Different materials like water, aluminium, steel or glass need different amounts of energy to heat them up and they give out different amounts of energy when they cool down.

Energy needed = a property of the material x mass x temperature rise

This property of the material is called the “specific heat capacity”

So that we can easily compare different materials, we use a standard mass and a standard temperature rise.

Most commonly the definition is:
The specific heat capacity is the energy needed to heat 1 KG of the substance by 1^0C

in symbol form

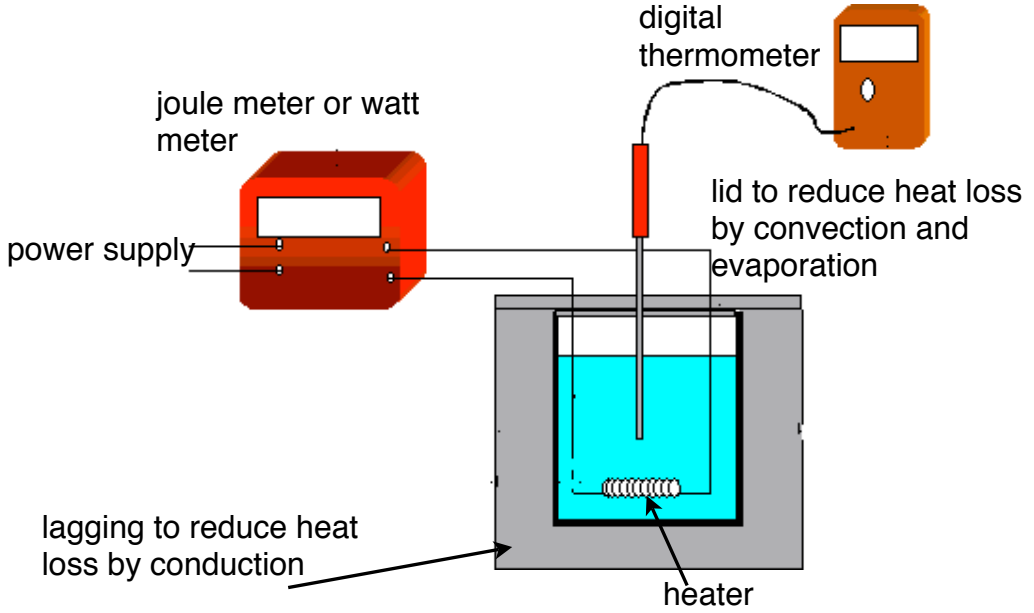
$E = cm\Delta\theta$ or $c = \frac{E}{m\Delta\theta}$

Specific Heat Capacity

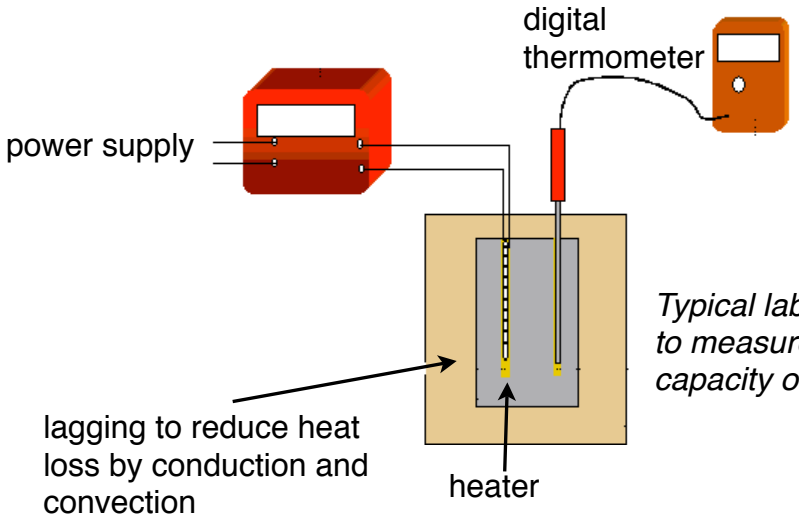
The Fizzics Organisation

www.fizzics.org

www.fizzics.co.uk



Typical laboratory experiment to measure the specific heat capacity of a liquid



Typical laboratory experiment to measure the specific heat capacity of a solid

Using figures from the video on Specific Heat Capacity
Example calculation

We have started with 1.120 Kg of water at 6.5^0C

after one minute with an average power of 2674 watts the total energy input is 60 x 2674 = 160440 joules

this energy input has raised the temperature to 36.5^0C a temperature rise of 30^0C

The specific heat capacity = $\frac{\text{Energy input}}{\text{mass x temperature rise}}$

$c = \frac{E}{m\Delta\theta} = \frac{160440}{1.12 \times 30} = 4775\ jKg^{-1}C^{-1}$

The generally accepted value is $4186\ jKg^{-1}C^{-1}$