

Teachers from Kates Hill Primary School describe uniting the school in a vision for science and raising the profile of science through enrichment

A whole-school vision for science



Children caring for chicks at Kates Hill Primary

Some of the teachers who were more confident in their science teaching would use them as part of the main lesson right from the start, which was brilliant. But for those that weren't so confident, just that small amount of time every day was enough to move science to the forefront of people's minds. As the year went on and teachers became more familiar with the activities, they were able to embed them more in their teaching. For example, we're doing STEM's Polar Explorer this year and we were able to find related activities on Explorify and incorporate them into the topic.

Building confidence

I think that many teachers lack confidence in science, perhaps because of their experiences of science at secondary school – my personal experience and memories are of science

being very hands-off, lots of copying out of text books and observing teachers doing experiments. Science was focused on the 'right results' rather than any sense of enquiry or real investigation. Often primary school teachers have little science beyond GCSE level, which compounds their lack of confidence when their subject knowledge is based on a qualification from some years ago.

One of the ways we addressed this in our school was through accessing the wealth of good, free, online resources to help with subject knowledge. Reach Out CPD (see useful links below) helped to improve staff confidence and they have described how much they have enjoyed engaging with it. Explorify

Polar Explorer display

Kevin's story...The Science Co-ordinator

When I was appointed as Science Co-ordinator in September 2017, there was little science happening across the school and interest in it was low. Teachers were nervous about lesson content, resources were limited and it had been pushed to the bottom of the priority list, losing out to English and maths. I wanted to bring the whole school together, to get everyone excited about science and improve the quality of our science education.

Creating a buzz

I do not have a background in science, but I have always been passionate about it. For science to be successful within the school, I knew I had to get other people passionate about it. I discovered Explorify and it proved to be the vehicle that drove interest in science at Kates Hill. The activities are short and require no preparation from teachers; it allowed us to raise the profile with a very quick intervention!

I asked teachers to use them after lunch, or before or after break times.



also offers excellent background science to support the teacher. As well as the question prompts with the activities, there is a cushion of confidence in terms of being able to offer an explanation of what is happening.

I know from personal experience and leading science in the school that there is still a lot of fear amongst teachers about being asked a question to which they don't know the answer! I have provided much staff training around what to do if this happens – my go-to principle is to ask the children what they think and reason it out together. We encourage children to ask questions and support them to find the answers when they don't know them, but there's this perception that teachers should know everything! Every day, we teach children that it's ok to fail – it's better to have a go and give the wrong answer than not try. But teachers aren't as good at doing the same.

If you ask any of the teachers in my school which of their lessons they'd least like to be observed, most of them will say science – it's a mix of anxiety around practical work and controlling the class, and being asked a question that they can't answer – potentially highlighting gaps in subject knowledge. It's just too scary. Since discovering Explorify, we have seen that it helps to fill in the gaps for a teacher. It's an incredibly easy introduction to science, which helps to make them feel confident in front of the class and debunks that myth that you need loads of equipment to do good science!

Seeing the opportunities

I feel very lucky to have a Headteacher who supports my ideas and efforts to bring science back to the forefront. We sat down together to add science to the school improvement plan and even designed a rapid improvement plan to address some of the immediate concerns that I had. I'm also able to have release time to do things like attend conferences and CPD, and was given time to complete our PSQM award, which we gained in September 2018.

Taking it outside

While I was at the Education Show, I found a stall from Trees for Cities (see useful links) and they are coming into school to build an edible playground for us. We are very excited to get this established and bring learning back into the school grounds. Many children in this area haven't got gardens and so we want to give them a learning experience around sustainability and food provenance that they might not get at home. We also do a lot of growing and planting around school and we are very lucky to have the space in our grounds and passionate staff who are willing to have a go – with some trial and error! – to do as much gardening as we can. I went on a training course called 'Explorify in the Garden' with the RHS (see useful links) at a lovely little inner city school in Birmingham. It was inspiring to see what excellent use they'd made of the

space they had and the course was really useful. We came away with lots of ideas for our own school grounds and were armed with many ideas for teaching.

We use Forest School to help us with outdoor learning but, as that is located offsite at an allotment, having more immediate grounds to support science is a fabulous opportunity.

Aside from the more obvious learning we do around growing, we also do wellbeing work in that space, with many opportunities for supporting writing and maths. The kitchen team have also agreed to cook as much of what we grow as possible – the rest we will send home with the children or to school fairs. The advantage of having a school-focused group like Trees for Cities to come in and help with this, rather than us going it alone, is that they revisit to help teachers make the most of the space and they also plan the planting around school terms and holidays, so there's nothing growing over the summer holidays when there's no one here to tend it and produce might be wasted. Once the edible playground is in and established, our aim is to develop science trails and getting families involved.

STEM outside the classroom

We are fortunate at this school that the philosophy is that teachers volunteer their time for after-school clubs – we have several clubs running every evening (free of charge), ranging from film studies to oracy to top trumps to science club across the school week. There wasn't much happening at lunchtime though, so I started a science club where we did a CREST award (ages 7-9 and 9-11 – see useful links). I wanted to target children who wouldn't normally come to any of these after-school clubs for whatever reason: pupil premium children, children with speech or language difficulties, children who could improve their teamwork – those who perhaps would not engage elsewhere.

There are some great, simple activities in CREST that the children really responded to. There's plenty to choose from, so we could pick activities that aligned with the children's interests. One, making your own birds' nest, was absolutely fascinating to watch! The children were all sure that they would be able to do it easily, but it was so challenging for them. We were out for ages trying to build one and what they came up with

I also spend a lot of my free time researching opportunities, grants and bursaries to help develop science within the school...I apply for everything! I have also been able to attend a few trade shows, such as the Education Show at Birmingham NEC (2018), to root out opportunities.

We've got a CPD grant from STEM Learning (the Enthuse partnership) (<https://www.stem.org.uk/employers/enthuse-partnerships>); I applied for a bursary to attend the Primary Science Teaching Trust's conference in Edinburgh (<https://www.primaryscienceconference.org/>); we've been selected to receive some microscopes from the Royal Microscopical Society for microscopes (<https://www.rms.org.uk/discover-engage/microscope-activity-kits.html>); we got a place on the Polar Explorer programme from STEM Learning (<https://www.stem.org.uk/welcome-polar-explorer-programme>), where we were able to turn the whole school into a scene from the Arctic.

We like to do as much as possible with STEM Learning – their resources, CPD and science days are fabulous. We try to get STEM Ambassadors to come into school and speak to the children.

That's to name just a few! There are so many opportunities out there: it's just having the time to seek them out.

barely resembled a nest! It led to great discussions about birds, the differences between us and birds and how they adapted to their environments. After that, we tried to make spider webs – I hadn't planned to do it that day, but we discovered the most beautiful web in the playground and it was too good an opportunity to miss – which made us all realise how incredible nature is. The longer-term plan is to get school-based Science Ambassadors to run lunchtime clubs as well as set up more after-school STEM clubs.

Becky's story...Year 2 (age 7): Putting the children in charge

I've been teaching for six years and though I had always loved science it felt like my classes hadn't been that engaged with it. Explorify has been a great hook to get them really excited about science!

One of the greatest benefits of Explorify is that it opens things up to the children that they can't do in school. For example, their favourite activity at the moment is 'SPF Natural' (see useful links below), which we came across one day prompting a great discussion during the lesson, but we then spent another hour discussing sun cream and how to protect ourselves from the sun. The children don't see the animals in the video in their day-to-day lives, so the clip allows them to have a good look and a good think about something very far from their everyday frame of reference.

We are learning about plants at the moment and looking at the importance of water. After watching a video to get the children thinking, one child asked 'What would happen if we gave a plant vinegar instead?', so we have set up an investigation around it! Our science teaching is a lot more child-led this year, because the starters we now use, such as the ones on Explorify, have inspired them to come up with their own investigations – the children are using phrases like 'I wonder if...', 'what if we...' or 'what could we do next', which is a positive shift since adopting these approaches.

They are less afraid of getting things wrong now, too. So, in the investigation about watering plants with vinegar, we were using mouthwash for one of them and, one day, a child said 'I think we've drowned this one in mouthwash, I think we need to start again'. It's great that they're learning from that and not being hindered by the possibility of being wrong.

I like to have an Explorify Odd One

Out or a Zoom In Zoom Out activity when children are coming back after play or after lunch. As well as engaging them in learning, their interest in what they are doing means that they will sit down on the carpet and start chatting with a partner about the activity. Rather than general chit chat about what they'd eaten for lunch, they start wondering, questioning and thinking in a more scientific way, which sets them up for an afternoon of learning. Using Explorify has promoted behaviour for learning.

Responding to shifting priorities

Priorities within the Academy Trust changed to favour a more cross-curricular approach and we quickly realised that science at times took a bit of a back seat. We do still try to take that cross-curricular approach if the topic allows, such as materials, but we found that we preferred taking some of the science topics discretely, allowing all the topics to be covered. We lead with science and incorporate English and maths into that, rather than the other way around. We are trying to put the focus back on the children, placing them in charge of their learning.

This approach is more in line with the new Ofsted framework (see useful links), which will focus on opportunities for writing across all curriculum subjects – but appropriate writing, allowing children to show their understanding across all subjects. We have had staff meetings to discuss the framework and how we will attack it coming into the next school year. We want to create as many opportunities as possible for the children to demonstrate what they know, through writing, across all subjects, not just discrete writing in English books.

The Academy Trust is moving to a STEM focus across the 4 schools, rather than just a science focus, so my role will become STEM Co-ordinator rather than Science Co-ordinator.

Zoe's story...Reception class: The power of observation

Last year we had butterflies in class and watched them turning from caterpillar to butterfly. The children loved it! They were so excited to see the changes and eventually watch the butterflies emerge. It was a fantastic learning experience for them and the only downside of this was that they

took about four and a half weeks to emerge, so it was hard at times to keep the children really excited and engaged with them.

This year we were looking for something else to have in the classroom and, after a trip to the farm, we decided to bring in some chicks. They came in as eggs in an incubator, so we had lots of discussions about what the eggs were, why they were in an incubator and what that was giving them. We hadn't told them that we were getting chicks, so we asked the children to say what they thought might be in the eggs and they came up with all sorts of ideas. Largely, they didn't have a clue what might be in there – one said it might be a cow! We had many discussions about the size, shape and look of the eggs to help them to identify what might be inside. A few of the children did identify the eggs as something they had eaten before, so we had some interesting discussions around that too as we looked at life cycles of the chicks.



My chick diary

We didn't have to wait long for things to start moving along – we got the eggs on Monday and, on Tuesday, the first one started to hatch. We observed that first chick, and the others as they hatched, to see how they changed. The children were desperate to hold them and were really interested in why they could hold some but not others – how some had fully dried out and become fluffy and how some took longer to do that.

The children were so excited to come in every morning and see how the chicks had changed. We did a little investigation and monitored the amounts of food that each chick was eating as they hatched, to try to explain why some ate more or less than others.

The children have really enjoyed caring for the chicks and have taken real ownership over the tasks of giving them food and water every day – we've had them for a week where they've been able to come out of the cage, so the children have really been able to get hands-on and interact with them. The children know that the chicks aren't staying and that they are off to a farm, so we were able to have discussions about what their lives will be like on the farm and what they might look like when they are fully grown. These particular ones are going to be used as show chickens!

Kevin's conclusion...Fast forward five years

In five years, I want to see evidence around the classroom that science is part of everyday lessons – not just a quick display here and there, but a flexible and

fluid thing. We have a science table in our Year 5 (age 10) class, where something new appears on the table every week. It's about visibility.

When you talk to the teachers, they will have a genuine love and passion for science and be excited about it and have more confidence in their science teaching. The more confident they feel, the easier it's going to be for them to teach science.

The children will be able to tell you what they have been doing in science and how that fits with everyday life, be able to talk about wider issues such as global warming, plastic use, etc. and connect their science learning with real-world issues.

Science will be at the front of the cross-curricular approach – it needs to be all around you, incorporated into everyday teaching and everyday life, and that's a culture shift.

What does CLEAPSS say?

For more information about keeping and studying chicks and other animals in primary schools, please search

<http://science.cleapss.org.uk/resources/> for the latest information. Don't know that you're a member of CLEAPSS? Most schools in England, Wales and Northern Ireland have membership directly, or via their local authority. To find out if your school is a member and to receive your CLEAPSS ID and password, e-mail membership@cleapss.org.uk with your school name and postcode.

Useful links and references

ReachOut CPD is freely available here: <https://www.reachoutcpd.com/>

Explorify 'SPF Natural' activity is available from: <https://explorify.wellcome.ac.uk/en/activities/whats-going-on/spf-natural>

Trees for Cities is available from: <https://www.treesforcities.org/>

RSC Explorify in the Garden is available from: <https://schoolgardening.rhs.org.uk/Training-courses-and-events>

For information on the CREST awards, see <https://www.crestawards.org/>

Ofsted inspection framework is available from: <https://www.gov.uk/government/publications/education-inspection-framework>

Kevin Orchard, Becky Hall and Zoe Milward are all teachers at Kates Hill Primary School. Kevin is Year 6 teacher, phase leader and Science Co-ordinator. He has been teaching for 12 years. Becky is a Year 2 teacher and Zoe is a teacher in Reception.



“The activities revealed a breadth of knowledge in pupils that I wasn't aware of. The activities were ready to use, the resources were well chosen and they really stimulated some great discussion.”

Elaine, Wales

Develop your pupils' thinking skills and enhance your science teaching. Explorify is a free digital resource for primary school teachers that is easy to slot into your teaching, inclusive and a great assessment tool.

Find out more at: <https://explorify.wellcome.ac.uk>

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