

## Basics of Energy - Definitions

### Energy

A measurement of matter based on the capacity for matter to perform tasks (*do things, i.e. Work*) to other forms of matter

### Kinetic Energy

The energy matter based on the movement of matter in space as *heat* or *speed* (velocity)

### Potential Energy

The stored energy of matter based on the physical connections, location, or interaction with other forms of matter

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## Basics of Energy – Math Stuff

### Kinetic & Potential Energy

$$KE = \frac{1}{2} m V^2 \quad PE = mgh$$

KE = Kinetic Energy    h = Height (m)    m = Mass (g)

PE = Potential Energy    g Force    v = Velocity (m/s)

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## Using Energy – Work and Power

### Examples of WORK DONE in Physics

#### Change in Position or Displacement

A man pushing a box and moving it from location A to another location B



A crane tow a broken car and takes it to a workshop

#### Change in Speed or Direction



In a school football match, when a boy hits the ball to dodge another player



A batsman hitting a ball during a cricket match

#### Change in Shape or Size



A compressed spring when released does work on a ball

Kids sitting at a place and making different shapes of objects with help of plasticine. They are doing work because they are changing the shape of the plasticine.



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Thermal Energy



Radiant Energy



Light Energy



Chemical Energy

## Types of Energy



Nuclear Energy



Electrical Energy



Gravitational Energy



Mechanical Energy

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## Forms of Energy

### Thermal Energy

Heat, the energy given off due to the interaction of different forms matter, which causes a change in speed (*i.e. temperature*)



### Radiant + Light Energy

Energy flow through the movement of light in space, normally due to heat (*infrared radiation*), nuclear energy (*nuclear radiation*), of visible light (*light energy*)

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## Forms of Energy

### Chemical Energy

Energy given off due to the change of the physical connections/structure of matter.

### Nuclear Energy

Energy given off due to the breakdown of atoms themselves, the smallest form of matter



positive charge

negative charge

### Electrical Energy

Energy flow due to the movement of electrons, the smallest fundamental parts of an atom

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## Forms of Energy

### Gravitational Energy

Energy given off by the interaction of mass with the spin/rotation of the earth

### Mechanical Energy

Energy flow due to the movement and interaction (*collisions*) of particles directly with each other



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