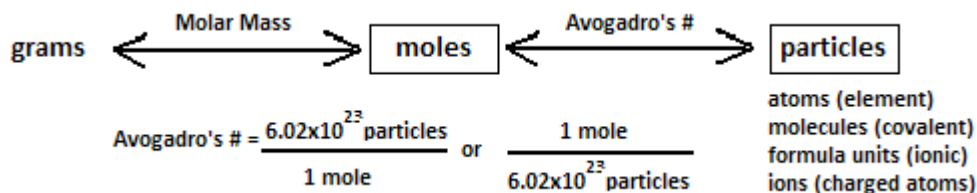


**Directions:** Show ALL of your work. Make sure to include units!!!!

**Mole-Particle Conversions (use Avogadro's number for your conversions)**



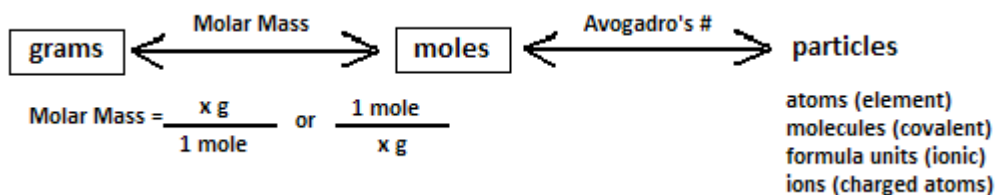
1. How many moles of magnesium are in  $3.01 \times 10^{22}$  atoms of magnesium?  
.05 moles

2. How many molecules are there in 4.00 moles of glucose,  $C_6H_{12}O_6$ ?  
 $2.41 \times 10^{24}$  molecules

3. How many moles are  $1.20 \times 10^{25}$  formula units of calcium iodide?  
**20 moles**

4. How many formula units are in 12.5 moles of calcium phosphate?  
 $7.525 \times 10^{24}$

**Mole-Mass Conversions (use the molar mass from the periodic table for your conversions)**



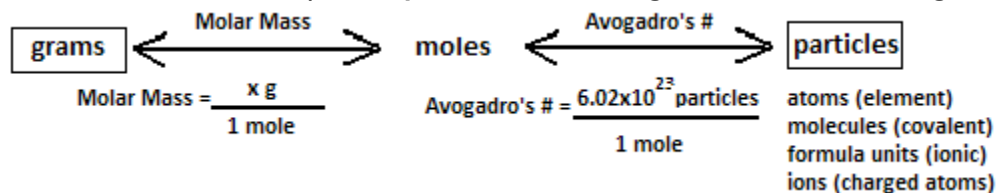
1. How many moles are in 28 grams of  $CO_2$ ?  
**.64 moles**

2. What is the mass of 5 moles of  $Fe_2O_3$ ?  
800 grams

3. Find the number of moles of argon in 452 g of argon.  
11.3 moles

4. How many grams are in 3.45 moles of  $CO_2$ ?  
151.8 grams

## Gram to Particle Conversions (two step conversions using molar mass and Avogadro's number)



- How many oxygen molecules are in 3.36 g of oxygen ( $\text{O}_2$ ) [2 x mass of O]?  
 $6.3 \times 10^{22}$  molecules
- Find the mass in grams of  $2.00 \times 10^{23}$  molecules of  $\text{F}_2$ .  
**12.6 grams**
- Determine the number of molecules of 14 g of nitrogen dioxide ( $\text{NO}_2$ ).  
 $1.8 \times 10^{23}$  molecules
- Find the mass, in grams, of  $1.00 \times 10^{23}$  molecules of  $\text{N}_2$ .  
**4.65 grams**
- Aspartame is an artificial sweetener that is 160 times sweeter than sucrose (table sugar) when dissolved in water. It is marketed by G.D. Searle as *Nutra Sweet*. The molecular formula of aspartame is  $\text{C}_{14}\text{H}_{18}\text{N}_2\text{O}_5$ .
  - Calculate the molar mass of aspartame.  
294 grams
  - How many moles are in 10.5 g of aspartame?  
.036 moles
  - How many molecules are in 10.5 g of aspartame?  
 $2.17 \times 10^{22}$
  - How many atoms of nitrogen are in 1.2 grams of aspartame?  
 $4.9 \times 10^{21}$