Mole Conversions
Multiply by...

Volume (liters at STP)

Mass in grams

MOLE

# of Particles

$\dfrac{22.4 \text{ L/mol}}{\text{molar mass}}$

$\dfrac{\text{molar mass}}{22.4 \text{ L/mol}}$

$\dfrac{1}{22.4 \text{ L/mol}}$

$\dfrac{22.4 \text{ L/mol}}{1}$

$\dfrac{\text{molar mass}}{1}$

$\dfrac{1}{\text{molar mass}}$

$\dfrac{6.02 \times 10^{23}}{22.4 \text{ L/mol}}$

$\dfrac{22.4 \text{ L/mol}}{6.02 \times 10^{23}}$

$\dfrac{1}{6.02 \times 10^{23}}$

$\dfrac{6.02 \times 10^{23}}{1}$

$\dfrac{6.02 \times 10^{23}}{\text{molar mass}}$

$\dfrac{\text{molar mass}}{6.02 \times 10^{23}}$

UNITS:

Mass = g
Avogadro's number (6.022×10^{23}) = atoms/mol or molecules/mol
Molar mass = g/mol
Molar Volume of a Gas = 22.4 L/mol
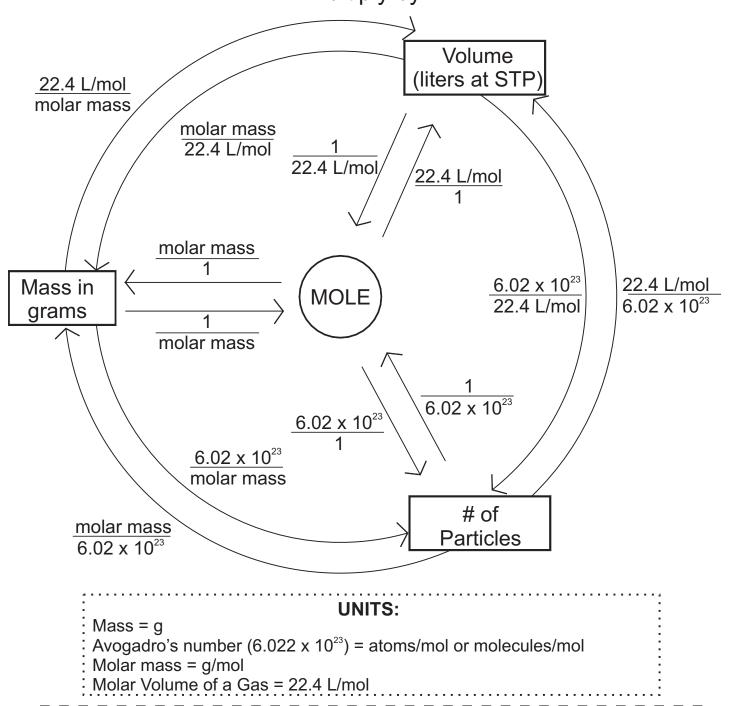

Or in other words...

If you know grams, find # of moles by: $\dfrac{\text{mass (g)}}{\text{molar mass (g/mol)}} = \#\text{ moles}$

If you know moles, find mass in grams by: $(\#\text{ moles})\,(\text{molar mass g/mol}) = \text{mass (g)}$

If you know # of moles, find # atoms or molecules by: $(\#\text{ moles})\,(6.02 \times 10^{23}\text{ atoms/mol}) = \#\text{ atoms}$

If you know # atoms or molecules, find # moles by: $\dfrac{\#\text{ atoms}}{6.02 \times 10^{23}\text{ atoms/mol}} = \#\text{ moles}$