

Adapting design & technology 2C Winding up



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Details from a small-scale pilot

A small primary school in the North West of England piloted an adaptation of the design & technology Unit 2C Winding up. The teacher was supported by a classroom assistant. The unit took one day to complete and was carried out by year 2 pupils.

Setting the scene

The teacher introduced the task by telling the class that they were going to tell a nursery rhyme story by making characters from that story move according to the story. She read out Incy Wincy spider and asked the class to tell her what the different characters in the rhyme were doing – going up, going down moving across etc.

Exploring construction techniques

Then teacher explored with the class how to attach a piece of string to a paper figure so that they could use the string to make the character move. There were several suggestions:

- PVA glue
- Sticky tape
- Staples

The pros and cons of each were discussed and it was agreed that sticky tape was probably the easiest and if masking tape was used then repositioning was also easy.

Then she explored with the class how to use the string to make the character move. It was easy to see how to get the character to jump up and down through short distances but moving through long distances was going to be a problem. So she introduced the idea of using a cardboard tube to help. The first problem was to attach the string to the tube. Members of the class were quick to suggest masking tape. She attached the string to the tube and then asked the class to predict what would happen if she rolled the tube between her fingers. They weren't sure so she asked what could they do to find out. They still weren't sure so she suggested that she try it and they could watch and tell her what happened. They were surprised and pleased when the string became tight enough to lift the figure. Then she asked what would happen if she rolled the tube the other way. All the hands went up. But she insisted on testing their prediction. Of course the figure moved down. She introduced two important phrases –

winding up and winding down and called the card tube a winder. She then posed the problem of how easy it might be to turn the winder if you had small hands and introduced the idea of a shaft that could go right through the middle of the card tube. She placed a long straw through the tube but when she twiddled it between her fingers the winder didn't move. What could they suggest? Simply sticking the straw to the tube gave very strange results so the class had to think about how to hold the straw in the middle of the tube. After much discussion the idea of using a card bracket emerged as shown in Figure 1.



Figure 1: *The solution to a tricky problem*

Making the winders

The children showed great perseverance in producing the winders as indicated by Figures 2 – 5.



Figure 2: *Careful handing of masking tape*



Figure 3: *I'm using my hands and my legs for this task*



Figure 4: *Putting the straw right the way through is not that easy*



Figure 5: *Carefully winding the string on so that it's tight*

A task too far

In order to teach more about mechanisms the teacher introduced the idea of the shaft having a handle and the whole assembly being supported on a structure of some sort. The children tackled this task with enthusiasm but it soon became clear that the resources at their disposal were not that suitable and in the final event it turned out to be much more convenient to use the winders without a handle or supporting frame. Simply twiddling the straw between your fingers gave all the control needed. Some examples of the support frames produced are shown in Figures 6 and 7. In both cases the children found it quite difficult to cut the resting slots so that the winder was level.



Figure 6: *A frame made from a drum and a box*



Figure 7: A frame from two boxes

The need for a backdrop

To provide a backdrop for the performance the classroom assistant covered the large sides of a small bookcase with black paper and decorated one side with features appropriate for incy wincy spider and the other side with features appropriate for Jack and Jill went up the hill. The backdrop for Jack and Jill is shown in Figure 8



Figure 8: The scene is set and waiting for the characters

The characters

The characters for incy wincy spider are shown in Figures 9 – 12. As there were four members in the group the children invented a new character – the moon – and added a line into the rhyme to provide this character with some action. Notice that the clouds are arranged so that they bulge out from the backdrop and the moon, sun and rain can appear out of the clouds.



Figure 9: The spider



Figure 10: The rain



Figure 11: The sun



Figure 12: *The moon*

The characters for Jack and Jill are shown in Figures 13 – 16. Again as there were four members of the group the children invented a new character – the sun – and added a line into the rhyme to provide this character with some action.



Figure 13: *Jack*



Figure 14: *Jill*



Figure 15: *The bucket*



Figure 16: *The sun*

The performance

The performance requires a high degree of collaboration and co-ordination. To begin with the characters had to be positioned in the correct location. Then as the classroom assistant read out the nursery rhyme the children had to move their characters on cue. If they had difficulty with the timing the teacher provided a prompt. The backgrounds were quite small so the children had to be careful not to get in each other's way. The performances are shown in Figures 17 and 18.



Figure 17: *The incy wincy spider performance*



Figure 18: *The Jack and Jill performance*

Assessment issues

Although putting on the performance is a group exercise there are plenty of opportunities for assessing individual pupils. They can be assessed on the design, quality of making and decoration of their characters and on the quality of making of their winders. They can also be assessed on their level of dexterity and co-ordination in using the winder. Finally they can be assessed on their ability to collaborate with other pupils.