## **Science Week: Detective Scientists**

This event formed part of the Science week activities at Abercanaid Community School, Merthyr Tydfil and took place on Thursday, 19<sup>th</sup> March 2015. Initially, it was to be delivered to the final year junior class (10/11 year olds), but due to unforeseen circumstances it was only delivered to a class of 28 9 and 10 year olds.

The focus of the event was centred on promoting scientific investigation, scientific thinking and enhancing English language skills. This was achieved by giving the children three known samples: sugar, bicarbonate of soda and cornflour. They were given a scenario that if they were crime scene investigators and they had found these powders at a crime scene, then they would need to find a way to differentiate between the 3 because they all look like a white powder on the surface.

Using the microscopes that the outreach grant allowed me to purchase, the children were able to work in groups to see how each looked under a microscope. The microscopes caused a ripple of excitement around the class when they were produced. Also the great thing with these microscopes was they were digital so we could put the pictures on the whiteboard and compare what we saw (figures 1, 2 and 3). The children were also asked to fill in a table so that each stage of the experiment was recorded. This ensured that the children were not only improving their scientific knowledge, but also enhancing their language skills.

Next the children were asked to feel the powders and describe how they felt, followed by how they smelt. At all times the information was recorded, discussed and related back to the fact that we need a lot of tests to make sure we can accurately differentiate between the powders (figures 4 and 5).

Water was then added to an aliquot of each powder. Again the children were asked to describe what happened. Then vinegar was added to a fresh aliquot of each powder. This time the bicarbonate of soda reacted causing much excitement, which was only increased when the iodine was added to fresh aliquots and the starch in the cornflour turned black!

Following the completion of the experiments and the table, the children were given an unknown sample of either sugar, bicarbonate of soda or cornflour and they were asked to see if they could work out which of the three it was, using the information they had already found out. First they had to look at the powder and guess what it was before conducting the tests. The class teacher had told me that many of the class struggle with getting the hypothesis wrong and were always changing it in science lessons so this served as a lesson that being wrong is fine because it means we learn something new and gain more experience.

Following the (successful) identification of these unknown samples, the event turned to look at chromatography of felt tip pens. Different colours were dotted on the bottom of filter paper and we saw how they separated out (figure 6). The experiment was repeated using black felt tip pens and they were asked to guess what that would see. While waiting for the colours to move up the paper, I explained why we would use such techniques and used members of the class to participate in a demonstration of capillary action.

The event ended with an interesting question and answer session. The whole class was asked to fill out a feedback form to gage how the event went. All feedback was very positive (figure 7). The children had a very good time and many were enthused by the day (figure 8). The teacher also said it was "probably the best science lesson I've seen in a primary school."



<u>Figure 1</u> – Pictures of the known samples taken using the microscopes. a) Sugar. b) Bircarbonate of soda. c) Cornflour.



Figure 2 – Microscope fun!



Figure 3 – More Microscope fun!



Figure 4 – Feeling the powder.



Figure 5 – Filling in the table.



Figure 6 – Chromatography fun!

In what ways did you enjoy yourself? I enjoyed every minute of it. It was two-exciting: cool and a fantashic. I are enjoyed the forensic and the microsopes.	In what ways did you enjoy yourself? I enjoyed the ways that we could do everything auselines and that we learn't something new every minute
What did you learn?	What did you learn?
In what ways did you enjoy yoursel? I for Sonally enjoy a Scientist "come mater my school. I also Jues thinky enjoyed t.	In what ways did you enjoy yourself? I enjoged priving all the different colours together on the rease of paper little paper and I littled to see them made different colours.
What did you learn?	What did you learn?
In what ways did you enjoy yourself? I enjoyed The Identifying Substances because If love tean work and I also wont to be a governer Secretst.	
What did you learn?	

Figure 7 – Some of the feedback received.



Figure 8 – Having fun!