Alchemy
KS4
Monday - Science

Alchemy is an ancient science that came before chemistry. The aim of alchemy was to try and change certain materials and substances into other materials. Many alchemists particularly tried to turn other metals into gold. Of course, today we know that this is not possible as this is one of the elements on the periodic table, but in chemistry we can create chemical reactions where the reactants (the substances we started with) react to make the new products. We can write symbol equations for these reactions, which should be properly balanced.

Here are some practice questions about balancing and writing equations for chemical reactions. If you are unsure how to do these you can check your school workbook, textbook or BBC Bitesize.

1. Explain why symbol equations must be balanced. [2 marks]
2. Balance the equation: $H_2 + Cl_2 \rightarrow HCl$ [1 mark]
3. a) A mass of 33.6g of magnesium carbonate, $MgCO_3$, completely decomposed when it was heated. It made 16.0g of magnesium oxide, MgO. Calculate the mass of carbon dioxide, CO_2, produced in this reaction. [1 mark]
   b) Write a word equation and a balanced symbol equation, including state symbols, to show the reaction to part a. [4 marks]
4. Balance these symbol equations.
   a. $KNO_3 \rightarrow KNO_2 + O_2$ [1 mark]
   b. $Li + O_2 \rightarrow Li_2O$ [1 mark]
   c. $Fe + O_2 \rightarrow Fe_2O_3$ [1 mark]
   d. $Fe_2O_3 + CO \rightarrow Fe + CO_2$ [1 mark]
5. Sodium metal, Na. Reacts with water to form a solution of sodium hydroxide, NaOH, and gives off hydrogen gas, H_2. Write a balanced symbol equation, including state symbols, for this reaction. [3 marks]