## Atomic Weights / Molar Mass

- Weights are listed in the periodic table without units.
- The weight listed is the average mass of one atom of each element, in amu.
- Avogadro's number is how many AMU sized things fit into a gram:

1 gram $\div 1.6606 \times 10^{-24}$ grams $=6.022 \times 10^{23}$
$1 \mathrm{gram} \div 1 \mathrm{amu}=1 \mathrm{~mol}$
1 gram $=1 \mathrm{~mol} \times 1 \mathrm{amu}$

- That means:

1 mol of anything will weigh in grams, what a single of that anything weighs in amu.

- If a cat weighs $X$ amu, a mol of cats weighs $X$ grams.
- That means each weight in the periodic table is:
- the weight of 1 atom of that element, in amu
- the weight of 1 mol of that element, in grams
- Reading from the periodic table...
- a hydrogen atom $(\mathrm{H})$ weighs 1.008 amu
- a mol of hydrogen atoms $(\mathrm{H})$ weigh 1.008 g
- a copper atom $(\mathrm{Cu})$ weighs 63.55 amu
- a mol of copper atoms (Cu) weighs 63.55 g

$1 \mathrm{H}=1.008 \mathrm{amu}$ $1 \mathrm{~mol} \mathrm{H}=1.008 \mathrm{~g}$
$1 \mathrm{Cu}=63.55 \mathrm{amu}$
$1 \mathrm{~mol} \mathrm{Cu}=63.55 \mathrm{~g}$

