ISSUE NO. 06 - JUNE 2024

The School STEM Technician

Contents

Supporting the professional development of the school technician community in Scotland

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CEO Introduction
Alastair MacGregor, CEO, SSERC

What a great turnout at the SSERC/STAC STEM Technician training event at SSERC HQ on Friday, May 17th, 2024. It was great to see so many new (and familiar) faces, and it was really encouraging to see the diversity of the delegate audience. Which made me think...

SSERC's unwavering commitment to elevating the status of school and college STEM technicians in Scotland is evident in the comprehensive range of activities we have planned for the coming years (see Fig 1 below).

The Scottish Technicians' Advisory Council (STAC) provides advice and support to SSERC regarding technician professional learning requirements in Scotland. However, this is a small subset of the school and college STEM technician profession. So, what can you, as a school or college technician, do to support any of the activities identified in Figure 1?

Technicians

To raise the professional status of school and college technicians and promote the role they play in the education community in Scotland.

SSERC Lead: Alastair MacGregor and Alan Purves

Not started	Started	On track	At Risk	Stopped	Completed

	Medium-term to March 2027	
T1	Review the current technician professional learning portfolio and develop new programmes as required,	On Track
T2	Deliver a range of twilight Technician SSERC Meets professional learning sessions	On Track
T3	Continue to promote Techne as the professional collaborative network for schools and college technicians	On Track
T4	Continue to support the Scottish Technicians' Advisory Council	On Track
T5	Continue to publish the School STEM Technician digital publication	On Track
T6	Develop a school technician leadership development programme	On Track
T7	Seek to engage with partner organisations that can support school and college technician professional learning	On Track
T8	Develop new guidance, procedures and protocols to support technician activity.	On Track
T9	Promote the work and achievements of Scottish school technicians in the rest of the UK	Started
	Long Term to March 2031	
T10	Develop a National School Technician Diploma with SCQF Credit and Levelled provision.	Not started

Figure 1

T1 – Feedback to your STAC representative or SSERC via alan.purves@sserc.scot gaps in the current portfolio of available professional learning via SSERC

T2 – Feedback to Alan Purves on any themes or activities that you might want to feature as a twilight online live session eg any new bits of 'kit' that could be showcased.

T3 – Access Techné and start to develop professional dialogue and discussion with other technician colleagues.

T5 and T8—Write an article for the STEM Technician that outlines your role as a technician, protocols, activities, and guidance that you have developed; the article could be shared as good practice. If you have attended an SSERC professional learning event, why not write a review of your experience?

It is a small ask, but one that would showcase the dedication and professionalism of the school and college technician profession in Scotland.

Finally, within the last six months, I have met with the education representatives from each main Scottish political party. As part of that, we have discussed the critical role that technicians play in supporting the STEM curriculum. Increasing awareness of your role and having ambassadors within the Scottish Parliament is just one example of the steps we are taking to promote the professional role of school and college technicians.

Liam Kerr, MSP, visited SSERC on 23rd April 2024 (image 1), and we chatted about the role of school technicians as part of the discussion. Interestingly, this article appeared in the Scotsman on 20th May 2024.

Are 'crucial' school technicians the latest victim of Scottish education cuts?

View article

SSERC will continue to champion your cause as an essential part of STEM education and training in Scotland, but we need your input, feedback, and support.

Alastair MacGregor
Chief Executive Officer, SSERC

Image 1

STAC update

STAC meet on a quarterly basis, and as a reminder, here are the terms of Reference for the Scottish Technician's Advisory Council.

Aims:

To represent the Scottish School Technician professional community and advise SSERC on matters relating to:

- Professional development needs of school technicians
- Qualification frameworks to support professional development of school technicians
- Technician based projects and activities

To receive regular reports about the progress of Technician based projects and activities including those relating to professional development and qualification frameworks.

To act as moderators for the Scottish School Technician Virtual Network (Techné)

To support and to act as advocates for:

- the Scottish School Technician professional community
- the work of SSERC with particular reference to supporting the Scottish School Technician professional community

Membership:

Each Scottish Local Authority will have one technician representative on the Council.

SCIS will have one technician representative.

Jordanhill College will have one technician representative.

SSERC will have three representatives: CEO, Technician Project Officer and Technology Education Manager.

A Chair will be appointed by the Council at its September meeting.

The SSERC Technician Education Officer will act as secretary to the meeting.

STAC
Scottish Technicians' Advisory Council

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Professional Learning

A Day of Learning:

SSERC STEM Technician Training Day, 2024

The SSERC STEM Technician Training Day was held on May 17, 2024. This event, tailored specifically for the often-unsung heroes of our educational infrastructure, school technicians, provided an invaluable platform for professional development, knowledge sharing, and collaborative networking.

Technicians from across Scotland converged at the SSERC headquarters in Dunfermline, bringing with them a wealth of experience and a keen desire to enhance their knowledge and skills. The atmosphere was buzzing with anticipation from the moment the participants arrived, and the agenda promised a day rich with learning opportunities, practical sessions, and meaningful professional learning workshops.

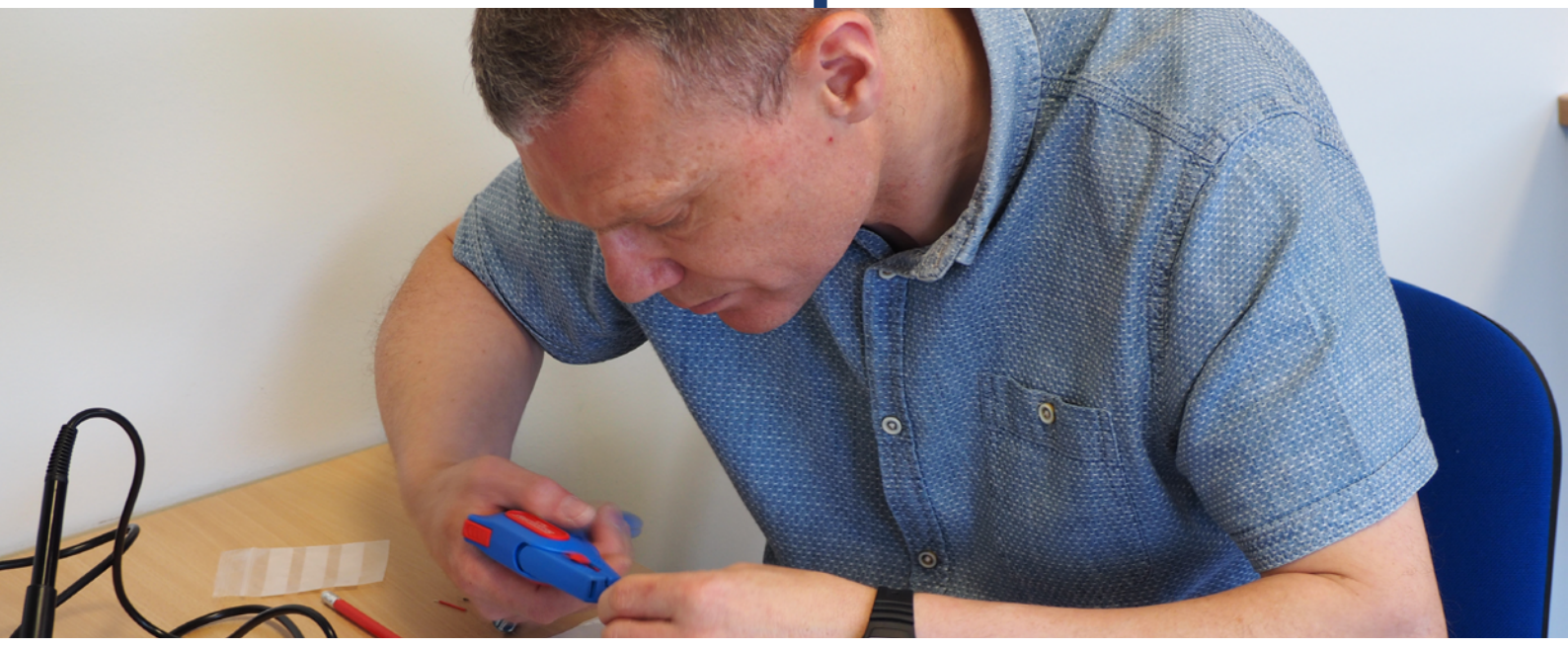
The day commenced with a keynote address by Jane Oldham, Chair of the ASE Technician Committee. She emphasised the pivotal role technicians play in the success of STEM education, highlighting their contribution to fostering an environment where curiosity and innovation can thrive. She championed technicians' ability to gain professional recognition through the RSciTech Program. Her speech set a tone of appreciation and motivation, reminding the attendees of the significant impact they have on students' educational journeys.

Technician Professional Learning

JUN 5 Wed	**Safe Use of Fixed Workshop Machinery Refresher** Jun 5 all-day
SEP 3 Tue	**Chemical Handling September 2024** Sep 3 – Sep 4 all-day
SEP 5 Thu	**Electrical Safety and PAT September 2024** Sep 5 – Sep 6 all-day
SEP 11 Wed	**Safe Use of Fixed Workshop Machinery** Sep 11 – Sep 12 all-day
NOV 20 Wed	**Intermediate Physics** Nov 20 – Nov 21 all-day
DEC 11 Wed	**Safe Use of Fixed Workshop Machinery Refresher** Dec 11 all-day
MAR 5 Wed	**Maintenance of Fixed Workshop Machinery** Mar 5 @ 12:00 am – Mar 7 @ 12:00 am

Look out for our new glass work and soldering courses. They will be running after the summer holidays.

Click here for more information.



Following the keynote, the participants were dispersed into their various workshops, each tailored to address different aspects of STEM technical support: microscale biology and microscale chemistry, seaweed and photosynthesis, and wood turning, to mention a few. For instance, the Experiments in Radioactivity workshop, led by Evelyn Lee, delved into different experiments using radioactive sources, ensuring precision and safety. Participants practiced these experiments, gaining confidence and knowledge that will go a long way to aid running these experiments in schools under the right conditions.

During the lunch break, the event transformed into a hub of Networking and idea exchange. The sense of community was palpable, with technicians sharing their challenges and solutions, fostering a supportive environment. Many participants expressed how valuable it was to connect with peers facing similar issues, and this camaraderie was evident in the collaborative spirit witnessed throughout the day.

Feedback from the participants was overwhelmingly positive. Many praised the event's organisation, the relevance of the workshops, and the quality of the instruction. One technician commented, "*I thoroughly enjoyed every session I attended. Each one was delivered in an engaging way, and I have something from each that I can take back with me to my school*".

The success of the SSERC STEM Technician Training Day 2024 underscores the vital role that continuous professional development plays in the education sector. By equipping technicians with the latest knowledge and skills, SSERC is not only enhancing their professional growth but also significantly contributing to the advancement of STEM education in Scotland. The event stands as a testament to the dedication and excellence that SSERC embodies, paving the way for future successes in STEM education.

Technicians' Corner

Ewan Middleton shares his career journey

Ewan Middleton, a dedicated Technological Education Technician at Ardrossan Academy, shares his career journey and the invaluable lessons he has learned through his professional career to date and his learning at SSERC. His unwavering commitment to continuous learning is a testament to his dedication to his profession and his desire to provide the best possible support to the teachers in his school and so to the benefit of learners.

I am a Technological Education Technician working at Ardrossan Academy in North Ayrshire. At the end of my second year, I can honestly say I have loved every minute of it.

My journey to becoming a Technological Education Technician started when I was a pupil at Garnock Community Campus. I knew early on in my school life that I wanted a skills-based job that involved working with people. I have always been a team player and wanted a career that would provide me with various experiences each day. I enjoyed working with people, and during my school years, I was involved in Scouts and the Columba 1400 Leadership programme. Both organisations are based on passing skills to the next generation. As a learner in school, I loved technical subjects and even went to work in another school's technical department as part of my S3 work experience. The practical skills gained in the design and technology department helped me to get a joinery apprenticeship, and so I left school at the end of S4 on my sixteenth birthday.

My apprenticeship was over four years with block release to college. During this time, I was able to experience everything the building trade had to offer. Even though my apprenticeship was in joinery, on a building site, the apprentice is expected to labour for electricians and plumbers, drive diggers, and erect scaffolding. While I enjoyed my apprenticeship, I wouldn't say that I liked the unpredictable nature of the building industry, so I looked for other career opportunities and applied for, and then was appointed as, a Technological Education Technician at Ardrossan Academy.

On a day-to-day basis, I maintain all the tools and machinery in the Technical department. I also cut and prepare all materials for the teachers to use with their classes and order materials for the coming year. In addition, I carry out in-class support; this can be working one-on-one with pupil support or manning a pillar drill to free the teacher to help the rest of the class.

I was initially apprehensive about my new Technician role as I knew that certain aspects of technological education involved working with metal, plastic, and wood and associated processes. Through my apprenticeship and associated training, I was confident in most aspects linked to woodworking and associated tools and machinery; I did, however, have more limited experience with metalworking and plastics. My line manager told me the school was very keen to support my further development as a Technician, and so suggested that I should see that professional learning opportunities were available at SSERC.

Given the importance of health and safety when using workshop machinery, I applied for SSERC's Safe Use of Fixed Workshop Machinery professional learning course. This was a two-day course, SCQF Credit and Levelled and regarded as mandatory training to meet health and safety requirements. This course gave me the self-assurance to maintain and safely use the bandsaw, circular saw and planer thicknesser with confidence. This experience was really positive and rewarding; the SSERC team were very friendly and welcoming, and the course tutors were very approachable and supportive. Undoubtedly, this positive experience encouraged me to see that other development opportunities might be available.

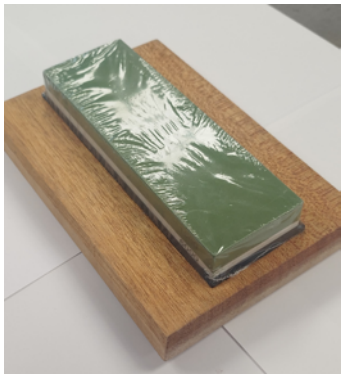
In the last 18 months, I have successfully completed the following SSERC professional learning courses:

- **Welding**
- **Hot & Cold Metal Forming**
- **Woodturning**
- **Safe Use of Fixed Classroom Machinery and, most recently**
- **Centre Lathe Turning.**

One of the great things about attending SSERC professional learning is not only the new knowledge, skills, and self-confidence that are developed but also the artefacts that demonstrate the new skills you have gained. Some examples are provided below.

Safe Use of Workshop Machinery and **Safe Use of Classroom Machinery**

Push stick and sharpening stone



Wood turning

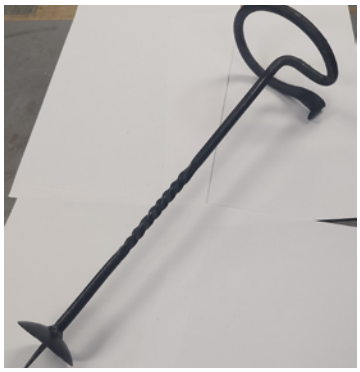
Plastic and wooded pens and a wooden bowl

I found this course very satisfying, and it helped me grow my confidence in using the lathe and tools when appropriate.

Welding course

Hanging basket holder

I learned many skills that I had never done before, and if I asked the staff members any questions, they would answer anything at all; they were very helpful. We initially used off-cuts of metal to practice and get the hang of welding, as we all had no experience. Then, we made a hanging basket by folding-forming various components, welding them together, and filing the welds so they looked nice and finished.



Hot & Cold Metal Forming

Wall-mounted wine rack and candle holder

We spent the day with a blacksmith for the hot metal forming and learned a lot of skills, knowing how long to keep what types of metal in the forge for how long and where is best to hit the metal, what to use and where to position the metal on the anvil as well. The cold forming was fun, too. We got to pick a model and form it using instructions on a sheet. We did get talked through how it all worked first before getting let free, and if we had any issues, Duncan and Chris were there as a helping hand as always.

Centre Lathe Turning

Metal Scribe and Hammer

The most recent course was a two-day course held in an engineering workshop. It was designed to develop knowledge and understanding of the functions, machining operations, and safe use of this workshop machine and allow teaching and support staff to successfully and safely implement lathe-turning projects into the curriculum and /or deliver SQA-based coursework.

The course involved setting up and using a number of different types of tooling to perform facing, taper, parallel, knurling, threading, drilling and parting processes.

"My experiences undertaking professional learning at SSERC have been very positive, and I would highly recommend this organisation as the go-to place for professional learning for school technicians and technology teachers."

The specific course outcomes were:

- Demonstrate safety precautions necessary for the safe operation of the centre lathe.
- Demonstrate how to set tools and prepare the centre lathe for safe use.
- Demonstrate how to operate the centre lathe to carry out the following basic functions safely. – Facing Off, Parallel turning, Taper turning, Drilling, Threading, Turning between centres, Parting, Knurling, Boring
- Demonstrate an understanding of tool grinding angles and cutting speeds.
- Demonstrate an understanding of work-holding methods

Like the other professional learning courses, you are always left with a relevant and useable artefact(s).

We started by turning a circular piece of aluminium. After safely securing the metal into the lathe, we faced one edge off. Then, we switched to taper turning the other edge, drilling a hole, and finishing by knurling and turning between centres. The final product was a scribe handle, and we glued the scribe piece into the section we drilled out.

The second piece we made was a hammer, which I learned much about as it required a few more steps than the scribe, such as threading. We also got to use the auto feed for the long tapper. I also learned a lot of useful information about what cutting speeds are appropriate for what material and what you are doing, angles, what angles certain tools should be at and what angles to grind the tools at when sharpening them.

My experiences undertaking professional learning at SSERC have been very positive, and I would highly recommend this organisation as the go-to place for professional learning for school technicians and technology teachers.

The challenges of providing practical science for ASN pupils

When our local ASN school approached me for help and advice in enhancing their science lessons I realised just how isolated these teachers can be. Not being sure where to turn for advice I realised this is where the strength and advantages of the STAC group could come in to play. It occurred to me that every local authority would likely have at least one ASN school facing the same challenges, and that this would be an ideal opportunity to pool ideas and solutions.

An email to STAC brought immediate responses from Glasgow, Edinburgh, Inverclyde and Dumfries & Galloway with technicians willing to share their own experiences. It seemed that the range of challenges was vast and covered the specific needs of pupils and the particular staffing in the schools.

Challenges of practical science for ASN pupils

Engagement

- Possible limited attention span – break lesson up into manageable sections
- Understanding – simplify language in science lessons to be easily followed
- Following instructions – uncluttered, clear instruction, preferably pictorial
- A role for everyone – if unable to participate fully can each pupil have a role?
    - Can they physically participate?
    - Can they read out instructions?
    - Can the make observations?
    - Can they write or narrate results?

Physical ability

- Visual impairment – can they be paired with someone to talk through process?
- Enlarge scales on beakers etc.
- Large text, simplified work cards
- Mobility – are there tasks that can be undertaken sitting down ie taking results, giving instructions?

Confidence

ASN pupils may **lack confidence** and need to be given tasks they are comfortable taking part in.

Safety

- **Unpredictable behaviour** – materials must be such that they cannot cause harm if used inappropriately
- Provide plastic versions of glassware where possible
- Enhanced risk assessments for ASN practical work with all above observations taken into account.
- **Limited dexterity** – equipment chosen to be easy to handle, chemicals selected to be safe if spilled
- Some schools had pupils with **attendance issues**, little or no self-esteem and emotional problems.
- Other schools had many and varied **physical problems**, but a full range of mental capacity and capability
- Whilst some schools had a **specific science teacher**, others did not.
- Most of the schools had **no science technician** support or science storage facilities.

The following points were shared:

From a science teacher:

- The use Makaton signing and boardmaker symbols is useful.
- The biggest help and support is having a learning assistant in class with you.
- Base groupings on mixed ability so that everyone can get involved. I will ask questions to gauge understanding, sometimes with boardmaker symbols to help understanding and provide choices of answers.

From a science technician supporting an attached unit:

As a technician the 'Safety' section is the most relevant and the section which I have most input.

Try to adapt the BGE courses followed by the main stream pupils as much as possible so that the practical's still feel "experimental, scientific and purposeful" rather than 'arts and crafty'. Some of the practical's for the main stream pupils involve plasticine and straws – making greenhouses etc which the ASN pupils also do.

- Use plastic labware where possible.*
- Large/easy read scales are also important. Budgets can be a limiting factor in apparatus procured.
- The science lab used has been adapted with a sink which lowers for wheelchair users for example. Bunsen burners with longer leads were a consideration to allow wheelchair users but this has been unsuccessful as tubing longer than SSERCs recommendation would be required. A specific risk assessment may make this safe where the benefits to the learner would outweigh the risks.
- A lot of contamination of chemicals occur with special needs pupils so I have tried to colour coordinate lids to try to minimise this. Minimising the amount of chemicals given in bottles also seems sensible but with dexterity challenges etc, more chemicals are required than perhaps for main stream pupils, so this is a bit of a trade-off and difficult to predict.
- Whilst exact measured quantities might help, that needs to be weighed up against the additional preparation time, which may be in a school with no technician support.

At this early stage of collaboration it seems that some level of technician support is essential for their knowledge, loan of kits where there are no storage facilities and their experience of main stream lesson adaptations.

We now have teams working on adapting main stream practical activities for a variety of ranges of additional needs as well as producing a simple course of science tester practical lessons for interrupted learners which cover a range of topics and can be taught by a non-science specialist. Specific risk assessments for the special circumstances will also be written to accompany these, as well as a clear protocol and pupil worksheets incorporating pictorial instructions.

We are at an early stage with this work, but if there are any others out there who feel they would benefit from this collaboration, or who have more to contribute, please contact your STAC representative who will put you in touch with us.

Frances Walsh, Principal Technician
West Dunbartonshire Council

* A bit of google research found that Fisher Scientific sell a range of good quality plastic lab-ware that has so much more than the usual plastic beakers and measuring cylinders. There range includes standard flasks, centrifuge tubes, guaranteed leak-proof bottles and even desiccators. Some of the equipment is even autoclavable. Whilst an expensive set up cost, this equipment is near indestructible.

Health and Safety Update

Keeping a classroom pet

We are a nation of animal lovers and, over this academic session, SSERC has received several enquiries about keeping a classroom pet. Your wish list has included terrapins, bearded dragons, snakes, leopard geckos and axolotl. Our Code of Practice (CoP), Materials of Living Origin, provides support when making the decision to commit to a classroom pet. The key consideration is that there should always be sound educational reasons for having any animal in school and the animal's wellbeing should be of paramount importance.

A member of staff, who has a sound understanding of the biology and natural history of the animal, should be assigned and we would recommend that a policy is drawn up that includes maintenance and procedures for the care of animals throughout the week, weekend and holidays, together with details of an appropriate vet who can support with professional care if required. SSERC can provide a template of such a policy. Appendix 5 of SSERC's CoP includes a guide for which animals might be suitable as classroom pets. A brief note on this: we receive many enquiries about reptiles; many reptiles, including the crested gecko in the image, would not be an animal SSERC would recommend given their complex care needs.

Crested Gecko: not recommended as a classroom pet.

Use of heavy metals in schools

We have had a few enquiries recently asking whether it is permissible for learners to use solutions of lead compounds in Advanced Higher project work; mainly in connection to enzyme inhibition.

The short answer is yes. The main danger from lead is from long-term exposure, even low level, and this mainly comes from ingestion or inhalation. Even preparing the solutions, there should be no danger of inhalation of dust or aerosols and good laboratory hygiene, perhaps enhanced with the wearing of gloves, should ensure that no lead is ingested either directly or, a more likely scenario, via the hands – which should, of course, be watched after carrying out practical work.

As well as lead, we have had queries about Cobalt compounds. The same caveats apply but both of these, and others, do still pose the problem of disposal. Most heavy metals, including copper, are potent, long-lasting environmental toxins and as such anything other than a very low concentration cannot be washed to waste and needs to be kept for uplift. A recent query involved 0.1 mol l-1 cobalt sulphate and this would need to be over 1,000 more dilute than that to be legally disposed down the sink!

It is also perhaps worth raising here one of the key points of Health and Safety law, including COSHH (the Control of Substances Hazardous to Health regulations): if there is a safer way of achieving an end then that is the way you should do it. There are various enzyme inhibition experiments that can be done that do not raise such issues of toxicity for either the individual or the environment so they are to be preferred unless there is no viable alternative.

Melting Point

Determining the melting point of a compound is one way to test if the substance is pure and is often used to test samples made from organic synthesis (eg of aspirin or paracetomol).

Pure samples usually have sharp melting points, for example 149.5-150°C or 189-190°C; impure samples of the same compounds melt at lower temperatures and over a wider range, for example 145-148°C or 186-189°C. So if your sample has a melting point at the temperature you expect, it is probably what you think it is. If the melting point is quite sharp, then it is likely to be fairly pure.

The general method is to heat a sample indirectly by placing the prepared sample (usually packed in a glass capillary tube) in or on a heated medium and observing it, and the temperature, closely until melting is complete.

There are a few ways of doing this

Melting point apparatus

This is the most common piece of apparatus for determining melting point. The sample is loaded in a capillary tube and the temperature of the sample gradually raised by means of a heated internal metal block.

Older, or budget, apparatus (like the one in Fig 1) is almost entirely manual. You have to manually control the rate of heating.

More modern, advanced ones, (see Fig 2), allow you to program the rate of heating and allow it to heat rapidly to a set point and then go more slowly.

In both cases, though, you need to watch (carefully) through a magnifier and determine for yourself when melting starts and finished.

The one problem with the melting point apparatus described above is that of cost. It is possible to purchase manual ones from around £200, or less, but the more advanced ones start around £700 or more.

But these days, even £200 is quite a chunk of an impoverished budget. Fortunately, there are lower cost alternatives.

Melting Point Block

This is a very simple arrangement, costing about £25, and used with care can give reasonable results.

It consists of a block of solid aluminium with a hole drilled in at an angle for a thermometer. You place a thermometer in the diagonal hole and put a small pile of your solid in the middle of the block.

You then heat the block, gently, from the bottom. The heat is conducted up and will eventually melt the solid on the top.

When you see it starting to melt, record the temperature and record it again when all the sample has melted.

It can be difficult to avoid heating the sample too rapidly, especially if you are using a Bunsen burner, but with care it is possible to get decent results.

Fig 1: Old MP apparatus

Fig 2: A more modern device

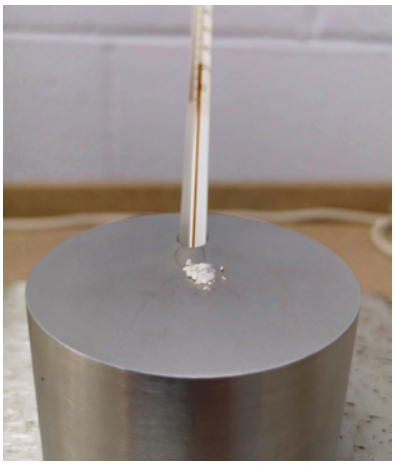


Fig 3: A melting-point block

Thiele Tube

Another cheap alternative that can, with care, still produce accurate results, is the Thiele tube. These cost only about £10 or so.

The Thiele tube is basically a boiling tube with a side loop (see diagram). The sample is placed in a capillary tube and is held next to the bulb of a thermometer by eg a band or wire and placed in the 'main', straight part of the tube.

The tube is filled to just above the loop with a liquid of a suitable boiling point, most commonly an oil and the side arm is heated. As the tube is heated, convection causes the liquid to circulate around the system distributing the heat.

Care needs to be taken to ensure that heating does not happen too fast. A mini burner or a spirit burner is easier to use than a Bunsen for this. It is worth noting that the temperature may continue to rise by 2 or 3 degrees after you stop heating.

It is possible, if even a Thiele tube is too expensive, to just use an ordinary boiling tube, again with a capillary tube fixed to a thermometer. But this is even harder to control to get a good result.

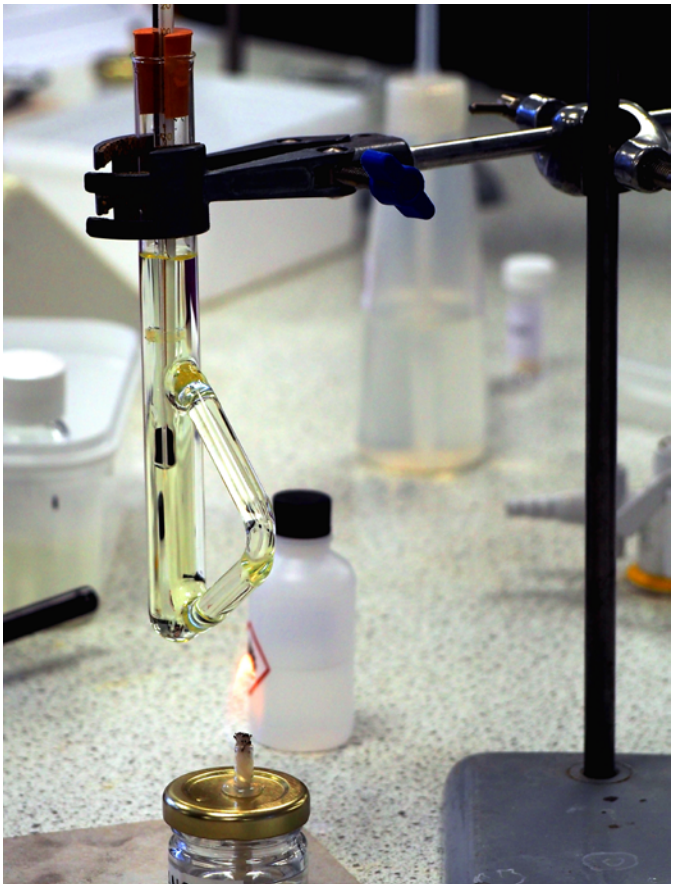


Fig 4: A Thiele tube in use

How to use a Thiele tube

1. Place some of your sample in a capillary tube.

2. Fix the capillary tube to a thermometer.

   We find the best option is to cut a small loop off a length of silicone tubing as a rubber band has a tendency to degrade and break in the oil.

3. Place the sample in your Thiele tube and start heating the side arm.

4. If you are testing the purity of your sample, you will have an idea of what the expected temperature is.

   If you are identifying an unknown though, it might be quicker to carry out a rapid melting point determination initially (by heating rapidly) to establish the approximate melting point before repeating it more carefully.

5. Once the temperature is getting close to your expected point, take care. It can often continue to rise 2 or 3 degrees after you stop heating. Try to increase the temperature as slowly as possible, by moving the burner or the tube nearer to or further from the flame.

6. When you see the first sign of melting in the tube, not the temperature.It is a good idea to use a magnifying glass (or some other device to magnify) so you get a clearer view of when the melting starts.

7. Keep heating, gently, until all the sample is melted. Record this temperature.

8. It is usually a good idea to carry out at least two further careful determinations until you obtain two consistent values.

Note that unlike boiling point, the melting point is relatively insensitive to pressure and no pressure correction needs to be made.

Conclusion

Determination of melting point is a useful analytical technique and although the apparatus can be expensive we hope this article has shown you that it is still possible to carry out a melting point analysis without breaking the bank.

A message to employers - radiation generators and registration

HSE are requiring employers with radiation generators to provide them with more information. Radiation generators are machines that produce ionising radiation, for example x-ray machines in a mail room. Radiation generators are not used in school science departments and are therefore not covered by SSERC. Employers with radiation generators will have to seek advice from a radiation protection adviser who specialises in this area. If an employer has a radiation generator, they will be required to re-register under IRR17. This will also involve informing HSE of school radioactive sources, and we have produced guidance to help. Please note that some schools have a radioactive source called a protactinium generator. Despite the name, this is not a radiation generator though it does emit radiation.

On the subject of protactinium generators

No school should have a protactinium generator (figure 1) that is more than 8 years old. If you have one, please get in touch with us and we will advise you about disposal. Whilst this will not be cheap, it must be done. Keeping it could turn out to be the falsest of false economies should it leak. The full reasons behind this are explained in **Bulletin 268**.

Figure 1 - protactinium generator

Ionising radiation - informing your employer

This article is about the information that school science departments working with radioactive materials should pass on to their employers. In state schools the employer is the local authority and in independent schools the employer is the board of governors. In both cases we suggest informing your senior management team, who act on behalf of the employer.

The documents, forms and checklist mentioned in this article can be accessed from the Ionising Radiation pages of our website https://www.sserc.org.uk/health-safety/physics-health-safety/ionising-radiation/. You will require to be logged in.

Last year, the Health and Safety Executive (HSE) began inspecting schools to check whether or not their use and storage of radioactive materials complied with the Ionising Radiations Regulations 2017. We have been informed that these inspections are to continue. The inspections highlighted the roles of staff, the employer and SSERC.

- Staff are legally obliged to follow their employer's health and safety guidance.
- SSERC, acting on behalf of the employer, produces guidance on safe, legal work with radioactive materials in schools. A member of staff at SSERC holds the HSE-recognised Radiation Protection Adviser qualification. We will be writing about Radiation Protection Advisers in the near future.
- The employer should ensure that this guidance is being followed.

Since the inspections began, many employers have become more proactive regarding this last point. They may well ask to see everything you have concerning working with ionising radiation and that's their prerogative. The following is what we consider to be the minimum you should pass on to them if you are taking the initiative.

Tell them that you are working with radioactive materials

It is possible that they do not know. It is also possible that, when you tell them, they may be full of misconceptions about the risks and benefits. SSERC has plenty of material about this, including an article about radiation dose in **Bulletin 278** that puts things into perspective.

Tell them the name of the supervisory member of staff
This will be someone who has had direct training from SSERC within the last five years (either face-to-face or online). Their role is ensuring that SSERC's guidance on working with ionising radiation is being followed in the school, though the ultimate responsibility is the employer's. Your SMT should be aware that if this member of staff leaves this role needs to be filled.

Pass on your staff training records
All staff who work with radioactive materials should be trained. With the exception of the supervisory person mentioned above, this can be inhouse, though we do love for as many of you as possible to join us on courses. HSE may in the future wish to know how many people work with radioactive sources and giving your employer a copy of training records is a good way to help them to do this.

Pass on your stocklist and tell them the location of your storage cabinet
This information will be required by the member of SMT who liaises with the Fire and Rescue Service. Your stocklist should consist solely of items approved by SSERC. Our document 'Working with radioactive materials in schools' tells you what you can and cannot keep.

Pass on your completed checklist
Download the checklist from our website. You should be able to tick all the relevant boxes and if you can, you and your employer can be content that you are following SSERC's guidance.

Radon
Your employer should have carried out a radon risk assessment at each workplace. It is not the responsibility of the member of staff who supervises work with radioactive material in the science department to do this, nor is it an area covered by SSERC. Having said that, there was a recent case in England where an independent school was prosecuted for ignoring this requirement. If you work in an independent school in Scotland you might mention the radon situation to your employer to ensure they are aware. SSERC cannot give comprehensive advice, but we can support employers taking the first steps.