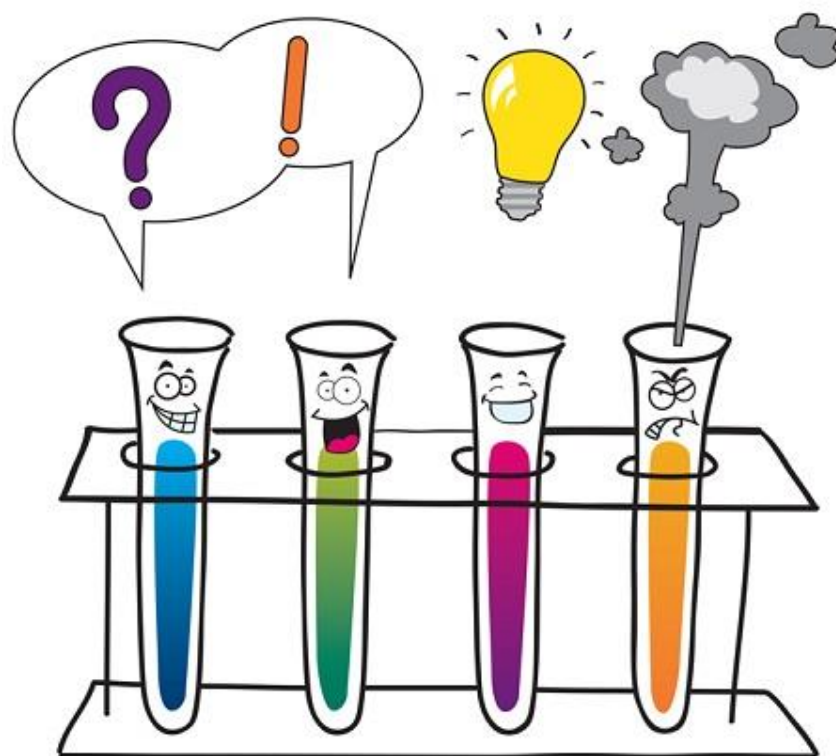


# GCSE CHEMISTRY



## Core Practicals

## Log Book

Name:

Class:

Teacher:

Target:

## Students are required to carry out all core practicals and make a contemporaneous record of work undertaken.

The following codes are used in this document

- **AT** – use of apparatus and techniques
- **WS**- working scientifically skills
- **MS**– mathematical skills.

You will be required to use certain techniques and apparatus and demonstrate working scientifically and mathematics skills as described in each of the core practicals below. Questions about these practicals, their procedures, techniques and skills will be included in your final GCSE exams. GCSE exam papers will contain a number of different types of question which will assess your practical skills and your understanding of practical techniques.

1. Questions that require a knowledge and understanding of a specific required practical activity procedure.
2. Questions that require a knowledge and understanding of apparatus and techniques from the list, but do not relate to a specific required practical activity.
3. Questions set in a practical context where students require an understanding of the science rather than direct experience of the practical activity.

## Once a core practical has been completed you need to add the date of completion to this log.

### Required practical activity - salts

Preparation of a pure, dry sample of a soluble salt from an insoluble oxide or carbonate, using a Bunsen burner to heat dilute acid and a water bath or electric heater to evaporate the solution.

	Date completed
<b>Apparatus and techniques</b> AT 2 – safe use of appropriate heating devices and techniques including use of a Bunsen burner and a water bath or electric heater. AT 3 – use of appropriate apparatus and techniques for conducting chemical reactions, including appropriate reagents. AT 4 – safe use of a range of equipment to purify and/or separate chemical mixtures including evaporation, filtration, crystallisation. AT 6 – safe use and careful handling of liquids and solids, including careful mixing of reagents under controlled conditions.	
<b>Key opportunities for skills development</b>  WS 2.3 – apply a knowledge of a range of techniques, instruments, apparatus, and materials to select those appropriate to the experiment. WS 2.4 – carry out experiments appropriately having due regard for the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations.	

### Required practical activity - titration

**Determination of the reacting volumes of solutions of a strong acid and a strong alkali by titration.**

**(HT only) Determination of the concentration of one of the solutions in mol/dm<sup>3</sup> and g/dm<sup>3</sup> from the reacting volumes and the known concentration of the other solution.**

	Date completed
<b>Apparatus and techniques</b>  AT 1 – use of appropriate apparatus to make and record a range of measurements accurately, including volume of liquids. AT 8 – the determination of concentrations of strong acids and strong alkalis.	
<b>Key opportunities and skills development</b>  WS 2.4 – carry out experiments appropriately having due regard for the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations. WS 2.6 – make and record observations and measurements using a range of apparatus and methods. MS 1a – recognise and use expressions in decimal form. MS 1c – use ratios, fractions and percentages. MS 2a – use an appropriate number of significant figures.	

### Required practical activity- Electrolysis

**Investigate what happens when aqueous solutions are electrolysed using inert electrodes. This should be an investigation involving developing a hypothesis.**

	Date completed
<b>Apparatus and techniques</b>  AT 3 – use of appropriate apparatus and techniques for conducting and monitoring chemical reactions. AT 7 – use of appropriate apparatus and techniques to draw, set up and use electrochemical cells for separation and production of elements and compounds. AT 8 – use of appropriate qualitative reagents and techniques to analyse and identify unknown samples or products including gas tests for hydrogen, oxygen and chlorine.	
<b>Key opportunities and skills development</b>  WS 2.1 – use scientific theories and explanations to develop hypotheses. WS 2.2 – plan experiments or devise procedures to make observations, produce or characterise a substance, test hypotheses, check data or explore phenomena. WS 2.3 – apply a knowledge of a range of techniques, instruments, apparatus, and materials to select those appropriate to the experiment. WS 2.4 – carry out experiments appropriately having due regard for the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations. WS 2.6 – make and record observations and measurements using a range of apparatus and methods.	

### Required practical activity- Reactions

**Investigate the variables that affect temperature changes in reacting solutions such as, e.g. acid plus metals, acid plus carbonates, neutralisations, displacement of metals.**

	Date completed
<p><b>Apparatus and techniques</b></p> <p>AT 1 – use of appropriate apparatus to make and record a range of measurements accurately, including mass, temperature, and volume of liquids.</p> <p>AT 3 – use of appropriate apparatus and techniques for conducting and monitoring chemical reactions.</p> <p>AT 5 – making and recording of appropriate observations during chemical reactions including changes in temperature.</p> <p>AT 6 – safe use and careful handling of gases, liquids and solids, including careful mixing of reagents under controlled conditions, using appropriate apparatus to explore chemical changes.</p>	
<p><b>Key opportunities and skills development</b></p> <p>WS 2.1 – use scientific theories and explanations to develop hypotheses.</p> <p>WS 2.2 – plan experiments or devise procedures to make observations, produce or characterise a substance, test hypotheses, check data or explore phenomena.</p> <p>WS 2.3 – apply a knowledge of a range of techniques, instruments, apparatus, and materials to select those appropriate to the experiment.</p> <p>WS 2.4 – carry out experiments appropriately having due regard for the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations.</p> <p>WS 2.6 – make and record observations and measurements using a range of apparatus and methods.</p> <p>WS 2.7 – evaluate methods and suggest possible improvements and further investigations.</p> <p>MS 1a – recognise and use expressions in decimal form.</p> <p>MS 2a – use an appropriate number of significant figures.</p> <p>MS 2b – find arithmetic means.</p> <p>MS 4a – translate information between graphical and numeric form.</p> <p>MS 4c – plot two variables from experimental or other data.</p>	

**Required practical activity - Rates**

**Investigate how changes in concentration affect the rates of reactions by a method involving measuring the volume of a gas produced and a method involving a change in colour or turbidity. This should be an investigation involving developing a hypothesis.**

	Date completed
<p><b>Apparatus and techniques</b></p> <p>AT 1 – use of appropriate apparatus to make and record a range of measurements accurately, including mass, time, temperature, and volume of liquids and gases.</p> <p>AT 3 – use of appropriate apparatus and techniques for conducting and monitoring chemical reactions.</p> <p>AT 5 – making and recording of appropriate observations during chemical reactions including the measurement of rates of reaction by a variety of methods such as production of gas and colour change.</p>	

AT 6 – safe use and careful handling of gases, liquids and solids, including careful mixing of reagents under controlled conditions, using appropriate apparatus to explore chemical changes.	
<p><b>Key opportunities for skills development</b></p> <p>WS 2.1 – use scientific theories and explanations to develop hypotheses.</p> <p>WS 2.2 – plan experiments or devise procedures to make observations, produce or characterise a substance, test hypotheses, check data or explore phenomena.</p> <p>WS 2.3 – apply a knowledge of a range of techniques, instruments, apparatus, and materials to select those appropriate to the experiment.</p> <p>WS 2.4 – carry out experiments appropriately having due regard for the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations.</p> <p>WS 2.6 – make and record observations and measurements using a range of apparatus and methods.</p> <p>WS 2.7 – evaluate methods and suggest possible improvements and further investigations.</p> <p>MS 1a – recognise and use expressions in decimal form.</p> <p>MS 1c – use ratios, fractions and percentages.</p> <p>MS 1d – make estimates of the results of simple calculations.</p> <p>MS 2a – use an appropriate number of significant figures.</p> <p>MS 2b – find arithmetic means.</p> <p>MS 4a – translate information between graphical and numeric form.</p> <p>MS 4b – understand that <math>y = mx + c</math> represents a linear relationship.</p> <p>MS 4c – plot two variables from experimental or other data.</p> <p>MS 4d – determine the slope and intercept of a linear graph.</p> <p>MS 4e – draw and use the slope of a tangent to a curve as a measure of rate of change.</p>	

### Required practical activity – Chromatography

**Investigate how paper chromatography can be used to separate and tell the difference between coloured substances. Students should calculate R<sub>f</sub> values.**

<p><b>Apparatus and techniques</b></p> <p>AT 1 – use of appropriate apparatus to make and record a range of measurements accurately.</p> <p>AT 4 – safe use of a range of equipment to purify and/or separate chemical mixtures including chromatography.</p>	
<p><b>Key opportunities for skills development</b></p> <p>WS 2.4 – carry out experiments appropriately having due regard for the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations.</p> <p>WS 2.6 – make and record observations and measurements using a range of apparatus and methods.</p>	

### Required practical activity – Flame tests

**Use of chemical tests to identify the ions in unknown single ionic compounds covering the ions from sections Flame tests through to Sulfates.**

	Date completed
<p><b>Apparatus and techniques</b></p> <p>AT 1 – safe use of a Bunsen burner.</p> <p>AT 8 – use of appropriate qualitative reagents and techniques to analyse and identify unknown samples or products including gas tests, flame tests, precipitation reactions.</p>	
<p><b>Key opportunities for skills development</b></p> <p>WS 2.4 – carry out experiments appropriately having due regard for the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations.</p> <p>WS 2.6 – make and record observations and measurements using a range of apparatus and methods.</p>	

### Required practical activity – Potable water

#### **Analysis and purification of water samples from different sources, including pH, dissolved solids and distillation.**

	Date completed
<p><b>Apparatus and techniques</b></p> <p>AT 2 – safe use of appropriate heating devices and techniques including use of a Bunsen burner and a water bath or electric heater.</p> <p>AT 3 – use of appropriate apparatus and techniques for the measurement of pH in different situations.</p> <p>AT 4 – safe use of a range of equipment to purify and/or separate chemical mixtures including evaporation, distillation.</p>	
<p><b>Key opportunities and skills development</b></p> <p>WS 2.3 – apply a knowledge of a range of techniques, instruments, apparatus, and materials to select those appropriate to the experiment.</p> <p>WS 2.4 – carry out experiments appropriately having due regard for the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations.</p> <p>WS 2.5 – recognise when to apply a knowledge of sampling techniques to ensure any samples collected are representative.</p> <p>WS 2.6 – make and record observations and measurements using a range of apparatus and methods.</p> <p>WS 2.7 – evaluate methods and suggest possible improvements and further investigations.</p>	