Thermnodymanics

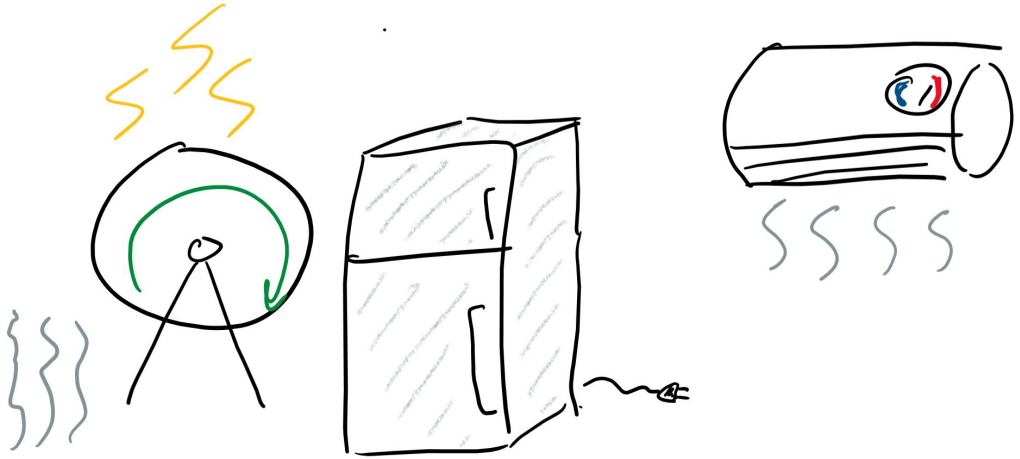
Spleing hrad soryr

Intro

What is thermodynamics?

The study of:

- Heat
- Temperature
- Energy



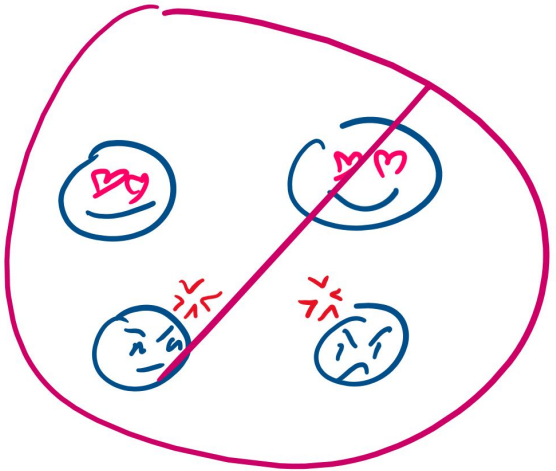
Kinetic Molecular Theory

Gas particles do not attract or repel

Particles just vibe

No force pulls them together

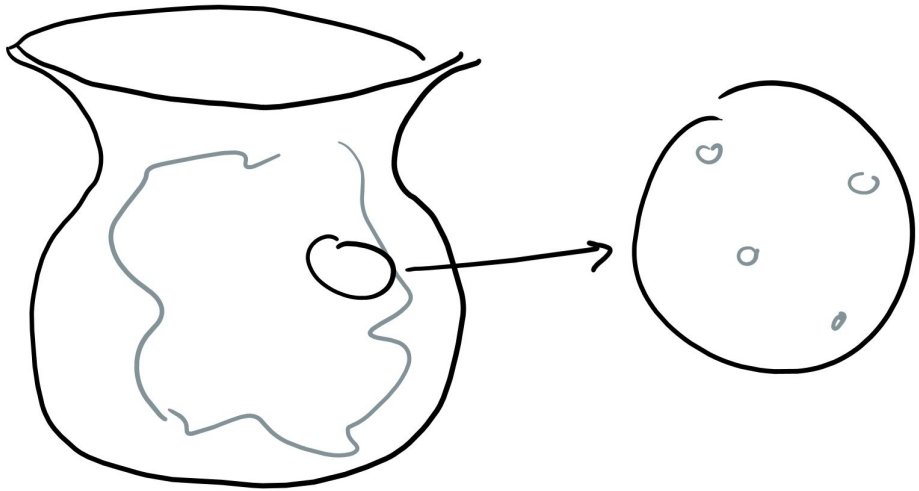
No force pushes them apart



Most of the gas is empty space

Just like me, gasses are mostly empty

Empty space is liek nothing; nothing is there, no gasses, no particles, no more desire to study thermo, no nothing



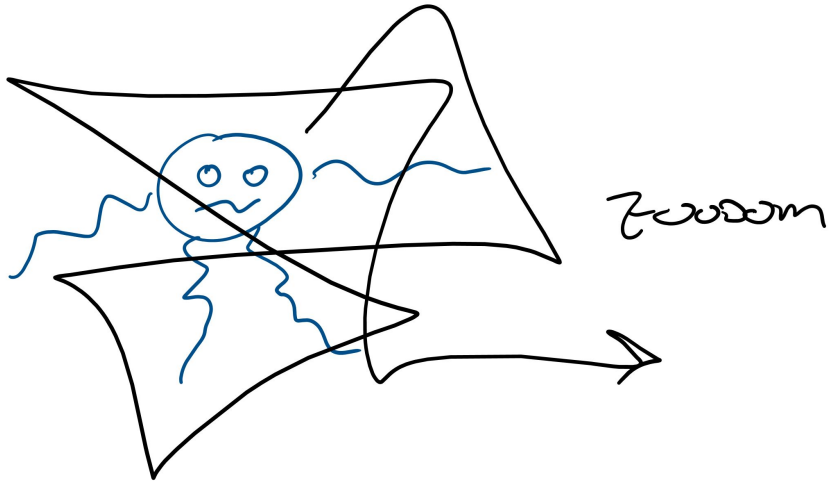
Particles in constant random motion

Never gonna give you up; never gonna let you down;
but they’re gonna run around and desert you

Speedy

Zoom

They don’t stop movin’ movin’

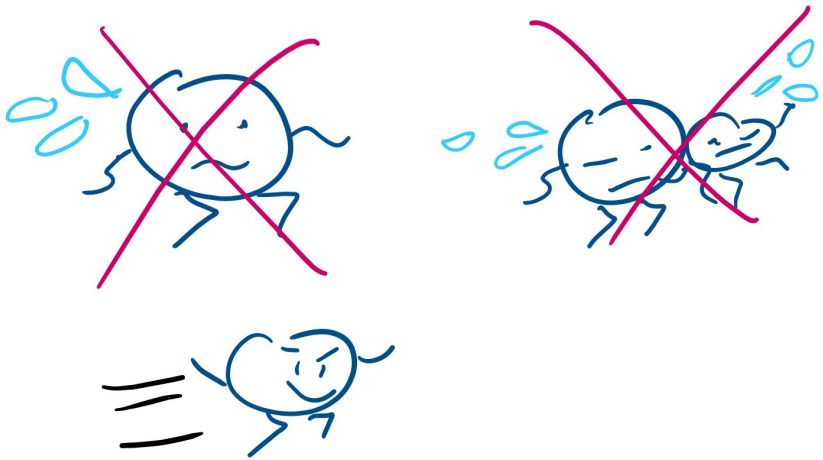


Collisions are perfectly elastic

Tl;dr, particles never get tired, even if they hit other particles

They keep moving, even if they bump into other particles, never slowing down

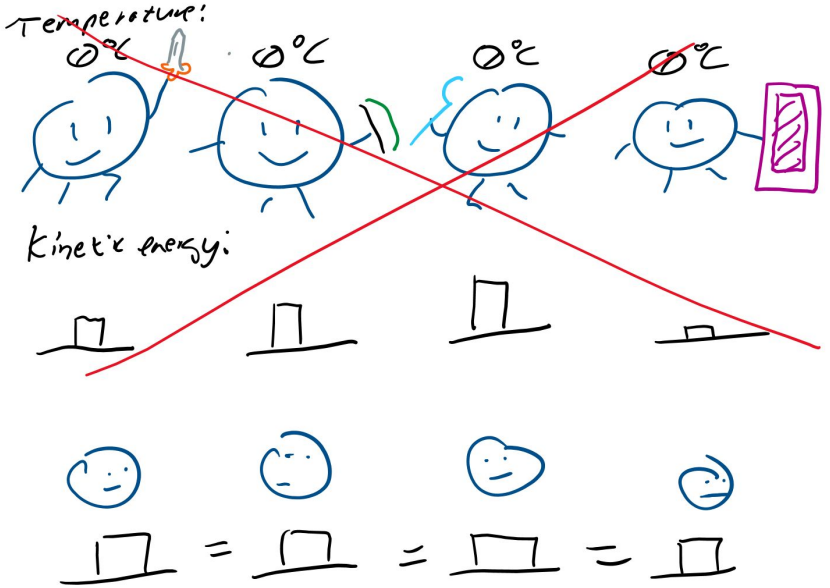
They just zoooom



Same temperature means same avg. KE

At any given temperature, all particles have the same amount of kinetic energy (energy of motion)

You can't have one particle more speedier than another, they're all the same (communism moment)

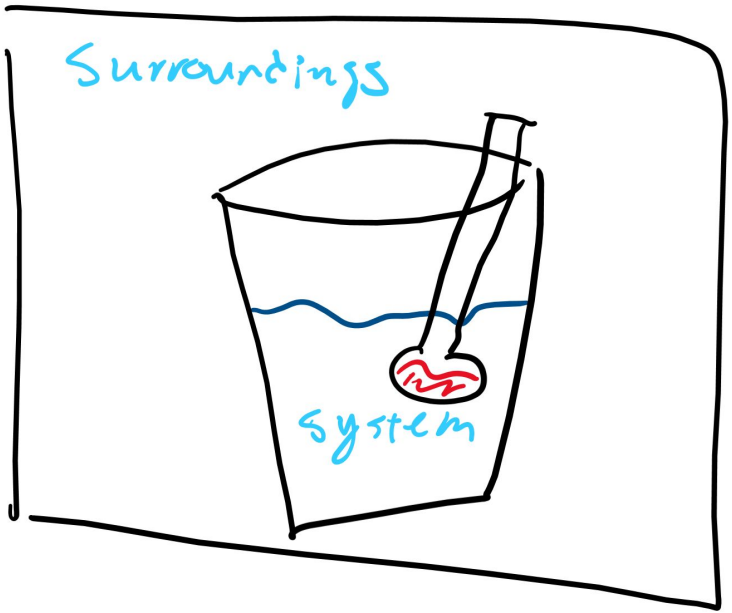


Macro (large-scale) level

System vs Surroundings

System: the thing you're measuring

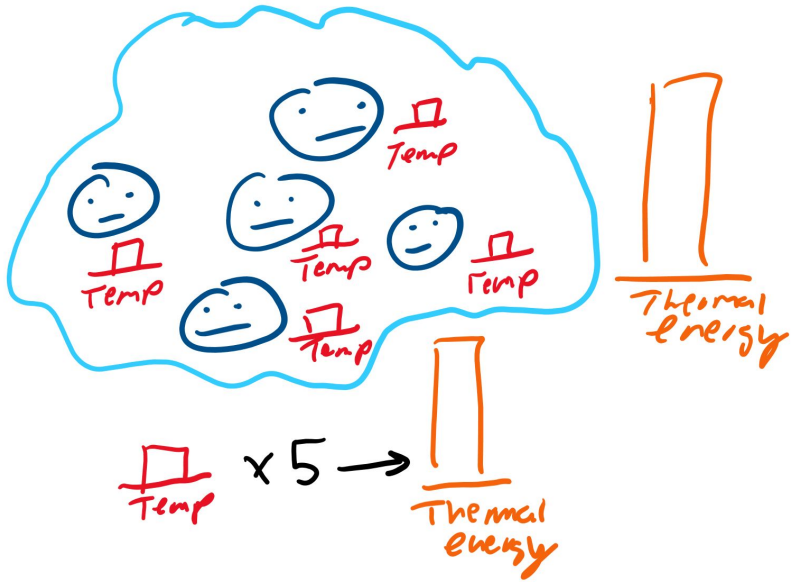
Surrounding: literally everything else; whatever you're not tryna measure



Temperature vs Thermal Energy

Thermal energy:
The total amount of energy in a system
The sum of the energy of all the particles in the system
Depends on the mass of the system

Temperature:
The average kinetic energy of a system



Which has more thermal energy?

Heat

Transfer of energy

The measure of the amount of thermal energy transferred

Very important that energy is transferred

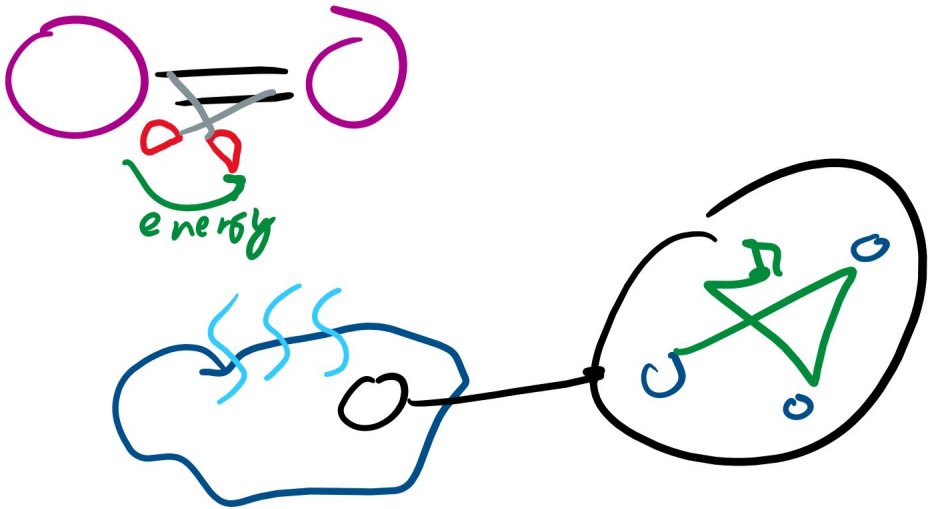
Did I mention that energy has to be transferred for heat to exist?

Molecular level

Heat in a system

If a system is heated up:

- It gains energy
- Bonds are broken (it takes energy to snip snip those bonds)
- Particles move speedier
    - More of the gas is empty space
    - They bump into each other more
    - They have a higher temperature



Heat transfer

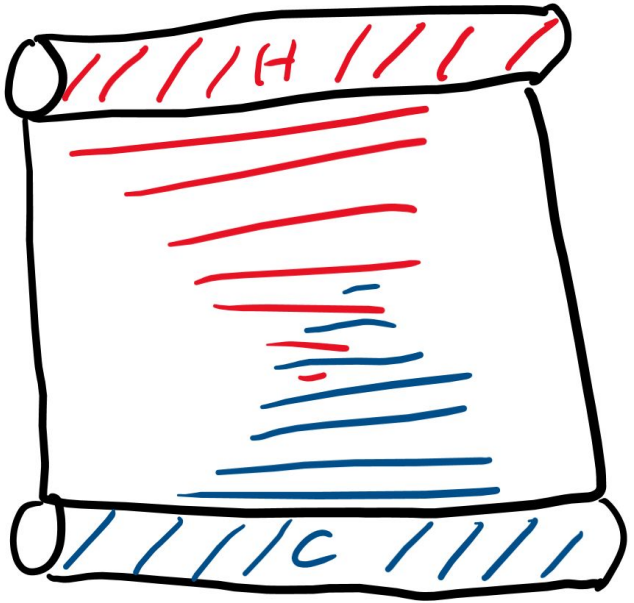
Conduction

If two things touch, there will be heat

“Hot” places transfer thermal energy to “cold” places

“Cold” cannot be transferred, that’s just a lack of the “hot”

Energy gonna leave hot places and go into cold places

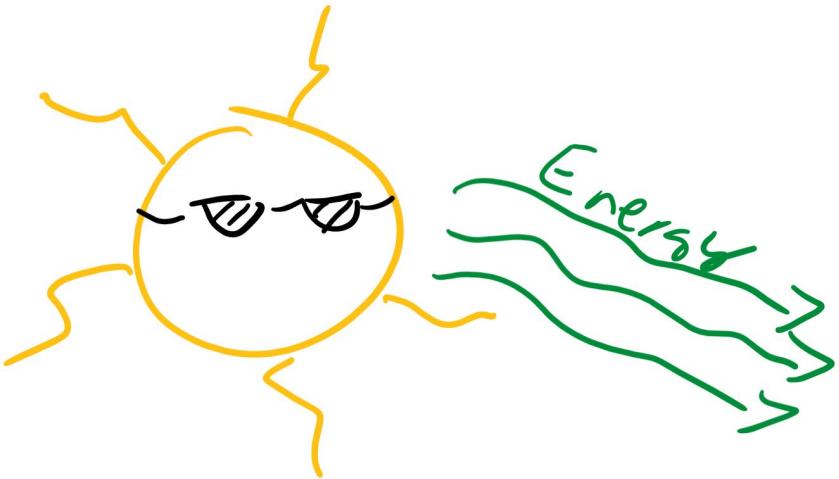


Radiation

Energy can be transferred through waves

Like the sun heats us with light rays

Basically, either heat is transferred through touch (conduction) or not touch (radiation)



Convection

Hotter air rises

Colder air falls