ASSESSING PUPILS' PROGRESS

Mike Ollerton asks 'What is APP really about?'

Call me naïve, but I thought that Assessing Pupils' Progress (APP) was an initiative created to support teachers' professional judgements regarding their pupils' achievements beyond the use of spurious, invalid data gathered via testing. I thought APP was intended to help teachers assess how pupils used and applied mathematics; how pupils made choices and used their initiative, mathematically speaking, to solve problems. I thought APP was intended to broaden teachers' approaches to assessment, to build upon Assessment for Learning (AfL) type strategies, to promote more peer and self-assessment as an ongoing part of the assessment mix.

Sadly I hear of other approaches to APP based upon and indeed driven by published schemes such as one named after an Australian animal. I hear of specific, published tasks being used through which assessment information might be gleaned; thus the tasks and the assessment becomes another bolt-on affair.

Equally sadly I heard from one head of department who claimed to have APP 'cracked'; this meant that someone had analysed each of the statements on the assessment guideline sheets for the different levels and had written test questions for each one! This predilection for testing is a catastrophe as far as the teaching and learning of mathematics is concerned; it is an outcome of the drive for collecting so-called 'data' on pupils. What those people, who should know better, either choose to ignore or even worse believe in, is that the data collected from test scores has any meaning whatsoever with regard to assessing pupils' mathematics; testing is a fundamentally flawed process and tells us nothing about achievement, understanding or the application of mathematics.

Even worse, is the *fact* that in some schools, some senior managers expect teachers to grade pupils, on a half-termly basis on a decimal-levelled scale. Just how it is possible to provide an assessment that a pupil is working at level 5.3 and what this means is certainly beyond me. Of course when such data is required then the danger is that APP is reduced to % scores from tests. But what is the pedagogical basis for making such requests?

Perhaps this drive for data arises through a desire to provide Ofsted inspectors with information which demonstrates that teachers are fully aware of where every pupil is. However, the following quote from the Ofsted report, *Mathematics: Understanding the score,* appears to offer another vision:

> *Strategies to improve test and examination performance, coupled with teaching that focuses heavily on preparation for the qualifications, does not equip pupils for their futures. It is vitally important to shift from a narrow emphasis on disparate skills towards a focus on pupils' mathematical understanding (2008).*

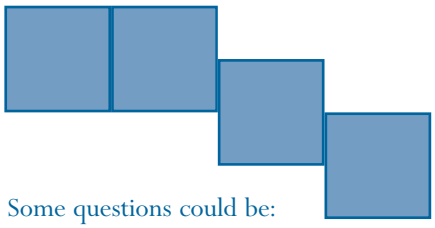
On the positive side I know of some schools who have embraced APP wholeheartedly in the spirit in which I thought it was intended. These schools are making pedagogic connections between what and how they teach mathematics, how pupils learn mathematics and assessment. Teachers in such schools eschew a narrow, tick box approach to assessment, based upon mathematical content, and instead are looking at how pupils use and apply their knowledge; how they explore situations and how they seek solutions to problems. I know of one primary school who only apply National Curriculum grading to pupils twice, once each towards the end of keys stages 1 and 2 – and the parents? The vast majority are onside and understand, through contacts with the school, that their children's education cannot be reduced to a set of levels – and Ofsted? – 'outstanding'

There is, however, a vast difference, pedagogically, between deciding to use tasks specifically to gather assessment data and using tasks which permeate a scheme of work from which assessment data might be gleaned. The latter provide more robust, purposeful approaches to assessment. Tasks which are a natural part of teachers' practices, which are embedded in everyday school mathematics may provide opportunities for assessment information to be gathered but they might not.

There are hundreds of problems which can easily be accessed, e.g. via the ATM, the resources published by the Shell Centre (Nottingham University) and NRICH. The key issue, however, is how problems and task are integrated into a scheme of work so problem-solving becomes a consistent, normal aspect of teaching and learning mathematics.

For example, the following task, which I title 'Joining Shapes', is intended to enable pupils to engage in a semi-structured exploration based upon joining squares together. The task is one I have used with classes ranging from Y4 to Y9 and all that is required in the first instance are a few ATM square MATs. Importantly the problem has a real sting in the tail; thus it caters for a wide age and attainment range of pupils.

You have four squares of unit length and are allowed to join them full edge to full edge or half edge to half edge, e.g.



Some questions could be:

What is the perimeter of this shape?

What are the smallest and the largest perimeters that can be made?

Can you make all the integer value perimeters between the smallest and the largest perimeters?

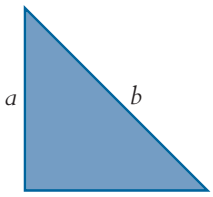
How would you need to change the rules to gain a perimeter of something and a half?

Further questions might be:

How many different perimeters with integer lengths can be made using 5 squares?

What about using triangles or pentagons?

Asking the question: *What about using isosceles right-angled triangles?* Raises the tempo as Pythagoras and root two enters into the melting pot.



We might label the sides of the isosceles triangle as a and b, so an algebraic coding could be use to describe the perimeter of shapes made.

My favourite *sting in the tail* is to pose the problem of determining minimum perimeter for any given amount of squares. As there is no single mapping from the number of squares to minimum perimeter it requires the problem-solver to create an 'algorithm' in order to construct a generality.

As for the potential content knowledge the problem offers the following:

- Counting
- Perimeter
- Simple fractions
- Decimals
- Limits
- Surds
- Algebra

As pupils work on the tasks there are opportunities for this content to be processed. As such the content can be worked on in a problem-solving context not as a bolt-on affair – I sound like a stuck record. This bolt-on approach to learning mathematics was replicated when coursework was first introduced zillions of education policies ago. Well, we all know what happened to coursework. How it incongruously fell under the banner of 'doing an investigation'; how meaningless and formulaic it became when examination boards subverted it by attaching narrow marking criteria to board-set problems, and how some politicians maligned coursework, aligning it to cheating.

However, if coursework is redefined as the work pupils do over a key stage or an academic year and, if such work involves the integration of puzzles and problems into a portfolio or a record of pupils' achievements then APP can have a key part to play. This notion of a portfolio is one which served as an extremely powerful approach to assessment when the 100% ATM-SEG (Southern Examining Board) GCSE scheme ran from 1986. As teachers from a small group of schools became more skilled at looking at pupils' folders of work, during internal and external moderation meetings we were able to speedily home in on and agree upon pupils' current, ongoing GCSE grades. The process was a forerunner of APP though the ATM-SEG GCSE had a greater emphasis upon how pupils engaged with mathematical content, how they carried out tasks, how they worked on problems and interpreted and communicated the work they did.

At the 2010 BCME conference at Manchester an interesting question arose from somebody in the audience towards to end of one of the keynotes. I do not have the question verbatim, however, the gist of it asked what an Art student took with them perhaps to an interview for a course or a job) and what a Mathematics student took. The comparison is stark because, of course, the Art student takes a portfolio of their best pieces of work… whilst a Mathematics student takes… well:

- What do they take?
- How best might they demonstrate their mathematical capability?
- How might mathematical capability be developed and assessed?

Mike Ollerton is an independent consultant and a longtime member of ATM.

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