

Maths Week

Cross-curricular lesson outlines: Science

The main problem the Angmering Science department said they had was the interpretation of graphs. This appears to be because the only graphs we introduce to them at key stage 3 are bar charts, pie charts and frequency polygons. Only a few select pupils will have heard of histograms and this is the main problem. The pupils are coming across continuous data in science from an early age and they have not got the mathematical understanding to help them with this. It seems to me we do cover the material but in lots of different sections and never really bring it all together until the later years. Looking at the national strategy though, it now seems specific to year 8 (*simple line graphs for time series*) and this can be used to have some cross-curricular work and show how maths is involved within the real world.

228-41 Measures & Mensuration - Read & interpret scales on a range of measuring instruments.

256-67 Processing & representing data - simple line graphs for time series

Lesson outlines:

Lesson 1: Each department will liaise with their own science department about which experiment they will be doing. The maths department can then look at the units involved.

Starters: With a counting stick one can look at different starting and end points and get the pupils to interpret different sections of the stick and state the amount.

I.e. 20cm - 80cm 1/2-50cm etc this can then be differentiated.

Again the work on units could explore the continuous nature of time and measure and look at approximation or levels of accuracy. Again differentiated to the individual group. This would be slightly more difficult in mixed ability groups but they all do the same experiment in science and so this may help raise the understanding of the lower ability groups.

Lesson 2:

This science lesson is where the experiment is completed. There will almost certainly be a science lesson before this, dealing with H&S and the scientific aspects of the experiment.

Lesson 3:

The pupils bring the data to the classroom where they draw the graphs. With the science department we can then bring in some mathematical questions about the interpretation.

I.e. How much oxygen was produced in 8 seconds?

In what time were 10cm³ of hydrogen produced?

Thus questions relating to reading the scales of the graphs.

As an extension one could look at extrapolation of the graphs.

If the pupils have all done the same experiment one could look at accuracy and bring in some statistical analysis by finding mean values at particular points. Even drawing a mean graph of the data.

The graphs could be put on OHP paper and shown the differences between the graphs and again a visual aid in helping pupils see the differences and averages.

Lesson 4:

This again would be the science lesson, but this would consist of science questions and hopefully any mathematical problems would be removed.

These are broad lesson outline that are trying to take into account the different styles of the schools. They will not all do the same experiments in October, so instead of picking one experiment I have tried to have a general outline, that can be adapted to different schools. What I can do is take a specific lesson and come up with the questions about that experiment and also look at the questions in the maths lesson, again every class is different, but if you would like me to produce a starting point then I can do.