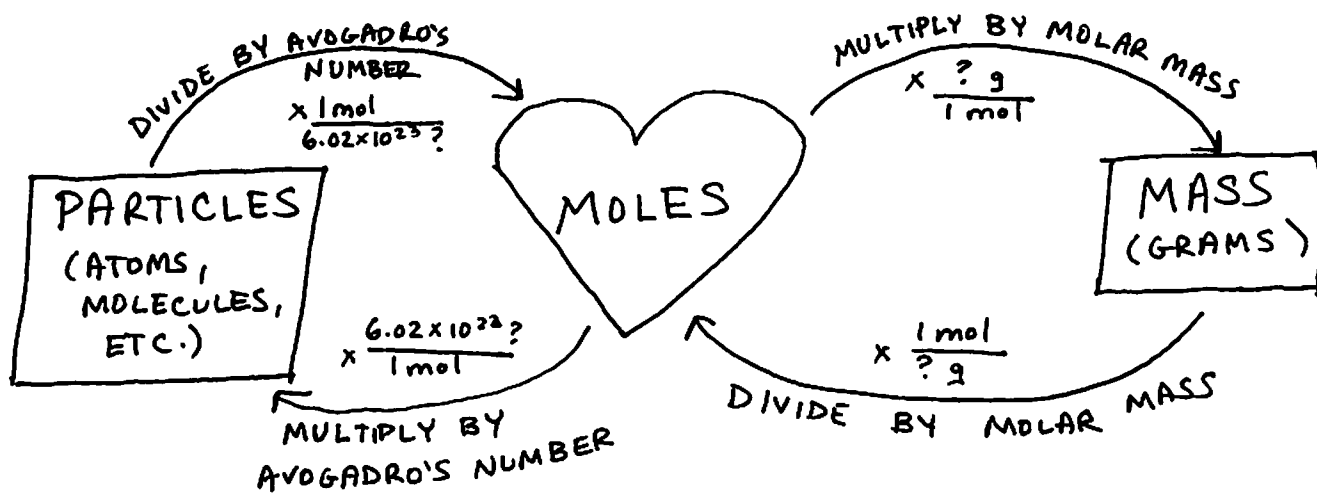


# EVEN MORE MOLE REVIEW!

NAME: \_\_\_\_\_



ANSWERS TO #13-15: #13: 8.13 x 10<sup>22</sup> molecules #14: 1.47 moles #15: 20.1 grams

## TYPE ONE: PARTICLES TO MOLES

1. Convert  $9.87 \times 10^{24}$  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  $5.00 \times 10^{23}$  atoms of Li?

## TYPE TWO: MOLES TO PARTICLES

3. Convert 2.00 moles of H<sub>2</sub>O to molecules of H<sub>2</sub>O.

$$\frac{2.00 \text{ moles H}_2\text{O}}{1} \times \frac{6.02 \times 10^{23} \text{ molecules H}_2\text{O}}{1 \text{ mol H}_2\text{O}} = 1.20 \times 10^{24} \text{ molecules H}_2\text{O}$$

(MULTIPLY BY AVOGADRO'S #)

4. If you have 3.99 moles of O<sub>2</sub>, how many molecules of O<sub>2</sub> do you have?

## 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<sub>2</sub>?

## TYPE FOUR: MASS TO MOLES

7. How many moles of  $\text{H}_2\text{S}$  are in 15.7 grams of  $\text{H}_2\text{S}$ ?

$$\frac{15.7 \text{ g } \text{H}_2\text{S}}{1} \times \frac{1 \text{ mol } \text{H}_2\text{S}}{34.09 \text{ g } \text{H}_2\text{S}} = 0.461 \text{ mol } \text{H}_2\text{S}$$

(DIVIDE BY MOLAR MASS OF  $\text{H}_2\text{S}$ :  $1.01 \times 2 + 32.07$ )

8. If you have 41.2 grams of  $\text{SiO}_2$ , how many moles of  $\text{SiO}_2$  do you have?

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

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

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

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

10. Convert  $9.99 \times 10^{29}$  molecules of  $\text{H}_2$  to mass of  $\text{H}_2$  (in grams).

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

11. How many molecules of  $\text{Cl}_2$  are in 50.0 grams of  $\text{Cl}_2$ ?

$$\frac{50.0 \text{ g } \text{Cl}_2}{1} \times \frac{1 \text{ mol } \text{Cl}_2}{70.90 \text{ g } \text{Cl}_2} \times \frac{6.02 \times 10^{23} \text{ molecules } \text{Cl}_2}{1 \text{ mol } \text{Cl}_2} = 4.25 \times 10^{23} \text{ molecules of } \text{Cl}_2$$

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

12. If you have 67.1 g of  $\text{Al}_2\text{O}_3$ , how many  $\text{Al}_2\text{O}_3$  molecules do you have?

## RANDOM TYPES OF MOLE CONVERSIONS!

13. How many molecules of  $\text{H}_2$  are in a balloon filled with 0.195 mole of  $\text{H}_2$  molecules?

14. If you have 99.9 grams of boron trifluoride ( $\text{BF}_3$ ), how many moles of  $\text{BF}_3$  do you have?

15. What is the mass (in grams) of  $7.53 \times 10^{23}$  molecules of  $\text{CH}_4$ ?