ACTIVITY FOR PEER ASSESSMENT (mole to mole ratio)

SAMPLE PROBLEM

Ammonia is made industrially by reacting nitrogen and hydrogen under pressure, at high temperature, and in the presence of a catalyst. The equation is $N_2(g) + 3H_2(g) \rightarrow 2NH_3$ (g). If 4 mol of H_2 react, how many moles of NH_3 will be produced?

1) **Organise** the data clearly:

| ITEMS	DATA	
Substance	H2	NH3
Coefficient in balanced equation	3	2
Molar mass	Not needed for this problem	Not needed for this problem
Amount	4.0mol	X mol
Mass of substance	Not needed for this problem	Not needed for this problem

2) **Multiply** by the mole ratio of NH3 to H2 determined from the coefficients of the balanced equation.

$$mol\ H2\ X\ \frac{2\ mol\ NH3}{3\ mol\ H2} = mol\ NH3$$

So: 4 x (2/3)= **2.7 mol of NH_3**

TO BE CORRECTED BY A CLASSMATE

1) How many moles of sodium will react with water to produce 4.0 mol of hydrogen in the following reaction?

$2Na(s) + 2H_2O(l) \rightarrow 2NaOH(aq) + H_2(g)$
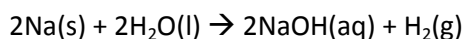
2) How many moles of lithium chloride will be formed by the reaction od chlorine with 0.046 mol of lithium bromide in the following reaction?

$2LiBr(aq) + Cl_2 \rightarrow 2LiCl(aq) + Br_2$ (l)
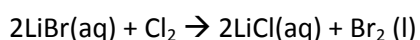
3) Aluminium will react with sulfuric acid in the following reaction.

$2Al(s) + 3H_2SO_4(l) \rightarrow Al_2(SO_4)_3 (aq) + 3H_2(g)$

a) How many moles of H_2SO_4 will react with 18 mol of Al?

b) How many moles of each product will be produced?