



Welcome back

Colleagues, I hope this newsletter finds you well and coping with all the restrictions that have been imposed on us by Covid. Hopefully the “light is at the end of the tunnel” is when some degree of normality will return to our lives and not an oncoming train.

On Saturday 13th March, we have our first ever online Scottish Annual Conference. If you have not signed up then I would encourage you to do so. It is a festival of best practice, in science education, for everyone with an interest - teachers, technicians, lecturers, trainees, advisors, CPD suppliers and more. Details on the Scottish conference are at the bottom of this page followed by a conference programme, next page. To give you a flavour of the quality of presentations, I have written a review on the Annual Conference in January, on pages three and four in the newsletter.

Also in this newsletter: we report on IOP Talkphysics; Learned Societies Group; RSC; Coronavirus Hub; Subjects Matter, and updates to professional development. Another feature, in the newsletter, is that of a past ASE Chair - Bob Kibble. Bob’s article highlights best practice in science education and challenges faced by science teachers.

Again, all the best for 2021 and I hope to see you at the online Scottish conference on 13th March.

Susie Burr: Chair of ASE Scotland.

Annual Scotland Online Conference 2021

Saturday 13th March 2021

In addition to supporting teaching in biology, chemistry and physics, the conference will explore primary science and careers in STEM. There will also be a full exhibition of support and resources for science education at this conference.

A programme for the online conference is on the next page; a full description of each workshop is listed on pages 16 to 20.

The fees for the online conference are:

- Students / early career ASE members rates: £10 + VAT
- ASE members rates: £35 + VAT
- Student / early career non-members: £35 + VAT
- Non-member rates: £60 + VAT

Click on QR code or tap the URL below.



[https://www.ase.org.uk/
events/ase-scotland-
conference-2021](https://www.ase.org.uk/events/ase-scotland-conference-2021)

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Scottish Annual Conference Programme

● All audiences

● Primary

● Secondary

ASE SCOTLAND CONFERENCE

09:30 – 10:05	Welcome and Keynote: Talk Dialogue and Questions: Stuart Naylor CSciTeach
Session A 10:05 – 11:20	<p>A1: Teaching physics through road safety: Ken and Jennie Hargreaves, <i>Institute of Physics</i></p> <p>A2: RSC: Edible Chemistry: Stephen Hendry, <i>RSC</i></p> <p>A3: Looking at the B and E in 'Sustainable' and the I and Y of Sustainability: Dr Liz Lakin, <i>RSB and University of Dundee</i></p> <p>A4: TAPS Scotland: Supporting teaching and assessment of scientific skills - The Teacher Assessment in Primary Science (TAPS) project. Dr Sarah Earle, <i>Bath Spa University</i></p> <p>A5: Timstar: DNA Fingerprinting: Lucienne McCallum, <i>Timstar</i></p> <p>A6: Developing STEM Capital in primary schools through partnership projects: David Rigmand and Paul Tyler</p>
11:20 – 11:50	Break
Session B 11:50 – 13:00	<p>B1: Using research to improve learning in the science classroom: Andrew Bailey, <i>Institute of Physics</i></p> <p>B2: Primary climate change practicals - on the road to COP26: Stephen Hendry, <i>RSC</i></p> <p>B3: Finding global solutions through science: Krissie Davis, Tracey Shaw, Claire Tatar (<i>secondary science teachers</i>)</p> <p>B4: Safeguards in the School Laboratory: Chris Lloyd, <i>SSERC</i></p> <p>B5: Let's talk about animals: Stuart Naylor CSciTeach</p> <p>B6: Building family science Capital through STEM workshops: Tracey Ellicott CSciTeach</p>
13:00 – 14:00	Lunch and ASE Scotland AGM from 13:30 to 14:00
Session C 14:00 – 15:15	<p>C1: Science Showcase: practical activities for use in the classroom, for home learning or as part of a science event: Dr Susie Burr</p> <p>C2: Laying the foundations of computer science: Kevin Reid, <i>SSERC</i></p> <p>C3: Be a magician! Using magic illusions to teach science: Adrian Allan, <i>Dornoch Academy, Highland Council</i></p> <p>C4: How does effective leadership and an aspirational curriculum impact on the quality of teaching and learning in science?: Jane Turner, <i>PSQM</i></p> <p>C5: Primary and secondary chemistry transition projects: Stephen Hendry, <i>RSC</i></p> <p>C6: SSERC and SCMA present STEM in the Early Years: Euan Mitchell, <i>SSERC</i></p>

Programme continued

15:15 – 15:25	Break
<p>Session D</p> <p>15:25 – 16:40</p>	<p>D1: The science of climate change: Stuart Farmer, <i>Institute of Physics</i></p> <p>D2: The perfect enzyme: Dr Doug Macdonald and Dr Alistair Macpherson, <i>Edinburgh Academy</i></p> <p>D3: Science in the outdoor classroom - a toolbox for educators: Christina Sinclair, <i>Field Studies Council (FSC)</i></p> <p>D4: 'People like me can do STEM' (Rolls Royce award): Kate Carter, <i>Castleview Primary School</i></p> <p>D5: Space in the primary curriculum: Olivia Johnson - <i>UKRI STFC</i></p> <p>D6: Visible learning in the science classroom - what might it look like?: Nicola Jones, <i>Monifieth High School, Angus</i></p>
17:00	Conference closes

Annual Conference 2021: Wednesday 6th – Saturday 9th January.

Susie Burr: Chair of ASE Scotland

I was looking forward to going to the University of Birmingham for the Annual Conference in January. Having been part of the organising group for the last seven years I was hoping to sample a good range of presentations and have a good *blether* with my friends rather than rushing around. Instead, we had our online conference, which I thoroughly enjoyed. Not only was I able to attend a good range of sessions, but also to catch up with others using the video sessions.

What were my highlights? Firstly, a fascinating Frontier Science lecture by Professor Andrew Pollard, who was in charge of the process which trialled and provided the vaccine information for the regulator. He also gave a good overview of different types of vaccine, including their own Oxford Astra-Zeneca one. We have a lot to thank him for, together with Professor Sarah Gilbert and their teams. They have developed the vaccine and made sure it was available to us in record time. As I write I have just received my first jab of this vaccine.

ASE president - Sir John Holman's message was that we must **Trust in Science** and in an interesting and thought provoking address provided us with some interesting quotes by others on the nature of Science: "*scientists advise and politicians decide*" – Margaret Thatcher and "*many experiments will not prove me right, one experiment can prove me wrong*" - Albert Einstein.

The advantages of an online conference were that we were joined by participants from around the world including an interesting presentation from Christine Pearson in Sydney, Australia on **Using models for learning about Electricity. Assessment of Practical skills** by Prof Chris Harrison highlighted the importance of good teacher demonstrations. There is an interesting article in September's SSR on Science practical work in COVID-19 that is well worth reading.

Good primary sessions included: **Beyond the KWL** was an interesting session with lots of good ideas for pre-assessment

looking at both the **Why?** and **How?** Drawings, posters, models, concept maps, quizzes, card sorts, word grids, concept cartoons, discussion, images, resources were all included.

The Brenda Keogh lecture on **Outdoor Learning** introduced Farmer Tom who does online sessions with primary pupils about his farm and what he does as a farmer. The examples showed great engagement from pupils and lots of really good messages about the importance of science in food production and the environment.

Another resource of immediate relevance, supporting children (and teachers), to make sense of the science of the coronavirus, was a pack all about the virus, by Jane Turner and Liz Lawrence. This is a SNAP resource *Let's talk about what is happening*.

Click on the link <https://www.ase.org.uk/resources/snap-science> or use the QR code:

If you would like a copy of a CfE reference sheet for the SNAP resource, then contact me at Susanburr952@btinternet.com



All in all a different experience - I only walked a few steps compared to my normal conference six or seven miles a day, but a great opportunity to catch up on some of the latest ideas and resources in science education. Although I do look forward a return to face-to-face events and the opportunity to catch up with everyone.



The ASE Coronavirus Hub

The hub has a suite of resources at <https://www.ase.org.uk/ase-coronavirus-hub>.

You can also use the QR code:



The resources linked to Primary and Secondary Directories were curated by representatives of the ASE's Primary Committee and 11-19 Committee, respectively. Both directories are relevant for educators focusing on the 3-11 and 11-19 age groups.

Primary link directory

- **Primary resources aimed at teachers**
- **Educational Resources provided by institutions, societies, zoos and more**
- **Useful blogs and digital communities for primary school teachers**



<https://www.ase.org.uk/primary-link-directory>

Secondary link directory

- **Teachers delivering lessons/support remotely**
- **Science activities to do at home**
- **Teacher, Student Teacher and Technician CPD**



<https://www.ase.org.uk/secondary-link-directory>

Competitions to engage pupils during lockdown

To help keep your pupils actively engaged during the COVID-19 lockdown, we have assembled a list of competitions and activities to get students involved in science from home.



<https://www.ase.org.uk/competitions-engage-pupils-during-lockdown>

Stephen Hendry: RSC

The Royal Society of Chemistry are launching Steps into Science – our brand new website dedicated to primary science teaching.

Join us for our first launch events, where we'll be giving you a tour through the new website, highlighting our most popular primary science resources and talking about all the support available for primary science teaching from the Royal Society of Chemistry and beyond.

These events are open to all – whether you're a primary teacher, teacher trainer, trainee, work within the primary science teaching community, or are just interested to find out more, we look forward to seeing you there.

We are holding three launch events:


**Thursday 25th February,
11-12 pm**

<https://edu.rsc.org/events/steps-into-science-launch-event-thursday-morning/4013159.article>



**Thursday 25th February,
4-5 pm**

<https://edu.rsc.org/events/steps-into-science-launch-event-thursday-afternoon/4013160.article>



**Monday 1st March,
4-5 pm**

<https://edu.rsc.org/events/steps-into-science-launch-event-monday-afternoon/4013161.article>




We are also holding two primary teacher events:

**Wednesday 10th March,
4-5 pm**

**Numeracy and literacy
in materials**

<https://edu.rsc.org/events/steps-into-science-sharing-our-most-popular-resources/4013239.article>



**Wednesday 24 March,
4-5pm**

Separation and colour

<https://edu.rsc.org/events/steps-into-science-sharing-our-most-popular-resources/4013239.article>




We are also holding secondary teacher support sessions:

**Tuesday 2nd March to
Thursday 1st April (starting
at 4 pm)**

**Online: Spring teacher
support sessions**

<https://edu.rsc.org/events/spring-teacher-support-sessions-march-and-early-april-timetable/4013221.article>









Stephen Hendry: RSC

New videos to help you teach Chemistry practical skills

The Royal Society of Chemistry have developed a new set of videos of common investigations, for Nat 5 / Higher learners, to support you with teaching practical skills. Each video comes with a variety of resources that will help you maximise your learning and support you to run the live practical.

- Pause & think questions
- Integrated instructions
- Follow up worksheet calculations
- Technician notes
- Addressing misconceptions

These new videos build on our existing range of resources for practicals carried out by both Nat 5 / Higher and Advanced Higher, and cover topics including:

<p>Conservation of mass</p> <p>https://www.youtube.com/watch?v=nmLcEQFIRh4&feature=emb_title</p> 	<p>Electrolysis of an aqueous solution</p> <p>https://www.youtube.com/watch?v=h-FWFJbtZLc&feature=emb_imp_woyt</p> 	<p>Halogen displacement reactions</p> <p>https://www.youtube.com/watch?v=TMwpLNZJmQo&feature=emb_imp_woyt</p> 
<p>Identifying Ions</p> <p>https://www.youtube.com/watch?v=8ld85NZP2zo&feature=emb_imp_woyt</p> 	<p>Preparing a soluble salt</p> <p>https://www.youtube.com/watch?v=xCPrzKSIQgs&feature=youtu.be</p> 	<p>Reactivity series of metals</p> <p>https://www.youtube.com/watch?v=-DPvXbGoCTc&feature=emb_title</p> 

The Royal Society of Chemistry brand new practical videos for Nat 5 / Higher can be found here : <https://rsc.li/3kiJiuw>



You can also read the Education in Chemistry article about making the most of practical videos in your classroom:

<https://rsc.li/2NQSbPQ>



TalkPhysics (<https://www.talkphysics.org/>) is the website set up by the Institute of Physics to allow physics teachers to, as the name suggests, talk physics. Some of the information is open access but to access all the benefits it is necessary to register, but this is a simple process of providing basic information such as your name and email and setting up a password. Once registered you can post information to groups or conversation threads, start new threads yourself, and upload and share resources.

There are two TalkPhysics groups specifically for the use of physics teachers in Scotland. The first of these is the Teaching Physics in Scotland group. In this group you will find resource files which have been transferred from GuzledScotland and before that SPTR.net, as well as resources that teachers have shared since. You will need to register on TalkPhysics to access the resources in this group.









The second group is the IOP Scotland Online CLPL group where you will find resources associated with the seventy or so online CLPL events delivered by IOP Scotland Physics Coaches since April 2020 as well as links to recordings of many of them.

The events page of TalkPhysics is where you will find details and how to register for IOP's wide range of professional learning events organised by the IOP Coaches around the UK and Ireland. During these COVID-19 disrupted times the IOP Scotland Physics Coach team organise on average two evening online CLPL per week on a range of topics including the use of language in science, evidence-based teaching, and space science as well as events targeted at specific audiences such as probationers and early career teachers, or those teaching Higher or Advanced Higher Physics. Events are also organised to support the IOP Domains CPD programme covering the teaching of core ideas in physics. These build on short CPD videos available for you to watch at your convenience on IOP's resource website IOP Spark. Direct links to IOP Spark and the first three series are in the table below.

The IOP Scotland Online CLPL events typically last around 45 minutes to an hour and usually either start at 5:00 pm or 7:30 pm. There are always opportunities to ask questions and have discussion through the chat box and depending on numbers in the event and time available also directly via microphone and camera too. Evaluations for events rarely receive less than 85% of respondents giving 5 out of 5 for the questions "Based on the quality of this event, how likely is it you would recommend an IOP CPD/CLPL event to a friend or colleague?" or "How likely will you be to use information from this event in your teaching?" along with open feedback comments such as:

"Always an excellent informational course. Very well organised", "Very thought provoking and insightful session that really helped me to get to grips with some of the misconceptions that pupils can have", "Researched, on topic, tested and totally fab" and "Great ideas and presentation".

The IOP Scotland Physics Coach team look forward to seeing you along at an online event soon.

https://www.talkphysics.org/ 	https://www.talkphysics.org/groups/teaching-physics-in-scotland/ 	https://www.talkphysics.org/groups/iop-scotland-online-clpl/ 	https://www.talkphysics.org/events/ 
https://spark.iop.org/ 	https://spark.iop.org/forces-cpd-videos 	https://spark.iop.org/energy-cpd-videos 	https://spark.iop.org/electricity-cpd-videos 

The Learned Society on Scottish STEM Education (LSG)

Stuart Farmer



During the autumn of 2020 the ASE, through its membership of the LSG contributed to two significant reviews of Scottish education. These were the rapid review of 2020 SQA National Qualifications led by Professor Mark Priestley, and the OECD's review of CfE. Both submissions can be downloaded from the LSG page on the Royal Society of Edinburgh's website:

<https://www.rse.org.uk/policy/standing-committees/learned-societies-group/> and QR code (bottom of this article) where a short video summary of the LSG's submission to the OECD's review presented by the LSG's Chair, Professor Maggie Cusack, can also be viewed. The LSG was represented at one of the OECD review team's focus groups arranged to gather evidence by Stuart Farmer, IOP Education Manager, but also a former Chair of ASE Scotland and ASE Trustees.

The LSG brings together the learned societies and professional associations to identify and promote priorities for STEM education in Scotland. The LSG comprises the: Association for Science Education; British Computer Society, The Chartered Institute for IT; Edinburgh Mathematical Society; The Institution of Engineering and Technology; Institute of Physics; Royal Society of Biology; Royal Society of Chemistry; Royal Society of Edinburgh; and the Scottish Mathematical Council.

QR code to access LSG:



Subjects Matter

Stuart Farmer

On 16 December 2020 the Institute of Physics (IOP) launched a major new report on the importance of subject-specific professional learning for all teachers, primary and secondary. This is the start of a campaign where IOP, working with other learned societies and professional associations, will work to influence governments across the UK to recognise the importance of good quality subject-specific professional learning in improving both student outcomes and the performance of the education system as a whole.

Further details can be accessed at <https://www.iop.org/about/news/invest-in-teachers-cpd-says-iop>

or use QR code:



and the report downloaded at <https://www.iop.org/about/publications/subjects-matter>

or use QR code:



Next newsletter...

If you have any news that you would like to share, with practitioners, on either:

- opportunities and challenges in teaching practical science
- supporting student and probationer teachers
- supporting technicians (for Technicians' Corner)

then please forward your news to either:

Susan Burr (Susanburr952@btinternet.com);
Tess Watson (tesswatson@ase.org.uk), or
Colin Oates (coates@pkc.gov.uk).

Updates on past ASE Chair

A life beyond teaching – whatever happened to Bob Kibble?

What is retirement like? I recall a wise owl told me that every evening is like Friday evening and every morning is like Saturday morning. That's not far from the truth for much of the time. The pressure is off, the lesson buzzers silenced and the constant need to plan, plan, evaluate and plan is replaced by 'what day is it today?' and 'let's plant the runner beans this morning because I'm playing nine holes with the boys this afternoon.' I've been retired from full time work now for eight years and have deliberately stepped away from the scene – ASE conferences, local meetings etc have become new lifestyle casualties. Yes I have missed them, missed seeing my pals and missed speaking and working with teachers but, as hard as it is to believe when you are in your teaching prime, there is a life beyond teaching.

Of course I am stretching the truth. I didn't really retire. I intended to but the invitation to work on international projects was just too enticing. The problem was that during my final week at the School of Education in Edinburgh, while I was tying up loose ends, I got a phone call from Prof. Philip Adey. Philip invited me to join him as an author for a project he was working on with a publisher in China. We worked on materials for a few months before illness prevented Philip from continuing. He died soon after.

After Philip's untimely death I took on the role of Editor in Chief on a project with this Chinese publisher, working in collaboration with Macmillan International Education, to produce a complete suite of primary science books for international schools in China. The series of books, under the banner of Light Up Science, was written especially for a CLIL (CLIL – Content and Language Integrated Learning) target audience. Schools adopting

Light up Science would be teaching primary age children both English and Science in parallel. The science became the vehicle through which language competence would develop. That was new arena for me, both the concept of CLIL and the international market. However with a great team of authors, many drawn from an ASE membership list, the books reached fruition and have been used across China for the past five years. Each year I travel to China to speak to teachers, address an annual science and language symposium and meet the Chinese editing team. I still had time to plant beans and play golf but worked about the equivalent of between two or four days each week for three years getting the series to publication. So not quite retired.



Playful pandas in Chengdu

Before the ink was dry on Light up Science came another phone call. Macmillan International Education invited me to lead a second project, again for Primary science but this time not based on CLIL. Macmillan had been successful on the international scene with MaxEnglish and MaxMaths. It was time for MaxScience to join them. With another great group of authors I took a lead on producing a brand new suite of science resources based on what we as educators perceived as the very latest and best ideas in science education. As a team we worked from a shared philosophy built on ideas from constructivist approaches, critical thinking, process skills, formative assessment, values and attitudes. Learner voices were central to the learning process and teachers learned to move from leaders to listeners. Each year's books included a student text book, a student workbook, a teacher's guide and a home journal. The Journal is designed to provide extension activities but also to provide a bridge between learning at school and learning at home. So once again I found myself on the international scene presenting to teachers, meeting with schools and promoting best practice in science education.

Travel has taken me to five cities in China and to countries in Europe and the Middle East. I've worked with teachers in Oman, Bahrain, Jordan and the Emirates. I waved my arms around at conferences in Amsterdam, Shanghai, Hong Kong and Beijing. I've visited the pandas in Chengdu and walked on the Great Wall. During lockdown the visits have been replaced with webinars to teaching audiences in China, South America and Europe. Again, not quite retired.

I have been fortunate to visit several schools in China. However working in a school and paying a fleeting visit are quite different prospects. As a visitor what might I share as initial perceptions? The first impression I had was that primary schools in the big cities can be very grand indeed. One I visited in Beijing had about 4000 pupils. It had its own theatre, a gym for staff and a restaurant open to guests in the evening. In contrast a provincial school I visited had three classrooms. Children seemed interested and happy everywhere I went, politely welcoming visitors, especially one looking as western as me. I saw no sign of unruly behaviour but much evidence of achievements celebrated and a sense of pride in their school. All pupils wore the school uniform and looked very smartly turned out. One school in Chengdu had its own science museum.



Bob Kibble (middle, top row) with delegates at Beijing Foreign Studies University.

Class sizes were generally large but not overly so. I estimated about 30 pupils in each room. I appreciate that in some schools the classes were as large as 50 which made my suggestions for simple practical tasks, formative assessment and shared dialogue all the more challenging for those teachers. The school day usually started with a large whole school assembly in the outdoor all weather play area/athletics track/football pitch. Classes lined up in rows, the national and school songs were sung, announcements made, some keep-fit style physical movements were followed and then formal classes began.



Bob promoting best practice in science education.

For the most part in China I observed lessons covering science and language following the CLIL model and using Light up Science resources. Children carried out simple practical tasks, teachers made good use of resources, including ICT and target ideas seemed broadly in line with what I have seen across the UK. However the default model of engagement in operation for many teachers was a simple call and response 'hands up' style of closed questioning. I try to focus on this area of pedagogy as one of the key targets in my symposium presentations. Encouraging learners to find their own voices, to 'think, pair, share' with teachers learning to move from leader to listener has been a central theme in my work with schools in China.

The challenges faced by teachers following the CLIL model were significant. It soon became clear to me that the teaching force for these classes was drawn largely from the school's pool of English language specialists. Not only did these teachers lack confidence when faced with teaching ideas in science, not uncommon for many primary school teachers in my experience, but the bigger challenge was that the pedagogy of language teaching could not have been further removed from the pedagogy of science teaching. Language teaching was very much about total immersion, call and response, listen and say. Science teaching was about thinking, sharing ideas and the development of concepts. So here was the steepest hill for teachers to climb. Not only were they expected to learn and be confident with science ideas but to adopt a completely new pedagogy.

Central to this clash of pedagogies is use of the learner's mother tongue in learning. Young children, age between five and seven for example could speak fluently in Chinese and express all sorts of idea about predictions, reasons, observations. However when limited to speaking only in the new target language, English, their tongues were tied. Their competence with English was far behind their ability to think about science. And so encouraging teachers to recognise this problem and find ways of juggling two languages, target and mother tongue, has become the second recurring theme in my symposia presentations.

With MaxScience presentations my approach has been different. Most schools adopting MaxScience would be already following an international science syllabus, for example Cambridge International. Max Science was written to cover all the Cambridge outcomes and learners were not operating in a CLIL environment. These schools would typically be International schools. I hadn't really appreciated the whole international school phenomenon until I started to travel and meet teachers. At a symposium in Shanghai I was greeted by a table of teachers in saris who sent me best wishes from their school, the Pakistani International school of Shanghai. Next to them sat a group representing the Philippine international school of Shanghai. And so through MaxScience, during Covid times I have found myself delivering webinar presentations to teachers in China, in Europe and South America, in Oman and the Middle East.

I have promised myself and my wife that the time is approaching for me to hang up my boots. New projects have come my way but I have ducked and apologised. More beans and tomatoes need planting, dogs need walking, places need visiting and my handicap needs reducing. When pandemic rules allow I'll get out and about to catch up with friends as indeed we all will. There will be hugs-a-plenty I'm sure. I may even book in to an ASE conference but it will be purely social. You see, I've retired haven't I?

Bob Kibble

Bob was Chair of London and Scotland regions before becoming ASE Chair in 2006. Rumour has it he retired from the University of Edinburgh in 2012. He lives in Peebles with wife Pia and a full set of clubs.

The link to *MaxScience – Primary* is <https://www.macmillaneducation.es/en/international-curriculum/science/max-science-new/>

or use the QR code.



ASE Scotland Secondary Science Teachers' Wellbeing Teachmeet

1st March 2021 17:30 – 19:00

This is a FREE event and is open to ASE members and non-members. This evening will be organised slightly different to previous Teachmeets.

This event is of relevance to all science teachers. During the meeting there will be the opportunity to listen to our speaker, Dr Andy Chandler-Grevett, and to take part in small group discussion. There will also be a general Q&A session.

The presenter, Andy Chandler-Grevett, is a member of the ASE 11-19 committee, co-author of Science Teacher SOS - resources to provide support and guidance for science teachers.

Recently Andy has been doing a variety of online sessions on mental health and wellbeing. He has worked with a mental health professional for the RSC doing sessions for Heads of Science on supporting the mental health of their department and sessions for science teachers for managing their own mental health. In addition to ASE SOS, He writes for Education in Chemistry on wellbeing issues:

<https://edu.rsc.org/eic/collections/teacher-well-being-hub>

Key theme for this event will be wellbeing of science teachers. Please sign up as a listener.

You can sign up using the QR code or click on:

<https://www.ase.org.uk/events/ase-scotland-secondary-science-teachers-wellbeing-teachmeet-tw>



The object of this puzzle is to identify which letters are represented by which numbers. Each number represents a letter. For this puzzle four letters of the alphabet are not used.

When completed, you should have two quotes – each from a famous scientist.

Can you identify the scientist for each quote?

QUOTE 1

1		2	3		2	3	4	5	6		7	8	4	9	10
11	8	4		7	8	1	5	12		7	8	2	7		
		9	13	1	10	5	13	10			8	2	9		
		6	14	10	2	7			15	10	2	16	7	17	

QUOTE 2

9	13	1	10	5	7	1	9	7	9		8	2	18	10	
		15	10	13	4	3	10			7	8	10			
	15	10	2	14	10	14	9		4	19		7	8	10	
			7	4	14	13	8			4	19				
20	1	9	13	4	18	10	14	17		1	5		4	16	14
			21	16	10	9	7		19	4	14				
			12	5	4	11	22	10	20	6	10				

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

1	2	3	4	5	6	7	8	9	10	11
			O			T		S	E	
12	13	14	15	16	17	18	19	20	21	22
			B							

Answers to the codewords are on page 22.

Professional Development







Early Years & Primary Teachers

<p>SSERC: Exploring Maths and Numeracy through Science – Early Level Self Study Course.</p>		<p>Click on QR code or tap the URL below.</p> <p>https://www.sserc.org.uk/professional-learning/primary-clpl/stem-clpl-for-early-level/</p>
<p>SSERC: Teddy in the Park Date: 3rd March 2021</p>		<p>Click on QR code or tap the URL below.</p> <p>https://www.sserc.org.uk/professional-learning/primary-clpl/teddy-in-the-park-sserc-meet/</p>
<p>SSERC: Science Inquiry: Fair Testing and Finding and Association Date: 9th March 2021</p>		<p>Click on QR code or tap the URL below.</p> <p>https://www.sserc.org.uk/professional-learning/primary-clpl/science-inquiry-fair-testing-and-finding-and-association-sserc_meet/</p>
<p>SSERC: STEM, Rocks, Our World Dates: 19th March 2021 to 20th March 2021</p>		<p>Click on QR code or tap the URL below.</p> <p>https://www.sserc.org.uk/professional-learning/primary-clpl/stem-rocks-our-world/</p>
<p>ASE Scottish Primary Teacher Science Teachmeet Date: 2nd March 2021</p>		<p>Click on QR code or tap the URL below.</p> <p>https://www.ase.org.uk/events/ase-scottish-primary-teacher-science-teachmeet-tw</p>
<p>Does your classroom help children learn? Date: 9th March 2021</p>		<p>Click on QR code or tap the URL below.</p> <p>https://www.ase.org.uk/events/does-your-classroom-help-children-learn</p>

Science Teachers and Technicians: Health and Safety

<p>SSERC: Online Radiation Protection Refresher Dates: 1st and 8th March 2021</p>		<p>Click on QR code or tap the URL below.</p> <p>https://www.sserc.org.uk/professional-learning/secondary-clpl/health-safety-clpl/online-radiation-protection-refresher/</p>
<p>SSERC: Electrical Safety – self-study course</p>		<p>Click on QR code or tap the URL below.</p> <p>https://www.sserc.org.uk/professional-learning/secondary-clpl/health-safety-clpl/electrical-safety-self-study-course-2/</p>
<p>SSERC: Physics Safety (other) – self-study course</p>		<p>Click on QR code or tap the URL below.</p> <p>https://www.sserc.org.uk/professional-learning/secondary-clpl/health-safety-clpl/physics-safety-other/</p>


Secondary Science Teachers

<p>SSERC: Royal Society of Biology Annual Teachers' Meeting</p> <p><i>Date: Thursday 27th May 2021</i></p>		<p><i>Click on QR code or tap the URL below.</i></p> <p>https://www.sserc.org.uk/professional-learning/secondary-clpl/biology-clpl/royal-society-of-biology-annual-teachers-meeting/</p>
<p>SSERC: Practical Techniques for Recently Qualified Biologists</p> <p><i>Dates: 23rd February and 25th May, 2021</i></p>		<p><i>Click on QR code or tap the URL below.</i></p> <p>https://www.sserc.org.uk/professional-learning/secondary-clpl/biology-clpl/practical-techniques-for-recently-qualified-biologists/</p>
<p>ASE: Physics for Non-Specialist Online - Energy</p> <p><i>Date: 27 March 2021</i></p>		<p><i>Click on QR code or tap the URL below.</i></p> <p>https://www.ase.org.uk/events/physics-non-specialist-online-energy</p>
<p>IOP: 46th Stirling Physics Teachers' Meeting</p> <p><i>Online: over a few days at the end of May</i></p>		<p><i>Click on QR code or tap the URL below.</i></p> <p>http://www.stirlingmeeting.org/home</p>
<p>RSB: Scotland: Royal Society of Biology Annual Teachers' Meeting</p> <p><i>Date: 27th May 2021</i></p>		<p><i>Click on QR code or tap the URL below.</i></p> <p>https://www.rsb.org.uk/events?event=scotlandroyalsocietyofbiologyannualteachersmeeting</p>
<p>Physics for non-specialists: Virtual physics teaching and assessment</p> <p><i>Date: 24 April 2021</i></p>		<p><i>Click on QR code or tap the URL below.</i></p> <p>https://www.ase.org.uk/events/physics-non-specialists-virtual-physics-teaching-and-assessment</p>

Early Years, Primary and Secondary Teachers

<p>GTCS: Engineering STEM Learning – Primary Engineer</p>		<p><i>Click on QR code or tap the URL below.</i></p> <p>https://www.gtcs.org.uk/professional-update/research-and-practitioner-enquiry/professional-recognition/accredited-professional-recognition-programmes.aspx</p>
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Technicians

<p>SSERC: Safe Use of Fixed Workshop Machinery</p> <p><i>Dates: 20th March 2021 – 21st March 2021</i></p>		<p><i>Click on QR code or tap the URL below.</i></p> <p>https://www.sserc.org.uk/professional-learning/technicians-clpl/safe-use-of-fixed-workshop-machinery/</p>
<p>SSERC: IOSH Working Safely</p>		<p><i>Click on QR code or tap the URL below.</i></p> <p>https://www.sserc.org.uk/professional-learning/technicians-clpl/35349-2-2-2-2/</p>
<p>SSERC: IOSH Managing Safely</p>		<p><i>Click on QR code or tap the URL below.</i></p> <p>https://www.sserc.org.uk/professional-learning/technicians-clpl/35349-2-2-2-2-2/</p>
<p>Technicians Online Leadership Programme - Working with and training others</p> <p><i>Date: 25th February 2021</i></p>		<p><i>Click on QR code or tap the URL below.</i></p> <p>https://www.ase.org.uk/events/technicians-online-leadership-programme-working-and-training-others</p>
<p>ASE New Technicians: Getting Started</p> <p><i>Date: 3rd March 2021</i></p> <p>Are you a science technician in a school that has recently started (within the last year)? If so, this one day online course can help you.</p>		<p><i>Click on QR code or tap the URL below.</i></p> <p>https://www.ase.org.uk/events/ase-new-technicians-getting-started</p>
<p>An introduction to professional registration</p> <p><i>Date: 10th March 2021</i></p>		<p><i>Click on QR code or tap the URL below.</i></p> <p>https://www.ase.org.uk/events/introduction-professional-registration-rb</p>
<p>ASE RSciTech online session to find out more</p> <p><i>Date: 15th March 2021</i></p>		<p><i>Click on QR code or tap the URL below.</i></p> <p>https://www.ase.org.uk/events/ase-rscitech-online-session-find-out-more-f</p>

ASE Scotland Conference 2021

Saturday 13th March 2021

09:00 - 17:00



<https://www.ase.org.uk/events/ase-scotland-conference-2021>

Keynote address – Talk, dialogue and questions: Stuart Naylor CSciTeach

This interactive talk explores some aspects of dialogic teaching, including how a growth mindset supports dialogue in classrooms. It focuses especially on the nature of thought-provoking questions and the impact that these can have on learners. Is asking thought-provoking questions the most valuable skill that teachers of science can develop?

Workshop A choices:

A1: Teaching physics through road safety: Ken and Jennie Hargreaves, Institute of Physics

A chance to be a road crash investigator and find the cause of a genuine road traffic incident. See how speed, velocity, distance, displacement and momentum can be explained using child playmats, and how road traffic incidents are an application of physics and science. We will show you how all of your kinematics and dynamics can be taught through the practical applications of Road Safety, including ideas for IDL. If you'd like to participate in a couple of real scenarios bring your calculator and a bit of paper, you'll feel like a real road traffic cop! Suitable for S1-S6 Physics and Technicians.

A2: Edible Chemistry: Stephen Hendry, Royal Society of Chemistry

Explore the science behind every-day eating experiences with our range of edible experiments and get your students talking about science that's relevant and fun, and guaranteed to help to inspire them. Find out why mustard burns your nasal passages but chillies don't, the link between beetroot and camels, why you might taste boiled potatoes when you eat cheddar cheese or how beetles can make a surprising contribution to our food.

You will also have an opportunity to learn more about the FREE educational support for chemistry and science teachers from the Royal Society of Chemistry. From our Education in Chemistry magazine, providing an overview of news, articles and teaching resources to our brand new Teach Chemistry website that aims to help you deliver inspirational chemistry teaching inside your classroom, and create a supportive and effective department at your school. Edible Experiments is suitable for both Primary & Secondary teachers.

A3: Looking at the **B** and **E** in 'Sustainable' and the **I** and **Y** of Sustainability: Dr Liz Lakin, RSB and University of Dundee

At a time when Environmental issues are regularly in the news, this session explores the **B**iological aspects and **I**mplications of these issues in terms of the 'here and now!' The session goes on to suggest wh**Y**, as teachers we can raise awareness and promote understanding of what we can do through 'learning for sustainability' [LFS]. Case studies include: nurdles and turtles, bacteria and acid drainage; e-waste and why we should recycle our redundant mobile phones and disturbing tales from the 'Poo Fairy'. The session is applicable to upper primary/secondary.

A4: TAPS Scotland: supporting teaching and assessment of scientific skills: Dr Sarah Earle CSciTeach, Bath Spa University

The Teacher Assessment in Primary Science (TAPS) project, now in its 7th year, works collaboratively with teachers across the UK to develop support for teaching, learning and assessment in primary science. This workshop will explore how to select a focus for teaching and learning during practical activities, to support progression and assessment of scientific skills. We will draw on the bank of free TAPS Focused Assessment plans and examples, together with sharing new draft TAPS Scotland materials. Dr Sarah Earle taught in primary schools for 13 years before moving to Bath Spa University as a PGCE in 2012. She is an active member of the ASE, a Primary Science Quality Mark Senior Regional Hub Leader and leads the TAPS project, working with teachers across the UK.

A5: Timstar DNA fingerprinting session : Lucienne McCallum, Timstar

Hands-on practical involving the preparation of agarose gel, pouring the gel and allowing it to set. Discuss the theory of PCR before moving on to the practical element using adjustable micropipettes to accurately measure the components; DNA, TAQ and Primer. The PCR samples are then loaded into the PCR machine and you are shown how to load and use the PCR machine. We then prepare and load the gels with amplified DNA doing different diagnostic tests; Crime scene, Paternity tests, Cancer gene detection, Sickle cell anaemia, simulation of a crime scene. We then finish the session looking at the results and relating the techniques in solving real life crimes.

A6: Developing STEM capital in primary schools through partnership projects: David Rigmand and Paul Tyler

Developing STEM capital in Primary Schools through partnership projects • Innovative approaches to developing science and STEM Capital in a primary setting • Partnership working across schools, further education and industry • Approaches to engaging children in STEM careers

Workshop B choices:

B1: Using research to improve learning in the science classroom: Andrew Bailey, Institute of Physics

Drawing on research from cognitive science, Rosenshine's Principles of Instruction, and reports such as the EEF's Improving Secondary Science, this session will explore how lessons and ideas from educational research can be used to improve learning in the science classroom. Suitable for Primary and Secondary Science

B2: Primary climate change practicals "On the Road to COP26": Stephen Hendry, RSC

Pupils are acutely aware of environmental, political, and socio-economic problems that societies face today. They have demanded urgent action on a global scale with "school strike for climate" and have become engaged with Greta Thunberg's activism, often cited as a diverse role model that is key for widening access and inclusion. COP26 Glasgow is being described as the most significant climate event since the 2015 Paris Agreement and the biggest event the UK has ever hosted. Climate change practical's will be demonstrated to the audience, that have been developed to be accessible, low hazard alongside links to integrated instructions for primary teachers that supports STEM capital and underpins the transition to secondary and beyond.

B3: Finding global solutions through science: Krissie Davis, Tracey Shaw, Claire Tatar (Secondary Science teachers)

Do you want to inspire young people to find scientific solutions to current global issues? Are you frustrated that materials you find on-line do not match the Scottish Curriculum? Then come along to our hands-on workshop to try a range of activities that set out to meet some of the big global challenges and deliver on the benchmarks of the BGE. Delivered by science teachers in Scotland for science teachers in Scotland as part of an EU project 'Global issues Global subjects' we will share our ideas and techniques from our newly published materials. Topics covered include plastics, sustainable energy and gender balance. All teachers will receive a copy of the resource.

B4: Safeguards in the School Laboratory: Chris Lloyd, SSERC

A lecture with some demonstrations to showcase the launch of the new edition of this invaluable ASE publication and to highlight how it can help you ensure your science laboratory is a safe environment for staff and pupils . . . without cutting back on practical science.

B5: Let's talk about Animals: Stuart Naylor CSciTeach

Teaching about animals isn't as easy as it looks. There's lots of information, not many obvious practical investigations, and didactic teaching can often replace enquiry-based learning. This workshop demonstrates how to use interactive strategies and techniques that promote discussion, encourage systematic research and inspire children.

B6: Building Family Science Capital through STEM workshops: Tracey Ellicott CSciTeach

Fun science workshops aimed at families of children at different stages of primary education have proved to be an effective way of engaging children in science with the added bonus of one-to-one support and parental enthusiasm. Once you've hooked families in, you will discover a willing cohort of your school community who are happy to commit their time, skills and enthusiasm to drive possibilities to the next level. Come along to learn about the journey of East Wemyss Primary School (winners of the Rolls-Royce Science Prize 2018) and leave with a bank of practical approaches towards building science capital across the school through collaborating with the parental community: Santa's Science Workshop; Young Einsteins; Makerspace; STEM Ambassadors; Tinkertots; Green Goblin Kit Car Project; Merry Makers, and Science Extravaganza.

Workshop C choices:**C1: Science Showcase: practical activities for use in the classroom, for home learning or as part of a science event:** Dr Susie Burr

Susie's Science Showcase includes lots of practical ideas for activities for use in the classroom, open days, evenings and home learning. These activities can be used individually to support enquiry or as part of a fun filled event run by primary pupils for primary pupils.

C2: Laying the foundations of computer science: Kevin Reid, SSERC

This session will explore some key, foundational principles required to understand computer science. We will be using a range of physical devices as well as "unplugged" activities to explore the wealth of opportunities to develop computational thinking and key Computing Science skills across the curriculum. We will explore different pedagogical approaches for computer science principles, and will gain hands-on experience in using devices to support these principles.

C3: Be a Magician! Using magic illusions to teach science: Adrian Allan, Teacher of Chemistry, Dornoch Academy, Highland Council.

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 demonstrate how science principles can be used to create magical illusions to enhance lessons and teach concepts. During the workshop you will learn how to bend metal using your mind and make a coin pass through another solid object. A true story of a how a French magician quelled a revolt in North Africa by removing a man's strength will be discussed. A practical method of making ghosts appear and disappear will be demonstrated. You will also learn how to cut and restore newspaper, vanish water and make objects invisible using new and old science technology. These demonstrations can be used by teachers but have also been taught to pupils who have in turn demonstrated these illusions to other pupils and parents. This session is suitable for all.

C4: Creating and implementing a whole school vision for science: How does effective leadership and an aspirational curriculum impact on the quality of teaching and learning in science? Associate Professor Jane Turner CSciTeach, PSQM

In this session at ASE Scotland conference, I am looking forward to sharing some of what we have learned about great primary science practice from schools in Scotland that have achieved PSQM. Over 500 schools a year achieve a Primary Science Quality Mark by developing and implementing a vision for science that is based on the best evidence available of what works in primary science. As Director of PSQM I am privileged, through our UK wide network, to work each year with 100's of dedicated, effective subject leaders who have each significantly raised the profile and quality of science teaching and learning in their schools.

C5: Primary & secondary transition projects: Stephen Hendry, RSC

The aim of the workshop is to develop relationships and encourage joint curriculum planning for primary & secondary practitioners. The content of the sessions will include input from the Royal Society of Chemistry regarding our free resources for Primary and Secondary practitioners and sources of funding. There will be a focus for the progression of practical skills, development of new methodologies for teaching science and linking curriculum learning with careers to highlight the relevance for a wide range of future career paths.

C6: SSERC and SCMA present STEM in the Early Years: Euan Mitchell SSERC

We all know from research, that children's interests and career choices tend to be influenced by the experiences and opportunities they are given in early childhood. SSERC and the Scottish Childminding Association (SCMA) have been working in partnership to provide quality play opportunities that can promote STEM related learning suitable for supportive learning. The development of 3 e-learning modules for SCMA has allowed for further reach and spread across Scotland for all their members. This workshop will be run jointly by SSERC and SCMA demonstrating how to stimulate children's learning, as well as making science and maths fun, engaging, and relating it to the world around us.

Workshop D choices:

D1: The science of climate change: Stuart Farmer CSciTeach, Institute of Physics

This session will explore the relatively simple science that is required to understand Climate Change. The session will include an exploration of cycles in climate change data, practical demonstrations using everyday apparatus, absorption, radiation, thermal expansion and sea level rise, specific heat capacity, positive actions to address climate change.

D2: The perfect enzyme: Dr Doug Macdonald and Dr Alistair Macpherson, Edinburgh Academy

What would your perfect enzyme look like? Simple, dependable, safe, low-cost, interesting, relevant. We've got it and we'll show you how to use – from introducing enzymes in S1-S2 to enzyme kinetics, metabolic pathways and enzyme inhibition for AH. Hands on practical workshop plus free stuff!

D3: "Science in the Outdoor Classroom; a Toolbox for Educators": Christina Sinclair, Field Studies Council (FSC)

Focussing on incorporating STEM skills in outdoor environments, this workshop will be broken down into mini-sessions that outline different activities whereby teachers and educators can obtain tangible techniques, equipment ideas and lesson plans for organising and delivering short outdoor sessions students of all ages. Ideas include nature surveys, outdoor graphs citizen science, DIY fieldwork equipment and more. All attendees will leave with a toolkit of sessions to implement in their own teaching and promote outdoor learning in the STEM subjects. This session is aimed at primary or early years secondary teachers.

D4: 'People like me can do STEM' (Rolls Royce Science Prize award): Kate Carter, Castleview Primary School

I am a class teacher at Castleview Primary School in Southeast Edinburgh. My undergraduate degree in physical geography gave me an appreciation that STEM is everywhere and that science does not have to be done in white coats. This love of science all around us and in our lives inspired me to try and engage my pupils with different, perhaps less traditional ideas of STEM in Primary school. Over the last year I led our successful STEM project; 'People Like Me Can Do STEM' with the aim of raising STEM aspiration and attainment in our school family (pupils, parents and staff) with a whole community approach. Our project won the Rolls Royce Science Prize 2019 and the Eden Award. This was due to the fact we created real links with the local science community and changed the culture around STEM for our families and staff. Our project is ongoing and outward looking. The inspiration for our project is not only a love of STEM but also a desire for social justice. Through this project I learned about creating partnerships, engaging parents and creating STEM links throughout a busy curriculum.

D5: Space in the Primary Curriculum: Olivia Johnson – UKRI STFC

Space is an inspiring context for learning across the primary curriculum, from Sciences/Technologies to Numeracy and Literacy. We present activities and resources based on the exciting research and ground-breaking technology developed by scientists and engineers at the Royal Observatory Edinburgh - and on young learners' Big Questions about the Universe!

D6: Visible Learning in the science class room - what might it look like?: Nicola Jones CSciTeach, Monifieth High School, Angus

Nicola Jones is a Chartered Science teacher who for the last few years has been part of the team guiding the whole school implementation of Visible Learning in Monifieth High School, Angus. This session will explore some of the key messages in John Hattie's work and examples of how results of his educational research have been implemented in science classrooms in Monifieth High School.

Membership <https://www.ase.org.uk/membership>

From organising local events to influencing national policy, the ASE works for teachers and educators like you to help develop your skills, your career and your professional recognition. A selection of the many benefits you'll enjoy as an ASE member include:

- *Access to thousands of curated teaching and CPD resources*
- *Subscriptions to influential, sector-leading journals and publications*
- *Inclusive public liability insurance cover up to the value of £10m*
- *Numerous CPD opportunities - both face-to-face at events and, now, in the online arena*
- *Professional registration opportunities to enhance your education credentials*
- *Opportunities to have your say and help shape the science education sector through our advocacy work*

You can find a more complete description of the benefits of joining the ASE - broken down into categories: **Primary Membership**; **Secondary and Colleges Membership**, and **Trainee and Early Career 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.

ASE Science Teacher SOS



The ASE's 11-19 Committee produced a guide, *Science Teacher SOS*, to help you make choices. The guide applies to teachers new to the profession; in their first few years of teaching; established teachers, and science leaders.

The ASE are looking for schools that may be or have in the past struggled with science teacher retention in a Gatsby-funded project - the SOS project.

The project entails a nominated contact, working with an ASE representative, to survey science staff and leadership attitudes to teacher retention. The information gained is used to determine the next steps activity for the department and there is a further questionnaire at the end of the project.

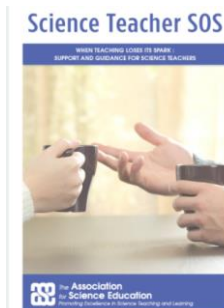
The training and discussion (for the nominated school contact) will take place online and the questionnaire takes less than 20 minutes to complete. All data is anonymised and schools get a copy of their own data plus the collated data from other responders. The ASE would also like to produce a few case studies from the participants - but again these will be anonymised.

Why take part?

In addition to departmental membership of the ASE, schools get information about and strategies to use to address retention related concerns in their setting. For the school rep this is also a chance to develop project leadership skills.

Further information and an opportunity to express interest can be found:

<https://www.ase.org.uk/news/help-shape-our-mission-keep-best-science-teachers-in-education> or by contacting sarahlongshaw@ase.org.uk or robbutler@ase.org.uk



TeachMeets and webinars

Due to Covid-19 pandemic, ASE has presented TeachMeets and webinars to technicians, student and probationer teachers; early years, primary and secondary teachers.

ASE Scotland is looking for teachers, ITE tutors, education consultants and faculty PTs who are willing to present in TeachMeets and webinars.

If you would like to share your expertise to colleagues then please contact Susanburr952@btinternet.com

ASE Scottish Committee

The Scottish Committee work together in organising TeachMeets; webinars; organising national conferences; newsletters, and many more.

If you are a member of ASE and would like to contribute to ASE Scotland Committee then contact Susanburr952@btinternet.com

Quote 2: SCIENTISTS HAVE BECOME THE BEARERS OF THE TORCH OF DISCOVERY IN OUR QUEST FOR KNOWLEDGE – Stephen Hawking

Quote 1: I AM AMONG THOSE WHO THINK THAT SCIENCE HAS GREAT BEAUTY – Marie Curie