

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 23

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

An apple has mass 200 grams. After being stored at room temperature 25 °C it is put into a fridge with the inside temperature 5 °C. How much heat would the apple supply to the fridge during cooling down? Specific heat capacity of the apple is about the same as of water, 4200 J/ (kg °C).