Chemistry on camera: Deaf A level students take the lead

Derek Rodger and **Dr Audrey Cameron** OBE (Officer of the Order of the British Empire) report on the outcomes of a deaf-funded project to make chemistry more accessible for deaf bilingual learners

At Heathlands Secondary School for deaf students in Hertfordshire, a quiet revolution is underway in the chemistry lab. It's not just about beakers, Bunsen burners, and bonding – it's about breaking barriers.

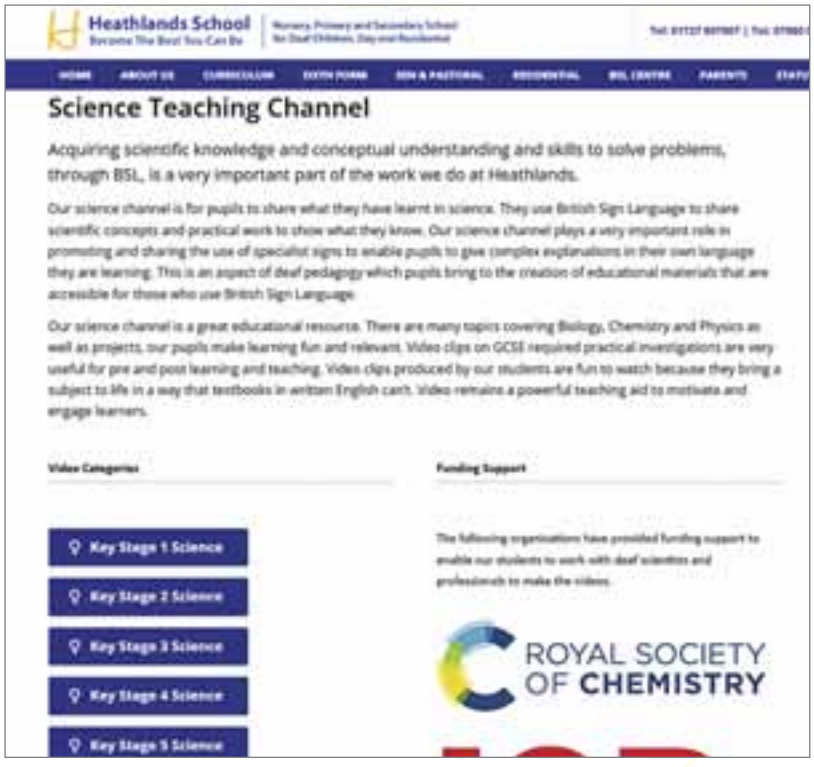
With support from a Royal Society of Chemistry (RSC) grant, Heathlands science teacher Mr Derek Rodger and Chancellor's Fellow and Lecturer Dr Audrey Cameron have reimagined A level chemistry instruction for deaf students whose first language is British Sign Language (BSL). The result? A vibrant project where students aren't just learning chemistry – they're teaching it, too.

The aim was simple: to make chemistry more accessible for deaf bilingual learners by creating resources in BSL. The method? Empower the students themselves to create the content.

Armed with iPads and scientific curiosity, a group of deaf A level students stepped into the role of science communicators. They planned and filmed videos explaining A level chemistry concepts and practical skills – all in fluent BSL. Students rotated between camera work and presenting, with practical work captured on film to simulate natural, collaborative classroom learning.

Passive learning was avoided; students were encouraged to take ownership of the content. Explaining concepts to peers promoted deeper understanding.

The results speak for themselves – 20 videos, covering topics from halogens to enthalpy changes, are now available on the school's science channel.



What the Science Teaching Channel looks like

The 20 videos can be found here on the school's science channel: https://heathlands.herts.sch.uk/science-channel-ks5/

This section is where all the videos are shown: https://heathlands.herts.sch.uk/science-channel-ks5-a-level-chemistry/

One standout is a concept presented on halogens between two deaf students – offering an authentic model of BSL in scientific discussion.

Watch it here: Vimeo: Halogens Discussion https://vimeo.com/1063135595

Crucial to the project's success was the collaboration with Dr Cameron from the University of Edinburgh. In June 2024 Dr Cameron visited the school alongside Abigail Sheridan, a chemistry undergraduate fluent in BSL. Their week-long visit provided hands-on support, building confidence, and understanding of the practical skills.

Dr Cameron also created filmed experiments and offered real-time Zoom coaching, helping Mr Rodger confidently teach the A level Practical Assessment Group (PAG) tasks.

Dr Cameron's input was a game-changer – looking at complex chemistry concepts, helping make the film clips, and ensuring the content was accessible.

Thanks to this collaboration, students completed a wide range of required practicals, capturing them on video to create enduring resources for current and future learners.

The videos were very informative, and while some were professionally edited, others were left unedited to give students the opportunity to edit their own. With funding support, we enlisted Fifi Garfield, a deaf actress and editor, to ensure high-quality visuals.

Having a deaf editor made a huge difference. Things were spotted which we might have missed, for example where a sign wasn't clear or a transition felt off. It saved us time and improved the quality.

Student reflections: chemistry comes alive

We asked Year 10 and 11 students to watch some of the video clips and provide feedback. The majority reported that they enjoyed the project very much and felt it helped deepen their understanding of chemistry.

Only four A level students were involved in the project – each using BSL as their preferred language. They felt the impact was remarkable in developing their A level chemistry knowledge and understanding. One student noted it made them feel more confident about pursuing a science, technology, engineering, and mathematics (STEM)-related career. This wasn't just about passing an exam – it was about showing students that they belong in science, and that science belongs to them.

The project has attracted attention well beyond the school. Professor Michael Seery, Deputy Director and Head of the International Foundation Programme at the University of Bristol, invited Mr Rodger to present on 24th April 2024 at 'Teaching chemistry to deaf students: a symposium in honour of Dr Audrey Cameron'.

The University of Derby hosted a full-day event with activities to engage deaf students in STEM fields. Even the University of Oxford took notice, inviting the students for a hands-on chemistry visit – a rare and exciting opportunity.

What's important is that these students are being seen. They're being invited into spaces where they might not have seen themselves before.

The project wasn't without challenges. Time was a major constraint, and some practicals had to be skipped to avoid burnout. It was also noted that many existing online chemistry videos, while subtitled, lacked BSL interpretation – leaving students to struggle with complex English.

To support bilingual learning, resources from the Scottish Sensory Centre's BSL Chemistry Glossary were used – an invaluable tool for building conceptual vocabulary in both languages.

Looking ahead, Mr Rodger hopes that further funding will enable the remaining PAG tasks, including those covering organic chemistry, to be developed into videos. It is good the students want to keep going, they want to help future learners – and that's powerful.

A model for inclusive STEM education

In the words of Dr Cameron:
"This project brought generative learning to life. Students weren't just consuming content – they were creating it, explaining it, owning it."

What began as an accessibility initiative became something more: a replicable model of inclusive STEM education. One that values deaf students as knowledge-makers, not just learners.

It's not just chemistry they're mastering. It's the art of communication, collaboration, and confidence.

And that's a formula worth sharing.

To promote deaf students' self-esteem and confidence, a science corridor wall now features deaf scientists from both the past and present as positive role models.

Derek Rodger is a qualified science teacher and Teacher of the Deaf. He is currently the STEM Curriculum Lead at Heathlands School. His main area of interest is generative learning and the use of BSL to communicate scientific ideas.

Dr Audrey Cameron OBE is a deaf chemist. She is currently a Chancellor's Fellow and Lecturer in Science Education and Sign Language at the University of Edinburgh. She leads the Scottish Sensory Centre's STEM BSL Glossary Project and teaches on Professional Graduate Diploma in Education (PGDE) Secondary Education and Master of Science (MSc) Inclusive Education courses. Her research focuses on science talk within the classroom.

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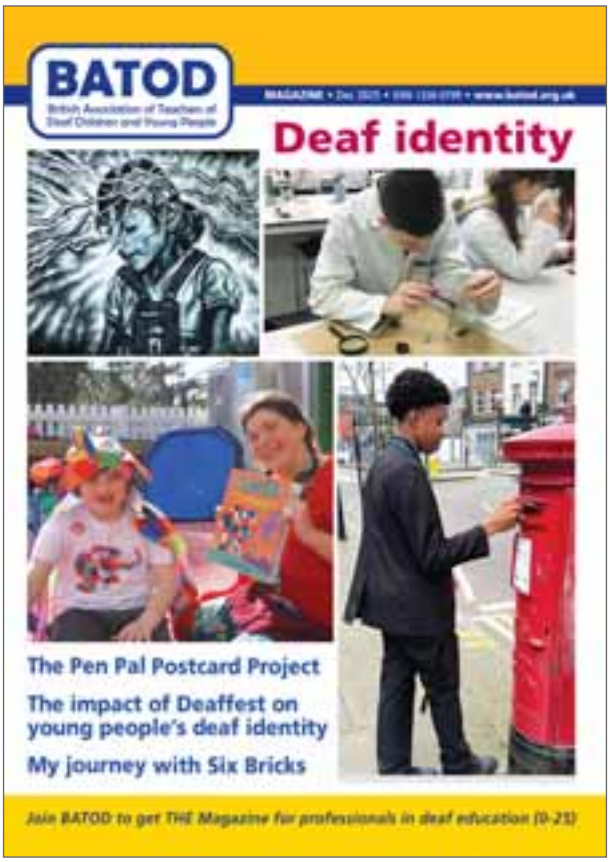

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