Pinwheel Cubes

Designed by David Mitchell

Pinwheel Cubes are two-part modular designs developed from the traditional design known as the Pinwheel or Puzzle Purse.

The basic form of the cube has four wings, and in this form it makes an attractive decoration or gift container.

Other versions of the cube can be produced by inverting one or more of the wings.

Assembling the cube becomes progressively more difficult as the number of wings you attempt to invert increases, and for this reason assembling a full set of Pinwheel Cubes makes an effective manipulative challenge.

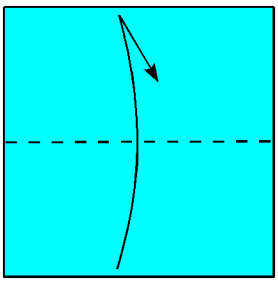
The folding sequence includes a rather lovely pull out move, step 19, in which the final form of the module is created all at once.

Pinwheel Cubes were designed in 1999.

You will need two squares of paper for each cube. You will also need another square of the same size to use as a template to help you achieve the first part of the folding sequence, which is to divide your two squares into 3x3 grids.

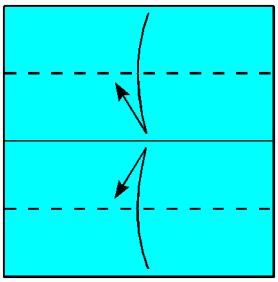
Any kind of paper can be used.

1



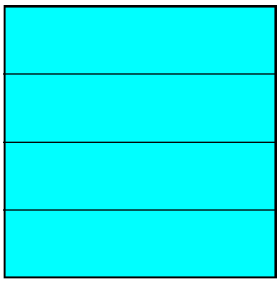
1. Fold the template in half upwards, crease, then unfold.

2



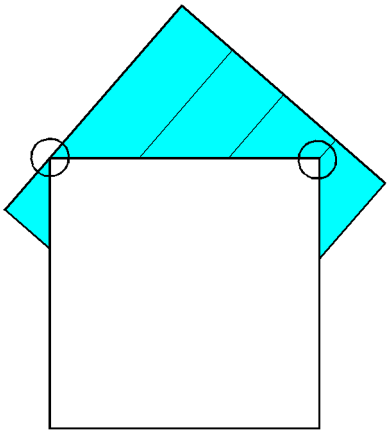
2. Fold both the top and bottom edges to the middle, crease, then unfold.

3



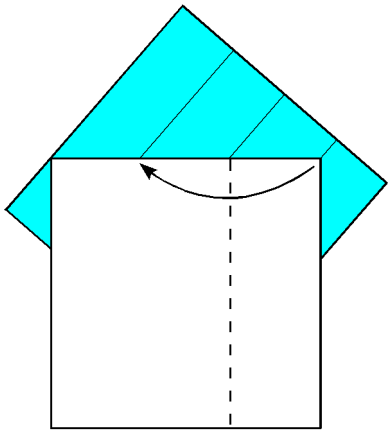
3. The template is finished.

4



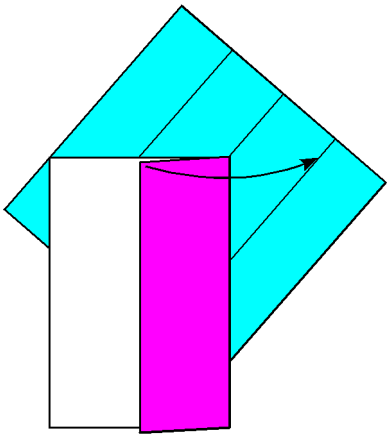
4. Begin by laying your square on top of the template like this, making sure the corners are aligned to the edge of the template and the crease in the way marked with circles here.

5



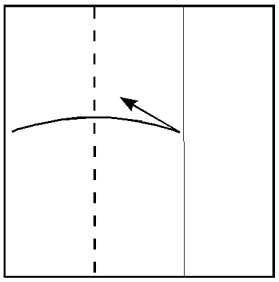
5. Fold the right hand corner inwards as shown. Make sure the two squares don't slip out of alignment as you make this fold.

6



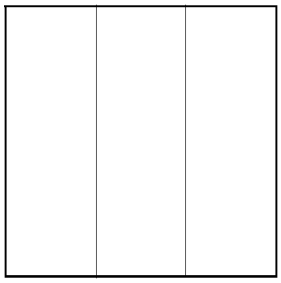
6. Open out the fold made in step 5 and remove the square from the template.

7



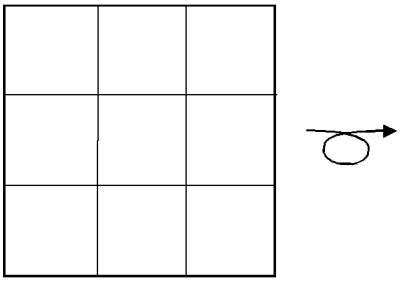
7. Fold the left hand edge onto the crease made in step 5, crease, then unfold.

8



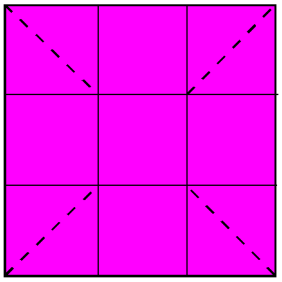
8. Your paper is now divided into thirds. To divide the paper into thirds in the other direction as well, rotate the paper through ninety degrees and repeat steps 4 through 7.

9



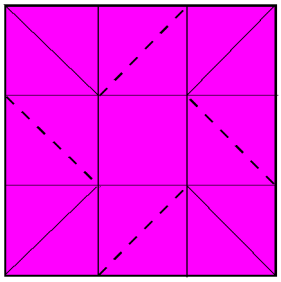
9. This is the result. The paper is now divided into a 3x3 grid of smaller squares.

10



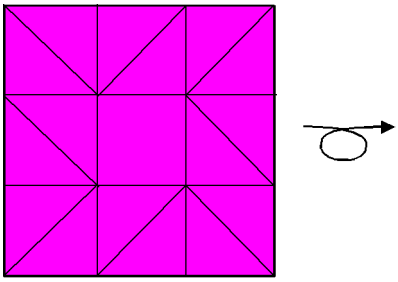
10. Fold diagonal creases into the four corner squares like this.

11



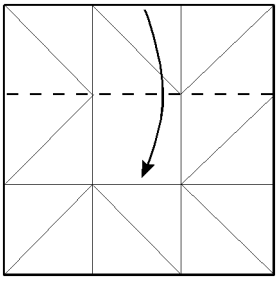
11. Add four more diagonal creases like this. Try to make sure the centre square remains crease free.

12



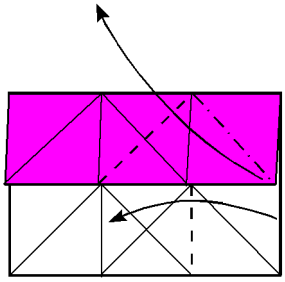
12. Your paper should now look like this. Turn over sideways.

13



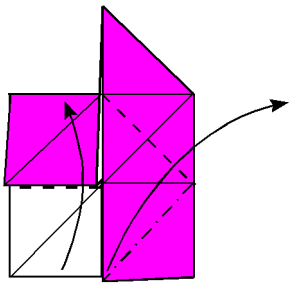
13. Fold the top edge downwards using the existing crease.

14



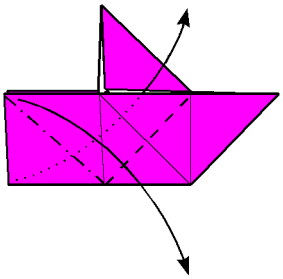
14. Fold the bottom right corner of the front layer diagonally upwards using the existing crease and flatten to look like picture 15.

15



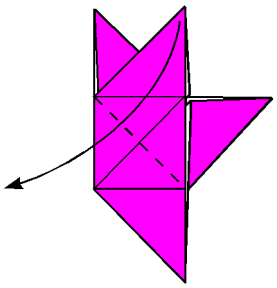
15. Fold the bottom left corner of the front layer diagonally upwards using the existing crease and flatten to look like picture 16.

16



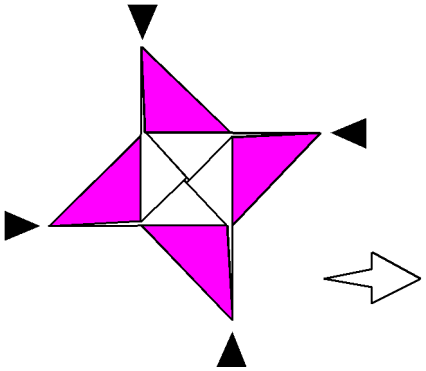
16. Fold the top left corner of the front layer diagonally downwards using the existing crease and flatten to look like picture 15.

17



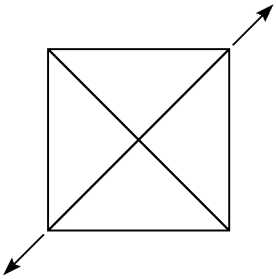
17. Fold the top point of the front layer diagonally downwards using the existing crease, like this.

18



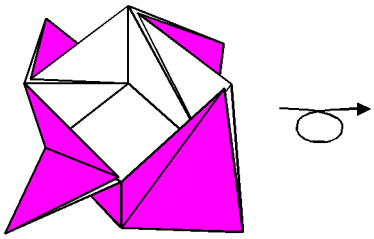
18. This is the traditional Pinwheel. Turn all four arms inside out in between the other layers using the existing creases.

19



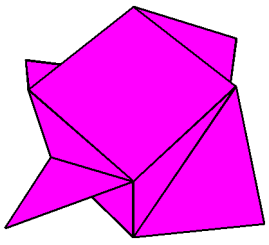
19. Press down firmly on all the edges and diagonals to ensure the creases are set into the paper. Take hold of the middle layers at the top right and bottom left corners. Gently pull outwards and twist anticlockwise. The module will become three-dimensional.

20



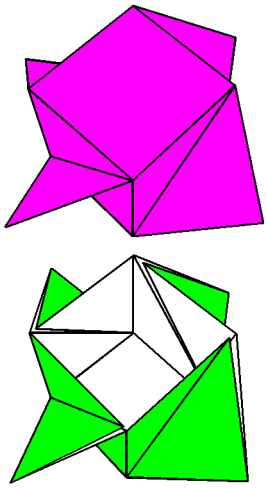
20. This is what the finished module should look like. Turn upside down.

21



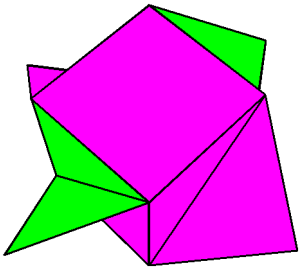
21. Make a second module but leave it the original way up.

22



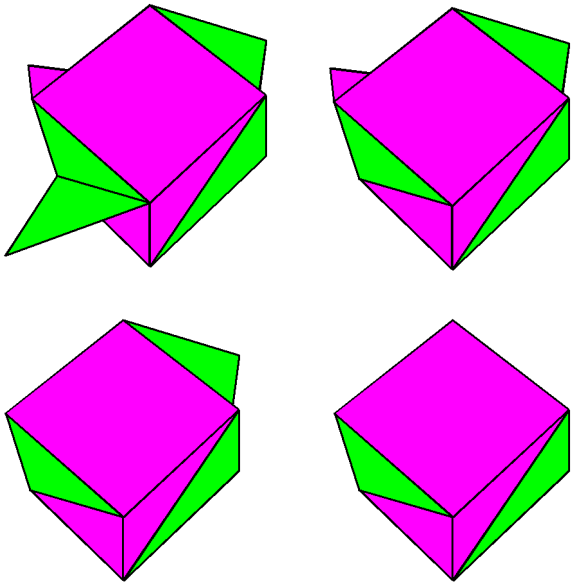
22. Arrange the two modules like this and interweave the wings.

23



23. This is the basic, four-winged, form of the Pinwheel Cube.

24



24. It is possible to arrive at other Pinwheel Cubes by inverting one, two, three, or, potentially, even four, of the wings in the way shown here. Assembly becomes progressively more challenging as the number of wings you are trying to invert increases. I have not yet managed to assemble a Pinwheel Cube in which all four wings have been inverted. You may, however, perhaps succeed in doing so ...