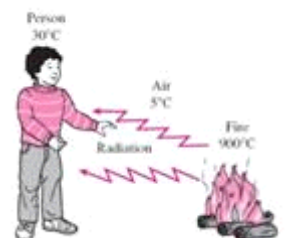


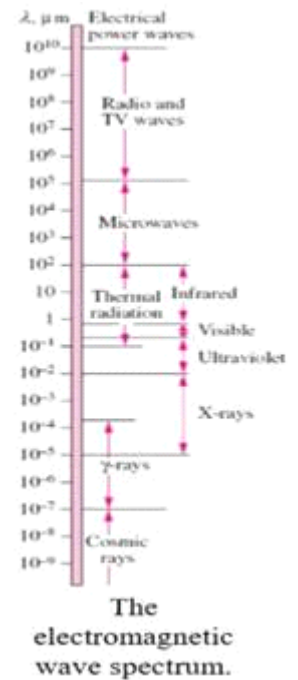
$$\begin{aligned}
 U_{Total} &= U_{wood} \times \frac{A_{wood}}{A_{tot}} + U_{ins} \times \frac{A_{ins}}{A_{tot}} \\
 &= \frac{1}{R_{wood}} \times 0.25 + \frac{1}{R_{ins}} \times 0.75 \\
 &= \frac{1}{1/109} \times 0.25 + \frac{1}{4/1007} \times 0.75 \\
 &= \frac{250}{1109} + \frac{750}{4007} \\
 &= 0.225 + 0.187 = \underline{0.412}
 \end{aligned}$$

$$\begin{aligned}
 Q_{tot} &= \frac{0.412}{1000} \times 100 \times 2.4 \\
 &= 412 \times 2.4 \\
 &= \underline{988.8}
 \end{aligned}$$



RADIATION: Both conduction and convection require matter to transfer heat.

Radiation is a method of heat transfer that does not rely upon any contact between the heat source and the heated object. ... Radiation is a form of energy transport consisting of electromagnetic waves traveling at the speed of light.



Electromagnetic radiation refers to the waves (or their quanta, photons) of the electromagnetic field carrying electromagnetic radiant energy. It includes radio waves, microwaves, infrared, (visible) light, ultraviolet, X-rays, and gamma rays.

$$\lambda = \frac{c}{\nu}$$

Electromagnetic waves transport in like other other waves and they are characterize by their frequency ν and wavelength

Blackbody is a surface that absorbs all radiant energy falling on it regardless of wavelenght and direction

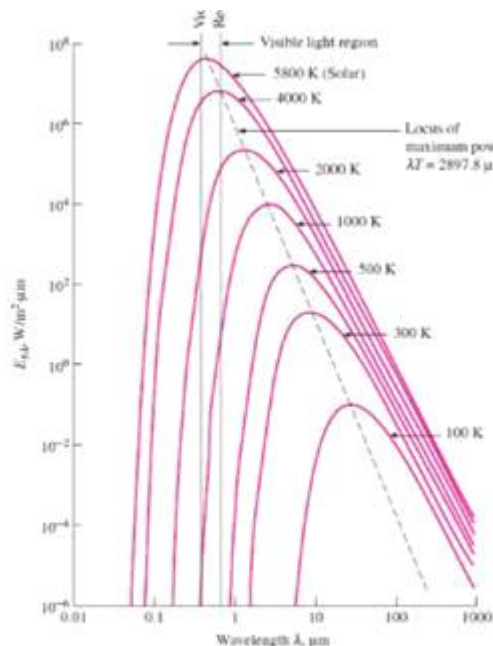
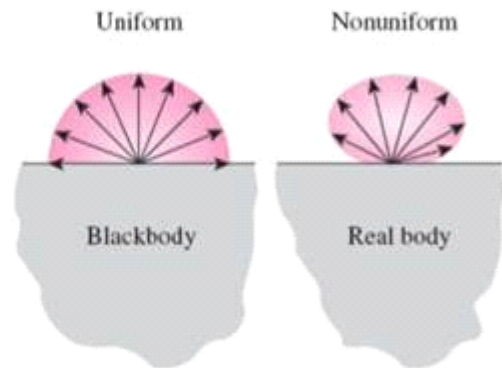
The radiation energy emitted by a blackbody:

$$E_b(T) = \sigma T^4 \quad (\text{W/m}^2)$$

Blackbody emissive power

$$\sigma = 5.670 \times 10^{-8} \text{ W/m}^2 \cdot \text{K}^4$$

Stefan–Boltzmann constant



The variation of the blackbody emissive power with wavelength for several temperatures.

Wien's law formula: This law states that the black body radiation curve for different temperatures peaks at a wavelength inversely proportional to the temperature. Maximum wavelength = Wien's displacement constant / Temperature

The peak wavelength related to temperature T : the form of the law remains the same, the peak wavelength is inversely proportional to temperature, and the peak frequency is directly proportional to temperature.