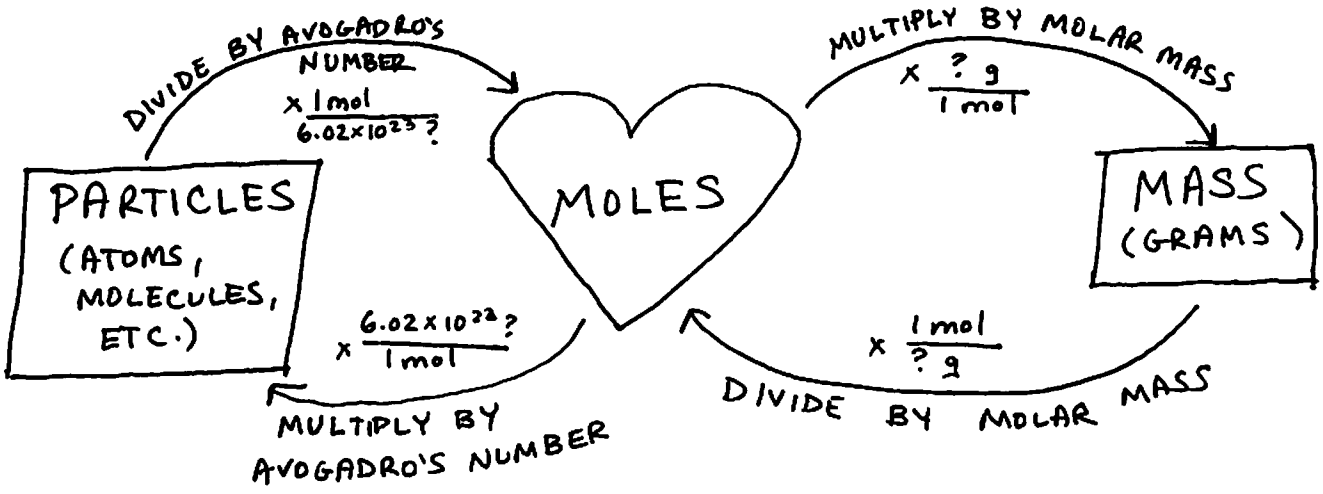
EVEN MORE MOLE REVIEW! NAME: _____



ANSWERS TO #13-15: #13 8.13×10^{22} molecules #14 1.47 moles #15 30.1 grams

TYPE ONE: PARTICLES TO MOLES

1. Convert 9.87×10^{24} atoms of Na to moles of Na.

$$\frac{9.87 \times 10^{24} \text{ atoms Na}}{1} \times \frac{1 \text{ mole Na}}{6.02 \times 10^{23} \text{ atoms Na}} = 16.4 \text{ moles Na}$$

(DIVIDE BY AVOGADRO'S #)

2. How many moles of lithium are in 5.00×10^{23} atoms of Li?

$$\frac{5.00 \times 10^{23} \text{ Li atoms}}{1} \times \frac{1 \text{ mol Li}}{6.02 \times 10^{23} \text{ Li atoms}} = 0.831 \text{ mol Li}$$

TYPE TWO: MOLES TO PARTICLES

3. Convert 2.00 moles of H_2O to molecules of H_2O.

$$\frac{2.00 \text{ moles } H_2O}{1} \times \frac{6.02 \times 10^{23} \text{ molecules } H_2O}{1 \text{ mol } H_2O} = 1.20 \times 10^{24} \text{ molecules } H_2O$$

(MULTIPLY BY AVOGADRO'S #)

4. If you have 3.99 moles of O_2, how many molecules of O_2 do you have?

$$3.99 \text{ mol } O_2 \times \frac{6.02 \times 10^{23} \text{ molecules } O_2}{1 \text{ mol } O_2} = 2.40 \times 10^{24} \text{ molecules } O_2$$

TYPE THREE: MOLES TO MASS

5. What is the mass of 1.23 moles of calcium?

$$\frac{1.23 \text{ mol Ca}}{1} \times \frac{40.08 \text{ g Ca}}{1 \text{ mol Ca}} = 49.3 \text{ grams Ca}$$

(MULTIPLY BY MOLAR MASS OF CALCIUM)

6. How many grams are in 1.52 moles of CO_2?

$$\frac{1.52 \text{ mol } CO_2}{1} \times \frac{44.01 \text{ g } CO_2}{1 \text{ mol } CO_2} = 66.9 \text{ g } CO_2$$

TYPE FOUR: MASS TO MOLES

7. How many moles of H_2S are in 15.7 grams of H_2S?

$$\frac{15.7\ g\ H_2S}{1} \times \frac{1\ mol\ H_2S}{34.09\ g\ H_2S} = 0.461\ mol\ H_2S$$

(DIVIDE BY MOLAR MASS OF H_2S: $1.01 \times 2 + 32.07$)

8. If you have 41.2 grams of SiO_2, how many moles of SiO_2 do you have?

$$\frac{41.2\ g\ SiO_2}{1} \times \frac{1\ mol\ SiO_2}{60.09\ g\ SiO_2} = 0.686\ mol\ SiO_2$$

$28.09 + 2 \times 16.00$

TYPE FIVE: PARTICLES TO MASS (TWO-STEP!)

9. What is the mass of 3.08×10^{24} atoms of zinc?

$$\frac{3.08 \times 10^{24}\ Zn\ atoms}{1} \times \frac{1\ mole\ Zn}{6.02 \times 10^{23}\ atoms\ Zn} \times \frac{65.39\ grams}{1\ mole\ Zn} = 335\ grams\ Zn$$

(DIVIDE BY AVOGADRO'S #) (MULTIPLY BY MOLAR MASS OF ZINC)

10. Convert 9.99×10^{29} molecules of H_2 to mass of H_2 (in grams).

$$\frac{9.99 \times 10^{29}\ H_2\ molecules}{1} \times \frac{1\ mol\ H_2}{6.02 \times 10^{23}\ molecules\ H_2} \times \frac{2.02\ g\ H_2}{1\ mol\ H_2} =$$

3.35×10^{6} grams H_2

TYPE SIX: MASS TO PARTICLES (TWO-STEP!)

11. How many molecules of Cl_2 are in 50.0 grams of Cl_2?

$$\frac{50.0\ g\ Cl_2}{1} \times \frac{1\ mol\ Cl_2}{70.90\ g\ Cl_2} \times \frac{6.02 \times 10^{23}\ molecules\ Cl_2}{1\ mol\ Cl_2} = 4.25 \times 10^{23}\ molecules\ of\ Cl_2$$

(DIVIDE BY MOLAR MASS OF DIATOMIC CHLORINE, 35.45×2) (MULTIPLY BY AVOGADRO'S #)

12. If you have 67.1 g of Al_2O_3, how many Al_2O_3 molecules do you have?

$$67.1\ g\ Al_2O_3 \times \frac{1\ mol\ Al_2O_3}{101.96\ g\ Al_2O_3} \times \frac{6.02 \times 10^{23}\ molecules\ Al_2O_3}{1\ mol\ Al_2O_3} = 3.96 \times 10^{23}\ molecules\ Al_2O_3$$

RANDOM TYPES OF MOLE CONVERSIONS!

13. How many molecules of H_2 are in a balloon filled with 0.155 mole of H_2 molecules?

14. If you have 99.9 grams of boron trifluoride (BF_3), how many moles of BF_3 do you have?

15. What is the mass (in grams) of 7.53×10^{23} molecules of CH_4?