

**AN EXCITING
CAREER AHEAD.**

AFTER SCHOOL

CHEMISTRY
**MAKING THE
DIFFERENCE.**

WHAT IS CHEMISTRY?

From the moment you're born you're surrounded by chemistry – the air you breathe, the food you eat and the clothes you wear – they're all chemistry. Chemistry is the study of substances: what they're made of, how they interact with each other and the role they play in living things.

From research in space to the depths of the oceans, chemistry helps you understand the world around you. Chemistry also forms the basis of other related subjects such as:

- environmental chemistry – understanding and solving challenges such as climate change, pollution or waste management on a molecular level
- materials chemistry – looking at the chemical structure of materials and using this knowledge to develop the materials of the future
- chemical engineering – producing chemical products on an industrial scale
- biological sciences – such as biochemistry, molecular biology and pharmacology

For the latest information check out the Royal Society of Chemistry's chemistry careers website, A Future in Chemistry: [rsc.li/future](https://www.rsc.li/future)

USE CHEMISTRY TO MAKE THE DIFFERENCE.

Chemists make a difference! Breakthroughs in chemistry impact our everyday lives and chemists play an important role in shaping the world around us, solving big problems and changing lives through new medicines and materials, as well as fixing the future with sustainable energy sources.

START WITH CHEMISTRY – END UP CHANGING THE WORLD.



WHY STUDY CHEMISTRY?

Chemistry-based jobs are interesting and rewarding with many opportunities available in research, education, field work and other industries you might not have thought of.

Lots of trained chemists work outside traditional chemistry careers because chemistry is all around us, and the skills you develop from a chemistry qualification can be applied to many areas of expertise.

REASONS TO STUDY CHEMISTRY

- it helps you to be analytical and logical
- you can apply chemistry to lots of different subjects, so it gives you a great foundation
- it's a core subject that enables you to cross over to the other core sciences or venture into biochemistry, geochemistry, chemical engineering or physical chemistry
- it can lead to a wide variety of careers
- you just love chemistry!

CHEMISTRY DEVELOPING YOUR SKILLS

Whatever your plans for the future, having a chemistry qualification could really help. It will increase your scientific knowledge. It will help you understand why and how things happen. It will give you practical hands-on experience. You'll also gain important skills that are sought after by all kinds of employers.

Chemistry is central to many of the major industrial sectors and employers, such as pharmaceuticals, healthcare, biotechnology, agri-food and the green economy.

In the future people will be needed who are good at explaining how things work and solving the chemical, biological and engineering challenges in these sectors. There will be a demand for people who can design and develop products for a better future. A qualification in chemistry gives you these skills and will be a valuable asset.

Chemical science graduates possess an excellent range of skills including problem solving, logical thinking, data handling and analysis, team working, report writing and laboratory techniques. These skills can open the door to a huge range of job opportunities.

However, it's making sure you stand out from the crowd by developing your skills that will ensure you get the job you want. You can gain these skills, as well as on-the-job experience, by doing a work-based qualification.

If you're interested in seeing where previous chemical science graduates have found employment, read *What do graduates do?* prospects.ac.uk/careers-advice/what-can-i-do-with-my-degree/chemistry

Find out about work-based chemistry qualifications and apprenticeships at: rsc.li/earn-while-you-learn

TILLY WOODLAND

ANALYTICAL CHEMIST, OWLSTONE MEDICAL

"Chemistry gave me a direction when I didn't really know what I wanted to do.

I'm very proud to be a chemist. When people ask me what I do for my job and I tell them that we're working towards the diagnosis of diseases like asthma and cancer, they all say 'wow' because they can tell that it's such a world-changing thing to be involved in."



EMPLOYABILITY AND EARNING.

Independent research shows that chemistry graduates have a high employment rate. If you want to find out more about salaries in a particular career area, current job advertisements are a good source of information.

Career websites and magazines focusing on topics relevant to your area of interest are good places to start.

Remember that salaries depend on a large number of factors, including qualifications required, location, experience, size and type of the organisation.

The 2018/19 *What Do Graduates Do?* report showed that the highest starting salaries for chemistry graduates six months after graduation was £27,500. This compares to the UK average starting salary of £22,399.

Over 70% of chemistry students entered a professional or managerial role after graduation, with double the UK average going onto further study.

The Royal Society of Chemistry's 2019 *Pay & Reward Survey* showed a median salary of £45,500 for member-respondents*. Members with PhDs showed higher earning potential during their career over other qualifications.

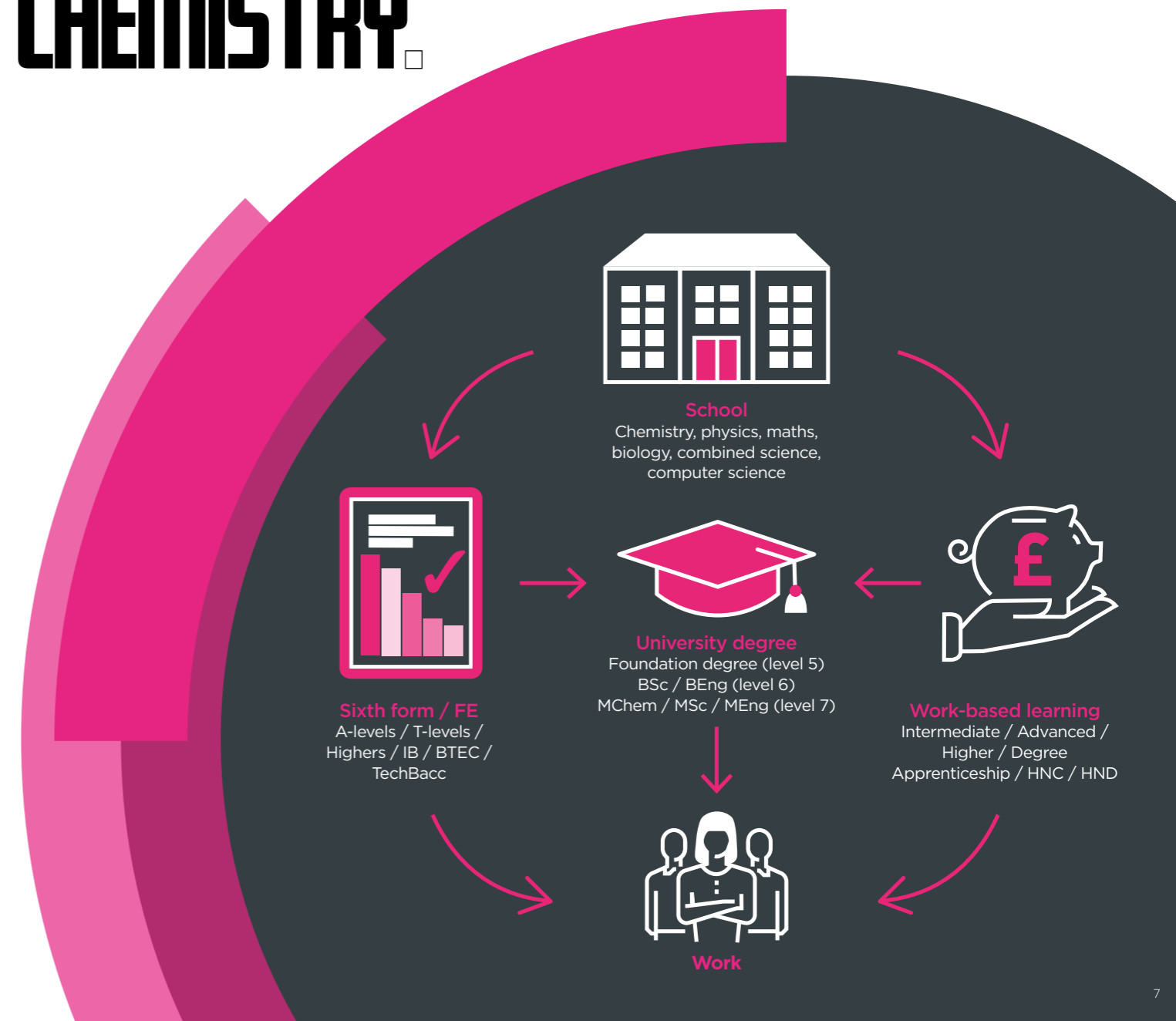
USEFUL WEBSITES.

Chemistry World Jobs
jobs.chemistryworld.com

What do graduates do?
luminate.prospects.ac.uk/what-do-graduates-do

* Results based on 6,194 members of the Royal Society of Chemistry who responded to the 2019 survey with profiles representative of current membership.

GETTING INTO CHEMISTRY.



CHEMISTRY. SHAPING YOUR FUTURE.

WHAT DO I NEED TO DO NEXT?

To give you the best options for a future in chemistry, study as much science and maths as you can while at school. Discuss your options with your teachers and see what's right for you:

- ask what science courses are available at your school.
- ask what the different courses involve.

You can also start thinking about your future in chemistry by asking the careers adviser at your school for advice and answers to any of your careers questions, or by visiting [rsc.li/future](https://www.rsc.li/future)

Chemistry, biology, physics and maths are some of the subjects that appear most often in university entry requirements for a variety of courses. So if you're undecided about your future plans, studying chemistry and other sciences can help you keep your options open.

Remember, if you decide not to continue with chemistry in the future, having a good knowledge of science and maths is useful for a wide range of careers, even outside of science.

WORK EXPERIENCE.

If you're interested in working in chemistry, why not try and get work experience during the school / college holidays? See our top tips for finding work experience on *A Future in Chemistry*. [rsc.li/work-experience](https://www.rsc.li/work-experience)



CLAIRE SZUSTER
BIOANALYTICAL SCIENTIST, LGC

"I studied forensic and analytical chemistry at university and I knew that I wanted to work within a science field but I didn't really know what. All I knew was that I wanted to help people and that chemistry gave me the opportunity to do just that."

OPTIONS AFTER SCHOOL

The two most common routes into a career in chemistry are studying it at university and work-based learning, such as an apprenticeship.

The first step is to choose a qualification in either chemistry or another subject with a lot of chemistry content. Maths is a good subject to study alongside chemistry at any level, as a good understanding of maths will always help. A maths qualification is a requirement for some chemistry degrees.

The different options can be confusing but each offers a different way to learn. Some options are also suitable if you're thinking about retraining for a career in chemistry, or if you didn't choose the right subjects or get the grades you needed.

STUDYING AT UNIVERSITY

There are a huge number of chemistry and related science courses available, but before you decide to study any subject, you should find out what the course will involve. Course content and length will vary at each university and you need to make sure you pick the right fit for you. You can do this by reading different university websites for course information, visiting universities on open days, contacting admissions tutors or speaking to someone already doing a similar course. You can also ask a teacher or careers adviser. This will help you make a more informed decision about which courses to apply for.

CHEMISTRY DEGREES:

- take three to four years to complete
- offer in-depth training in both theoretical and practical chemistry
- often allow students to specialise in a particular field of chemistry in the final years of the programme.

WHICH DEGREE?

There is no single 'best' course and it's important that you choose the right university and course for you.

Choosing a course is only part of the challenge – the university also has to be right for you. Once you've drawn up a shortlist of courses, make sure you try to visit the universities to get a feel for what living and studying there will be like. While there are plenty of online resources, attending open days is the only way to experience the campus atmosphere, see the facilities and discuss the courses in detail with staff and current students. Remember: you'll be there for three or four years so it's important to make the choice that's best for you.

If you're planning to specialise early make sure you're really interested in the area and the career paths that the subject leads to.



WHAT ARE THE ENTRY REQUIREMENTS FOR DOING A CHEMISTRY DEGREE?

These vary between universities and some courses are more competitive than others so require higher grades. The UCAS website [ucas.com](https://www.ucas.com) has a comprehensive database of courses available and their entry requirements.

A different points system is used in the Republic of Ireland. Details are provided on the Central Applications Office website ([cao.ie](https://www.cao.ie)).

DO I NEED MATHS TO STUDY CHEMISTRY AT UNIVERSITY?

Maths is an extremely important part of nearly all chemistry degree courses. However, an A-level (or equivalent) in maths isn't always an entry requirement. You may need to take a course in maths once you reach university, and most universities will provide additional maths support during your degree.

ACCREDITED COURSES

If you're looking for a degree programme with a lot of chemistry content, check which courses are accredited by the Royal Society of Chemistry. By choosing an accredited degree, you can be confident you're getting a high quality education that will provide you with the right skills for future employment.

[rsc.li/accredited-courses](https://www.rsc.li/accredited-courses)

CHOOSING A UNIVERSITY

Your choice depends on what your preferences are in terms of level, location and course content. There are likely to be many institutions close to home that offer chemistry and closely related courses at degree level.

It's also possible for you to study in other countries. This can be a rewarding experience but do your research first. There's a lot of useful material online that can help you make the right choice. International students can also study in the UK and there's information on our website for students wanting to study chemistry.

Of course, no one university suits everyone. Some things you should consider when choosing a university are:

- the courses available and entry requirements
- the location
- whether it's a campus or city university
- the accommodation options and costs
- the number of students at the university and on the course.

For help choosing a degree visit our website.
[rsc.li/going-university](https://www.rsc.li/going-university)



CELINE MOREIRA
ANALYTICAL TECHNICIAN, POLYMATERIA

"I chose to study chemistry because it's a very complex subject and it's a subject that always makes you think and it challenges you and I love a challenge."

THE BENEFITS OF WORK-BASED QUALIFICATIONS

Work-based qualifications are designed with the help of employers, meaning you'll develop the skills and knowledge that employers look for.

Your qualification and work experience will also help you stand out in the eyes of future employers. Work-based qualifications have no age restrictions. Entry requirements vary so having the right subjects or grades isn't always an issue. If you have a learning disability the entry requirements can usually be adapted – speak to a training provider, teacher or careers adviser to find out more.

These qualifications are suited to students who can manage work and study and want to earn while they learn.

APPRENTICESHIPS

A nationally recognised qualification such as an Advanced Level Apprenticeship which you can take after GCSEs or equivalent or a Higher Apprenticeship (England and Wales) for those with A-levels or equivalent. Apprentices do not pay fees towards their qualification as you would with a university degree. They're also paid at least the minimum wage for apprentices (£4.15 p/h from April 2020), although those in science-related roles are usually paid more.

HIGHER NATIONAL CERTIFICATES (HNCs) AND HIGHER NATIONAL DIPLOMAS (HNDs)

Work-related qualifications designed alongside industry partners to ensure students gain the skills and knowledge employers want. Chemistry-related courses include analytical science, applied science and chemical science for industry.

FOUNDATION DEGREES

Work-based qualifications offered by universities and other higher education establishments available in areas such as applied chemistry, analytical chemistry, forensic science and pharmaceutical science. They take two years to complete full-time (some can be studied part-time) and can be used to enter undergraduate study.

For more information about your different options, how to apply for them, and what you could be doing as an apprentice in chemistry visit [rsc.li/earn-while-you-learn](https://www.rsc.li/earn-while-you-learn)

JOSEPH GOODWIN

LABORATORY ANALYST AND HIGHER DEGREE APPRENTICE, THAMES WATER

"I'm working towards a chemistry degree which goes well with my job. I get to do the practical aspect at work and then the theoretical aspect at university. I also get on-the-job training while getting paid to do this."



CHEMIST PROFILES

HOLLY CARTER

ASSOCIATE SCIENTIST, ASTRAZENECA

"The chemistry I do means that I can develop medicines that will make a life-changing difference. I started at AstraZeneca through an apprenticeship scheme. This involves working at AstraZeneca alongside studying for my degree in chemical science. The apprenticeship scheme works for me because I'm quite a practical person. I learn from doing things, not necessarily sitting and learning from a textbook. So being able to go into the lab and work and understand how things work is a lot better for me.

Although I'm just one person in such a huge company, the difference that I do in my job can make a difference to the people who need it."



CHARLES RENNEY

PATENT ATTORNEY, ABEL & IMRAY

"The thing that motivates me in my job, is that as a patent attorney you have a real impact on bringing new inventions to market which can change people's lives and wellbeing.

I studied chemistry at university, and this is what ultimately led me on to a career as a patent attorney as it was able to provide me with some exposure to research but outside the lab.

Abel & Imray helps get legal protection for new inventions for companies and inventors. A patent will allow them to get protection for their product and prevent others from making and selling that product for a short period of time. One day I may be out meeting an inventor to discuss their new inventions. Another day I may be at the European patent office defending a client's patent."

CHEMIST PROFILES

MARIAM KHALFEY

DEVELOPMENT CHEMIST, DOMINO PRINTING SCIENCES

"I'm really proud to be a chemist. I feel really valued at work and I feel that I make a difference.

We make inks and we make printers which allow our customers to print labels, to print 'best before' dates on their products. So this could be anything from make-up to your favourite drink, even to eggs.

Printing on food packing is really important because if you're allergic to, let's say, nuts that's in your favourite chocolate spread and you can't eat it, then our printers and our inks allow our customers to print on that product to let you know what is safe and what isn't safe for you to eat."



LEWIS HUDSPITH

RESEARCH ASSISTANT, OWLSTONE MEDICAL

"I spend a lot of time in the lab. I'm working on TD GC-MS instruments, which are how we analyse our breath samples, separate the breath into its individual components and analyse potential biomarkers for disease.

Every day brings something new and it's a very fast-paced environment where I'm constantly learning and I feel like I'm actually making a difference to the world of medicine and disease detection as well, as we're working on really cutting-edge science here. It's a really exciting place to be."

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