

Introduction

When the children at Chiddingstone Primary School started learning about the Ancient Egyptians, little did they realise that they would end up helping to design and make an interactive display about the Ancient Egyptians and the Pyramids which would not only be open to the public, but also attract interest from history advisors and British Museum staff!

A number of factors combined to bring this about. Local architect and parent Annette Hards had attended a course run by The Building Experiences Trust in December 1995, which was designed to provide training and support for volunteer architects and designers to work in schools encouraging teachers to use the built environment as a learning tool. Following a discussion in January 1996 with the headteacher, Margaret Cooke, it was agreed that they would work together on Class 4's (upper juniors) forthcoming history topic about Ancient Egypt.

Researching the topic

Annette considered that the most obvious built form associated with Ancient Egypt was the pyramid and that the keys to answering the questions as to when, where, how and why they were built lay in finding out about the kind of society that existed in Ancient Egypt. This became the starting point for the lessons. In the first three sessions small groups of children each researched different aspects of life in Ancient Egypt, such as clothing, food, homes, games etc. and reported their findings to the rest of the class, so that an overall picture of Ancient Egyptian society could be formed.

During the research stage Annette accompanied a small group of children on a visit to neighbouring Chiddingstone Castle to look at their collection of Ancient Egyptian artefacts. Following on from the discussions between Annette and Margaret as to how the children might present both the research and the forthcoming work on pyramids, the idea evolved of putting together an interactive display at the Castle on aspects of Ancient Egypt. The Castle is often visited by primary school parties, mainly to view the Ancient Egyptian collection, and it was felt

that a 'hands-on' type of display would offer a complementary and stimulating experience for visitors, quite apart from the valuable design and technology exercise it would provide for the Chiddingstone children. The Castle trustees agreed that a display, some time in June or July, could be located in a basement area in the Castle, which was generally only used at Christmas.

Shortly before the Easter holidays, a small group of Year 6 children accompanied Annette to carry out a measured survey of the basement area and take photographs. As a starting point Annette made a scale model of the basement area which could be used in class discussions, together with some photographs, to help those pupils who hadn't had the opportunity to see the space for themselves. The Year 6 'surveyors' described to the rest of the class the problems that they had identified which would need to be overcome before the basement could house the planned interactive display. The dampness and unevenness of the walls meant that any display material would need to be attached to screens or boards. The existing limited lighting would need to be supplemented. The access to the basement and the unevenness of the floors were flagged as safety issues.

Display ideas

Once Annette was satisfied that the practical problems could be overcome, the class were asked to think about possible display ideas. To get the children thinking along the right lines, Annette described to the class the ideas that she and Mrs Cooke already had in mind for the display. She highlighted how the ideas related to work the class had already done about Ancient Egypt, and the ways in which visitors to the display might 'interact' with the displays. The class also had to bear in mind that their displays would need to be suitable for either mounting on the screens, or being placed on either a table or the floor, and that there was a limited amount of space for the entire exhibition. The whole concept of 9, 10 and 11 year olds designing and making an interactive display based on Ancient Egypt was, with hindsight, quite ambitious but Mrs Cooke's confidence that the children would rise to such a challenge was well founded.

**Annette Hards,
RIBA**

Designing the exhibition layout

The first lesson after the Easter holidays was spent drawing together all the information that was needed to design a preliminary layout for the exhibition in the basement. The class looked at the model and the photographs of the basement again. Annette described to the class the screens that they were borrowing, and described, with the aid of some models of the screens, how the screens needed to be hinged to each other before they would stand up.

A checklist listing all the proposed display ideas was handed out to the class. As Annette went through the list with the class, each class member had to fill in the checklist with

- information about which pupils were doing which display
- how many screens, tables etc. were estimated to be needed for each display item.

This enabled an estimate to be made of the total number of screens, tables and floor spaces that were likely to be needed.

A second handout showed a scale plan of the basement area, together with the elevations of each of the four walls of the basement area. The scale of this plan was different to the scale of the model, which provided the opportunity to talk about scales. The two different ways of showing a scale were discussed: a drawn bar scale and a written scale. To try and ensure that the class understood the plans and elevations, they were asked to mark them up, labelling items such as the entrance, the window and the niches.

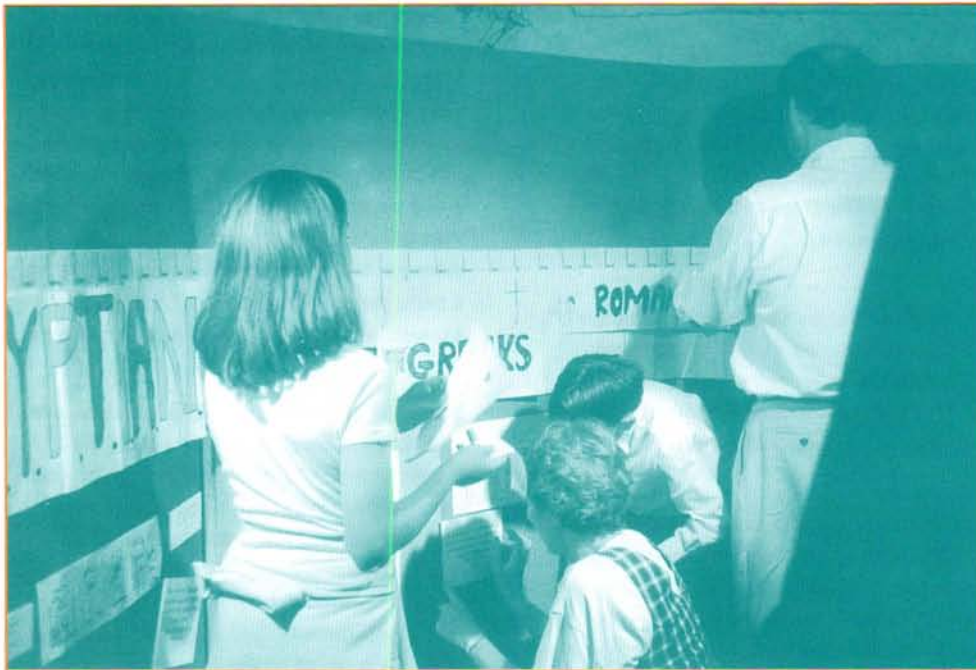
A third handout showed a plan and elevation of one of the screens, and described how the screens did not have any 'feet', and needed to be fixed together in order to stand up. The handout asked the pupils to illustrate how they thought the screens might be joined together so that they would stand up safely.

The bottom third of the handout showed plans of the screens and a number of tables etc. to the same scale as the basement plan. The class were asked to colour in the shapes and then cut them out, so that they could arrange them on the basement plan to create a layout for the display. Once they had arrived at a layout which they were happy with, the shapes could be glued into place. This task was allocated as their homework, and it was emphasised that they shouldn't be worried that they might not get the layout 'right' and that indeed there was no such thing as a right layout. It was possible that each pupil could design a different layout, and they might all work equally well! Annette stressed to the class that it was important that they had a go at this exercise, even if they found it hard. The youngest children (Year 4) in the class did find this exercise difficult, but the older children produced some very well thought through layouts, which showed that they had been able to look at a wide range of information, (the plans of both the basement and the screens and tables etc., the checklist of displays and their spatial requirements, the way in which the screens needed to be fixed together, how the displays with the same theme might be grouped together etc.) and sort out how to use this information to create a coherent layout.

Preparing the displays

The children worked mostly in pairs preparing prototypes for their display ideas. Although Annette had an overall vision of how the display would evolve, much of the detail design was worked out with the children trying out ideas – real design and technology in action. A list of materials needed that couldn't be found in school was circulated to parents, and a local company, Colour Processing Laboratories Ltd, supplied offcuts of medium density fibreboard (MDF) and foam-core board which formed the basis for a number of the displays. The total cost of mounting the display, in terms of materials which had to be purchased specifically, was less than £10.

The making of the displays was mostly carried out in lesson time, with varying degrees of adult support. Each group had to decide on a title for their display, and draft a set of instructions to explain how visitors



Setting the historical context

were to interact with their display. It was decided that all the writing within the display would be printed in the same typeface, to create a more professional look. Annette produced samples of a range of typefaces for the class to vote on, and was pleased to find that the majority of the class chose the typeface that she would have selected herself, 'Comic Sans MS' in Lotus Ami Pro.

By the second week of June the display material was ready to be set up in the basement at the Castle and during that week the damp dark 'dungeon' metamorphosed into a bright and colourful interactive display. Many of the display ideas have to be both seen and done in order to be fully appreciated, but to give you a flavour, here is a brief description of some of the displays.

The displays

The first display sets Ancient Egypt in its historical context. A large timeline stretches across three screens covering from 2500 BC to the present day. The timeline is made of cream cotton fabric and has a number of hooks sewn onto it. In a pocket close to the timeline there are a number of plastic covered pictures illustrating different historical periods, which should be familiar to Key Stage 2 pupils – 'The Roman Empire', 'The Ancient Greeks', 'The Vikings', 'The Tudors', 'The Victorians' and of course,

'The Ancient Egyptians'. These pictures are hooked by the visitor onto the timeline, hopefully in the right place!

The pupils who worked on this display had to work out how long their timeline needed to be together with an appropriate scale, what materials might be appropriate for each of the timeline and the 'events', which would withstand being handled, and how they would attach the events to the timeline, testing out Velcro, hooks and eyes, and rings. These activities can be readily identified within the design and technology programme of study, incorporating all the aspects of designing skills. The making activity associated with this display similarly corresponds to the skills which should be developing at Key Stage 2 in design and technology.

Everyday life

A series of displays illustrate everyday life in Ancient Egypt:

- Two pupils made clay models based on the tomb models of houses displayed in the British Museum.
- Ancient Egyptian clothing is illustrated by some dolls who have to be dressed in outfits created by two pupils.

- There is a small basket full of pictures of different foods familiar to us all – the visitor has to decide which of these foods were eaten in Ancient Egyptian times – some are obvious, but some are not. A checklist can be consulted when the visitor has completed his food sorting activity.
- Another display consists of a number of toys and games made by four pupils, based on some of the actual Ancient Egyptian toys and games which can be seen in the British Museum.

The four displays described above involved a wide range of making skills. In each case the pupils needed to consider how they could communicate information about a particular aspect of Ancient Egyptian life in a way that would be interesting to other children of a similar age. For the clothing display, the pupils originally wanted to make full size clothing for visitors to try on, but realised that such a project would be too ambitious in the time allowed, and so had to consider how else they could illustrate Ancient Egyptian clothing, coming up with the idea of using dolls.

One of the toys made was based on a 'Snake game' which is in the British Museum. It consists of a circular clay tablet with indentations around which, it is assumed, game pieces are moved. Having made the game board, the pupils 'invented' some rules for the game, and created their own design for clay game pieces. So, although these displays were created using a wide range of materials, all the pupils worked through a common design process.

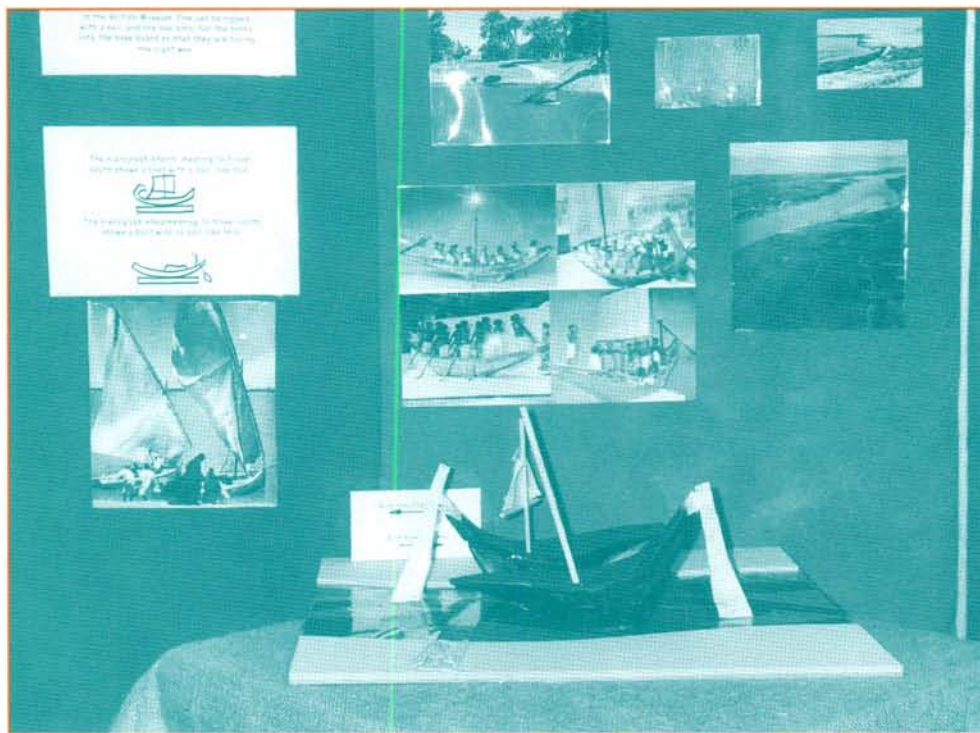
The least interactive of all the displays were probably the clay houses based on the British Museum tomb models. Their creators were so proud of what they had achieved that they weren't keen on the idea of their models being handled and possibly broken. They discussed how they might address this lack of interactivity, and suggested that there could be a pot of plasticine available for other children to have a go at making their own version.

Boats

A display consisting of two models of boats, again based on the tomb models of boats in the British Museum, illustrates how the Ancient Egyptians travelled northwards along the Nile using oars to take advantage of the river's current, and then used sail power to exploit the prevailing winds

Some pupils made clay models of houses



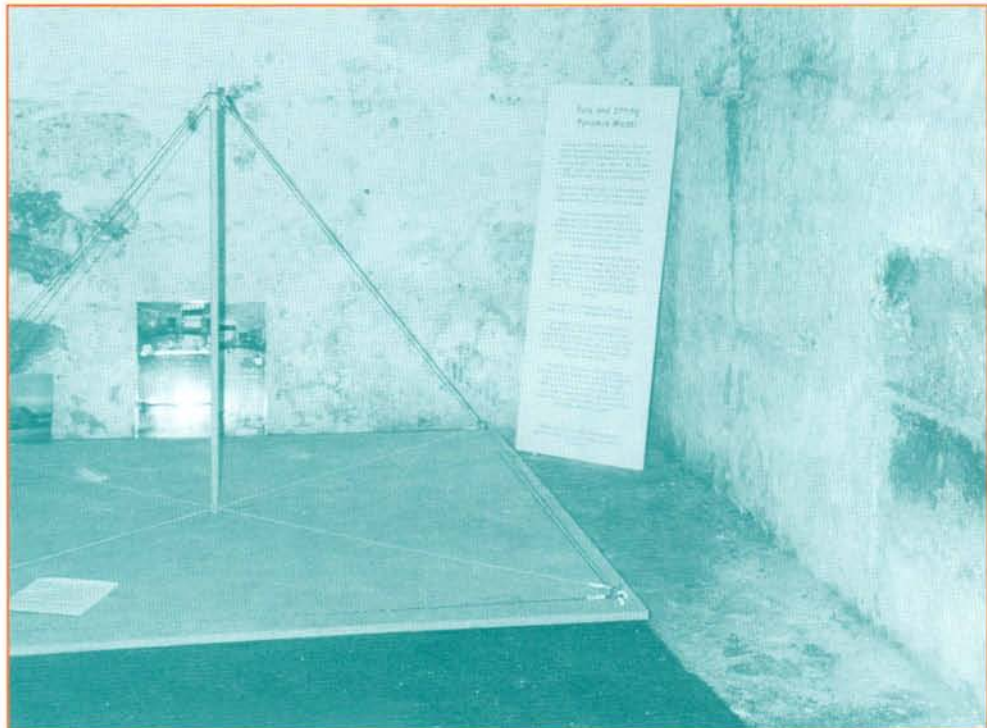
*Travelling the Nile*

blowing off the Mediterranean to travel southwards against the current. The pupils working on this display studied photographs of tomb models of boats from the British Museum, before deciding how they would make their own versions of such craft. They identified the problem of the boats needing to be able to withstand being handled, and of making the rigging for the boats interchangeable. Prototype boat shapes

were made from cardboard, and after consideration of a number of possible ways of reinforcing them, the pupils decided to use the cardboard models as a permanent mould, and fill them with Plaster of Paris. The masts were wrapped in waxed paper and inserted before the plaster set. Once the plaster was hard, the masts could be put in and taken out easily. The whole designing and making process involved in creating this

*The hieroglyphics display*

A scale model of a Pyramid was made with some MDF, a pole and some string



display can be clearly related to the designing and making skills identified in design and technology at Key Stage 2.

Hieroglyphics

A number of pupils wanted to produce a display about hieroglyphics. Three pupils decided to make a set of cards each showing a hieroglyph, and its nearest equivalent letter from our alphabet. They liked the idea of being able to see what their name or other familiar word would look like 'translated' into Ancient Egyptian. They realised that their cards would need to cope with a lot of handling, and decided to make them from rectangles of foam board, light but rigid, covered with clear book covering film. Rather than place these cards on a table where they would inevitably end up on the floor, they decided to use Velcro on the back of them so that they could be 'stuck' onto the screens. This 'formula' of plastic coated foam board cards which could be attached to the screens with Velcro was adopted by several groups, and was found to work very well in practice. To complement the hieroglyphic cards, two pupils made a Visitors' Book, so that people could sign themselves both with their name, and its hieroglyphic version. Another pupil made a set of matching cards, jigsaw-style, each with a word and its hieroglyphic equivalent. These ideas came from the pupils

themselves, and they got a tremendous sense of achievement from seeing their germs of ideas develop into fully fledged items on display to the public.

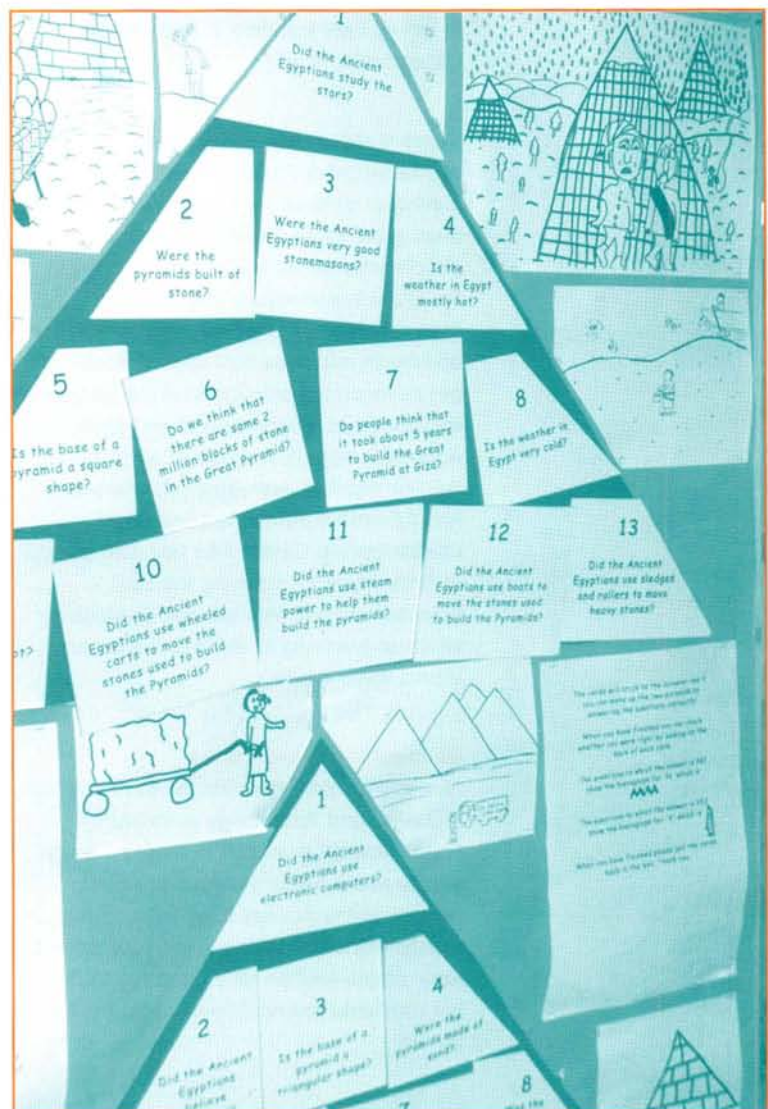
The Pyramids

The final group of displays is concerned with the Pyramids. During the series of lessons about the Pyramids, Annette had wanted to find a way of showing the class just how huge the Great Pyramid at Giza is. Looking at photographs just doesn't convey the scale of the edifice. She worked out that a scale model of the Great Pyramid to the same scale as that of a LEGO person would need to have a base square with sides 5.2m long and that the apex of the pyramid would be 3.3m high. How could such a three-dimensional outline be created? The answer was with a 3.3m long pole and some 40m of coloured string! Four 5.2m lengths of blue string were joined with brass curtain rings to form the base square, the ring at each corner of the square being held by one of the pupils. Two lengths of yellow string each about 7.3m long form the diagonals of the base square. They are used to check that the square is true, and also give us the location of the pole where they cross. All good maths revision! The pole is held upright carefully by two or three reliable pupils. Four lengths of red string, each about 4.95m, long have been joined to a

single brass ring which is attached to the top of the pole. These red strings then form the 'edges' of the triangular faces of the pyramid model running from the pyramid apex at the top of the pole, down to the rings at the corners of the base square. When the LEGO man is then placed on the floor next to the pole and string model, everyone can get a feeling of just how vast the Great Pyramid really is. This exercise inspired some very interesting questions from the class, not all of which can be adequately answered, which in itself is a valuable historical lesson.

The lack of space and headroom in the basement meant that this particular pole and string pyramid could not be recreated within the display area, but a couple of the pupils wanted to make a smaller version of the model. This is mounted on base board about 115cm square, with a pole about 69cm long. When the visitors have assembled the pyramid, the display instructions invite them to guess how big a person would be to be to scale with the model. The answer is about 8mm high!

The pupils who designed and made the pole and string pyramid started knowing that their display needed a square board, a pole, and some lengths of string. The problems that they needed to solve included: how large a square board can be readily obtained, and what material could it be made of? How could the strings be attached to the board, and to the pole, in such a way as to be readily demountable? The scaling down of the LEGO scale pyramid involved fairly straightforward maths with a calculator. They considered various different board materials, finally choosing MDF as a material which could be screwed into easily, would be splinter-free, and wouldn't be unduly affected by the damp floor on which it would be placed. Cup hooks were screwed into the base for attaching the strings which defined the base square and diagonals. The four strings defining the 'faces' of the pyramid were connected to a ring which fitted onto the top of the pole. Once connected to the four cup hooks, the pole was held firmly in place by the strings. Designing, making and evaluating this display gave the pupils the opportunity to cover all aspects of the Key Stage 2 design and technology curriculum.



Another pyramid-related display involves a set of 26 cards. On each card is a question about Ancient Egypt or the Great Pyramid. The correct answer to 13 of the questions is Yes and to the other 13 questions is No. Each set of 13 cards fits together like the blocks of stone in a pyramid shape, and the Velcro backed cards can be attached to the fabric covered screens. Visitors to the display are invited to make up the two 'Yes' and 'No' pyramid shapes by correctly answering the questions on the cards. They can check whether they have answered the questions correctly at the end by looking on the back of each card, before they put the cards back in the box for the next visitor. This display also features some imaginative line drawings by the children. One particular question card asks 'Is the weather in Egypt generally cold?' and this question has prompted a delightful drawing of Egyptians

Testing visitors' knowledge of Ancient Egypt

in woolly hats standing in front of snow-capped pyramids!

There is a coordinated leaflet and poster to accompany the display in which the individual children responsible for each display are listed and the various other people who helped to bring the display to life are acknowledged. The children themselves are extremely pleased with the end result and hope that other children will get as much fun learning from the display as they did from designing and making it. Annette is hoping that part or all of the display might be recreated professionally and become a permanent feature at Chiddingstone Castle. She has also got lots of other ideas for weaving the Built Environment into the National Curriculum which she intends to develop if she can attract some funding.

National Curriculum links

How did the project relate to the Key Stage 2 Design and Technology curriculum?

Pupils worked in groups to devise a range of interactive exhibits based on work in History on the Ancient Egyptians. Some groups worked together to produce a single item, others worked on a common theme but produced individual work. (1a, 1b, 2a, 2b, 2c)

Although each of the displays was quite different, all pupils worked within a common 'design process' framework. For each display, pupils, through discussions with staff and amongst themselves, started by considering how a visitor to the display would interact with their display. Having decided how the display might 'work' they then considered what materials would be appropriate for their display, worked up prototype ideas, which sometimes then led to either the materials or ideas being modified. They assessed which tools and skills would be needed, and where necessary sought 'expert' assistance. Wherever possible the actual making was done by the pupils, but the need to get the display finished and 'open to the public' meant that some finishing off was carried out by adults. (3a, 3b, 3c, 3d, 3e, 3f, 3g, 4a, 4b, 4c, 4d, 4e)

Once the display was complete, all pupils were asked to evaluate both their own, and at least one other display, by completing evaluation sheets. (3g, 4f, 4g)

How did the project address the issues of literacy and numeracy?

The whole project provided many opportunities for pupils to discuss and share ideas – the class, mostly Years 5 and 6, plus three Year 4's, came together on many occasions to discuss issues such as their initial display ideas, why they were making a display when the Castle already had its own display of Ancient Egyptian artefacts, whether the displays should use a common typeface, and if so, which one should be used etc.

Throughout the designing and making of the displays the pupils needed to be able to communicate their ideas, sometimes through talking, sometimes in writing. Each group was asked to devise 'instructions' for the visitor to their display, which proved a challenging task. Evaluation of the displays was done through initial discussions followed up by written assessments.

The early stages of the project which involved the whole class looking at Timelines, and the scale and geometry of the Pyramids called for the application of their mathematical skills, and a space planning exercise considering how the display could be fitted into the basement area also exercised a range of mathematical skills: Using and Applying Mathematics, Number, and Shape, Space and Measures.