

Energy (Temperature Changes)

Internal (Thermal) Energy -> Energy stored in the movement of particles Amount of internal energy depends on temperature, materials, mass

Temperature -> How hot or cold something is

Efficiency Formula (Energy)

Formula: $\frac{\text{Efficient Powers}}{\text{Total Amount of Electricity Produced}} \times 100\%$
 $\frac{4/40}{100\%} = 100$

Energy Formula

Formula: $Q = mc\Delta T$ Q -> Amount of heat transferred

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M = Mass C = Specific Heat Capacity

A = The changes in temperature T = Temperature

In a refrigerator, 2kg of water cools from 30 °C to 0 °C and then freezes to form ice at 0 °C. The specific heat capacity of water is 4200 J kg °C, and the specific latent heat of fusion of ice is 336000 J kg °C. What is the heat washed in this process?

$$Q_1 = mc\Delta T = 2 \times 4 \times 200 \times -30$$

$$Q_2 = m\Delta H_f = 2 \times -336000$$

$$Q_1 + Q_2 = -924000$$

Listric Energy

Appliances -> Machines Power -> Different appliance transfer different amount per second

Wratts -> Method measurement of the rate of electricity Power rattings -> Max amount of power a device produce under normal circumstances

Efficiency -> Ratio of useful energy from total energy Sankey Diagram -> Diagram that shows efficiency

Paying for Energy

Unit (Times, Energy, Power wrattings) Electricity and gas are paid base on usage and measure in Kwh

Formula -> $KW \times H \times KWH$ (Hour)

Controlling Energy Transfer

Insulation -> Retain warmth inside the house and reduces fuel costs. Air is only good conductor if it is trapped

To test insulation effectiveness, use containers with different insulating materials and measure temperature changes over time. Light color -> Reflect energy, while Dark color -> Emit radiation

Transferring Energy

Evaporation

Conduction

-> Passing
vibrations
(heat)

Radiation -> All objects emit
infrared radiation (hotter,
emit more, no need medium,
thermal imagers)

Convection -
> Cooler
fluid sink,
hotter fluids
rise



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