

Heat

Traditionally, Heat was measured in calories (cal):

- **1 calorie is an amount of heat needed to increase the temperature of 1g of water by 1°C.**
- For nutritional/dietary purposes people use “big Calories” (Cal, with capital “C”). **1 Cal=1000cal (or simply kilocalorie). By definition, this is an amount of heat needed to increase the temperature of 1 kg (1 liter) of water by 1°C.**
- Heat is a form of energy, so calories can be converted to Joules:

$$1\text{cal}=4.184\text{J}$$

$$1\text{Cal}=1000\text{cal}=4184\text{J}(\text{used for dietary purposes})$$

Homework

Problem 1

How much energy, in Joules, do you consume with each standard serving of your favorite food (check the nutrition label)? Assuming that you need about 70,000 J to run 1 mile, what distance can you run on one serving?

Problem 2

A droplet of water falls from the height $h=1000\text{m}$, onto a thermally isolating surface. Assume that all mechanical energy goes to heating the water. Find the change in its temperature ΔT .