Promoting High Level Reasoning – and Assessing the Outcomes

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Many science curricula and policy documents throughout the world pay lip service to the notion that they promote scientific thinking, or higher level thinking in the context of science. Sadly the implementation of such ideas in the classroom often fall far short of the grandiose hopes expressed in policy documents. This may largely be due to (a) the underestimation of the difficulty of teaching for reasoning and consequent underinvestment in professional development; and (b) a failure of assessment systems to value the types of reasoning ostensibly being promoted – if you still test the acquisition of knowledge, you should not be surprised if that is what teachers focus on.

In this presentation I will explore the nature of high level reasoning, say something (with evidence) of how it can be promoted in students aged 5 to 15 years of age, and discuss the types of assessment of the possible effects of teaching reasoning. This last will include both measuring improved reasoning directly, and the effects of better reasoning on more traditional outcome measures of content.