



Royal Society of Chemistry Support for mentors



Acknowledgements:

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Section 1: The role of a mentor

Good mentors inspire their mentees with the confidence to keep improving.

In any mentor-mentee relationship, trust is key.

“Feeling able to speak realistically ... without fear of judgement or condemnation [as well as the] ability to celebrate and laugh together, and availability, are important. Simply knowing that the mentor is there for support can prove reassuring.”

Trust is gained when it is clear the mentor wants the best for the mentee.

“As a mentor, it’s important to listen and not be too quick to give advice. The relationship is absolutely not about making your mentee into another version of you. It’s about using your experience to help them become the best version of themselves.”

Similarly, the relationship is always about helping mentees, and should never be seen as a corporate accountability exercise.

How to establish a productive mentoring relationship

When you’re preparing to become a mentor, it’s important to find out as much as you can about your mentee’s background and what makes them ‘tick’ to gain the best insight into their professional practice.

Using the right tone and establishing mutual trust in the very first meeting is vital for a productive relationship between mentor and mentee, so make sure to smile, use open body language and project an attitude of expectancy and cooperation.

Keep the meeting informal, clearly explain the reasons behind the mentoring programme and give your mentee the opportunity to discuss any worries or concerns they might have right at the start.

It’s also useful to establish ground rules and expectations early. Question what your mentee hopes to gain from their mentoring sessions and really pay attention to their response.

In addition, discuss and agree with your mentees how often you’ll meet, who else (if anyone) will know the details of the meetings and exactly what support mentors will offer. For example: observations or joint planning.

“I acknowledge as a mentor that I don’t have all the answers and cannot always prescribe solutions. I will pass on ideas and suggestions, which come from experience, and together we look to reflect on how to become better teachers.”

Top tips for optimising your mentoring sessions

1. Get the balance right in your communication. For some mentees, too formal can be off-putting while too informal can undermine the relationship's significance. Adjust your communication style based on your mentee.
2. Discuss the topics you and your mentee would like to cover every half-term or term then put together a bespoke programme – but keep in mind that you'll need to be flexible if an unexpected difficulty comes up for your mentee.
3. Always agree on a meeting agenda in advance, even if it only includes one or two items. This gives you the chance to find things you might want to bring to the mentee's attention in the meeting, like lesson resources or plans.
4. Consider how you'd like to open and close your meetings. It can be helpful to start your meetings with a general chat to find out how things have been going, to put the mentee at ease and make sure they're in a suitable frame of mind. But always aim to finish your meetings by reaching a point from which your mentee can go away and reflect on and/or implement points you've discussed.
5. At each meeting, allow time to discuss any follow-up actions or reflections from the previous meeting to assess the impact of the strategies you discussed.
6. During meetings, practice active listening. Looking beyond your mentee's words to non-verbal cues, such as facial expressions and body language, can open up even more valuable and productive conversations.

Section 2: Classroom and behaviour management

Disruptive behaviour has the potential to spoil learning for the whole class, so Chemistry teachers need to be able to create and maintain a climate for all students to experience learning success and build confidence.

This issue is as important for teachers as it is for students. Making sure that the classroom is a calm place for learning (rather than a battleground) is vital for all teachers but particularly for those in the early stages of their career. A disruptive class causes teachers extra stress, which could lead to depression, low self-esteem or other mental health problems. On top of this, disruptive behaviour puts unnecessary pressure on teachers when they face lesson observations.

How to discuss classroom and behaviour management with your mentee

It's essential that your mentee should not feel that any classroom or behaviour management issues have been caused by a personal weakness on their part. Disrupted lessons can induce a sense of failure in teachers, especially if they've invested a lot of time in careful planning.

Keeping a sense of perspective is important. Reassure your mentees that struggling with behaviour is completely normal for early-career teachers and point out that even experienced teachers find some classes difficult to handle.

Honesty is key. Classroom behaviour is often 'the elephant in the room' during discussions so a direct but generalised approach can be helpful. For example, you could say "many teachers, including those with a lot of experience, have classroom management issues." Then ask "how does this reflect your experience?".

If you have observed your mentee's teaching, you could ask them to appraise their strengths and weaknesses and see whether they pick up on the same points you did. In the unusual case that they don't, you should highlight them as an area for discussion.

If you haven't seen your mentee in action, try using open-ended questions to prompt them to talk about classroom and behaviour management. Asking your mentee to recall a particular situation and to analyse how it developed, how they dealt with it and how it could be avoided is an excellent way of moving from general to specific discussion. Questions could include:

- Can you describe something that worked well?
- Can you think of something you'd like to improve?
- What could you have done differently?
- What strategies could you use to diffuse a situation before it escalates?

These general questions can then lead to more specific ones, such as:

- Did you practice this practical or demonstration in advance?
- How have you seen the school's behaviour management policy used?
- How would you use the policy in specific cases in your classroom?

More resources, techniques and tips

When dealing with behaviour issues in the classroom, consistent routines are helpful so encourage your mentee to understand and apply the school's existing behaviour policy and reward system.

Suggest to your mentee that they let their students know both what is expected of them and what will happen if they do not meet required standards of behaviour. These simple expectations could be lining up outside the lab before a lesson, placing bags under the table or always wearing safety glasses during practical work. Don't let your mentee forget that routines at the end of lessons are as important as at the start.

Good classroom and behaviour management depend on competent planning and assessment skills – not just on following disciplinary procedures. So help your mentee to avoid poor behaviour resulting from student boredom or frustration by adequately assessing learning needs before the lesson.

“Good teachers do need to know how to react to poor behaviour, but it is equally important to be proactive and match teaching to student needs to lessen the chances of poor behaviour.”

By getting to know their students and relating to them as individuals, your mentees can get students 'on side' by doing something as simple as attending a student concert or play. One expert gave an example of a comment she made to a difficult alpha male ring leader: "I casually remarked, 'I hear you scored in the football match on Saturday'. Suddenly he glowed; respect was established."

In this way, heads of department and other senior colleagues can be valuable resources. Your mentee might find it helpful to observe how students behave in different classes, with other science teachers or different subject teachers.

Section 3: Time and workload management

The first few years of teaching can be physically and mentally demanding. Early-career teachers are often extremely committed and dedicated workers who want to benefit their students and impress their colleagues. However, they can work too hard and lose their work-life balance. Over-tired teachers are unproductive and unhappy, they don't perform as well in the classroom and this can, if not managed, lead to ill-health or switching professions.

“It is important for teachers to learn to work smarter, not harder.”

This is where you can have a career-saving impact.

High-quality mentoring can help teachers navigate the most challenging of challenges.

Help your mentee effectively manage their time. It's not about clever strategies; it's about ensuring mentees are realistic about their resources, expectations and needs. You can help them prioritise responsibilities and make sure key tasks don't become too onerous and time-consuming.

Key topics for discussion

Find out how your mentee uses their time, what they struggle with, and what their routines look like out of school. Try to get them to keep a rough log of time spent on school work, hobbies, friends and family, sleep, etc. Or ask them some direct but general questions to get a clearer picture. These might include:

- How much free time have you had this week?
- What are your plans for the weekend?
- How do you relax?

Teachers often reinvent the wheel or spend too long on a bespoke resource which might only be used once, so follow up with more specific questions such as:

- What work do you take home at weekends?
- How long do you spend marking?
- Are there any tasks you don't have time to complete?
- How are resources and planning shared in your department?

Mentees need to realise that their work-life balance is important.

Things like report deadlines may make some weeks particularly stressful so there's no shame in planning some 'easier' lessons using self-assessment and ready-made resources for those times. Equally, there is increasing recognition that 'time out' is crucial to positive mental health. Reassure your mentee that they shouldn't feel guilty about devoting time to things outside school work.

More resources, techniques and tips

Teachers are often distracted by school electronic devices that continue to issue alerts and notifications at home in the evening. They can be difficult to ignore but encourage your mentee to focus on completing just one task at a time and make sure they factor in time for rewards.

Several experts stress the importance of exercise and relaxation. You could help your mentee to schedule time off into their week. For example, they could timetable one work-free day at the weekend or add in some extra time at school one evening, so that they don't have to take work home.

You can also remind your mentee to use their break and lunch times to chat with colleagues rather than to work. The extra interaction with colleagues and the chance to reflect is important for mental health and community and could boost their spirits and help them get through their afternoon sessions more productively.

Section 4: Lesson planning, paperwork and bureaucracy

We all know the importance of lesson planning, but this can take a long time when mentees first start teaching. Plus, new teachers can get into bad habits if they don't take enough notice of what underpins good lesson planning. They can, for example, be preoccupied with tasks over what they want their pupils to learn.

Similarly, paperwork can be overwhelming and demoralising for new teachers when time is precious. However, certain kinds of paperwork do give a valuable return on investment: lessons planned with objectives and aims, and data on student progress, can help to clarify and focus thinking.

Your mentee may just need support to learn what works.

Helpful topics to discuss with your mentee

- Explore how your mentee plans on teaching a certain topic.
- Ask if they have a range of activities (practicals, card sorts etc.) planned.
- Probe your mentee's thinking behind their lesson plan.
- Suggest they keep a log of approximately how much time they spend on planning and other administrative tasks to better understand their workload.

Open-ended questions can prompt your mentee to talk about their lesson planning and administrative tasks. Useful questions are:

- How do you implement the departmental policy on planning?
- How much time have you taken to complete paperwork this week?
- How much time have you spent looking at data this week?

To investigate more deeply, ask:

- What do your students already know?
- What do you want them to learn?
- How will you find out if they have learnt it?

It may be helpful to talk through a specific topic, come up with ideas and put them in order. This would be an excellent time to look at the resources available on the Royal Society of Chemistry website, [Learn Chemistry](#).¹

Your mentee might benefit from discussing the rationales behind any perceived bureaucracy they face. Alternatively, you could encourage them to consider why they are using corporate, whole-school approaches to teaching that may not be universally effective.

You could also help your mentee think about the effect of paperwork on students and the paperwork's context. After all, data quality is much more important than data quantity.

More resources, techniques and tips

The key to dealing with paperwork and bureaucracy is establishing good routines for efficient administration.

Departmental and school policies on data and reporting must be followed, so teachers should make use of or draw up their own daily, weekly or termly timetables that help them to easily see what needs to be done and when.

It's important to keep lesson planning simple and to consider the bigger picture. It might help your mentee to have a designated time in the week to upload data and complete reports.

One particularly helpful resource is the #5minuteplan from @teachertoolkit on Twitter. She points out that OFSTED are less interested in detailed lesson planning than in teaching impact and learning quality.

Section 5: Pedagogical approaches

Teacher subject knowledge is important, but it's only half the story.

Early-career Chemistry teachers need to be aware that, although there are general pedagogical approaches, chemistry education requires techniques specific to science and chemistry. On top of this, chemistry learning relies upon connecting observable phenomena with unobservable, and often abstract, concepts.

If chemical knowledge can't be effectively passed on through explanation, illustration and links to the wider world, then it's unlikely that students will make the required progress. Teachers may have a good knowledge of chemistry, but they still need to know how to get the ideas across to their class.

An effective range of different skills helps build variety, stimulates learning and gives the teacher increased confidence.

Your mentee may need help approaching this challenge.

How to discuss effective pedagogy with your mentee

Start by exploring how your mentee thinks about general and subject-specific pedagogies. This could involve talking about how their students might think about chemical concepts, why or how their students may see real-world relevance in curriculum content and how learning activities can be structured to promote progress and interest.

Once they have observed experienced teachers to see effective pedagogical skills in action, question your mentee on the lessons they witnessed, get them to reflect on the skills they saw and ask how they could incorporate them into their own teaching.

Peer observation can be very supportive so, as an extra step, you could suggest to your mentee that they observe lessons by colleagues who report struggling with teaching the lesson topic.

Open-ended questions are, as usual, useful for prompting your mentee to talk about their experiences. These questions could include:

- To what extent have you tried different pedagogical approaches in the classroom?
- How could you incorporate a different strategy into your teaching this week?
- What stops you from taking risks and trying something new?

Questions about specific topics can be difficult to answer – but revealing. For example:

- Most students struggle with abstract ideas such as 'the mole'. How would you approach teaching this to your Year 10 students?
- What misconceptions do you think children might have about this concept before you teach them?

Encourage your mentee to experiment with pedagogies during lessons, or a series of lessons, and to be unafraid to risk teaching imperfect lessons as a result. It's important that they feel they have permission to try new things and different ways to enthuse students about chemistry.

Trying an alternative pedagogical approach can be surprisingly liberating. If it isn't, remind your mentee to be philosophical. After all, nothing will have been lost.

With that in mind, why not ask your mentee how they have fun in the classroom? This may seem like a strange question but ensuring top-notch subject knowledge alongside detailed awareness of assessment strategies while keeping a lid on difficult behaviour sometimes leads to routine, predictable and regimented lessons.

More resources, techniques and tips

There are many CPD courses that address effective pedagogy as well as subject content. The Royal Society of Chemistry has developed a suite of online CPD courses called *Developing expertise in teaching chemistry*.² These are particularly relevant for early-career teachers and include a wealth of evidence-based research. *Education in Chemistry* magazine also frequently publishes articles intended as teacher CPD, which focus on the pedagogy associated with teaching particular topics.³

Vanessa Kind's *Beyond appearances: students' misconceptions about basic chemical ideas* suggests ways to identify and minimise student misconceptions.⁴ Loughran, Mulhall and Berry's *work on Content Representations* (CoRes) is a good structure for making pedagogical content knowledge explicit, and Lee Shulman has also carried out some *relevant research* in this area.^{5,6}

Section 6: Assessment approaches

It's important that early-career teachers understand the purpose, scope and limitations of formative and summative assessment. They shouldn't see formative assessment simply as boxes to tick or forms to fill in. Their general strategy of teaching should be based on finding out what learners' needs are, and then tailoring their teaching to meet those needs. Similarly, they should be aware that summative assessment is not simply an accountability measure but can be used to help pupils make progress.

When it's done well, formative assessment informs day-to-day planning, identifies gaps in pupil learning and helps teachers take the appropriate next steps. While this is the bread and butter of the teacher's craft, and it makes for effective teaching and outcomes, summative assessment helps provide evidence of pupil progress.

Helping students achieve their potential in examinations is a fundamental teaching goal and appreciation and knowledge of assessment criteria will help your mentee focus their teaching and enable their students to succeed. Happy, successful students can mean a satisfied teacher with boosted confidence and morale.

Conversations to have with your mentee about assessment

Try to draw analogies between teaching and tangible learning situations, such as learning to drive or learning to play a musical instrument. These learning processes also proceed by formative exercises with most people being able to identify with them. In that way, they can help your mentees to appreciate that the chemistry learning process doesn't need to proceed differently, despite its different context.

Use your mentee's lesson plan as a basis for your discussion. Ask your mentee to point out where assessment is going on, or ask them to select a particular class they are working with and outline the strategies they plan to use to make judgements about pupil progress.

Encourage your mentee to think about how they will support or provide intervention for those who are struggling. Self- and peer-assessment can be powerful tools for helping students improve but you may need to do the initial work to embed these ideas.

Advise your mentee to look for examples of high-quality formative and summative assessment, marking and feedback from their colleagues and department.

Useful questions range from basic to probing:

- What is the difference between formative and summative assessment?
- What does formative assessment look like in your lessons?
- How will you remind students about what they did last lesson?
- Can you give examples of how you are using formative and summative assessment with your classes?
- How will the topic you are teaching with that year-group be assessed?
- How will you use the data obtained?
- Can you show me a lesson plan incorporating assessment?
- How can we work together to integrate assessment into this lesson?

Useful questions also focus on more practical day-to-day activities such as:

- Have you seen a copy of the end-of-unit test?
- Has everything been taught for the end-of-unit assessment?
- Do you know how and when to enter students' grades into the system?

More resources, techniques and tips

A common pitfall for teachers is assuming that formative assessment must take up a significant part of a lesson when it is entirely possible to make informative assessments using informal starter quizzes, verbal question and answer sessions and peer- and self-assessment reflections.

Most schemes of work have assessments written into them. Your mentee can use school end-of-topic tests or summative assessment tasks together with concept cartoons and quick-fire questions for formative assessment. Examination boards produce assessment criteria, which, when translated into language students understand, can be extremely helpful.

If pupils have access to iPads, *Socrative* is an invaluable tool for both quick formative and more detailed summative assessments.⁷ While these can take a while to prepare, they can be shared across the department and reused.

Older pupils can mark exam question answers that include misconceptions and common mistakes by consulting the published mark scheme. They can annotate the incorrect work and give clear explanations as a further step. This is to help students realise how ruthless markers are, as well as the level of accuracy required in their responses.

Paul Black and Dylan Wiliam describe the importance of formative assessment for raising standards in their article, *Inside the black box*.⁸

Section 7: Career progression

Career progression helps teachers to continually refresh their approach. Teachers need to be well aware of their options for changing and developing their career in new positions, both within their current school and at other schools.

All schools are different and will offer teachers a new experience and different challenges. There are several reasons why a teacher might wish to apply for a different teaching post:

- Sometimes early-career teachers make mistakes and want a fresh start.
- If a teacher starts in a 11–16 school, they may wish to teach post-16 students.
- Good teachers are always looking for the next challenge, and at some point, will be ready to take on further responsibility.

Early-career chemistry teachers first need to establish themselves in the classroom. They need to become expert teachers with secure subject knowledge. Once they've achieved that, it's natural that they might consider looking for extra experience or taking on different responsibilities. While continuing to gain experience and skills in the classroom, many will relish the opportunity to apply their skills in a different environment by managing a department or taking on other responsibilities within education, for example in a pastoral role.

You could help your mentees to think through their next steps, set goals and personal challenges and think about how they could achieve them. However, it's important to remember that some people do not have ambition in terms of progressing up the career ladder and are simply content doing an excellent job on the chalk face in the classroom, often passing on their enthusiasm and good practice to others. This contribution to mentoring others should be valued. They should not feel coerced into applying for jobs if they don't have the desire or motivation – even if they do have the skills.

How to approach career progression with your mentee

This can be a difficult topic to address if your mentee has unrealistic aspirations; there might not be any jobs available in their particular location at a particular time.

It might be best to first encourage your mentee to consider the positive aspects of their career choice.

Try to gain a sense of what makes them feel a strong sense of personal fulfilment. Ask questions like:

- What brought you into the profession in the first place?
- What motivates you most strongly as a teacher?
- What do you love or enjoy most about teaching?

From here, you can explore ways in which your mentee's present situation could be fine-tuned to create more of these positive experiences – and in such a way as to allow for potential, future career progression.

If relevant, use your own experience to start the discussion. As many teachers know, career paths often develop in unexpected ways that can nonetheless be exceptionally fulfilling.

Appropriate questions to help focus your mentee on their future plans include:

- Where do you see yourself in five or 10 years?
- What specific aspirations do you have for your teaching career?
- How are you building the experience and skills you need to progress your teaching career in your current work?
- Do you see yourself following an academic career path or a pastoral route?
- Where do your professional interests lie?
- Which geographical area would you like to settle in?

These questions could help your mentee reflect on their suitability for progression:

- What could you offer a school as a head of department?
- How would your classroom experience qualify you to be an effective year head?
- What CPD do you feel would enhance your CV?

More resources, techniques and tips

If your mentee identifies specific areas of weakness or lack of experience, talk with them about planning appropriate opportunities to plug the gaps. Opportunities may include running a school trip, organising a regular activity, providing personalised intervention or applying to be an exam marker.

Encourage your mentee to get involved with extracurricular interests that reflect their chosen career path. If they want to remain in academic roles, they should get involved with things like STEM clubs and regional chemistry competitions; if they prefer pastoral roles, suggest that they talk to, or shadow, a head of year to find out what a typical day is like.

Section 8: Day-to-day teacher experiences

Learning from a more experienced person is a fundamental part of the mentoring process. But early-career chemistry teachers can be discouraged after observing established teachers and thinking, “I could never be as good as them!” In these cases, you need to remind your mentee that everyone started at the bottom and that it takes time, classroom experience and regular reflection on practice to become a great teacher. Sharing your day-to-day experience will help your mentee understand that all teachers struggle with aspects of teaching when they start, and that there may even be things that will remain challenging throughout their whole career.

Sharing experiences with your mentee

When you summarise a success or disappointment from one of your own recent lessons, you make it easier for your mentee to follow you by reflecting on one of theirs.

Reiterate that we all continue to learn.

Use open-ended questions to get your mentee to talk about their day-to-day experiences:

- What behaviours, habits or attitudes have you noticed in successful colleagues?
- How do you think I felt during my first year of teaching?
- How does your experience today in the classroom and staff room and at home mirror mine?

Let your mentee lead the conversation. Invite them to ask any questions and seek advice on the issues on their minds.

Highlight the hugely beneficial effect that dedicated teachers have on their students – no matter what their career stage of experience level.

Section 9: Pastoral support

Teaching is a demanding profession and a classroom can be a challenging working environment. As a mentor, you need to be open and honest about teaching's inherent stresses as these may be causing your mentee anxiety, particularly if they are highly committed and conscientious. It's important that you offer them someone to talk to in a supportive environment about the things that are getting them down.

To put stress into perspective, remind your mentee that even experienced teachers can get nervous before a lesson or before the start of a term. Some degree of stress is normal and healthy and is to be expected. It's when it becomes intolerable that problems crop up, and a swift resolution will be needed to prevent health difficulties or breakdowns.

It's important to be able to recognise signs of stress and anxiety. Your mentee may not have noticed themselves becoming stressed and may need someone else to point it out.

How to discuss pastoral issues with your mentee

Some mentees like to give the impression that they have no issues and are coping but if you suspect that your mentee is struggling with something, questions like this can help them open up about their concerns:

- When you have a bad lesson, how do you react?
- What differences have you noticed in your sleeping patterns during term weekdays and during the weekend and holidays?
- Which aspects of your job cause you the most stress and how do you deal with the stress?

Try to encourage your mentee to isolate specific causes of stress, as well as strategies to tackle them.

More resources, techniques and tips

Sometimes a crisis point can prove helpful to reassess ways of working.

Question the support network around your mentee. Their school may have a designated person for confidential conversations but, if not, try to get your mentee to identify a trusted colleague or friend to talk to.

Unions can provide tips on managing stress. Mindfulness strategies and breathing techniques can be useful. Careful planning can reduce stress (see section 3), and clear priorities along with the ability to say "this is good enough" without self-condemnation can go a long way to minimising anxiety.

Stephen Covey's *The 7 habits of highly effective people* can help identify priorities and time-wasting activities.⁹

The Association for Science Education has put together a *science teacher SOS guide*.¹⁰

And the *Education support partnership* offers 24-hour counselling.¹¹

Section 10: Interacting with stakeholders

A school community is made up of more than teachers and pupils. Excellent schools have many different people contributing to the pupils' success and early-career teachers need to appreciate their crucial place in the picture while understanding how stakeholders are interdependent. You can help your mentee establish clear lines of communication with stakeholders.

Whether your mentee feels valued as part of this wider team will partly be down to how they contribute to creating a pleasant, cooperative working environment in which different roles and responsibilities are acknowledged.

“Teachers are not superior beings to support staff. A friendly, kind word, smile and word of thanks for a job well done makes everyone’s life more pleasant.”

All teachers interact with a wide range of people, depending on the needs of their pupils or activities that they're involved with, but perhaps the most familiar (and potentially challenging) stakeholders are parents and carers.

While most parents are supportive and will do anything they can to help, some parents are more demanding. Some blame their child's lack of progress on the teacher or school. Others are not supportive of homework. And some overestimate their child's abilities and good behaviour. These difficult parents can be hard to handle, so it's valuable for early-career teachers to have someone they can talk to about these issues.

Dealing with stakeholder issues with your mentee

First of all, does your mentee greet you with a smile or a scowl? What is their typical response to advice or suggestions? How do your conversations generally flow?

The way in which your mentee interacts with you might reveal clues as to how they interact with others around school.

If your mentee is having problems with parents, try these questions to open up discussion:

- At what point do you think parents should be brought in?
- What is the school policy about this?

Section 11: Chemistry practicals

Chemistry practicals are an integral part of teaching and learning in chemistry. They help pupils to reinforce knowledge, understand tricky concepts, develop practical skills, increase their engagement and develop scientific enquiry. In addition, cooperative, enquiry-based learning develops social, communication and emotional skills.

Some teachers are reluctant to run practicals because they fear losing control of the class or they have excessive anxieties over safety. Other teachers worry that practical time could be better spent getting through the large amounts of curriculum content.

These concerns underestimate the value of carefully chosen practicals and the motivation and enjoyment they bring to lessons. Teachers who still get excited about practicals are better able to transmit that enthusiasm to their pupils.

“Surely chemistry teaching is about having fun in the classroom and recreating the excitement of using a Bunsen burner for the first time.”

Mentees who gain confidence in running practical work successfully early in their careers will be well rewarded.

How to build practical confidence with your mentee

If your mentee hasn't overseen many practical experiments and hasn't seen good practical sessions modelled, a discussion of their own experiences in the classroom and what they learnt through practical experiments could be a useful starting point.

Open-ended questions stimulate discussions about practical work:

- Why did you choose that activity?
- What did the students learn from that practical activity?
- Could you talk me through a recent class practical?
- Was it successful?
- How have you established safe practical routines in your classroom?
- What department policies on compiling risk assessments do you have?
- What are your biggest fears or concerns about running practicals in your classroom?

A common mistake early-career teachers make is not practicing an experiment before attempting it in a lesson. There is no substitute for testing the written instructions, and doing the practical, to become aware of pitfalls.

Encourage your mentee to try to work out what could go wrong. Get them to think about how they will manage the practical activity. Ask them where the equipment be. Question what safety measures and lab rules will need to be followed.

More resources, techniques and tips

Subject-specialist training is available, for example from *the National Stem Centre*.¹² *CLEAPSS* and *SSERC* publish comprehensive information about practical work.^{13, 14}

Risk assessments are particularly important for science teachers. Make sure that your mentee has access to departmental risk assessments or *CLEAPSS* resources, that they take a sensible approach to risk assessment and that they think through everything that could go wrong.

The RSC *Learn Chemistry website* has a huge number of resources for teaching and learning chemistry.¹⁵

The benefits of practical work are well attested by *the Gatsby foundation research* and the *Getting practical project*.^{16,17}

And finally, when it comes to running practicals, technicians and other experienced colleagues are always invaluable assets.

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16. Gatsby Education: www.gatsby.org.uk/education
17. Improving Practical Work in Science: www.gettingpractical.org.uk

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