Strengthening links in Mathematics

School: Abbot's Hill School

Strengthening links between maths in the classroom and the real world

In what way were you planning to strengthen links in Mathematics?

My plan was to make maths lessons more relevant to the 'real world' so that pupils could link what they were learning in maths to their experience of the world outside, and to see that maths is not just confined to the classroom.
I wanted to bring more resources from real life into lessons and planned to do that by using packaging as a resource: aiming to assist pupils with understanding measures and getting a better understanding of the relative sizes of metric measures.
I then intended to share my findings with colleagues and assist them to try out these sorts of activities with other year groups

Why did you choose this area?

I felt that pupils often found it difficult to remember the relative sizes of different measures because they regarded them as abstract concepts which had to be memorised. I hoped that with more handling of real life objects and resources they might become better at linking the measures with their own images of actual objects and relative sizes. By increasing the relevance of the maths being used in the classroom I also hoped to increase the pupils' enjoyment in their learning.

What did your project involve?

My project involved planning and delivering lessons on different types of measurement for classes of children from Years 4, 5 and 6.

To explore what might be possible, I started the project with a Year 6 class – providing them with some boxes of Jaffa cakes and some boxes of a supermarket equivalent cakes. I then asked them to explore what maths they could find in these, and each group prepared a poster of what they had discovered. Their enthusiasm and creativity demonstrated to me that this was an area that could be explored further. The ideas they covered included:

- Weighing the packet and working out the weight per biscuit
- Weighing the biscuits and the box separately
- Working out the surface area of the box
- Working out the volume of the box
- Working out the perimeter of a face of the box
- Measuring the circumference and radius of a biscuit and calculating pi (a week after pi day)
- Comparing measurements between real Jaffa cakes and Sainsbury's
- Working out how long before the end of the shelf life

While they obviously enjoyed this exercise it was also a useful opportunity to identify some confusion between area and volume. This then led on to two other parts of my project.

One part of the project involved collecting a range of empty boxes from a variety of food stuffs which were then used for a number of measuring activities including:

- Working out perimeters of different faces
- Working out surface areas – covering faces with centimetre squared paper for those who needed a more concrete demonstration of the concept of area
- Solving a problem about how much wrapping paper would be needed to wrap a box and then comparing the area of the wrapping paper required with the actual surface area of the box and considering if the difference in the two answers was reasonable and why.
- Working out and comparing volumes

By actually working out these different measures on real life objects which could be written on, drawn on or even taken apart where necessary, this enabled the pupils to gain a deeper understanding of what they were calculating.

The second part of the project involved using full packages of foodstuffs so the children could experience the relevant weights which were not apparent from the empty boxes. Activities with these included:

- Converting a recipe for making different quantities of cookies – this was supported by having bags of the relevant ingredients to hand. While the ingredients were not used for cooking, they were helpful for pupils to consider if their answers were reasonable. This also led onto investigating the costs involved in making different quantities, with the requirement to consider at what point it was necessary to purchase additional packets of ingredients.
- A similar activity involved having bottles of lemonade etc on display when working on calculations about capacity – considering how many bottles needed for a certain number of glasses and then the costs involved.

What did you find out through carrying out your project?

I found that pupils seemed to enjoy using everyday objects in lessons which they recognised from the outside world and this seemed to encourage them to engage with the activity more readily. With a variety of boxes available they were able to choose which to use and the fact that they were using a box of, for example, 'their' cereal helped to promote their interest and encouraged them to pursue the task for longer. I hope this will also work the other way in that they will be able to recognise that there is maths around them in everyday objects outside the classroom.

However, I was also able to identify that pupils who appeared to understand certain concepts when working from the textbook were not so confident when presented with an actual object to investigate. This appeared to demonstrate the theory that we had discussed as a group, about pupils sometimes moving too quickly from concrete objects to abstract – by bringing the resources into the classroom the pupils were able to go back to the concrete materials to better understand what they were learning about and the purpose of the calculations they were doing. (Connective model: Haylock and Cockburn)

What differences did it make to your learners?

The use of these resources increased the enjoyment and enthusiasm of the learners and as a result they appeared to be better able to understand the concepts they had been learning and apply them to the concrete resources. They also seemed to gain a better understanding of the different measurements being used and improved their ability to estimate measures. However, it is too soon to know if they will retain the information better in the long term.

What difference did it make to your school?

I have used these resources and promoted the links in my own lessons which covered several different age groups and I have discussed these ideas with some of my colleagues. The next stage will be to promote these ideas further within my school and to develop these types of activities for other age groups next term.

What did you learn yourself?

I have learnt to promote more explicitly the links between the maths being explored in the classroom and everyday objects which are familiar to the pupils.
I have also learnt to think more about using concrete resources with older age groups who can still benefit significantly from a more 'hands-on' approach.

Carolyn Wallis