

## Switching to OCR B (Salters) from AQA

### Introduction

We are really excited about our GCE Chemistry B (Salters) qualification. Whether taking on the AS Level or the full A Level, this fantastic course is a great qualification for those with an interest in the subject. Why choose Chemistry B (Salters)?

- Building on our existing popular course of over 20 years, the specification has been updated in consultation with teachers, higher education, learned societies, industry and heavily supported by the University of York Science Education group.
- Chemical concepts (Chemical Ideas) are taught in a spiral curriculum in the context of contemporary Chemical Storylines, underpinning the knowledge and understanding needed for the next generation of chemists.
- Chemistry B (Salters) is enjoyable to teach and learn, giving learners the essentials for chemistry-related higher education courses as well as many transferable, marketable skills, with a strong focus on practical skills and chemical literacy.
- The chemical concepts are clearly presented in the specification, with maths, How Science Works and practical opportunities highlighted throughout, supporting you in your teaching, and linked to our flexible practical assessment model.
- An integrated textbook is available, bringing together the Chemical Ideas and Chemical Storylines, with links to specially developed support resources available through our publishing partner.

### Textbook comparison

We have not included a textbook comparison in this switching document as there are a number of textbooks available for each exam board's qualifications, and the order and organisation of content within these textbooks can vary. However, similarities in content across exam boards mean that it is possible to use any textbook for the core content of any board's qualifications. The specification can be used to identify relevant content, as well as that which is not required for a specific qualification. If you need further clarification on any specific content, you can email our Subject Advisor team at [science@ocr.org.uk](mailto:science@ocr.org.uk).

## Support from OCR

We offer a range of support to teachers of our qualifications. This includes:

- A dedicated Subject Advisor team, with teaching and assessment experience, available to answer your queries and support your delivery of our qualifications. You can contact us by email at [science@ocr.org.uk](mailto:science@ocr.org.uk) or by phone on 01223 553998.
- Monthly newsletters highlighting new resources, CPD courses, and other news about our qualifications.
- An online scheme of work builder which helps you create a bespoke scheme of work using the extensive range of resources we have provided for each specification.
- A wide range of support materials, including handbooks covering practical and mathematical skills, delivery guides, lesson elements, practical activity suggestions, candidate exemplar resources, and more.
- Free access to ExamBuilder, our mock assessment service that allows you to create your own bespoke assessments.
- Termly regional Science Teacher Networks, giving you the opportunity to meet with other teachers and our Subject Advisors.
- CPD courses, including courses for teachers new to teaching our qualifications and courses on outcomes from previous examination series to help inform your teaching.
- You can also follow and interact with our Subject Advisors on Twitter ([@ocr\\_science](https://twitter.com/ocr_science)).

## Key differences

OCR Chemistry B (H033/H433)	AQA Chemistry (7404/7405)
<b>Practical skills take centre stage</b> , detailed in full at the start of the specification in a separate module for <b>clarity</b> and <b>prominence</b>	Required practical activities listed in the specification
<b>Flexible practical</b> assessment that allows you to use your own practical activities, those provided through our publishing partner or from our range of fully-detailed suggested activities.	A core set of 12 required practical activities.
The core chemical concepts covered in contemporary contexts with a strong focus on <b>practical skills</b> and <b>chemical literacy</b> development.	The core chemical concepts divided into Organic, Inorganic and Physical Chemistry.
<b>Clear labelling and organisation</b> of the learning outcomes in the specification	Chemistry content presented in unlabelled lists within sub-sections
<b>Extensive support for mathematical skills development</b> , with linking of skills in the specification and a dedicated Mathematical Skills Handbook.	Linking in the specification and outline suggestions of activities.
<b>All papers assess content from across all teaching modules</b> , providing a thorough test of a candidate's knowledge, understanding and skills.	Division of Organic, Inorganic and Physical Chemistry topics between the papers.
<b>Fewer marks in the AS and A Level assessments</b> , giving learners more time to develop their answers. (AS 140 marks in 180 minutes; A Level 270 marks in 360 minutes)	20 more marks in AS Level and 30 more marks in A Level compared to OCR Chemistry B.

## Content

One of the pillars of the [Chemistry B \(Salters\) specification](#) is that the qualification is taught in a 'context-led' manner. Everyday examples of chemistry in action, as well as modern industrial and other applications of chemistry, are used to set the scene in which the concepts are allowed to unfold.

The specification is divided into a series of modules that are designed to be taught through 'Storylines'. Each Storyline discusses a particular application or series of applications of chemistry. The Chemical Ideas are split across the modules to tie in naturally with the Storylines, rather than being split into related areas of content. This results in a 'spiral curriculum' in which areas of chemistry are revisited and reinforced throughout the course.

To exemplify this structure, the learning outcomes of the *Elements of life* Storyline can be summarised as the following journey from the creation of atoms in the Big Bang to quantitative analysis of solutions:

From the formation of hydrogen, then helium and ultimately the heavier elements in **nuclear fusion**, the Storyline moves on to **atomic structure** and then the fundamentals of **mass spectrometry**. The role of **electromagnetic radiation** in our analysis of star light is used to introduce the **quantum nature of energy** in atoms and their detailed **electronic structure** to the level of **orbitals**. We then move on to the story of the taming of the elements into the **Periodic Table** and our subsequent ability to make sense of the **trends in properties** of the elements. Returning to outer space, the nature of the interstellar gas clouds is used to introduce **covalent bonding** and **molecular shape**. Focussing then on a more human scale, the composition of the human body is used to introduce the **mole concept**, **relative masses**, and **amounts of substance** calculations. The nature of chemistry in our bodies such as in our bones and our nervous system provides the context for the **properties of ionic substances**, including **salt formation**, **structure** and **solubility**. The links between **structure and properties** is discussed in detail including **melting and boiling points**, **solubility** and **electrical conductivity**. Greater detail of **Group 1 and Group 2 elements** is then studied, looking at applications of the elements and compounds of the s-block and their property trends such as **first ionisation enthalpy**, **reactivity with water and oxygen**, and the **stability of the Group 2 carbonates**. Finally, the **basic** nature of **Group 2 oxides and hydroxide** leads into **acid–base chemistry** and the introduction of **titration techniques and calculations**.

From a Chemical Ideas point of view, the weaving of chemical concepts throughout the Storylines can be exemplified by looking at the development of the ideas of structure and properties of materials:

Firstly in *Elements of Life* the properties of **ionic substances in solution**, **ionic equations** and the **bonding in ionic, covalent and metallic substances** are studied. Next in *The Ozone Story*, **temporary and permanent dipoles** between molecules are studied in the context of haloalkanes, branching of alkanes and halogens. Further on in *The Ozone Story*, **hydrogen bonds** are studied in various contexts, including the properties of the hydrogen halides and alcohols. Next, *Polymers and Life* introduces the **bonding in protein structures**, leading on to **molecular recognition** in enzyme active sites. Finally, in *Colour By Design*, many aspects of structure and properties are summarised in the study of bonding dyes to fibres, covering **ionic, covalent, hydrogen and the dipole bonds**.

## Summary of content by Storyline

AS Topics / First year A Level Topics	Second year A Level topics
<b>Elements of life (EL)</b> atomic structure, atomic spectra and electron configurations fusion reactions mass spectrometry and isotopes the periodic table and Group 2 chemistry bonding and the shapes of molecules chemical equations and amount of substance (moles) ions: formulae, charge density, tests synthesis of soluble and insoluble salts titrations and titration calculations	<b>The chemical industry (CI)</b> aspects of nitrogen chemistry kinetics equilibrium and equilibrium constant calculations effects of factors on the rate and equilibrium yields of reactions; consideration of the best conditions for an industrial process analysis of costs, benefits and risks of industrial processes
<b>Developing fuels (DF)</b> thermochemistry organic chemistry: names and combustion of alkanes, alkenes, alcohols heterogeneous catalysis reactions of alkenes addition polymers electrophilic addition gas volume calculations shapes of organic molecules, $\sigma$ - and $\pi$ -bonds structural and <i>E/Z</i> isomers dealing with polluting gases	<b>Polymers and life (PL)</b> condensation polymers organic functional groups amines and amides acid–base equilibria amino acid and protein chemistry optical isomerism enzyme catalysis and molecular recognition the structure and function of DNA and RNA structural analysis
<b>Elements from the sea (ES)</b> halogen chemistry redox chemistry and electrolysis equilibrium and equilibrium constant atom economy	<b>Oceans (O)</b> dissolving and associated enthalpy changes the greenhouse effect acid–base equilibria and pH solubility products entropy

AS Topics / First year A Level Topics	Second year A Level topics
<p><b>The ozone story (OZ)</b></p> <p>composition by volume of gases</p> <p>the electromagnetic spectrum and the interaction of radiation with matter</p> <p>rates of reaction</p> <p>radical reactions</p> <p>intermolecular bonding</p> <p>haloalkanes</p> <p>nucleophilic substitution reactions</p> <p>the sustainability of the ozone layer</p>	<p><b>Developing metals (DM)</b></p> <p>redox titrations</p> <p>cells and electrode potentials</p> <p>d-block chemistry</p> <p>colorimetry</p>
<p><b>What's in a medicine (WM)</b></p> <p>the chemistry of the –OH group, phenols and alcohols</p> <p>carboxylic acids and esters</p> <p>mass spectrometry and IR spectroscopy</p> <p>organic synthesis, preparative techniques and thin layer chromatography</p> <p>green chemistry</p>	<p><b>Colour by design (CD)</b></p> <p>the chemical origins of colour in organic compounds</p> <p>aromatic compounds and their reactions</p> <p>dyes and dyeing</p> <p>diazonium compounds</p> <p>fats and oils</p> <p>gas–liquid chromatography</p> <p>carbonyl compounds and their reactions</p> <p>organic synthesis and polyfunctional compounds</p>

## Content in OCR Chemistry B not in AQA Chemistry:

- shapes of atomic orbitals
- fragmentation patterns in mass spectrometry
- s-block metal flame colours
- stabilities and decomposition of the group 2 metal carbonates
- properties and preparation of hydrogen halides
- iodine-thiosulfate titrations and calculations
- reaction of alcohols with hydrochloric acid
- azo dye formation
- carboxylic acid reactions with metals
- reactions of alkenes with hydrogen
- halogenation of aromatics
- sulfonation of aromatics
- Friedel-Crafts alkylation

- reactions of phenols
- properties and uses of phenols
- pharmacological activity of compounds
- identifying spontaneous changes from entropy data
- defining and using the term 'half-life'
- using kinetic data to propose steps in reaction mechanisms
- rusting and prevention (electrochemical explanations)

## **Content in AQA Chemistry not in OCR Chemistry B:**

- column chromatography
- halogens trend in electronegativity
- stereoisomerism in transition metal complexes
- explaining and predicting the stability of complex ions
- ligand substitution reactions in the transport of oxygen
- precipitation reactions as acid-base equilibria
- properties, bonding and structure of the period 3 oxides
- formation of carboxylic acids from acyl chlorides
- reaction of alcohols with  $\text{PCl}_5$
- formation of bromoalkanes from alcohols
- reduction of nitriles
- formation of secondary amines from amines
- formation of nitriles from amines
- reduction of carbonyl compounds to form alcohols
- reaction of carbonyl compounds with 2,4-DNP
- fermentation
- formation of alkenes from haloalkanes
- reaction of haloalkanes with cyanide ions
- reactions of phenols with bromine and dilute nitric acid
- transesterification
- using plane-polarised light to identify optical isomers
- fractional distillation of crude oil
- fuel additives
- relating properties of polymers to their uses
- Born-Haber cycles
- calculating free energy changes



- partial pressures
- $K_p$
- effect of changing concentration on value of  $K_c$
- effect of pH and ligands on transition metal redox potential
- hydrogen fuel cells
- simplified electrode reactions in a lithium cell

*Please note: the original specifications should be used as the definitive source of qualification content.*

## Assessment – AS Level

OCR Chemistry B (Salters) (H033)	AQA (7404)
<p><b>AS Paper 1: Foundations of chemistry</b>  <b>All teaching modules</b>            70 marks, 50% of AS Level            Written paper – 1 hour 30 minutes</p> <p>Section A: multiple choice questions, 20 marks.            Section B: includes short answer question styles (structured questions, problem solving, calculations, practical) and extended response questions, 50 marks.</p>	<p><b>AS Paper 1: Inorganic and Physical Chemistry: Sections 3.1.1–3.1.4, 3.1.6, 3.1.7, 3.2.1–3.2.3 and relevant practical skills</b>            80 marks, 50% of AS Level            Written paper – 1 hour 30 minutes</p> <p>65 marks of short and long answer questions; 15 marks of multiple choice questions.</p>
<p><b>AS Paper 2: Chemistry in depth</b>  <b>All teaching modules</b>            70 marks, 50% of AS Level            Written paper – 1 hour 30 minutes</p> <p>Includes short answer (structured questions, problem solving, calculations, practical) and extended response questions, including those marked using Level of Response mark schemes.</p>	<p><b>AS Paper 2: Organic and Physical Chemistry: Sections 3.1.2–3.1.6, 3.3.1–3.3.6 and relevant practical skills</b>            80 marks, 50% of AS Level            Written paper – 1 hour 30 minutes</p> <p>65 marks of short and long answer questions; 15 marks of multiple choice questions.</p>

## Assessment – A Level

OCR Chemistry B (Salters) (H433)	AQA (7405)
<p><b>A Level Paper 1: Fundamentals of chemistry: All teaching modules</b> 110 marks, 41% of A Level Written paper – 2 hours 15 minutes</p> <p>Section A: multiple choice questions, 30 marks.</p> <p>Section B: includes short answer question styles (structured questions, problem solving, calculations, practical) and extended response questions, 80 marks</p>	<p><b>A Level Paper 1: Inorganic and Physical Chemistry: Sections 3.1.1–3.1.4, 3.1.6–3.1.8, 3.1.10–3.1.12, 3.2 and relevant practical skills</b> 105 marks, 35% of A Level Written paper – 2 hours</p> <p>Short and long answer questions.</p>
<p><b>A Level Paper 2: Scientific literacy in chemistry: All teaching modules</b> 100 marks, 37% of A Level Written paper – 2 hours 15 minutes</p> <p>A particular emphasis is placed on scientific literacy and the exam paper includes a pre-release Advance Notice article worth 20 to 25 marks. Question styles include short answer (structured questions, problem solving, calculations, practical) and extended response questions.</p>	<p><b>A Level Paper 2: Organic and Physical Chemistry: Sections 3.1.2–3.1.6, 3.1.9, 3.3 and relevant practical skills</b> 105 marks, 35% of A Level Written paper – 2 hours</p> <p>Short and long answer questions.</p>

OCR Chemistry B (Salters) (H433)	AQA (7405)
<p><b>A Level Paper 3: Practical skills in chemistry: All teaching modules</b> 60 marks, 22% of A Level Written paper – 1 hour</p> <p>A particular emphasis is placed on practical skills and the exam paper includes a practical insert. Question styles include short answer (structured questions, problem solving, calculations, practical) and extended response questions.</p>	<p><b>A Level Paper 3: Chemistry: Any content and any practical skills</b> 90 marks, 30% of A Level Written paper – 2 hours</p> <p>Practical techniques and data analysis, 40 marks. Questions testing across the specification, 20 marks. Multiple choice questions, 30 marks.</p>
<p><b>Practical Endorsement in chemistry</b> Separately reported non–exam assessment, with candidates demonstrating competence in a range of skills and techniques, in a minimum of 12 assessed practical activities. Teacher assessment against the Common Practical Assessment Criteria.</p>	<p><b>Practical Endorsement in chemistry</b> Separately reported non–exam assessment, with candidates demonstrating competence in a range of skills and techniques, in a minimum of 12 assessed practical activities. Teacher assessment against the Common Practical Assessment Criteria.</p>

## Want to switch to OCR?

If you're an OCR-approved centre, all you need to do is download the specification and start teaching.

Your exams officer can complete an [expression of interest form](#) which enables us to provide appropriate support to them. When you're ready to enter your students, you just need to speak to your exams officer to:

1. Make estimated entries by 10 October so we can send you any early release materials, prepare the question papers and ensure we've got enough examiners.
2. Make final entries by 21 February

If you are not already an OCR-approved centre please refer your exams officer to the [centre approval section](#) of our admin guide.

## Practical Endorsement Administration (A Level only)

The requirements for the Practical Endorsement have been set by the Department for Education and Ofqual working with all awarding bodies to ensure a common approach. Just as when following the AQA A Level Chemistry qualification, your A Level learners studying OCR Chemistry B (Salters) will need to demonstrate to you, their teacher(s), that they are competent in each of the skills and techniques defined for A Level chemists, and are consistently and routinely demonstrating competence against the Common Practical Assessment Criteria (CPAC).

You will need to:

- Keep records of carrying out practical activities as well as your assessment of competence of each of your learners in each of these skills and techniques. This can be done using our popular [OCR PAG tracker spreadsheet](#). Centres have found the tracker helpful and easy to use, and updated improved versions are available from September 2016.
- Designate a 'Lead Teacher' who will need to make sure that they have completed the [online Lead Teacher training](#)
- Email us at [science@ocr.org.uk](mailto:science@ocr.org.uk) to let us know you've started teaching the qualification. This will make sure we have up-to-date information on your centre for planning monitoring visits. When a monitoring visit takes place at your centre for Chemistry it will be carried out by an OCR-appointed monitor applying the criteria

agreed across all awarding organisations. Up-to-date details on the monitoring process are available on the [Positive about practical](#) page.

Students need to keep records of their practical work, which can be done in whatever format best suits you and your learners, be it a lab book, a loose leaf folder or an electronic record. Help, guidance and training are available from our [Positive about practical page](#).

## Next steps

1. Familiarise yourself with the specification, sample assessment materials and teaching resources on the [OCR Chemistry B \(Salters\)](#) qualification page (Assessment Preparation) of the OCR website.
2. Browse the [online delivery guides](#) for teaching ideas and use the [Scheme of work builder](#) to create your personal scheme of work.
3. Speak to your exams officer to [get a login](#) for our secure extranet, [Interchange](#) – this allows you to access the latest past/practice papers and use our results analysis service, [Active Results](#).
4. Sign up to receive [subject updates](#) by email.
5. Sign up to attend a [training event](#) or take part in webinars on specific topics running throughout the year or our Q&A webinar sessions every half term.
6. Attend one of our free teacher network events that are run in each English region every term. These are hosted at the end of the school day in a school or college, with teachers sharing good practice and Subject Advisors on hand to lead discussion and answer questions.
7. Follow us on Twitter ([@ocr\\_science](#)) where you can have discussions with other teachers and OCR Subject Advisors, and where new resources are developed and posted first.