

Improving science with the Lab 13 project: Irchester Community Primary School

URN: 133601
Region: East Midlands
Remit: Schools

Provider background

[Irchester Community Primary School](#), in the small town of Irchester, Northamptonshire, improved from requires improvement to [good](#) between September 2012 and April 2014. It has also been awarded the [Primary Science Quality Mark](#).

Brief description

This good practice example shows how Irchester Community Primary School has improved science as part of a whole-school journey to good. In responding to earlier Ofsted inspection recommendations, school leaders realised that a focus on science could help to develop pupils' overall skills of questioning, provide scope for them to find out answers for themselves and improve their understanding through, for example, practical investigations. The school appointed a full-time professional scientist in residence to enhance the practical delivery of science. This has enabled all teachers to confidently incorporate scientific enquiry into science lessons. The science provision captures all the elements of the new science national curriculum and reflects much of the good practice set out in the 2013 Ofsted report '[Maintaining curiosity](#)'.

The good practice in detail

Hypothesis

The school was judged as requires improvement at its inspection in [September 2012](#). The headteacher and her leadership team proposed that the areas for improvement could be addressed by developing an approach to teaching that enabled pupils to:

- raise questions in response to teachers' lessons and to demonstrate inquisitiveness
- spend time applying the knowledge they have learned in lessons and finding out answers to develop their understanding
- increase the quality and quantity of their written work.

Science, by its nature, involves all of these elements through experimental enquiry. School leaders reasoned that by using science teaching and learning as a focus point overall pupil standards would rise. The challenge was to develop a suitably demanding academic science curriculum that was coupled to thoroughly challenging experimental work for pupils in a school with no specialist science teachers.

The headteacher proposed appointing a graduate scientist in residence who would provide science expertise and encourage high quality science learning across the school.

Her final hypothesis was that, as pupils developed their enquiry skills in science, these skills would help their learning of other subjects. She also expected that pupils' cross-curricular literacy skills would increase as pupils started to talk about 'science questions' with their teachers and each other and then report their findings accurately both orally and in writing formal reports.

Method

Step one was to seek funding for the equipment needed to allow pupils to carry out more advanced science investigations safely.

The headteacher approached [Ignite](#) to seek the necessary financial support that would allow the setting up of a 'Lab 13' space in school. Lab 13 is a designated space for science, where children's experimentation is driven by imagination. There are two other 'Lab 13' projects operating in England.

A fundamental principle of Lab 13 is that, guided and advised by the scientist in residence and the school's science coordinator, especially on health and safety matters and resourcing, pupils run the laboratory through a committee. The committee takes a major role in determining what science to investigate by asking pupils across the school to suggest science questions they would like the school to investigate, building on their teacher-led science lessons. The Lab 13 committee then considers and selects the questions for further research.



Once resources from school and external agencies had been identified and school governors had approved the approach, the Lab 13 committee helped draft the recruitment advertisement for a scientist in residence and took part in the interview process. The school appointed a graduate scientist to the post as a full-time support staff member to lead the laboratory work.

The school assigned a small workroom to become the science laboratory; it can accommodate eight pupils at a time. The capital cost and equipment price for this work were relatively low. Some initial costs were supported by one-off donations and grants from local businesses and individuals. The scientist in residence was able to advise on equipment purchases and the set-up of the laboratory hardware in consultation with the Ignite staff.

Lab13 provided external support and a website that allowed exchange of ideas with the two other schools involved nationally with this project.

The scientist in residence acts as a consultant to the teachers in all year groups. The school science coordinator maps the delivery of the science national curriculum to ensure full coverage, efficient use of the specialist science laboratory and a programme of in-class support for teachers if necessary.

Pupils of all ages spend up to two hours a week carrying out the investigations on a rolling pattern of release from main classes during the academic year. Whole-class experiments, led by the teachers with their enhanced subject knowledge, are also a regular weekly feature across the school.

The school has further benefited from its involvement in the Primary Science Quality Mark award. To gain this award, a school must submit evidence of science activities

within the school that are raising science standards. Schools are linked to a hub led by an expert primary science leader. That leader provides professional development support to the award school and organises network meetings to allow schools to share ideas and examples of good science practice.

Results

The inspection report from April 2014 noted:

'Lab 13, the school's science area, and the questioning approach to learning, develops scientific and investigation skills well.'

All of the areas for improvement identified at the 2012 inspection have been resolved, with rising standards across the school. The improvements in science have contributed in a substantial way to the overall improvements in the school and the school's overall effectiveness has risen from requires improvement to good.

Because of the in-house science expertise and resources, teachers have been able to try out quite challenging experiments that would normally be impossible to attempt without on-site expertise. The scientist in residence is a qualified biochemist. The school has the necessary equipment to prepare sterile Petri dishes, and to dispose of them safely afterwards. This allows teachers and pupils to investigate microbes at a sophisticated level, so pupils learn about hygiene, where germs are to be found, the rate that they multiply and how to stay safe when handling potentially hazardous materials. This has rapidly built up the knowledge and confidence of teachers to use scientific enquiry in their lessons.



The academic rigour and high level of subject knowledge development in pupils' science work is outstanding. For example, Year 1 pupils develop a detailed understanding of scabs, including the role played by various components of the blood, as they built models of scabs.



Science has helped drive literacy development. Pupils thought a lesson on describing the making of bread was a science lesson, but the teacher was using this as a way of developing purposeful writing skills. Teachers understand that good science needs good communication skills and insist on thorough experimental reports.

The Lab13 committee allows pupils to develop a good understanding of project leadership and management. Pupil committee members present to staff training sessions at other schools. They explain to teachers how Lab 13 involves pupils in organising science work in their school and how the scientist in residence supports the Lab 13 committee and teachers in ensuring good science enquiry. These pupils regularly present their science findings at local and national conferences on, for example, 'how laughing is contagious'. The pupils' development of critical communication skills is one of many valuable benefits.

Lab 13 is also active as an after school session. This includes parents and carers as well as pupils, and gives more time for extended investigations. A number of fathers are active participants here and the school welcomes their involvement.



Lab 13 provides a base for workshop opportunities for other schools and the science subject leader (a specialist leader in education) runs a programme of continuing professional development events for teachers in the local area.

Conclusion

'What I like most is doing my own investigations' – that testimony captures the real success of Lab13.

Pupils have become young scientists, capable of carrying out their own enquiries, skilled at using scientific apparatus and confident in sharing their findings orally and in writing.

The school is already delivering the aims of the revised science national curriculum for science:

'Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena.'

It does this because experiments and the results that emerge from them are central to weekly, teacher-led science lessons. Pupils see the science happen and learn to review and adjust experiments that do not on the surface appear to deliver the 'right answer'.

Building on the knowledge learned in lessons, pupils develop the confidence to ask 'why is that happening?' They also develop the skills to answer the question.

The quality of scientific work, pupils' subject knowledge and the motivation of pupils and teachers for science is very high in the school. Pupils are confident: 'I can do this' said one. Teachers are also now confident in delivering science themselves and have become 'scientific' in their approach to experiment work. They are not reliant on the resident scientist, although they do seek her advice and value her expertise. Teachers and pupils raise questions that they set out to resolve together through investigations.

Good teaching of science requires good science knowledge coupled with practical expertise. Schools can acquire that science specific knowledge and expertise through a professional scientist in residence.

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