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Seed Cities for Science

A COMMUNITY APPROACH FOR A SUSTAINABLE GROWTH
OF SCIENCE EDUCATION IN EUROPE

Cross-curricular Hands-on Primary Science

Science and Art





Spring 2007

Science and Art

The teachers in the Pollen Project tried out and developed activities following a day's in-service in February 2007. Each teacher took 2 of 4 possible workshops given by Rosemary Feasey and Tina Jarvis.

The workshops focused on:-

1. Creating art from observing scientific phenomena. This session included using electronic microscopes and digital cameras to capture images of physical phenomena and then recording and commenting on the images in a PowerPoint presentation.

2. Communicating observations of scientific phenomena through art such as painting, collage, printing, observational drawing and textiles.

3. Using scientific understanding of changing materials to develop art. This session included exploring materials used by artists in the past such as soil and plants. The session also considered how artists need to take account of how different types of paper, colour markers and paints react in different situations.

4. Rocks, minerals and fossils as a stimulus for artistic creation which included using different crystals, rocks and fossil samples.

During March each teacher tried out and developed at least one of the ideas introduced during the in-service with their classes. Each class was visited by Karen Stuart or June Agar who again provided an audience for the children to show their science work. This pamphlet gives a taste of some of the sessions that were observed.

Schools in first year of the Project

- Catherine Infant School
- Coleman Primary School
- Dovelands Primary School
- Heatherbrook Primary School
- Holy Cross Catholic Primary School
- Humberstone Infant School
- Linden Primary School
- Mellor Primary School
- Northfield House Primary School
- Rushey Mead Primary School
- Sacred Heart Primary School
- Scraptoft Valley Primary School
- St Joseph's Primary School
- Wolsey House Primary School

Contents

'It is hard to find today a true artist-scientist like Leonardo da Vinci, as noted for his science and engineering skills as his Mona Lisa and Last Supper.. But recently there has been an increasing awareness on the part of some artists of the heritage of scientists and vice versa'

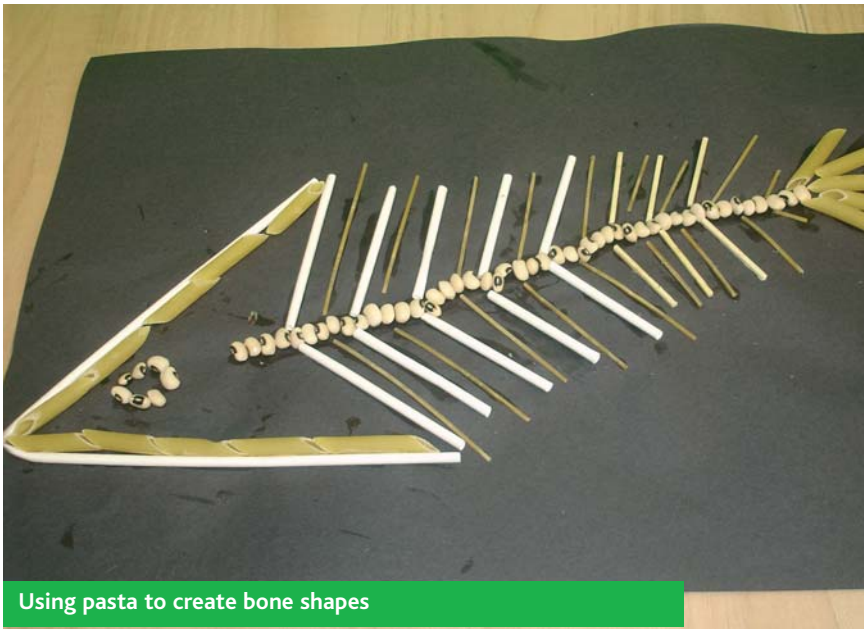
www.nature.com/nature/focus/arts

Developing observational skills and art

Observing bones and skeletons

Year 4

Year 4 classes in different schools were studying the function of skeletons. One class was given a variety of actual bones. Another class used pictures of different animal skeletons. The children observed closely and were questioned by the teachers during the activity on the shape of the bones, function of the skeleton etc. The children practiced drawing the shapes of the bones in the air with their fingers to help them focus on the different shapes. Some recorded their observations using close-up digital photography. Others made an accurate 3D model of a skull while others made close observational drawings, carefully colour-matching the pastels to the bone. Yet others reproduced the basic shapes using different pastas and seeds. The pupils became very knowledgeable and having to reproduce the skeleton led to enhanced observation and discussion. The wide range of animal skeletons available provoked discussions about how different bones were adapted to the shape of the animal and, in turn, to its environment.



Using pasta to create bone shapes

Close observational drawings...

...with careful colour matching using pastels

Observing minibeasts

Foundation 1 & 2

Foundation Stage pupils were introduced to the parts of minibeasts by using manufactured plastic insect minibeasts. The teacher encouraged the children to observe closely and discuss the body parts of the plastic insects. They then used sponge pieces, lollipop sticks, cotton buds etc. to produce a picture of the animals. They were also asked to choose appropriate coloured paper to match the background colours of the animals' patterned skin.

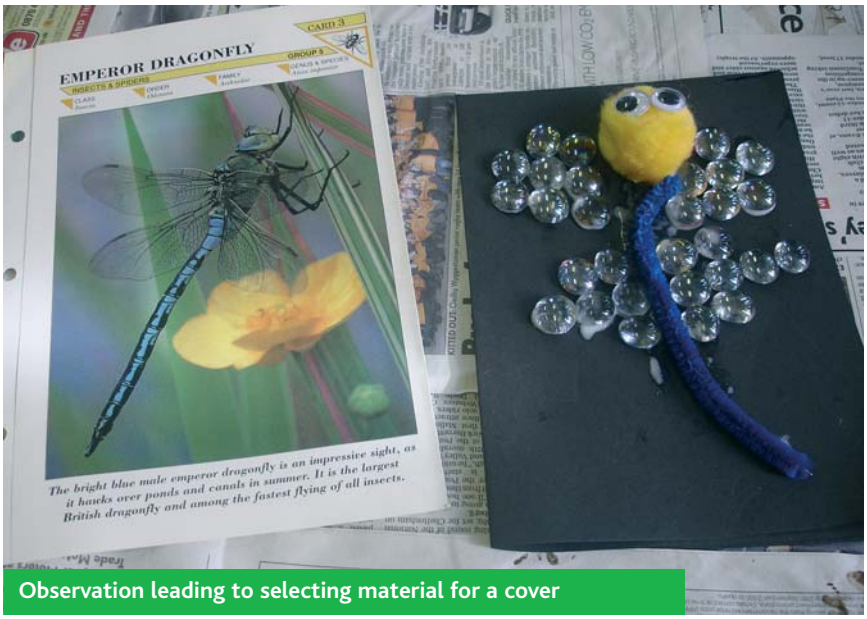
Year 3

In another school, older pupils took turns in using a digital microscope to look closely at minibeasts, which they had collected to observe and draw. Although these were mostly worms and woodlice, the pupils were impressed. The teacher also took the opportunity to discuss in detail the different habitats of the creatures. Whatever magnifying device the pupils were using, they were encouraged to look very carefully first before starting to draw. This technique enabled the pupils to notice variations both in structure and colour. For example, they found that earthworms' segments were not as regular as they appear at first sight.

Year 6

A Year 6 class also investigated minibeasts. They used their observations to design a 3D minibeast to illustrate the front cover of an information booklet. They selected the best materials for the artwork and tried to ensure that the finished minibeast models were anatomically accurate.

Using sponges to illustrate insects



Observation leading to selecting material for a cover

Observation of earthworms

Painting with a soil and egg mixture

Soil

Year 5/6

A Year 5/6 class had collected soil samples from the local area. They observed these closely and then compared them to other samples and recorded their observations. They then investigated how porous each type of soil was. Having seen the soil paintings of J. Lang, they mixed then mixed the soils with raw egg and made their own paintings with the mixture. The children were enthusiastic about the paintings and were able to talk knowledgeably about the different types of soil used.

Feathers

Foundation Stage, Year 1 & Year 2

One school had hired 10 fertile chickens' eggs to observe them hatching through to the development of the chicks' first feathers over two weeks. Part of the project included studying feathers. For example, Year 1 investigated whether large or small feathers fell faster. Year 2 children carried out a series of activities on different types of feathers, including how washing in a soapy solution affected the permeability of duck feathers, how many feathers there were in 20 grammes and using a digital microscope to look at the detailed structure of feathers. The children then designed and made feather masks, inspired by the Brazilian carnival masks they had seen and worn. Their art work also included pictures and finger prints of the chicks.

Masks inspired by Brazilian carnival masks

Looking at the detailed structure of feathers

Making science displays to practice art skills

Science displays and pictures

Year 1 & Year 5

Displays about science work enabled a number of classes to revise their science and practice artist skills. One Year 1 class produced a display about materials for the three pigs from the fairy tale. While doing this they had to justify their choice to each other, giving clear reasons why the materials would provide a defence against not only wolf attack and cold but would also give a degree of comfort. After reading 'See, hear, touch, taste, smell Big Book', a different Year 1 class produced a 3D picture of one of the sense organs. A year 5 class in a different school produced a display about the water cycle. They needed to discuss the science and terminology constantly while they selected and planned the layout.

Micro organisms

Year 6

As part of a Year 6 project on micro-organisms, the pupils used images they had found on the internet to produce a display that included a 3D image of a micro-organism using collage materials and information about the work of Edward Jenner. They also produced a DVD to illustrate their work.

Seeds

Year 3/4

After brainstorming and identifying which part of plants we eat, children in a Year 3/4 were given the task to make a flower picture using different types of edible seeds. This work was carried out as part of a topic on helping plants grow well.

Making flower pictures from edible seeds

Forces

Year 1 & Year 2

Pushes and pulls were the science focus for Year 1 and Year 2 classes in different schools. In each case the children were offered a circus of activities and encouraged to identify and discuss pushes and pulls. These included moving paint by blowing through straws; pulling card cones dipped in paint across paper; running model car tyres through liquid paint; dragging string through paint; and folding paper to make repeated patterns. One activity involved making paper snake spirals to make mobiles that would rotate in the heat above a radiator. The teacher ensured that the children were very clear about the science involved and were using the language of forces to explain their activities. They did not just get carried away with the fun of using paint.

Moving paint by blowing through straws

Looking at kaleidescope patterns

Light and reflections

Year 1

One Year 1 class looked at a series of kaleidoscope patterns, eliciting a lot of awe and wonder. They identified both the fact that light hitting mirrors created the reflected patterns and that it would not work in the dark. The teacher explained that there were three mirrors inside and showed the pupils how to make similar symmetrical patterns, from paper circles folded in half twice. The pupils then went on to create their own examples, using a variety of techniques such as cutting to produce snowflake patterns and dropping food colour onto kitchen paper to make a softer (but still kaleidoscopic) effect.

Making Mother's Day cards from dyed fabric

Investigating and using natural dyes

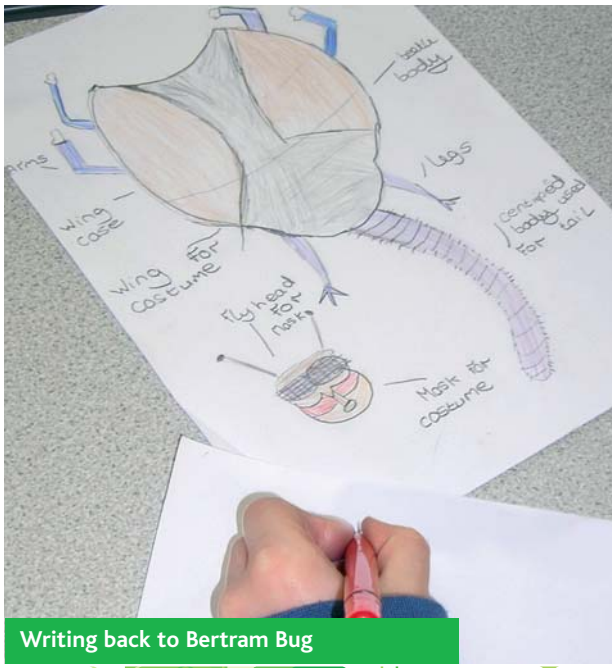
Year 2

A year 2 class investigated ways of colouring fabric that was to be used as part of creating some Mother's Day cards. The children investigated both types of dyes and how well different fabrics took the dye. They investigated natural dyes – tea, spinach, red cabbage and turmeric, but found that a commercial one performed best. They also investigated how well cotton, polyester cotton, nylon and wool took the dye. In another activity, the story of the Rainbow Fish was used as a stimulus. The children dyed paper towels with red cabbage and then cut these into fish shapes. Vinegar and bicarbonate of soda were then dripped onto the fish, changing the colour and creating a fish scale effect.

Year 6

Investigations of natural dyes was also the basis of work in a Year 6 class. A letter from Bertram Bug set the task. He was going to the Ugly Bugs' Ball and needed a costume. He stipulated that white would not match his 'bad boy' image, so the fabric needed dyeing. Pupils investigated how to extract the colour from natural substances and how they would dye the fabric. This also involved predicting what the final colour would be. Sometimes personal experience of accidents with such things as red cabbage supported the predictions. When some pupils found that green dye was very difficult to extract, they came up with the idea of mixing turmeric and red cabbage colour to create it. Although this failed, they had extended the investigation. Finally, the class wrote back to Bertram, enclosing their costume designs accompanied by advice on suitable dyes.

Investigating natural dyes



Writing back to Bertram Bug

Flicking the paint...

Mixing and changing paints

Foundation Stage 2

One class were encouraged to observe how colours of paint changed as they were mixed. The children had to flick blobs of thick paint of different colours onto a piece of paper. They then put a piece of plastic film on top of the blobs and squashed the paints together allowing them to observe how the colours changed as they mixed and later dried.

...and then squashing it

Timetable 2007-2008

2007

18th October.....10.00am - 4.00pm .....Geography and science in context of materials

29th November.....4.00pm - 6.00pm.....Magnetism and poetry/sharing practice

2008

7th February .....10.00am - 4.00pm .....PE and mathematics in the context of living things (Humans)

13th March.....4.00pm - 6.00pm .....D&T and physical processes/sharing practice

5th June .....4.00pm - 6.00pm.....Post SATs Challenge: Sound & music

Eight new city schools will join the project in 2007-2008. By July 2008 over 65 teachers will be part of the project.

Teacher's comments

'Brilliant day – lots of fun but yet stimulating and informative.'

'I enjoyed the practical elements because I could really see me using them in the classroom.'

'Rocks and Soils' is a very tedious QCA topic. So these were great ideas to help motivate the children.'

'Using the digital microscope (was most helpful) because it is hard to find time to explore new ICT products.'

'(We will) add in science/art links. As whole school long term planning is being reviewed the ideas from this project are very useful.'

'I have gained some fantastic ideas that I can't wait to try.'

Further information:
www.pollen-europa.net

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