Conduction

Conduction:
Conduction-heat transfer between or through a solid medium
Fouriers law of conduction for one dimension

$$q_{cd} = kA\frac{dt}{dx}$$

Where:

q_{cd}=heat transfer (conduction)
k=thermal conductivity (different value for different substances)
dt= change in temperature surface to surface (t $_{final}$ −t $_{initial}$) ΔT
dx= wall thickness Δd

Equation can be rewritten to establish heat transfer/area

$$\frac{q}{A} = k\frac{dt}{dx}$$

What is the heat loss per area if a 10cm thick piece of wood wall experiences a temperature decrease of $15°C$ from the inside of a building to the outside of a building. k$_{wood}$ = 0.17 (watts/(m°C)

$$\frac{q}{A} = 0.17\frac{watts}{m\,°C}\frac{15°C}{10cm}\frac{100cm}{m} = \frac{25.5watts}{m^2}$$

The watt is a derived unit of power.
 The unit is defined as one joule per second and
measures the rate of energy conversion or transfer.