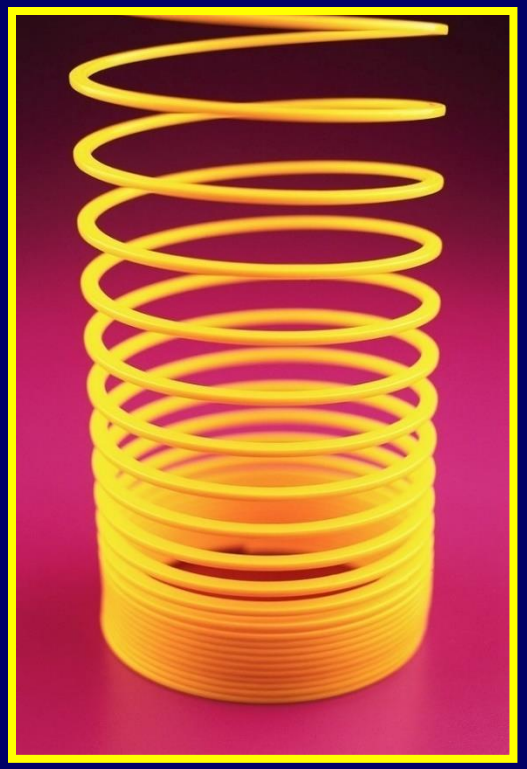
Types of Potential Energy

Potential energy can be put into six main categories:

1. Elastic Potential Energy
2. Chemical Potential Energy
3. Electrical Potential Energy
4. Nuclear Potential Energy
5. Gravitational Potential Energy

Elastic Potential Energy

Elastic Potential Energy is energy stored by things that stretch.



Chemical Potential Energy

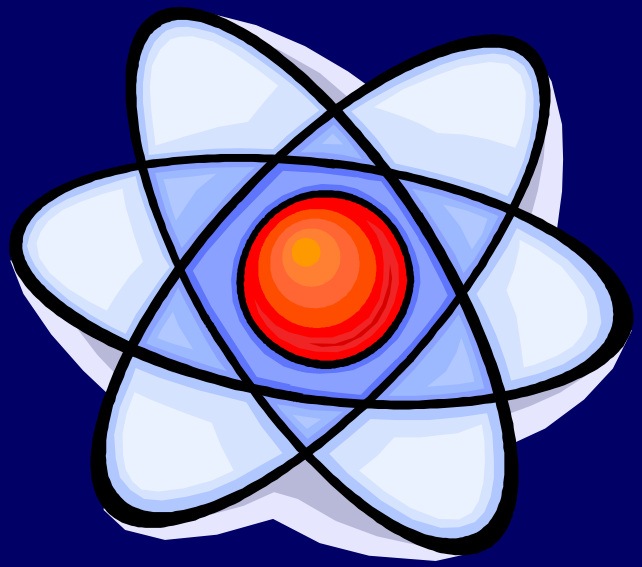
Chemical Potential Energy is energy stored in the chemical bonds between atoms.

Electric Potential Energy

Electrical Potential Energy is energy stored in an electrical charge.

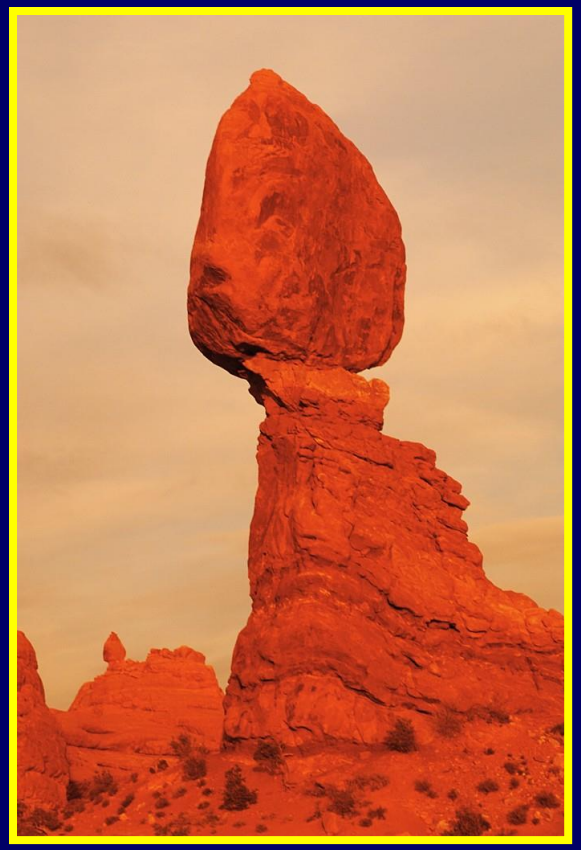
Nuclear Potential Energy

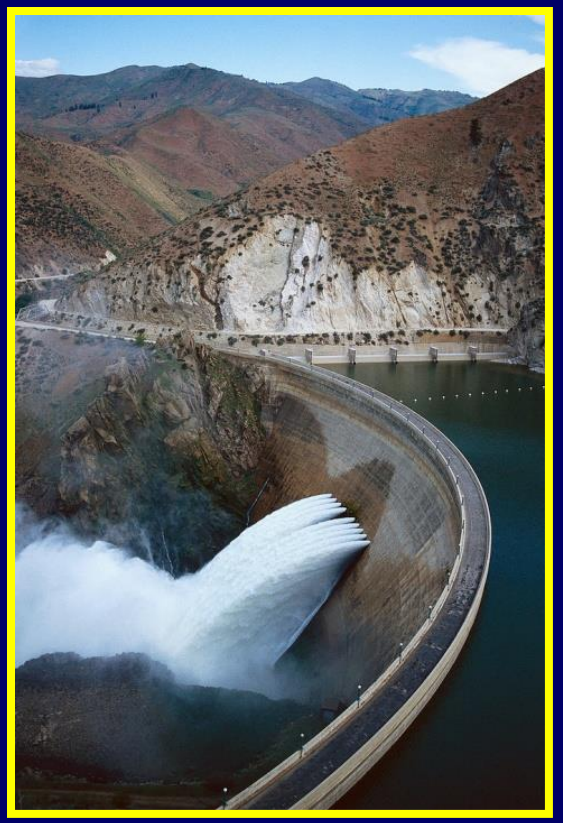
Nuclear Potential Energy is energy stored in the nuclei of atoms.



Gravitational Potential Energy

Gravitational Potential Energy is energy stored in things that are above ground level.





Mechanical Energy

Mechanical energy is the energy something has due to its movement or its position.

Kinetic Energy

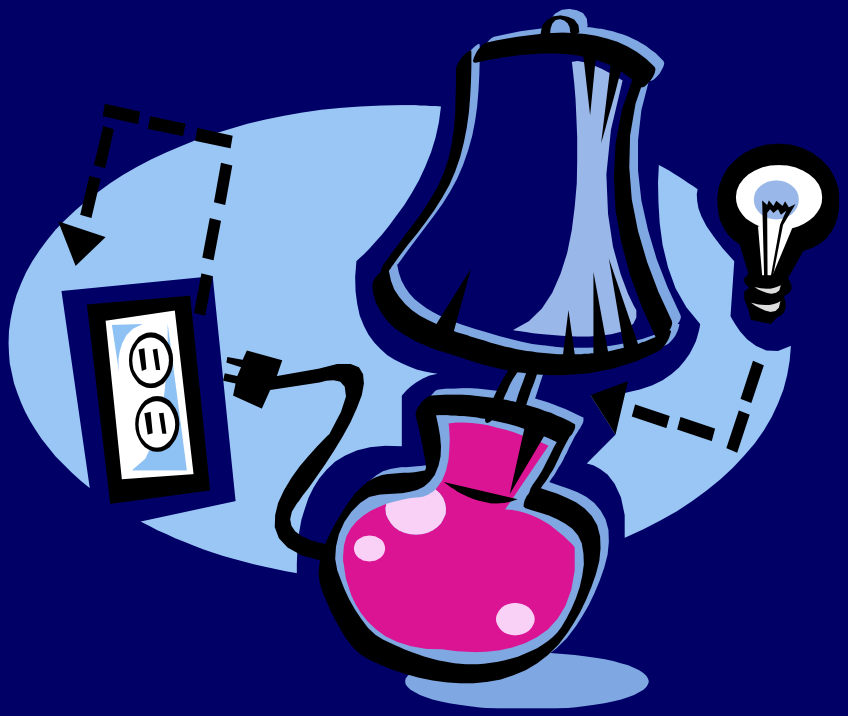
And

Potential Energy

Energy Transfers

Energy transfers occur when energy is changed from one form to another.

Electrical Energy

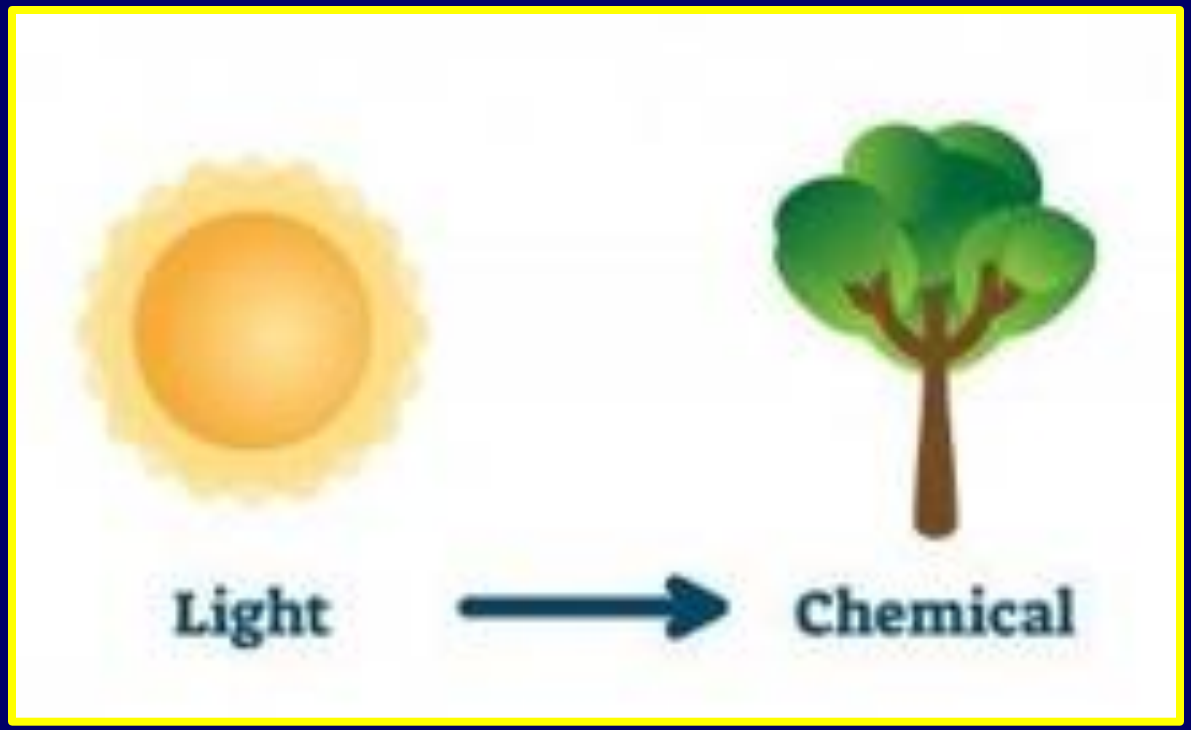


Light Energy

Heat Energy

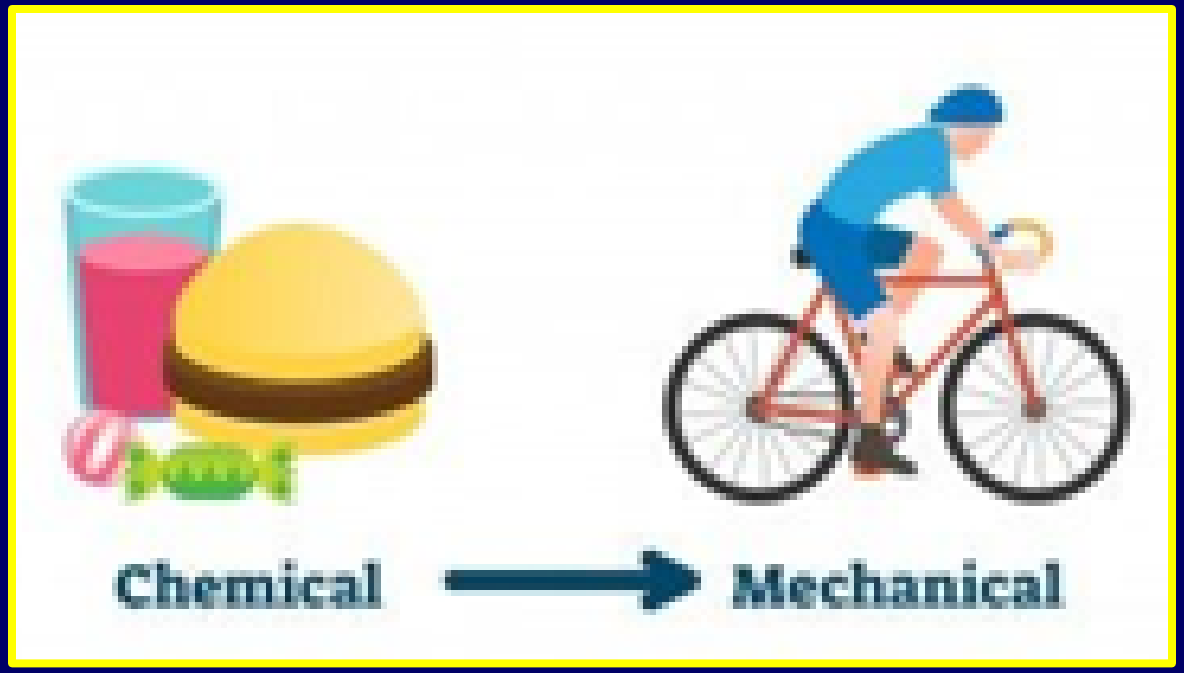
Light Energy → Chemical Energy

Photosynthesis is an example of light energy be transformed into chemical energy.



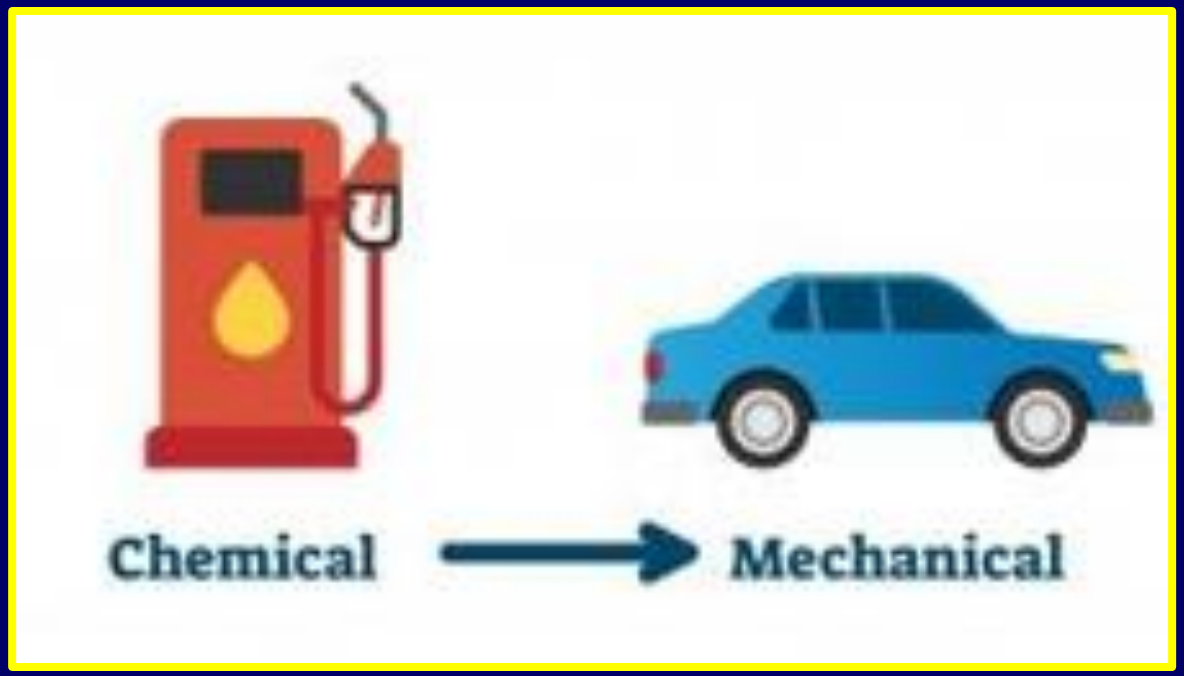
Chemical Energy → Mechanical Energy

Chemical energy in the foods we eat is transformed into mechanical energy, allowing us to do the things we do.



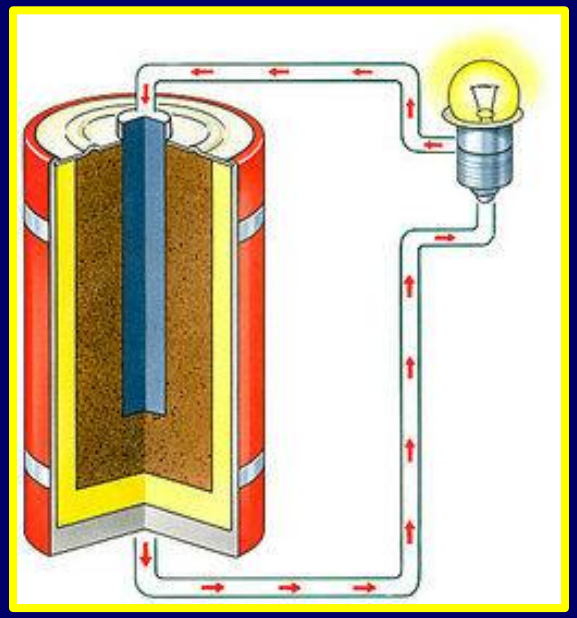
Chemical Energy→Mechanical Energy

Chemical energy in gasoline is also transformed into the mechanical energy that enables our cars to run.



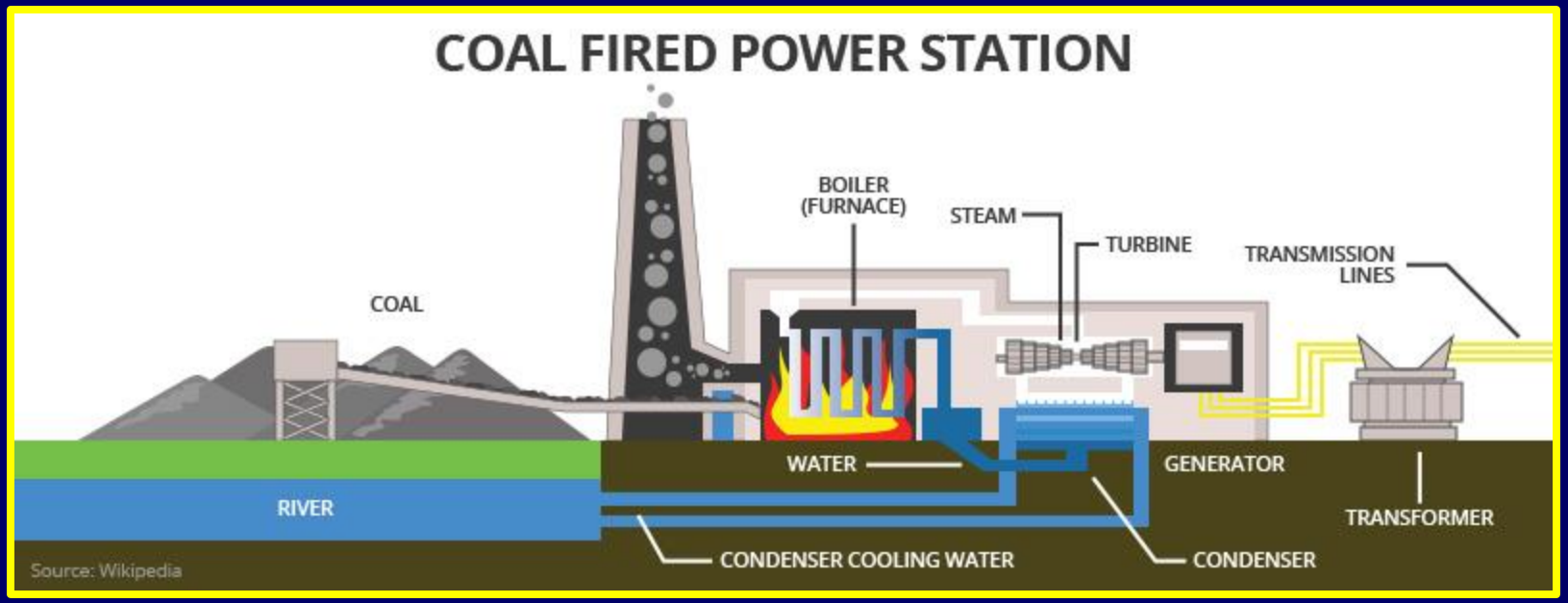
Chemical Energy → Electrical Energy
Electrical Energy → Light Energy

Chemical energy can be transformed into electrical energy which can then be transformed into light energy.



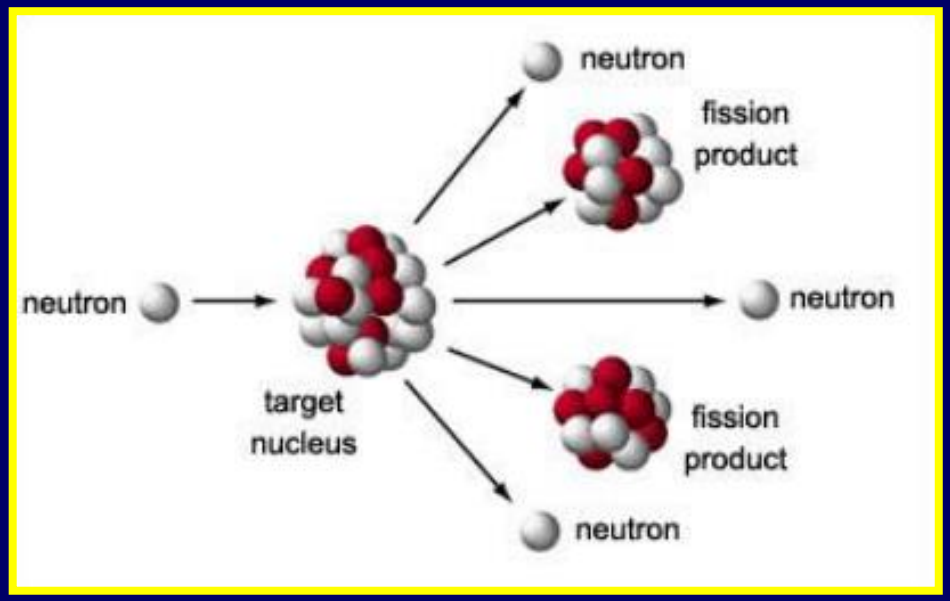
Thermal Energy → Mechanical Energy

Nuclear power plants, coal burning power plants, and wood burning power plants all used steam to turn the turbine inside a generator.



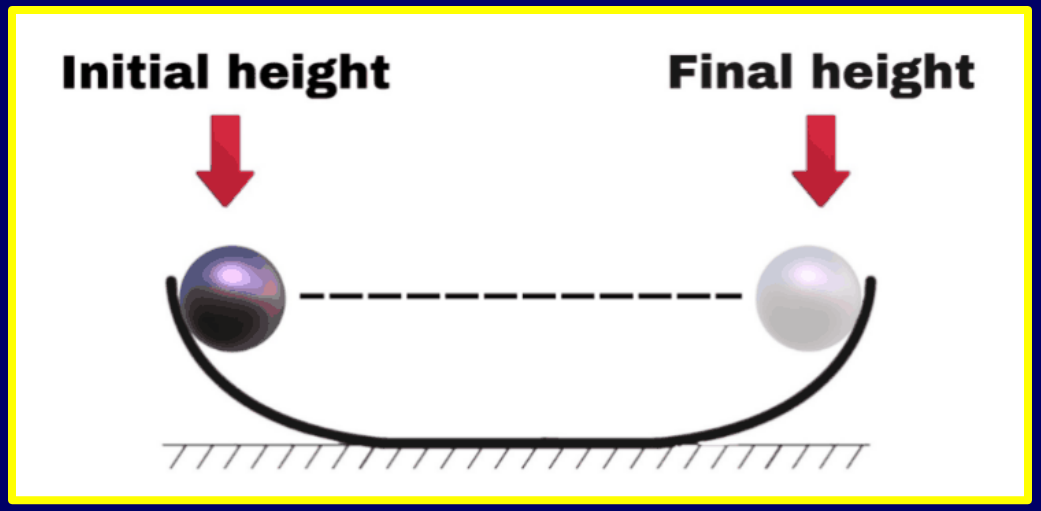
Nuclear Energy → Thermal Energy

Inside a nuclear power plant, the thermal energy released from fission reactions is used to turn water into steam.



Law of Conservation of Energy

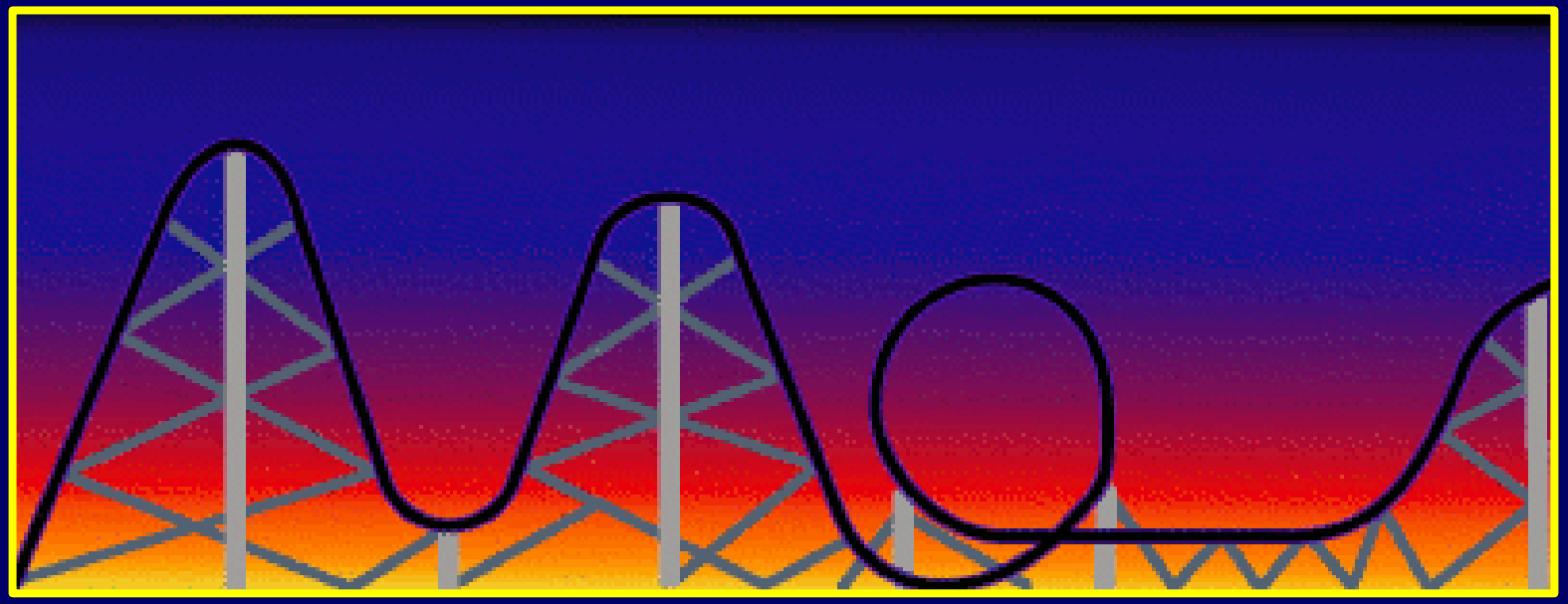
During energy transfers, energy cannot be created or destroyed, only changed from one form to another.



A ball rolling down an inclined plane cannot travel higher than the original height on another inclined plane.

Law of Conservation of Energy

This is how roller coasters work.



A machine pulls the cart to the top of the first hill. After that, the cart goes through a series of energy transfers, until it finally comes to a stop due to loss of heat energy from friction.

The End