

Action Model:  
Blooming Flower by Bill Reyes  
Text by Paula Versnick, 2024

This design was taught by Koustubh Oka at the OUSA convention in New York in 2014. He developed the first instructions for the model (photo diagrams) with Bill. I was enchanted by the model when I learned it in the last year.

Unfortunately, Bill Reyes passed away, but before he did, he told Koustubh that his models may be freely shared, without profit. Let us respect Bill's wishes.

Start with a hexagon, about 17 cm in width, sturdy paper. Photocopy paper works well. There is no need for color change, but in the instructions I talk about colored side for the front and white side for the back of the paper.

1. Start with the colored side up, valley fold the 3 diagonals. To do this you align 2 opposite sides together.
2. Turn over, now the white side is up.
3. Valley fold the paper in half. To do this you bring one corner to the opposite corner. Do this 3 times.

In this last direction, we need to make an 8x8x8 grid. We call this a rotated grid, because it is not parallel to the sides.

4. To do this we fold a corner to the center and unfold. We do this for all corners.
5. Then we fold the corner to the middle of the farthest crease we just made, just between the center and the opposite corner. Unfold. Again for all corners.
6. And we make a pre-crease by bringing a corner to the middle of the most nearby crease we just made and back. Again for all corners.

Make sure you have an 8x8x8 grid and not forget a fold.

7. Turn over, now the colored side is up.
8. You can make a kind of preliminary base with 6 flaps by folding the central mountain creases and the valley diagonal creases. The shape resembles a kite with the colored side on the outside. The closed corner will be on top.

Now we concentrate on the top part of this shape. We need to make sharp pre-creases because we need to sink and un-sink these folds later. The first crease we encounter from the top we call A.

9. We fold the top point to the middle of A, this crease is C.
10. We make a sharp fold between folds A and C, this crease is B.
11. And we make a sharp fold from the top point to C, this crease is D.
12. Unfold the top part of the shape so that the hexagon formed by creases A will be flat. It is like a table cloth. Reinforce the mountain folds starting from the corners of hexagon A to the sides of the paper.
13. Hexagon B will have valley folds all around, pinch with your finger on the corners of hexagon A to make it happen.

14. Hexagon C will have mountains again, D will have valleys and the center of the paper will stick up (but not out) at the end. The model is 3 dimensional and stays that way for the rest of the instructions.

Now you have something that resembles a six sided skirt with, seen from above, a star shape. Don't fold it flat.

We need some small folds, the smallest of the model. These folds help the action go smoother.

15. Between 2 corners of hexagon A we need an inside reverse fold, as deep as it wants to go. To do this we bring 2 corners together. Then we can pull the edge in-between the corners down. Start making the folds sharp from the corners to the center. When the folds are in place you can reinforce them by bringing the 2 corners together. Try not to tear the paper. Do this step on all sides of hexagon A.
16. We are going to make an inside reverse fold. The creases that start at the corners of the paper and go to the top (diagonals of the original paper) are now valleys. Two thirds of these should be mountains, from the corner of the paper to the second crossing. Make this a mountain and align the corner of the paper with the 2 adjacent corners of the shape and press down. Make sure you make no new creases by doing this, and that the crease is precise from beginning to end. The inside reverse fold is aligned with the raw edge of the paper. Do this 6 times.
17. We have to make two smaller inside reverse folds on both sides of the bigger one we just made. Make sure you make no new creases by doing this, and that the crease is precise from beginning to end. Repeat on all sides.

Now the model resembles a part of a Christmas tree, with many small and big spikes on the edge.

The next part is difficult to explain, but I try it anyway.

18. Imagine you have 6 fingers instead of 5, and grab the star at the top with your main hand. Put the edge of the model in your other hand and turn clockwise (or, if you prefer, counter-clockwise), almost 180 degrees. Gently push on the model while doing this. The pivot point is the top of the outside reverse fold of step 16, these 6 points meet in the middle of the model. The bottom of the model is a bit concave, and shows a star shape made of 6 rhombuses (each made of 2 equilateral triangles).
19. Make sure the inside reverse folds of step 17 are in place. Hold the model between your thumb on top and your index finger at the bottom. Take a point of the star shape, now on the bottom, with a mountain fold to the bottom center point. As you do this, a petal takes shape on the top side. Work your way around, making sure the inside reverse folds of step 17 stay in place and the petals go up, and the model is convex on the bottom.
20. The flower is almost finished. Just make a soft crease outwards on every petal.

To see it in action, push on the bottom while spreading the petals gently. The top of the model comes up! Push on the star to get the first shape again.

The first time it may be a bit difficult, but it goes smoother when you do it more often.