I find myself reading through this issue of MT whilst surrounded by flyers. Text books that promise to deliver the KS3 strategy. Interactive programs that will turn my ‘D’s to ‘C’s, however, the need for good quality teaching is not mentioned.

I was fortunate to begin my career teaching at a school that did not rely heavily on a text. This made me more creative as a teacher, as I had to be one step ahead and aware of extension and enrichment ideas that were easy to administer. Colin Foster’s Golden opportunities for creativity, documents a prime example of every learner taking an activity to their own level with the design of golden coins. The pupils used problem-solving skills to develop their own shortcuts to their solutions. The article even finishes with Colin developing his own coin!

Alf Coles, Proof and insight, plays on the differences between following a proof and being able to replicate a proof with true understanding. It takes confidence for some teachers to go back and question their own understanding. It is important that we enable learners to safely shake mathematical structures to ensure that their knowledge is sound. I was particularly interested in the strategy of using alternative methods to build and describe the reasoning behind examples of proof.

One of the best activities that I sometimes use to develop the seeds of proof came from an ATM Easter conference. Asking whether a statement is sometimes, always or never true encourages pupils to ask internal ‘What if . . .?’ questions in order to satisfy themselves and the group that their categorisation is correct. Simple probing questions can often allow insight into understanding.

Questioning their mathematics by Vicky Inman, a PGCE student, reflects on the importance of open questions. The list of ‘points for teachers to think about’ includes several pertinent statements. In particular the statement ‘Don’t impose your mathematics on them, listen to theirs!’ is particularly relevant to conversations that I have had with trainee teachers within my own school. Observation of colleagues can often lead to interesting discussion of both questioning strategies and alternative approaches to solving mathematics.

Friday reflections by Emily Lipman made me smile. How often do we catch ourselves using stock phrases that remind us of something that our parents would say? Emily found herself in week three of her training, standing up in front of the class, resorting to using familiar teacher phrases. Indeed I am sure that she is not alone, I have observed similar exchanges when observing trainee teachers.

There is however a serious message here. As mathematics teachers we are happy with mathematical concepts and links, and have not often suffered the cognitive difficulties that some of our pupils experience. Emily Lipman reflects on this point and makes the statement, ‘what is obvious for us may not be obvious for our pupils’. There is greater awareness now of the need for a range of learning styles to be catered for within the classroom, often a range of strategies and materials can promote greater understanding and help to clarify the mysteries of mathematics.

Recent lesson observations within my own department have reflected on the importance of language within mathematics. Word meanings by Darla Shields, Cinda Findlan & Cyndy Portman, looks at effective instruction methods to allow pupils to construct connections between prior knowledge and appropriate use of vocabulary. I particularly liked morphology, the study of origins, as it fits so well with the principle of encouraging pupils to apply prior knowledge and to understand the use of prefixes.

I feel strongly that as teachers we must empower pupils and promote the use of joined-up thinking in order to solve problems. We need to encourage pupils to be able to use internal dialogue to think around a problem. In analysing assessments it is often the ‘have a go heroes’ – quite often boys – that score higher marks as they are happy to extend diagrams, show partial workings and sometimes answer questions that a more timid pupil will leave, as they are reluctant to commit to an answer.

A recent conversation with a colleague revolved around the question: are we as mathematicians creative? After the initial decision that we were unable to produce an artistic masterpiece, we then reflected that actually mathematicians were at times extremely creative. The discussion then turned to how we, as teachers, try to equip students with as many tools as possible and highlight links within mathematics.

I find the support of the local branch and materials produced by ATM constantly challenge my thinking and inspire me to think creatively about my teaching within the classroom. It is always refreshing to read books and articles that result in further questions and reflections, rather than a list of correct answers.
The attached document has been downloaded or otherwise acquired from the website of the Association of Teachers of Mathematics (ATM) at www.atm.org.uk. Legitimate uses of this document include printing of one copy for personal use, reasonable duplication for academic and educational purposes. It may not be used for any other purpose in any way that may be deleterious to the work, aims, principles or ends of ATM.

Neither the original electronic or digital version nor this paper version, no matter by whom or in what form it is reproduced, may be re-published, transmitted electronically or digitally, projected or otherwise used outside the above standard copyright permissions. The electronic or digital version may not be uploaded to a website or other server. In addition to the evident watermark the files are digitally watermarked such that they can be found on the Internet wherever they may be posted.

Any copies of this document MUST be accompanied by a copy of this page in its entirety. If you want to reproduce this document beyond the restricted permissions here, then application MUST be made for EXPRESS permission to copyright@atm.org.uk.

Membership of the ATM will help you through

- Six issues per year of a professional journal, which focus on the learning and teaching of maths. Ideas for the classroom, personal experiences and shared thoughts about developing learners’ understanding.
- Professional development courses tailored to your needs. Agree the content with us and we do the rest.
- Easter conference, which brings together teachers interested in learning and teaching mathematics, with excellent speakers and workshops and seminars led by experienced facilitators.
- Regular e-newsletters keeping you up to date with developments in the learning and teaching of mathematics.
- Generous discounts on a wide range of publications and software.
- A network of mathematics educators around the United Kingdom to share good practice or ask advice.
- Active campaigning. The ATM campaigns at all levels towards: encouraging increased understanding and enjoyment of mathematics; encouraging increased understanding of how people learn mathematics; encouraging the sharing and evaluation of teaching and learning strategies and practices; promoting the exploration of new ideas and possibilities and initiating and contributing to discussion of and developments in mathematics education at all levels.
- Representation on national bodies helping to formulate policy in mathematics education.
- Software demonstrations by arrangement.

Personal members get the following additional benefits:

- Access to a members only part of the popular ATM website giving you access to sample materials and up to date information.
- Advice on resources, curriculum development and current research relating to mathematics education.
- Optional membership of a working group being inspired by working with other colleagues on a specific project.
- Special rates at the annual conference
- Information about current legislation relating to your job.
- Tax deductible personal subscription, making it even better value

Additional benefits

The ATM is constantly looking to improve the benefits for members. Please visit www.atm.org.uk regularly for new details.

LINK: www.atm.org.uk/join/index.html