CONCEPT: BALANCING CHEMICAL EQUATIONS

- When balancing always make sure the _____ and _____ of atoms on both sides of the arrow are equal.
  - □ In a balanced equation the **numbers** are referred to as _____.

$$\mathbf{2}\ H_2\ (g) \quad + \quad \mathbf{1}\ O_2\ (g) \longrightarrow \mathbf{2}\ H_2O\ (g)$$

EXAMPLE: Write the balanced equation for the following by inserting the correct coefficients in the blanks:

$$\_\_\_\ C_4H_{10}\ (g) \quad + \quad \_\_\_\ O_2\ (g) \longrightarrow \_\_\_\ H_2O\ (l) \quad + \quad \_\_\_\ CO_2\ (g)$$

STEP 1: Set up a list for the elements that are **Reactants** and another list for the elements that are **Products**.

$$\_\_\_\ C_4H_{10}\ (g) \quad + \quad \_\_\_\ O_2\ (g) \longrightarrow \_\_\_\ H_2O\ (l) \quad + \quad \_\_\_\ CO_2\ (g)$$

C =	C =
H =	H =
O =	O =

STEP 2: Start from the top and going down both lists determine how many of each element is present.

STEP 3: Start from the top and going down both lists begin balancing each element to ensure they match.

- □ Sometimes you may have a decimal or a fraction as a coefficient and so must multiply the equation by _____.

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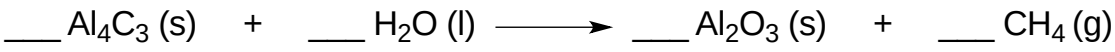
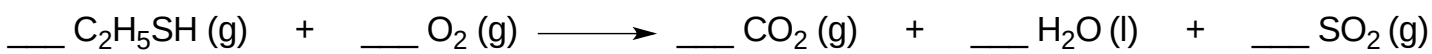
PRACTICE: Write the balanced equation for the following by inserting the correct coefficients in the blanks.



___ Al_4C_3 (s) + ___ H_2O (l) ⟶ ___ Al_2O_3 (s) + ___ CH_4 (g)

PRACTICE: Determine the total sum of the coefficients after balancing the following equation.



___ C_2H_5SH (g) + ___ O_2 (g) ⟶ ___ CO_2 (g) + ___ H_2O (l) + ___ SO_2 (g)

PRACTICE: Determine the balanced chemical equation when ethanol, C_2H_6O is ignited in the presence of air.

a) $C_2H_6O + 4\ H_2O \longrightarrow 5\ CO_2 + 7\ CO$

b) $C_2H_6O + 2\ O_3 \longrightarrow 2\ CO_2 + 3\ H_2O$

c) $C_2H_6O + 3\ O_2 \longrightarrow 2\ CO_2 + 3\ H_2O$

d) $C_2H_6O + 3\ O_2 \longrightarrow 5\ CO_2 + 4\ H_2O$