# Intro to Stoichiometry – Grams to Grams NOTES

## Step-by-Step
  If you have **grams of a chemical** and **want grams of a different one**
   1) Convert from **grams** to **moles**.
   2) Convert **moles** of one chemical into **moles** of another chemical.
   3) Convert **moles** of your NEW chemical into **grams** of that chemical.

$$2\ H_2\ +\ O_2\ \rightarrow\ 2\ H_2O$$

**Ex. 1:** Given 68 grams of $H_2$, how many <u>grams</u> of $O_2$ are produced?

| **68 grams H₂** | x | **1 mole H₂** | x | **1 mole O₂** | x | **32.00 grams O₂** |
|---|---|---|---|---|---|---|
| 1 | | 2.02 grams H₂ | | 2 moles H₂ | | 1 mole O₂ |

**Answer:  538.61 grams of $O_2$**

**Ex 2:** Given 2 grams of $O_2$, how many <u>grams</u> of $H_2$ are produced?

| **2 grams O₂** | x | **1 mole O₂** | x | **2 moles H₂** | x | **2.02 grams H₂** |
|---|---|---|---|---|---|---|
| 1 | | 32.00 grams O₂ | | 1 mole O₂ | | 1 mole H₂ |

**Answer:  0.25 grams of $H_2$**

**Ex 3:** Given 8.35 grams of $H_2$, how many <u>grams</u> of $H_2O$ are produced?

| **8.35 grams H₂** | x | **1 mole H₂** | x | **2 moles H₂O** | x | **18.02 grams H₂O** |
|---|---|---|---|---|---|---|
| 1 | | 2.02 grams H₂ | | 2 moles H₂ | | 1 mole H₂O |

**Answer:  74.49 grams of $H_2O$**

**Ex 4:** Given 0.94 <u>grams</u> of $H_2$, how many gram of $O_2$ are produced?

| **0.94 grams H₂** | x | **1 mole H₂** | x | **1 mole O₂** | x | **32.00 grams O₂** |
|---|---|---|---|---|---|---|
| 1 | | 2.02 grams H₂ | | 2 moles H₂ | | 1 mole O₂ |

**Answer:  7.45 grams of $O_2$**
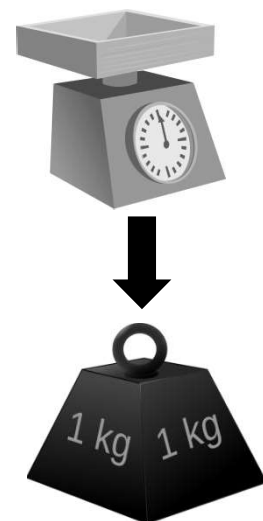
# Intro to Stoichiometry – Grams to Grams QUESTIONS

## $2\ NaN_3\ \rightarrow\ 2\ Na\ +\ 3\ N_2$

1) Given 0. 38 grams of $N_2$, how many <u>grams</u> of $NaN_3$ are needed?

2) Given 5.86 grams of $NaN_3$, how many <u>grams</u> of Na are produced?

## $2\ Fe_2O_3\ +\ 3\ C\ \rightarrow\ 4\ Fe\ +\ 3\ CO_2$
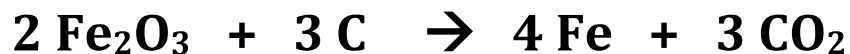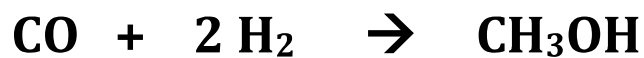
3) How many grams of Fe will be produced if 39.64 <u>grams</u> of $CO_2$ are used?

4) How many grams of $Fe_2O_3$ are used if 2.88 <u>grams</u> of Fe are produced?

## 2 Al  +  3 S  →  Al₂S₃

$$2 \text{ Al} + 3 \text{ S} \rightarrow \text{Al}_2\text{S}_3$$
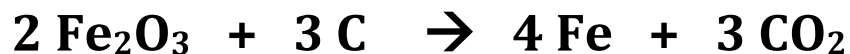
5) If 5.53 grams of $Al_2S_3$ are produced, how many <u>grams</u> of S are used?

6) If 59.33 grams of S are used, how many <u>grams</u> of Al are used?

## CO  +  2 H₂  →  CH₃OH

$$\text{CO} + 2 \text{ H}_2 \rightarrow \text{CH}_3\text{OH}$$

7) If you insert 2.57 grams of CO, how many <u>grams</u> of $H_2$ are also used?

8) If you use 0.89 grams of $H_2$, how many <u>grams</u> of $CH_3OH$ are produced?

$$2\ Fe_2O_3\ +\ 3\ C\ \rightarrow\ 4\ Fe\ +\ 3\ CO_2$$

9) How many <u>grams</u> of Fe will be produced if 0.897 grams of $CO_2$ are produced?

10) How many <u>grams</u> of $Fe_2O_3$ are needed if 8.73 grams of Fe are produced?

$$CH_4\ +\ 2\ O_2\ \rightarrow\ CO_2\ +\ 2\ H_2O$$

11) If 4.59 grams of $O_2$ are used, how many <u>grams</u> of $CH_4$ are also used?

12) If 6.81 grams of $CO_2$ are created, how many <u>grams</u> of $CH_4$ were used?