W-GP Physics

SI units

length → meter m

mass → kilogram kg kilo = 10^3

time → seconds s

temperature → Kelvin K

Celsius (°C) ~~0°C~~

Kelvin uses Celsius scale → starts at absolute zero.

Prefixes

T	Tera	10^{12}	
G	Giga	10^9	God
M	Mega	10^6	Me
k	kilo	10^3	king
h	hecto	10^2	Henry
da	deca	10^1	dragon
	base	10^0	
d	deci	10^{-1}	dog
c	centi	10^{-2}	cat
m	milli	10^{-3}	mouse
μ	micro	10^{-6}	
n	nano	10^{-9}	

128 km → cm

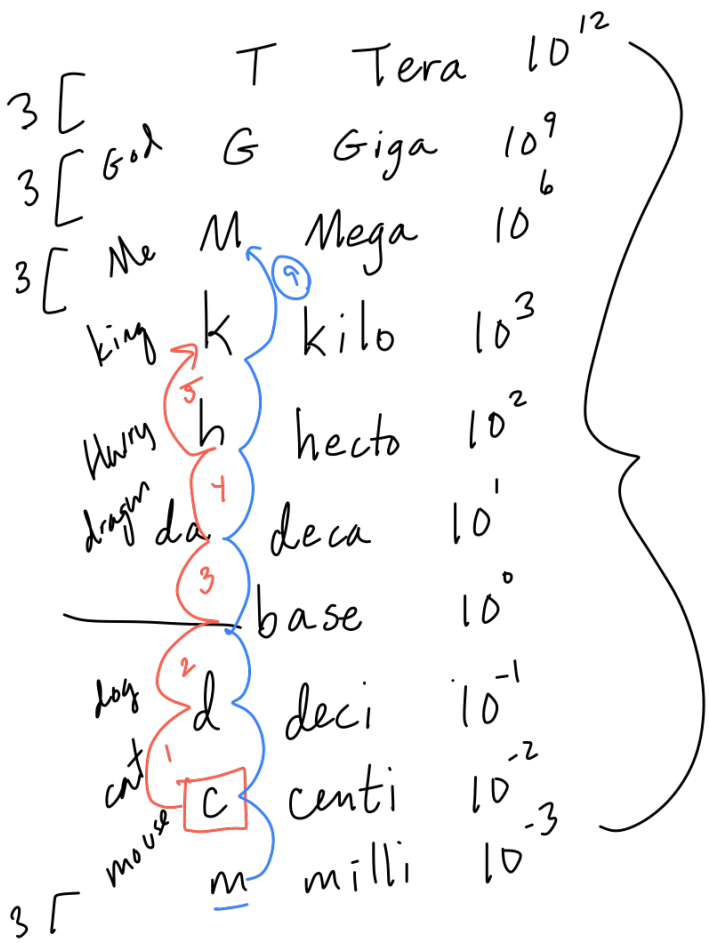
$$128\ \text{km} * \frac{1000\ \text{m}}{1\ \text{km}} * \frac{100\ \text{cm}}{1\ \text{m}}$$

12,800,000 cm

$$128\ \text{km} * \frac{10^3\ \text{m}}{1\ \text{km}} * \frac{10^2\ \text{cm}}{1\ \text{m}}$$

$128. * 10^5\ \text{cm}$

$1.28 * 10^7\ \text{cm}$



128 km ⟶ cm

128.00000.

128000000 cm

793 mg → ___ Mg

0.000000793 Mg

$793\,mg * \frac{1\,g}{1000\,mg} * \frac{1\,Mg}{1000000\,g}$

$\frac{793}{1000000000}$

deci → 10^{-1} d

kilo → 10^{3} k

mega → 10^{6} M

centi → 10^{-2} c

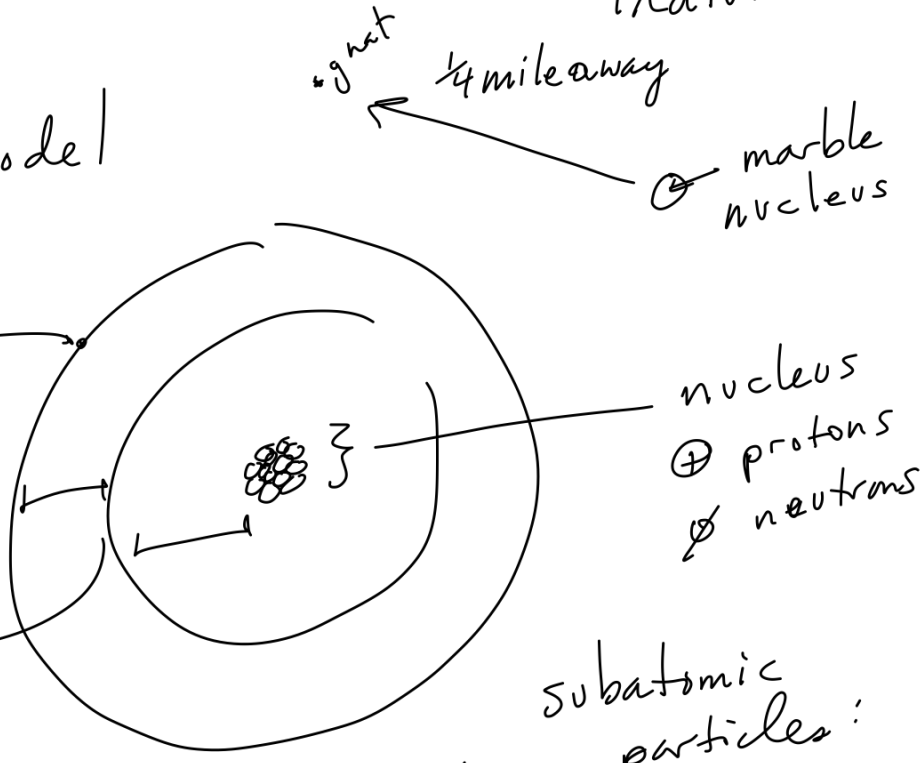
micro → 10^{-6} μ

nano → 10^{-9} n

giga → 10^{9} G

Democritus → cut in half → atomos
indivisible

Atomic Model



quarks
up, down, top, bottom, strange, charmed

protons
neutrons

arrangement of 3 quarks

subatomic particles:
protons ⊕
neutrons ⊘
electrons ⊖

$$\text{Density} = \frac{\text{mass}}{\text{volume}}$$

$$D = \frac{M}{V}$$

$$V(D) = \left(\frac{M}{V}\right)V$$

$$M = VD$$

mass 208 g
volume 8.0 L

$$D = \frac{208\ g}{8.0\ L} = \boxed{26\ g/L}$$

$$D = \frac{M}{V}$$

mass = ?

volume = 42 mL

density = 5.5 g/mL

$V(D) = \left(\frac{M}{V}\right)V$

$M = VD = (42\ \text{mL})(5.5\ \text{g/mL})$

$= \boxed{231\ \text{g}}$

Volume = ?

mass = 24 g

density = 6.0 g/mL

$D = \frac{M}{V}$

$V = \frac{M}{D} = \frac{24\ \text{g}}{6.0\ \text{g/mL}}$

$\boxed{4.0\ \text{mL}}$

HW

Quiz #1 due Sep 23rd

make sure you understand outline

Online HW wk 2 (Fri) due Sep 30th

Quiz 2