The account of the progression of a topic from Primary school through Secondary school and beyond

Introduction to Secondary School Teaching Task 4 – Mathematics

The topic I am following came up in a year 8 lesson at secondary school. It is straight line graphs and their equations. Before the pupils can be taught this, there are a number of prerequisites they must have already mastered. Firstly, a basic understanding of algebra. This is necessary to understand the relevance of the y = mx + c. The pupils need to recognise that the values x and y are not merely unknown values, but actually variables. Most children will come across algebra and straight line graphs, but not necessarily in the same context. Primary schools may get as far as drawing a line of best fit onto a scatter graph, and years 7 and 8 will come across linear equations, but it may be difficult to accept that instead of finding the specific numbers for x and y which make the equation 'work', the solution is actually a set of paired x's and y's in the form of a line.

Many children will encounter functions to some level or other before secondary school. Usually this will be in the form of a 'machine' which has a certain input, eg 4, a series of operations, eg times 2 take away 1, and an output, 7. At secondary school they will tabulate results of linear operations like this one and use the table of values to create a straight line. This will give them some idea of how an equation of the form y = mx + c can be related to a line.

The lesson I observed was concerned with manipulating lines by altering the gradient and y-intercept. The pupils had to draw a series of lines and notice patterns in equations in order to link them to similarities in the graphs. For instance, two lines with the same gradient would be parallel, and lines with the same intercept cross each other at the y-axis.

There are a whole host of topics this leads on to. As the pupil moves up secondary school and onto A-level they will use more and more algebraic equations to plot graphs, they will solve simultaneous equations and may come across linear programming. The concept of function will be expanded, especially if they take maths on to university level, but the R^2 representation will provide a valuable base. Certainly for me it was useful to have a solid base to visualize functions in when working with theorems from Analysis.

In terms of the usefulness of the topic for non-academic maths, it is a relatively important concept to be able to grasp. It relates to computing, and also to statistical analysis of trends and graphs.