Formulas and numbers that are useful to memorize:

(1.1)

$$1\,mile = 1610m; 1\,inch = 1" = 2.54cm; 1\,ft = 12";$$
$$1m = 100cm = 1000mm; 1mm = 10^{-3}m = 0.1cm$$
$$1kg = 1000g$$
$$1\,mph = mile\ per\ hour = \frac{1610m}{3600s} = 0.4472\frac{m}{s}$$
$$1\frac{m}{s} = \frac{1}{0.4472}mph = 2.236mph$$
$$1ton = 1000kg$$
$$1ml = 1milli - liter = 1cm^3 = 10^{-3}liters$$
$$1gallon = 3.786L = 3.786dm^3 = 3786cm^3$$

(1.2)

$$5\% = \frac{5}{100} = 0.05$$

The radius of the earth is based on a circumference of 40,000km.

(1.3)

$$\text{radius} = \frac{40,000km}{2\pi} = 6,370km = 6.370\cdot 10^6 m$$

The surface of a sphere is $A=4\pi r^2$

(1.4)

The diameter of an atom $\approx 10^{-10}m$

The diameter of an atomic nucleus (Hydrogen atom) $\approx 10^{-15}m$

Distance earth-moon is approximately 10 times the circumference of the earth $3.84\cdot 10^8$ m.

The distance from the earth center to the center of the sun = $1.5\cdot 10^{11} = 1\,astronomical\ unit = 1AU$

The surface of the earth receives about 1.3kW of solar power per square-meter. How much power does the whole earth receive? Use the cross-section of the earth as the receiving surface.

$$\pi r^2 \cdot 1000\frac{W}{m^2} = 1.3\cdot 10^{17} Watts$$

1Btu=1055 joules

Universal important abbreviations:

(1.5)

$1km = 1kilo - meter = 1,000m \Rightarrow kilo = k = 1000$

$1kg = 1kilo - gram = 1,000g$

$1mm = 1milli - meter = \frac{1}{1000}m \Rightarrow milli = m = \frac{1}{1000} = 10^{-3}$

$1mm^3 = \left(\frac{1}{1000}m\right)^3 = \left(10^{-3}m\right)^3 = 10^{-9}m^3$

$1mg = 1milli - gram = \frac{1}{1000}g$

$1cm = 1centi - meter = \frac{1}{100}m \Rightarrow centi = c = \frac{1}{100}$

$1\mu m = 1micro - meter =$ 1millionth of a meter=$10^{-6}m \Rightarrow \mu = micro = 10^{-6}$

$1\mu s = 1micro -$ seconds

$1Mton = 1Mega - tons = 1million\ tons \Rightarrow M = Mega = 10^6$

$1nm = 1nano - meter =$ 1billionth of a meter=$10^{-9}m \Rightarrow n = 10^{-9}$

$1Gtons = 1Giga - tons = 1Billion\ tons \Rightarrow G = Giga = 10^9$

In computer languages the binary system is used and 1kilo = 1k=2^{10}, i.e. 1024 is treated as 1000.

$1Terabytes = 1Tbytes = 2^{40}bytes \approx 10^{12}bytes$

$1k = 2^{10} \approx 10^3$

$1M = 1k \cdot 1k = 10^6 = \left(10^3\right)^2 \approx 2^{20} = \left(2^{10}\right)^2$

1 gallon = 3.786 Liters = 3786 ml =3786 cm^3