

Name _____ Date _____ Per _____

Mole to Grams, Grams to Moles Conversions Worksheet

To find moles divide molar mass

To find grams multiply molar mass

What are the molecular weights of the following compounds?

- | | |
|----------------------|--|
| 1) NaOH | 2) H ₃ PO ₄ |
| 3) H ₂ O | 4) Mn ₂ Se ₇ |
| 5) MgCl ₂ | 6) (NH ₄) ₂ SO ₄ |

Each definition can be written as a set of two conversion factors. They are:

1 mole = molar mass(g) can be written as $\left(\frac{1 \text{ mole}}{\text{molar mass (g)}} \right)$ OR $\left(\frac{\text{molar mass (g)}}{1 \text{ mole}} \right)$

Solve any 5 of the following:

- 1) **How many moles** are in 15 grams of lithium?
- 2) **How many grams** are in 2.4 moles of sulfur?
- 3) **How many moles** are in 22 grams of argon?
- 4) **How many grams** are in 88.1 moles of magnesium?
- 5) **How many moles** are in 2.3 grams of phosphorus?
- 6) **How many grams** are in 11.9 moles of chromium?
- 7) **How many moles** are in 9.8 grams of calcium?
- 8) **How many grams** are in 238 moles of arsenic?

Solve any 5 of the following:

- 9) How many grams are in 4.5 moles of sodium fluoride, NaF?
(molar mass of NaF is $23 + 19 = 42$ g/ mole)
 $4.5 \text{ moles} \times \frac{42 \text{ grams}}{1 \text{ mole}} = 189 \text{ grams NaF}$ OR $4.5 \text{ moles} \times 42 \text{ g} = 189 \text{ g}$
- 10) How many moles are in 98.3 grams of aluminum hydroxide, Al(OH)_3 ?
(molar mass of Al(OH)_3 is $27 + (3 \times 16) + (3 \times 1) = 78$ g/ mole)
 $98.3 \text{ grams} \times \frac{1 \text{ mole}}{78 \text{ grams}} = 1.26 \text{ moles Al(OH)}_3$ OR $(98.3\text{g}/78\text{g} = 1.26 \text{ moles})$
- 11) How many grams are in 0.02 moles of beryllium iodide, BeI_2 ?
- 12) How many moles are in 68 grams of copper (II) hydroxide, Cu(OH)_2 ?
- 13) How many grams are in 3.3 moles of potassium sulfide, K_2S ?
- 14) How many moles are in 1.2×10^3 grams of ammonia, NH_3 ?
- 15) How many grams are in 2.3×10^{-4} moles of calcium phosphate, $\text{Ca}_3(\text{PO}_3)_2$?
- 16) How many moles are in 3.4×10^{-7} grams of silicon dioxide, SiO_2 ?
- 17) How many grams are in 1.11 moles of manganese sulfate, $\text{Mn}_3(\text{SO}_4)_7$?

Mole Calculation Worksheet – Answer Key

What are the molecular weights of the following compounds?

- | | |
|---|---|
| 1) NaOH $23 + 16 + 1 = 40.1$ grams | 2) H_3PO_4 $3 + 31 + 64 = 98.0$ grams |
| 3) H_2O $2 + 16 = 18.0$ grams | 4) Mn_2Se_7 663.0 grams |
| 5) MgCl_2 95.3 grams | 6) $(\text{NH}_4)_2\text{SO}_4$ 132.1 grams |

Solve any 15 of the following:

- How many moles are in 15 grams of lithium? $15/7 = 2.14$ moles
- How many grams are in 2.4 moles of sulfur? $2.4 \times 32 = 76.8$ grams
- How many moles are in 22 grams of argon? $22/40 = 0.55$ moles
- How many grams are in 88.1 moles of magnesium? $88.1 \times 24 = 2114.4$ grams
- How many moles are in 2.3 grams of phosphorus? $2.3/31 = 0.074$ moles
- How many grams are in 11.9 moles of chromium? $11.9 \times 52 = 618.8$ grams
- How many moles are in 9.8 grams of calcium? $9.8/40 = 0.25$ moles
- How many grams are in 238 moles of arsenic? $238 \times 75 = 17,850$ grams
- How many grams are in 4.5 moles of sodium fluoride, NaF? $4.5 \times 42 = 189$ grams
- How many moles are in 98.3 grams of aluminum hydroxide, $\text{Al}(\text{OH})_3$? $98.3/78 = 1.26$ moles
- How many grams are in 0.02 moles of beryllium iodide, BeI_2 ? $0.02 \times 263 = 5.26$ grams
- How many moles are in 68 grams of copper (II) hydroxide, $\text{Cu}(\text{OH})_2$? $68/99 = 0.69$ moles
- How many grams are in 3.3 moles of potassium sulfide, K_2S ? $3.3 \times 110 = 363.0$ grams
- How many moles are in 1.2×10^3 grams of ammonia, NH_3 ? $1.2 \times 10^3 \times 17 = 70.59$ moles
- How many grams are in 2.3×10^{-4} moles of calcium phosphate, $\text{Ca}_3(\text{PO}_3)_2$? $2.3 \times 10^{-4} \times 278 = 0.064$ grams
- How many moles are in 3.4×10^{-7} grams of silicon dioxide, SiO_2 ? $3.4 \times 10^{-7} / 60 = 6.00 \times 10^{-9}$ moles
- How many grams are in 1.11 moles of manganese sulfate, $\text{Mn}_3(\text{SO}_4)_7$? $1.11 \times 837 = 929.07$ grams