



ENERGY



What is Energy?

Energy is defined as the ability to do work, that is, *produce certain changes* within a system.

Types (forms) of energy:

- Mechanical
- Chemical
- Electromagnetic
- Heat (Thermal)
- Nuclear



- We cannot actually see energy 😊
- We can observe how *energy makes matter change* in numerous ways (for example, change of physical properties, change of state, change of position etc.)
- We can observe how energy changes its *form*.

Mechanical Energy

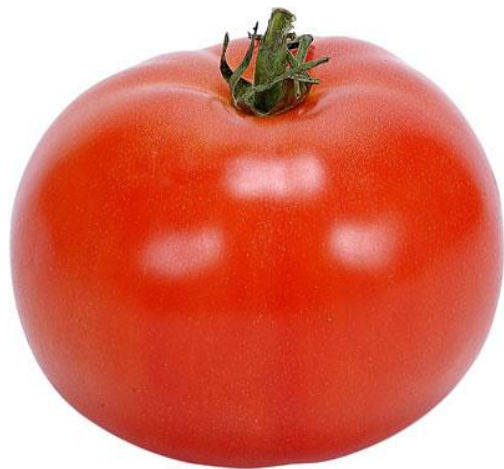
Energy due to an object's **motion** or **position**.



Chemical Energy

Chemical energy is an inherent energy of a substance due to its chemical composition:

- All compounds are held together by chemical bonds.
- All types of chemical bonds have specific stored energy that can be released (transferred to another form, for example, heat or light) when the bonds are broken in a chemical reaction.



Electromagnetic Energy

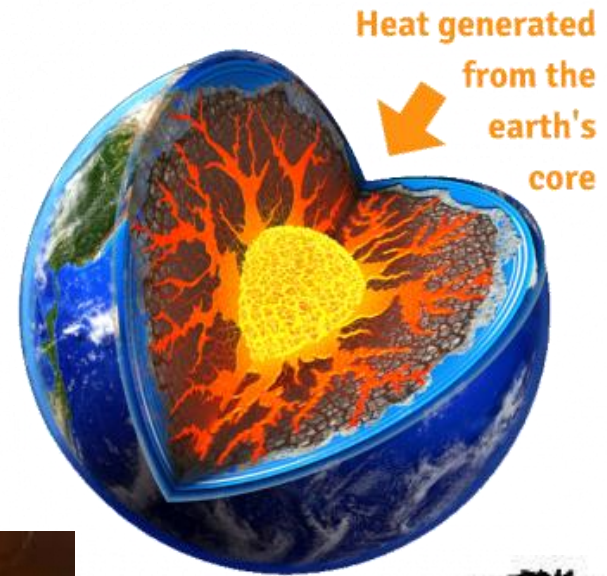
Electric (from electric fields), Magnetic (from magnetic fields),
Radiant (from electromagnetic radiation including *light*)



Thermal Energy

Thermal energy originates from the individually **random**, or disordered, **motion of particles** in a substance:

- All objects constantly give off or gain thermal energy.
- Heat is an **amount of thermal energy being transferred** in a given process in the direction of decreasing temperature.

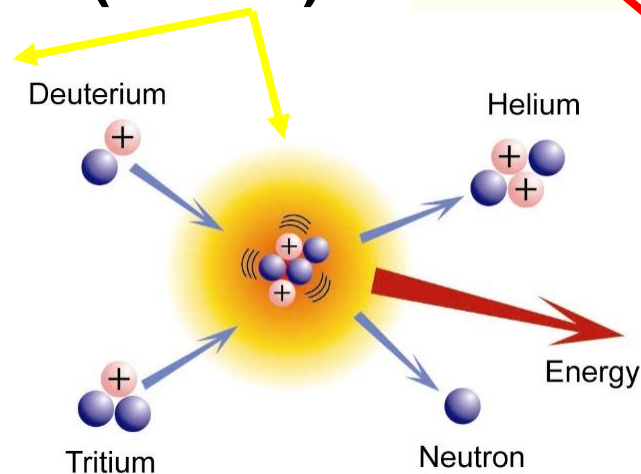
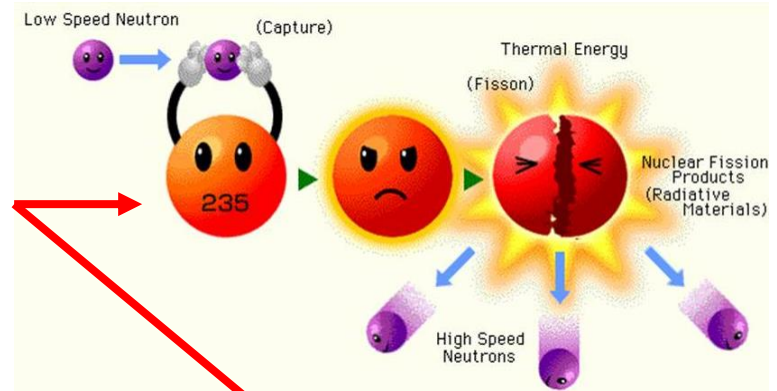


Nuclear Energy

Energy stored in the nucleus of an atom.

Nuclear energy is released in the form of heat and light when:

- the nucleus splits (**fission**)
- the nuclei collide at high speeds and join (**fusion**).



Nuclear energy is the **most concentrated** form of energy.