

## An enquiry-based approach to learning: St Anne's CofE Primary School

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### Brief description

This case study highlights how St Anne's CofE Primary School's enquiry-based approach to learning, using practical demonstration, enables pupils to learn about the complexities of glacial movement and consider the impact of climate change on the Arctic icecap and the wider environment. The activities are challenging but show what can be achieved through stimulating enquiring minds with hands-on investigation.

### Overview – the school's message

'Following a self-evaluation of our school's curriculum provision for sustainability, in which we attained a low score, I took the opportunity to become a local authority pilot [climate change lead](#). The Year 6 Climate Change unit was developed to embed practical learning in geography, historically an unpopular subject in the school. Aspirations were raised through close partnership with the Glaciology Department at Newcastle University, including visits to the school by Master's students to present their findings from field trips to Icelandic glaciers and visits by our pupils to the Glaciology Department to conduct experiments linked to these findings. Not only has the injection of a sustainability element into the curriculum raised the profile of geography across school, but it has also improved non-fiction literacy levels in both reading and writing across a range of genres.'

*Lynne Sixsmith, Deputy Headteacher and Year 6 class teacher*

### The good practice in detail

#### The approach in action

In a previous lesson, the Year 6 pupils had been introduced, through a photograph, to Rupert Bainbridge, their student-friend from Newcastle University, who had been to Greenland to study glaciers as part of his Master's degree. The teacher briefly questioned the pupils on what they could remember. Pupils were aware of some of the implications of climate change, having studied it earlier, were familiar with the term 'glacier' and were able to explain what a glacier was. The teacher then explained the purpose of the lesson so



pupils understood clearly that their task was to experiment and investigate how glaciers behave. She also explained how this learning would link to a [later lesson](#) where they would investigate the effects of climate change on them. Pupils watched a [presentation](#) and listened to a [taped message from Rupert](#). Their interest was further engaged by an invitation to visit the university laboratory to conduct experiments following the ones they were to complete in class. The pupils split into groups to complete their separate experiments supported by clear verbal and [written instructions](#). Porridge was used to represent the glacier and plastic guttering the glacial valley. One group drew horizontal lines with pepper across the 'glacier' and had to predict what would happen when the 'valley' was tilted upwards and the 'glacier' began to flow.

Another group placed a piece of sandpaper horizontally across the valley and had to predict what would happen to the speed of the glacier when it reached the sandpaper; and the third group had added water to their porridge to make the mixture more fluid. They had to predict what would happen to the speed of the glacial flow. Without initially realising, these pupils were actually attempting to predict the impact of friction on the flow of the glacier at its base and sides as well as identifying that flow was greater in the centre where friction was least effective; difficult concepts which pupils usually cover as part of their work at GCSE. The experiments provided practical experiences which developed clearer understanding of glacial movement and processes. [The practical experiment](#) enabled these Year 6 pupils to develop a good understanding of glacial flow. Pupils found that the experiments were fun, especially when they could get messy! Rupert adds: 'We chose the experiment because it really helps to visualise and explain glacial processes, while keeping the subject fun and engaging for the pupils.'

‘These are difficult concepts which pupils usually cover as part of their work at GCSE.’

Following the experiments, a spokesperson from each group fed back to the rest of the class, eliciting further discussion, by the end of which pupils were able to talk confidently about glacial movement. The teacher, in conclusion, accessed [daily Arctic sea ice maps](#) to enable the pupils to compare ice coverage over a 30-year period. This raised further questions about the shrinking ice caps and provided the basis for further investigation in the next lesson about the impact of climatic change.



## The impact

Through practical activities such as these, pupils develop a greater interest in their environment and the world around them. A subject which had been 'historically unpopular', was 'coming to life'. This new found enthusiasm for geography was clearly articulated by one pupil after his follow-up visit to the laboratory at Newcastle University: 'I want to go to this university to study geography when I grow big!' The link with the university and upsurge in

interest and enjoyment in geography also raises aspirations, as one parent of a Year 6 pupil remarked: 'Having observed the reaction of the children on the visit to the Glaciology department, I can appreciate the value of such a project in not only raising standards, but also in raising aspirations'.

The work enables pupils to formulate their own hypotheses and theories and test them. Through this form of enquiry, real understanding is developed; pupils are challenged and responded impressively. Group work encourages the development of cooperative and organisational skills, stimulates discussion and higher-order thinking. As a result, literacy skills improve and pupils talk and write about complex glacial processes with confidence. A Year 6 pupil explains: 'I am more confident with non-fiction writing and find it easier to write non-chronological reports, because I have better subject knowledge.'

As well as supporting very good learning in geography, the project enthuses pupils to the extent that they want to find out more about the Arctic and the impact that global warming is having on this fragile environment. This resulted in an extended project, 'Polar Plight', which was driven by pupils' own interest. Other issues linked to climate change are also explored, including the impact of the floods in Workington and Cockermouth in Cumbria as well as a consideration of whether the human race deserves to inhabit the earth. The in-depth study of climate change provided a rich reservoir of information which stimulated a wide range of discussions linked to global warming. It was also used to support work and raise standards in literacy. Pupils used their geographical learning to write in a variety of non-fiction genres. This included [persuasive writing](#), chronological and [non-chronological reporting](#), formal and informal letters, instructional writing for a game, as well as [writing in a journalistic style](#). Pupils were able to write with confidence and authority because they had the knowledge and understanding to articulate their views and illustrate their points.



In 2012, of the 29 pupils in the class, all reached Level 4 or above in English with 16 attaining Level 5 or above.

## The school's background



[St. Anne's CofE Primary School](#) is an average-sized primary school in Bishop Auckland, County Durham. Nearly all pupils are from White British families; a few come from minority ethnic families. A below-average proportion of pupils are known to be eligible for free school meals. The proportion of disabled pupils and those with special educational needs is also below average.

Are you thinking of putting these ideas into practice; or already doing something similar that could help other providers; or just interested? We'd welcome your views and ideas. Get in touch [here](#).

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