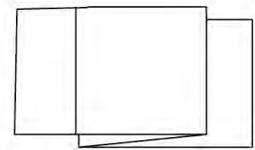


# Double Pleat Hexagonal Tessellation

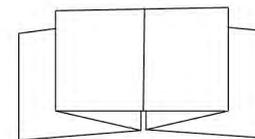
Most tessellations created with precreased grid structures tend to use single pleats in their construction. This pattern is a bit different, using what I prefer to call double pleats to put a new spin on a very common design. Double pleats (a pleat axis with a pleat of equal width on each side) change the nature of twist folds slightly; since there is folded pleat material on both sides of the pleat intersection, there is no longer any rotational orientation that is required for the tessellation to fold flat. This handy nature of double pleats is particularly useful when tessellating patterns that have an odd number of sides, like triangles or pentagons. In this instance, however, we are using our new freedom from specific twist rotation to put a counter-clockwise spin on every triangle twist- something that would be impossible to do if we were using single pleats.

The basic structure of this design is simple regular hexagons, also known as a p6 tiling or 6.6.6 tiling. We will use double pleats to outline all of the hexagons, and use triangular twists at all of the pleat intersection points.

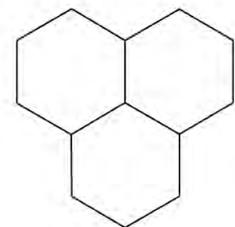
A crease pattern is attached for reference; however, I encourage you to try folding this design on your own, first. Good luck!



single pleat



double pleat



basic structure

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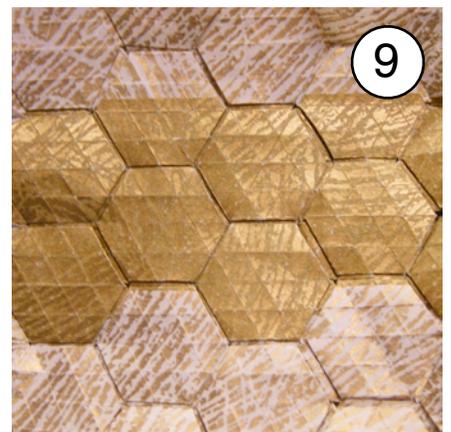
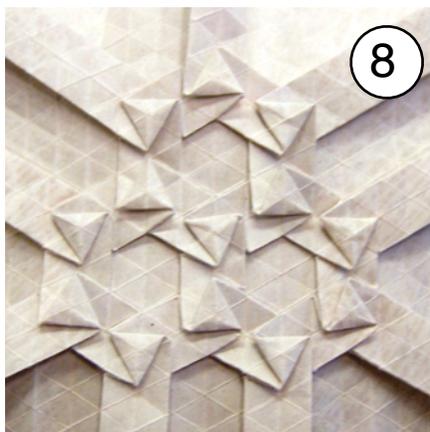
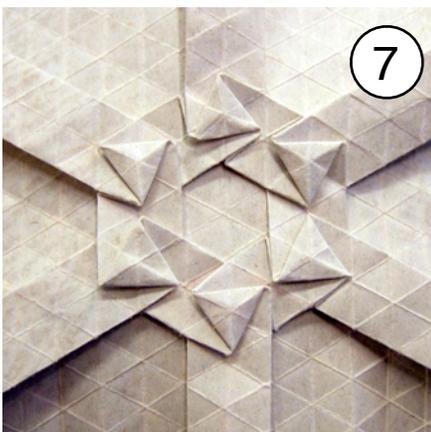
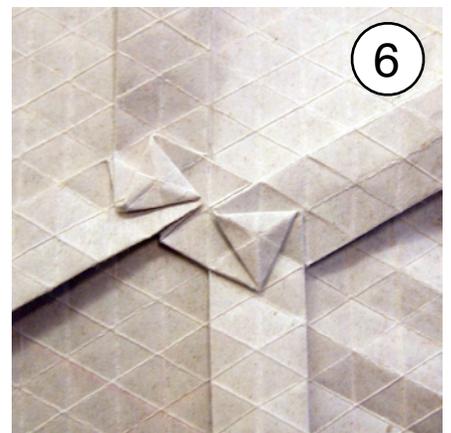
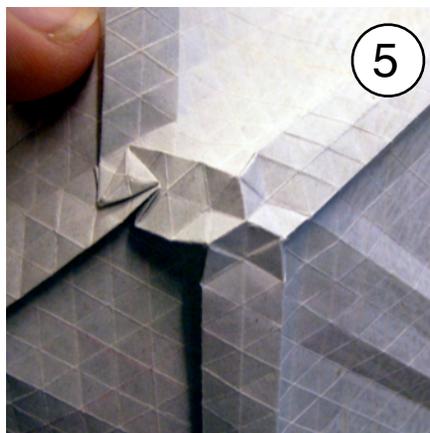
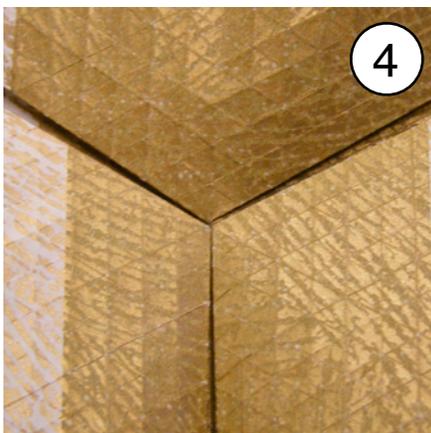
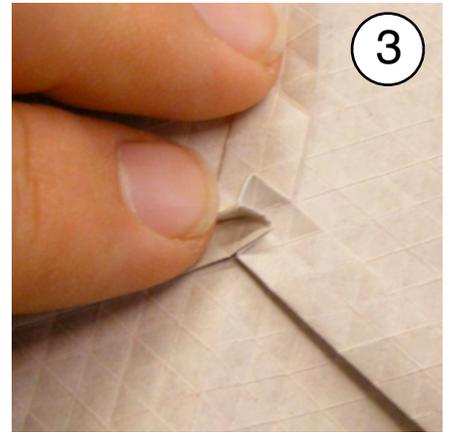
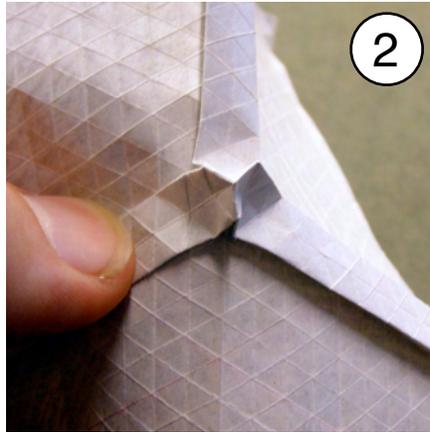
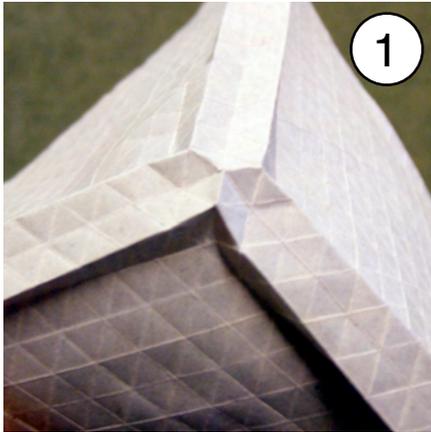
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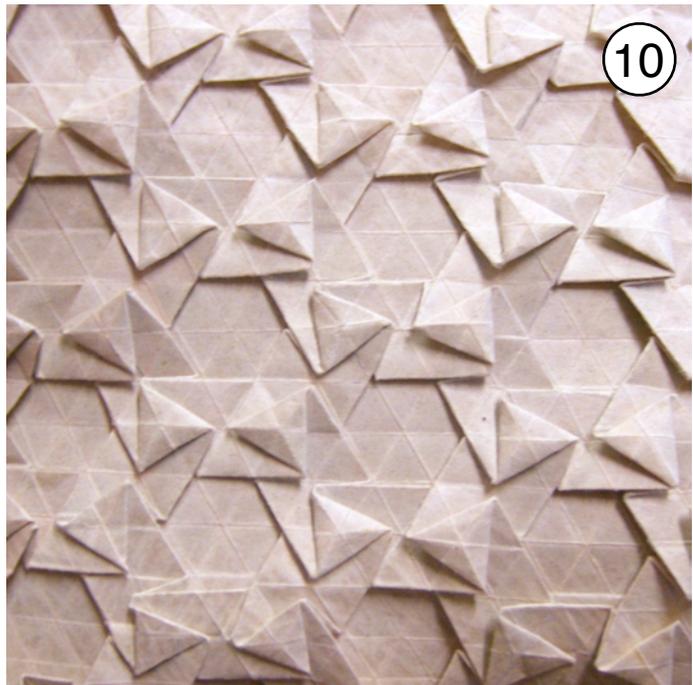
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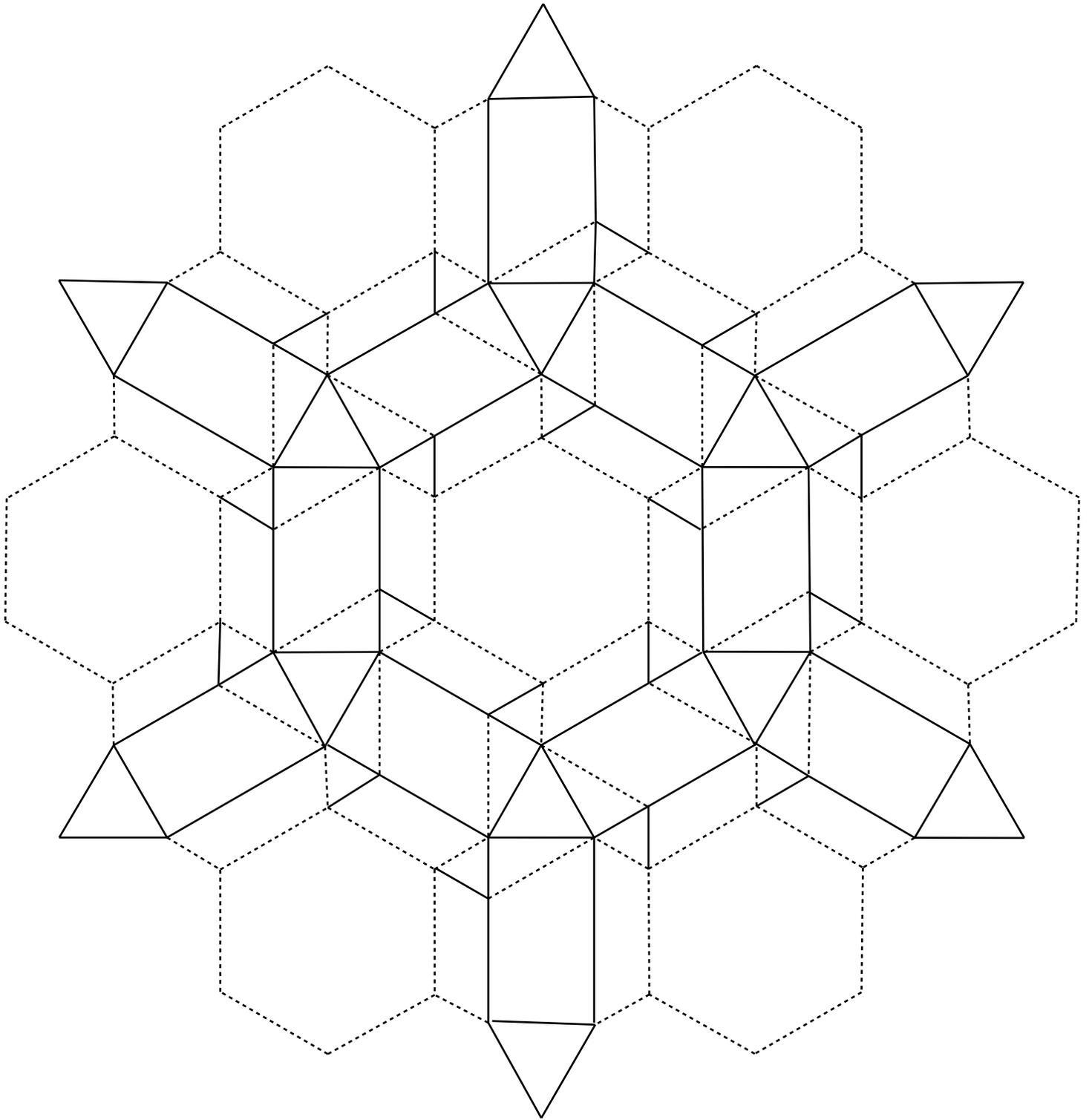
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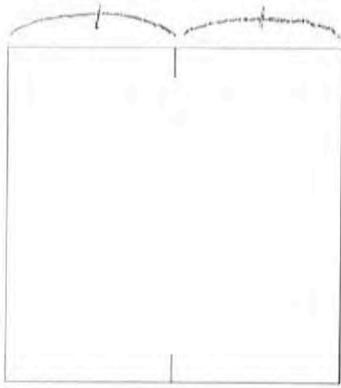
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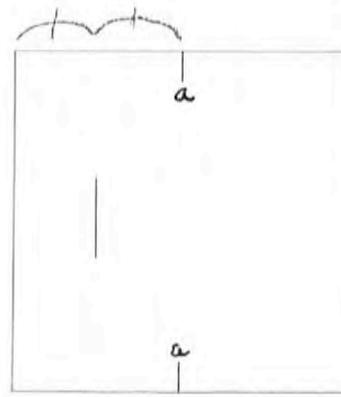
1. Fold double pleats into a triangular intersection, and start pulling the extra pleat paper together at the intersection point.
2. Completed intersection, prior to twisting.
3. Rotate and squash twist the triangular intersection.
4. Completed twist intersection, as seen from the back. Notice the lack of directionality- a single pleat twist would have one side “higher” than the other. With the double pleats, both sides are equally matched and appear level.
5. Travel down one of the double pleats and create another intersection; to create this particular pattern, the center of the intersection point should be two triangle lengths away from the tip of the previous triangular twist.
6. Completed second twist.
7. Continue around the hexagon, creating triangular intersections and twisting them, until the hexagon is complete.
8. Repeat the same process in all directions. It is easier (in my opinion) to finish one hexagon completely before moving on to another one.
9. The finished pattern from the back. Notice the even tiling, and complete lack of directional orientation to the pleats and tiles.
10. The finished tessellation, with all the triangular twists rotated in the same direction. (Hopefully your finished piece is more accurate than this example!)



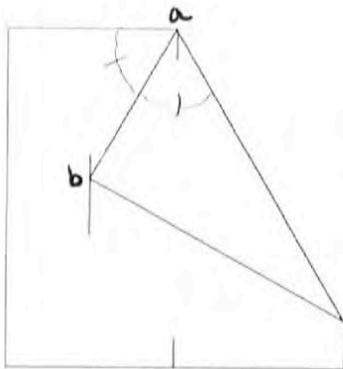




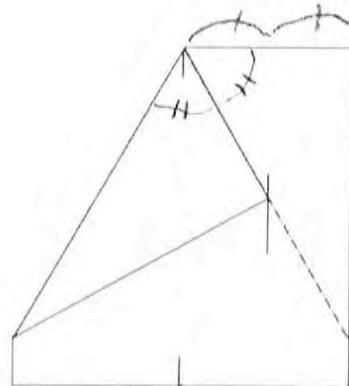
1. Book-fold center, crease ends only.



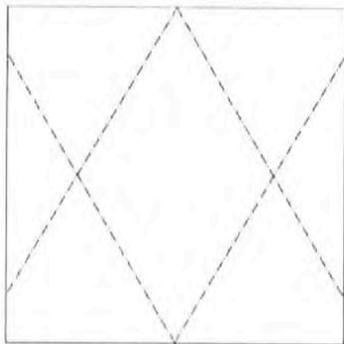
2. Valley fold to crease 'a', crease where indicated.



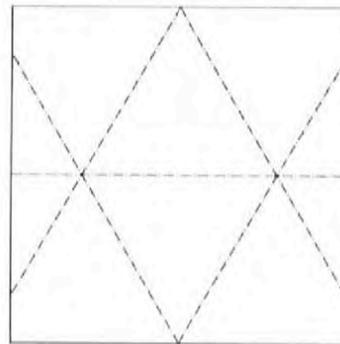
3. Fold corner to crease 'b' using crease 'a' as guide point.



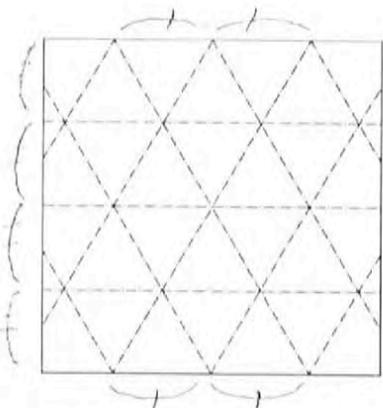
4. Repeat on other side use existing crease as guide or repeat step 2 on other side, folding opposite corner to



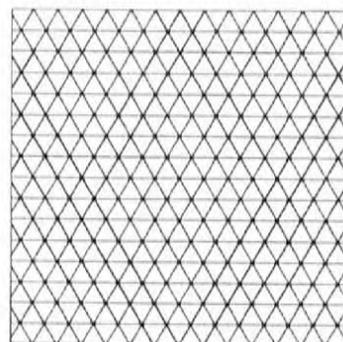
5. Rotate 180°, repeat steps 3 & 4.



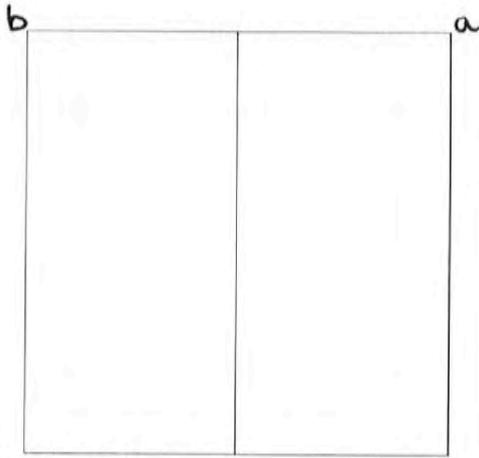
6. Fold in half. (Crease should fall on intersecting points of diagonals.)



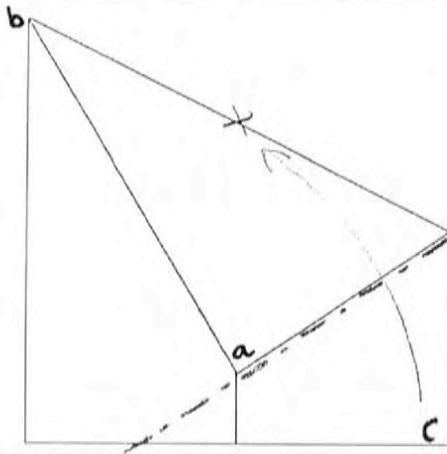
7. Fold in quarters horizontally; fold additional diagonals using existing creases as guideline.



8. Repeat till you can't stand it anymore.

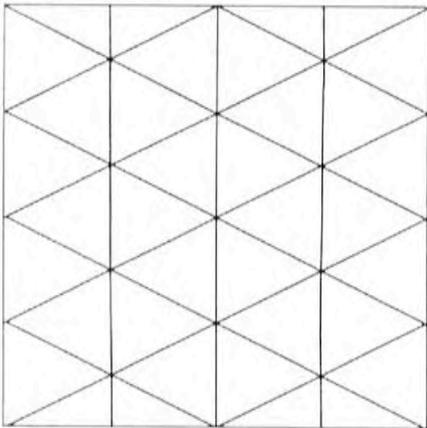


Book fold. (This can be done on any length of paper so long as the fold runs down the length and not across the width)



Fold point 'a' to center line using point 'b' as pivot. ~~Repeat using each of the four corners once as a pivot point and once as a match to the center point.~~

*Fold corner C to diagonal crease using edge as a guide.*



Repeat till you can't stand it anymore!