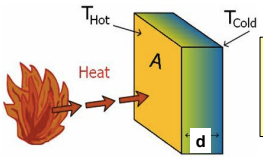
Our Objectives
To describe the three major modes of heat transfer
To explain the factors affecting the rate of heat transfer through these modes
To show how science concepts can help explain seemingly strange or mysterious occurrences in life

CONDUCTION



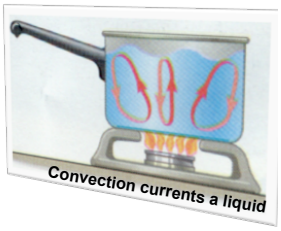
$$\frac{\Delta Q}{\Delta t} = k\frac{A\Delta T}{d}$$

↑ ΔQ/t ↑ ΔT ↑ A ↓ d

↑ k = thermal conductivity of the material

- Kinds of convection :
  - ➢ natural
  - ➢ forced

$$\frac{\Delta Q}{\Delta t} = h\,A\,\Delta T$$



convective heat transfer coefficient:
- orientation, form of object
- properties/ motion of fluid

RADIATION

RADIATION

- Heat transfer through empty space --- no need for material medium
- *Radiant energy* is in the form of electromagnetic waves
- *Every* object radiates EM waves of *all wavelengths* depending on its temperature

Stefan-Boltzmann Law

$$P = e\,\sigma\,A\,T^4$$

P = power

A= surface area of the body

e = emissivity of surface (0-1)

σ = Boltzmann constant (1.3807×10^{-23} J/K)

T = Kelvin (*absolute*)