The Association of Teachers of Mathematics
for mathematics educators
primary, secondary and higher

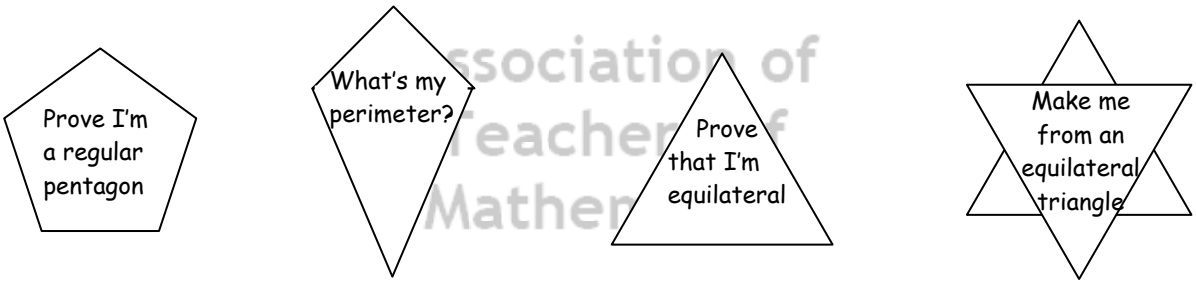
7 Prime Industrial Park • Shaftesbury St • Derby • DE23 8YB • +44 (0) 1332 346599 • www.atm.org.uk • info@atm.org.uk

**In'creasing' participation in creative geometry.**
**By Ellen Pearson and Julian Brown**

Despite the growth of ICT based active geometry packages, at a recent Avon branch meeting we rediscovered a great way of exploring geometry in the classroom.

The activity is based on a fringe event from ATM's 2006 annual conference entitled "without…scissors and glue" and is one of a number Jan Winter brought back from annual Conference for Avon Branch members to work on.

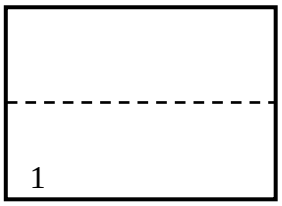
Origami shapes, which Jan told us were made out of whole pieces of A4, were placed on the tables around the room. They got our attention straight away because they were bright, tactile and had interesting challenges written on the front of them, like the ones below. Some members of the group quickly set about trying to reproduce the shapes using their own A4 while others preferred to unravel the pre-made ones stage-by-stage perhaps sketching, labelling and analysing angles and lengths resulting from the folds as they went.



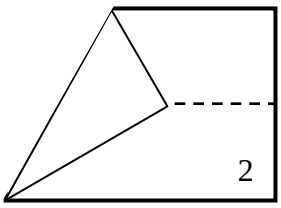

I tried this activity at Maths Club when I got back to school and the students were engaged and interested from the outset. The students were asked why the shapes were what we had labelled them as and, as soon as we had overcome the hurdle of "well, it's just obvious" they all made great inroads in their own particular level of investigation. For example, some of the higher ability students focused on how to prove the nature of the shapes by exploiting algebraic techniques such as labelling identical sides, simplifying expressions and identifying recognisable angles and similar triangles. Some found themselves exploring areas of mathematics that were new to them, such as the Year 7 students beginning to explore Pythagoras' Theorem. This was also, however, a great activity for low ability students as they could focus on the visual and practical sides of making the shapes as well as examining geometric properties such as the lines of symmetry. There was a real feeling that the conversations were not over by the end of the session; lots of shapes were taken away.

You are invited to work on the task yourself…but you can find instructions on how to make an equilateral triangle and a six point star on the next page.

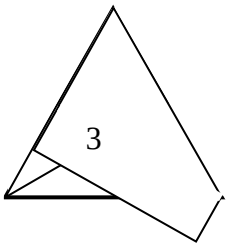
**AN EQUILATERAL TRIANGLE**



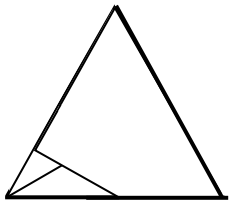

1. Take an A4 piece of paper. Fold it in half length ways then unfold it.




2. Then take the top left hand corner and fold down until it meets the centre fold (as shown).

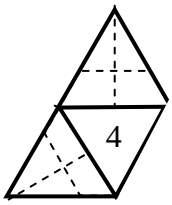



3. Now take the top right corner and fold this down until the top edge of the paper matches in line with the fold made in step 2

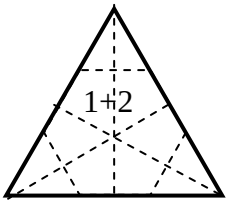


4. Tuck the remaining flap behind the base of the triangle

**A SIX-POINTED STAR** Make an equilateral triangle from the instruction above.



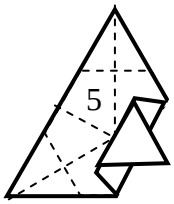

1. Fold and unfold down the 3 lines of symmetry to mark the centre of the triangle.



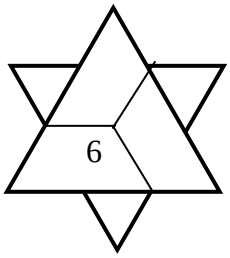

2. Fold and unfold each vertices in the centre (so that you can see all the creases shown here).

3. Turn the triangle over.

4. Fold one point to the centre of the opposite side and leave there.




5. Fold the vertex back on itself using the crease formed in part 2




6. Repeat steps 4 and 5 for the other vertices.


**The work that went into the research, production and preparation of this document has to be supported somehow.**

**ATM receives its financing from only two principle sources: membership subscriptions and sales of books, software and other resources.**

## Membership of the ATM will help you through

*Now, this bit is important - you must read this*

- 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**