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

5 pieces of bread

5 pieces of meat

5 pieces of cheese

5. 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:
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

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

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

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

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

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