sserc

Annual report 2024

Contents

Overview

Chair introduction

It is with great pleasure that I present my second introduction to a SSERC Annual Report as the Chair of the Board of Directors and Trustees. I am deeply grateful for the opportunity to serve on the Board of an organisation that is held in such high regard within the STEM education sector in Scotland. To chair a Board that is both supportive and challenging, all in the pursuit of our shared vision is a privilege and one to which I am happy to devote my time and experience.

The Board receives regular reports and presentations from the SSERC Senior Management Team on progress across all eight workstreams associated with the organisation's vision for 2030 to be ***internationally recognised as a centre of excellence for STEM learning and support.***

It is encouraging to note significant progress on medium-term (by 2027) actions associated with each workstream.

The work undertaken by the organisation relating to its three core functions would not be possible without the ongoing support (financial and other) from our key strategic partners: the Scottish Government, STEM Learning, The Primary Science Teaching Trust, and the Edina Trust. We are deeply grateful for their continued support which allows the continued development of the organisation and the delivery of its objectives. We also extend our gratitude to our member organisations: the 32 Scottish Local Authorities, most independent sector schools, and some Scottish colleges. Their partnership is invaluable to us in delivering our ambitions in STEM learning and support. We are also grateful to all the other bodies and organisations supporting SSERC's work, many of whom are recognised throughout this report.

Our Board has experienced some changes due to the natural progression of members' terms and their work commitments. However, I am pleased to report that our new members have seamlessly integrated into the Board and are actively contributing to our meetings and other activities. This transition reflects the dynamic nature of our organisation and our commitment to maintaining a diverse and engaged Board. We are delighted that Kaukab Stewart, MSP remains on the Board following her promotion into government as Minister for Equalities. To find out more about the Board, visit: Who we are - SSERC.

On behalf of the Board, I would like to convey my thanks to the CEO, the Senior Management Team, and, importantly, the whole of the SSERC team for their ongoing commitment to the organisation, their pursuit of excellence in supporting STEM learning and for continually demonstrating the core values of the organisation.

Alistair Wylie - Chair of SSERC Board of Directors and Trustees

Message from the CEO

SSERC has not only weathered the storm of ongoing financial challenges faced by many in the UK but has also emerged stronger, as evidenced by the contents of this 2024 Annual Report.

The financial year April 2023 to the end of March 2024 was yet again another very successful year for the organisation – across all the core main functions:

Professional Learning
Advisory Service
STEM Engagement

The organisation's three core functions do not work in isolation; they provide an integrated portfolio of products and services to benefit educators in Scotland and beyond. This contributes to the organisation's Vision for 2030: to be ***internationally recognised as a centre of excellence for STEM learning and support***.

Despite the challenges of austerity, teacher shortages, teacher release from school, and increasing teacher work pressures, the organisation significantly exceeded all key performance indicators set by our external funders for professional learning. As outlined below, several contributing factors are associated with this.

The re-introduction of Practical Assignments and Projects at National 5, Higher and Advanced Higher Sciences helped to reinforce the critical role that practical work plays in learners developing practical skills related to the generalisation, interpretation, and application of certain scientific ideas and materials. This re-introduction after a period of absence rightly caused some anxiety within the teaching profession; newly qualified teachers were unsure of the assessment standards and requirements, experienced teachers required reassurance that assessment standards had not changed, and all were seeking support and advice to benefit learners. In the academic session 2023/2024, SSERC supported this re-introduction by providing a range of professional learning opportunities focusing on assignment and project activities that could be used to support SQA assessment specifications. We are grateful to all the delegates who attended these events and provided positive feedback.

As an organisation, we are proud of the role that our advisory service plays in supporting health and safety relating to STEM (and other) curriculum areas. The commencement of random school inspections by the Health and Safety Executive (primarily relating to school science departments working with radioactive materials) reinforced the importance of understanding and adhering to health and safety guidance and regulations and ensuring that staff (teachers and technicians) had appropriate health and safety training relating to their specific roles and responsibilities in their establishment. In the academic session 2023/2024, SSERC supported the professional development of teachers and technicians through a range of health and safety professional learning courses (face-to-face, online, and self-study) in a wide range of areas, including, for example, Storing Radioactive Sources, Safe Use of Workshop Machinery and Physics Safety.

SSERC is fortunate to have staff who are not only experts in their own areas but also contribute passion, enthusiasm, creativity, and innovation to developing and delivering professional learning activities. New and exciting professional learning opportunities are continually being added to the SSERC professional learning calendar, including Welding Skills, Saving the World with Data, Microscale Chemistry, VEX 123, and Sowing the Seeds of STEM, to name but a few.

As we embark on a new financial year, we anticipate significant financial pressures. However, with the continued support from the Scottish Government and our unwavering commitment, we are prepared to face these challenges head-on and develop innovative solutions to overcome them.

Alastair MacGregor

Alastair MacGregor - Chief Executive Officer

Corporate activity

SSERC is a membership organisation

Members include:

- All 32 Local Authorities
- Most schools in the independent sector
- Some Scottish colleges
- International centres
- Other organisations

SSERC has Scottish charitable status and is a company limited by guarantee. The organisation is governed by Articles of Association Articles, and it is the responsibility of the SSERC Board of Directors and Trustees to undertake a scrutiny and governance role.

Membership of SSERC offers access to a unique portfolio of products and services that cannot be provided by any other organisation. Additionally, our reputation for excellence brings funding from other parts of the UK, which is reinvested to support STEM education and training, ultimately benefiting learners in Scotland.

Staffing

We had the privilege of seconding John Cochrane as Education Manager (Chemistry) on a 0.4FTE basis for a full academic year. This strategic move allowed for the delivery and development of a range of additional professional learning, significantly supporting Chemistry and Environmental Science.

Notably, we welcomed Annie McRobbie, our Education Manager (Biology), onto our Senior Management Team as Lead for Special Projects. The projects progressed by Annie underscores our unwavering commitment to Diversity, Equity, Inclusion, and Belonging, reassuring our stakeholders of our dedication to these principles.

Our total staffing complement in this reporting year was

We also welcomed our inaugural Fellow, Paul Beaumont, back into SSERC, where he supports the development and delivery of professional learning activities for the organisation.

Equality, Diversity and Inclusion data

SSERC actively collects equality, diversity and inclusion data from delegates who attend our professional learning activities. This data, voluntarily provided by delegates, is crucial in better understanding how our policies, processes, decisions, products, and services affect different groups. By doing so, we can identify and take action to address any potential discrimination, harassment, and/or unconscious/conscious bias. The data for 2023/2024 can be found at: EDI-23-24.

Complaints

Stop period poverty

Tackling period poverty across the UK is a large and complex task. So, whilst as a business we can't put a complete stop to period poverty, we can play our small part in tackling this crisis. In this reporting period we commenced a scheme to offer free access to menstrual products to visitors, delegates and staff at SSERC.

SSERC Honorary Fellowship Award 2023

We were delighted to award Iain Hunter the 2023 SSERC Honorary Fellowship at an event at the Scottish Parliament in October 2023.

Kaukab Stewart MSP (Board member), Iain Hunter, Alastair MacGregor (CEO)).

Iain is a Research Professor of Molecular Microbiology at the University of Strathclyde. He has a strong interest in STEM and has been an avid supporter of SSERC for many years. He has been involved in several national STEM-related activities and programmes, including Co-Chairing the Scottish Government's STEM Advisory Group and STEM Strategy Advisory Group.

The Honorary Fellowship Award recipients for 2024 have been announced and will feature in the 2025 Annual Report. 2024 SSERC Honorary Fellowship Award.

The SSERC garden project

We continue to work with King's Road Primary School, Rosyth, to develop our outdoor garden activities. With funding from Edinburgh Airport Community Fund, Tesco Community Grants and MGM Timber we were able to transform a second unused space in SSERC HQ into a garden area with the specific purpose of designing, building and maintaining an outdoor space in which fruit and vegetables could be planted, harvested and then used to support simple but healthy dishes such as leek and potato soup and fresh berry smoothies.

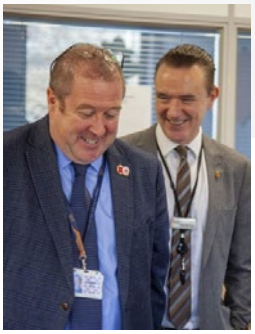
For more information click here.

Before.

After.

Kings' Road Primary School learners.

We were pleased to welcome a range of visitors to SSERC so that they could learn more about the valuable work we do to support STEM education and training in Scotland.



Graeme Dey, MSP Minister for Higher and Further Education and Veterans.

Liam Kerr, MSP, Conservative and Unionist Education spokesperson.

Pamela Duncan Glancy MSP, Labour Education spokesperson.

Our main corporate social media accounts

SSERCofficial

5944 followers	407 followers	340 followers

SSERC 60th anniversary

SSERC will celebrate its 60th anniversary in the summer of 2025. We are currently working with staff and Board representatives to plan a week of activities to celebrate this milestone event.

Professional Learning

Aim
To increase the breadth and impact of the professional learning offering.

Secondary

SSERC is the leading organisation for hands-on, practical, experiential STEM-based professional learning in Scotland and offers a diverse range of opportunities. Our professional learning supports Biology, Chemistry, Environmental Science, Mathematics, Physics, and Technology, catering to the needs of different education sectors. This includes Newly Qualified Teachers, Early-Career Teachers, Mid and Late Career Teachers, and those undertaking a STEM leadership role within their centre.

From April 2023 - March 2024 the Secondary Education Team delivered

9435	1887	1633	1374	100	71	88
Hours of combined professional learning	CPD units* achieved	Delegates	Teachers	Technicians**	NQTs	Other delegates including STEM Ambassadors and CLD Staff

*1 CPD unit equates 5 hours of SSERC PL ** technicians attending teacher based courses

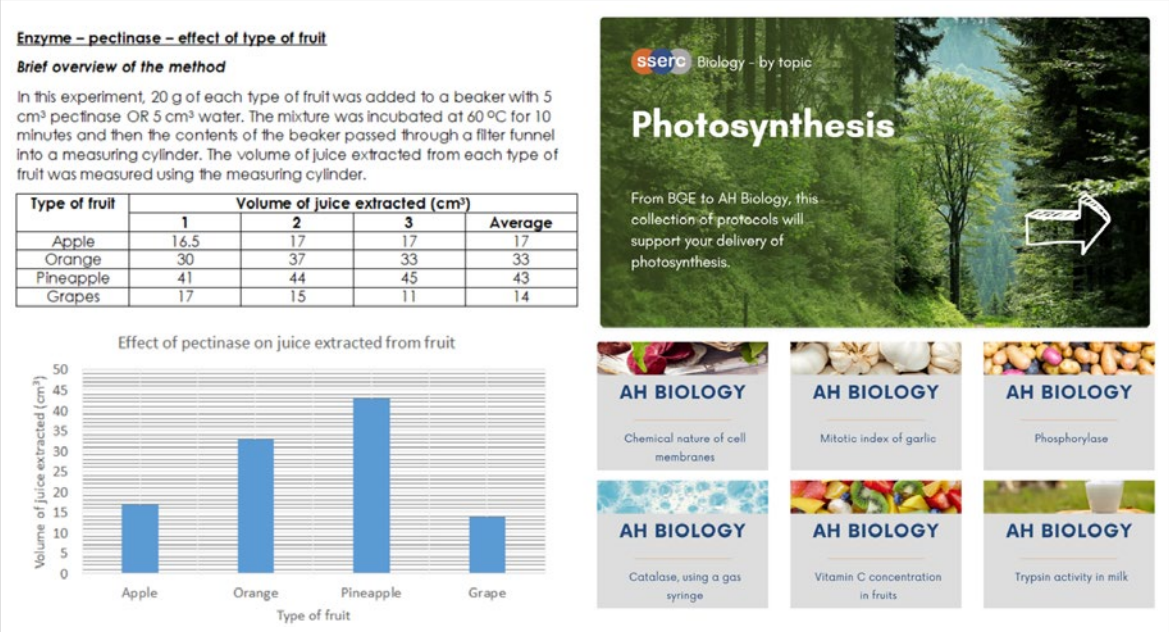
Biology

The 2023/2024 academic session saw the return of the national Assignment and Project tasks for learners. This created a professional learning need across Scotland, with many practitioners lacking experience in delivering these core assessment pieces since entering the profession after 2020. SSERC responded to this by developing a suite of new courses, both face-to-face and online to ensure equity and accessibility, and tailoring our offer to demonstrate a wider variety of practical activities that could be adopted by learners to satisfy the course assessment task.

In 2023/2024, the Biology team delivered a range of professional learning offers to support practitioners.

1430	286	630	10
Hours of combined professional learning	CPD units* achieved	Teachers	Courses (8 face-to-face 2 online)

- Scottish STEM Placement Programme - Merck
- Biology Summer School
- Moray Council Bespoke Professional Learning Offer
- SCIS Biology Teacher Meeting
- Techniques to support Senior Phase Biology
- Investigations to support Advanced Higher Biology
- SSERC Meet - Supporting AH Biology Projects
- SSERC Meet - Supporting Assignments



A range of downloadable resources have been developed this year, including a variety of practical activities suitable for National 5 and Higher Biology Assignments and Advanced Higher Biology Projects, further activities to support microscale biology approaches, and a new feature called "Protocols by Topic". A useful collection of data sets to support teachers and learners with data literacy across practical activities has also been made available on the website.

Evaluation quotes

Advanced Higher Biology – Measuring Impact Form

"As the course has increased my knowledge and enthusiasm, this has then passed onto pupils who have really enjoyed their chosen project. I feel that this is one of the most beneficial CLPL I have undertaken and has definitely inspired me to put my all into teaching advanced higher to the best of my abilities and to always strive for the best for pupils."

"This course greatly increased my confidence in guiding pupils through their advanced higher as I could give them firmer answers on what was AH appropriate and what was not. I felt comfortable showing them how to do certain experiments and knowing how to inform practices, in what should be avoided and what areas are tricky and how best to proceed."

Techniques for Senior Phase – Post-course evaluation

"I think this professional learning will help improve my subject knowledge, as well as improving my delivery of the content. I think this will help make senior phase biology more accessible for pupils and help me better develop their skills within the course."

"I feel more confident approaching appropriate curriculum design and planning to meet the learning needs of senior phase learners."

"This learning has already enhanced my teaching practice, allowing me to run an engaging practical with my Higher Human class I wouldn't have otherwise known about. Pupils enjoyed it and found it really helped to illustrate the idea of viral spread. I feel like I taught a better lesson as a direct result."

Some evaluation data to choose from		
How would you rate the overall quality of this Professional Learning?	Excellent – 87%	Good – 13%
The PL was well organised and planned	Agree strongly – 95.7%	Agree – 4.3%
The PL was relevant and useful	Agree strongly – 92.5%	Agree – 7.5%
The PL will impact my future practice	Agree strongly – 88.8%	Agree – 11.2%

We will continue to revise existing and develop new professional learning to support STEM education practitioners. Here is a sample of what to look forward to:

- Updated course with new practical activities to support AH Biology Projects.
- Updated course content to progress Techniques for Senior Phase Biology.
- A new course called "Assignments for Senior Phase Biology".
- Continuation of the Safety in Microbiology Level 3 course – for technicians.
- Continued input into the Probationer course, reflecting on evaluations from this year.
- Progress with further development of the "Protocols by Topics" resource series.

Environmental sustainability

Across our courses, we have made a concerted effort to reduce single-use plastics. Instead, we have reused such materials or substituted i.e. with glassware. In every course Biology has delivered in 2023/2024, at least one outdoor learning session has been included, with numerous opportunities highlighted for progression or alternative investigations that could be carried out in a similar setting. The link between course content and the United Nations Sustainable Development Goals has been explicitly stated to delegates wherever relevant.

Chemistry

As with all science subjects, the reintroduction of Assignments at National 5 and Higher, as well as Projects at Advanced Higher, caused an increased demand for support, which we provided at SSERC HQ and other locations in Scotland.

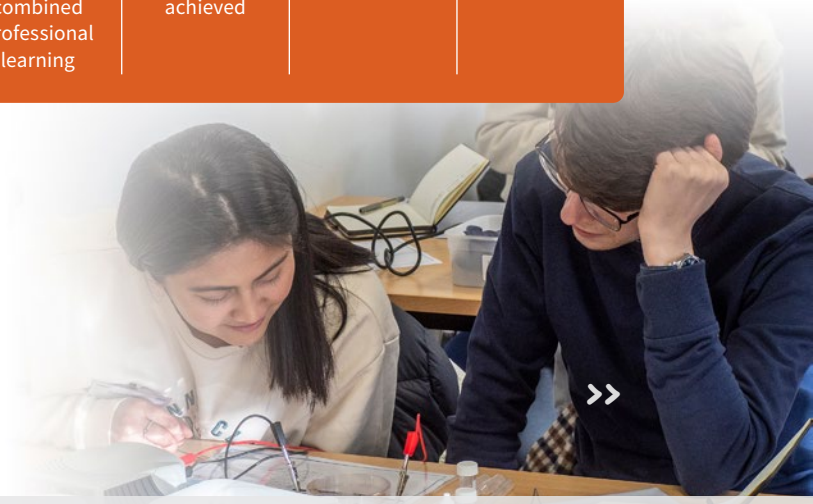
We managed this by introducing a new courses: Assignments for National 5 and Higher Assignments (for which we also produced an online, self-study option).

1380 Hours of combined professional learning

276 CPD units achieved

203 Teachers

33 Technicians



Newly Qualified Teachers and Early Career Teachers in Chemistry continue to be supported by the team at SSERC. During the year 2023/2024 we ran the following courses:

For Teachers
- Microscale Chemistry Summer School
- Chemistry for Advanced Higher
- Chemistry Assignments for National 5 & Higher (face to face and an online course)
- A chemistry training day for Dumfries & Galloway teachers (and some technicians)
- 2 Days of Chemistry PL for Moray teachers

For Technicians
- A new Technicians course for Higher and Advanced Higher Chemistry.
- Chemical Handling (2 courses)
- Introductory Chemistry – now an online, self-study course.
- Chemistry also contributed to the SSERC Technicians Conference

Additionally, chemistry contributed to:
- Probationers Courses (3 Cohorts
- N5 Lab Science course
- Environmental Science

Evaluation quotes

"I now feel more confident with delivery of practical techniques and how to ensure that these are carried these out safely."

"It's given me the foundation skills needed to move science forward into a greener, safer and cheaper way of working."

"Given me an extra spark and determination to improve my teaching/course and make the course more engaging for my pupils."

To support the professional learning, we have developed a number of new experimental activities which have been placed on the website along with sample data which can be used for a variety of data analysis activities as well as secondary sources in assignments. Data Sets

We will continue to revise existing and develop new professional learning to support STEM education practitioners. Here is a sample of what to look forward to:

- At the time of writing we have already developed and run a course for Advanced Higher Projects.
- We are also in the process of developing a 1-day course of Chemistry for Non-Specialists; aimed at Biologists and Physicists teaching Chemistry elements of BGE.
- Over the next year we are also going to develop a number of short, self-study courses aimed at assisting teacher or technicians (or even learners) to develop their practical skills.

Environmental sustainability

We have been addressing the issue of sustainability in Chemistry in a couple of ways:
- Firstly by continuing to develop and promote Microscale Chemistry. The small scale and low-cost equipment involved reduces environmental footprints as well as reducing costs for schools. As well as a 2-day course on Microscale Chemistry, we also ran several sessions at the technicians conference focused on making Microscale Chemistry equipment.
- Secondly by continuing to develop new experimental procedures that use less harmful chemicals.

Environmental Science

In 2023/2024, a 2-day professional learning course focused on National 4, National 5 and Higher Environmental Science was offered in September. This was delivered to 16 delegates from across Scotland and included support from SQA across both days.

160 Hours of combined professional learning

32 CPD units achieved

16 Teachers

1 Course

SSERC have continued to develop a range of practical activities, throughout 2023/2024, to support STEM teachers deliver Environmental Science in school. This includes an increasing number of Geography teachers, who do not always have access to laboratory space. This has focused our attention on developing outdoor learning opportunities and wider investigations.



Evaluation quotes

Environmental Science – Measuring Impact Form

"This course gave me lots of inspiration to deliver interesting and engaging lessons to my students! I also shared these lessons with my colleagues."

"I felt this course developed my practical knowledge and application. This supported the delivery of the Assignment, but also helped engagement of learners. I deliver the course with a biologist and so this course helped to build my confidence and improve my teaching quality."



From the Measuring Impact Form

"The most valuable aspect was the simple ways we learned to carry out practical work both in the lab and outside. This has given us confidence to do a whole variety of experiments with our classes."

Some evaluation data to choose from		
The PL was relevant and useful	High – 91%	Medium – 9%
The PL will impact my future practice	High – 82%	Medium – 19%

We will continue to revise existing and develop new professional learning to support STEM education practitioners. Here is a sample of what to look forward to:

- A new Caterpillar Foundation funded Enthuse Partnership focused on National 5 and Higher Environmental Science.

Environmental sustainability

We have focused substantial time in our professional learning offer to deliver outdoor learning opportunities. This has included a half day at a nature reserve in Fife, offering kick sampling, aquatic invertebrate sampling and identification and soil sampling. We have continued to develop and update our interactive Sustainability resource booklet, aligned to the National 5 Environmental Science course, bringing together national and international resources relevant to sustainability.

Leading the way in STEM

In June 2023, and after a highly successful inaugural year in 2022/2023, SSERC launched year 2 of its Leadership in STEM Education course. Many aspiring Principal Teachers or Faculty Heads work with us on this course, but it's not just designed for them. Some of our delegates simply want to build their knowledge, skills and professional abilities to develop experience as leaders of STEM in their respective centre.

Aligned to the GTCS Standards for Career-Long Professional Learning and Middle Leadership, the content and learning are set at SCQF Level 11.

- ✓ Developing academic writing skills and engaging with publications/articles.
- ✓ Exploring key current educational policies in STEM and measuring their impact.
- ✓ Carrying out self-evaluation and improvement activities in their centre.
- ✓ Developing an understanding of management and leadership skills, theory and practice.
- ✓ Analysing their own leadership skills and potential through the views of themselves and others.
- ✓ Investigating the range of STEM engagement opportunities that exist in Scotland and how they can impact and enhance the learner journey.
- ✓ Completing a professional enquiry on a key area relevant to their setting.

with input from:

- ✓ GTCS
- ✓ Education Scotland
- ✓ Skills Development Scotland
- ✓ Strathclyde and Stirling Universities
- ✓ Experts and consultants in leadership and management strategies
- ✓ Organisations that support STEM education

Evaluations quotes

Leadership in STEM Education course

"This course has benefited me in so many ways, including but not limited to: making connections I will maintain with colleagues at other schools; an improved confidence, knowledge, and understanding of the language and theories of Leadership; and engaging in a Critical Collaborative Professional Enquiry had led to sustainable improvements to my practice and that of my department which has been shown to already have an positive impact on pupils."

Kirsty

"I have enjoyed this course and the opportunity it has allowed me to reflect on my practice. The confidence I have gained from this course has been important to me and my leadership journey. I applied for maternity cover acting Faculty Head of science in my department and was successful in December. A position I would not have had the confidence to strive for without this course."

Claire

"The Leadership in STEM course had an excellent variety of professional development across the year that all tied into the Standard for Middle Leadership. The interruption to practice through CCPE has been an excellent opportunity to develop an area of research in a way that has directly benefited myself as a practitioner, the learners in my centre and has left clear scope for further work that can be taken forward departmentally."

Andy

"The Leadership in STEM course has allowed me to become more confident in my role in school. The structure and support on the course was excellent. Meeting a diverse group of teachers gave the opportunity to share ideas and collaborate in new ways. I have had opportunities to drive change to curriculum and gain mentoring opportunities following the skills I have developed from this course."

Asha

"The course has really help develop my Leadership in areas which I had not even considered such leadership styles. For me however the Practitioner Enquiry had the most impact, I would go as far as to say I would replace PRD with Practitioner Enquiries."

Sandeep

"Throughout this course I have developed my Leadership and organisation skills, built a network with colleagues across the country, and engaged in evaluation tasks that I would not normally be able to complete. I have explored aspects of STEM policy and taken part in sharing of good practice, implementing some of these ideas already in my classroom. The presentations have helped develop my confidence, which I hope to put to good use in an upcoming interview."

Darren

Professional Recognition Accreditation

The Leadership in STEM Education course carries Professional Accreditation by GTCS. This means that delegates who complete the course are recognised with the accomplished expertise they deserve.

21
Delegates

3000+
Collective hours of professional learning delivered

Physics

In 2023/2024, the Physics team delivered a range of professional learning offers to support practitioners, including for the introduction of National Assignments and Projects at Higher and Advanced Higher levels. The Physics team continues to provide a wide and diverse range of professional learning opportunities delivered in various ways to suit the needs of practitioners, e.g., self-study, hybrid, and, of course, face-to-face as illustrated below.

1215	243	129	15
Hours of combined professional learning	CPD units achieved	Teachers	Courses

Courses

Throughout this session, we continued offering our self-study courses, and delegates completed various short courses related to curriculum and safety.

- Practical satellite activities for beginners
- Tracker
- Optical radiation
- Electrical safety
- Physics self-study (other)
- Mobile devices

We added a new classroom activity to plot the Doppler curve of an orbiting satellite to our satellites self-study course.

"All activities are fun and practical. I did activity 1, 8 and 9 and I found all of them very helpful in terms of course teaching and inspirations to pupils."

We delivered a two-day CLPL event for Moray council and a short CLPL session for teachers in East Lothian, both aimed at supporting senior phase Physics.

We again ran our very successful 4-day IOP/SSERC Physics Teachers Summer School in partnership with IOP Scotland.

We partnered with Edinburgh University's Data Education in Schools to run a pilot 'Data Science' course which was held, concurrently, at SSERC and online for those remote or with caring responsibilities.

As a direct result of HSE inspections of schools we offered, at short notice, extra online 'Working with Radioactive Sources' courses.

We again ran our very popular 2 day H/AH course and due to high demand ran an extra 3 x 1 day H/ AH courses. The 2-day course included a session from the SQA Qualifications Manager. This was recorded and made available to those delegates on the 1-day courses.

"Everything in the SSERC course was so useful - I would have been lost without it this year as it was my first year teaching advanced higher."

"I found all the sessions very useful. This is perhaps the most useful CLPL I have attended in my years of teaching. The staff were very knowledgeable, friendly and informative and it was clear that a lot of work had been put into designing the course. The experiments planned by the staff and carried out by us provided me with valuable insight into how to run advanced higher practical experiments."

Photo by Cottonbro studio | pexels.com

We also ran our Introductory Physics two-day course for technicians this session and ran sessions to support the Lab Science course and the Technology Probationer's course.

We supported all cohorts of the Science Probationer's events. In Physics the delegates looked at how tricky concepts such as forces could be explained and how valuable insights can be gleaned from careful observation of simple, practical science experiments. The balloon zip-line, the dancing raisins and the 'O' wing glider activities were particularly enjoyed!

Technicians working hard on our Introductory Physics course.

Development
We have written-up a laser ruler diffraction experiment for our AH course and updated some optics measurement techniques for inclusion in future H/AH courses.

Our Optical Radiation self-study course was moved to the SSERC Online Learning platform.

We have written up and evaluated three pieces of equipment of use at AH manufactured by a new, Scottish, supplier and one piece of apparatus from a national supplier. These have and will feature in bulletin articles.

Other activity
We worked with the IOP to plan our new 'Raising Attainment in Physics course' which will take place in May 2024.

We again partnered with 'Data Education in Schools' from the University of Edinburgh, along with colleagues from early years and primary to offer a five-week, twilight, online BGE Data Science Course. This course introduced teachers to a progression of activities that allow learners at all levels to tell a story using information and to understand and interpret data. This is a hugely important skill across all subjects.

We were invited and met with staff from the Physics department of Edinburgh University to discuss a teaching resource they were developing which would support the Particle Physics area of the Higher Physics syllabus. A second meeting is scheduled for June 2024.

Throughout the year we continued to get a high number of requests for advice and support from teachers regarding the AH projects.

We constructed a second 'phototube' Planck's constant apparatus to loan to schools and have loaned apparatus to schools to support AH Physics projects on nine occasions.

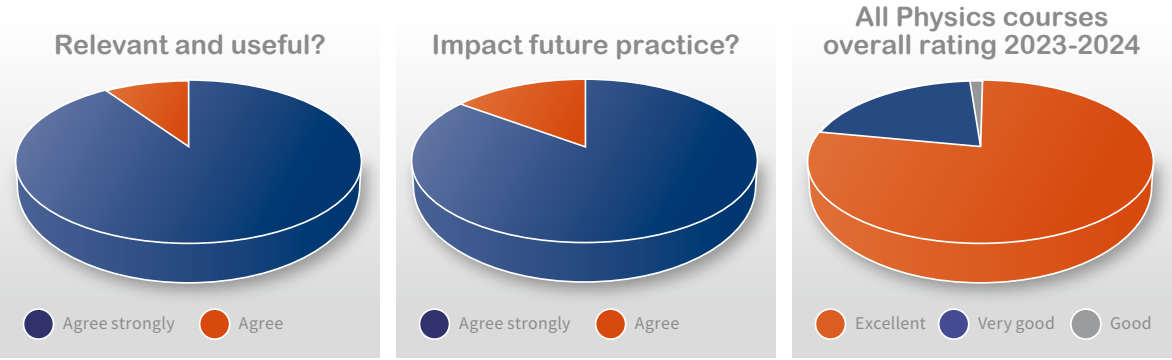
> *"I really appreciate the help you have provided, running the AH course would be almost impossible without it."*

AH learners from three schools, accompanied by their Physics teacher, visited SSERC to undertake AH Project experiments.

> *"Just to say a huge thank you to ... for your help with the rotary motion Pasco kit. My student really enjoyed doing the experiment at SSERC and it allowed her to finish her investigation. The Physics teaching community of Scotland are so lucky to have you. With very best wishes."*

We continue to support the IOP and delivered several 'AH on a Budget' sessions for them.

We are pleased with the positive evaluations obtained from delegates participating in our Physics PL as illustrated by the pie charts below:



We will continue to revise existing and develop new professional learning to support STEM education practitioners. Here is a sample of what to look forward to:

H/AH lab manual - For session 2024/2025 additional experiments and measurement techniques will be added to our already comprehensive 144pp H/AH lab manual.

New electronics courses - We will be developing electronics courses to support teachers new to N5 Practical Electronics and for technicians wishing to learn more about electronics.

Muon detector - We purchased two Muon detectors for demonstrations in our H/AH course.

Cube Sat Simulator - A long-term construction project which, when completed, we hope to be able to loan to schools. The AMSAT CubeSat Simulator is a new tool for education and demonstrations. It can be used in a classroom to introduce the basics of satellites, or it can be used to teach STEM (Science Technology Engineering and Math) concepts.

Environmental sustainability

We offer a range of self-study courses with downloadable support resources and have successfully used the concurrent online/in-person model of course delivery in our Data Science courses in order to increase our reach, reduce the need for travel, reduce accommodation costs and allow for increased participation for those with caring responsibilities or who may have other responsibilities that would otherwise prevent them from attending a traditional in-person course. We continue to support teachers in bringing old equipment back into use and have designed some small 3D-printed items for Physics experiments that can be printed locally, often in school, as a replacement for obsolete or expensive equipment. We continue to include our very popular 'AH on Budget' sessions, which use cheap, readily available materials and items.

Technology

In 2023/2024, the Technology team has continued to deliver a range of practical hand and machine skills-based courses to develop and enhance teacher and technician competence. The following range of 2-day courses were delivered this session:

- Welding Skills
- Woodturning Skills
- Hot and Cold Metal Forming
- Centre Lathe Skills
- Technology Probationer Residential.
- Safe Use of Classroom Machinery

1040 Hours of combined professional learning

208 CPD units achieved

87 Teacher

23 Courses (face-to-face)

In addition to this the Technology team have also delivered a further 178 CPD units (945 hours) under the technician portfolio of professional learning. This was through the delivery of:

- Safe Use of Fixed Workshop Machinery
- Safe Use of Fixed Workshop Machinery Refresher.

Centre lathe skills delegates.

Evaluation quotes

"Practical hands-on sessions were most useful because you could ask questions while on the machine."

Centre lathe skills 2023

Welding skills delegate, May 2023.

"I found the welding course extremely useful, learning different types and techniques for both personal benefit and to improve my teaching."

Welding skills 2023

"I found the forge most interesting as it was new to me and feel more confident incorporating it into the curriculum in my department."

Hot and cold forming 2023

"I found the course excellent. It was great to be involved in making the different products which have focussed on the different skills."

Woodturning 2024

Woodturning skills delegates, June 2023.

We are pleased with the positive evaluations obtained from delegates participating in our Technology PL as illustrated in the table below.

Evaluation data		
How would you rate the overall quality of this Professional Learning?	Excellent – 77%	Very good – 21%
The PL was well organised and planned	Agree strongly – 90.1%	Agree – 9.9%
The PL was relevant and useful	Agree strongly – 82.2%	Agree – 17.8%
The PL will impact my future practice	Agree strongly – 82.6%	Agree – 17.4%

Courses/resources developed

- New fume extraction developed and integrated into workshop space to facilitate safe finishing techniques within courses.
- Bulletin article on selection of dust masks suitable for use in Technology departments, range of PL offered and correct selection of bandsaw blades.
- Welding H&S information session (in-school free pilot, morning session, 5 delegates).
- Development of a 1 Day bespoke Tool Sharpening course.
- Delivered and developed a small number of Hot and Cold Metal Forming courses for specific LA's.
- The Technology team contributed to the STEM Technicians training day, developing, and delivering workshop taster sessions in welding skills and woodturning.

Technology NQT Residential


Tech probationer, woodwork basics.

November 2023 saw the second Technology NQT residential being held at SSERC. This event was well attended with 18 delegates representing a wide spread of Local Authorities in Scotland. 5 practical workshop sessions were developed with fresh projects, ideas, and teaching strategies to support NQT's to deliver safe, high-quality hands-on practical STEM learning within the technology curriculum.

"I have learned how much I enjoy teaching practical and how I would shy away from it but now with a little more confidence I am able to take on and, in some circumstances, even lead projects within the department."

"I loved the practical classes as it allowed me to gain skills in cold metal forming, which is an easy process that offers great results for pupils."

We will continue to revise existing and develop new professional learning to support STEM education practitioners. Here is a sample of what to look forward to:

Courses and resources in development 2024/2025

- New metalworking course, focusing on skills and processes for SQA Practical Metalworking coursework.
- Development of Technology probationer residential 2024.
- Continuation of the Safe Use of Fixed Workshop Machinery, Refresher Training – for Technicians & Teachers.
- Further dates for the recently added course for training in classroom-based machinery (bandsaw, pillar drill, bandfacer and mortice machine).
- Woodturning and centre lathe skills with new project ideas.

Environmental sustainability

Within the Technology PL provision, we strive to ensure that all materials consumed during training exercises have been precured in an economical and environmentally friendly fashion. We ensure that there is minimal wastage and any that does occur is suitably recycled. For example, all steel and aluminium stock that is consumed during our centre lathe courses and welding courses is recycled. We have also recently trialled the use of VR welding equipment. Integrating this into the course allows delegates to practice the processes taught using digital technology. This reduces the consumables required considerably.

Furthermore, we have undertaken the refurbishment of several machine tools. These machines being donated to SSERC, have went through an extensive refurbishment programme, saving substantial costs and saving machinery from being disposed.

Refurbished woodturning lathes.


VR Welding.

Early Years and Primary incorporating Digital Skills and Computing Science

The Early Years and Primary team have engaged with and provided professional learning (PL) for the following groups across the academic year 2023/2024:

- Early Years Practitioners
- Nursery Teachers
- Primary School Teachers
- ASN Teachers (supporting learners working at Early and Second CfE levels)

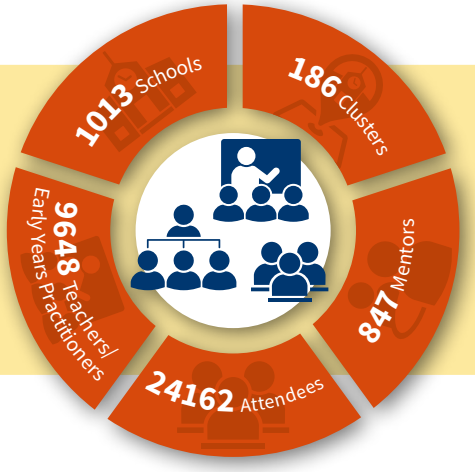
Educators have shown a strong interest in innovative STEM activities this year, recognising STEM's potential as a learning context across the curriculum. Practical STEM activities are an engaging, inclusive tool for delivering content covering various subjects. SSERC's professional learning has equipped educators with strategies to develop crucial science enquiry skills in learners, including critical thinking, collaboration, curiosity and problem-solving. Integrating STEM principles prepares learners for success in a STEM-oriented world while addressing 'core' curriculum requirements.

Professional learning delivered:

- Primary Cluster Programme (PCP) 2023/2024
- Open SSERC Meets
- Courses supported by STEM Learning

"The dedication of the team, their enthusiasm and support, the explanations of all the activities, how to adapt them to different levels, the whole experience has been amazing."

Numbers to date

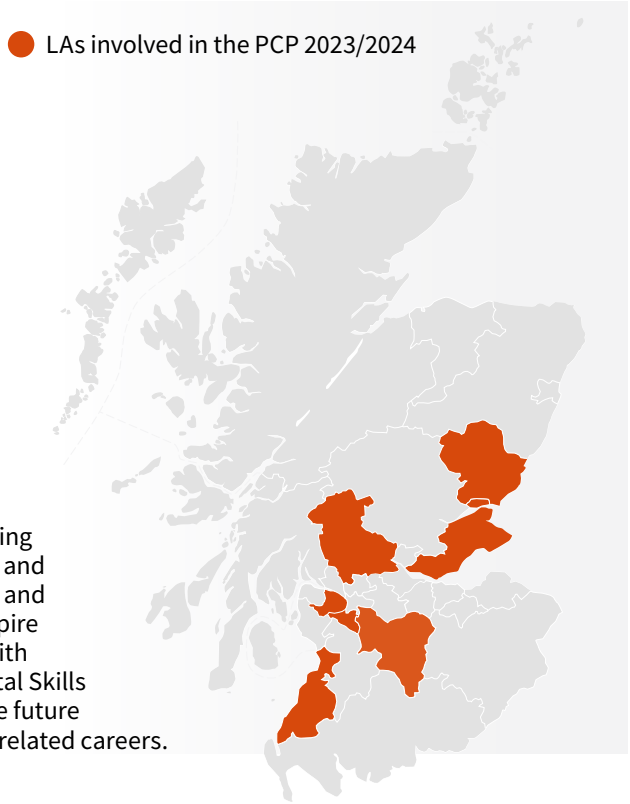


Primary Cluster Programme

PCP has run successfully since the pilot in 2011/2012, providing clusters, schools, educators and learners with hands-on practical activities in STEM. The programme has supported Early Years Practitioners and Primary Teachers to improve their knowledge, skills, confidence and expertise in delivering motivating and engaging STEM lessons.

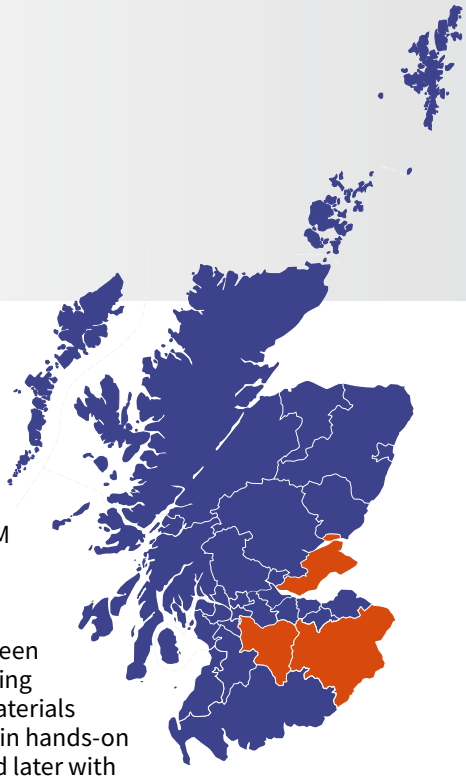
LAs involved in the PCP

SSERC's Primary Cluster Programme (PCP) has had a significant positive impact on schools, clusters, and Local Authorities (LAs) in Scotland as highlighted by an independent evaluation in 2019. The programme has successfully increased teacher confidence and competence in delivering STEM activities, developed professional practices and pedagogy, and supported learners' critical thinking, scientific enquiry and problem-solving skills. However, the evolving educational landscape in Scotland and challenges in aligning cluster schools have led to questions about the programme's long-term sustainability and legacy.



SSERC has developed a new 3-year programme, '*Inspiring a Sustainable Approach to STEM*', promoting and supporting Science, Technology, Engineering, and Mathematics (STEM) education in primary schools and the wider community. The programme aims to inspire and engage practitioners to equip their learners with STEM-related knowledge and skills (including Digital Skills and Computing Science) required to succeed in the future workforce and encourage them to consider STEM-related careers.

SSERC will support Local Authorities (LAs) and schools to address the challenge of raising attainment, closing the equity gap and contributing to the continuing improvement of STEM learning and teaching, which can be utilised to support topical curricular themes such as sustainability, climate, biodiversity, green jobs, UNCRC as well as providing a suitable content for the delivery of numeracy, literacy and health and wellbeing.



The following LAs were successful in gaining a place on Inspiring a Sustainable Approach to STEM: Dundee, Scottish Borders, South Lanarkshire and Fife.

SSERC Meets

A SSERC Meet is a no-cost, live online twilight session providing STEM professional learning for educators. SSERC Meet professional learning is supported by the Edina Trust and the Scottish Government, delivered between 3.30 pm to 5 pm via Teams. Participating settings receive a resource kit with materials for multiple staff members to engage in hands-on STEM activities during the session and later with learners. SSERC Meets include access to supportive online materials, opportunities for questions and idea sharing. This format allows for cost-effective, practical STEM training that can benefit both educators and learners.

- **Chemical Changes** – our first 2-part SSERC Meet providing the opportunity to observe activities over time. Investigating a range of chemical reactions, including fermentation, rusting and burning. Looking for evidence that new substances had been made, such as effervescence, colour change or a change in temperature. Reflecting on how the activities could be used to develop Science Skills at First and Second Level.
- **Marvellous Magnets** – investigating and understanding magnets, magnetic fields and magnetism. How to use the knowledge and skills learned and applying these into engaging activities for learners of all ages. Demonstrating progression through the CfE levels.
- **Further Fun with Forensics** – a storyline approach to a 'who dunnit' type of investigation and piecing the evidence together to discover the perpetrator.
- **Christmas STEM** – making Christmas STEM decorations while investigating chromatography, dissolving and evaporation to make crystal candy canes, understanding floating and sinking to make dancing bells in carbonated liquid.
- **Light: Shades and Shadows** – investigating colour mixing, how shadows are made and what a shadow is, understanding refraction and reflection when making a rainbow indoors.
- **Sowing the Seeds of STEM** – a seasonal SSERC Meet focussed on seeds, planting and germination. All done with sustainability and eco friendliness at its core.

SSERC Meet figures 2023/2024

29
LAs covered through the open SSERC Meets

320
Schools supported

953
Delegates have attended these SSERC Meets

"A fantastic opportunity to enhance knowledge of STEM. The course has provided me with the confidence to promote STEM in school."

"SSERC learning is always very comprehensive and geared perfectly towards primary teachers, the fact resources are provided is a huge help in the primary setting."

Open courses

- Investigating the Human Body
- STEM Challenges for CfE First and Second Level

Open course figures 2023/2024

18
LAs covered

30
Schools supported

30
Delegates have attended these open courses

"Absolutely outstanding. Great presenters, resources, activities and too many ideas to mention. I am going to be busy and can't wait to share with all my staff in school!"

Other activities

Engineering Educates Farmvention Challenge

SSERC has continued to support schools across the country in the role of Engineering Educates Champion for Scotland. Working in partnership with SEERIH (Science and Engineering Education Research and Innovation Hub) at the University of Manchester, SSERC has supported schools with projects linking engineering and farming. Across the initial two years of Engineering Educates, 186 educators across Scotland have signed up to access the Farmvention Challenge resources.

Engineering Educates figures

186
Educators signed up across Scotland

51
New sign ups for 2023/2024

46
Learners attended an online celebration event

Great Science Share for Schools (GSSfS)
Since 2018 SSERC has been a supporter and promoter of the GSSfS, over the last 4 years we have been Scottish Champions for this innovative, engaging and exciting programme.

We will continue to revise existing and develop new professional learning to support STEM education practitioners. Here is a sample of what to look forward to:

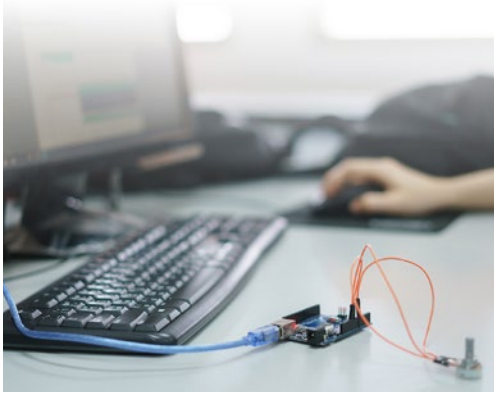
- Inspiring a Sustainable Approach to STEM – pilot year of our 3-year programme – developing new workshops to deliver across the residential days.
- Launch of an Embodied Learning and Gesturing self-study course after the pilot in August 2024 – this course focusses on making meaningful gestures to convey teaching ideas and concepts to all learners and shows how this can impact positively on teaching and learning in the classroom. The research, theory and practice of this initiative will be covered in this course.
- Relaunch of Investigating the 'M' in STEM self-study course.
- STEM by the Book SSERC Meet – linking literacy to practical STEM activities, demonstrating progression through the CfE levels.
- STEM context planners – launch in August 2024 – planners that show how practical STEM can be used as a context for learning linking in other areas of the curriculum. These context planners are downloadable and fully editable to battle the bureaucracy for teachers.

Environmental sustainability

Reusable, upcycled or multipurpose resources are now provided through our SSERC Meets and our in-person PL. We have been using less plastic in our workshops and instead have resources of recycled materials – cardboard boxes for our SSERC Meets rather than plastic boxes, Sugarbeet containers instead of polystyrene, and paper straws instead of plastic. We also raise awareness of environmental sustainability throughout all workshops. Our use of digital technology to deliver PL has a considerable positive impact on the environment extending reach and local delivery.

Digital Skills and Computing Science

Digital Skills and Computing Science (CS) should be integrated into all early years and primary education settings in Scotland. Many Scottish learners are currently not receiving full and essential access to these vital subjects, leaving learners ill-equipped to thrive in our increasingly digital world.



Educators must foster critical thinking, collaboration, problem-solving, and creativity skills to enable all learners to become active participants in the digital age. SSERC have demonstrated innovative ways to incorporate Digital Skills and Computing Science across the CfE levels. These efforts aim to bridge the digital divide, ensuring equal opportunities for all Scottish learners.

Empowering educators with the necessary skills and resources can better prepare learners for future academic and career success in a STEM industry. Addressing this disparity in access to Digital Skills and Computing Science is crucial for Scotland's future workforce and economy.

The Digital Skills and Computing Science professional learning (PL) courses delivered this year.

PL courses delivered	
VEX Go	Sphero Indi
VEX 123	Sphero Bolt
Marty V2	Let's play @ Computing Science

Each of these sessions was run multiple times across the academic year and supported through STEM Learning funding. During the academic year, our Digital Skills and Computing Science PL calendar reached 315 teachers in 220 schools across 26 different LAs.

Digital Skills and Computing Science figures

315
Teachers

220
Schools

26
Local Authorities

"The session at SSERC was delivered in a way that was suitable for those with no experience and provided a range of examples and ideas that meant you were set up from the beginning to implement the resource."

This extensive reach and coverage demonstrate our commitment to ensuring that learners across Scotland have access to high-quality Digital Skills and Computing Science education.

Additional bespoke PL delivered

Apple RTC (in partnership with Fife Digital Education Officer) – planned, collaborated, developed and presented 4 sessions covering subjects such as photography, green screen, videography, and creating music. These sessions were made available to educators in the local area to SSERC HQ.

Glasgow Early Years Working Group – requested to deliver two full days PL, as a continuation to the work started in 2022/2023, for the LA early years working group. One day was delivered from SSERC HQ with the other being delivered in Glasgow. The group requested easy-to-access CS early years resources with a focus on unplugged activities.

University of Highlands and Islands – supporting the UHI development STEM outreach coordinators in delivering Sphero Mini sessions across their primary schools. SSERC introduced the use of this resource, showing progression through the CfE levels.

St Anthony's Primary School, Renfrewshire – delivered half a day PL to all staff on the Sphero Bolt resource.

Micro:bit Champion sessions – providing introductory micro: bit sessions as well as advanced sessions to all educators in the local Fife area.

PSDO digital day – request made by RAiSE National Education Officer to deliver a full day of CS to all the Primary Science Development Officers (PSDO) at National Mining Museum, Midlothian. This session introduced the officers to a variety of CS resources including VEX 123, VEX Go and Sphero Bolt.

"The full day was excellent for showing how to use the resource and how to access the online resources. Well delivered, great pace, it was a very enjoyable as well as educational day."

Partnerships

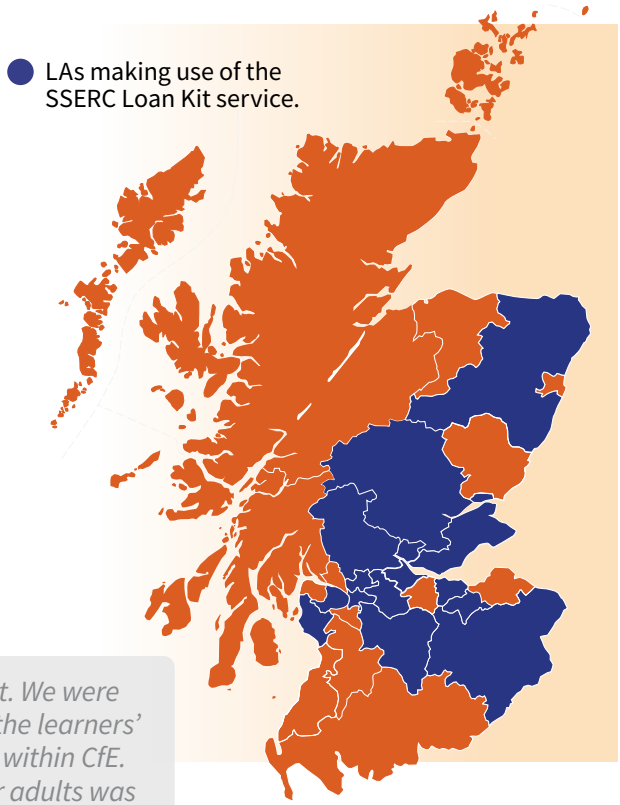
Our strategic partnerships with Sphero, Vex, Robotical and Elecfreaks have grown significantly stronger over the last 12 months. SSERC continue to demonstrate and deliver PL linked to these ever-evolving resources.

Sway resources accessed linked to the PL

Let's Play @ CS	Micro:bit	VEX GO
Unplugged & Outdoor CS - 369 views	Keep it Simple - 137 views	Welcome to VEX GO - 343 views
Botley - 164 views	Let's Get Started - 254 views	The Next Level - 105 views
Code & Go Mouse - 191 views	Get Creative - 151 views	Build It. Power It. Code It - 189 views
Unplugged CS: Foundation of of Understanding - 110 views		

Digital loan kits access

SSERC digital loan kit lending library continues to be in high demand. The loan kit is available only to those educators that have attended a face-to-face professional learning course at SSERC. The loan kit is borrowed for a full term to allow for the transfer and application of knowledge and skills gained from the PL event to positively impact the learners.



2023/2024

58 Schools

62 Loan kits

"The in-person session at SSERC was excellent. We were able to understand how the resources link to the learners' skills and the Computing Science progression within CfE. Being able to explore the resources with other adults was also useful and gave me increased confidence to bring them into the classroom."

We will continue to revise existing and develop new professional learning to support STEM education practitioners. Here is a sample of what to look forward to:

- Development of a Sphero Mini course – a much more affordable resource for schools and very engaging with numerous cross curricular links and possibilities.
- Development of a course around the resource from Wonder – Dash and Dot, with a view to delivering this in collaboration with Digital Officers from various Local Authorities.
- Partnership working with STACS to ensure that Computing Science is reaching all learners across Scotland from 3 -18.

Environmental sustainability

To ensure we are being as sustainable as possible we use rechargeable batteries in all our devices rather than disposable batteries. We also use cardboard boxes when sending out the loan kits to schools and ask that they use the same box to return the kits to us. Robots are an integral part of the future of environmental sustainability. This is discussed, and activities are demonstrated using specific resources and STEM Lab links.

School technicians

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

SSERC continues to recognise the important contribution that school and college technicians make to STEM education and training in Scotland. We are proud of the diversity of PL courses we offer to support Technicians' professional development.

Professional learning courses for Technicians have achieved 916 units of CPD, equating to 4580 hours (about six and a half months).

We have supported 322 Technicians through a total of 52 Technician-specific professional learning courses. These figures are a combination of courses held at SSERC and at SSERC Accredited Centers.

PL courses for Technicians 2023/2024

4580	916	322	52
Hours of combined professional learning	CPD units achieved	Technicians	Technician spefific PL courses

Course	Amount
Safe Use of Fixed Workshop Machinery courses	23
Safe Use of Fixed Workshop Machinery Refresher courses	2
Safe Use of Fixed Classroom Machinery courses	2
Safety in Microbiology for Schools	11
Safety in Microbiology for Schools Refresher courses	4
Chemical Handling Courses	2
Introductory Physics	2
Intermediate Physics	1
Electrical safety and PAT courses	5

Evaluation quotes

"I thought the course deliverers were great guys and worked extremely well together as a team. I also found the lady, who was providing the refreshment service/lunches welcoming and friendly. I look forward to attending further course at SSERC."

"I found the demonstrating part of the course where participants were able to use the PAT machines most beneficial. It has provided me with another tool to put the theory into practise which allowed for me grasp the course easier."

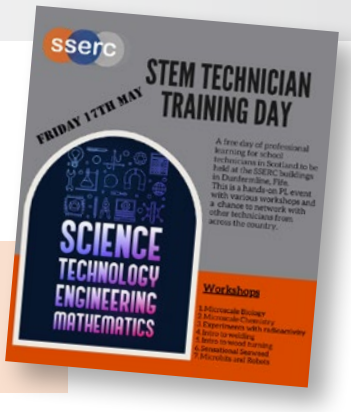
"The course tutor did an excellent job of running this course. She is a brilliant teacher and explained things in great detail, as well as showing extremely helpful demonstrations."

"The course in a whole was very useful. The practical aspect of the course complimented the theory side perfectly. Hands on the machines gave me a better understanding of the maintenance and all the hazards associated with the operation of them. A great building block to start gaining confidence of the fixed workshop machinery."

STEM Technician Training Day

This year's STEM Technician Training Day was a remarkable success, with 52 Technicians from all over Scotland coming together for a full day of face-to-face PL. With seven sessions to choose from, there was something for everyone.

- Microscale Biology
- Microscale Chemistry
- Experiments with Radioactivity
- Intro to Welding
- Intro to Woodturning
- Sensational Seaweed
- Microbits and Robots



Techné

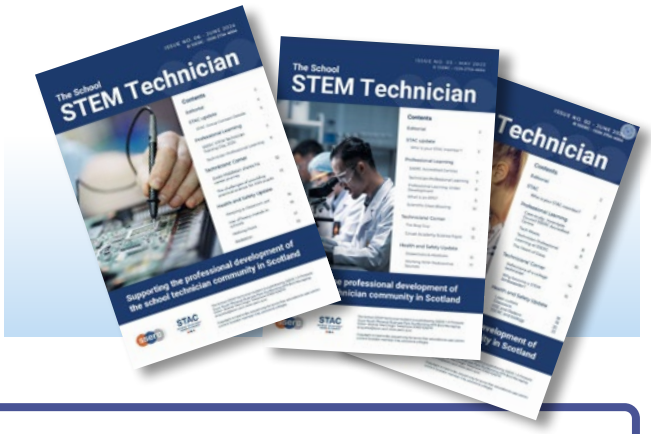
Techné is a support community for Technicians across Scotland, promoting the sharing of knowledge, ideas, and skills to benefit all. We continue to support this platform on our new website with a fresh new look.

Presenting at the National STEM Learning Centre in York

In June 2023, SSERC Technicians presented a training session at the STEM Technicians Festival, at the National STEM Learning Centre in York. There were over 100 technicians at the event with the SSERC session being maxed out at 20 participants. We were quite surprised when 25 Technicians showed up to take part. Anticipation being the name of the game, and we were ready for the possibility of oversubscription and had enough resources to ensure everyone had a wonderful experience.

STEM Technician Bulletin

We published both issue 4 and 5 during the last year with large numbers downloading the document. Members can access these here.



We will continue to revise existing and develop new professional learning to support STEM education practitioners. Here is a sample of what to look forward to:

- A new Leadership in Technical Support course has been developed and will run for the first time in August 2024.
- A series of Technician skills courses have been developed, concentrating on Working with Glass, Basic Electronics, and Soldering.
- All new courses will debut very soon at the SSERC buildings in Dunfermline.

Outreach work

Aim
To increase capacity and capability to offer a greater volume and range of Professional Learning via SSERC accredited centres and the use of digital communication and technology.

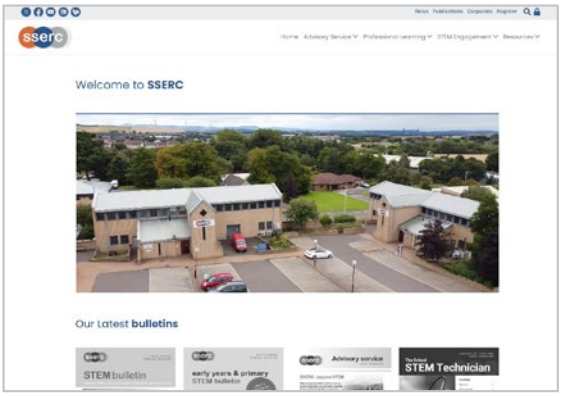
As an organisation, we know the ongoing challenges faced by education establishments that support STEM education and training. These include staff release and shortage issues, limited budgets, and the need for environmental sustainability. Our outreach work aims to respond to these issues via localised PL delivery and the use of digital technology to support online delivery – whether live, pre-recorded or self–study.

The SSERC website

By the time of publication, we will have a new website.

In addition to switching to a different host, we have built a new website using the Umbraco platform rather than WordPress.

The general structure has not changed significantly, but the search has been greatly enhanced, so our users should manage to find their way around much more quickly.



Much of it is in the form of documents (Word, PowerPoint, PDF, etc.) for download. In 2023/2024, our resources were downloaded over 200,000 times! The UK makes up 66% of our users.

	Overall	UK	Scotland
Users	94930	62368	31609
Session	145762	111967	66871
Pageviews	408133	362773	264779
Pages per session	2.8	3.24	3.81
Session duration	3.09	3.47	4.39

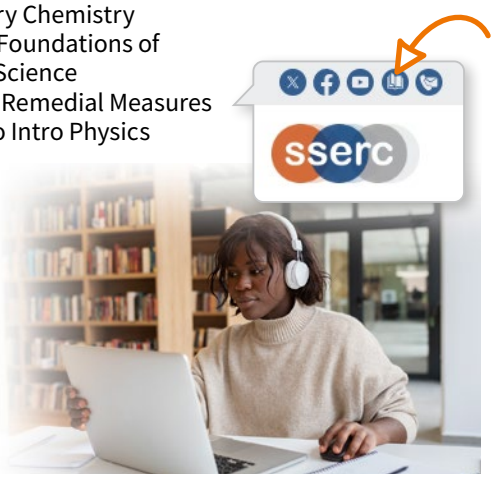
Members
Over this period, 676 new accounts were approved, a slight increase (about 50) over last year.

SSERC Online Learning

We continue to update and add accessible courses via our SSERC Online Learning platform.

Current courses include:

- Chemistry Assignment for N5 and Higher
- Practical Support for the National 5/Higher Biology Assignments
- Health and Safety for Students
- STEM Ambassador Mentoring Skills and Knowledge Training
- Microbiology for the Classroom
- Maths Week Scotland/SSERC/SAiS CfE Early/ First Level Maths
- Introduction to Safety in Microbiology
- Exploring the M in STEM
- Cyber Resilience and Internet Safety Programme
- Introductory Chemistry
- Laying the Foundations of Computer Science
- Immediate Remedial Measures
- Welcome to Intro Physics



2023/2024

199
Delegates

199 delegates accessed online learning opportunities via SSERC OnlineLearning in the financial year 2023/2024.

If you are a member you can access SSERC Online Learning directly from the SSERC website - using the same username and password.

SSERC TV

Academic year 2023/2024

22
New video uploads

30510
Views

839.1
Hours watched

138
New subscribers for a total of 659

Top 10 videos for 2023/2024

Content	Views	Watch Time (hours)
Eye Dissection	7,912	173.1
Secret Message Using Water	2,096	42.6
Immobilised Yeast	1,763	52.9
Quantum Tunnelling in Radioactive Decay	1,135	19.9
Secret Message	992	30.9
Immobilised Algae	975	24.9
Micro Technique 9 Vital Stain S cerevisae	806	21.6
Balancing Butterfly	778	16.7
Micro Technique 11 E coli Smear	754	24.7
SQA Physics Assignments	722	49

Top 10 Playlists for 2023/2024

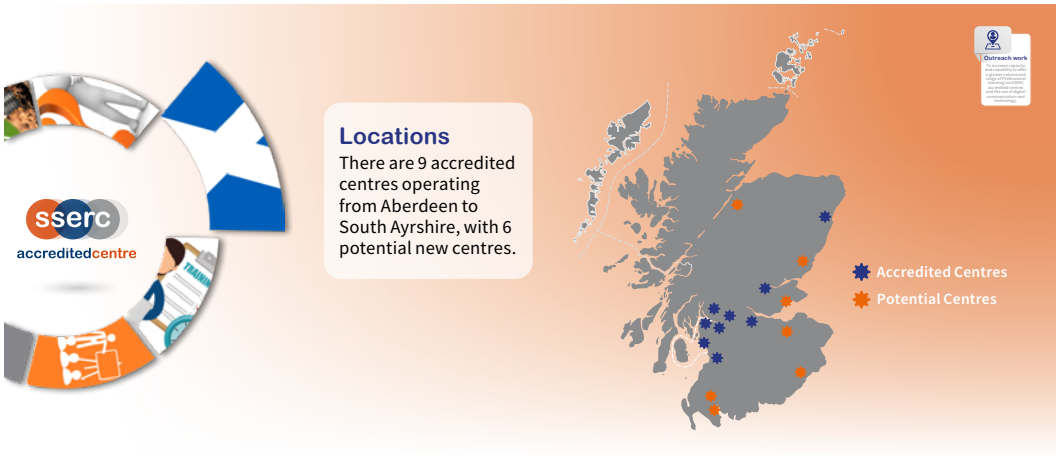
Playlist	Views
Microbiological Techniques	1,477
Primary	350
Secondary Biology	226
Secondary Technology	161
Physics videos for Technicians	153
Understanding Electricity SSERCmeet	150
Secondary Chemistry	69
Secondary Physics	57
Light, shade and shadows SSERCmeet	38
Tech Meets	35

You can access SSERC TV directly from the SSERC website by clicking on the appropriate website icon.

SSERC Accredited Centres

We launched the SSERC Accredited Centre programme in 2019, and it continues to grow and develop.

We have added a new course, Safe Use of Fixed Classroom Machinery to the Accredited Centre program and plan to offer free training to existing Safe Use Tutors to enable them to run this course if the centre takes it on.



SSERC Accredited Centres delivered:

30	162	528	2640
Courses delivered	Delegates	CPD units of Professional Learning	Hours

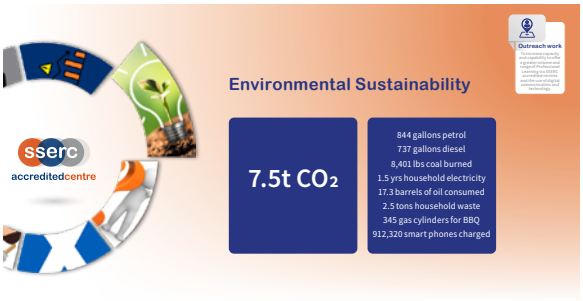
We will continue to look at ways in which we can provide high-quality, low-cost STEM education and training to all parts of Scotland (and beyond).

We have added a new course, Safe Use of Fixed Classroom Machinery to the Accredited Centre program and plan to offer free training to existing Safe Use Tutors to enable them to run this course if the centre is approved to offer.

Environmental sustainability

One of the benefits of becoming a SSERC Accredited centre is the positive impact on sustainability. Keeping professional learning local will help to maintain an ecological balance in our planet's natural environment.

With reduced training costs, economic sustainability is assisted. Working together we can conserve our natural resources to support the wellbeing of current and future generations.



Evaluation activity

Aim
To use evaluation data to influence the direction of all SSERC workstreams and publish using various channels, e.g. website, academic journals, social media.

The SSERC evaluation process

SSERC continues to monitor the effectiveness of our evaluation process for delegates who take part in our many professional learning offers.

Our three-step evaluation process is linked to the National Model for Professional Learning and the GTCS Standards for Career-long Professional Learning. With bi-annual review meetings among the SSERC Education Managers and SMT, we are confident that our approach generates the right type of data, allowing delegates to give us feedback on our performance as a PL provider. We also expect our delegates to measure the impact of their own learning back at their respective centres with their colleagues and, most importantly, their learners.

Step 1

Pre-course evaluation to understand the aims and objectives of the delegate.

Step 2

Post-course evaluation to collect feedback on our own performance in PL delivery and for the delegate to begin planning for positive impact back at their centre.

Step 3

Measuring impact evaluation to investigate the impact the PL course has had on themselves, colleagues and learners in their centre over a subsequent period of time.

GTCS Professional Learning Award: Leadership in STEM Education

SSERC is proud to be a Professional Learning Awarded Organisation with the General Teaching Council for Scotland. In addition, with our recently gained Professional Recognition Accreditation for our Leadership in STEM Education course, our latest cohort will be further recognised for the enhanced, significant, sustained and reflective enquiry they have undertaken and the development of their professional learning in a particular area.

What GTCS say about our course...

"The GTC Scotland Professional Standards are well mapped across the programme with teachers being able to the select aspects relevant to them as part of their professional enquiry."

"Both the design and delivery groups for this programme have actively ensured it has been developed based on teacher voice, experience and needs."

We will continue to review our evaluation data to ensure that our products and services remain suited to the needs to our members and delegates.

SSERC has worked with The University of Stirling to recruit a PhD student who has joined us to carry out advanced research and evaluation into the impact of the Young STEM Leader Programme and how it is challenging the stereotypes and misconceptions in STEM, whilst increasing access and participation for young people in Scotland.

Advisory Service

Aim
To further develop and promote the Advisory Service.

The Advisory Service represents one of the organisation's three core functions; it was a core function when SSERC was first established. Over this year, the SSERC Advisory Service has continued consolidating and expanding its provision and reach.

Key functions

- Specialist health and safety advice for schools and Local Authorities
- Unlimited access to specialist advisors in Primary Science, Biology, Chemistry, Digital Skills and Computing Science, Physics, Technology, Technician Services and health and safety.
- Guidance and compliance advice for radiological health and safety legislation through our Radiation Protection Adviser.
- Free online management of health and safety courses for Curriculum Leaders.
- Other face-to-face and digital specialist health and safety courses, including radiological protection, which are heavily subsidised or free.
- Access to the SSERC website - curriculum support materials, health and safety advice and resources e.g. exemplar risk assessments for both specific subject and whole school activities.
- Recommendations on equipment and design of specialist accommodation.
- Free consultancy and technical information.
- Apparatus testing for safety, performance and conformity with standards.
- Free health and safety courses for Initial Teacher Education (ITE) students.

SSERC Advisory personnel

The training of our Education Officer (Physics and RPA) to become a Radiation Protection Adviser (RPA), is ongoing and it is anticipated that she will achieve RPA status during the coming year. There have been no further changes in personnel but another one of our advisors is now undertaking the NEBOSH National General Certificate in Occupational Health and Safety. The NEBOSH-qualified staff have begun meeting regularly to drive progress in this area.

SSERC Advisory Service

While most of our advice is accessed at will by members via the website, more complicated matters require a more personal approach by phone, email or the enquiry form on the website. Over the past year, the Advisory Service has dealt with over 2,000 enquiries across a broad spectrum of both curricular and non-curricular areas.

HSE inspections

We continue to support those centres that were inspected by the HSE during the year to help them to address any issues raised. We will continue to support our member centres to ensure they are prepared for any future inspections.

Publications & advice

The Advisory Service continues to contribute to the various SSERC publications, especially the STEM Bulletin and the STEM School Technician Bulletin, and it has its own dedicated Advisory Service Bulletin. These can all be accessed at: SSERC | Bulletins.

Recent articles have included guidance on: ionising radiation, use of wooden pallets, keeping pets in the classroom, purchasing chemicals and much more.

Following on from the Risk Assessments for Art and Design, we have fully updated and overhauled

- Risk Assessments for Food and Textile work.
- Risk Assessments for general activities around schools and colleges:
  - Trips and visits
  - School events
  - Sports and other activities
  - Locations around the school such as offices, libraries classrooms etc.
- A Guide for the use of Display Screen Equipment.
- A Guide for dealing and disposing of Waste Electrical Equipment.

Advisory related courses

A range of health and safety courses was delivered to ITE students in Aberdeen, Napier, Edinburgh, Stirling and Highlands and Islands Universities. This has further developed our strong working relationships with ITE institutions in Scotland to support the safe delivery of practical STEM learning by educators at the gateway of the profession. A typical comment was

> *"It was reassuring to understand that SSERC are there to help you to find ways to do things and will support with risk assessments and questions."*

For students at Glasgow, an online course was requested so we have created a self-study course for this on our online-learning website, which was well received by the students who took it.

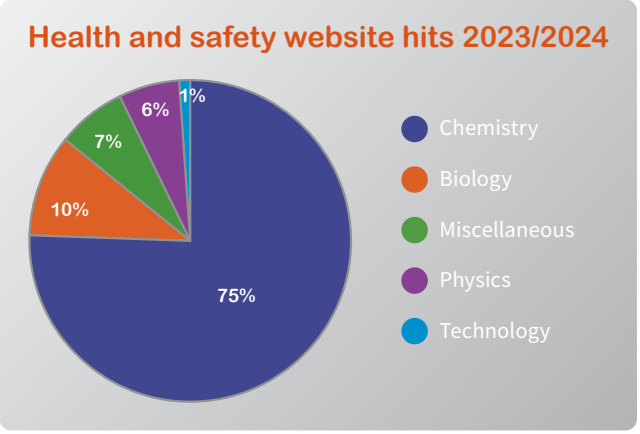
There was also a live, 3-part live online health and safety course run in November for Teachers and Technicians. A typical comment was

> *"The explanations of what risk assessments actually are and how to try and judge them in a practical science lesson scenario were particularly useful because it usually isn't explained very well."*

Health and safety website

The health and safety home page again got 21% of all the traffic to the website, and 3 of the top 10 web pages on the whole site were related to health and safety.

Bearing in mind that unlike most of our content, these pages are viewable by members only, this is another strong performance.



In-house health and safety

SSERC has continued working with Croner (our external HR and safety partner), mainly via their BrightSafe health and safety management system, to help us with aspects of in-house health and safety. With their assistance we have continued to review and develop our practices and documentation, in particular, implementing a more formalised programme of staff development in health and safety. We now have monthly health and safety updates for Staff after our regular Monday Staff meeting as well as an annual inspection from Croner. At the time of writing, this inspection has taken place: verbal feedback indicates nothing more than trivial issues to address but we await the full report.

Radiation Protection

One of the important services that we provide to our members, is that of being their identified Radiation Protection Advisor for the radioactive materials used for science teaching in secondary school science departments [1].

Cloud chamber.

2023/2024 saw another busy year for our Radiation Protection Advisory Service. The HSE continued its programme of inspections across England, Wales, and Scotland to assess how schools manage the safe use and storage of radioactive sources used in science teaching.

We view the inspection programme as a very positive process that leads to greater engagement with our guidance. As a result, the team continues to deal with many more enquiries and has seen an increase in demand for training. We responded by adding an additional training course in June 2023, free of charge, over and above our usual regular timetable of courses.

Our collaborative efforts with local authorities have been commendable. We have provided support to several who have initiated their own audit programmes, a move that the HSE inspections have underscored as crucial for employer compliance. Over the past year, our team has directly engaged with the HSE, gathering feedback and incorporating it into our bulletin articles and a comprehensive review of our main guidance document, which was updated and published in January 2024.

"Many thanks to you and the rest of the SSERC team for the guidance you give us all."

"Thank you so much for your advice and support. I'll now be far more confident carrying out a demonstration using radioactive sources in the future."

We will continue to support our members and delegates by further developing our Advisory Service.

We will continue to support our members with advice relating to all aspects of safety in schools and colleges and provide guidance to ensure that practical based STEM activities can once again become a core part of the curriculum at all stages.

We will further expand our self-study professional learning offerings and examine what additional support we can provide to other practical-based curriculum areas.

[1] Employers who work with ionising radiation need to consult a suitable RPA for advice on complying with the Ionising Radiations Regulations 2017 (IRR17). Radiation Protection Advisers (hse.gov.uk)

STEM Engagement

Aim
To increase the breadth and impact of the STEM engagement offering.

SSERC offers a wide range of STEM engagement and enrichment programmes to further increase access to, and participation in STEM, well beyond the classroom setting. Our STEM engagement portfolio supports individual educators and their institutions, young people, and industry partners to collaborate to create learning activities and opportunities in STEM for children, young people and adults in Scotland.

Young STEM Leader Programme (YSLP)

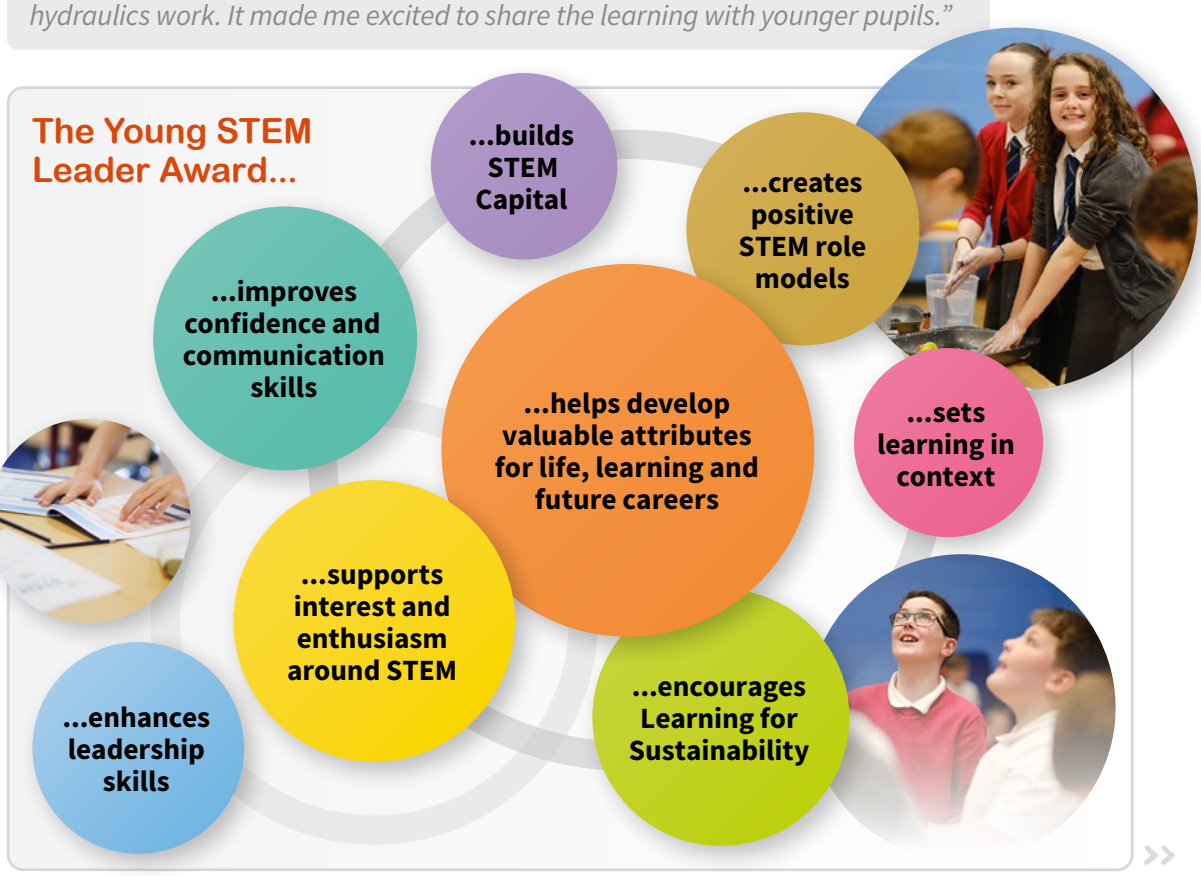
YOUNG STEM leader led by sserc

> *The **Young STEM Leader Programme** will stimulate and strengthen the development of peer mentoring and inspiration in STEM **for children and young people by children and young people.***
>
> SCIENCE TECHNOLOGY ENGINEERING MATHEMATICS
> Education and Training Strategy for Scotland

The Young STEM Leader Programme (YSLP) is an Award that is free and open to all young people in Scotland. Supported by the Scottish Government and delivered by SSERC, the programme is built on a learner centred approach with young people encouraged to lead and develop STEM activities and share these, in an inspirational way, with an audience of their choice.

The free programme is delivered in schools, colleges and community groups across Scotland, with over 20,000 young people engaging since the programme's launch in 2019. For more information on the YSLP visit www.youngstemleader.scot.

"I have learned a lot more about STEM. I really enjoyed learning about how hydraulics work. It made me excited to share the learning with younger pupils."



Programme participation

The programme continues to reach across all Local Education Authorities in Scotland and begins at CfE aligned levels 2-4, which are termed the Non Formal Awards. The Formal Awards are SCQF accredited, offering Insight points at Levels 4-6. Level 7 has been fully piloted throughout 2023/2024.

"Young STEM Leader let us be role models for our P1 buddies."

Award certificates by level for Financial Year 2023/2024

Award level	# Certificates
YSL2	1592
YSL3	247
YSL4NF	265
YSL4F	61
YSL5	187
YSL6	472
Total	**2824**

Estimated **89,440** hours of STEM leadership activity as a result of YSLP

Total of **2632** SCQF points* earned by Young STEM Leaders

Over **20,000** young people have taken part in the programme

Participation in the Young STEM Leader Programme

1014 Delivering Centres (129 new)

555 Primary schools

320 Secondary schools

139 Other Delivering Centres*

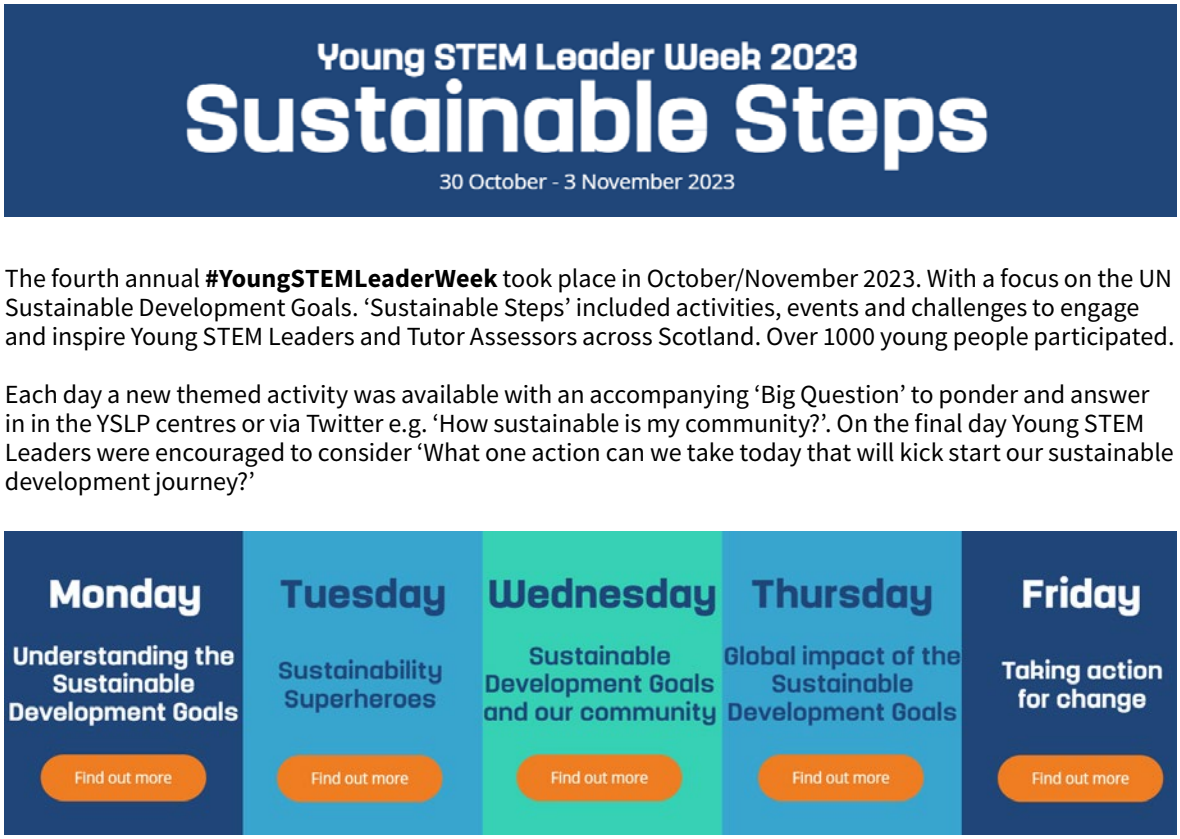
3234 Trained Tutor Assssors (534 new)

* e.g. local authorities and partners

"We had to practice our lessons and teach each other first that helped me feel more confident."

"I have improved my leadership skills by preparing and presenting my STEM learning to parents."

Examples of Young STEM Leaders delivering and engaging with the Young STEM Leader programme can be found on @YoungSTEMLeader.



The fourth annual **#YoungSTEMLeaderWeek** took place in October/November 2023. With a focus on the UN Sustainable Development Goals. 'Sustainable Steps' included activities, events and challenges to engage and inspire Young STEM Leaders and Tutor Assessors across Scotland. Over 1000 young people participated.

Each day a new themed activity was available with an accompanying 'Big Question' to ponder and answer in in the YSLP centres or via Twitter e.g. 'How sustainable is my community?'. On the final day Young STEM Leaders were encouraged to consider 'What one action can we take today that will kick start our sustainable development journey?'

Associate Regional Trainers and Verifiers (ARTAVs)

The Associate Regional Trainers and Verifiers (ARTAVs) team are a group of inspirational individuals (www.youngstemleader.scot/the-team) with experience and expertise of delivering STEM Learning in Primary, Secondary, CLD and ASN settings across the country. Working alongside the YSLP team, they play a vital role supporting the quality assurance processes, helping with development, and delivering high quality YSLP professional learning in face-to-face sessions and online.

The YSLP and ARTAV Teams.

Partnerships and auto-awards

The YSLP partners with many other organisations and Award programmes to ensure that young people already engaged in excellent STEM learning and leadership can gain additional recognition through an 'Auto Award' for the Young STEM Leader programme. The YSLP team works closely with partners to align the outcomes and criteria of the partner programmes to the YSLP frameworks.

For this year, around 35% of Awards were achieved through participation in a partner programme, serving as an effective way to recognise the achievements of young people and promote the benefits of YSLP Awards.

Pilot Year of STEM Leader Level 7

During this past year, and until the end of the academic year (June 2024) the YSLP team has been working with a selection of centres to pilot a new SCQF level 7 Award. This Award is part of the Young STEM Leader family and is called STEM Leader 7 (SL7). It supported by Ocean Winds and can be accessed for free by anyone in Scotland age 16+ who is supported by a trained Tutor Assessor. Training for new Tutor Assessors is available throughout the year here.

The STEM Leader 7 Award enables candidates to identify, research and address challenges in STEM, linked to sustainability in a local, national or international context by developing and answering a project question. Their project question should be set in the context of existing research in the wider world by linking their work with an individual(s), group(s) or organisation(s) in the field. Results of the research question are analysed and shared in a method of the STEM Leader's choice such as a report, scientific poster, podcast or video etc. Enabling STEM Leaders to have choice, take ownership and direct their own learning builds leadership and communication skills throughout the Award. These are essential transferable skills for lifelong learning.

"STEM Leader 7 provided the opportunity for students to take ownership of their learning and own project. It allowed them to develop their skills and it was incredible to see their confidence grow as they worked through the programme. They made connections with industry and have formed professional relationships that will continue to benefit themselves and our centre beyond their projects this year."

The Young STEM Leader and STEM Leader programme will continue to grow with the aim of inspiring more educators to empower learners to lead STEM activities across Scotland.

The launch and roll-out of SCQF Level 7 qualification will offer a new opportunity for learners age 16+ to engage in the programme through schools, CLD settings and college and apprenticeship sectors thus widening access.

The 2024 Young STEM Leader Annual Report will be published in September 2024. Young STEM Leader week will commence on Monday 28th October 2024 with the theme "The Power of Curiosity".

Environmental sustainability

Learning for sustainability is threaded throughout every level of the Young STEM Leader/STEM Leader Programmes. STEM Leader 7 is an excellent example of this approach as it requires that the STEM Leader's project question directly consider the UN Sustainability Goals and Learning for Sustainability Themes.

STEM Ambassadors in Scotland

Introduction and overview

This is the third year that SSERC, STEM Ambassadors in Scotland (SAIS), have been the Scottish delivery partner for the STEM Ambassador Programme. This year introduced a new focus on research and innovation and a drive to support more intensive sustained activity, such as mentoring through project-based activity. STEM Learning have coordinated online training for STEM Ambassadors and teachers across the UK, with SSERC contracted to deliver weekly teacher information sessions.

April 2023 - March 2024

1474
New STEM Ambassadors registered on the digital platform

2032
STEM Ambassadors participating in volunteering activity

36384
Volunteer hours were completed

32.34%
of Primary schools engaged with the programme

86.58%
of Secondary schools engaged with the programme

201
Scottish STEM Ambassadors attended STEM Learning led online training sessions between October 2023 and March 2024

Upskill and Engage Programme

This programme was launched in 2022 and came to an end in September 2023. 62 STEM Ambassadors were trained to deliver a series of simple STEM activities to early primary school level. 5 activities packs were developed for STEM Ambassadors to take into their partner school, as well as a toolkit to support gathering of feedback. One STEM Ambassador commented,

> *"I want to thank you for this opportunity. I have enjoyed every minute."*

And a teacher commented,

> *"They have loved your sessions and it has been the highlight of the week."*

in reference to their STEM Ambassador's support. The legacy of this programme is the activity packs and feedback toolkits which will continue to be shared.

Digital Xtra

The SAIS team secured funding from Digital Xtra to facilitate the participation of 8 Fife secondary schools in this year's FIRST® LEGO® League competition, an international programme which encourages young people to discover STEM skills through hands-on learning. Over a period of 4 months, pupils worked in teams to learn how to build and programme the LEGO® Education Spike robots to complete a series of missions for this year's theme, the Masterpiece Challenge. Fife STEM Ambassadors supported local schools throughout the challenge, serving as project mentors for the students. The Digital Xtra grant allowed each team to receive the LEGO® Education Spike Robot kits, FIRST® LEGO® League registration fees/Challenge kits, and training for teachers and ambassadors provided by Raising Robots. 7 out of the 8 schools that planned to participate were new to FIRST® LEGO® League and had not engaged in a digital programme such as this before. This provided the young people with more access to people in STEM careers through the STEM Ambassador volunteers, more access to extra-curricular STEM Clubs which had not previously been available at their school, and the opportunity to visit Fife College during the Regional Tournament. Five participating teams competed at the Fife regional final, with two winning awards: Most Enthusiastic, for creating a supportive atmosphere at the competition, and Overall Winner, with the team going on to compete at the UK final in Harrogate with support from their school's Young STEM Leaders.

Scotland Spotlight

This year marked the beginning of the SAIS team's 'Scotland Spotlight' sessions for STEM Ambassadors. These monthly online sessions are designed to give Scottish STEM Ambassadors an avenue to ask questions, share tips and tricks, and build a community with fellow volunteers. Each session involves a short presentation delivered in collaboration with an experienced STEM Ambassador, while the rest is devoted to discussion, troubleshooting difficulties, and upcoming opportunities to get involved in. The SAIS team has seen a diverse group at each session: new STEM Ambassadors eager to get involved, more experienced volunteers wanting to share their knowledge, and those who may be nervous about or unfamiliar with engaging learners in the classroom have all come together to engage in these peer-to-peer knowledge exchanges. Over 35 STEM Ambassadors have participated in the two sessions that have already taken place.

STEM Ambassadors in Scotland Week 2024

STEM Ambassadors in Scotland Week was held in February 2024 to celebrate the achievements and impact of our STEM Ambassador volunteers. Every active STEM Ambassador received a certificate to commemorate their engagement with young people in Scotland over the last year, and over 100 STEM Ambassadors attended sessions with local partners over the course of the week to discover more ways to enthuse and inspire young people to pursue STEM. Additionally, the team ran a successful social media campaign with an incredible response from STEM Ambassadors, highlighting successful activities, promoting the programme to others in their network, and expressing excitement for what the next year of volunteering as a STEM Ambassador in Scotland could bring.

Example of partnership working with Food and Drink Ambassadors

In March 2024, SSERC worked with Food and Drink Federation Scotland and DYW Moray to host a Food and Drink sector STEM Ambassador event with the aim of recruiting more Food and Drink Ambassadors in Moray. 7 Food and Drink companies actively engaged with the programme after the event with more companies than this in attendance. Scottish Food and Drink Ambassadors numbers now sit at 67 registered, 37 of which registered as a STEM Ambassador this year and 46 completed STEM activity in the last 12 months. Food and Drink Federation Scotland actively use the STEM Learning partnership dashboard on the digital platform and have proved how beneficial this tool can be to develop and maintain a population of volunteers. The SAIS team plan to support other organisations, employers and schemes to engage in a similar manner.

SAIS will continue to develop a sense of community within Scottish STEM Ambassadors through sessions like Scotland Spotlight and encourage use of the STEM Learning online community.

STEM Ambassador in Scotland Week will continue with a focus on celebrating STEM Ambassadors and offering them a range of online training. Employers and organisations will also be encouraged to host their own celebratory events during the week.

With a focus on supporting long-term relationships between STEM Ambassadors and schools/students, SAIS will run the GSK sponsored Brightside Mentoring Programme which aims to give 14-16 year old students from disadvantaged backgrounds the opportunity to connect with a STEM Ambassador of their choosing through an online platform.

STEM Ambassadors will continue to support other SSERC programmes including SSPP, ESERO, Research and Experience Placements, Enthuse Partnerships, EIPs, Young STEM Leader (specifically linking with STEM Leader 7), professional learning courses and more!

Scottish STEM Placement Programme

Partnership working

Education Industry Partnerships

PARTNERSHIPS

At SSERC, we work in partnership with individuals and organisations who are committed to support STEM learning experiences in Scottish education. Our Education Industry Partnerships (EIPs) are a growing list of programmes and initiatives that represent an increasingly diverse range of settings and specialisms, all with the shared value to develop and deliver inspirational and engaging STEM Learning opportunities for educators and their learners.

Taking part in an Education Industry Partnership with SSERC gives organisations the opportunity to innovate, creating fresh and impactful engagements in STEM. It gives everyone involved the collaborative and creative space and time to ensure corporate social responsibilities are delivered with the greatest possible effects and outcomes.

Leidos STEM Challenge

SSERC's EIP with Leidos Innovations UK is in year three with more to come. Year three of The Leidos/SSERC STEM Challenge has seen us partner with eight schools in Glasgow and the West. A combination of secondary, primary and ASN schools have been offered a series of careers-based professional learning opportunities for staff and STEM challenges for their learners. Throughout the process, the growing STEM Ambassador team at Leidos has supported and mentored the staff and pupils. Every year, this EIP celebrates and showcases it's achievements at Leidos HQ in The Glasgow Skypark Building.

Educators, STEM Ambassadors and young people taking part in the Leidos x SSERC STEM Challenge 2023/2024.

Ocean Winds

The Education Industry Partnership between Ocean Winds and SSERC continued in 2023/2024, building on the success of the first year of the EIP. With multiple STEM learning and engagement activities taking place across Scotland, young people can gain a greater awareness of the skills requred by Ocean Winds relating to a career in the offshore wind sector.

Key successes include

OW funded:
• STEM Leader Award, SL7, development and pilot of new YSL Award aimed at young people in the senior phase of secondary school.
• FIRST® LEGO® League Challenge for 8 secondary schools in Moray including training, robot kits, challenge kits and Regional Final at UHI Moray.
• EDT Industrial Cadets Bronze registration and Challenger activity days for S1/S2 pupils Fraserburgh Academy, Trinity High School and Royal High School.
• 34 wind turbine kits for secondary school teachers attending SSERC's Environmental Science course.
• Prizes and Sponsorship of TechFest's STEMNext essay competition for 16-19 year olds.

In addition, STEM engagement involved:

- 20 active STEM Ambassadors, delivering over 240 volunteering hours of activity this year.
- 6 OW mentors, supervised 4 Nuffield Research Placement students during Summer 2024.
- Support for DYW career events.
- Curriculum support for secondary schools.

Ocean Winds' Mark Baxter with the SSERC Board and SSERC SMT.

Ocean Winds' Roger McMichael and young people taking part in FIRST® LEGO® League Challenge.

Ocean Winds Wind Turbine Workshop with teacher taking part in the Environmental Science professional learning course.

Enthuse Partnerships

ENTHUSE Partnerships empower schools, colleges and employers to share practice and work collaboratively with the aim to achieve:

- ✓ Increased attainment in STEM subjects, narrowing the gap for disadvantaged students.
- ✓ Increased interest in STEM careers: more students interested in working in STEM industries.
- ✓ Increased understanding of STEM careers: more students aware of the qualifications and routes to progress in STEM.

BP Super Enthuse Partnership

In September 2024 a two-day professional learning event took place at Aberdeen Science Centre with 20 delegates taking part. Our workshops covered curricular areas such as forces, energy, electricity, renewables and other key STEM themes. An impact update took place in February 2024 with the funders. Year 2 has been planned, a 2 day event in November at the Aberdeen Science Centre, covering engineering and biodiversity.

Delegates from primary schools in northeast Scotland taking part in our 2-day professional learning course.

>>

Aramco Northeast

This Partnership ended in March 2024 with an online showcase event focussing on the schools sharing impact evidence that the 2 year programme has made a difference in educators pedagogy, learner experience and sustained impact of change. Over the 2 years of the programme the schools involved have developed their knowledge and skills in areas of Physics, Engineering, Construction and Digital Technologies. SSERC will be sending out the 6-9 month follow up evaluation in November/December 2024.

Delegates on the Aramco Northeast Enthuse Partnership working on STEM Challenge workshops.

Dundee Spectris

This Partnership ended in March 2024 with an online showcase event focussing on the schools sharing impact evidence that the 2 year programme has made a difference in educators pedagogy, learner experience and sustained impact of change. Over the 2 years of the programme the schools involved have developed their knowledge and skills in areas of Physics, Engineering, Construction and Digital Technologies. SSERC will be sending out the 6-9 month follow up evaluation in November/December 2024.

Primary schools from Tayside in Scotland showcasing their learning and skills in Digital Technologies.

Intergen - The M in STEM

Supported by Intergen Rocksavage, SSERC and a team of schools have now completed this year-long professional learning course with us. The aim is to identify ways - via a shared appreciation and understanding of mathematical techniques - to enhance learning for young people and ultimately contribute to raising attainment in STEM subjects via numeracy. Cohort 2 of this course will begin in August 2024.

APAX

Supported by APAX educators and learners move into year 2 with a professional learning event planned to take place from September 2024. Educators and school involved have already received resources and input on VEX Go and the extended STEM capabilities of this resource.

In year 2 we will use another VEX product, VEX 123, much more aimed at Computing Science in the early years. A showcase event, to demonstrate the impact the 2 years of this programme, is planned for early 2025.

Amazon

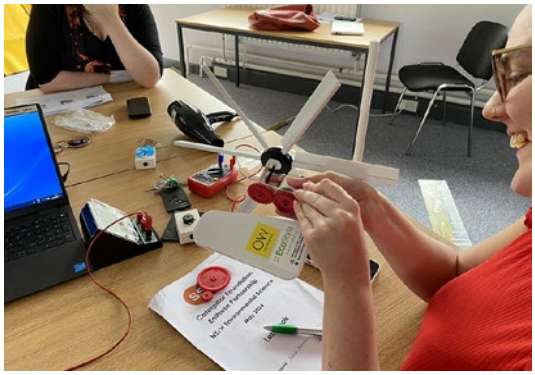
Supported by Amazon, a large number of educators and their learners are benefitting from a series of professional learning events linked to digital technologies and the use of Vex robotics products for primary learning. With opportunities across the entire 3-18 curriculum, we also designed a bespoke 2-day professional learning event for secondary teachers of Computing Science, hosted by the digital team at West Lothian College.

UK Space Agency

This Enthuse Partnership is now underway with a creative and pioneering method of delivery, ensuring we reach even more teachers than before. Online events are taking place for 20+ primary schools across Scotland in space-based professional learning and our partner schools are also working towards the Space Education Quality Mark. This partnership launched in early 2024 and will run through to Easter 2025 with STEM Ambassadors from the space sector in Scotland supporting the wealth of activity taking place in schools.

Caterpillar Foundation

This Enthuse Partnership launched in early 2024 with an online welcome followed by a 2-day professional learning event for teachers of Environmental Science. We will continue to work with the group into the 2024/2025 academic year, supporting them to work with STEM Ambassadors in their classrooms and enhance their delivery of the Young STEM Leader Programme.



SSERC is proud to be leading the way with school employer partnerships in Scotland, linking industry and education together to benefit all learners through Enthuse Partnerships and Education Industry Partnerships.

We will continue to welcome more and more employers to connect with us to explore the huge impact they can make in education whilst working with us and education setting all over Scotland.

Nuffield Research Placements

After 27 years in operation, the Nuffield Research Placement Programme has had a name change! At the start of 2024, the programme became “Research Placements and Experiences, formerly Nuffield Research Placements” and is now part of the new “Destination STEM” brand provided by STEM Learning. The placement programme remains unchanged however, providing engaging, real-life research experiences for S5 learners from disadvantaged backgrounds. The placements are a fantastic opportunity for learners to apply skills and knowledge learned at school while providing a meaningful contribution to the work of researchers and industry professionals.

70 young people from across Scotland participated in two-week research placements over the summer in 2024. Covering a wide range of STEM related subjects, learners had the opportunity to work with mentors in a university or industry environment and engaged in active research projects such as investigating realistic vs colourful 3D printed anatomical models for anatomy education, exploring the role of ageing in colorectal cancer, examining embodied carbon in engineering design decisions and applying machine learning for biophysics applications. After placement, each learner produced a scientific report and poster, which will be showcased at the Celebration Event on 1st October at the University of Glasgow. The learning continues into S6 with learners using their Research Placement knowledge to work towards STEM Leader 7 or a Gold CREST Award.

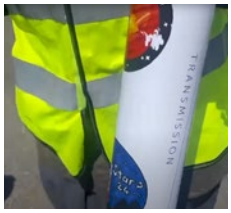
Applications for Research Placements in Summer 2025 will open in November.

ESERO

SSERC continues to be one of only two champions in Scotland for the European Space Education Research Office (ESERO). Working with the Royal Observatory in Edinburgh, SSERC supports ESERO and STEM Learning in their mission to create professional learning opportunities for educators and learning experiences for young people in the context of space.

"Space Inspirations" is an initiative to attract more young people into STEM subjects and the space industry. There are over 150 STEM Ambassadors in Scotland who work within the space sector, or have a keen interest in space, and by delivering successful interactions with young people, they seek to inspire and encourage the next generation of space professionals.

STEM Ambassadors supported the STEM team at Argyll and Bute Council, DYW and Discover Space UK to deliver STARS24 Space day at Machrihanish Air Base for 230 young people from eleven schools. This Space, Thrust, Aerospace and Rocketry STEM event included guest speakers, interactive workshops, rocket launches, and a careers area manned by STEM Ambassadors. Special guests included Dr Suzie Imber, a leading space physicist and winner of the BBC Astronauts programme and Dallas Campbell, TV presenter, writer and STEM Ambassador. Together they led a workshop on five objects from space, including a replica of Neil Armstrong's space suit.



STEM Ambassadors also supported a day of school activities as part of the European Lunar Symposium in Dumfries. This was the first time that the premier Moon-focussed meeting in Europe has taken place in the UK, attracting experts from across the world to discuss the latest developments in science and exploration of the Moon. Young people from the four local secondary schools had the opportunity to meet researchers, take part in activities and be inspired about the developments in lunar science.

If you would like a Space Inspirations STEM Ambassador to inspire your learners in any topic related to space, please contact stem-ambassadors@sserc.scot.

Our Physics team have developed a Satellite Reception for Beginners Self-Study Course. This course aims to introduce teachers (secondary) to a number of low-cost, practical activities that demonstrate the reception of voice or data live from both Low Earth Orbit (including GPS satellites) and Geostationary satellites.

There are nine activities. In order to complete the self-study course, delegates must show evidence of having completed any two activities of their choice.

Activity 1	Listening to voices from a geostationary satellite.
Activity 2	Listening to satellites in Low Earth Orbit.
Activity 3	Building your own satellite station antenna.
Activity 4	Using a tablet to receive raw GPS data.
Activity 5	Build your own TinyGS ground station.
Activity 6	Software defined Radio.
Activity 7	Using a cheap handheld radio to listen to satellites.
Activity 8	Space careers/STEM ambassadors video.
Activity 9	Plotting a satellite doppler curve.

Scottish STEM Placement Programme

Scottish STEM Placement Programme

Teacher Education

Introduction and overview

SSPP (Scottish STEM Placement Programme) aims to connect educators and learners with industry and research through 2-day placements in workplaces. These placements aim to highlight links between the curriculum and the workplace, as well as increase knowledge of STEM careers and pathways.

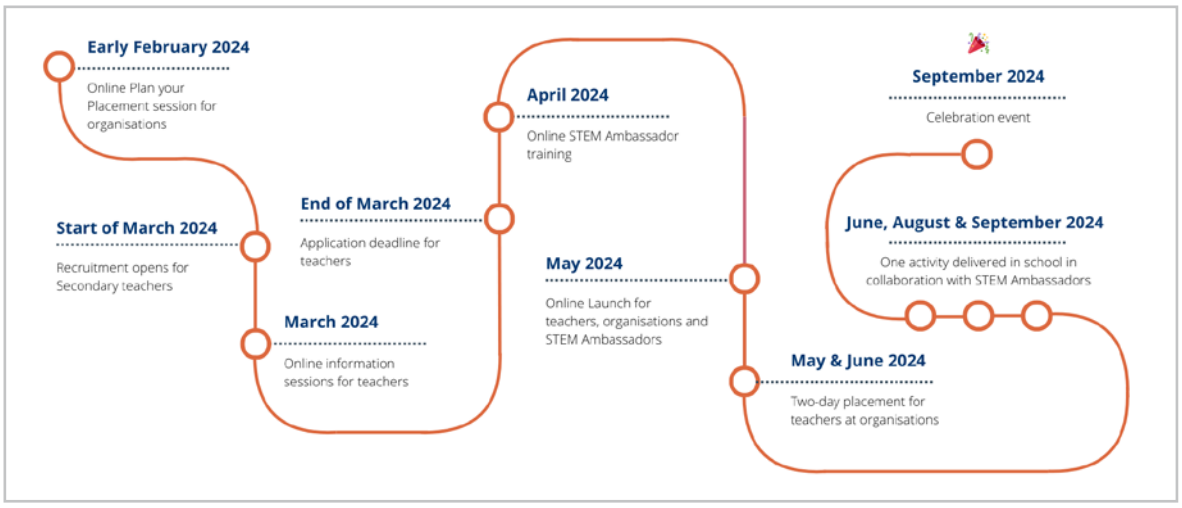
Merck 2023

In May 2023, 5 STEM teachers took part in a 2-day placement at Merck BioReliance, a leading provider of contract services in the biopharmaceutical industry. Delegates were given practical insights into how Merck BioReliance perform lab methods through practical training in aseptic techniques, analysis of GMP studies and the impact on medicines, patients and gene products. The delegates were given a complete overview of Merck BioReliance as a Contract Testing Services Company to understand the skills required for careers in STEM and the Life Sciences industry.




Chemical and Life Sciences SSPP 2024

After the successful pilot programme, the SSPP has expanded with placements planned in 6 companies across Scotland. In Edinburgh: Roslin CT and Charles River Laboratories, in Glasgow: Merck and CPI, in Dundee: Abbott and in Inverness: Lifescan. Each company has 5 placements available to local Biology Teachers and Chemistry Teachers at secondary level. Applications have been open to teachers throughout March with 27 applicants so far.



Timeline 2024.

We will continue to expand the SSPP to allow access for more teachers and launch our SSPP for technicians and learners.

The 2-day teacher placements are due to take place in May and June 2024. Each teacher will then plan an engagement with their learners in collaboration with their companies STEM Ambassadors, as well as contribute to an educational resource, similar to the Merck resource developed in 2023.

SSERC plan to continue running this programme in the future and expanding to cover other subject areas, curriculum levels and sectors – embedding careers education in teacher practice.

Scottish STEM Placement Programme
Learner Research

Scottish STEM Placement Programme
Technician Education

YSLP beyond Scotland

The STEM Leaders programme in England continues to build momentum across the secondary education sector and community sector. Now it's third year, The Leadership Skills Foundation – via a joint venture project with SSERC - is supporting and empowering young people elsewhere in the UK to drive their future and become change-makers within their community.

Leadership Skills Foundation

"We know that STEM touches almost every aspect of young people's lives. And we know that they are curious about the world around them and the way the world works.

Working with our partner, SSERC, the STEM Leaders programme has been developed to include a mixture of theory and practical experience and encourages peer-to-peer learning in a way that develops students' self-belief, confidence and their ability to work as a team. From leading STEM activities and delivering sessions during class time to establishing extra-curricular or after-school clubs, learners are able to take that confidence into situations that will support themselves and others in their communities and futures."

International activity

Aim
To participate in a range of international activity linked to SSERC's three core functions.

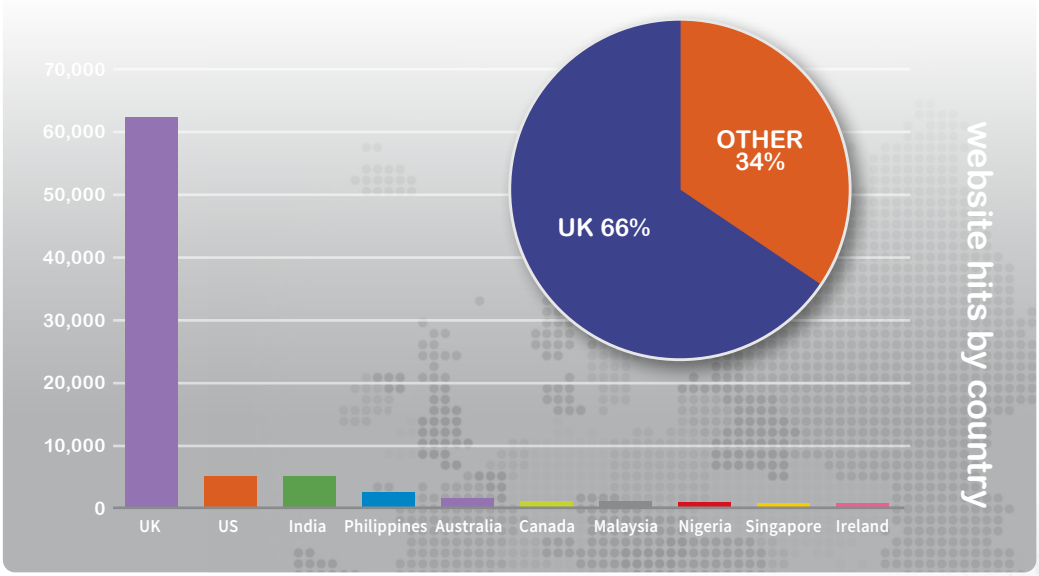
International activity is the newest workstream associated with SSERC Vision 2030; most activity is online. With the introduction of a new website in summer 2024, we hope to further our impressive online reach and progress the workstream activities identified below.

Medium term to March 2027	
IA1	Seek opportunities to reach an international audience.
IA2	Identify existing pages/sections/materials for the SSERC website for International members.
IA3	Create new pages/sections/sections for the SSERC website for International members.
IA4	Increase Search Engine Optimisation.
IA5	Explore opportunities to market YSLP Internationally.

Long term to March 2031	
IA6	Explore opportunities to develop the SSERC-accredited centre model internationally.
IA7	Explore opportunities to market SSERC Meets Internationally.
IA8	Explore opportunities to market online training that is accessible to the international market via SSERC Online Learning.

SSERC Website

We have 188 countries accessing our website, with the top 10 below.



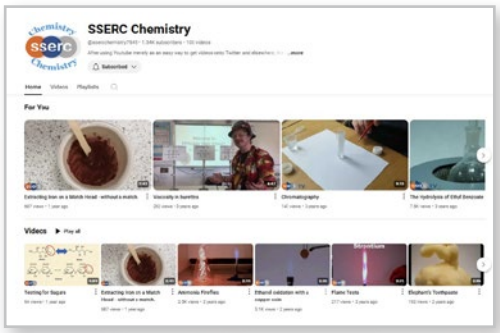
SSERC TV has an international audience. The top 10 countries that view SSERC TV are shown below.

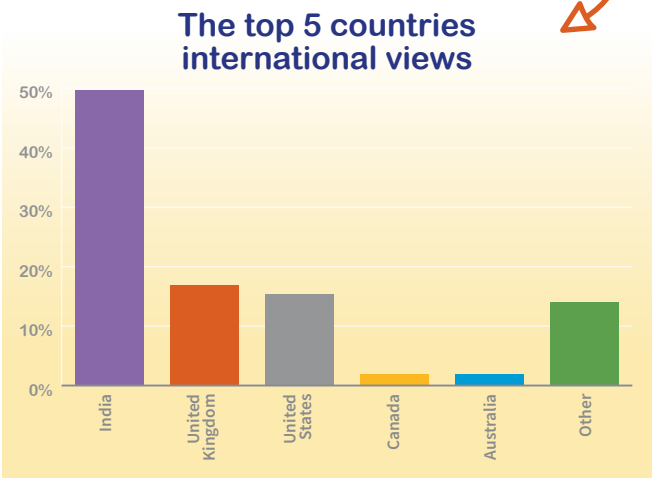
Amount of views per country

6225 United Kingdom	**3089** India	**1218** United States	**885** Egypt	**776** Iraq
377 Algeria	**248** Saudia Arabia	**151** Hong Kong	**73** Morocco	**52** Indonesia

SSERC Chemistry has its own YouTube channel and, like SSERC TV, has a very international audience:

104200 Total views	**2000** Hours watch time	**+355** Subscribers	**58** Countries





Other relevant activity

We welcomed visitors from Denmark representing the Confederation of Danish Employers who were interested in our approach to working in partnership with STEM industry.

Our first international member of the organisation is the International School of Dakar, Senegal.

We look forward to welcoming more in the new financial year.

From left to right: Graeme Rough (Head of STEM Programmes at SSERC), Alastair MacGregor (CEO at SSERC) and our Danish visitors.

Business development activity

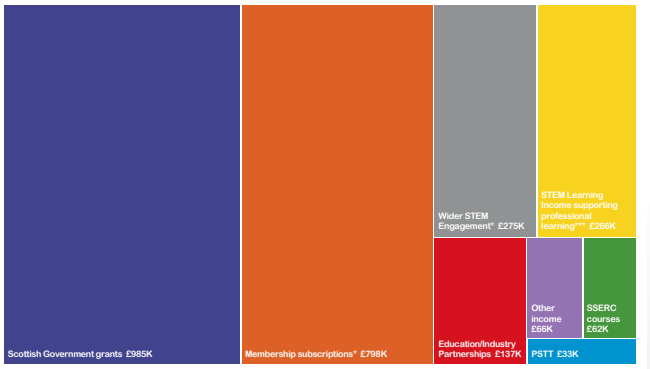
Aim
To increase income streams from non-traditional sources to allow for increased capability and activity.

We continue to examine ways to expand the range and diversity of our portfolio of products and services by improving internal business processes and seeking additional income streams within the organisation.

Our funders

Every £1 donated by the Scottish Government earns an extra £0.71 from other funders, which is invested in supporting STEM education and training in Scotland.

Income 2023/2024

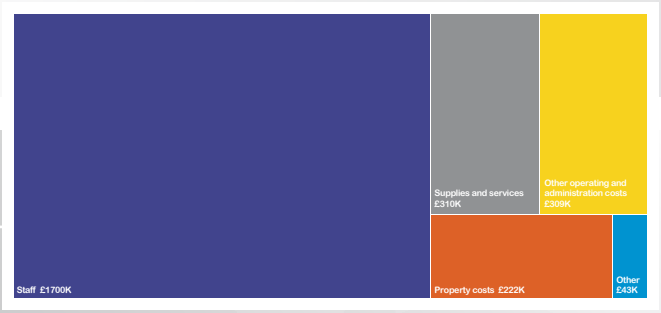


	£'000s	%
Scottish Government grants	985	38
Membership subscriptions*	798	30
Wider STEM Engagement**	275	10
STEM Learning Income supporting professional learning***	266	10
PSTT	33	1
SSERC courses	62	2
Education/industry partnerships	137	5
Other income	66	3
Total income	**£2622**	**100**

* Local Authorities, collleges and independent schools.
** This includes courses where schools received Enthuse subsidies towards the cost.
*** This includes STEM Ambassadors in Scotland and the STEM Enrichment Partnership.

Expenditure*

2023/2024



	£'000s	%
Staff	1700	66
Property costs	222	9
Supplies and services	310	12
Other operating and administration costs	309	12
Other	43	2
Total expenditure	**£2584**	**100**

* Expenditure before pension scheme interest, current service costs and actuarial remeasurements.

Other activity

Rental Hire

SSERC continues to maximise the use of our professional learning facility in Dunfermline by hiring our training rooms for conferences and courses. Our relationship with the Rock Trust continues as they utilise office spaces within SSERC.

System Developments

Using the Microsoft Dynamics platform, SSERC's new CRM system went live in the year. This major IT update has improved staff access to our course data, with better access navigation. The improved efficiency of access will enable SSERC to be more responsive to our delegates and funders.

We will continue to review our business processes to progress continuous improvement to increase capability and activity.

SSERC will launch a new website in July 2024 with an up-to-date look and 'cleaner' style. The navigation will also be updated to enable better access, especially for mobiles, tablets, and iPads.

Environmental sustainability

Following the successful roll-out of LED lighting in a large area of our office buildings last year, we have continued to replace light bulbs with LEDs where funds allow. In addition to a 20% saving in electricity usage, the new LEDs provide a brighter and flicker-free environment.

Where practical, SSERC allows staff to apply for 'hybrid' working patterns, where they can work some days a week from home. Staff have enthusiastically received this as an improvement to work/life balance. The reduction in commuting to work has the added benefit of lower carbon emissions.

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