Integrating science

Science and history
The curriculum promotes the integration of history and science in terms of content. The history curriculum has a strand titled, continuity and change over time. One of the objectives is to, “study aspects of social, artistic, technological and scientific developments over long periods” (G.O.I., 1999(c), p71). Scientists worked in the past, made mistakes and learned from their mistakes. Integrating science and history could enable students, “to appreciate the creativity of previous scientists” (Lin, Hung and Hung, S., 2002, p454).

Science and geography
The curriculum promotes integration by designing a cross curricular strand environmental awareness and care common to both geography and science. “Environmental studies provide a very important context for curriculum integration” (Siraj-Blatchford and MacLeod-Brudenell, 1999, p80). Environmental awareness is an area that is difficult to box into a specific subject area. The science and geography curricula also have a set of skills in common. The science curriculum refers to these set of skills as working scientifically and the geography curriculum refers to them as geographical investigation skills. These skills have identical labels and the wording of the skill objectives is almost identical. It is ultimately up to teachers to look closely at the scientific skills and then the skills in other curricular areas to check for cross curricular skill development and integration.

Science and art
I also examined how the curriculum promotes the integration of science and art. I enjoy teaching art and science and in my opinion they could be integrated a lot in terms of content as “There is also a strong link between science and art” (Harlen, 1996, p116). Art fosters creativity in children. Children need to be creative when working scientifically. The science teacher guidelines suggest integrating science with art, “The skills outlined in designing and making and the tasks suggested in the exemplars in the science curriculum are equally dependent on the child’s aesthetic awareness and craft-handling skills” (G.O.I., 1999h, p45). When I cross checked the teacher guidelines for art in the curriculum I found a lot of information about integrating art with science. It suggests integrating science with the following strands and strand units.

Strands
• Environmental awareness and care.
• Energy and forces.

Strand units
• Plant and animal life.

As a new school year begins so to does the planning of a new set of long term schemes. Included among the various planning headings is integration. This article analyses the 1999 Primary Science Curriculum with regard to science integration. There is much debate about integration. One aspect of the debate is to define integration. “A common definition of integration does not exist” (Czerniak, Weber, Jr, Sandmann and Ahern, 1999, p422). Advocates of integration stress the importance of how children learn, “nothing is learned in isolation” (Gibson-Quick, 1999, p3). While the argument against integration looks at weakened disciplines of knowledge with the debate hinging on the child’s learning, “what is integrated by the learner?” (Driver, 1983, p79).

The challenge of time
Time can be a huge challenge in the primary school classroom. One of the advantages of an integrated topic is that it, “can extend the child’s experience” (Harlen, 2000, p238). Carefully integrated topics can allow for more flexibility in time tabling, “Where topic work is the predominant way of working, the timetable usually allows this to take place for extended periods of time” (Harlen, 1996, p119). A cross curricular approach can help to achieve progress in science. It will allow for a larger slot of time which aids children’s skill development in that they have more time to use the skill. When the time allocated for each subject is rigidly timetabled it restricts the “opportunities for children to try things out, discuss them, try other ideas whilst things are fresh in their minds and so derive maximum learning from their activities” (Harlen, 1996, p119). A cross curricular approach allows, “time for children to carry out investigations which would not fit into small time slots” (Harlen, 1996, p119). For example, if skill integration were the focus for a month, activities in design and make, maths, art, geography, could be carefully chosen to promote the chosen skill or skills.

Diluted subject content
One of the disadvantages mentioned is that subjects become diluted in terms of their content. Perhaps teachers should approach integration with caution. Integration can work to the detriment of science.

“In practice, the integration of science with other subjects is extremely difficult, when not done well it has been criticised by school inspectors for leading to fragmentation of the subject and compromising activities that do not justify the label of ‘science activities’” (Harlen, 2000, p238). If integration is planned, it is very important that valuable learning in science as well as valuable learning in other subjects takes place.