Thursday: Lab station, partner, materials* August 21st
↳ 8 - 8:20 (optional) * manual $15 sections 1.1 - 1.6
notebook $15
safety glasses $5

Problem club with Kendall
↳ 7:30 - 9:00pm, starts Sunday
(every Sunday + Thursday)

SI units → official units of all of science

Mass (Kg)
Length (m)
Temperature (Kelvins)
Amount (mol)
Time (s)
+2 others

chemists prefer
g → grams
cm → centimeter
$1\,cm = 10^{-2}\,m$
$*\ 1\,cm^3 \equiv 1\,mL$
"same as"

Derived units:
vol density velocity ↳ speed

volume $\begin{cases} V = \ell^3 \\ V = \ell_1 \cdot \ell_2 \cdot \ell_3 \\ V = \frac{4}{3}\pi r^3 \end{cases}$

density = $\frac{mass}{vol}$
↳ units:
$\frac{g}{L}$ gases, $\frac{g}{cm^3} \equiv \frac{g}{mL}$ liquids + solids

10^{12}	tera, T	$1\,Tm = 1 \times 10^{12}\,m$
10^{9}	giga, G	
10^{6}	mega, M	
10^{3}	Kilo, K	$1\,Kg = 1 \times 10^{3}\,g$
10^{-3}	milli, m	$1\,mg = 1 \times 10^{-3}\,g$
10^{-6}	micro, μ	$1\,\mu g = 1\,\mu g$
10^{-9}	nano, n	
10^{-12}	pico, p	
10^{-15}	femto, f	

Worked problems: August 21st

Earth → Sun is 1.5×10^{11} m

distance = $1.5 \times 10^{11}\ m \left| \frac{1\ Tm}{1 \times 10^{12}\ m} \right.$ = **0.15 Tm**

or

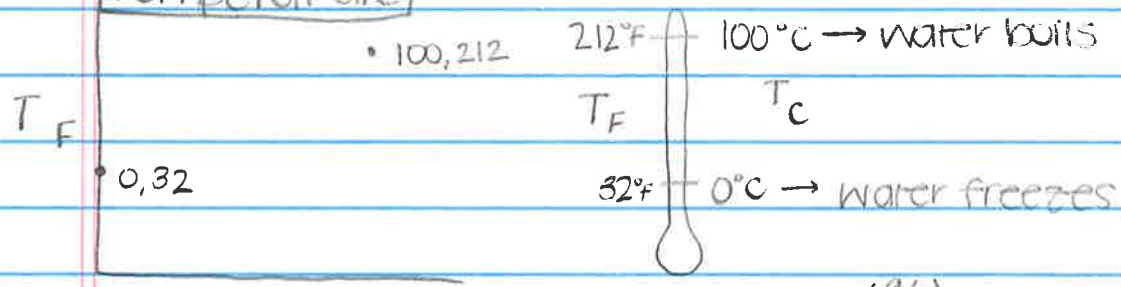
distance = $1.5 \times 10^{11}\ m * \frac{1\ Tm}{1 \times 10^{12}\ m}$

The diameter of a sodium atom is 3.72×10^{-10} m. convert this to units of nm.

length = $3.72 \times 10^{-10}\ m \left| \frac{1\ nm}{1 \times 10^{-9}\ m} \right.$ = **0.372 nm**

$1\ nm = 1 \times 10^{-9}\ m$

Temperature



$$T_F = \frac{212-32}{100-0} T_C + 32 \rightarrow T_F = 1.8\, T_C + 32 \quad (9/5)$$

$y = m(\text{slope})\, x + b$

$$T_C = \frac{5}{9} T_F - 32$$

$$T_K = T_C + 273$$