

Burlington Junior School case study



How they use Explorify and the impact it has.

About Burlington

Burlington Junior is a community school in East Riding, Yorkshire catering for just over 300 pupils aged between 7 and 11, 36% of whom are eligible for free school meals. The school has recently achieved Primary Science Quality Mark (PSQM) which has also allowed the school to extend their networks. Although the school is currently judged as “requiring improvement”, there has been a conscious decision not to focus only on English and maths but to ensure a varied curriculum is taught to foster a positive learning environment.

How science is led and taught at Burlington

The Science Leader at Burlington is very active and has provided input to the school improvement plan ensuring science is covered, which has helped to improve the profile of science in the last few years. Using her knowledge from undertaking the PSQM, alongside other continuing professional development (CPD) (including training at the STEM Centre in York), the Science Leader provides regular internal training to staff at Burlington. During staff meetings the Science Leader also passes on information and directs staff to online CPD they can view during their PPA time. The training and CPD is described as impacting on staff at the school: *“we’ve really been able to up-skill and develop the pedagogy and knowledge and understanding of the teachers” (Science Leader)*. Teachers agree as they highlight how it has been invaluable to them, and they now feel more confident teaching science.

Teaching over the last few years at Burlington has become increasingly cross-curricular. Science is woven into almost every lesson as integral to each subject, with the view to reinforce the mantra that science is “all around”, challenging the stereotypical view of science and scientists.

“Science is all around. It’s not just about inventions and potions and to really embrace science, it’s something that is part of life all of the time.” (Science Leader)

Science is taught in fortnightly ‘focused’ blocks each term and over each of these weeks, the number of hours spent teaching science can be up to 8 hours. Teachers describe how delivering science in this way means that teachers and students can really “get their teeth into it” and dedicate plenty of time to the subject. This recent change to the delivery of science teaching sees science taught every afternoon during each block. It is also taught across other subjects for the rest of the term. The average weekly time allotted to science equates to at least 2 hours.

Science lessons are interactive at Burlington and teachers aim to get pupils involved in learning through doing frequent investigations and group work. They try to ensure pupils get experiences in the school they may not get at home. Pupils enjoy working together during practical investigations and especially enjoyed a heart dissection their teacher carried out. They also describe another experiment they particularly enjoyed where they soaked an egg in vinegar until it became bouncy – to the children’s delight, it eventually exploded!



How Burlington uses Explorify¹

The Science Leader found out about Explorify through a training course at the STEM Centre, and has been hooked on the resource ever since. She recommended the resource to all staff at Burlington and all teachers are required to use Explorify at the start of every science lesson to refresh children on a topic or provoke discussion. Practical investigations are often preceded by an Explorify video showing pupils what they are about to do, as was done with the bouncy egg.

As well as being used at the start of a lesson, Explorify activities such as 'The Big Question' extend into a longer lesson as the discussion it creates can last for longer than anticipated. *"It's not just a little question that you can answer in five minutes. It could last the whole lesson"* (Pupil). The activities spark conversation and discussion and pupils can take the discussion as far as they want to. Pupils see it as a great way to start their lesson and having been exposed to the resource repeatedly they know what is coming and what is expected of them.

"It gets you more intrigued for the rest of the lesson, start off with something, like, stupid fun, and then you can go into the next part being happy" (Pupil)

Teachers find Explorify useful for revising topics they have previously covered and use the resource for reviewing vocabulary. It's also used as an assessment tool in some respects, so teachers can see how much children progress after using each activity.

Pupils enjoy the activities so much that they often ask teachers to put on a short activity if there are a few spare minutes. Explorify is also used when teachers have some spare time. This allows children to have a say and choose something they enjoy using. It also means that science is being taught more, at times which may normally be wasted. Teachers also use Explorify in lessons other than science, as they find it links with subjects such as English, maths and art.

What works well about Explorify?

Teachers at Burlington most commonly use Zoom In Zoom Out and pupils enjoy this activity the most primarily due to everything being up for discussion. Pupils thrive on the opportunity to share ideas about what they think is in the picture. It is especially useful at the start of a lesson as children are encouraged to get them into the habit of using observation skills which they can employ during the rest of the lesson.

Pupils and teachers like the fact that there is not always a definitive answer as part of many of the other activities: *"because if there was just one answer, then I'd be a bit scared because then I might get the answer really wrong"* (Pupil). The opportunity to voice their opinion without fear of it being wrong makes children at Burlington more likely to engage in discussion about subjects which they don't know everything about.

The visual aspect of Explorify also helps pupils understand what exactly they are expected to talk about, whilst also encouraging development of observation skills through an interactive exercise: *"It's better when you can see it, I'd rather see pictures than words, because you can get a visual representation of what you might need to know"* (Pupil).

Teachers find the website professional and easy to navigate, and can find an activity that fits in with their intended lesson plan with ease. They appreciate that the site can point you in the direction for suggested further learning, but also lets them teach an activity however they want.

The evaluation team observed the Science Leader at Burlington using a Zoom In Zoom Out activity in their lesson. The teacher used the exercise to trigger observations and discussions amongst pupils. During the discussion children were encouraged to use science-based vocabulary think back to what they have previously learnt. Following the Explorify exercise, pupils were in groups and worked together to create the fastest circuit they could using equipment chosen by them, including brushes, wire and batteries. The preceding Explorify activity stimulated ideas and discussion about how best to create this.

¹ For more information about Explorify please visit: <https://explorify.welcome.ac.uk/>

Impact of Explorify

Impact on teachers and the school

Staff at the school all described the various impacts using Explorify has on their teaching. Explorify has helped teachers to deliver science lessons by giving them a structure which makes it easier to explain the knowledge they want children to gain, whilst allowing pupil-led discussions.

As teachers use the resource at the start of every science lesson, they are now experienced at using the resource. As a result Explorify, alongside the provision of CPD and other resources, has helped teachers become more confident teaching science.

“As part of a selection of things that we’re doing, I think everybody is much more confident with teaching science. They’re happy and engaged with science.” (Science Leader)

By making it easier to plan and deliver science lessons through provision of high-quality, accessible content which spans numerous subjects, Explorify has motivated teachers to pursue further science related CPD. Teachers are given the opportunity to undertake external training courses, and Explorify has encouraged teachers to do so: *“It’s been positive and I would continue with Explorify. I think it’s impacted brilliantly and I would take any science CPD” (Teacher).*

The Science Leader at Burlington wants to continue to use the resource to create the most interesting, engaging science lessons they can. They are pleased with the impact it has had on science teaching in the school so far and can foresee further impacts in the future:

“I’m hooked. I love [Explorify]... All I want to do is just develop more in science. I want to be able to enhance opportunities for children and more impact on pupils” (Science Leader)

Through lesson observations the impact that Explorify has had on pupils inspires the Science Leader who gains enthusiasm about science and the development of teaching at the school.

“[Explorify is] good for their metacognitive skills and their communication. They’re sharing their ideas about things and respecting each other’s opinions and just growing up and developing. And that in turn for me, that affects my teaching and learning because it means we’re able to do things better.” (Science Leader)

The resource has had an impact on the overall profile of science across the school, by contributing towards the facilitation of quality science teaching and engaging teachers in the subject.

Impact on pupils

Staff and pupils described various impacts that Explorify has had on pupils. Pupils enjoy Explorify because the content is interesting and fun to them, but they’re also aware of how the activities they do develop their skills. For example pupils are sometimes aware which skill their teacher is trying to develop with each exercise, including the Odd One Out: *“I think it is a very fun thing to decipher which [image] is different. It definitely helps observational skills and all that” (Pupil).*

The entertainment value of Explorify has helped it to gain favour with pupils, whilst the ability to inform and develop pupils is what is most attractive to teachers; being able to do both is what makes it such a popular, valuable resource to the school.

“It’s just one of the key things about learning when you don’t really realise that you’re learning. They’re learning all these things and they’re practicing their observational skills or discussing, in sometimes quite a deep way, their thoughts and feelings about things and sharing and listening, but they just think it’s a fun activity” (Science Leader)

Some pupils previously did not like science lessons but now look forward to using Explorify in their learning: *“I think science is so much better than when before we had Explorify...I used to think science was so boring and now it’s my favourite lesson” (Pupil).* Pupils are engaged while using the resource and feel confident discussing ideas amongst themselves and with the teacher. They do not fear being wrong and know that if they have thought through their point they can voice it.

What is perhaps most interesting about Explorify for children at Burlington is the impact it has had on their behaviour, and to some extent their attainment, which has seen a noticeable improvement since the use of activities such as Zoom In Zoom Out. The structure of exercises like this has encouraged pupils to make reasoned judgements about what they can see, forcing them to consider the guesses they have made and contemplating how and why their opinions might change between images. The measured responses pupils give whilst using Explorify have extended into other lessons.

“They think about being sensible, positive, focussed, purposeful and I think things like that, the observational things where they’re now calm, sitting, thinking about it and they can carry that forward into the outside, or other things that they’re doing. They can sit and take a moment and be a bit more focussed and think a bit more carefully... they’re working in a more grown up and mature way and I would say, yes, there is an improvement in the quality of their work and their attainment.” (Science Leader)

As seen in the lesson observation, teachers are keen to get pupils using technical scientific vocabulary and Explorify has had a noticeable impact on pupils’ writing skills and ability to explain concepts in detail. Skills which children develop whilst using Explorify also affect their ability to recognise patterns which may support them in maths.

Charlestown Community Primary School case study



How they use Explorify and the impact it has.

About Charlestown Primary

Charlestown is a two-form entry community school in Manchester. It caters for just under 500 pupils aged between 3 and 11, 39% of whom are eligible for free school meals. The Headteacher recognises and appreciates the variety of skills pupils learn through science; therefore, science has been put on the school's improvement plan for the next two years, raising the profile of science with all teachers and improving standards in the school.

How science is led and taught at Charlestown

Whilst most teachers at Charlestown teach science the part-time Science Leader, who is the planning, preparation and assessment (PPA) teacher, covers the Year 5 and 6 weekly science lessons. This ensures science does not take a back seat, especially for Year 6 pupils approaching SATs. Science is taught as a discrete weekly lesson separate from other subjects, a requirement brought in by the Headteacher to ensure science is being taught. The Headteacher and Senior Leadership Team decide how much time science is timetabled for to ensure it is not missed or deprioritised. Constant curriculum review is undertaken to ensure there is progression through the years with no duplication of subjects. Key stage 1 pupils receive just under 2 hours of science a week whilst Key stage 2 receive around 2 and a half hours.

The school has a passionate and enthusiastic Science Leader who provides a range of support to teachers including help with science planning, staff training (which is described as making an impact on teachers and the number of investigations being undertaken in classes), monitoring pupils' work and answering queries. She has a drive to improve science across the school and has sourced a range of training to help her in her role. She leads around three science training sessions a year for teachers, with the most recent focusing on types of scientific enquiry.

The Science Leader at Charlestown attends external training two or three times a year, often through the SEERIH (Science and Engineering Education Research and Innovation Hub) in Manchester, and passes on what she has learned to colleagues through internal staff meetings (as described above). She is responsible for the organisation of science resources and ensures these are available for staff. The school has also allocated a set budget for each year group to buy 'perishables' (e.g. sweets, organs for dissection) needed for certain investigations.

There is a drive across the school to move away from using 'worksheets' to teach science. Pupils engage with scientific concepts in their science lessons by observing, discussing and getting hands on with interactive activities. Teachers ask children to approach everything they see in science lessons using 'PMI', and write down a *plus*, a *minus* and something *interesting* about what they have observed, on the screen or first hand.

Pupils at the school enjoy when they do science investigations as they are "fun" and hands on. *"Last time we did Science, we were building towers and going outside to drop balls in a pot of flour to represent asteroids hitting the Earth."* (Pupil). They also enjoy working in groups and going on trips. They also mention that they like using Explorify in science lessons.



How Charlestown uses Explorify¹

The Science Leader discovered Explorify during a training course at SEERIH in 2017, and encouraged teachers to use it by signing everyone up during a staff meeting. The Science Leader regularly reminds and encourages teachers to use Explorify, showcasing its capabilities in staff meetings. Also, if staff have queries she'll help them use the Explorify website. They started to use Explorify at the same time as pushing science across the school.

All teachers who teach science are signed up to Explorify, and the majority of them use it regularly. The Science Leader ensures all pupils in Year 5 and 6 are regularly exposed to Explorify by using it in every lesson she teaches. Explorify is often used at the beginning of a lesson as a way of sparking discussion and setting the scene for the upcoming lesson, which is sometimes then based on further Explorify activities. *“At the start or the end of a lesson we do Zoom In Zoom Out, we always have fun doing it.” (Pupil)*. Teachers also use Explorify to follow up and consolidate learning and to assess what pupils understand. Charlestown teachers find Explorify useful for identifying where children's knowledge is before they begin a lesson. It is also used to show children how to carry out an investigation they are about to do themselves.

“It's to trigger their thinking, so if we are starting a new topic we can gather information about what the children already know about a certain topic. Or, if we are doing an investigation, it could be giving them a bit of information about what they are going to be doing.” (Teacher)

The science lesson the evaluation team observed showcased how Explorify was used. The lesson started before lunch and began with a “What if” Explorify activity followed by the teacher using *plus*, *minus* and *interesting* (PMI) to assess their knowledge. Following lunch the next session started with a “Zoom In Zoom Out” activity. The class were familiar with the activity and there was lots of discussion about what the object was, providing justification for their guesses. The lesson then continued with an investigation. Pupils were engaged and enjoying the lesson and were able to discuss what they had learned. Some pupils also made links with the “What if” session earlier in the lesson.

What works well about Explorify?

The Zoom In Zoom Out and Odd One Out activities are favourites with both teachers and children at Charlestown. Teachers like these activities because they epitomise the ‘no wrong answer’ principle which they see as instrumental to Explorify's ability to engage pupils in non-threatening discussion.

Teachers and pupils enjoy using Explorify due to it being fun and creating interesting discussion. The headteacher described how over the last year pupils have been excited about science lessons, something which hasn't been seen for the last 16 years, which they attribute to pushing science across the school and using Explorify. Teachers find the resource easy to navigate and the high number of activities means that there is always something which will fit in with the curriculum. It also helps teachers link between different areas within the science curriculum and the variety stops pupils getting bored. Teachers also find the prompts and questions provided with each Explorify activity useful.

Pupils report how they like using Explorify because they find it interesting. Zoom In Zoom Out was liked because often the image was a surprise and there was the chance to see close up images of things which they would never get the chance to see (e.g. a Praying Mantis). Odd One Out was liked due to their not being a wrong answer – *“It's like you get to try and have a guess, and it's not a right or wrong answer” (Pupil)* – and they enjoy listening to other pupil's ideas. Finally pupils spoke about the What's Going On videos and how each one was completely different, especially enjoying the ones based on “experiments”. Pupils stated they would love to use Explorify even more at school and thought it (or the same types of activities) could be used in other subjects.

¹ For more information about Explorify please visit: <https://explorify.welcome.ac.uk/>

Impact of Explorify

Impact on teachers and the school

Staff at the school all described the various impacts using Explorify has on them and their teaching. Explorify makes it easier for teachers at Charlestown to assess their pupils' knowledge and gives them the opportunity to observe their class during discussions. Using Explorify has also led to teachers questioning whether they need to always have all the answers. This has led to an increased acceptance of the concept of 'no right or wrong' allowing teachers to approach their teaching differently and allowing children to take the lead.

Teachers report how they have improved their own knowledge whilst using Explorify which in turn helps them to feel more confident:

"You gain more confidence the more knowledge, and more understanding you have of a subject. So, yes, there is that backup and it helps to support your [knowledge]" (Teacher)

For some, using Explorify has led to science being taught to children slightly more when used outside of a science lesson. Explorify is now integral to Charlestown and contributes towards making science lessons as exciting and interactive as possible for both teachers and pupils.

"Science is on the agenda for the school period. So we are all boosting science as a core subject anyway, and everybody's really on board with that. And, I think Explorify offers a new path for science as well" (Teacher)

Impact on pupils

There had been a noticeable change in how much pupils enjoy science, which in part is attributed to using Explorify. The concept of there being no right or wrong answer is key to Explorify's success as children feel more open to having a go at answering questions and also asking more questions. Children know they are expected to be able to back up their answer, and teachers will prompt them to reason their thinking if they don't do it automatically. *"They know that whatever they say, as long as they can justify it themselves is fine."* (Teacher)

Pupils who normally do not have the confidence to speak up during lessons are impacted the most by Explorify. Since the content is open to interpretation and they see other children making reasoned judgements, they realise they can do the same. *"You see the quiet ones actually putting their hand up and having a go because, as I said before, there is no right or wrong answer so, they've got the confidence to have a go."* (Headteacher)

Pupils are learning new science vocabulary and the skills learnt through Explorify are being employed in other lessons; the problem-solving skills Explorify develops can be useful in maths and the capacity to consider others' opinions helps children see multiple points of view.

"I just think it gets them thinking a bit more outside the box exploring different aspects that they're not necessarily just going into the same answer straightaway, trying to explore different aspects which is always interesting." (Teacher)

Explorify sometimes has a lasting effect on children at Charlestown, with examples of children going home thinking about something they have learnt from Explorify, or something they want to learn more about.

Kingsmead Primary School case study



How they use Explorify and the impact it has.

About Kingsmead

Kingsmead Primary is a community school in Cheshire, catering for just over 300 pupils aged between 4 and 11, 3.5% of whom are eligible for free school meals. Science has a high profile at Kingsmead and its annual Science Week attracts speakers and visitors from around the country. This is just one of a number of events organised by the school's active Science Leader.

How science is led and taught at Kingsmead

The Science Leader supports teachers at the school by monitoring the planning and teaching of science through 'learning walks' and lesson observations, provision of individual 1-to-1 mentoring and school wide internal training. In these internal CPD sessions, the Science Leader passes on knowledge she has accumulated from external training she attends two or three times a year. Teachers also periodically observe the Science Leader delivering a 'model' science lesson to a group of Kingsmead pupils.

Kingsmead's Science Leader is an active member of the scientific community outside of the school – she has delivered teacher training herself and holds a science doctorate. Her pupils hold her in high esteem and are proud of their teacher's previous science career. She is an active participant in regular science cluster meetings with a group of other local primary schools. She is passionate about the impact of science in primary schools and is aware of how it can influence pupils at a young age.

"I hope that high quality science teaching in primary schools will actually enthuse children about science and perhaps encourage them to think about a career in science... good teaching at primary level is just as important in science as it is at secondary"
(Science Leader).

Since Kingsmead's recent school expansion and move towards mixed-phase classes, teaching across all subjects is done on a two-year cycle. All teachers at Kingsmead deliver their own science lessons one afternoon a week, with sessions normally lasting between one and a half to two hours. The science curriculum, created by the Science Leader, gives teachers an overview of the main learning objectives, highlights key vocabulary to be taught, but also provides ideas for possible practical investigations to be done for each subject area. The 'average' science lesson at Kingsmead might include a discussion, initiated by the teacher asking a question about a certain scientific topic and sometimes an investigation – typically one practical investigation will be carried for each topic.

Pupils enjoy these practical sessions the most, which are often followed by writing up their observations and results. Group work involved during investigations is popular with pupils, *"because then you've got people to talk to if you're stuck"* (Pupil), and after an investigation they occasionally have something physical to show for it and take home which they feel proud of. Science lessons can leave pupils full of wonder and curiosity and sometimes when they go home they undertake their own research.

During the observation carried out by the evaluation team, pupils took part in several activities, including an investigation into how to make toothpaste; a test of the effectiveness of their toothpaste, which included concepts such as fair testing and validity, in addition to recording findings; designing packaging; and a written task about teeth. Pupils were very excited about the opportunity to make



their own toothpaste, saying that they usually work in this way and enjoy doing lots of “*experiments*” in classes.

In addition to teaching science on a weekly basis, Kingsmead also has annual science weeks focussing on topics such as ‘Our Earth’, ‘Bio Diversity’, ‘Inventions and Discovery’, ‘Energy’ and ‘Space’. During a group discussion, pupils explained that they particularly enjoy these. In addition to the science weeks, the Science Leader is always on the look-out to engage in other ad-hoc initiatives such as the Cambridge Science Ambassador Scheme which involves Cambridge University students visiting the school and undertaking practical science investigations with the pupils and visiting speakers to talk to different year groups on topics such as Charles Darwin, sound (speaker from Daresbury Laboratory, Runcorn), and healthy eating (Morrisons supermarket).

How Kingsmead uses Explorify¹

The Science Leader at Kingsmead found out about Explorify through an external training course with STEM Learning. She continues to recommend the resource through staff meetings and regular emails to teachers in the school, often highlighting exercises which would be useful for specific curriculum areas. The Science Leader has also given teachers training on how to teach using ‘Wow starters’ – the idea of starting a lesson with something exciting, this includes using Explorify activities, such as Zoom In Zoom Out, What’s Going On and Odd One Out.

The investigation carried out in the lesson observation was preceded by an Odd One Out exercise, to spark discussion around the topic of teeth, and was followed by a Zoom In Zoom Out activity as a plenary.

The Science Leader uses Explorify regularly alongside a few teachers within the school, and the Science Leader is the main champion of the resource. As seen in the observation, it is used as an introduction to the lesson which is how Explorify is most commonly used: as a starter to ‘Wow’ the children and instigate discussion at the beginning of a lesson. It can be used at any point in the day, though, and teachers use activities like Odd One Out as short fillers to trigger questioning.

What works well about Explorify?

The range of Explorify activities available means that teachers do not have to recycle exercises and children do not get bored with the same format each time. The Science Leader even adds their own exercises on to the Explorify activities, creating short, fun, multiple-choice quizzes to test children’s knowledge on what they have seen.

Pupils like aspects of Explorify which allow them to learn more about areas of science they already enjoy, such as animals and habitats. They also like how the resource introduces them to new science topics which they did not know they would be interested in, and does so in a way which lets them work things out without fear of being wrong.

‘What If’ Explorify activities which encourage teachers to use PMI as part of the exercise (where children are asked to write a *plus*, a *minus* and something *interesting* about what they see on the screen) are useful and receive an array of different responses. This has been great for encouraging pupils who are not normally vocal in lessons to speak up by giving shyer children a structure to base their response on.

Since children enjoy group work, they welcome the opportunity to collaborate with others which Explorify provides. The Odd One Out exercise, for example, is seen as a great facilitator of discussion: “*you get to explain your answer a bit more, and everyone had really different answers, and it’s interesting to see what other people had come up with, and there was no, like, wrong*” (Pupil).

The ‘Mystery Bag’ and ‘Zoom In Zoom Out’ activities are also favoured for this reason, as everyone gets involved and pupils enjoy the eventual surprise it gives them after being held in suspense for so long. Pupils find it funny that some of their own guesses are so far from the end product in these

¹ For more information about Explorify please visit: <https://explorify.wellcome.ac.uk/>

activities. The activities which work best are generally those which use images and physical activities to help children visualise concepts, as descriptions of activities involving abstract concepts may sometimes confuse pupils.

Impact of Explorify

Impact on teachers and the school

Explorify has been a useful timesaver for teachers by helping them initiate discussion with very little preparation time. Teachers use the questions and ideas provided on the resource to engage the children and do not necessarily need to spend a long time thinking about how they should start their lesson. The planning resources provided within Explorify have helped teachers feel more confident about their delivery of science, and teachers are more inclined to pursue further science related CPD:

“I think my science teaching and planning has grown a lot and I’m much more confident in my lessons but I think there is still a lot further I can go with Explorify, and definitely I’d be interested in doing more CPD and using [Explorify] more” (Teacher)

Explorify has helped the Science Leader at Kingsmead move away from teaching methods which rely on worksheets and activities which require minimal interaction; they have also passed this practice onto other teachers at the school. Choosing not to use worksheets in lessons would previously have incurred more planning time and Explorify has saved teachers at Kingsmead time by providing everything necessary within the same resource, including references to further reading.

“In the past teachers might have spent ages trying to find something suitable on the internet or in a book. I think having it there, on hand, makes it much easier... to provide really good quality resources for lessons and there isn’t really an excuse then for printing off an uninspiring worksheet, I don’t think” (Science Leader)

The Science Leader has been instrumental to the improved profile of science at Kingsmead, and Explorify has been a valuable part of their endeavour to give science the status it now has.

“Science is such a, sort of, a focus in our school anyway and, especially, within our phase. So, I do think [Explorify] contributes to that in a way that it’s really accessible and really easy for teachers to use and you don’t have to make a big change or put loads of effort into use it and improve your Science teaching” (Teacher)

The more teachers at Kingsmead use Explorify, the greater the impact they have seen it have on their confidence using the resource and teaching science in general: The impact Explorify has had on teachers’ confidence delivering science lessons has been instrumental in ensuring that it is taught frequently and to a high standard. The ease with which teachers can access the resource means it is always there for them, and they can trust that it will support them to provide quality science teaching.

“If teachers feel less confident teaching a subject, they don’t enjoy teaching it... I think they’re less likely to teach it well, or they’re less likely to teach it as regularly or give it the value that it should have. I think any way that you can make a lesson easier to teach, such as being well-resourced and making resources easily accessible for the teachers helps...I think from that point of view, Explorify can help because if teachers think ‘I’ve got that really nice activity, that will be five minutes of a lesson started off and then I can teach the part that perhaps they’re not quite so keen on doing or don’t feel as confident about’” (Science Leader)

Impact on pupils

The Explorify activities teachers at Kingsmead use are effective at initiating pupil discussion and holding children’s attention, even after they have undertaken an activity. Children feel safe in the knowledge that their opinions matter, and they can alter the course of their questioning in whichever direction they please. Far from taking the lesson off course, children go on to take responsibility for their own learning and shape the debate with conviction.

A large part of that confidence in discussing science comes from the knowledge that they do not have to have the right answer. By having this confidence, pupils can broaden their science vocabulary.

“I think it’s probably also improved their scientific vocabulary, and the language that they’re using, because I think when they’re explaining concepts and describing observations they tend to use the scientific terms more accurately. (Science Leader)”

The vocabulary that children at Kingsmead develop, and the discussion abilities they hone whilst using Explorify, has a noticeable effect on writing skills and oracy, which can be seen in other lessons. Since many Explorify activities require pupils to interact with classmates, pupils are able to build on their ability to work as a team. Pupils learn how to position themselves within a group and develop the social skills which are essential.

“Collaborative work – they have to cooperate and work together to try and solve the mystery of the bags or puzzles. It’s not an individual task quite often, it’s that group work, I think, that’s the real value of the Explorify tasks” (Science Leader)”

Stokes Wood Primary School case study



How they use Explorify and the impact it has.

About Stokes Wood Primary School

Stokes Wood is a community primary school situated just outside of Leicester city centre. It is a culturally and ethnically diverse school catering for approximately 500 pupils aged between 3 and 11, just over a quarter (27%) of whom are eligible for free school meals. Year groups are two or three form entry.

Stokes Wood has maintained the profile of science since it first appeared on the School Improvement Plan several years ago. The Headteacher has a background in science and believes that a good science education has a positive impact on the development of a range of skills. In addition, the Science Leader drives science forward in the school to ensure that pupils' attainment continues to improve.

How science is led and taught at Stokes Wood

The Science Leader is enthusiastic and regularly attends science co-ordinator network meetings to learn about new resources and share good practice. He provides varied support to help staff teach a relevant and exciting science curriculum by providing internal continuing professional development (CPD) during staff meetings, introducing them to resources, modelling good practice and providing ad hoc support when requested. In addition, the Science Leader also encourages teachers to become more involved with science outside of the classroom. One teacher accompanies the Science Leader to selected external science related CPD and another two teachers are invited to external meetings to encourage them to include science in the subjects that they lead. Teachers are appreciative of all the support available to them at the school.

Each class is taught two hours of science each week; while teachers are given the freedom to decide how and when they teach science, the Science Leader encourages teachers to dedicate this time to one session, partially to make it easier to include practical investigations. In addition to weekly science lessons, the school undertakes lots of science activities during British Science Week, puts on a science morning that parents can attend, arranges for visitors to come in to talk to pupils and undertakes science school trips to further engage pupils in science.

Teachers include discussions in their science lessons, which was observed during the school visit. Teachers ask pupils lots of questions and pupils discuss their thoughts in small groups before feeding back to the class. This helps to ensure that all pupils engage in the lesson and that pupils hear others' points of view.

Practical investigations are a big part of how science is taught at Stokes Wood, allowing pupils to learn through first-hand experiences. Teachers make use of the Forest School to help with this and have access to a budget to buy materials to undertake practical investigations. Pupils said that investigations are their favourite part of science lessons. One pupil described the fun they had mimicking the digestive system in a lesson:

"We did this fun thing where...we mashed different types of food. There was beans and tomatoes and bread, and we mashed them all together. It was disgusting!" (Pupil)

The school's tendency towards cross-curricular lessons means that pupils often practice literacy and numeracy as part of a science lesson where they will collect and graph the results from scientific investigations and then write-up their observations in reports. Pupils are also exposed to science in



other lessons, for example children will read about famous scientists and write about what they have learnt.

To help ensure that science remains an engaging subject, the Science Leader undertakes research with pupils to find out what they like and what could be improved about their science lessons. In addition he undertakes regular lesson observations to monitor how science is taught to ensure that pupils are making progress.

How Stokes Wood uses Explorify¹

The Science Leader found out about Explorify, when it first launched in 2017, through the local science co-ordinator network meeting. He explained that it was the enthusiasm of the network leader that made him first use the resource and he has since gone on to recommend the resource to all teachers at the school.

The Science Leader is so passionate about Explorify that he requests all teachers use at least one activity with their pupils each half term. Within the school there are now at least five teachers who use it weekly – sometimes multiple times a week! Explorify activities are normally chosen to integrate as closely as possible into a science lesson. Explorify is used to “enrich” lessons and the engagement it incites in children is especially useful for jump-starting the beginning of a session or wrapping up learning in a plenary, rather than constituting an entire lesson in itself. Teachers find Explorify very useful for encouraging discussion which they see as important and will show pupils a video or activity before asking them to think about what is happening, describe it and link it to previous learning.

The school has also found that Explorify helps them to do assessments within lessons. It allows teachers to address misconceptions, provides an opportunity to evidence pupils reasoning using their prior knowledge, allows pupils to make links to other learning and raises new questions. The Science Leader requests that teachers feed-back on these areas when they use the resource so that this can be evidenced.

Explorify has also been used during science weeks. The Science Leader explained how he had used three activities to link to a theme of ‘journeys’ one afternoon during science week:

“I managed to get them to use three activities in that afternoon from Explorify, so one was a ‘What’s Going On?’ activity, manoeuvring on the moon. So, they watched a video of a lunar lander, and then they also did an ‘Odd One Out’ activity about the maps of the solar system. Then, as a ‘Problem-solving’ activity, they also made their own resilient rovers. So, all three activities were tied in and, you know, they were really engaging activities, practical activities” (Science Leader).

What works well about Explorify?

Teachers at Stokes Wood find Explorify straightforward to navigate and use. They like that they can easily identify a wide variety of age-appropriate activities which align with the curriculum. This saves teachers from “*spending hours trawling*” through the internet for resources. Teachers also value the ‘Take it Further’ activities and links to other resources available on the Explorify website to help build additional lesson content. The Science Leader described how he had used this to create a fun educational activity at the Great Science Share. Teachers describe that Explorify helps to provide *structure* to a lesson. They often use Explorify activities to open a lesson, they then might have a discussion or do a practical session before wrapping up the lesson with a consolidation activity. Teachers feel that this helps to create a routine for pupils as they “*know what is expected of them*”.

One of the things that teachers like best about Explorify is how well it engages pupils. Teachers describe their pupils’ “*excitement*” whilst using it which helps to “*make science fun*”. Because it is so engaging, “*it makes it so much easier to make it [the lesson] child-led*”. It also helps teachers engage the entire class as they do not need to differentiate activities. The fact that the resource

¹ For more information about Explorify please visit: <https://explorify.welcome.ac.uk/>

helps to promote the notion that there is “*no wrong answer*” also promotes the engagement of all pupils. A pupil also felt that this was one of the key benefits of Explorify:

“You don’t necessarily have to be the smartest one in your class to join in... it’s just fun to watch the opinions change and contribute yourself and your opinions change as well.” (Pupil)

Teachers also value the way that Explorify allows pupils to contextualise their learning and see first-hand how science works by bringing scientific concepts to life:

“It’s certainly been a useful tool to just help the children to visualise what it is you’re talking about in... because children don’t necessarily have the life experiences... If you’ve got a visual or a practical activity that helps them.” (Teacher)

Impact of Explorify

Explorify has had a range of positive impact on Stokes Wood Primary, which are outlined below.

Impact on teachers and the school

Explorify has helped teachers to improve their own “*subject knowledge*”, which is particularly valuable given the breadth of the subject. Alongside the structure the resource provides to a lesson, this increase in knowledge has a knock on effect on their confidence in teaching science.

The Science Leader and other teachers have noticed an improvement in the quality of science teaching as a result of using Explorify, as it helps teachers to plan efficiently, well-structured lessons and gives a “*more in depth approach*” so that pupils learn more. The school believe that this is having a positive impact on raising pupil attainment in science.

Using Explorify to support assessments also contributes to the Science Leader having a compelling body of evidence which helped the school achieve their Primary Science Quality Mark. This was an additional unexpected benefit of using the resource.

Impact on pupils

Explorify activities have a significant, positive impact on pupils’ engagement in lessons. This is because the resource helps to promote the notion that there is no wrong answer, and every pupil has a right for their opinion to be heard without fear of being wrong. This has helped to increase pupils’ confidence to engage in class discussions, which also extends into lessons more widely.

“There’s a lot of people talking who wouldn’t normally talk ... there’s no pressure because there’s no right or wrong answer... we’re all part of a group, we all laugh together, we all enjoy it, and we all unlock each other. So, it boosts their confidence... I’ve got a couple of boys in my class who find English and maths really hard, but throw them in a science lesson, even though they’re doing the same skills, and they’re there, constantly sharing ideas.” (Teacher)

This increased engagement in group discussions has also had a positive impact on pupils’ oracy and has broadened their vocabulary. Further to this, Explorify has helped pupils at Stokes Wood to link their learning and better understand the world around them, which has impacted on their reasoning skills.

“I have noticed now at the end of the year from the beginning of the year, when they ask a question, they want to answer it themselves... now, they’ll think about it and they’ll try and use their reasoning ... it’s given them a lot more of an understanding that science is all around us... when they’ll be on the playground, they’ll point out leaves and say, ‘Oh, that was in that video,’ or, ‘That was in that discussion’.” (Teacher)