

SUMMER PROJECT 2019

Subject: Chemistry

Teacher: James Moore

Why do we do a summer project?

We ask all students who are intending to come to L6FC to study in September 2019 to complete a short project in their chosen subjects over the summer holidays. The purpose of this is to enable you to start researching and gaining an understanding of the topics which will be covered in your course, and to show your teachers that you can organise your time and work independently. You will bring your summer projects to college in the first week of term to hand in to your teachers.

What is the summer project?

Balancing Equations – section 1

In chemistry it is important to be able to balance and construct chemical equations. Balance the chemical equations below.

| | | | | | | | | |
|---|--------------------------------|---|-----------------|---|---------------------|---|--------------------------------|---|
| 1 | H ₂ | + | Cl ₂ | → | HCl | | | |
| 2 | Zn | + | O ₂ | → | ZnO | | | |
| 3 | Cl ₂ | + | Al | → | AlCl ₃ | | | |
| 4 | Na | + | O ₂ | → | Na ₂ O | | | |
| 5 | Mg | + | O ₂ | → | MgO | | | |
| 6 | Mg | + | HCl | → | MgCl ₂ | + | H ₂ | |
| 7 | Fe ₂ O ₃ | + | Al | → | Fe | + | Al ₂ O ₃ | |
| 8 | CaCl ₂ | + | KOH | → | Ca(OH) ₂ | + | KCl | |
| 9 | HCl | + | | → | NaCl | + | | + |

| | | | | | | | |
|----|-------------------------|---|--------------------------|---------------|--------------------------|---|------------------------------------|
| | | | Na_2CO_3 | | H_2O | | CO_2 |
| 10 | HNO_3 | + | NaOH | \rightarrow | NaNO_3 | + | H_2O |
| 11 | HNO_3 | + | Ca(OH)_2 | \rightarrow | $\text{Ca(NO}_3)_2$ | + | H_2O |
| 12 | H_2SO_4 | + | KOH | \rightarrow | K_2SO_4 | + | H_2O |
| 13 | | | NaNO_3 | \rightarrow | NaNO_2 | + | O_2 |
| 14 | KI | + | $\text{Pb(NO}_3)_2$ | \rightarrow | KNO_3 | + | PbI_2 |
| 15 | CaCl_2 | + | Na_2SO_4 | \rightarrow | CaSO_4 | + | NaCl |
| 16 | HCl | + | K_2SO_3 | \rightarrow | KCl | + | $\text{H}_2\text{O} + \text{SO}_2$ |
| 17 | KOH | + | MgSO_4 | \rightarrow | Mg(OH)_2 | + | K_2SO_4 |
| 18 | K | + | H_2O | \rightarrow | KOH | + | H_2 |
| 19 | NaOH | + | H_3PO_4 | \rightarrow | Na_3PO_4 | + | H_2O |
| 20 | | | $\text{Pb(NO}_3)_2$ | \rightarrow | PbO | + | $\text{NO}_2 + \text{O}_2$ |

Writing chemical equations – section 2

It is also important to be able to construct chemical equations from given reactants or products; you should be able to predict the products from specific reactions. If you don't know what the products are look them up. Construct balanced symbol equations for the following reactions and include state symbols.

1. Zinc and hydrochloric acid
2. Iron and sulphuric acid
3. Silver and nitric acid
4. Copper carbonate and nitric acid
5. Sodium hydroxide and sulphuric acid

6. Silver nitrate and sodium chloride
7. Chlorine gas and potassium bromide
8. Barium oxide and water
9. Calcium and water
10. Strontium hydroxide and hydrochloric acid
11. Chlorine and water

The Molecule of Your Choice – Section 3

Go to this website <http://www.chm.bris.ac.uk/motm/motm.htm> and choose a molecule; it could be one that you have heard of or it could be one that you haven't. Create a poster of that molecule explaining its structure and a little bit about why the molecule is important.

Can you give me some more guidance on what is expected?

Complete all the tasks set; you will need all of the skills from all sections and need to know the reactions listed in section 2. You can print out the exercise and complete it on the sheet. You may be unsure of some of the products of some of the reactions; this is where independent study is required. They are all common reactions. If you have any questions just email j.moore@lowestoftsfc.ac.uk