

Transfer of Heat

We know heat is the transfer of thermal energy

How exactly does it move?

That depends on the state of matter

Conduction



Heat moving through solids

- as particles gain E_k they vibrate faster
- particles transfer E_k when they collide
- particles do not change positions



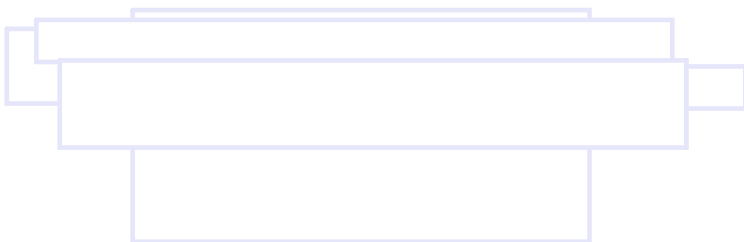
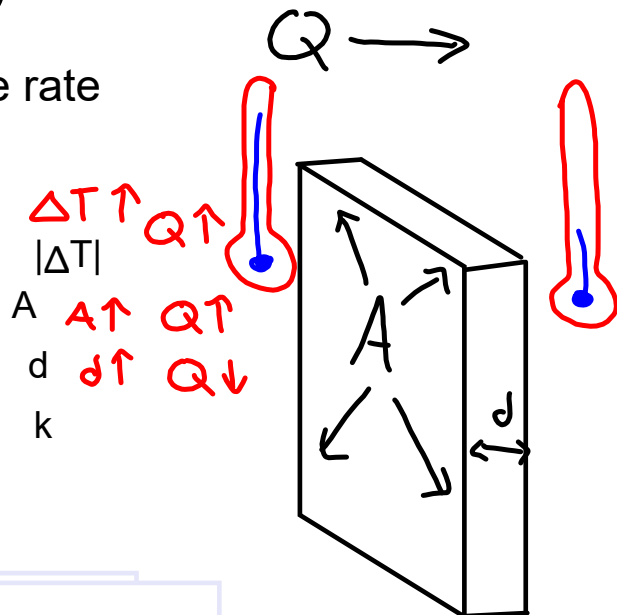
<https://www.youtube.com/watch?v=wXtxvbnIBNY>



Thermal Conductivity

Factors controlling the rate heat can transfer

- Temperature Difference
- Surface Area
- Distance Travelled
- Thermal Conductivity (material)



Convection

Heat moving through fluids (liquids and gases)



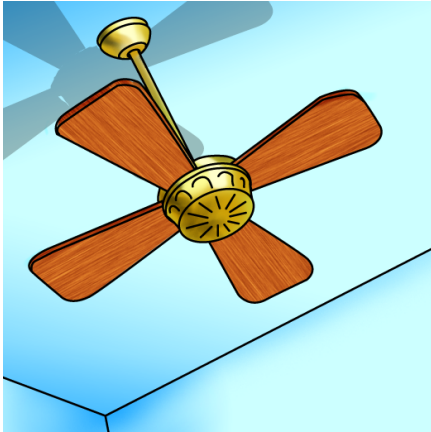
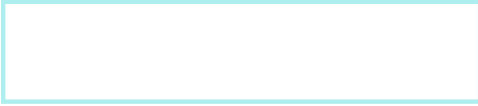
- as particles gain E_k they travel faster
- particles transfer E_k when they collide
- particles change positions

<https://www.youtube.com/watch?v=JBGT6UPTgWE>



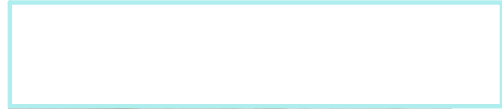
To increase
convection...

force the fluid to move



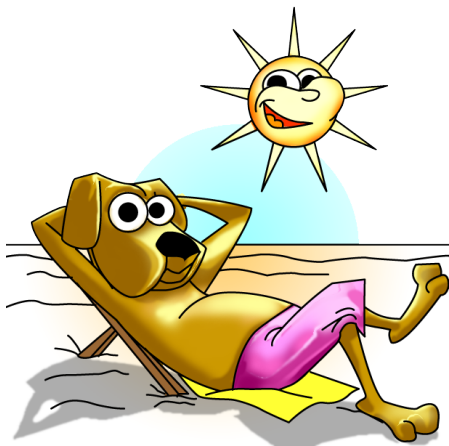
To decrease
convection...

stop the fluid from moving



Radiation

Heat moving through by electromagnetic
waves (EMW)



- EMW do not require a medium to travel (can travel in vacuum)
- EMW include: gamma, x-ray, UV, visible light, infrared, microwaves, radiowaves

<https://www.youtube.com/watch?v=CIRrU6JuBOc>



Two things can happen when EMW hit an object:

Reflect

Light colours
(White)

Absorbed

Dark colours
(Black)



1, 2a, 4, 5, 6, 7