

Level 6 Science - Deduce the practical design from Limited Information

PEEL in Practice: 1300 ideas for quality teaching

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Problem:

When we did practical work which was intended to help the development of the theory, the students had little idea of what they were doing and why they were doing it. Moreover, they would skim over the instructions and frequently remain unclear about what they actually had to do. Even though they had lists of equipment, they'd still ask me what equipment they needed. They couldn't seem to use the equipment according to instructions and didn't seem to be thinking about instructions.

Response: 'DEDUCE THE PRACTICAL DESIGN FROM LIMITED INFORMATION'

I decided I had to get them more involved with the questions behind the experiment. Accordingly I gave them a problem "Which is a conductor and which is an insulator?" and some equipment and told them to use the equipment to solve the problem. I told them to work in groups of three or four, to design a 'method', carry it out and record what they had done and what they had found out. All of the groups were able to solve the problem and they seemed to enjoy the work a lot more. I didn't get all the usual questions and I noticed that everyone in the group was contributing where normally two or three students take over.

They were able to write out the list of steps they had used to solve the problem using the predict, observe, explain method. In this approach, the students are asked to make written predictions, with reasons about what they think will happen when a particular action is taken. The action is then taken, the students record their observations and, if they have predicted incorrectly, attempt a written explanation for what happened. It is crucial to the success of this procedure that the students do not feel that they will be judged as 'better' if they predict correctly. Its purpose is to make the students aware of their existing views.

Using this approach and the method that they designed, the students were able to group metals as conductors and non metals as insulators. They also seemed to develop a sense of ownership about their practical procedure. As a follow up, I found students asking a variety of more thought provoking questions rather than the usual. 'What do we do?' 'Do we have to hand this in?' One example which directly followed this experiment was a lesson in which we had an interesting discussion on why birds can sit on powerlines and how people get shocks from electric train sets. In other words, students were able to relate the lesson to what they'd observed outside school.

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