**Hot and Cold Mixing Problems**

Heat energy always flows from the higher temperature to the lower temperature until they reach the same temperature.

The higher temperature material releases heat energy = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The lower temperature material absorbs heat energy = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Q = mc∆T where Q represents heat energy

-Q = mc∆T = exothermic +Q = mc∆T endothermic

**HOT COLD**

i) Hands and Hands Activity

ii) Water and Water Activity

iii) Water and Ice Lab

In each case the hot and the cold eventually reach the same temperature!

|  |  |
| --- | --- |
| **HOT WATER** | **COLD WATER** |
|  |  |

Therefore there are 2 formulae to use depending on the question asked!

i) **- Q = + Q** or

ii)

Be careful with mass! Only water has a density of 1g/1 mL.

Mass volume!

Mass (amount of matter) Volume (the space the matter occupies)

1 g mass of water occupies 1 mL of volume

But! 1 g 1 mL

What would be the final temperature if 75.0 mL of water at 80.0 oC were to be mixed with 30.0 mL of 20.0 oC water?