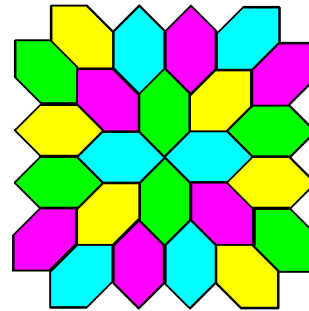


# Squashed Hexagon Tiles

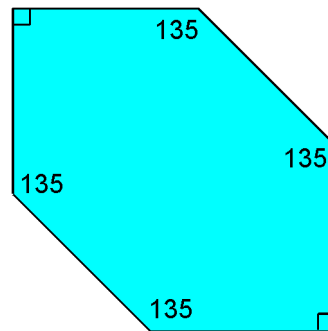
Designed by David Mitchell

Squashed hexagon tiles have two right angle corners and six edges that are all the same length. Because of this they can be laid together to create the tiling pattern shown to the right.



You could imagine the shape of this tile as a regular hexagon that has been sat on by an elephant.

Mathematically, of course, it would be more correct to think of it as the oblate hexagon tile, but I like the elephant idea..



The diagrams show you how to fold this tile from both the silver rectangle and the square.

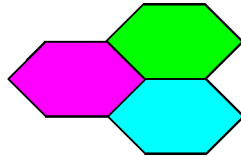
Silver rectangles are rectangles with edges in the proportion of  $1:\sqrt{2}$ . DIN paper sizes such as A4, A5 etc are good enough approximations of silver rectangles for practical paperfolding purposes.

I have included brief notes on how the folds have been located to ensure that all the edges of these tiles are the same length.

I designed these tiles in 2000.

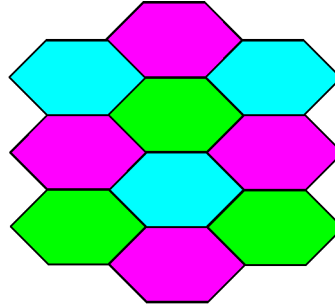
# Tiling patterns

1



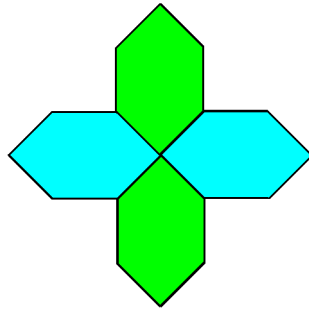
1. Stretched hexagon tiles will ...

2



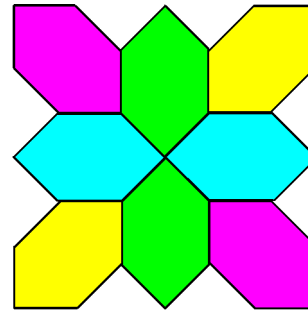
2. ... tile the plane like this.

3



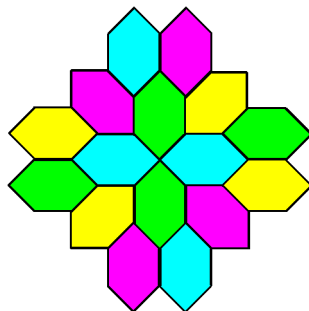
3. Four tiles will go together to form a cross ...

4



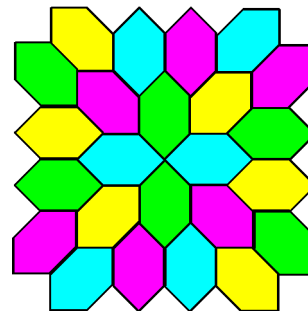
4. ... which can be extended ...

5



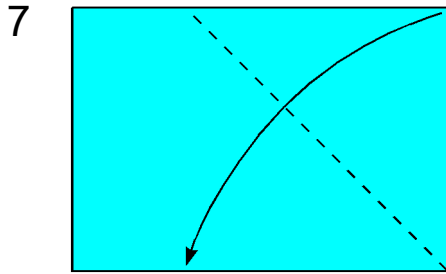
5. ... in all directions ...

6

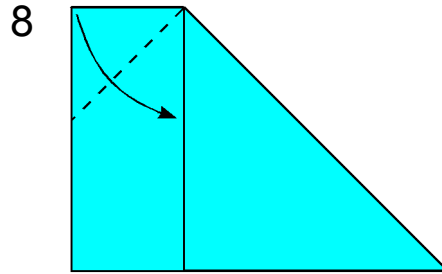


6. ... ad infinitum.

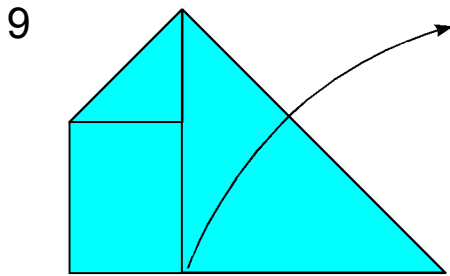
## Folding from the silver rectangle



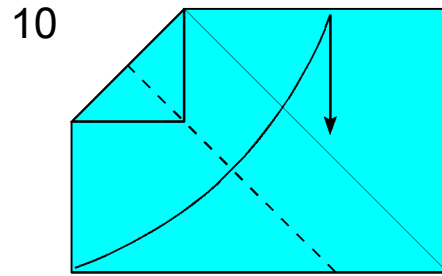
7. Fold the right edge onto the bottom edge.



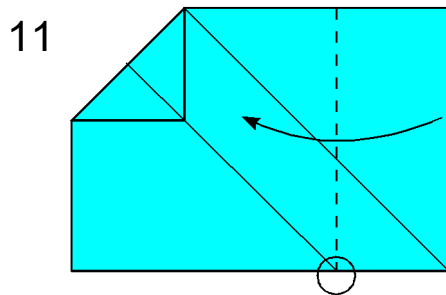
8. Fold the top left corner inwards like this.



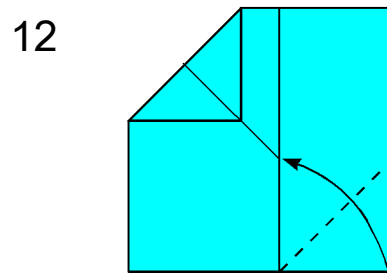
9. Open out the fold made in step 7.



10. Fold the left edge onto the top edge, then unfold.

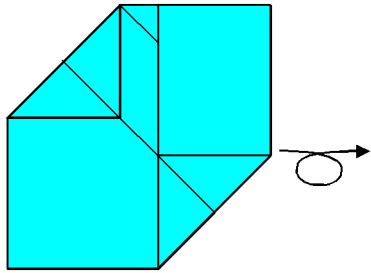


11. Fold the right edge inwards using the point where the crease made in step 7 intersects the bottom edge to locate the fold.



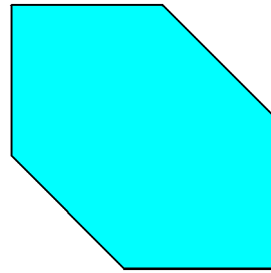
12. Fold the bottom edge of the new flap onto its left edge.

13



13. Make sure all the layers lie flat then turn over sideways.

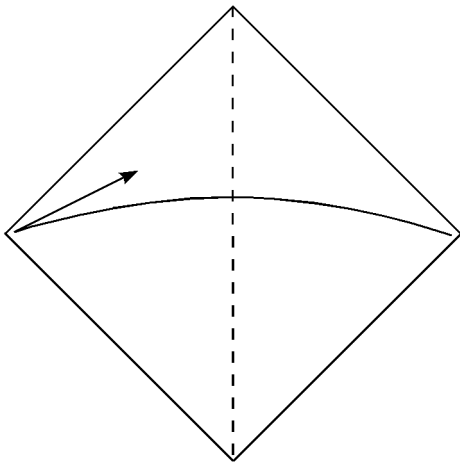
14



14. The squashed hexagon tile is finished.

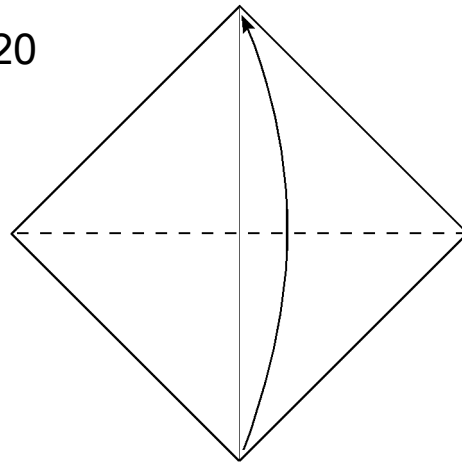
## Folding from the square

1



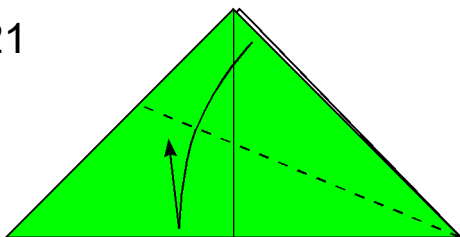
19. Fold in half sideways, then unfold.

20



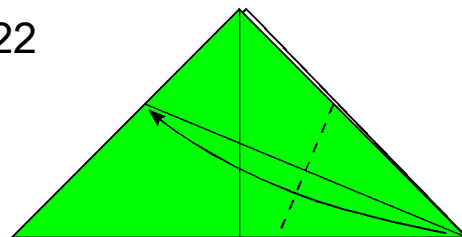
20. Fold in half upwards.

21



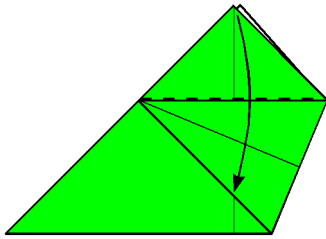
21. Fold the sloping right edge of the front layer onto the top edge, then unfold.

22



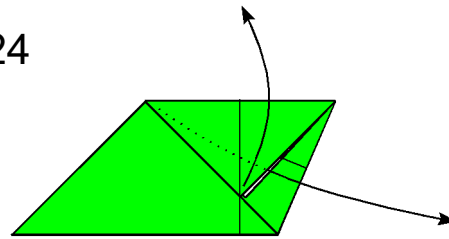
22. Fold the right hand corner onto the point where the crease made in step 21 intersects the sloping left edge.

23



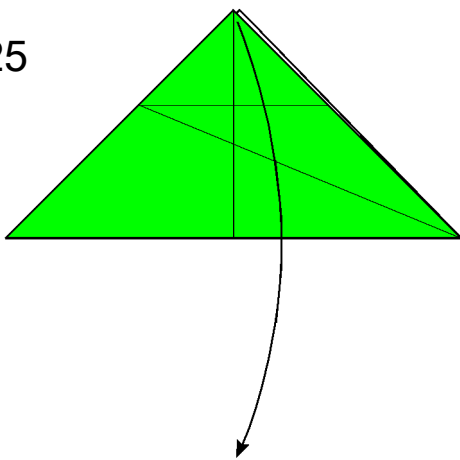
23. Fold the top point downwards over the edge of the front layers as far as it will go. Make this fold in both layers.

24



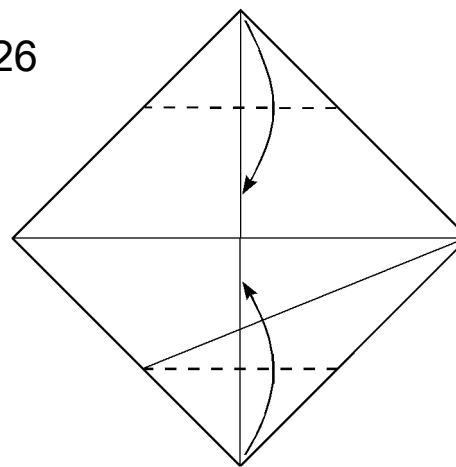
24. Open out the folds made in steps 22 and 23.

25



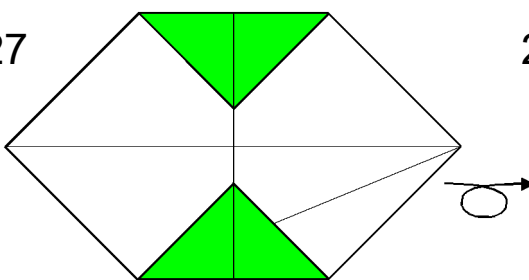
25. Open out the fold made in step 20.

26



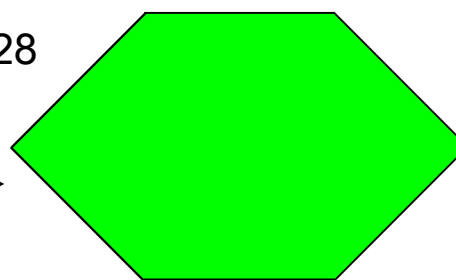
26. Fold the top and bottom edges inwards using the existing creases.

27



27. Make sure all the layers lie flat then turn over sideways.

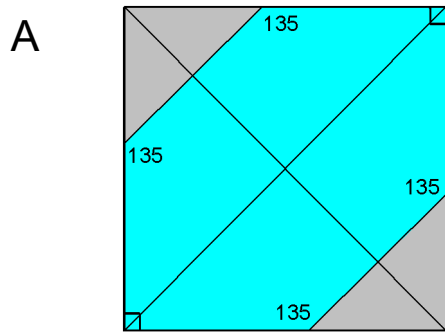
28



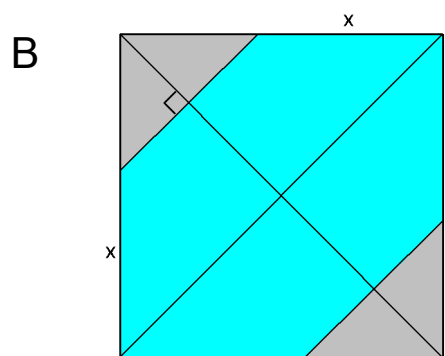
28. The squashed hexagon tile is finished.

# Notes

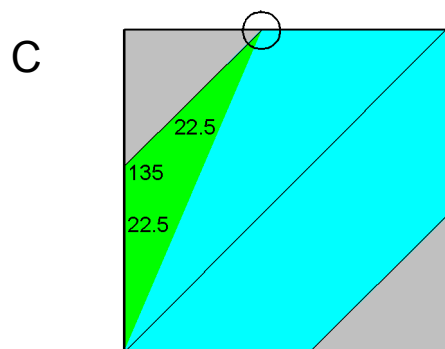
Showing that all the sides of the squashed hexagon tile are the same length.



A. It is useful to begin by labelling the tile with its internal angles.

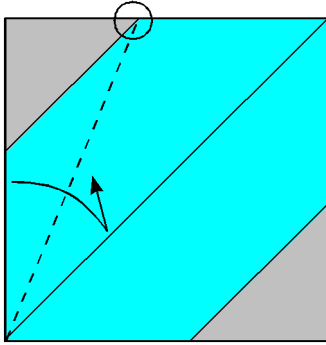


B. The tile is created by folding two opposite corners inwards. Because these folds are made by folding one point on a diagonal onto another point on the same diagonal the crease created by that fold must lie at right angles to that diagonal. Given this, wherever this crease is made the two edges of the tile marked  $x$  will always be of equal length.



C. The point marked with a circle is the point we need to identify in order to locate the fold. In order to do this we need to construct an isosceles triangle which has the internal angles shown here.

D



D. It is simple to create this triangle by bisecting the angle between the left edge and the diagonal. The point where this crease intersects the top edge is the location point we need.

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