Heat

- Energy that flows from something warm to something cooler
- A hotter substance gives KE to a cooler one
- When heat is transferred (lost or gained), there is a change in the energy within the substance

Temperature

- Temperature is the measurement of the average amount of kinetic energy of the particles that make up a substance.
- Temperature is a measurement usually expressed in degrees. (ºC, ºF, K)
- **Absolute Zero** is the temperature at which the kinetic energy in the system has been stopped.

Some Equalities for Heat

Heat is measured in calories or joules

- 1 kcal = 1000 cal
- 1 calorie = 4.18J (specific heat of water)
- 1 kJ = 1000 J

Specific Heat

- Why do some foods stay hot longer than others?
- Why is the beach sand hot, but the water is cool on the same hot day?
- Because different substances have different capacities for storing energy

Specific Heat Values

Specific heat is the amount of heat needed to raise the temperature of 1 g of a substance by 1 °C.

Examples:	cal/g °C	J/g °C
water	1.00	4.18
aluminum	0.22	0.90
copper	0.093	0.39
silver	0.057	0.24
gold	0.031	0.13

Measuring Heat

Requires

- Grams of substance
- Temperature change ΔT
- Specific heat of the substance

The equation:

The amount of heat energy (q) gained or lost by a substance = mass of substance (m) X specific heat capacity (C) X change in temperature (ΔT)

$$q = m \times C \times \Delta T$$

Energy and Nutrition

1 Calorie (nutritional) = 1 kcal

1 Cal = 1000 cal

LecturePLUS Timberlake 99 8