**Sandwich Stoichiometry Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Part I : Cheese Sandwiches**

1. Go to the PhET simulation website:

<https://phet.colorado.edu/sims/html/reactants-products-and-leftovers/latest/reactants-products-and-leftovers_en.html>

1. Select “Sandwiches”
2. Select “Cheese” at the top
3. Use the arrows to enter the following under reactants on the left (“Before Reaction”):

**Before Reaction**

8 pieces of bread

8 pieces of cheese

 5. Fill in the number of products and leftovers under “After Reaction” in the table below.

 Products Leftovers -------------------------------



|  |  |  |  |
| --- | --- | --- | --- |
| # |  |  |  |

How many pieces of bread and how many pieces of cheese do you need to make exactly **3** sandwiches with no leftovers?

\_\_\_\_\_ pieces of bread \_\_\_\_\_ pieces of cheese

**Part II : Meat and Cheese Sandwiches**

1. Go to the PhET simulation website: Select “Sandwiches”
2. Select “Meat and Cheese” at the top
3. Use the arrows to enter the following under reactants on the left (“Before Reaction”):
4. **Before Reaction**

5 pieces of bread

5 pieces of meat

5 pieces of cheese

1. Fill in the number of products and leftovers under “After Reaction” in the table below.

Products ------------------- Leftovers





|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| # |  |  |  |  |

1. **Before Reaction**

8 pieces of bread

3 pieces of meat

4 pieces of cheese

**After Reaction**

Products ----------------------------- Leftovers ------------------------------



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| # |  |  |  |  |

How many pieces of bread, meat, and cheese do you need to make exactly **3** sandwiches with no leftovers?

\_\_\_\_\_ pieces of bread \_\_\_\_\_ pieces of meat \_\_\_\_\_ pieces of cheese

**Part III: Water**

1. Go to the PhET simulation website: <https://phet.colorado.edu/sims/html/reactants-products-and-leftovers/latest/reactants-products-and-leftovers_en.html>
2. Select “Molecules”
3. Select “Water” at the top
4. Use the arrows to enter the following under reactants on the left (“Before Reaction”):

**Before Reaction**

6 H2

4 O2

 5. Fill in the number of products and leftovers under “After Reaction” in the table below.

 Products ------------------------------ Leftovers -------------

|  |  |  |  |
| --- | --- | --- | --- |
|  | H2O | H2 | O2 |
| # |  |  |  |

How many H2 and O2 molecules do you need to make exactly **4** water molecules with no leftovers?

\_\_\_\_\_ H2 \_\_\_\_\_ O2

**Part IV: Ammonia**

1. Go to the PhET simulation website:
2. Select “Molecules”
3. Select “Ammonia” at the top
4. Use the arrows to enter the following under reactants on the left (“Before Reaction”):

**Before Reaction**

5 N2

5 H2

 5. Fill in the number of products and leftovers under “After Reaction” in the table below.

 Products ------------------------------ Leftovers -------------

|  |  |  |  |
| --- | --- | --- | --- |
|  | NH3 | N2 | H2 |
| # |  |  |  |

How many N2 and H2 molecules do you need to make exactly **2** ammonia molecules with no leftovers?

\_\_\_\_\_ N2 \_\_\_\_\_ H2

**Part V: Methane**

1. Go to the PhET simulation website:
2. Select “Molecules”
3. Select “Combust Methane” at the top
4. Use the arrows to enter the following under reactants on the left (“Before Reaction”):

**Before Reaction**

6 CH4

6 O2

1. Fill in the number of products and leftovers under “After Reaction” in the table below.

-------------- Products ----------------------------------- ----------------------- Leftovers ---

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | CO2 | H2O | CH4 | O2 |
| # |  |  |  |  |

How many CH4 and O2 molecules do you need to make exactly 1 CO2 and 2 H2O molecules with no leftovers?

\_\_\_\_\_ CH4 \_\_\_\_\_ O2

Now use the ‘Reactants, Products & Leftovers – Game’

**Part VI: Game time**

1. Go to the PhET simulation website:
2. Select “Game”
3. Play Levels 1 first, then level 2 (if you like the game you can try level 3)

Level 1: You need to score a **6 or better** on level 1. Your score: \_\_\_\_\_\_

Level 2: You need to score a **6 or better** on level 2. Your score: \_\_\_\_\_\_

1. Take a snap shot of your final screen (see sample below). Paste it below my sample.



**Save your document as a PDF file and upload it in the assignment portal.**

prt sc

fn

Note: on my PC I take a screen snap shot by pressing + ,

 v

ctrl

Then +