

Lynne Scott writes about building resilience in an ever-changing digital landscape and the benefits of putting science into context



Children engaging in a discussion about plants

Developing resilience in a digital world

A digital landscape

Children in most schools, especially in Primary 7 (age 11, England Year 6), are increasingly engaging with technology and social media in a way that is completely different from 10 or even 5 years ago. More time is spent on phones and devices and, as a result of this, observations and appreciation of the wonderful natural world around them are potentially on the decrease. This is proven with the removal of words such as bluebell, conker, magpie, dandelion, etc. from the Children's Oxford Dictionary. As teachers, we have to take cognisance of this and put in maximum effort to opening up their world and encourage them to notice what is around them and widen their horizons.

Alongside this, we are working on resilience, which is hugely important for development as well as for their scientific thinking. When you're trying an experiment, you need to have the skills and resilience to have a go, then adapt and try again to achieve a better outcome. In a world of instant gratification, it is common to see some students switch off straight away after not getting something quite right the first time and become frustrated. We know, however, that life doesn't work in that

way; we very often do need to do things a few times to get them right. Children need to get used to having thinking time... it's a key skill for scientists, but also a key skill for life!

The growth mindset is at the heart of all of our teaching where, if things don't quite work out, you try again using a multitude of strategies, asking yourself what didn't go so well, what can I do to do it better, do I need help from a peer, teacher? We see FAIL as the First Attempt In Learning and that it is very important to make mistakes and learn from them. The biggest mistake we will ever make is by being too afraid to make one.

We know that children are naturally curious, but that declines slightly as they get older; even at P7/Year 6, with this instantaneous culture, you can see them not wondering quite so much about how things work, or why certain things happen, and I think part of that is confounded by an increase of time spent on the new online digital world.

Developing the right atmosphere in class

To encourage the children to participate in class discussions, you have to develop the sort of environment that gives a platform for everyone's voice to be heard

and, to do that, you need an atmosphere in which people feel confident enough to share their opinions.

The **Making Thinking Visible** programme is part of a wider Glasgow City Council initiative and it is being delivered in partnership with Tapestry. Pupils are encouraged to develop their skills and knowledge through the **thinking** routines and moves. It helps to promote the idea 'I think, I see, I wonder' and those questioning skills that are so vital to science and to education in general.

Explorify's Odd One Out activities offer a wonderful platform to facilitate this kind of questioning. The children feel more secure as there is no wrong answer, so they won't be embarrassed to give opinions or be in fear of offering an opinion that could potentially be shot down in flames. They know that, if they can give evidence to support their opinion, then their answer is valid. Explorify gives an open forum for everyone's opinions to be respected. I've seen changes in attitudes through classes in the school; for example, Primary 4 (age 8, Year 3) are so eager and enthusiastic, whereas Primary 7 are at times more reticent – some are very conscious of being 'cool' and not wanting to embarrass themselves. When they do share their thoughts, though, they give greater evidence and discuss the reasoning behind their ideas. They are also great at debating with each other. Using Explorify and these approaches has helped them to develop excellent talking and listening skills and the very important social etiquette of not interrupting others when they are in full flow, developing the patience to

time their input. The ability to wonder, question and share their ideas is great for building their confidence and self-esteem. We are trying to instil the belief that, in science, anything is possible if you have these abilities.

Becoming problem solvers

I love the Problem Solver activities on Explorify. They're really engaging for the children and so easy to execute, as all the things that you might need for them are easily found around the classroom or the wider school. There's a perception that to do good practical science you need a lot of specialist equipment and therefore a large budget or well-stocked science cupboard. While much of the science we do here does cost money and requires special pieces of equipment, Explorify's Problem Solver activities do not, so it is a great way of increasing our practical science without needing more investment. We all know that budgets can be an issue so, at times, you have to be a bit creative to do a lot of practical science.

We did the 'Water Carriers' Problem Solver (see useful links below), where we asked the children to design something that would allow them to carry 1 litre of water across a certain distance a certain number of times, which kept them engaged for hours! We did this just using items we had around the classroom. We also did the 'Mission Survive Ice Lollies' challenge (see useful links below), where we tried to stop an ice cube from melting, exploring ideas around insulation.

This allowed some of our pupils who were not overly fond of numeracy and literacy to excel and they were delighted, as was I and the rest of the class. It gave them their chance to shine and show how great they are too. They really embraced the challenge, identified the best materials to use and were greatly enthused. We ran with their ideas and

went off course from the planned lesson; it was great to feed their interests and extend sessions or topics that excite and engage. The best way for children to learn is by discovering – I hold back from providing too much input – maybe a top tip! Apart from that, they're on their own and, every time we do this, it is as much an experiment for me, and a learning platform! They're more engaged when they're discovering through their learning – if I just tell them how something works, then the engagement factor can slide down significantly.

Widening the environment

Some people have a misconception that science is all about explosions and white coats, but it is our responsibility to show the children that science is all around them and in everything they do. You can work in a scientific job and not wear a white coat and have crazy hair. This is a damaging myth and so, when I ask the children what science is and then show them examples of what science *really* is, they're blown away. This real-world application is so vital to their understanding of science and what a science-related job looks like.



Protecting ice cubes

We're also trying to take part in as much enrichment as possible and to take the children out of school on trips to expose them to as many experiences as we can. Recently we went to the RSS Discovery Centre, Dundee (see useful links)] to broaden and deepen our learning about our Polar Explorer topic. We have the Science Centre just

down the road too and we are very fortunate to get free access as a Glasgow City Council school. We also invite a variety of professionals into our schools to discuss their careers, to broaden the children's horizons.

After we started using Explorify, we took the children outside on a biodiversity day to look at the living things around the school. They were spotting all sorts of things in really fine detail, which was a huge difference from the previous year where they had not noticed things as closely. We are aware of giving them the time and skills to look closely and notice the finer details. Overall, we are fine-tuning observation skills and leading them in their thinking. At first, our thinking can be a bit narrow, but that's all part of growing and learning.

By showing images, films or ideas that are quite foreign to our children, this is really opening their eyes to the wider world around them, as well as helping them to notice what is in their immediate surroundings – having that unfamiliar context offers an even playing field for all the children. They might never have seen a certain animal, for example, but they can really notice the detail and discuss what's up on the board.

Practically, one of the reasons I love to use Explorify is that it's arranged by the topic areas in the Curriculum for Excellence, so everything is so easy to find but is broad enough to use outside science time. Explorify is all about developing scientific thinking and the skills associated with that, so if you find an activity that relates to a different topic, or just something that the children are interested in, you are sneaking that scientific thinking time into other subjects. Those scientific thinking skills benefit literacy, maths and other subjects. Science helps them to build those transferrable skills and apply them across the board.

Acknowledgement

We have been delighted with the Explorify Science resource at Sandwood. The success of Explorify Science within Sandwood Primary School is very much attributable to our P7 teacher, Lynne Scott. She is passionate about STEM and her drive and enthusiasm to involve our pupils and staff in the world STEM is what has made this resource produce such an impact.
Fiona Donnelly, Headteacher.

Useful links and references

The Water Carriers problem solving activity: <https://explorify.wellcome.ac.uk/en/activities/problem-solvers/water-carriers>
The Ice Lolly challenge: <https://explorify.wellcome.ac.uk/en/activities/mission-survive/ice-lollies>
Information about the RSS Discovery Centre: <https://www.rssdiscovery.com/plan-your-visit/>
The Polar Explorer Programme: <https://www.stem.org.uk/welcome-polar-explorer-programme>
Glasgow Science Centre information: <https://www.glasgowsciencecentre.org/>

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Lynne Scott is the Primary 7 teacher at Sandwood Primary School, Glasgow.
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