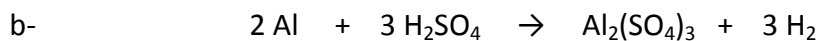
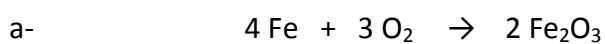


## Particle Model and Balancing Worksheet 2

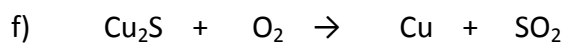
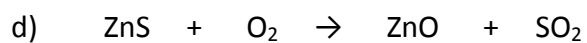
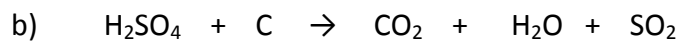
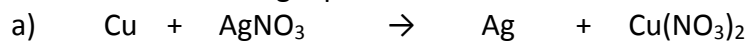
1. Represent the following with symbols.

3 Be		2 Ca(OH) <sub>2</sub>	
2 O <sub>3</sub>		CH <sub>3</sub> COOH	

2. Represent each equation using the particle model.



3. Balance the following equations.



4. While consulting some old documents, you find a lab report written in 1968. Here is part of the document.

**Experiment Results**

mass of Pb (NO<sub>3</sub>)<sub>2</sub> before reaction : 3.31 g  
 mass of NaI before reaction : 3.00 g  
 mass of PbI<sub>2</sub> after reaction : 4.61 g  
 mass of Na NO<sub>3</sub> after reaction :

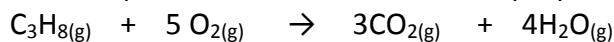
Conclusion : The results of this experiment confirm  
 Law of Conservation of Mass

Pb(NO<sub>3</sub>)<sub>2</sub> + 2 NaI → PbI<sub>2</sub> + 2 NaNO<sub>2</sub>

3.31 g    3.00 g    4.61 g

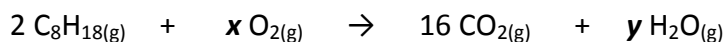
You notice that the mass of one of the products, NaNO<sub>3</sub> is missing. If all of the reactants were used up, what must be the missing mass of NaNO<sub>3</sub> ?

5. The balanced equation for the combustion of propane is as follows:



When a barbeque is used and 14.7 g of propane (C<sub>3</sub>H<sub>8</sub>) reacts with 53.3 g of oxygen gas (O<sub>2</sub>), this produces a certain amount of carbon dioxide (CO<sub>2</sub>) and 24.0 g of water vapour (H<sub>2</sub>O). What mass of carbon dioxide is released in this situation?

- A) 14.7 g                      B) 44.0 g                      C) 61.7 g                      D) 68.0 g
6. To solder two pieces of metal, a soldered uses acetylene gas (C<sub>2</sub>H<sub>2</sub>) that is reacted with oxygen (O<sub>2</sub>). The combustion produces two gases, carbon dioxide (CO<sub>2</sub>) and water vapour (H<sub>2</sub>O), as well as a lot of heat. Which balanced equation represents this reaction?
- A) 2 C<sub>2</sub> H<sub>2(g)</sub> + 5 O<sub>2(g)</sub> → 4 CO<sub>2(g)</sub> + 2 H<sub>2</sub> O<sub>(g)</sub> + Energy  
 B) 4 CO<sub>2(g)</sub> + 2 H<sub>2</sub> O<sub>(g)</sub> + Energy → 2 C<sub>2</sub> H<sub>2(g)</sub> + 5 O<sub>2(g)</sub>  
 C) C<sub>2</sub> H<sub>2(g)</sub> + 5 O<sub>2(g)</sub> → 2 CO<sub>2(g)</sub> + H<sub>2</sub> O<sub>(g)</sub> + Energy  
 D) 2 CO<sub>2(g)</sub> + H<sub>2</sub> O<sub>(g)</sub> + Energy → C<sub>2</sub> H<sub>2(g)</sub> + 5 O<sub>2(g)</sub>
7. The unbalanced equation for the combustion of Octane (C<sub>8</sub>H<sub>18</sub>) is as follows:



What must the value of **x and y** be so that the equation is balanced?


- A) x=16 and y=9    B) x=16 and y=18    C) x=25 and y=9    D) x=25 and y=18


8. During a chemical reaction, two molecules of hydrogen gas,  $H_2$ , react with one molecule of oxygen gas,  $O_2$ , to produce two molecules of water,  $H_2O$ .

The balanced chemical equation for this reaction is as follows:  $2H_2 + O_2 \rightarrow 2H_2O$

Below are four proposed models of the balanced chemical equation for this reaction.

They were constructed using the following symbols:

Hydrogen: 

Oxygen: 

Which of these models represents the balanced chemical equation for this reaction?

