## INTRODUCTION TO STOICHIOMETRY

## Evidence Notebook

## Key Ideas

1. Why learn stoichiometry?
a. Stoichiometry is used to determine the $\qquad$ of chemicals that will be produced in a chemical reaction.
2. When you add solid potassium to water you produce potassium hydroxide and hydrogen gas.
a. Write the chemical equation (in symbols) for the reaction above.
b. Balance the equation above:
3. Stoichiometry walkthrough
a. Stoichiometry is the process of converting $\qquad$ of one substance to
$\qquad$ of another substance using a balanced equation.
b. Rewrite the balanced equation from above (2b):
c. Use the equation above to determine the ratio between the following substances (set the ratios up as fractions:

$$
\text { i. } K: H_{2}
$$

$$
\text { ii. } \mathrm{K}: \mathrm{H}_{2} \mathrm{O}
$$

iii. $K: K O H$
iv. $\mathrm{H}_{2} \mathrm{O}: \mathrm{H}_{2}$
d. Determine the number of moles of hydrogen produced when 0.0400 mole of potassium is used. Use dimensional analysis and include all units!

$$
2 \mathrm{~K}+2 \mathrm{H}_{2} \mathrm{O} \rightarrow 2 \mathrm{KOH}+\mathrm{H}_{2}
$$

e. Stoichiometry is a $\qquad$ to $\qquad$ relationship.
4. Sodium chloride or table salt ( NaCl ) is produced when chlorine and sodium react vigorously together.
a. Write the balanced equation for the reaction above:
b. Write the mole ratio between NaCl and $\mathrm{Cl}_{2}$ in the form of a fraction from the balanced equation above:
c. If 1.25 moles of chlorine gas react in the equation above, what would be the mass of NaCl produced? Use dimensional analysis and include all units!
Step 1 - Convert moles of $\mathrm{Cl}_{2}$ to moles of NaCl

Step 2 - Convert moles of NaCl into grams

## CHECKPOINTS

1. How many moles of water are produced when 3.21 moles of calcium hydroxide are used in the reaction below?

$$
\mathrm{Ca}(\mathrm{OH})_{2}+2 \mathrm{HBr} \rightarrow \mathrm{CaBr}_{2}+2 \mathrm{H}_{2} \mathrm{O}
$$

2. How many moles of aluminum sulfide are formed when you react 0.45 moles of hydrogen sulfide? (Balance the equation first)

$$
\mathrm{H}_{2} \mathrm{~S}+\mathrm{Al}(\mathrm{OH})_{3} \rightarrow \mathrm{Al}_{2} \mathrm{~S}_{3}+\mathrm{H}_{2} \mathrm{O}
$$

3. How many moles of water and sodium nitride are formed when you react 0.75 mol of sodium hydroxide with ammonia (hydrogen nitride).
