From buds into blossoms – the stories of GSSfS growth in the West Midlands and Scotland

Kate Redhead in the West Midlands and **Paul Tyler** in Glasgow share their GSSfS journeys over the last four years

Children working together to explore liquids

Introduction

Describing the aims of the Great Science Share for Schools (GSSfS) has always been easy: bringing schools, teachers and science advocates together to collaborate and share their scientific questions in an engaging and inspiring way. However, explaining what a GSSfS looks like can be more tricky as it can take many different guises: the children may be from the same or a different school; it may be run during class time or as an enrichment event; it could be held in a classroom, a school hall, a university…the possibilities are endless, but essentially it is whatever works best for the individual school(s). At the core of any sharing event are the children themselves, asking and developing scientific questions of the world around them, answering them in a practical way and facilitating other children to explore in an inclusive and non-competitive way. As an 11 year-old child at a GSSfS in Birmingham last year said: *'It's a bit like a Science Fair, only loads better!'*

The West Midlands experience!

In the West Midlands, the first Share was a 'toe in the water' collaboration by Clifton Primary's Science Network, where five schools each brought a small group of children together for an afternoon of sharing in the science lab. What was immediately clear was the children's confidence in facilitating their own practical approaches to answering questions; there were hardly any teacher voices. Children from Year 2 (ages 7-8) to Year 6 (ages 10-11) were exploring together, which is the real impact of GSSfS – children leading science learning with each other, developing their confidence and exploring new areas of enquiry.

The focus of the GSSfS served to bring the schools closer together and, quite quickly, plans were made to build on the success of the first year. With a clearer understanding of the impact, there was a strong element of professional learning underpinning the collaboration. Teachers discussed how they could develop and improve children's understanding of good science questions, and many reported the improvement that this created in the use of questioning, both in their own classrooms and across school. The outcome was seven schools bringing more children to the Share, with one school hall used to host the event. Additional support was provided by Science Ambassadors from Wolverhampton University, as well as STEM Ambassadors.

Scaling up

The success of the 2018 GSSfS and the enthusiasm of the school cluster drove further growth. With me in role as a Primary Science Teaching Trust Regional Mentor, reaching out to other schools and organisations was timely. In 2019, the West Midlands was alive with GSSfS events, all drawing on the learning from the original group of schools:

- **10 schools holding a GSSfS at Birmingham City University (BCU), beginning with an aspirational talk in the lecture theatre before sharing in a large hall full of children, science museum ambassadors and University undergraduates.**
- **10 schools in Coventry also ran a GSSfS at Coventry University involving PhD students collaborating with children to extract DNA from strawberries.**
- **6 schools in Warwickshire attended an event run by the National Farmers Union Education team at Stoneleigh Park.**
- **6 schools in Birmingham held their Share at Blakesley Hall, a Tudor House 4 miles outside the city centre.**

Taste testing at the Coventry University Share

Keywords: Collaboration ■ Teacher and pupil confidence ■ Transition ■ Outreach ■ University engagement

BCU Student Ambassadors took an active role in the event

Birmingham Share hosted at BCU – ten primary schools working together to explore questions

These pictures are from 2019. At each of the events there were people (teachers, science ambassadors, education officers and many more) who were taking part with a view to running their own event in the future and, before the impact of lockdown, there were already eight Shares planned for 2020 in the West Midlands. The beauty is that each Share would have been (and hopefully will be in 2021) different from the next, each one being best fitting to those running the event and the children with whom they are working.

Glasgow takes on the GSSfS – from the family kitchen to school networks!

The very first GSSfS was launched in July 2016 to tie in with the European City of Science Festival. This was problematic, as Scottish schools had broken up for the summer holiday, but as I hate to miss out on anything I decided to take part at home, in the kitchen with my 3 year-old daughter. We had great fun making a mess with chemical reactions and my daughter exploring with a constant stream of 'Why?' questions. We tweeted our activities to share with everyone else and, from the range and amount of science shared that day, it was obvious that the GSSfS was going to grow and grow. I wanted Scottish schools to have the opportunity to get involved and, after a bit of persistent lobbying, the date was moved to fall in line with term time across the UK.

Why did we bother?

Science is always a priority at Mearns Primary School, so I had no problem persuading my Headteacher to let me run a GSSfS event in 2017. I gathered together a small group of pupils who I knew had a particular interest in science and they organised the event during their lunchtimes. In the two weeks building up to the GSSfS, they visited all 28 classes across the school to do a short presentation about the importance of questions in science. They invited each class to come up with a question to investigate and then present their findings to the school.

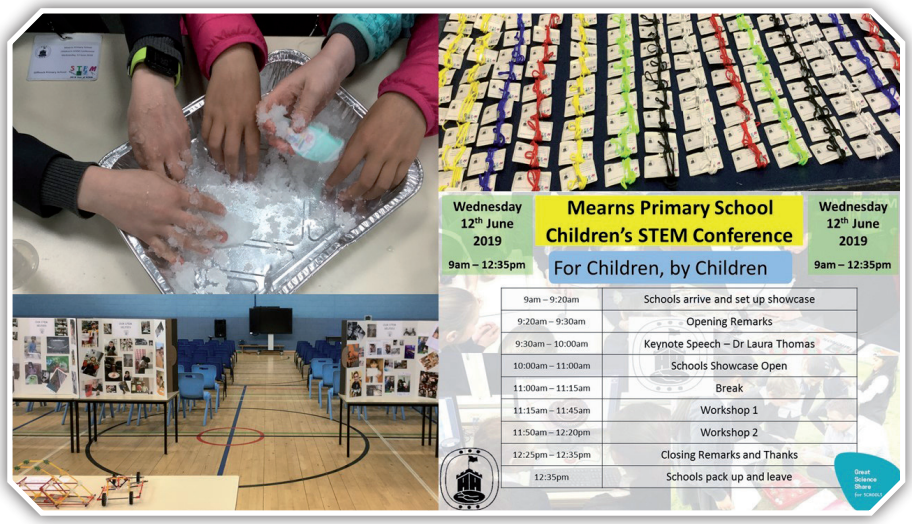
The creativity was brilliant – classes investigated bubble solutions, parachute materials, paper aeroplanes, cookie recipes, yeast rates of reaction, reaction times and a whole lot of other things – all based on their own interests and questions. Each class made a poster and a 2-minute film to share their findings with the rest of the school.

As Scottish schools fall under Local Authority control and work in geographically close clusters with a high school partner, I saw this as the next area of progression for our GSSfS activity. Our cluster chose to have a joint GSSfS event at Mearns Primary, where 8 pupils from each of the 4 schools engaged in a Science & Engineering-themed day. The day was designed to show children the power of collaboration and the importance of basing science and engineering on well thought-out questions, and involved a local inventor who shared his career journey and gave the children an insight into how inventing works.

The children then worked in small groups on a series of engineering investigations, each based on questions they wanted to answer. They built bridges with lolly sticks and wire, towers out of cocktail sticks and midget gems and a pulley system with cotton reels and string, and we joined the Scottish Schools Education Research Centre's (SSERC) live GSSfS lesson to make O-wing gliders.

Widening the appeal

In 2019, my ambition was to give children an opportunity to share with an even wider audience. This saw my school host two GSSfS events. Both were organised and run by the science lab technicians in the school after some training on child-led approaches, and



Mearns Primary School hosted the GSS conference in 2019

Ideas for developing Great Science Share for Schools activities		
Toe in the water	**A little braver**	**Dive right in!**
Run a classroom GSSfS over two afternoons: working in 2s or 3s, children develop and explore a question one afternoon, which they then share the next. Split the class in half and give each group time to be facilitators and delegates.	**Run a year group or phase GSSfS**: classes could visit each other's classrooms. Special guests (teachers/ parents/governors) could be invited after school. Or run a lunchtime GSSfS, hosted in the school hall.	**Invite other schools to GSSfS:** this could be a small number of children e.g. 8 pupils and 2 teachers or a whole year group. Consider inviting 'real' scientists to share; this could be parents or local STEM Ambassadors.

Children extracting DNA from strawberries

During the 2020 lockdown GSSfS, over 400 questions were submitted by children from across Scotland. Over 200 of them were answered by experts in various fields

they were very excited to have the opportunity to take part in the GSSfS.

The Primary Science Conference involved:

- **96 children from 12 different schools:**
- **a full morning of science;**
- **a keynote speech about the importance of science and the work of scientists;**
- **a showcase of children's science questions and investigations; and**
- **a choice of practical workshops, run by the lab technicians, based on hydraulics, chromatography, rocket building, surface tension and meteorites.**

The Early Years Outdoor Science Festival involved:

- **70 nursery children from 10 different providers; and**
- **the opportunity to explore minibeasts, sound and bubbles through hands-on activities and asking questions.**

Overcoming lockdown the GSSfS way!

We had all planned to run a GSSfS Science Festival at a high school for children across the Local Authority. When it became obvious that lockdown couldn't let this happen, we moved everything online and created a full day of activities for the children. Hosted in three Google Classrooms (Infants, Middle School and Upper Primary), we had over 1000 children from all over Scotland engaging over a two-week period, and over 900 involved in our GSSfS day activities. Linking in with the national programme resources, children were invited to ask questions in the two weeks building up to June 16th and these were collated and sent out to experts from around the world, or shared on Twitter, to answer. In total, over 400 questions were submitted and over 200 were answered and shared back with the children. On June 16th, we joined in with the GSSfS live lessons and #AskAQuestion throughout the day, as well as having a few additional debates and opportunities for children to share the science that they had been doing at home.

It was a huge success and I think that we have found a platform and format that we will be able to use again moving forward. The online event allowed us to engage children from across Scotland, which would otherwise not be possible. It also allowed opportunities for children to share their ideas and questions, comment on each other's, discuss and debate in a safe and supportive environment. The opportunity for nationwide collaboration and sharing is something that we will explore for next year's GSS event.

Some ideas if you're just starting out

In both Scotland and the West Midlands, it has been a really exciting journey building year on year on the successes of the previous event and looking for ways to increase the reach and opportunities for children to take the lead. Our main advice would be to start where you feel most comfortable… small is still great! Start with your class or across your school, see what works and then look outwards for opportunities to collaborate and share with other schools, and organisations, in your area.

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