

Engaging young people with a career in chemistry

Sharing best practice and
guidance on working with
young and vulnerable adults

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“I became keen to help inspire the next generation of future scientists showing them it is possible to transfer the key skills learned in school to the workplace. I do indeed get a lot of enjoyment out of STEM and just wish I had joined up earlier.”

Nigel Gill CSci CChem FRSC



Outline purpose of this booklet

This guide is intended to support and enhance the work you do with young people and share best practice with other members volunteering in schools.

It will give you some new ways to inspire the next generation and demonstrate the presence chemistry has in everyday life.

Volunteering in schools is an excellent way to develop your professional skills. We recognise volunteering as a form of continuous professional development and it can also help you gain professional registration.

Your activities not only give young people an opportunity to learn about working in the chemical sciences - they also help schools in England meet the Gatsby Benchmarks through employer or employee encounters.

Research from the Education and Employers Taskforce shows that a young person who has four or more meaningful encounters with an employer is 86% less likely to be unemployed or not in education or training and can earn up to 22% more during their career.

Preparation

Giving a presentation, running a practical activity or attending a careers fair are valuable ways to raise awareness in young people about where chemistry can lead.

Think about:

1. What is the aim?

Work with the teacher or science lead to establish specific outcomes, understand how much they already know and when they are making their study choices. Good communication with the school is key. Visiting the school/venue can also be helpful.

2. Who are the audience?

Consider their ages and abilities. Link to what they are currently learning at school and show the real-world applications through your own work. Consider any adjustments – having a few activities with components that can be easily tailored to ability, age or knowledge is helpful.

3. What will you need for your activity?

Consider where you will be delivering the activity. Portable or low-key activities that can be delivered anywhere with re-useable components that you have access to everyday will be more convenient. Having a checklist, a few stock presentations and keeping a box of materials for each activity is practical. Ask us about the resources we have freely available.

4. How much time do you have?

Consider how to best use the time. A short but interactive presentation giving context, background and introducing yourself, your career story and the purpose of the event will engage students, manage expectations and set professional boundaries.

5. Maximising student engagement

Running practical activities that are interactive is the best way to engage students and makes them feel part of the activity. Most of all make it fun, be enthusiastic and informative!

“Delivering activities in schools is not something you can easily wing, and if the children are not impressed they will let you know about it! I create activities that can be adapted so I can re-use the materials. For younger children or less able, I might guide them through the activity, whereas for older children or more able, I might give them a worksheet or ask additional questions.”

Anisha Wijeyesekera MRSC

Why chemistry?

Chemistry saves lives and makes a difference. It is at the centre of everything we can see, smell, touch and taste.

Chemistry can help you understand how the world around you works, how things are made and where you stand on important topics that shape our lives.

Chemistry helps solve the world's biggest challenges, saves lives through medicines and solve crimes through forensics.

Chemistry helps feed the world and protects and cleans up our environment for future generations.

Chemistry teaches you skills such as problem solving and logical thinking that open up lots of career options.


Flexible study routes allow students to shape their paths through work and study.

“It can be easy when you do science every day to forget how amazing science is and when you have to explain to younger kids you can take a step back and realise what you do is really cool.”

Sarah Bucknell
CSci CChem MRSC

“Make the audience see your enthusiasm and knowledge of the topic you are delivering – share with them a story of your experience and what you learned even if the outcome was not as expected.”

Nigel Gill CSci CChem FRSC



Visit [edu.rsc.org](https://www.edu.rsc.org) to access various education resources, ideas and worksheets including experiments about protecting astronauts from the effects of harmful UV light, investigating why boiling water freezes quicker than cold water and other activities linked to UK curricula

On the day – top tips to engage students

We asked a few members who are STEM ambassadors to share their top tips with us:

- Be enthusiastic about science and your work! Be mindful about the level of science you're using – it's easy to slip into terms that aren't suitable for a classroom.
- Discuss what inspired you to choose your career path and talk positively about what you enjoy about your job, if you're proud of your work, what your organisation does and why it's important. Personal stories go down well so share your successes and failures. They will be interested in what you have to say and what you do.
- Talk about the skills you use at work and the skills they are using during the activity. These can be soft or technical skills such as teamwork, communication etc.
- Get practical! With the necessary Personal Protective Equipment (PPE), encourage students to get involved and perform the task with your support (as needed). Talk through the equipment or samples and what they are used for.
- Involve and engage the audience by asking them open questions about the activity.
- Bring in any leaflets, samples, props or academic posters to make it tangible. Don't share business cards or contact details.
- Ask for volunteers when working with larger groups to help engage with smaller groups or individuals.
- Explain 1-to-1 with students who are unsure.
- Avoid acronyms!
- When using examples reference current and diverse ranges of chemical scientists (see 175 faces of chemistry).
- When doing an activity with a broader range of ages choose an activity that can have several levels to it so you can scale it up or down depending on the age of the students you're talking to.
- You may end up talking with parents who have their own opinions at careers fairs so bear in mind that you may need to engage with adults as well as students.

"I love the enthusiasm that school pupils have to get involved 'hands-on' – to me personally that is where the real learning begins."

Nigel Gill CSci CChem FRSC

Working with children and vulnerable adults

When you are working with children and vulnerable adults, while issues are rare, it is still important to be aware of the latest safeguarding practices and procedures.

The following information supplements the training you should have received through STEM Learning or another school engagement scheme. It is not intended to be authoritative and seeks to create a safe, productive environment for yourself and the individuals.

- **Never be alone with children and vulnerable adults.** Ensure that whenever practicable the persons who are normally responsible for the children and vulnerable adults (teachers, parents, carers, guardians, etc.) or another adult is always present during activities.
- **Treat all children and vulnerable adults equally and with respect.** Bear in mind that someone else might misinterpret your actions, no matter how well intentioned.
- **Set professional boundaries, dress appropriately and act as a role model** of good and appropriate behaviour and language.
- **Don't touch.** Be aware that any physical contact with a child or vulnerable adult may be misinterpreted and so must be avoided whenever possible. In any emergency call a first aider or teacher to assist.
- **Don't take photographs of children and vulnerable adults or post on social media** without the express permission of their school, parents, carers, or guardians.
- **Don't share or request any personal information.** Any follow up contact should be done through the school with permission from their parent or guardian.
- **Never be under the influence of alcohol or other substances when working on activities.**
- **Don't assume it could never happen to you,** or rely on your good standing with a school or teacher to protect you.
- **Challenge unacceptable behaviours** and report all allegations and/or suspicions of abuse. Don't let any allegations made go unrecorded, or if you have concerns about any information shared with you then report it to a teacher or youth worker.
- **Use staff toilets** not student toilets.

If you have any queries about working with children or the latest policies you can seek advice from STEM Learning, your school engagement scheme or from us (safeguarding@rsc.org).

Requests for work experience

Work experience, shadowing or placements should **always** be arranged through the school. It is not your responsibility to arrange or provide work experience but you can highlight if your employer offers work experience to school children.

The information below can be shared with schools to enable them to find suitable experience;

- Schools can register with the Careers & Enterprise Company and their network of Enterprise Coordinators and Advisers who can connect them with local employers.

- Contact your Local Enterprise Partnership
- Contact local businesses directly or University outreach teams to see what they can offer.
- Other information and tips: **[rsc.li/work-experience](https://www.rsc.li/work-experience)**

“Sessions that have had the most benefit include CV and interview preparation – showing the class the structure and layout of a typical CV they found a real eye-opener but very informative.”

Nigel Gill
CSci CChem FRSC

Evaluating your activities

It is good practice to assess the impact of your work to inform future activities for yourself, peers and the school.

Ask students and teachers for their thoughts through a show of hands or questions about how inspired they felt, the overall level of understanding, how

interested they were and if they learnt something new. Shadowing or being shadowed by a peer for their feedback can also be useful.

“Last year STEM Learning ran a Future Learn online course which was useful. I also did People Like Me WISE training. It was really interesting and highlighted different resources, the way you think about bias and what your skills are.”

Sarah Bucknell
CSci CChem MRSC

“You need some sort of practical element because that means that everyone can get involved or you can rotate who is at the front. It’s important to signpost what it is you’re trying to achieve from the activity because if they understand what they’re trying to learn then they get more out of it. You have to find the activity exciting yourself so you can deliver in an exciting manner.”

Sarah Bucknell
CSci CChem MRSC



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Case Studies



Nigel Gill
CSci CChem FRSC

I'm a Process Specialist for Chemical Processing within the Rolls-Royce Inchinnan Civil Services covering chemical cleaning, descaling, pre-penetrant etching and paint processes in addition to my site role as RP (Responsible Person) for process safety management.

As a Fellow of the Royal Society of Chemistry (FRSC), and with Rolls-Royce active in this field, I became keen to help inspire the next generation of future scientists showing them it is possible to transfer the key skills learned in school to the workplace. I do indeed get a lot of enjoyment out of STEM and just wish I had joined up earlier.

I get involved a lot in supporting the classroom syllabus with 'hands-on' practical chemical analysis that reinforces the key topics being learned. I have had a lot of fun working with pupils performing manual titrations to explain acid-base titrations, showing them automated titration equipment, giving

simplified explanations of how Karl Fischer titration works for water content analysis, in addition to discussing the environmental aspects of our business. I normally talk through what the pipettes, burettes, and associated equipment we use is actually used for and what its' function is. I ensure they have the necessary PPE on and get the audience to perform the task with your full support - this really gets them involved!

I try to emphasise the key messages of health and safety, environmental considerations in addition to demonstrating chemistry in the classroom can lead to the workplace - it did for me!

I love to leave a session feeling that it was informative, worthwhile, enhanced their learning but showed that all the skills they are learning in the classroom are all transferable to many areas of the chemical sciences and that STEM sessions in particular should be fun and enjoyable.



Anisha Wijeyesekera

MRSC

I'm a lecturer in the Department of Food and Nutritional Sciences at the University of Reading. I convene the Fundamental Biochemistry in Food and Nutrition undergraduate module and the Microbes in Health and Disease postgraduate module.

I was interested in Science at school but had no idea of career opportunities. I feel that if there had been visits from STEM ambassadors or some interaction with scientists who applied what we were learning in their day-to-day jobs, then it would have helped me to identify potential career paths much earlier - I went to University not having a clue what I could do when I graduated!

I enjoy being able to share my journey and potentially inspire a future generation of scientists. I absolutely love (the sometimes very frank) questions and think it's so important to do this and pique curiosity, and provide young people with a much better insight into what science careers are actually like as opposed to what they may have perceived based on TV/films or didn't have any awareness of at all.

I think one of the most important points is to highlight that the chemical sciences are all around us! An activity needs to appeal in order for your audience to want to engage with it. I always use lab supplies for the practical activities I run. I think it's great to give people an opportunity to handle analytical laboratory equipment.

I have run activities with small groups of children in classrooms, to large groups of students in the lab, as well as thousands of people in a tent but my favourite experience was running an activity as part of Imperial College's Imperial Festival. This is an annual event where you get to talk to the general public about your work and research. I enjoyed it as the people who attend are genuinely so interested in science (and sometimes ask many unexpected questions) but also, the whole place was buzzing with activity so it's a great atmosphere. Conducting outreach activities is extremely rewarding but also can be absolutely exhausting!

Case Study



Sarah Bucknell
CSci CChem MRSC

I'm a medicinal chemist in the biotech industry. One of the best parts of being an ambassador is when someone gets it and is so excited about what you're telling them.

It can be easy when you do science every day to forget how amazing science is and when you have to explain to younger kids you can take a step back and realise what you do is really cool. It's really motivational. School science doesn't really cover careers at all so this helps open the student's eyes to the possibilities of what they can do.

I have done 'chemistry at work' days where we run the session with a whole year group. The school will act as a host and small groups of schools from the local area visit to attend various workshops. It's important to link the workshops to the curriculum and what they're currently learning. We also talk to students about what we do every day as the careers aspect. I have also been involved with the Big Bang Fair running a stand and activities for kids on behalf of the organisation I work for.

Personally, the CChem attribute aspect was initially why I started and I also realised that there is a soft skills aspect. If you're ad-libbing in front of a group it can be daunting but the more I do the better I become at presenting. There is also the altruistic aspect of giving back. If I can inspire one person in the group I'm talking to then that's good.

I like my aspirin activity where students build molecules with Molymod® kits and they get so excited. For the Big Bang Fair we were using Google Cardboard as a colleague had written an app that showcased the molecules and receptors. The kids saw the 3D VR of what we were trying to explain.

If you are new to volunteering then I'd recommend going along with someone more experienced to learn how they run things. It's always good to take advice and feedback from others. If you're going to a new school then ask the teachers about the kids beforehand. I've been to schools during Ramadan when they're fasting and their attention might be less than you'd expected. If you don't ask then you may not have been aware.

Event planning checklist

- ✓ What are the aims of the engagement for the teachers, students, yourself?
- ✓ How many students will be involved, how many sessions are you doing, how long is each session, how old are the students and what ability are they?
- ✓ What activity and format will be most suitable for what is being asked?
- ✓ What type of space have you been provided with (lab/classroom/table top in a hall)?
- ✓ How interactive and hands-on is your activity? Does it include a prop?
- ✓ Does your presentation allow students to ask questions? Do you have questions in mind to ask them?
- ✓ How adaptable is your activity? Can it be shortened/extended last minute?
- ✓ What resources and materials are required? Does the school need to provide anything? Can you use a USB or will you need to email the presentation in advance?
- ✓ Are your materials suitable for all audiences?
- ✓ Is a risk assessment required? Will you need to show your DBS number/form on arrival?
- ✓ How much time do you need to set up and pack down? Can the venue support you with this?
- ✓ What time are you expected and is parking available?
- ✓ Does the school know that you are expecting the students to be accompanied at all times?
- ✓ Is there anything that you need to know about the venue or audience in advance?
- ✓ Who is the main/emergency contact for the school/venue?
- ✓ When working with other volunteers, are you clear on what each person's role is and that you are not repeating the same information?
- ✓ Will you be recording audio, video or taking pictures or any other information? Check what is permitted with the venue and whether you need photo permission forms.



Getting involved

Our resources

- Education, teaching and learning resources and ideas linked to UK curricula edu.rsc.org
- Find your local Education Coordinator who can provide advice and support edu.rsc.org/our-work/regional-support/education-coordinators
- Outreach activities and opportunities rsc.li/outreach
- A Future in Chemistry careers website rsc.li/future-in-chemistry
- Downloadable schools presentation to show the value of chemistry and various career pathways www.rsc.org/campaigning-outreach/outreach/future-of-career-guidance/
- Print materials including career booklets, posters and postcards available on request education@rsc.org
- 175 faces of chemistry rsc.li/175faces

Other useful links

Become a STEM Ambassador and access STEM Learning resources
www.stem.org.uk/stem-ambassadors

Wise campaign for women in STEM
www.wisecampaign.org.uk/what-we-do/expertise

National Centre for Public Engagement
www.publicengagement.ac.uk/do-engagement/planning

Gatsby Career Benchmarks
www.gatsby.org.uk/education/focus-areas/good-career-guidance



Get in touch

For support, resources and information about careers in chemistry **careers@rsc.org**

For help working with children and safeguarding **safeguarding@rsc.org**

To share your volunteering story with us and the community **pressoffice@rsc.org**

www.rsc.org

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