



Carleton

Carleton's Geothermal Energy Project  
presents.....

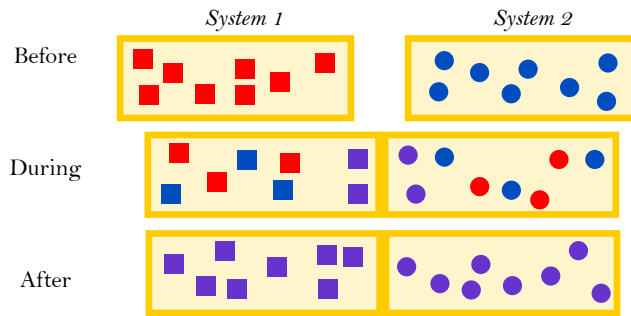
# What is **HEAT** ?

-Transfer of energy between systems due to the changing kinetic energy of particles in the systems

-NOT a property of an object

### For example:

Here we have two isolated systems where the system on the left is hotter than the system on the right (assuming they have the same volume, number of particles and are both at atmospheric pressure). Red indicates a high kinetic energy particle, purple is an intermediate kinetic energy particle and blue is a low kinetic energy particle.



When the systems are put in contact, molecules collide at the boundary, sharing kinetic energy and transferring heat from System 1 to System 2. Thermal equilibrium is reached when the average kinetic energy of the particles in each system is equal. It is important to note that squares will remain in System 1 and circles will remain in System 2 since no molecules are physically exchanged between systems.

### Check Your Understanding

Why does rubbing your hands together cause them to get warmer?

Answer: Friction opposes the relative motion of your hands and increases the kinetic energy of the molecules, allowing energy to be dissipated in the form of heat.

### Why should I care?

Heat transfer is the basis for Carleton's geothermal energy system, allowing Carleton to save money and reduce dependence on steam boilers.

Want to learn more about the physics of geothermal energy?

<https://apps.carleton.edu/geothermal/>

Department of Physics and Astronomy

