# Practical work for OCR GCSE (9–1) Chemistry

**Gateway Science and Twenty First Century Science**

The OCR model of practical work for the GCSE (9-1) Sciences is based on offering flexibility and encouraging teacher professionalism. The required apparatus and techniques have been divided up into Practical Activity Groups (PAGs), mirroring the successful approach taken with our A-Level qualifications. Teachers should choose **a minimum of one activity per PAG** (a total of **eight per single science** or **sixteen for combined science**) and **enough activities to ensure full coverage of the required apparatus and techniques**. In addition, note should be taken of the learning outcomes throughout the specifications, where practical work above and beyond that discussed here will form part of learners’ entire study of the qualifications.

Rather than specifying particular practicals that must be used, OCR’s approach is to suggest a range of suitable activities and to allow teachers to choose the activities that best suit them and their learners.

To support teachers and departments with first teaching of the Chemistry specifications, we have selected a set of practicals, highlighted in yellow in the table below, which will ensure that all students have used all of the required apparatus and techniques.

(*Equivalent example sets of practicals for the other OCR GCSE science specifications are available here:* [*http://social.ocr.org.uk/groups/science/resources/gcse-sciences-example-sets-practical-activities*](http://social.ocr.org.uk/groups/science/resources/gcse-sciences-example-sets-practical-activities)*).*

**Variety in practical activities**

Three general types of activities have been suggested for each Chemistry PAG:

* traditional – commonly used practical activities using standard laboratory equipment available in most schools, many based on [Royal Society of Chemistry activities](http://www.rsc.org/learn-chemistry/collections/experimentation/practical-chemistry)
* microscale – practicals using reduced amounts of reagents and smaller/simplified equipment, many based on [CLEAPSS activities](http://science.cleapss.org.uk/resources/resource-search.aspx?search=microscale)
* kitchen-chemistry - simplified practicals that can be used to introduce concepts and useful when access to standard equipment is limited (e.g. in hospital schools and pupil referral units).

The activities produced by OCR build on the previously published high quality resources, adding extra information, including mapping to OCR specifications, a range of questions and answers, and trial data and photographs.

In addition to these suggested activities, many teachers and science departments will have their own practical activities that have been developed over the years, which will be equally valid and can be used to fulfil the requirements. Many publishing companies also produce resources to support the teaching of the sciences that include practical activities – for example the [OUP Kerboodle package](https://global.oup.com/education/secondary/kerboodle/science/?region=uk) written for the new OCR specifications.

If you have any questions, please contact us on [gcsescience@ocr.org.uk](mailto:gcsescience@ocr.org.uk).

### All suggested activities for GCSE (9–1) Chemistry

| **PAG** | **Traditional/bench** | **Microscale** | **Kitchen-chemistry** |
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| **Reactivity trends**  Chem PAG 1 | **OCR Suggested Activity 1:** [Reactivity trends of the halogens](http://www.ocr.org.uk/Images/360166-pag-activity-chemistry-reactivity-trends-suggestion-1.docx) | **OCR Suggested Activity 2:** [Reactivity of metals](http://www.ocr.org.uk/Images/323617-pag-activity-chemistry-reactivity-trends-suggestion-2.docx) | **‘Rusting’ nails investigation** – iron/zinc/copper in different conditions  e.g. Using ‘[The causes of rusting](http://www.rsc.org/learn-chemistry/resource/res00000434/the-causes-of-rusting)’ |
| **Electrolysis**  Chem PAG 2 CombSci PAG C1 | **OCR Suggested Activity 1:** [Electrolysis of brine](http://www.ocr.org.uk/Images/358283-pag-activity-chemistry-electrolysis-suggestion-1.docx) | **OCR Suggested Activity 2:** [Microscale electrolysis of copper(II) chloride](http://www.ocr.org.uk/Images/311750-pag-activity-chemistry-electrolysis-suggestion-2.docx) | **OCR Suggested Activity 3:** [Some gas tests](http://www.ocr.org.uk/Images/358332-pag-activity-chemistry-electrolysis-suggestion-3.docx) |
| **Separation techniques**  Chem PAG 3  CombSci PAG C3 | **OCR Suggested Activity 1:** [Separation in synthesis](http://www.ocr.org.uk/Images/358305-pag-activity-chemistry-separation-techniques-suggestion-1.docx) | **OCR Suggested Activity 2:** [Chromatography of leaf chloroplasts](http://www.ocr.org.uk/Images/323640-pag-activity-chemistry-separation-techniques-suggestion-2.docx) | **OCR Suggested Activity 3:** [Kitchen chromatography](http://www.ocr.org.uk/Images/358282-pag-activity-chemistry-separation-techniques-suggestion-3.docx) |
| **Distillation**  Chem PAG 4 CombSci PAG C2 | **OCR Suggested Activity 1:** [Extraction of limonene](http://www.ocr.org.uk/Images/323641-pag-activity-chemistry-distillation-suggestion-1.docx) | **OCR Suggested Activity 2:** [Fractional distillation of a crude oil substitute](http://www.ocr.org.uk/Images/360827-pag-activity-chemistry-distillation-suggestion-2.docx) | **Making a solar still**  e.g. ‘[How to make a solar water distiller](https://www.youtube.com/watch?v=C5olBFYgsdY)’ |
| **Identification of species**  Chem PAG 5 | **OCR Suggested Activity 1:** [Precipitation and flame tests](http://www.ocr.org.uk/Images/351862-pag-activity-chemistry-identification-of-species-suggestion-1.docx) | **OCR Suggested Activity 2:** [The march of the precipitANTs](http://www.ocr.org.uk/Images/323619-pag-activity-chemistry-identification-of-species-suggestion-2.docx) | **Testing for the presence of group 2 ions**  e.g. ‘[Testing the hardness of water](http://www.rsc.org/learn-chemistry/resource/res00000426/testing-the-hardness-of-water)’ |
| **Titration**  Chem PAG 6 | **OCR Suggested Activity 1:** [Titration of sodium hydroxide and hydrochloric acid](http://www.ocr.org.uk/Images/351861-pag-activity-chemistry-titration-suggestion-1.docx) | **OCR Suggested Activity 2:** [The vinegar dilemma](http://www.ocr.org.uk/Images/323620-pag-activity-chemistry-titration-suggestion-2.docx) | **Investigating vinegar and baking soda solutions and mixtures with vegetable/fruit pH indicators.**  e.g. RSC ‘[Making a pH indicator](http://www.rsc.org/learn-chemistry/resource/res00000422/making-a-ph-indicator)’ |
| **Production of salts**  Chem PAG 7  CombSci PAG C4 | **OCR Suggested Activity 1:** [Prussian blue investigation](http://www.ocr.org.uk/Images/323623-pag-activity-chemistry-production-of-salts-suggestion-1.docx) | **OCR Suggested Activity 2:** [Microscale copper sulfate synthesis](http://www.ocr.org.uk/Images/340544-pag-activity-chemistry-production-of-salts-suggestion-2.docx) | **Making soap**  e.g. CLEAPSS [‘Soap preparation – the microscale way’](https://www.youtube.com/watch?v=nkF712_NmeM)  (see also CLEAPSS [TL007](http://science.cleapss.org.uk/Resource-Info/TL007-Making-soap.aspx) – login required) |
| **Measuring rates of reaction**  Chem PAG 8  CombSci PAG C5 | **OCR Suggested Activity 1:** [Measuring the rate of reaction between Mg and HC*l*](http://www.ocr.org.uk/Images/351867-pag-activity-chemistry-measuring-rates-of-reaction-suggestion-1.docx) | **OCR Suggested Activity 2:** [The disappearing cross](http://www.ocr.org.uk/Images/323621-pag-activity-chemistry-measuring-rates-of-reaction-suggestion-2.docx) | **Rate of reaction between vinegar and chalk**  e.g. [A simple rates experiment](https://youtu.be/NzsHfzMlBUU) |
| **Reaction energetics:**  **OCR Suggested Activity 3:** [Investigating reaction energetics](http://www.ocr.org.uk/Images/360172-pag-activity-chemistry-measuring-rates-of-reaction-suggestion-3.docx) | **Reaction energetics:**  **OCR Suggested Activity 4:** [Heat of a displacement reaction](http://www.ocr.org.uk/Images/340535-pag-activity-chemistry-measuring-rates-of-reaction-suggestion-4.docx) |