**Thermal ENERGY**

**Energy comes in two main categories:**

1. Kinetic Energy: the energy of

Examples:

1. Potential Energy:  The energy an object has because of its , rather than its motion

Examples: a

**Energy comes in many forms of either kinetic or potential energy. Here are some examples:**

1. chemical energy: energy stored in the bonds of  (atoms and molecules)
2. electrical energy:  energy made available by the flow of through a conductor
3. nuclear energy: the energy stored in the and released during nuclear fission or fusion
4. thermal energy:  energy due to the

We are going to study THERMAL ENERGY more today.

Is thermal energy: POTENTIAL ENERGY or KINETIC ENERGY? (circle one)

Kinetic Molecular Theory of Heat

*States*

**Solids**: particles/molecules . This is the only motion experienced by this state of matter.

**Liquids**: particles/molecules also but they as well, giving them their familiar freedom to of whatever container they are poured in.

**Gases** Gas molecules move from one point to another; they're said to . Of course gas molecules still rotate and vibrate.

*Hot vs. Cold*

**Heat**= the transfer of from one object to another

Therefore cold is a lack of and hot is the abundance of

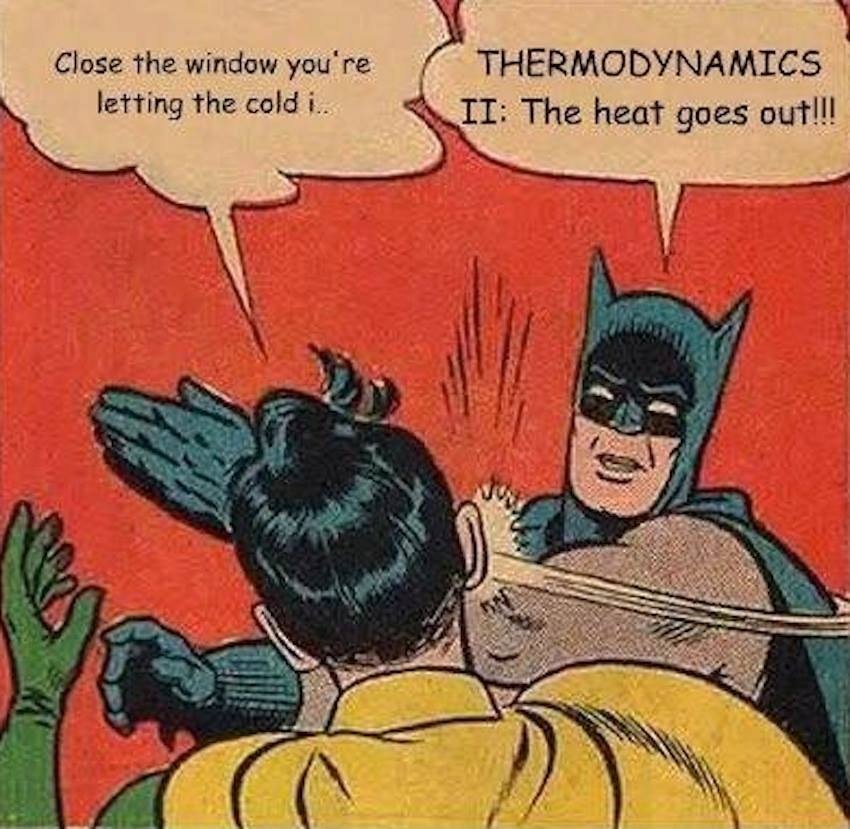
The **Laws of Thermodynamics** will help explain how thermal energy is transformed or transferred

1. Energy cannot be , but can be from one to another or from one to another.

2. No process can be . Some energy will always remain in the form of thermal energy.

Therefore, thermal energy always spontaneously flows from an object at a to an object at a .

Why is Batman correct?



Using the definition of thermodynamics, thermal energy and particle movement explain the following scenarios:

1. How a pot of soup can warm up on a stove
2. An icecube melting in a hot bowl of soup can ‘cool off’ the soup
3. An icepack on an injured knee