1. Calculate the formula weights for all of the following compounds.
   a) NaBr  b) FeCl₂  c) Co(CN)₃  d) Sr(MnO₄)₂  e) CaHPO₄  f) Cr₂(CO₃)₃  g) PbO₂
   h) N₂O₅  i) CuF  j) KH₂PO₄  k) FeO  l) SnO₂  m) K₂SO₃  n) Ba(NO₂)₂
   o) N₂O₄  p) Cu(NO₃)₂  q) Ni(OH)₂  r) CoPO₄  s) Al₂(SO₄)₃  t) AgHCO₃

2. Calculate the mass (in grams) of 3.26 x 10¹⁹ Zn atoms.

3. How many atoms of phosphorus are present in 23.5 g of calcium phosphate?

4. Balance the following equations:
   a) ___ C₆H₁₈ + ___ O₂ ——> ___ CO₂ + ___ H₂O
   b) ___ Ca₃(PO₄)₂ + ___ H₂SO₄ ——> ___ H₃PO₄ + ___ CaSO₄
   c) ___ Al₂O₃ + ___ C + ___ Cl₂ ——> ___ AlCl₃ + ___ CO

5. The antibiotic penicillin G has the molecular formula, C₁₆H₁₉N₂O₅S.
   a) How many molecules of penicillin G are in a 251 mg dosage of penicillin G?
   b) How many grams of oxygen are in this dosage?
   c) What is the mass of 5 molecules of penicillin G?

6. Phosphorus trichloride can be dangerous because it reacts with water to produce hydrogen monochloride and trihydrogen phosphite. Write a balanced equation for the reaction and calculate the mass of hydrogen monochloride that would be produced if 26.8 g of phosphorus trichloride reacted completely.

7. When ammonia, NH₃, reacts with copper(II) oxide, copper metal, nitrogen gas and water are produced.
   a) write a balanced equation for the reaction
   b) How many milliliters of nitrogen (density = 1.25 g/L) can be produced from 5.00 g of copper(II) oxide?
   c) How many molecules of nitrogen are in the produced sample?

8. Methane reacts with chlorine to produce chloroform and HCl.
   CH₄ + Cl₂ ——> CHCl₃ + HCl
0.50 L chlorine (d = 1.23 g/L) was reacted with excess methane how many mL of chloroform (d=1.483 g/mL) could be produced?

9. A 11.9 g sample of Fe₃O₄ is reacted with 5.31 g of oxygen to produce iron (III) oxide according to the following equation: Fe₃O₄ + O₂ ——> Fe₂O₃
   What is the theoretical yield of iron(III) oxide? When Ted carried out this reaction he obtained 10.4 g of iron (III) oxide, what is his percent yield?

10. For the following reactions, determine the oxidation numbers of all the elements, and which substance is oxidized, which is reduced and determine which reactant is the oxidizing agent and which is the reducing agent.
    a) 2Al + 3Hg²⁺ ——> 2Al³⁺ + 3Hg
    b) 6CrO + 2HNO₃ ——> 3Cr₂O₃ + 2NO + H₂O
    c) Zn + 2H⁺ ——> H₂ + Zn²⁺
    d) 3H₃PO₄ + 2HNO₃ ——> 3 H₃PO₄ + 2NO + H₂O