

Al-Mustaqbal University Colleg  
Medical Physics Department



# General Physics/ lecture 7

First stage

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# Lecture 7

## Outline

- **The heat**
  - **Specific heat**
  - **Heat transfer**
  - **Thermal expansion.**
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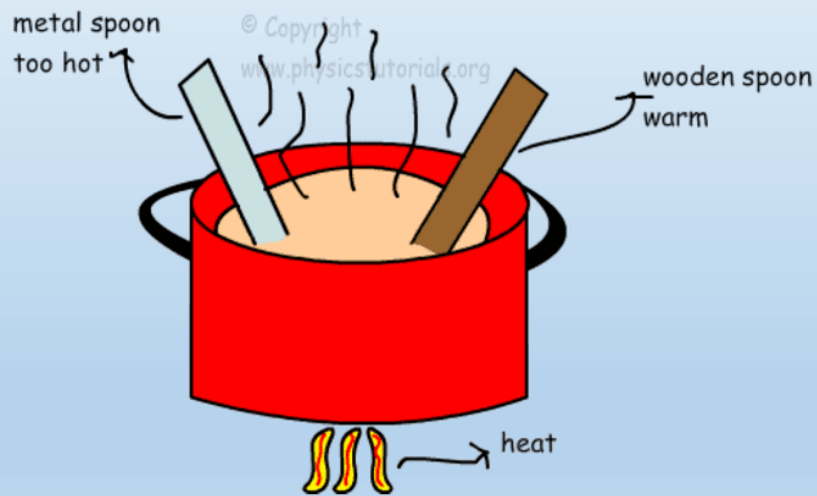
## The heat

- ✓ In thermodynamics, heat is energy in transfer to or from a thermodynamic system, by mechanisms other than thermodynamic work or transfer of matter (e.g. conduction, radiation, and friction).
- ✓ Heat in physics and chemistry is a form of energy, accompanied by the movement of atoms, molecules, or any particle that enters into the composition of matter. Heat can be generated by;
  - ✓ chemical reactions such as combustion,
  - ✓ nuclear reactions, such as nuclear fusion in the sun
  - ✓ electromagnetic radiation, such as in electromagnetic stoves
  - ✓ movement, such as the friction of machine parts

## Specific heat

Heat transfers from a hot body to a cold body, and the opposite does not happen. This is the pronunciation of the second law of thermodynamics. The heat continues to transfer until the temperature in the two bodies is equal and the two bodies reach a state called thermal equilibrium.

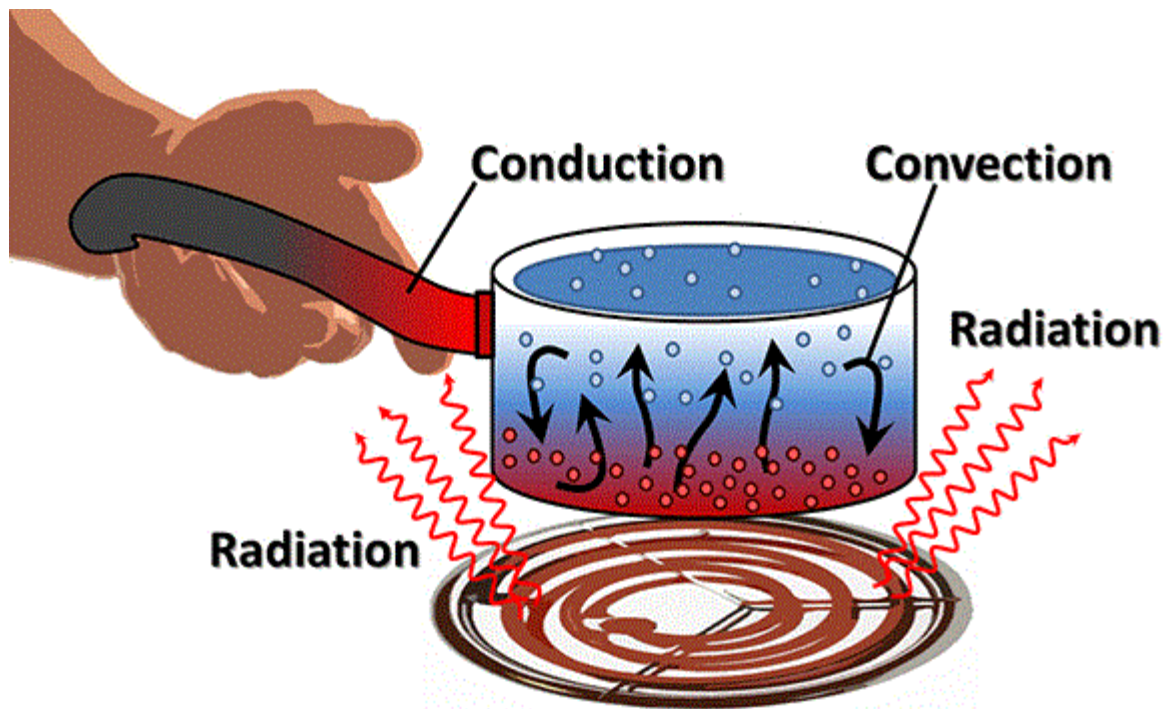
# Specific Heat Capacity



Specific heat is the amount of heat needed to raise the temperature of 1 kilogram of a substance by one degree Celsius. Its units in the international system are (joules / kilograms / kelvin) and its units are: joules / (kg. m) or joules / (kg. Kelvin)

## **Heat transfer**

heat transfer, any or all of several kinds of phenomena, considered as mechanisms, that convey energy and entropy from one location to another. The specific mechanisms are usually referred to as convection, thermal radiation, and conduction (see thermal conduction).



### **Thermal expansion**

Thermal expansion is the tendency of matter to change in shape, volume, and area in response to a change in temperature. Temperature is a monotonic function of the average molecular kinetic energy of a substance. Thermal expansion defines the tendency of an object to change its dimension either in length, density, area, or volume due to heat. When the substance is heated it increases its kinetic energy.

Thermal expansion is of three types:

Linear expansion.

Area expansion.

Volume expansion.