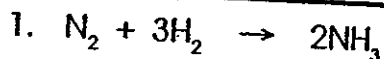


# STOICHIOMETRY: MOLE-MOLE PROBLEMS

Name: \_\_\_\_\_



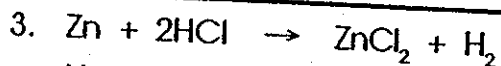
How many moles of hydrogen are needed to completely react with two moles of nitrogen?

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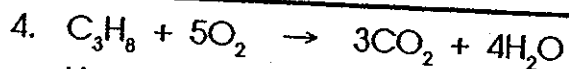
How many moles of oxygen are produced by the decomposition of six moles of potassium chlorate?

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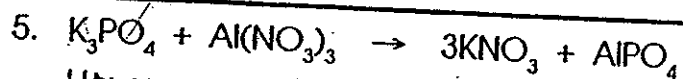
How many moles of hydrogen are produced from the reaction of three moles of zinc with an excess of hydrochloric acid?

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How many moles of oxygen are necessary to react completely with four moles of propane ( $\text{C}_3\text{H}_8$ )?

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How many moles of potassium nitrate are produced when two moles of potassium phosphate react with two moles of aluminum nitrate?

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## Stoichiometry Worksheet 1 – Mole-to-Mole Calculations

**Learning Target** Students will calculate the theoretical yield in moles.

**Directions:** You must solve each of the following problems using dimensional analysis. EVERY number in your work should be followed by a unit and a formula.

- For this reaction:  $\underline{\quad} \text{Al} + \underline{\quad} \text{O}_2 \rightarrow \underline{\quad} \text{Al}_2\text{O}_3$ 
  - How many moles of aluminum oxide will be formed from 17 moles of aluminum reacting?
  - How many moles of oxygen are needed to react with 23.8 moles of aluminum?
- For this reaction:  $\underline{\quad} \text{NH}_3 + \underline{\quad} \text{O}_2 \rightarrow \underline{\quad} \text{NO} + \underline{\quad} \text{H}_2\text{O}$ 
  - How many moles of oxygen are needed to react with 3.24 moles of ammonia?
  - How many moles of water are produced from 12.8 moles of oxygen?
- For this reaction:  $\underline{\quad} \text{Fe}_3\text{O}_4 + \underline{\quad} \text{CO} \rightarrow \underline{\quad} \text{Fe} + \underline{\quad} \text{CO}_2$ 
  - How many moles of carbon dioxide are produced from 2.87 moles of  $\text{Fe}_3\text{O}_4$ ?
  - How many moles of carbon monoxide are needed to react with 8.25 moles of  $\text{Fe}_3\text{O}_4$ ?
- For this reaction:  $6 \text{PbO} + \text{O}_2 \rightarrow 2 \text{Pb}_3\text{O}_4$ 
  - How many moles of  $\text{Pb}_3\text{O}_4$  are produced from 1.25 moles of oxygen?
  - How many moles of oxygen must react with 8.75 moles of lead(II) oxide?

1a) 8.5 mol aluminum oxide  
3a) 11.5 mol carbon dioxide

1b) 17.8 mol oxygen  
3b) 33.0 mol carbon monoxide

2a) 4.05 mol oxygen  
4a) 2.50 mol  $\text{Pb}_3\text{O}_4$

2b) 15.4 mol water  
4b) 1.46 mol  $\text{O}_2$