***Example* 1**

Is the following chemical equation balanced?

$$Ca + H_2O \longrightarrow Ca(OH)_2 + H_2$$

1 Ca	1 Ca
2 H	4 H
1 O	2 O

** Since the number of each element is not the same on both sides, the equation is **NOT** balanced

* Start with O, it is unbalanced and occurs in the least number of places.

$$Ca + 2H_2O \longrightarrow Ca(OH)_2 + H_2$$ **Balanced**

1 Ca	1 Ca
4 H	4 H
2 O	2 O

***Example* 2**

Balance the following chemical equation.

$$C_3H_8 + O_2 \longrightarrow CO_2 + H_2O$$

3 C	1 C
8 H	2 H
2 O	3 O

* Start with H or C, since both are unbalanced and occur in the least number of places.

I chose H:

$$C_3H_8 + O_2 \longrightarrow CO_2 + 4H_2O$$

3 C	1 C
8 H	8 H
2 O	6 O

* Now, use C.

$C_3H_8 + O_2 \longrightarrow 3CO_2 + 4H_2O$

3 C	3 C
8 H	8 H
2 O	10 O

* Finally, balance O.

$C_3H_8 + 5O_2 \longrightarrow 3CO_2 + 4H_2O$ **Balanced**

3 C	3 C
8 H	8 H
10 O	10 O

Now that all same number of elements occurs on each side, the chemical equation is balanced.