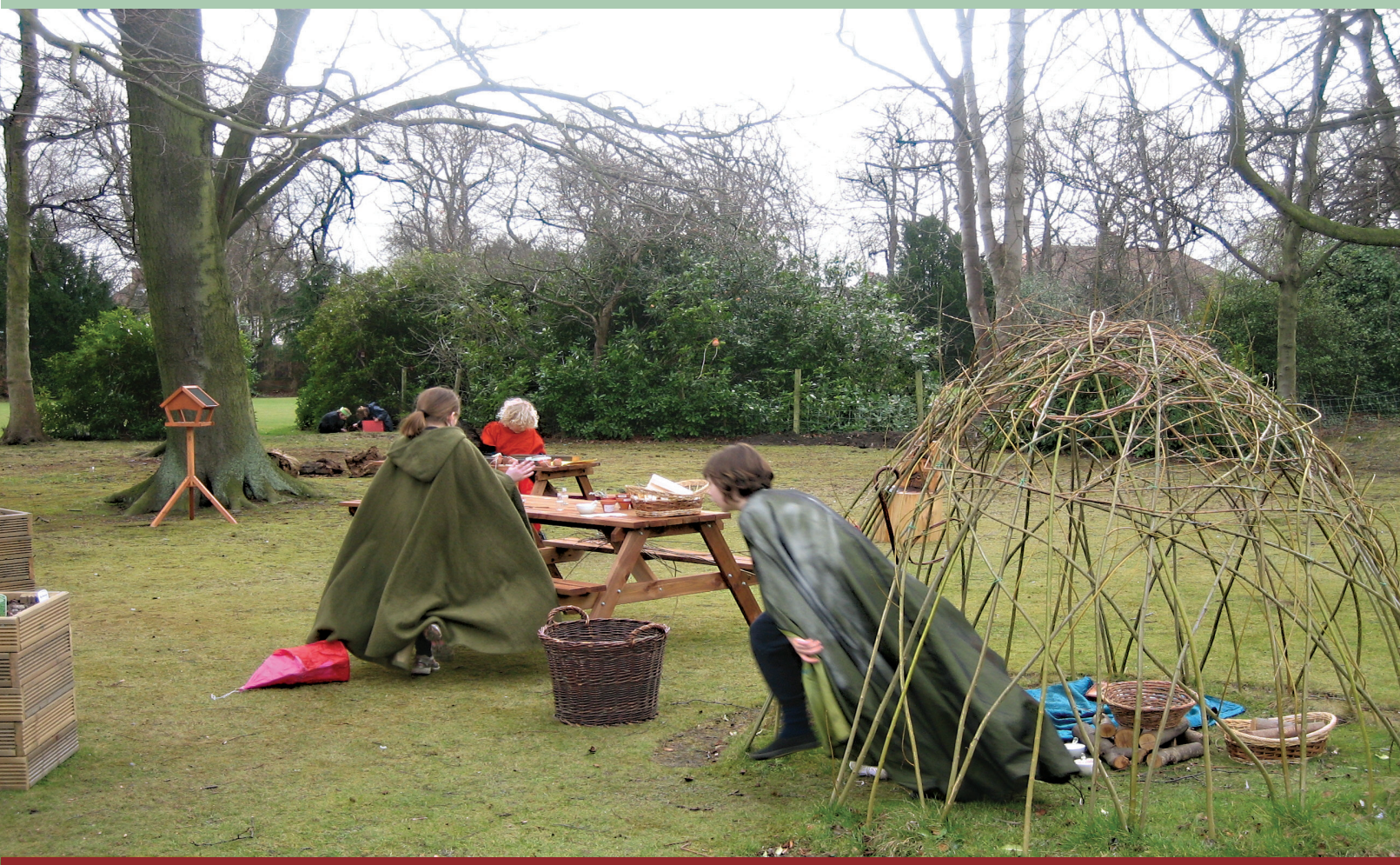


'I love this project'

CONSTRUCTING A ROMAN APOTHECARY GARDEN

Key words:
Cross curricular
Creativity

***Debbie Myers**, with her project that judges said 'placed learning in a real context for children' shares how her school became Rolls-Royce Science Prize finalists*

It may be quite daunting to put together a proposal for an award, especially something as prestigious as the Rolls-Royce Science Prize! But this is exactly what I did as soon as I was appointed head of juniors at BuLa Sagesse School in Newcastle upon Tyne. Why did I do it? After a consultation with staff, governors, the school council and the parent–teacher association (PTA), I found that we needed to develop both children's scientific enquiry and creative thinking skills in order to increase their enthusiasm for science and their uptake of science subjects at secondary school.

We decided to design a science-focused curriculum in which the key development would be the construction of a Roman apothecary garden for key stage 2 (ages 7 to 11) to provide multiple learning environments. (For our 4- to 7-year-olds we linked science to traditional tales and a fairytale willow village.) Furthermore,

through the development of partnerships with 'informal learning environments' such as Segedunum Roman Museum, Wallsend, we hoped to encourage a cross-curricular approach to the teaching and learning of science through the synthesis of links between role-play, art, poetry, music, history, geography, mathematics and ICT.

A project team was put together (see end) and, as our submission for entry into the Rolls-Royce Science Prize 2007 was successful, we were rewarded with a grant of £5000 and a place in the finals. This grant funded the development of partnerships with Segedunum Roman Museum, the Laing Art Gallery, the Centre for Life and the Forestry Commission including rangers from Chopwell Woods.

Creating a purposeful context

To make the experiences of the pupils more meaningful, we developed conceptual understanding using talk through role-play tasks, in which individuals are given opportunities to link their implicit or tacit knowledge with more abstract scientific notions (Harlen, 2009). Role-play was also used by staff to model scientific language in context, with the support of a Latin *PowerPoint*, prepared by Oxford University Department of Classics, and for pupils to enrich their Romano-British apothecary roles.

The pupils took part in three workshops: two focusing on apothecary medicine (at Segedunum Roman Museum and Dilston Physic Gardens, Corbridge), and the third in a theatre workshop (led by Suzy Wilson from Tempus Fugit Educational Theatre). The pupils were then divided at random into three 'tribes'; each tribe helped to plant apothecary, sensory and vegetable gardens and create their own living Roman-Celtic willow huts prior to moving into them (Figure 1)! Using this approach and a variety of research tasks, they developed an understanding of how ancient communities survived using plants, not only for food, but also for medicines, fuels, building materials, weapons, tools, textiles, dyes and recreation.

Battlefield medicine

The research activity involved the pupils in looking at the development of Roman expertise in battlefield medicine, particularly the use of plant anaesthesia, oral and external plant therapies and the design of early surgical equipment. They considered how soldiers maintained good health without the availability of modern medicines. They sorted ancient and modern foodstuffs, participated in drill practice, identified herbs grown in the Roman garden and created medicines to treat burns inflicted in an imaginary battle (Figure 2).

Staff observed that, after participation in these workshops, children remained highly motivated during the follow-up tasks on return to school. Assuming the identities of apothecaries, pupils researched and constructed detailed 'herbals' to document the use of plants used in healing by the botanists accompanying Nero's armies into battle. They researched the development of hospitals, known as valetudinaria, and debated the quality of modern diets, our dependence on synthetic medicines and the effects of diets/exercise on health and wellbeing.

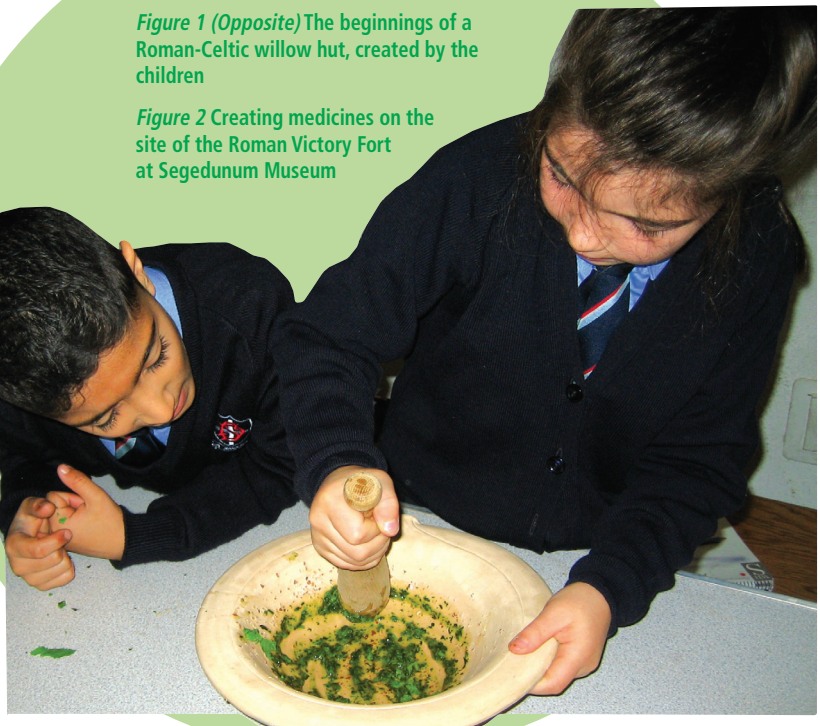
Children's enthusiastic responses accord with the studies of Anderson *et al*. (2002) who observe that informal learning experiences, embedded in familiar socio-cultural contexts such as role-play or stories, engage children because they are already at ease with these methods of learning and therefore receptive to new experiences presented in this way.

Linking to science units

Following the work on the medicines, links were then made to the plants that made up the herbals and salves that the children had researched. Year 5 and 6 pupils (ages 9–11) set up a 'Bean Investigation Agency' to explore the life-cycles of flowering plants and the conditions necessary for the germination of beans and seeds. These explorations required children to undertake detailed observational drawings and disassembly and reconstruction activities to examine the relationship between the physical

Figure 1 (Opposite) The beginnings of a Roman-Celtic willow hut, created by the children

Figure 2 Creating medicines on the site of the Roman Victory Fort at Segedunum Museum



structures and functions of flowers, their roles in pollination and fertilization and the variety of mechanisms that have evolved to enable plants to disperse their seeds.

We then gave purpose to this study, and issued a challenge to the children, prompted by the story *The tin forest* (Ward and Anderson, 2001), as part of our cross-curricular approach. The children had to construct a set of seedcases to demonstrate each seed-dispersal mechanism, and the seeds had to travel over one metre (Figure 3). The performances of each child's seeds were evaluated using pupil-designed rubrics (Box 1).

Figure 3 The children's seed-dispersal designs

Eco-friendly

One of the offshoots of the children's more independent work on plants was that they learned about photosynthesis and its essential role in supporting

Box 1 Example of the tool used by the children to evaluate their seed designs

Method of dispersal	Special adaptation	Example in nature	Testing the success of a model seed	How my seed performed		
				1. Excellent	2. Good	3. Needs to improve
Eaten by animals	colourful, juicy sweet	berries acorns	delicious, put it out for birds	eaten	curious, but not sampled	ignored
Sticking to animal fur	hooks, cling-ons	burdock	sticks to fur	squirrel puppet test, sticks to fur	sticks then falls off	does not stick to puppet
Carried by wind	spinners, parachute, fluff, pepper pot shakers	sycamore dandelions poppies	flies well	1 metre	10 cm	does not move
Carried by water	can float	coconut	floats on water	floats and moves on water currents	static	sinks
Explosion – flung away from parents	springs, catapults	pansies lupins	pings into the air	10 cm	2 cm+	Does not move

How well did my seeds perform?

	Excellent	Good	Poor
Eaten by animals			
Carried by animals			
Carried by wind			
Carried by water			
Explosion			
Other			

the diverse range of oxygen-dependent life forms on earth. Six weeks into the project I was delighted when one of my pupils, Lily, asked if the school's Eco-Council could launch a whole-school enquiry into measuring the amount of carbon dioxide each child generated on their way to and from school, using party balloons as a child-friendly measuring unit rather than carbon footprints. After researching a variety of Internet sources, they informed me that every mile travelled by car generates 30 party balloons full of carbon dioxide. The eco-councillors collected data from all pupils and then set up a display featuring interviews to express the viewpoints of polar bears and penguins, animals that are suffering the consequences of increasing carbon dioxide production on polar environments.

Project evaluation

The implementation of the project enabled staff to develop greater confidence in planning, delivering and evaluating creative teaching and learning experiences for pupils, who were observed showing a great sense of excitement and interest in the world around them (Box 2).

As a result of this work, the school was invited to become part of the Climate Change Lead Schools network, by Dr Krista McKinzey of the Science Learning Centre North East. This proactive response by pupils to the 'planet in peril' exemplifies the original aims of the revised National Curriculum for England (DfEE/QCA, 1999) that, through the study of science, children:

learn to question and discuss science-based issues that may affect their own lives, the direction of society and the future of the world. (DfES/QCA, 1999).

The Rolls-Royce funding award enabled the development of partnerships with informal learning environments to provide professional development opportunities for teaching staff. The staff improved their subject knowledge and it enriched curricular provision. These partnerships also enabled pupils to gain experience of scientific enterprises and early careers education through contact with professional scientists.

Our pupils, staff and team members were proud to take part in this unique competition. As pupil Sophie stated:

I love this project, I never want it to end: Roma Invicta.

Box 2 Creative ways in which the children communicated and quantified observations

The children had been encouraged to communicate their scientific observations using a range of methods, including:

- role-play
- science themed play-scripts
- debates
- creation of scientific poetry
- factual report writing
- biographies of ancient herbalists
- newspaper articles
- letters to scientists

They had also been encouraged to quantify their scientific observations by:

- counting
- comparing
- ordering
- measuring and recording changes over time
- tabulating data to identify patterns and emerging trends
- producing and interpreting graphs
- gathering and presenting evidence using *PowerPoint*

Acknowledgements

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Tempus Fugit: **www.tempus-fugit-educational-theatre.com**

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