After adding the reaction coefficient "2" in front of the O_2 reactant and the H_2O product, the equation is now balanced since the number of carbon, hydrogen and oxygen atoms on the left equal those on the right. We now have a balanced equation for methane combustion:

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

The way we say the reaction is, "One molecule of methane (or you could say 'CH_4' if desired) combines with two molecules of oxygen (or 'O_2') to produce one molecule of carbon dioxide (or 'CO_2') and two molecules of water (or 'H_2O')."

Before we move on, let's do another example using the "start with the element with the most atoms" method and after that, we'll do a couple more using another method. Between these two methods, we ought to find one that works for you.

- Elemental iron, Fe, can be extracted from the compound iron oxide, Fe_2O_3. In order to separate the iron from the oxygen to obtain pure iron, it is heated in the presence of carbon monoxide (CO), forming elemental iron (Fe) and carbon dioxide (CO_2). The general reaction is below; let's balance it!
  - First, write the skeletal equation and determine if it is balanced:

1. Skeletal equation

$$Fe_2O_3 + CO \longrightarrow Fe + CO_2$$

2 Fe	not balanced →	1 Fe
1 C	balanced →	1 C
4 O	not balanced →	2 O

  - The skeletal equation is not balanced. Next, we make the first move to balance it. Let's start with O, since it has the most atoms in the skeletal equation. There are 4O on the left and 2 on the right, so we will add the reaction coefficient 2 in front of the CO_2:

2. Add a whole number in front of CO_2

$$Fe_2O_3 + CO \longrightarrow Fe + 2CO_2$$

2 Fe	not balanced →	1 Fe
1 C	not balanced →	2C
4 O	balanced →	4O

  - We have one element balanced, so next we need to balance either the Fe or the C. Let's do the Fe (just as easily could have done the C). There are 2 Fe reactant atoms and 1 product Fe atom, so we add a coefficient of 2 in front of the product Fe and then check the balance:

3. Balance for the Fe

$$Fe_2O_3 + CO \longrightarrow 2Fe + 2CO_2$$

2 Fe	balanced →	2 Fe
1 C	not balanced →	2C
4 O	balanced →	4O

  - We are getting closer. The final element that isn't balanced is carbon, with 1 on the left and 2 on the right. If we add the reaction coefficient "2" in front of the reactant CO, it will give us 2 carbon atoms on each side of the equation, but it will also increase the number of oxygen atoms on the left side from 4 to 5:

4. Balance for C

$$Fe_2O_3 + 2CO \longrightarrow 2Fe + 2CO_2$$

2 Fe	balanced →	2 Fe
2 C	balanced →	2C
5 O	not balanced →	4O