

## Abstract

This study took place in a reception class in a small, one form entry primary school in Penge. Due to the fact that the school has no on-site nursery, the children in the class have had very varied pre-school experiences, ranging from no pre-school experience at all to attending full-time at a school nursery elsewhere. There are currently 16 children in the class, all of whom had been in school for a maximum of eight weeks at the start of the unit of work titled 'Designing and making a party bag'.

## Planning in the school

The school has adopted the Qualifications and Curriculum Authority (QCA) scheme of work for design and technology and this has replaced any existing schemes of work in the school (QCA 1998). The planning in reception is based on the Foundation Stage early learning goals and is therefore not included in the QCA scheme (QCA 2000). In order to provide the children in the school with a 'well-planned and resourced curriculum to take their learning forward' (QCA 2000), I adapted the existing planning, which was available when I started at the school, and have been reviewing and revising it since.

## Planning in reception

Design and technology in reception covers many of the early learning goals (QCA 2000). Within the area of 'Knowledge and Understanding of the World' it relates to: 1. 'to build and construct with a wide range of objects, selecting appropriate resources, and adapting their work where necessary' and 2. 'to select the tools and techniques they need to shape, assemble and join the materials they are using'. Design and technology is also included in other areas of the foundation curriculum, for example: Physical Development – 'to handle tools, objects, construction and malleable materials safely and with increasing control' and Creative Development – 'to express and communicate their ideas, thoughts and feelings by using a widening range of materials, suitable tools, designing and making' (QCA, 2000). Many design and technology activities also relate to various personal and social goals, which will be discussed in more detail later on.

## Existing planning for autumn term two

When planning in reception it was the intention to keep a topic-based approach to teaching. Makiya and Rogers (1992) conclude that using this approach is crucial to the success of introducing design and technology. In order to cover the early learning goals, Foundation Stage Guidance (QCA, 2000)

describe how activities need to be diverse and challenging and teaching should involve a variety of styles. This is achieved through a number of different activities, planned under broad topic headings.

The topic for the half-term was 'Celebrations'. As well as looking at the obvious celebration of Christmas, celebrations from other religions are talked about, and the theme of birthdays has a strong thread in the planning. The role-play area in the classroom is set up as a birthday party to provide opportunities for imaginative play and language development.

## Adapting existing planning to accommodate a design and technology unit of work

In order to tie the unit in with the existing topic, the activity was based around something most of the children have some experience of – birthday parties. Even those children in the class with little personal experience of birthday parties were able to experience a simulated birthday party in the role-play area and, through interacting with the other children, have an idea of what a birthday party is like.

Through my own experience I have found that young children are very impressed by the giving of party bags to guests after a birthday party. This led me to think of how this motivating topic could provide a starting point for a design and technology activity.

## Children's previous experience of design and technology

The practical joining and making skills that children learn in reception are very basic ones, but ones that are essential to their development further on in the school (OFSTED 1997). Some children come to school being very proficient in cutting and sticking, whereas other children have very little or no experience of using scissors or glue or other joining methods. Thus, one of the important goals in reception is to ensure all children are able to carry out these skills independently.

Before coming to school the children may also have had different experiences with designing. Makiya and Rogers (1992) have described how designing for young children can be thinking of possible solutions to a problem or a challenge. An example may be designing a vehicle that will move a teddy along using different materials. The design may consist of a teacher-led idea or a verbal description but this reflects the early stages of designing. A problem with having no on-site nursery is that it is very hard to know what opportunities the children have been given for both designing and evaluating in their pre-

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school settings. Throughout the reception year all the children need to be introduced to different areas of design and technology, such as thinking about characteristics of existing products and how we can design new ones.

The design and technology carried out in the previous term included many construction activities using construction toys such as Lego. The children also experienced a great deal of cutting and sticking activities in other areas of the curriculum, i.e. cutting and matching shapes in maths. As yet the children have had no experience in school of focused evaluating or designing.

### **Planning a unit of work based on existing planning and past experience**

The planning for design and technology during this term in the last two years has been more related to making things for Christmas. I am very much aware that at this point in the year my design and technology activities are predominantly teacher-assisted and the children have limited opportunities to actually design and make anything that has not been prescribed by me.

As a result, the unit of work prepared by me for this half-term was planned in order that at the end of the unit the children would produce an independent piece of work developed during a design and make activity (DMA). I wanted to see what the children were able to produce at such a young age and explore the issues that arose from the task.

In order to prepare the children with enough knowledge and skills to complete the DMA, I planned a series of sessions, each varying in length to prepare the children to make a party bag. The five sessions were carried out over a four-week period during the autumn term.

### **SESSION OVERVIEWS**

#### **Session one – looking at and talking about different bags**

As a whole class we sat in a circle and passed around a wide variety of different bags. We talked about what the bag was used for, what it was made of, and how it was joined together. This was an opportunity for the children to begin to consider different aspects of design – the purpose of the object, and how it was made and why.

#### **Session two – focused practical task**

Firstly, I demonstrated different ways of joining material (i.e. stapling, blu tacking etc.) and we briefly talked about which ones worked best and why. Then I demonstrated in front of the class how to cut and join a paper template to make a bag. The children then attempted to make their own template bag. The learning outcomes for this session were

mainly practical ones – to experience different methods of joining and develop joining skills.

#### **Session three – looking at party bags**

We now focused on looking at different party bags and asking questions, such as ‘How are these bags different from the other bags we looked at?’ and ‘What features about this bag make you want to have one?’ As a class, we talked about issues of colour, design, shape, and what we put in it! We ended the session by each child drawing a picture of a party bag that they would like to be given. Again, the focus of this session was to consider and evaluate attributes of familiar objects through asking questions and discussion.

#### **Session four – DMA activity**

The children were then given the opportunity to make their own party bag. The criteria to be followed were for the bag to be: 1. bright and colourful and 2. able to hold a small bar of chocolate and a piece of cake. The children were given access to a wide variety of different materials and joining materials. The main focus of this session was to develop both designing and making skills by expressing and communicating their ideas through designing and making and also selecting the tools and techniques needed to shape, assemble, and join the materials used.

#### **Session five – evaluating and testing the bags**

Kimbell et al (1996) describe how, even when doing DMA tasks with young children, it is important to allow time to compare the finished products with the original design criteria. In this session we focused on how successful our bag making had been. Each child showed us their bag and we talked about how colourful it was. Then we had a testing session whereby I put the items into the bag to see if they would fit and if the bag was strong enough to hold them! If it was, then the children took their bag and goodies home. If it hadn't been, it would have been a good opportunity to discuss why, but all the bags held in the testing session so the issue did not arise. The main focus of this session was to share and commend everyone's efforts and to develop evaluative skills by asking how successful each bag had been and why.

#### **Other adults in the classroom**

During the practical sessions I put my classroom assistant with my special educational needs group. The needs of this group varied. One child had previously been identified as having poor motor control and delayed development in many areas and is on a statement. The adult was there to advise and help as needed in all areas of the activity, as specified on his individual education plan. The other children had displayed difficulty in

working on a task for a long period of time, leaving the task unfinished, so the adult was there to encourage and motivate and keep them on task.

### Findings

#### Timing

The whole unit of work was very time-intensive, especially as it coincided with the Christmas activities that occur at school. This has implications for carrying out the activity with a full class of 30 children. Having an adult with my special educational needs group, I found I did manage to get round and speak to each child individually about their bags but I feel that if I had had 30 children this would have been very difficult. A rotating group organisation for a larger group may work better as it would ensure that the children received sufficient time with an adult to help if they needed it.

#### Resources

Cohen and Manion (1996) emphasise that the availability and use of resources is an important factor influencing children's learning. I had to carefully consider the resources I used throughout the unit. During session one the resources were varied and many were very different. I felt that this was appropriate as it highlighted clearly the differences in the various bags and different issues to look for, such as the size of the bag, whether it had handles, the colour, and so on.

I found the issue of a small class equally important when it came to resources. Again, with a small group the resources were sufficient but with a larger group the children would have been limited in what they could do at one time due to sharing too few appropriate resources. The resources for this activity were also quite expensive as the wrapping paper that I made available was a popular choice. A possible reason for this would be that, at this stage in their development, children find it hard to produce drawings that they are happy with. Cox (1990) describes how children often say things like 'I can't make it look right' when drawing. This worry was eliminated by choosing pre-drawn paper. During the DMA, when deciding which paper to use, Aaron chose pre-drawn characters and explained 'I couldn't draw pictures like that, they are 'proper' pictures from the shop'. Martyn announced that his paper 'will make it have lots of colour', showing that the children were aware of the objectives and the importance of following them. Thinking of implications for resourcing however, to have enough bright and colourful paper available for 30 children could be quite expensive!

### Motivation

The motivation factor for this unit of work was terrific! The thought of the end product containing sweets and cake provided enthusiasm right from the start of the project. This, I feel, was very important as Holt (1997) suggests that children will pay more attention and concentrate more during activities that they are interested in. I also felt the children could relate the project to what they had experienced in real life; Kimbell et al (1991) suggest that this will make learning more effective. Indeed, there was a real sense of purpose and each child knew what they were doing and why. This was reflected in some of the children's observations:

'If I make a big bag, there will be room for more sweets.' (Martyn)

'This bag is bigger than the one I had before.' (Jordan)

From listening to these and other children's comments, it became clear that the motivational factor was an important one in helping them keep the specified criteria in mind when working.

### Evaluation

#### Children's ability

Some of the children were kind enough to return their bags to me after the final session. I was pleasantly surprised at the high level of attainment of the majority of the class. Through a number of case studies, Makiya and Rogers (1992) have provided examples of how, even at a young age, children are able to formulate an idea and carry out the process of developing and refining their idea using appropriate resources and receiving focused, direct teaching. From viewing the video evidence and looking at the finished product, the main activity has supported the findings of Makiya and Rogers (1992) as the work carried out by the children has provided evidence that young children can produce a good quality piece of design and technology work.

#### Questioning

I was aware that one of the issues relating to design and technology in primary schools was that of questioning. In OFSTED reports (1996, 1997 and 1998), the use of poor questioning in design and technology was noted. A review of publications (Ritchie, 1995; Siraj-Blatchford and Macleod-Brudenell, 1999; Jarvis, 1993) relating to design and technology showed that few contain references to the importance and effectiveness of questioning, whilst those relating to science emphasise its importance (Johnston, 1996; Max de Boo, 2000; Harlen, 1992). Consequently, one of the learning objectives for this unit was to develop design

and technology questioning and encourage questions such as ‘Who uses this product?’, ‘How are they going to use it?’, and ‘How is it made?’. Craft (1997) suggests that when developing children’s questioning skills the first step is to ask them open questions which are related to what the children are thinking about. During session one the majority of the questions were prompted by me in an attempt to encourage the children to think about why each bag had certain characteristics. During the session I did find that the children found it hard to volunteer questions that you might ask about the bags we were studying. I feel this was due to inexperience rather than a reluctance to talk, which suggests that the children had previously had very little input in design and technology questioning in their pre-school setting.

Rogers (2002) uses two examples of infant teachers who were able to develop the children’s questioning skills through carrying out evaluative activities on existing products. They found that, although each activity needed little in terms of material resources, the experiences gained by the children were invaluable in their experience of questioning design. Their findings suggest that young children *can* be competent at evaluating products. This has implications for future work with the children. Using existing products in future design and technology sessions and building on the questioning experienced when talking about the different bags should help develop the questioning skills of the children in my class.

In contrast to their limited ability to ask questions at this stage, the children were able to talk confidently and concisely in their answers to my questions. They possibly found it easier doing this because they were familiar with what most of the bags are generally used for. We started with a Tesco carrier bag and most recognised it as being a bag their mother or grandmother used when she went shopping. Some children were already beginning to formulate ideas about similarities with other bags they had seen: ‘my mum gets those from Costcutter but it has green on’ (Chelsea). We then moved on to introducing the other bags. The children had some fantastic ideas for what actually goes in some of the bags – including a bag from a pet shop with a picture of a fish that could be used for transporting fish! The children also had strong ideas about how the bags were made:

‘You cut a square, draw a cookie on it, then tie the back on.’  
 ‘How?’  
 ‘Glue.’ (Macauley describing how to make a cookie bag.)

‘How is the handle connected?’

‘They made a hole, put string through, then tied a knot.’

‘You cut it into rectangles, then put some tape on the bottom to help it not to open.’ (Eve describing how a pick ‘n’ mix sweet bag is made.)

Eve’s explanation led into a discussion about why objects stay in the bag. We had a great time putting a car into a bag with no join at the bottom. As well as the children finding it very funny, the intention was that they would recognise the importance of joining the bag correctly at the bottom. As none of the final bags had any trouble holding the items, this suggests that this was indeed the case.

### Differentiation

It was apparent, as with many subjects, that there was a wide range in ability. Even at this age, some children knew exactly what they wanted to do and how they would do it, while others found the task more difficult, both in the thinking of something to do and the physical making of the bag, and needed some adult intervention. However, with encouragement and with some prompting questions, these children were able to produce a piece of work that they were satisfied with.

Makiya and Rogers (1992) found that the understanding of concepts embedded in designing and making are acquired by children continuously engaging in design and technology activities. For many of the children in the class, this was the first time they had participated in a design and technology activity so they were meeting many concepts for the first time. A lack of previous experience may therefore explain some of the mistakes made by the children. An example was that Chelsea knew she wanted a ribbon handle and knew she wanted it connected with glue but put the glue all along the strip so that it just stuck together. This indicated a lack of experience in joining, as well as an inability to think two steps ahead as to what would happen to her handle when she actually tried to attach it. Problems could also be due to motor skills being more developed in some children. Some children, for example, found the end of the sellotape independently whereas others struggled to no avail! In order to make the practical parts of the joining easier for the less confident children in future sessions, items such as sellotape on a reel could be used to save time and prevent some of the frustrations that arose.

An issue that did arise from the session, that I need to consider carefully, is extending the able children. All the children were able to make a bag, with varying levels of help, but the main activity demonstrated that some of the children are very able in design and

make activities even at a young age. I need to consider how I could have extended the able children and think about possible challenges I could set. I feel that at this early stage in their school development, the extension work needs to come after this unit of work, as proficient children may not be identified until during the activity. In this case, for example, although Aaron proved to be competent when joining materials in the focused practical task, I did not know if he would perform as well in a task that was not prescribed by me, where he may have had problems thinking of his own original idea. As it was, he managed extremely well but I don't think that in the DMA, Aaron could have improved his bag any further after he had made it. On a similar unit of work however, I would now know that Aaron would need extending. I could do this by giving him more criteria at the beginning of the task or limiting his resources (i.e. not letting him have a stapler, which was his preferred method of joining) to see how well he managed then. This unit of work provided very informative assessment material, on which I can base my decisions when I carry out my next design and technology task.

#### **Links to personal and social development**

Ritchie (1995) suggests that design and technology should involve children working together on a task and teachers should actively encourage this. I was extremely pleased to observe on the video a number of examples of children helping other children in small ways (for example, Aaron helped Sophie press down on the stapler hard enough for it work) and the children shared really well (an example being Jordan asking 'Can I use the sellotape?'). There is evidence to suggest that, even without direct encouragement by the teacher, children will co-operate and help each other at this early age. The design and technology unit was therefore also helping the children achieve a number of early learning goals relating to the area of personal and social development, in particular developing the skills of 'being confident to try new activities', 'initiate ideas and speak in a familiar group', 'working as part of a group or class, taking turns and sharing fairly' and also 'to be able to select and use activities and resources independently' (QCA, 2000).

#### **Children as 'designers'**

Jarvis (1993) describes how children begin evaluating by first using significant criteria and then moving on to more complex, detailed evaluations. They suggest that as children develop their evaluative skills, their ability to fulfil specified design criteria for their own work also improves. I limited the specified

criteria for the DMA to two very significant criteria: bright and colourful and able to hold cake and sweets. During the evaluating sessions the children were asked whether each bag fulfilled the criteria. The final result was that the children were able to evaluate using the two criteria and all the bags did fulfil the criteria, showing that having two criteria is a suitable expectation that young children can work to.

The poor development of designing skills is highlighted in every OFSTED report from 1990–2001. Commentary reveals that very often children are asked to draw a picture of the product they will make without really understanding the task and, at this stage in their development, the children in my class may not have the knowledge about the product, the materials and the tools to design effectively.

Hope (2001) suggests that young children see the drawing and the making as two unrelated activities only linked by subject matter. With this in mind, although I did ask the children to draw a party bag, the majority of the class were not given back their drawings and were left to adapt their bags as they went along. However, in order to find out more about the children's designing, I gave three of the children their original bags back and gave them the option of using their drawing to help them make a bag. I found that the links between the drawn bag and the actual bag were very few and often accidental (i.e. Chelsea had writing on her original plan and also had writing on her finished product, although it was part of the paper she used and not her own writing). Chelsea claims that this was because she knew she wanted Barbie and didn't need to look at her picture. Other reasons for this included forgetting about the handle on the bag: 'I forgot to draw a handle and I need one now' (Thahira) and the original drawing not being the correct size: 'My drawing is too small' (Macauley). This would support the findings of OFSTED (1999–2000) that suggest that the children's knowledge and understanding of designing is not yet sufficiently developed to allow them to draw and annotate a realistic design that they can utilise at the making stage.

#### **Children as 'joiners'**

Siraj-Blatchford and MacLeod-Brudenell (1999) describe how tools used in design and technology, such as scissors and hacksaws, are reliant on the child having fine motor skills, which they claim develop with experience. Previous to this unit of work, the children in the class had relatively little experience of tools other than scissors. It was interesting to observe how they managed with the different

tools, such as a stapler and hole punch, when joining materials together. Overall, the only method that caused real problems was stapling. It turned out that they found attaching two pieces of paper with a stapler much harder than stapling the template bag. I can now see that this makes sense, as the template bag is already folded and in position so the children were juggling two pieces of paper and trying to put one over the other as well as actually working the stapler. This suggests that when faced with many things to do at once, children often find it difficult and the stapling of the template bag is an example of how the process of stapling can be made easier by giving the children less variables to worry about. It helped for the children to stand up when stapling to increase the pressure on the stapler, which was the main problem. Overall, apart from the stapling, they were content to test and experiment with the joining, suggesting that their motor skills were developed sufficiently for them to work independently and it may be lack of experience that led to problems with the stapler.

When attaching the handle, many different methods were used and some children even tried two methods just to be sure: 'I stuck them with glue first but then I put sellotape to stop them falling off.' (Savanna). Although this idea was logical, when next evaluating products I need to introduce the children to thinking about identifying the one best method of joining, rather than having to rely on more than one method. This will start to develop their ideas of time and cost effectiveness in designing and making products.

### Handles

Although I did not anticipate it, the handles proved quite an interesting obstacle during the activity. This may have been that I didn't make handles a clear focus in the earlier sessions and may have needed to talk explicitly about why handles are where they are. During session two the children were confident with actually attaching the handles but there was a clear divide between the children; either they took on board the fact that each handle had to be joined at both ends and attached the handles correctly or they connected one end of each handle and left the other loose. On asking the children about it, answers included holding the two ends in your fist, which the child concerned found quite acceptable. Aaron completed a loose handle bag but then realised that it 'doesn't look right' and asked to make another one, which he did on his own and did correctly. This is a good example of where a child can learn from their mistakes and change and review their work in progress. It provided an

interesting issue to watch out for in the making of the party bags.

It was interesting to observe how the children coped with handles during the DMA. It was surprising how few did incorrect handles, considering the amount of incorrect handles during session two. The video of the DMA provided useful evidence of handles. Aaron actually put six handles on his bag all attached quite firmly. When asked why he had so many handles, he told me 'If this one breaks, there is the other one' – a very sensible reason for putting on lots of handles, which shows that he thought very carefully about the fact that he wanted his party bag intact. This again supports the view provided by Makiya and Rogers (1992) that young children can evaluate and improve their work in progress.

### Implications for future planning

My original thinking about the planning for design and technology work in reception was that, due to the second intake coming into school in January, it seemed sensible to begin 'proper' design and technology then, rather than have half a class with experience and half a class with no school experience. I feel now that this first term with only half a class could be highly beneficial in developing essential design and technology skills. This has been displayed to me by carrying out this project so early in the year, and from having seen what the children can actually produce independently. I feel that I have largely underestimated their ability in design and technology.

I can now use the experience the children have in making something independently to my advantage when the second intake arrive in January. There were examples during the DMA activity of the children being able to share and help each other and this is an issue that could be extended in my future planning. I intend to make my next design and technology task a paired or group task whereby the more experienced September children will be placed with the new January intake, the idea being that the children with experience will pass on information to the other children. Several authors have supported the view that group work in design and technology is beneficial to children's learning, an example being Yeoman (1983) who claims that children learn more during a group task than when working alone. Thus, I feel that attempting a collaborative piece of work may produce some interesting design and technology work. Overall, by carrying out this unit of work, I have a great deal of information with which to inform my planning of design and technology activities in the future.