



Hands-on, brains-on science

**ASE Scotland Conference
supported by SSERC**

2023

Keynote speaker: *Adrian Allan [Dornoch Academy]*

Primary:

- **Thinking skills revisited** – Susie Burr [PSQM]
- **Unplugged Computing Science** – Kevin Reid [SSERC]
- **Be part of a brighter energy future!** – Nicola Jordan [RSC]
- **Active Global Citizenship through Primary Science** – Jennifer Buchan [Scotdec]
- **A Bee Workshop (includes focus on Explorify)** – Hayley Sherrard & Euan Mitchell [SSERC]
- **They say it's your birthday: Promoting STEM with poetry** – Nicky Souter
- **PSQM – Outreach: Increasing Science Capital using diverse books and vocabulary** – Bridget Lamb [Holy Cross PS] & Elaine Arbuckle [Mearns PS]
- **SmArts vs STEAM** – Nicola Jones [Glasgow University]

Secondary:

- **Microscale Biology** – Annie McRobbie [SSERC]
- **Easy Bioinformatics Exercises to View Proteins, RNA & DNA in Genes & Genomes** – Suzanne Duce [Dundee University] & David Leader [Morgan Academy]
- **Sick Bag Biology** – Tess Watson [ASE]
- **Microscale Chemistry** – Chris Lloyd [SSERC]
- **Be a Magician** – Adrian Allan [Dornoch Academy]
- **Stealth Learning with Chemical Card Games** – Pete Johnson [Kitchen Chemistry]
- **Effective, research-based, study techniques** – Drew Burrett & Adrian Bailey [IOP]
- **Preparing for Practical Electronics** – Colin Oates [Kinross H.S.]
- **Visualising Electric Circuits** – Stuart Farmer [IOP]

All:

- **Applying English as an Additional Language (EAL) in a science lesson** – Henrietta Ashley [Kinross H.S.]
- **Young STEM Leader programme** – Eileen McaLeod [SSERC] & John Cochrane [SSERC & Greenfaulds H.S.]
- **Discover Materials Science & Engineering** – Chris Hamlett [Birmingham University]
- **Air Racing! Quadcopters as a STEM Resource in the Classroom** – Hannah Nisbet & Alisdair Stewart [Aerospace Kinross]
- **Effective Practical Work in Science** – Colin McGill [Napier University]

**Saturday 10th June
Kinross High School**

Details of each workshop and curriculum links are listed on pages 2 to 6 of the newsletter. The conference programme is on page 7.

ASE SCOTLAND CONFERENCE 2023



Supported by



**Tickets from
£15 (for ASE
members)**



ASE Scotland Conference

The ASE Scotland Conference 2023, in partnership with SSERC, is a festival of best practice with sessions for everyone with an interest in science education: teachers, technicians, university lecturers, trainees, education advisors, CPD and resource suppliers and more.

Join us on Saturday 10th June 2023 to enjoy an array of workshops that will enable you to tailor your own unique professional development, whilst providing opportunities to network with like-minded professionals in the Scottish science education community.

You will be able to attend sessions on topics such as inclusion in science, sustainability, practicals in biology, chemistry and physics, diversity, outdoor science and much more...

Primary workshops:

Thinking Skills revisited – Dr Susan Burr

"Let's Think through Science" come for a refresher or a first look. Recent work on progression highlights the fact that children's ability to think about thinking (metacognition) is an important part of their learning. There are three elements to "Let's Think...", which supports the development of thinking in primary age children from early years to upper primary. These are activities to challenge (cognitive conflict), group working (social construction) and reflection (metacognition).

Curriculum links: supports all aspects of primary science curriculum with different examples for each stage

Unplugged Computing Science: the foundation for understanding for - Kevin Reid

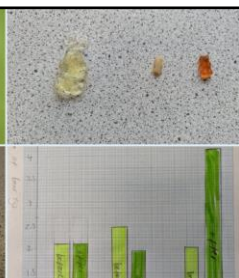
In this session we will consider the importance of unplugged computing science (CS) in helping learners to build a solid foundation of CS concepts. Through looking at various unplugged activities and resources, CS concepts, and cross curricular links, we will consider how engaging learners in the beginning stages of CS will help to lay the foundation for future understanding and development. We will also consider some next steps in the learning journey via introducing some play-based robotics equipment and how this can be implemented in your setting to develop computational thinking skills.

Curriculum links: Covers several outcomes from the Computing Science organisers 'Understanding the world through computational thinking' and 'Designing, building and testing computing solutions'.

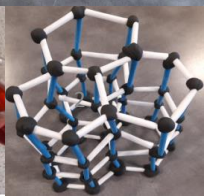
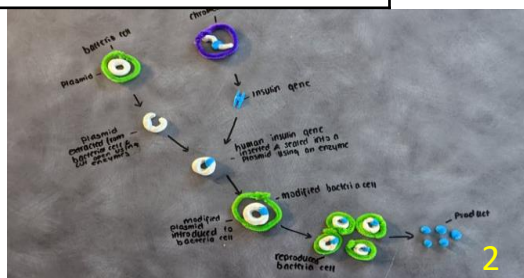
Active Global Citizenship through Primary Science - Jennifer Buchan

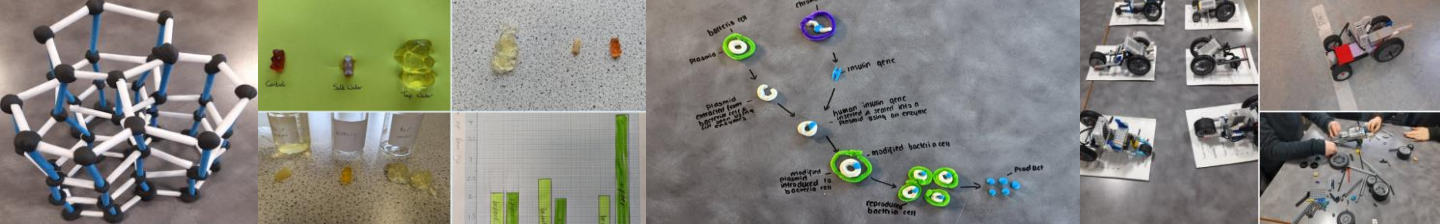
This practical session makes explicit the links between the Scottish Primary Science curriculum, Global Citizenship and Learning for Sustainability. Through exploration of resources, methodologies and planning tools, Primary teachers will be equipped to embed Global Citizenship in their teaching of Science. Course Aims: - To discuss what we mean by Global Citizenship and relate this to the Scottish Primary Science curriculum - To explore participatory methods and planning tools for different Primary Science topics - To look at ways to develop active citizen science across different topics.

Curriculum links: Links to Learning for Sustainability, all Primary Science Es and Os, Citizen Science



<https://www.ase.org.uk/events/ase-scotland-conference-2023>





Primary workshops continued:

A Bee Workshop (includes focus on Explorify) - Hayley Sherrard & Euan Mitchell

Take a closer look at this amazing insect and find out what can be done to support biodiversity in your setting. Find out more about the anatomy, behaviour and fascinating life cycle of the honey bee and its role as a pollinator. This workshop will provide lots of practical ideas and resources for early years and primary practitioners to try out with learners. There will be an opportunity to find out more about Explorify with specific links to this workshop.

Curriculum links: **Planet Earth: Biodiversity** I have observed living things in the environment over time and am becoming aware of how they depend on each other **SCN 0-01a**; I can distinguish between living and non-living things. I can sort living things into groups and explain my decisions **SCN 1-01a**; I can identify and classify examples of living things, past and present, to help me appreciate their diversity. I can relate physical and behavioural characteristics to their survival or extinction **SCN 2-01a**; I have helped to grow plants and can name their basic parts. I can talk about how they grow and what I need to do to look after them.

SCN 0-03a; I can distinguish between living and non-living things. I can sort living things into groups and explain my decisions **SCN 1-01a**; **Biological systems: Inheritance** By investigating the lifecycles of plants and animals, I can recognise the different stages of their development **SCN 2-14a**

The say it's your birthday - Promoting STEM with poetry. - Nicky Souter

A poem for every day of the year provides suitable contexts, and starters for STEM learning. Focusing on science has the potential to embed literacy as the vehicle, rather than endpoint of children's learning. A few days' poems will be illustrated. Delegates will discuss the validity of the suggested approaches, comment on the structure and make development suggestions.

Curriculum links: Various, including items from: SCN 1-20, TCH 1-15, MNU 1-22, LIT 1-31, HWB 1-51 etc

PSQM – Outreach: Introduction; Increasing Science Capital using diverse books and vocabulary – Holy Cross PS, and Working towards Outreach and gathering evidence – a class teacher's experience

Bridget Lamb & Elaine Arbuckle

Two sessions from schools who are doing or have done Primary Science Quality Mark - Outreach Holy Cross PS: showcasing a targeted scheme to improve children's and families' science capital and experience of science, supporting both the library and classroom experience. The session also hopes to support and encouraging others to do the same.

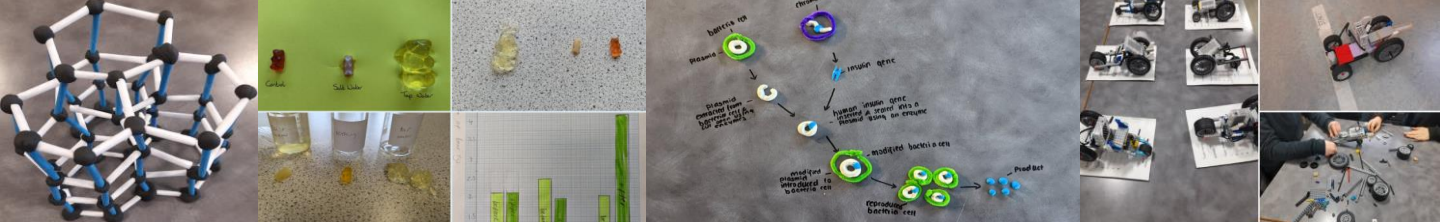
Mearns PS: reviewing the PSQM experience and looking at the evidence that the school collected.

Be part of a brighter energy future! – Nicola Jordan

To tackle our growing climate crisis, we need to move away from fossil fuels and embrace electrification. A crucial part of this journey is bigger and better **batteries**; we need them to be a sustainable storage solution to ease our energy transition. In this session from the Royal Society of Chemistry, you'll learn how batteries can be made in primary classrooms from everyday materials and how to encourage your learners to think more about energy and sustainability. You'll hear how your learners can take part in an experiment alongside learners from across the world. This session will give you the opportunity to explore the science behind batteries – and why they are such an important part of our bright energy future.

SmArts vs STEAM – Nicola Jones

This session will explore what the inclusion of the 'Art's into 'Science' education may (or may not) bring. As part of the session, we will consider specific examples of how pedagogical approaches from the 'Arts' can be used to enhance the learning of science in the primary classroom.



Secondary workshops:

Microscale Biology – Dr Annie McRobbie (BIOLOGY)

In this session, we will explore microscale approaches to support delivery of the Biology curriculum, across BGE and N5 biology.

Curriculum links: The sessions will include use of enzymes (SCN4-13b - I have taken part in practical activities which involve the use of enzymes and microorganisms to develop my understanding of their properties and their use in industries; N5 Cell Biology, KA4) and fermentation (N5 Cell Biology, KA6). All the protocols are low-cost and quick to carry out and repeat. Perfect for the modern Science classroom.

Easy Bioinformatics Exercises to View Proteins, RNA, & DNA in Genes & Genomes – Dr Suzanne Duce & David Leader (BIOLOGY)

Jalview is one of the most widely used programs for visualizing and analysing DNA, RNA and protein sequences. The Jalview team at the University of Dundee have developed easy, hands-on, web-based exercises helping pupils view and interact with these biological molecules for themselves. Sequences, 3D structures, and similarity trees of DNA, RNA and proteins can be viewed in its multi-window interface. The genetic mutation identified and their location on the 3D structure of protein viewed.

Curriculum links: photosynthesis, cell ultrastructure, biological molecules, classification, phylogeny, genetic technologies, health & disease

Sick Bag Biology – Tess Watson (BIOLOGY)

From gums to bums - what happens to your food when you eat? From lungs to liver Do you know how to inflate lungs outside the body and what toxins can do to our tissues?

Aimed at BGE Science, in this session you'll find out lots of fascinating facts and how to demonstrate dissections of tissues safely with all the required risk assessments. It will be a hands on session not for the 'fainted hearted!' Dissections will include: Lungs (lamb); Heart (lamb); Liver (lamb), and Eye (Cod fish)

Microscale Chemistry - Chris Lloyd (CHEMISTRY)

This is a hands-on, practical session showcasing a variety of microscale chemistry experiments and highlighting the ways in which the techniques can enhance teaching and learning, improve safety and also save money.

Curriculum links: BGE but some are also applicable to senior phase.

Be a Magician! - Adrian Allan (CHEMISTRY)

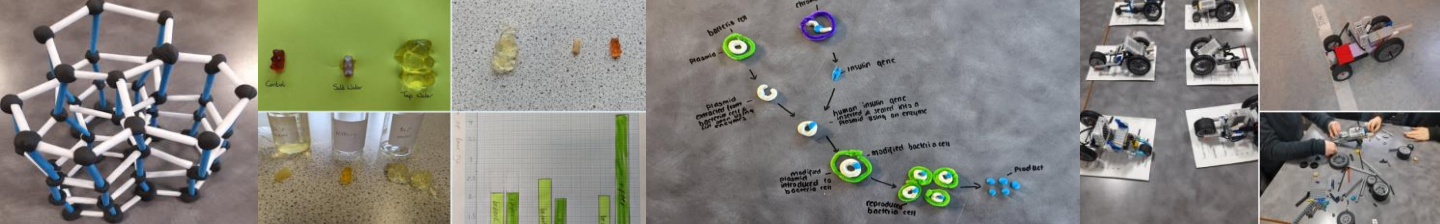
Spectacular science demonstrations and magic illusions have many things in common. They involve practice, showmanship, audience interaction and suspense followed by a moment of astonishment. This workshop will show an exciting selection of magic "tricks" which are in fact demonstrations of hidden science. Use them as introductions to topics or simply as puzzles for students to solve. These demonstrations can be used by teachers but can also be taught to students.

Curriculum links: This has links to the BGE and chemistry in the senior phase. The demonstrations can be used to help teach polymers, alloys, combustions, smart materials and catalysts.

Stealth Learning with Chemical Card Games - Pete Johnson (CHEMISTRY)

Chemical card games are a great tool for getting students to think about chemistry without realising they are actually doing it. These active learning activities are great for introductions to new concepts, consolidation or plenary activities. This session will look at a variety of different games and how to make your own or give the power over to your students.

Curriculum links: All areas of the chemistry curriculum are covered from BGE to Advanced Higher.



Secondary workshops continued:

Effective, research-based, study techniques. - Drew Burrett (PHYSICS/GENERAL)

Cognitive science research into effective study practices have identified a range of techniques which can be applied across the full range of subjects to improve student performance in assessments. Based around resources shared by the Learning Scientists - learningscientists.org - IOP Physics Coaches Andrew Bailey and Drew Burrett will discuss their use of these techniques in their own practice.

Curriculum links: Suitable for all subjects and levels.

Preparing for Practical Electronics – Dr Colin Oates (PHYSICS)

This workshop is offered to those who are preparing and presenting National 5 Practical Electronics. There will be an introduction to the assignment and delegates will practise soldering on stripboards and printed circuit boards.

Curriculum links: SQA National 5 Practical Electronics

Visualising Electric Circuits - Stuart Farmer (PHYSICS)

The workings of electric circuits involve many abstract ideas. In this hands-on workshop Stuart will draw on research and experience to explore how to make the invisible more concrete for learners. This will include how to make the most of modelling charge, current, potential difference, resistance, and series and parallel circuits. This workshop is suitable for teachers from BGE Level 1 to National 5.

Curriculum links: BGE SCN1-09 to SCN4-09 and N4/5 Electricity

General workshops:

Applying English as an Additional Language (EAL) in a science lesson. - Henrietta Ashley

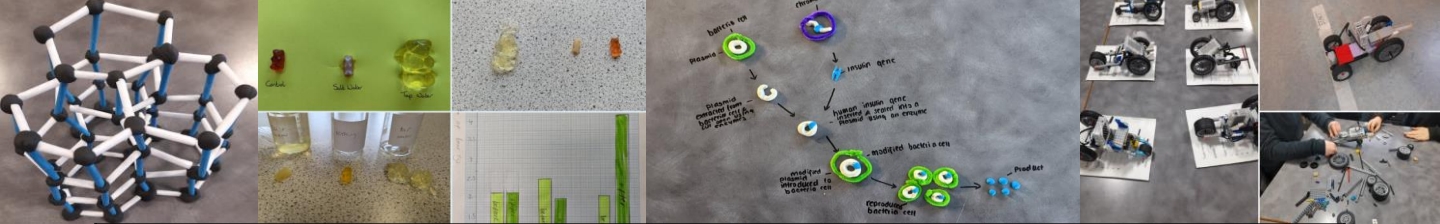
This interactive workshop highlights ways to support students with EAL. This can be applied to learners, for example, who have arrived in Scotland and have difficulty in learning English, or even have no English as a written or spoken language. The methods shown are straightforward to use for both teacher and student and require a low level of teacher preparation. I will demonstrate the different methods and provide opportunity for colleagues to try these and will share the benefits of utilising such a powerful tool in a science class and beyond.

Curriculum links: All areas of the science curriculum are covered from BGE to Advanced Higher.

Young STEM Leader Programme - Eileen MacLeod & John Cochrane

This session will showcase how you can use the Young STEM Leader Award with the young people in your setting. It will be suitable for both primary and secondary practitioners. There will be a chance to try out activities from the programme and to share how the award is working for you already or find out how to introduce it in your setting. It will be delivered by John Cochrane and Eileen MacLeod who are both Area Regional Trainers and Verifiers for the Award.

Curriculum links: The award links to levels 2,3 and 4 of Curriculum for Excellence and has a focus on learning for sustainability. The formal levels are at SCQF levels 4,5 and 6.



Discover Materials Science and Engineering - Chris Hamlett

Materials are the stuff from which things are made and Materials Science and Engineering (MSE) involves learning how materials behave, how to make new materials and how they can be used.

Discover Materials is a group of universities who promote MSE. We will introduce how we support teachers to deliver inspirational material science content in their lessons, the activities we can offer and give an overview of what we have in our exhibition stand.

Curriculum links: SCN 1-15a, SCN 2-15a, SCN 4-16a (Properties and uses of substances – Materials selection, physical properties of materials); SCN 1-08a (Forces – Magnetic materials); SCN 2-10a (Electricity – Batteries and making chemical cells); SCN 2-17a (Earth’s materials – Analytical techniques); SCN 2-18a (Chemical changes – Chemical properties of materials and interfaces); SCN 3-03a and 3-04a (Energy sources and sustainability – Thermal properties of materials and materials sustainability); SCN 3-11a (Vibrations and waves – Light and interactions of light with materials), and SCN 4-08 (Forces – Physical properties of materials)

Air Racing! Quadcopters as a STEM Resource in the Classroom. - Hannah Nisbet

Science Educators from Aero Space Kinross will share the success of their Air Race Challenge for P6-S2 and demonstrate quadcopters as a potential STEM learning tool. Find out about the project and the success of the 2022 schools and have a go at manoeuvring a quadcopter yourself!

Curriculum links: Specific Experiences and Outcomes at Second & Third level were identified for the original challenge in the following areas: Forces, Design, Materials, Information Handling, Art & Design.

Effective Practical Work in Science - Dr Colin McGill

Practical work is carried out in the science classroom to teach scientific concepts, increase motivation, develop practical skills and practise being a scientist. Research suggests that much practical work carried out in science classrooms has very little impact on the learning of scientific concepts. This presentation outlines how we can use principles from cognitive science to improve the use of practical work in the science classroom.

Curriculum links: BGE - Inquiry & Investigative Skills, Senior Phase - practical work to support learning

Keynote

"The Art of Astonishment - Using Magic Illusions to Teach Science"

Adrian Allan

Performing science demonstrations and magic illusions both require involve practice, showmanship, audience interaction and suspense followed by a moment of astonishment. A selection of magical science effects will be presented that can be used to mystify, enthuse and engage students in the classroom.

Saturday 10th June: 08:45 to 15:05

Conference Programme

08:45 - 09:30	Registration, exhibition and welcome refreshments
09:30 – 09:35	Welcome from the ASE Scotland Committee Past Chair
09:35 – 10:05	Keynote: Adrian Allan (Assembly Hall) <i>The Art of Astonishment – Using Magic Illusions to Teach Science</i>
10:10 – 11:10 Session 1	<p>A1. Applying English as an Additional Language in a Science Lesson, Henrietta Ashley, <i>Kinross High School All</i></p> <p>A2. Young STEM Leader programme, Eileen MacLeod (SSERC) & John Cochrane (SSERC, <i>Greenfaulds High School</i>), All</p> <p>A3. Thinking skills revisited, Dr Susan Burr, <i>PSQM Primary</i></p> <p>A4. They say it's your birthday – Promoting STEM with poetry, Nicky Souter, Primary</p> <p>A5. SmArts vs STEAM, Nicola Jones, <i>Glasgow University</i>, Primary</p> <p>A6. Stealth learning with chemical card games, Pete Johnson, <i>Kitchen Chemistry</i> Chemistry</p> <p>A7. Easy bioinformatics exercises to view proteins, RNA & DNA in genes & genomes, Dr Suzanne Duce (<i>Dundee University</i>) & Michael Leader (<i>Morgan Academy</i>) Biology</p> <p>A8. Preparing for National 5 Practical Electronics, Dr Colin Oates, <i>Kinross High School</i> Physics</p>
11:10 – 11:40	Tea, coffee and exhibitions (The Street)
11:40 – 12:40 Session 2	<p>B1. Discover materials science & engineering, Dr Chris Hamlett, <i>Discover Materials – Birmingham University</i> All</p> <p>B2. Air racing! Quadcopters as a STEM resource in the Classroom, Hannah Nisbet & Alisdair Stewart, <i>Aerospace Kinross</i>, ALL</p> <p>B3. Active global citizenship through primary science, Jennifer Buchan, <i>Scotdec</i> Primary</p> <p>B4. A bee workshop (includes focus on Explorify), Hayley Sherrard & Euan Mitchell, <i>SSERC</i> Primary</p> <p>B5: Be a magician! Adrian Allan, <i>Dornoch Academy</i>, Chemistry</p> <p>B6. Sick bag Biology, Tess Watson, <i>ASE</i> Biology</p> <p>B7: Effective, research-based, study techniques, Drew Burrett & Andrew Bailey, <i>IOP</i>, Physics/General</p>
12:40 – 13:50	Lunch and exhibition (The Street) Pop-up for Science – Activity Space area Exhibitions – The Street
13:50 – 14:50 Session 3	<p>C1: Effective practical work in science, Dr Colin McGill, <i>Napier University</i> All</p> <p>C2: Unplugged computing science: the foundation of understanding, Kevin Reid, <i>SSERC</i> Primary</p> <p>C3: PSQM – Outreach: Increasing science capital using diverse books and vocabulary. Working towards Outreach and gathering evidence, Bridget Lamb (<i>Holy Cross PS</i>) & Elaine Arbuckle (<i>Mearns PS</i>), Primary</p> <p>C4: Be part of a brighter energy future! Nicola Jordan, <i>RSC</i>, Primary/Chemistry</p> <p>C5. Microscale Chemistry, Chris Lloyd, <i>SSERC</i>, Chemistry</p> <p>C6: Microscale Biology, Dr Annie McRobbie, <i>SSERC</i> Biology</p> <p>C7: Visualising electric circuits, Stuart Farmer, <i>IOP</i>, Physics</p>
14:50 – 15:05	Plenary Q & A and exhibitors prize draw



The Association
for Science Education
in Scotland



ASE Scotland
for Science Education
The Association



European Science on Stage 2024

Science on Stage, Turku, Finland

Applications to join the delegation to represent the UK at the 2024 biennial Science on Stage Festival are now open. The Festival will be held in Turku, Finland on 12-15 August 2024, however, **the deadline for applications is 15 July 2023**. Further details and a link to the electronic application form are available at <https://www.ase.org.uk/events/science-stage-europe-festival-2024>.

The Science on Stage Festival is an inspiring event bringing together 450 teachers of the STEM subjects from across Europe and beyond to share teaching ideas. The UK delegation is limited to 11 teachers, but at recent Festivals Scotland has been well represented within the UK delegation by teachers such as Jennie Hargreaves, Adrian Allan, Paul Tyler, Tim Browett, Catherine Dunn, Lara Carnegie, David Rigmand, and John Cochrane.

The core of the event is the Festival Fair where all the delegates will have an exhibition space to showcase a project or teaching idea. This is not a conference where the exhibitors are trying to sell you things, but are all teachers sharing their ideas and enthusiasm for teaching the STEM subjects. A small number of the participants with the strongest applications will be selected to also present workshops sessions and there will be visits and social events during the four-day residential conference.

The themes for the 2024 conference are:

- **Science for the Youngest** (projects for early years and primary school)
- **STEM Education for Sustainable Development** (projects that show how STEM can contribute to achieving the SDGs)
- **Digital Technologies in STEM education** (projects involving coding, ICT, big data, AI, VR, network security, etc.)
- **Diversity in STEM Education** (projects including the variability of teaching methods, for talented students, for inclusive learning, cooperation between younger and older students etc.)
- **STEAM in Education** (e.g. projects combining STEM with other disciplines – i.e. arts, music, sports, history, etc.)
- **Low-Cost Experiments in STEM Education** (e.g. projects involving practical work with low-cost and everyday materials)
- **STEM for Teachers in Training** (e.g. projects for teachers during initial teacher education)

The Science on Stage Festival always lives up to the Science on Stage guiding principle “From teachers, for teachers”, and I am sure there are many of you reading this who have good physics and science teaching ideas that are worthy of sharing with an international audience. What may seem mundane and the way it is always done may not be the case for many working in different education systems.



IOP Scotland Stirling Physics Teachers' Meeting – Thursday, 25 May 2023

The date of the Stirling Meeting is Thursday 25 May 2023, the week after the SQA physics exams. To make the most of the face-to-face conference setting, as well as two keynote talks, there is also a choice of three from nine workshops and lots of time to networking and browse the exhibitions built into the programme.

Full programme details and registration are available at <https://iop.eventsair.com/spt48-2023/>. The registration deadline is 17 May 2023.

Limit Less – Support our young people to change the world

In March, IOP had a special campaign focus on helping teachers to make schools inclusive and equitable for all students with the launch of new specialist teaching resources.

At iop.org/InclusiveResources you will find a new evidence-led resource - Top Tips for Inclusive Science Teaching - which offers practical advice on making teaching, interactions and classrooms as inclusive as possible. There's an accompanying Inclusive Science Teaching poster to go with it.

The booklet supports physics teachers with practical ways to make teaching, interactions and classrooms as inclusive as possible. It's structured as nine guiding principles for inclusive teaching, arranged under the three themes of:

- Creating an inclusive culture
- Making the learning relevant
- Building literacy and numeracy for science

If you did not have a chance to look at the new resources in March then please have a look now.

STEM career information

IOP, through its Challenge Fund has supported Planet Possibility [Explore the world of physics | Planet Possibility](#) who are producing careers videos as part of their work, see [FF Infinity #PlanetPossibility on Vimeo](#).

The IOP's Careers website [Careers with physics | Institute of Physics \(iop.org\)](#) links to various pages which include case studies of people with a wide range of backgrounds and career paths including vital apprenticeships and technical routes as illustrated in this recent report [IOP-Solving-Skills-report.pdf](#). See [Physics apprenticeships | Institute of Physics \(iop.org\)](#) for a video including Emily an apprentice from Edinburgh and [Choosing physics: A-levels, Highers and Leaving Cert | Institute of Physics \(iop.org\)](#) for a number of case-studies.

The Limit Less campaign to increase equity, diversity, and inclusion in the physics community and beyond includes resources to download [Limit Less careers resources | Institute of Physics \(iop.org\)](#)

For lots of information about the contribution of physics to the economy see [Physics and the Economy – 2022 findings | Institute of Physics \(iop.org\)](#) and [IOP contribution of physics to the Scottish economy summary](#).

Step Into Physics

IOP has worked in partnership with ESP to produce the [Step into Physics](https://esp-scotland.ac.uk/step-into-physics/) website to provide career information about physics opportunities, particularly through more vocational routes. Recent research has shown that 53% of physics-based jobs do not require a degree and that although physics-based industries make up 8% of the economy they contribute 16% of GDP, and average salaries are well above the national average. Industries also report widespread physics skills shortages which put economic growth and wellbeing as well as our ability to meet key targets, such as reaching net-zero, at risk. Addressing these issues overlaps with IOP's work on our Limit Less campaign and other work in the skills area, for example, only 8% of apprentices in the energy sector are female.

Visit the Step into Physics website at <https://esp-scotland.ac.uk/step-into-physics/>, and also the related ESP websites <https://esp-scotland.ac.uk/step-into-renewables/>, <https://esp-scotland.ac.uk/step-into-science/>, and <https://esp-scotland.ac.uk/step-into-robotics/>.

We would also like to expand the range of videos available on the website so if you know of any potential contributors, especially those who have followed apprenticeship or other FE or more vocational routes into a physics career then please contact stuart.farmer@iop.org.

ESP **IOP** **STEP INTO PHYSICS**
Institute of Physics

WHY PHYSICS?

Studying physics provides the stepping stone into rewarding careers in a wide range of industries including; the growing Scottish space sector, renewable energy, medical physics, and photonics where light is used in telecommunications, sensing, medicine and many other applications. Knowledge of physics provides practical skills and problem solving strategies widely sought after by employers.

Demand for physics spans all skills levels. High skill level roles are seeing the fastest growth, with for example, the number of jobs for physical scientists growing by 40% between 2010 and 2020. More than half (53%) of physics based jobs do not require a degree; 46% require intermediate level qualifications such as National 5, Highers and apprenticeships.

Between 2016 and 2021, 66% of physics innovators reported having to suspend or delay business activities because of a shortage of people with physics skills. Recruiting more people with Physics skills will help to increase investment in new and existing physics based industries.

Information provided by Institute of Physics <https://www.iop.org>

PHYSICS STATS

Scotland has a total of **27,235** physics based businesses representing 15% of all Scottish businesses.

Physics based businesses employ **220,000** full time equivalent staff in Scotland.

In 2019, physics based industries contributed **£28bn** to the Scottish economy, providing 17% of the total Scottish Gross Domestic Product (GDP).

UK SALARY RANGES

The average salary of someone employed in a physics based business in Scotland in 2019 was **£47,000**

From Idea to Career

New careers booklet about careers in 12 branches of engineering.
<https://neonfutures.org.uk/resource/booklet-from-idea-to-career/>

IOP autumn day conferences

IOP is organising two Saturday conferences in the autumn. These will have a focus on physics in the BGE and physics practical work. Further programme details will be available early next term, however, the dates and venues are:

- * Saturday, 4 November 2023, Edinburgh Napier University, Sighthill Campus
- * Saturday, 18 November 2023, Millburn Academy, Inverness

Volunteer opportunity

The education policy team is looking for chemistry teachers and those in school leadership roles to take part in a virtual focus group session. The focus group is aimed at identifying ways the RSC can support teachers in embedding more globalised perspectives and examples of ethnic minority chemists into their teaching. We welcome all volunteers no matter your level of experience on the topic. We also welcome both primary and secondary teachers, and teachers at all stages of career.

The focus group session is likely to take place in early June, exact date and time to be confirmed.

[EXPRESS YOUR INTEREST](#)

Help shape the future of RSC's professional development e-learning courses *May – July*

Do you want to support the development of future e-learning professional development offerings from RSC? We are looking to run a focus group in March/April and want to get the opinions of secondary chemistry teachers across UK and Ireland. Email us to register your interest. Thank you to those that have been in touch and we get in touch with everyone once we have some dates finalised.

[REGISTER YOUR INTEREST](#)

Dawn Gillies

Nominations open for RSC Education Prizes

Do you know someone in education who deserves recognition?

The RSC Education prizes are part of a prestigious portfolio of annual awards for the chemical sciences community. Our Education prizes recognise individuals and teams doing great things in their classrooms. They are leading by example in all sorts of ways, including:

- designing innovative and effective science curricula
- making a step-change in science education through new initiatives, programmes or technologies
- engaging pupils through practical science
- championing inclusion and diversity in science education
- supporting the development of colleagues ... to name a few.

There are two main categories; Excellence in Education Prizes, and our Horizon Prizes for Education and both categories apply to primary educators and beyond.

[FIND OUT MORE AND NOMINATE](#)

Nigel Botting meeting

Friday 26 May, 10am–3pm, University of St Andrews

The 27th Nigel Botting meeting for teachers of chemistry in Scotland will take place in person at St Andrews within the school of chemistry. This meeting is for all teachers and educators of chemistry in Scotland, and also for those that support that enterprise. Registration is required and is free, such that delegates receive a link to enter the meeting.

[REGISTER HERE](#)

Young STEM Leader Programme



Pilot for Level 7 Qualification in STEM Leadership

The SCQF Level 7 Qualification in STEM Leadership is a new award designed by the Young STEM Leader Programme team at SSERC, aimed specifically for learners aged 16+ in the senior phase of secondary schools, further education or community learning and development.

The award is in the development stage, estimated to comprise 60 notional learning hours for learners, with a focus on the development of leadership skills through STEM with links to the Sustainable Development Goals and Learning for Sustainability. Part of the award will include learners engaging with a mentor and undertaking an independent project, which comprises the majority of the assessment for the award. The award will not have a structured Log that makes up the entirety of the assessment - as is the case with other YSLP awards - and instead will have flexible assessment methods that are appropriate for the learner and setting, comparable to the assessment style of SVQs.

Up to 25 centres will be invited to take part in the YSL7 Award Pilot, including a maximum of 15 secondary schools, 5 colleges and 5 community learning and development settings. Centres that are not successful in being invited to join the SL7 pilot will be able to start the delivery of the award upon its full national launch in June 2024.

The intended audience for the award is primarily secondary schools (senior phase), further & higher education, community learning and development settings and apprenticeship programmes within STEM employers.

We recommend that a maximum of 20 learners per centre take part in the award pilot. It is beneficial if centres already have experience delivering the formal YSLP, although this is not essential.

To find out more and to register your interest for the SL7 Pilot, click here: <https://forms.office.com/e/iJSjZaSmPi>

Professional Learning Early Years and Primary incorporating Digital Skills and Computing Science

The Early Years and Primary team's professional learning calendar will soon be populated for the next academic year. However, in the meantime there are some incredible computing science courses (with resources provided) for you to sign up for [Digital Professional Learning – SSERC](#)

Early Years and Primary - April/May 2023 Bulletin

We have just launched our most recent edition to the library of bulletins - this one is focussed on micro:bits. Please do take a look and download. This bulletin along with many others are fully interactive filled with videos, thinglinks, hyperlinks and activity ideas. [96 \[Spring 2023\] - SSERC](#)

96 [Spring 2023] – SSERC

Complete Primary Bulletin 96 Don't put Micro:Bit in the Cupboard Learn where to get started with micro:bits to enhance Computing Science outcomes in your setting. Great Science Share for School www.sserc.org.uk



Early Years & Primary Bulletins – SSERC

Our most recent early years & primary bulletins are available below. We have taken the decision that we are not going to revert to the pre-covid situation so all our Bulletins will be open for all to read. If you get asked for a log-in to read one, let us know - it will

www.sserc.org.uk

To access our other Early Years and Primary bulletins, all linked to different areas of the curriculum please click [here](#)



Technicians in Scotland

A range of bespoke opportunities (contact alan.purves@sserc.scot for more details), SSERC has, in partnership with the Scottish Technicians Advisory Council (STAC), developed a number of courses which have been levelled and credit rated by SQA. What to take a look and find out more then click [here](#)

School STEM Technician publications

'The School STEM Technician' will be a triannual publication dedicated to supporting school technicians' professional development and encouraging professional discussion and debate. [The School STEM Technician - SSERC](#)

Secondary Science, Technology and Health and safety courses

We are still populating our website with the new academic years courses for all the above subject areas, please keep this link to hand as these will be going live in the coming weeks. [Secondary PL - SSERC](#)

Secondary PL – SSERC

Update (3rd March 2022) Everything is pretty much back to normal for our courses now. A few of them are still partially (or wholly) online but this is a decision relating to the best way to deliver rather than as a result

www.sserc.org.uk



The secondary science bulletin publications can be found here these bulletins cover up to date health and safety guidance, activities and wider STEM engagement opportunities

Membership Sign Up

Science Department (11-19)

Save your school up to £250 per year on individual memberships.

Scan QR code or tap the URL below.



<https://www.ase.org.uk/membership-sign-science-department>

ASE Science Department membership can help support the entire science team in any secondary school or FE college. For example, trainee and early-career teachers will be able to develop their careers through access to our extensive range of *live CPD events* and recorded webinars, while heads of science might benefit from strategic-level materials such as our *Good Practical Science guidance* or *Best Practice Guidance Documents*.

For just **£250 per year**, science departments are granted five individual logins (additional logins can be added for £30 per user), with registered users able to enjoy benefits such as:

- Member discounts of up to 50% on all ASE CPD events (including online), such as our annual conference - traditionally the largest gathering of science education specialists in Europe
- Access to recorded video CPD materials through our member-only *secondary CPD Video hub*
- Physical copies and digital archive access to our leading primary journal *School Science Review* (1x physical copy per school - UK only)
- Physical copies and digital archive access to our leading primary journal *Education in Science* (1x physical copy per school - UK only)
- A wealth of digital teaching/department resources such *BEST STEPS* or our *Science Department Scenarios*
- Market-leading technician-facing resources such as *Topics in Safety*, and the *Prep Room Organiser*
- Up to 50% the vast majority of ASE & Millgate publications at *Millgate*.

If you get your science department to sign up, you get your next year's individual membership for free!

Primary membership

ASE primary membership provides teaching resources and professional development opportunities to support primary science subject leaders, teachers and schools.

Scan QR code or tap the URL below.



<https://www.ase.org.uk/content/membership-sign-primary>

For just **£149 per year**, schools are granted eight individual logins, with registered users able to enjoy benefits such as:

- Member discounts of up to 50% on all ASE CPD events, including our four-day annual conference - traditionally the largest gathering of science education specialists in Europe
- Access to recorded video CPD materials through our member-only Primary CPD Video hub
- Physical copies and digital archive access to our leading primary journal *Primary Science* (1x physical copy per school - UK only)
- Physical copies and digital archive access to our leading primary journal *Education in Science* (1x physical copy per school - UK only)
- The *Primary Science Leaders' Survival Guide* (Online resource)
- A wealth of teaching resources such *PLAN*, *Primary upd8* and the *Primary Remote Learning Resources*
- Up to 50% off ASE & Millgate publications at *Millgate*.

Student Teacher & Early Career 3 Year Option

We want you to be able to enjoy the support and benefits that being part of our network and community bring, and are delighted to be able to give our student teacher & early career members a special three-year offer, at a significantly discounted rate of **£136 for three years** (charged at £24, £44 and £68 in years 1-3 respectively or as a single one-off payment). If you feel a three-year membership option might not be for you, we also offer a one year plan for £70 for the year instead.

Some of the benefits trainee and early career members receive include:

- Priority access to ASE webinars as well as to our popular *Teachmeets*.
- Big discounts on professional development, from hands-on *workshops*, to our flagship *Annual Conference* (including one free day per year at any ASE CPD event during your three year plan)
- Access to early-career member online sessions providing opportunities to ask questions and share concerns & best practice.
- ASE Journals and full access to our *journals archive online*.
- Secondary members will also get online access to *School Science Review*, our leading peer reviewed journal; Primary members will get online access to our leading *Primary Science* journal.

Scan QR code or tap the URL below.

<https://www.ase.org.uk/individual-membership>



Professional Registration

The ASE is licensed by the Science Council to manage professional awards, which recognise excellence for practitioners in science education:

- **RSci** (Registered Scientist Award), which benefits all those concerned with science teaching as a profession;



<https://www.ase.org.uk/rsci>

- **RSciTech** (Registered Science Technician Award), which benefits all those concerned with science education, and



<https://www.ase.org.uk/rscitech>

- **CSciTeach** (Chartered Science Teacher Award), which benefits all those concerned with science teaching as a profession.



<https://www.ase.org.uk/csciteach>

These can be awarded to eligible members. If you are not yet a member of ASE, you can click on the above QR code, that applies to you, in the membership section.