Developing, recalling and embedding scientific vocabulary through GSSfS

Kulvinder Johal, Nathan Williams, James Bennett, Emily Fisher and **Claire Hofer** reflect on the way in which GSSfS provides inspiration for pupils to learn and develop scientific vocabulary when working scientifically

The idea behind the Great Science Share for Schools (GSSfS) campaign is simple and uncomplicated: give children the chance to ask their own scientific questions, investigate them and then share their learning with others.

Our team has reflected on the features that makes it so effective and how teachers in Kent schools (an area of high socioeconomic disadvantage, with schools averaging pupil premium rates of 50%) have found it to be highly effective in encouraging pupils to properly talk about science!

Explaining and justifying ideas

If you think about your setting, to what extent are you able to give enough time and support to pupils to do more than just repeating facts or answering test questions? To what extent are you truly able to give the space where pupils can explain their ideas, justify their predictions, and respond to new questions with each other?

In this article we explain how GSSfS can provide inspiration for teachers to take time to focus on enriching working scientifically. We focus on the way that undertaking a GSSfS sharing event with pupils from different schools or classes has led to them confidently engage with each other, and in particular peers they'd never met before. We have also seized the opportunity to teach and embed the use of accurate scientific vocabulary and the promotion of reasoning as pupils explain their questions, investigations and outcomes to each other.

This article focuses on the way in which we have capitalised on the experience of GSSfS to focus on the development of pupils' oracy in science. Many schools in the UK have noticed that oracy confidence amongst our pupils has decreased over the past few years. Many more classes are seeing elective mutes and the

On the 16th June, Discovery Park in Sandwich (South East of England) organised a fantastic Great Science Share for Schools event. Since 2023, Discovery Park has hosted the Great Science Share, recognising it as an ideal venue to inspire scientific enquiry, with its strong heritage of over 70 years at the forefront of pharmaceutical research and development. This meant that 250 pupils from a range of schools across Kent came together, hosted by the Stem Hub part of Canterbury Christ Church, part of an ongoing series of STEM opportunities provided in partnership with the Primary Science Teaching Trust.

Teachers brought groups of 8 pupils from different schools, having met online and clubbed funding together to hire a coach that could pick up pupils from multiple schools

recent SEND data release shows that the primary need identified for one in four pupils is speech, language and communication needs (25.7%). (see *Useful link*) resulting in oracy being a key part of school improvement plans and a daily issue in classrooms.

Developing Tier 3 vocabulary through GSSfS

The campaign's emphasis on collaboration and sharing provides an ideal opportunity to build on all the teaching and learning of oracy that is regularly happening in our classrooms today. The experience provides inspiration and time for pupils to speak clearly, articulately and confidently, and gives them a real audience and prestigious context to do it in.

Research by Alex Quigley (a leading authority in enhancing oracy), in his *Closing the Vocabulary Gap* publication (2018), sheds light on what is now commonly referred to as '*tiered vocabulary*'. He explains that there is a hierarchy of vocabulary form Tier 1 to Tier 3. Tier 3 vocabulary includes subject-specific vocabulary particular to science concepts e.g. stamen, insulator, ventricle etc.

The Education Endowment Foundation's *Improving Primary Science* Guidance (2023) provides a range of recommendations to educators. It recommends that we should, '*develop people's scientific vocabulary*' and in doing so be able to create, '*opportunities for repeated engagement and use over time*' (Recommendation 1). This is very much at the heart of what the Great Science Share enabled teachers involved in the Kent GSSfS to foster, together with encouraging people to explain their thinking, whether verbally or in written form – also key points of recommendation in the guidance.

Table 1

Vocabulary tier	Examples
Tier 1 – words that are encountered day-to-day.	push pull metal object
Tier 2 – words that are important across many science topics.	predict compare observe describe
Tier 3 – words that are specific to a science topic.	magnetic nonmagnetic bar magnet oesophagus

Methods used to develop, recall and embed vocabulary

There were a number of ways teachers prepared for the Great Science Share. Initially, this began with quality first teaching in the classroom, ensuring that vocabulary was at the heart of the lesson.

- Using working walls and knowledge organisers to introduce new vocabulary, as a prompt to use those words in oral and written work once taught.
- 'Think, Pair, Share' group work or whole class work ensured that all pupils were given different opportunities to communicate their learning in a variety of ways.
- Sentence Starters provided prompts to support pupils to initiate and structure their sentences.
- Mini-whiteboards provided an alternative and quick-write way to jot down their ideas and sentences to rehearse out loud.

Practice was also important. Once pupils had come up with their ideas in lessons, they were given other opportunities to share the learning in school with other classes and year groups. This led to them building confidence and having practice time to recall and embed the vocabulary, where they verbalised their understandings independently and without prompts.

Using GSSfS resources to support scientific vocabulary and oracy

In the lead-up to this year's Great Science Share for Schools, several teachers requested help since it was their first involvement. An initial meeting on *Zoom* gauged interest and explored different ways teachers could do the preparation work for the science sharing in school. They considered the pros and cons of individual, small group, single class, or a whole-school involvement and feasibility.

Exploring the range of resources available on the GSSfS website was also useful, from reviewing the short *Skills Starter* videos that support both teachers and pupils in specific aspects of working scientifically. We also looked closely at the *Great Guided Enquiries* as some schools were initially unsure about giving pupils the freedom to generate and pursue their own questions.

By sharing examples of pupils' work and questions from previous years, teachers received reassurance about the quality of learning that could be achieved; not only in science knowledge but also in confidence, curiosity, and communication.

Features of the resources that offer particular support for the development of scientific vocabulary and oracy are shown in Table 2.

Table 2

GSSfS Toolkit Resource	Oracy development
GSSfS Enquiry Planning Tool	This supports pupils' cognitive skills when coming up with an enquiry question together. Pupils could work individually or in groups, supported by staff who prompt their thinking with open-ended questions such as: How will you test that? What do you think might happen? How can you make it a fair test?
GSSfS Question Makers	Encourages exploratory talk. Use these in small groups to develop collaborative group discussion skills. Get pupils to develop a question together and articulate their choices and reasons why.
GSSfS Prediction Prompts	Supports pupils' vocabulary development by using the correct scientific vocabulary to predict what may happen.
GSSfS Conclusion creators	Supports pupils' vocabulary development by using the correct scientific vocabulary to conclude what they have found out, linking it back to their original question.
GSSfS Reliability Checker	Supports collaborative group discussions when critically evaluating data sources. Use this as a prompt during small group discussions on the reliability of information.
GSSfS Share Prompts	Supports pupils in deciding which audience they will share their science work with and to consider various ways in which they can communicate their science.
GSSfS Talk Prompts	Supports pupils in talking effectively in groups by thinking about the verbal behaviours they use when they react to what other people say and seek to clarify understanding in discussions.

Positive outcomes on pupils' oracy that we continue to notice

1. Pupils increased in confidence in oracy and using scientific vocabulary

We have come to expect pupils using Tier 3 vocabulary when explaining their questions and investigations, showing motivation to shine. For us, recalling higher order science vocabulary as they demonstrated their investigations to other pupils enabled us to see first-hand what they have learnt in lessons.

> *'I liked being the expert. We do science at school, but today we shared it. That made it feel really important.'* 9–10 year old pupil

2. Confidence to communicate science to new audiences

This is what we consider the pinnacle of being able to show you what they know: being able to transfer the vocabulary, skills and learning from the classroom to another setting outside of their comfort zone. By engaging in GSSfS, pupils have really shown that if they have fully harnessed the science skills of working scientifically themselves, they are increasingly confident to articulate their learning and are proud of the outcomes they have produced.

> *'I felt nervous at first, but when I started talking about our experiment, it just flowed. I didn't know I knew so many science words!'* Year 4 pupil

3. Pupils embed disciplinary literacy

Developing the language of science is what's needed to engage in discussions and debates where pupils can apply scientific vocabulary in context. One teacher, who has taken part in three of these events now said:

> *'I've seen just how powerful GSSfS can be not just for developing science knowledge, but for building confidence, especially when it comes to oracy. Events like this don't just happen in isolation, they feed directly back into classroom practice. Since getting involved with the Great Science Share, I've noticed a real difference in how our pupils approach science. They speak more confidently in lessons, they're more willing to explain their thinking, and they use key scientific terms with far more understanding and purpose.'*

Sharing with a new unfamiliar audience strengthens pupils oral and scientific confidence

4. Pupils were encouraged to recall previous learning

Retention of learning is enhanced through experiential opportunities and GSSfS provided this in bucket loads! This helped them to embed and consolidate the learning, reminding them of key knowledge and concepts to the point where teachers explained that the pupils 'really owned it'.

> *'It was fun talking to other schools. They asked questions we didn't think of and it made us think more about our results.'*

5. Linking learning, knowledge and modelling skills with real world contexts

The links to the Global Sustainability Development Goals and real-world research contexts also led to increased engagement and interest; something that often can be difficult to do in the fast-paced standard timetabled lessons.

> *'Great Science Share helps make science more visible, more relevant, and more accessible. It promotes the very skills and approaches that we know are essential if we want primary science to be high-quality and inclusive. It's not just about experiments, it's about empowering pupils to think, question, and share. And that, for me, is the real magic of the Great Science Share.'* C. Hofer

In summary

GSSfS in Kent has fast become a highlight of our schools' calendar and we consider the impact on pupils' oracy to be significant. The emphasis on communication during the campaign preparation and the sharing event always leads to pupils having so many questions and presenting their enquiries with creativity and flair. They consistently rise to the challenge.

We have also noticed that pupils who can be reluctant to even raise their hands at school are confidently exploring the science projects and speaking to their peers during the sharing events. They have been heard to ask pertinent questions which broaden their scientific knowledge and interests.

> *'Some of our pupils are eager to share their learning with as many people as possible. It is so refreshing to attend an event where the pupils really are in charge of the conversations.'* E. Fisher

What next?

GSSfS continues to show that when pupils are trusted to lead their own learning, they not only develop scientific skills but also a lasting sense of curiosity and ownership over their ideas. It is a powerful reminder of how science can inspire, connect, and empower young learners across all settings.

USEFUL LINK

https://explore-education-statistics.service.gov.uk/find-statistics/special-educational-needs-in-england/2024-25 (Accessed 2.12.25)

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