1. A balanced equation representing a chemical reaction can be written using

   A) chemical formulas and mass numbers
   B) chemical formulas and coefficients
   C) first ionization energies and mass numbers
   D) first ionization energies and coefficients

2. Which chemical equation is correctly balanced?

   A) $H_2(g) + O_2(g) \rightarrow H_2O(g)$
   B) $N_2(g) + H_2(g) \rightarrow NH_3(g)$
   C) $2NaCl(s) \rightarrow Na(s) + Cl_2(g)$
   D) $2KCl(s) \rightarrow 2K(s) + Cl_2(g)$

3. Given the unbalanced equation:

   $$\_\_ Fe_2O_3 + \_\_ CO \rightarrow \_\_ Fe + \_\_ CO_2$$

   When the equation is correctly balanced using the *smallest* whole-number coefficients, what is the coefficient of CO?

   A) 1 B) 2 C) 3 D) 4

4. Given the unbalanced equation:

   $$\_\_ Al + \_\_ CuSO_4 \rightarrow \_\_ Al_2(SO_4)_3 + \_\_ Cu$$

   When the equation is balanced using the *smallest* whole-number coefficients, what is the coefficient of Al?

   A) 1 B) 2 C) 3 D) 4

5. If an equation is balanced properly, both sides of the equation must have the same number of

   A) atoms B) coefficients
   C) molecules D) moles of molecules

6. Given the unbalanced equation:

   $$\_\_ Mg(ClO_3)_2(s) \rightarrow \_\_ MgCl_2(s) + \_\_ O_2(g)$$

   What is the coefficient of O_2 when the equation is balanced correctly using the *smallest* whole number coefficients?

   A) 1 B) 2 C) 3 D) 4

7. Which equation is correctly balanced?

   A) $H_2 + O_2 \rightarrow H_2O$
   B) $Ca + Cl_2 \rightarrow CaCl$
   C) $2\ H_2 + O_2 \rightarrow 2\ H_2O$
   D) $Ca + Cl_2 \rightarrow Ca_2Cl$

8. Given the unbalanced equation:

   $$\_\_ Al(s) + \_\_ O_2(g) \rightarrow \_\_ Al_2O_3(s)$$

   When this equation is correctly balanced using smallest whole numbers, what is the coefficient of O_2 (g)?

   A) 6 B) 2 C) 3 D) 4

9. Given the unbalanced equation:

   $$\_\_ Na + \_\_ H_2O \rightarrow \_\_ H_2 + \_\_ NaOH$$

   When the equation is correctly balanced using the smallest whole-number coefficients, the coefficient for H_2O is

   A) 1 B) 2 C) 3 D) 4

10. Given the unbalanced equation:

    $$\_\_ N_2(g) + \_\_ O_2(g) \rightarrow \_\_ N_2O_5(g)$$

    When the equation is balanced using smallest whole numbers, the coefficient of N_2(g) will be

    A) 1 B) 2 C) 5 D) 4

11. Given the unbalanced equation:

    $$\_\_ CaSO_4 + \_\_ AlCl_3 \rightarrow Al_2(SO_4)_3 + \_\_ CaCl_2$$

    What is the coefficient of $Al_2(SO_4)_3$ when the equation is completely balanced using the smallest whole-number coefficients?

    A) 1 B) 2 C) 3 D) 4

12. Given the unbalanced equation:

    $$NaOH + H_3PO_4 \rightarrow Na_3PO_4 + H_2O$$

    When the equation is correctly balanced, the coefficient of H_2O will be

    A) 1 B) 2 C) 3 D) 4

13. When the equation

    $$\_\_ Cu + \_\_ H_2SO_4 \rightarrow \_\_ CuSO_4 + \_\_ H_2O + \_\_ SO_2$$

    is correctly balanced, what is the coefficient of $CuSO_4$?

    A) 1 B) 2 C) 3 D) 4

14. When the equation

$$\_\_\ C_2H_4 + \_\_\ O_2 \rightarrow \_\_\ CO_2 + \_\_\ H_2O$$

is balanced using smallest whole numbers, what is the coefficient of the O_2?

A) 1 B) 2 C) 3 D) 4

15. Which equation is correctly balanced?

A) $CaO + 2H_2O \rightarrow Ca(OH)_2$
B) $NH_3 + 2O_2 \rightarrow HNO_3 + H_2O$
C) $Ca(OH)_2 + 2H_3PO_4 \rightarrow Ca_3(PO_4)_2 + 3H_2O$
D) $Cu + H_2SO_4 \rightarrow CuSO_4 + H_2O + SO_2$

16. Given the equation:

$$\_\_FeCl_2 + \_\_Na_2CO_3 \rightarrow \_\_FeCO_3 + \_\_NaCl$$

When the equation is correctly balanced using the smallest whole numbers, the coefficient of NaCl is

A) 6 B) 2 C) 3 D) 4

17. When the equation

$$\_\_\ Al_2(SO_4)_3 + \_\_\ ZnCl_2 \rightarrow \_\_\ AlCl_3 + \_\_\ ZnSO_4$$

is correctly balanced using the smallest whole number coefficients, the sum of the coefficients is

A) 9 B) 8 C) 5 D) 4

18. When the equation

$$\_\_\ Cu_2S + \_\_\ O_2 \rightarrow \_\_\ Cu_2O + \_\_\ SO_2$$

is completely balanced using smallest whole numbers the coefficient of the O_2 would be

A) 5 B) 2 C) 3 D) 4

19. When the equation

$$\_\_\ SiO_2 + \_\_\ C \rightarrow \_\_\ SiC + \_\_\ CO$$

is correctly balanced using whole-number coefficients, the sum of all the coefficients is

A) 6 B) 7 C) 8 D) 9

20. Given the unbalanced equation:

$$\_\_ Al_2(SO_4)_3 + \_\_ Ca(OH)_2 \rightarrow \_\_ Al(OH)_3 + \_\_ CaSO_4$$

When the equation is completely balanced using the smallest whole number coefficients the sum of the coefficients is

A) 5 B) 9 C) 3 D) 4