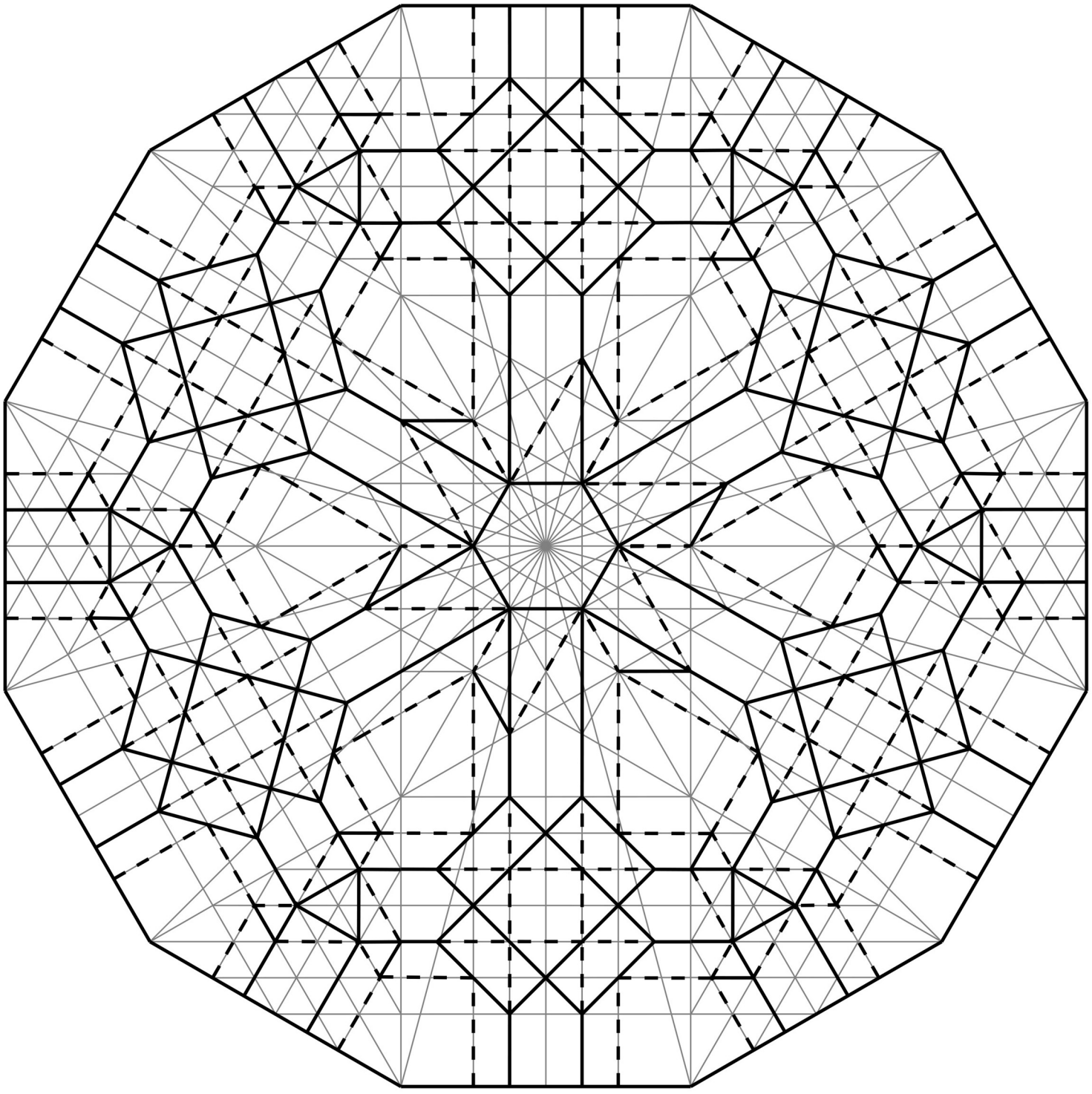
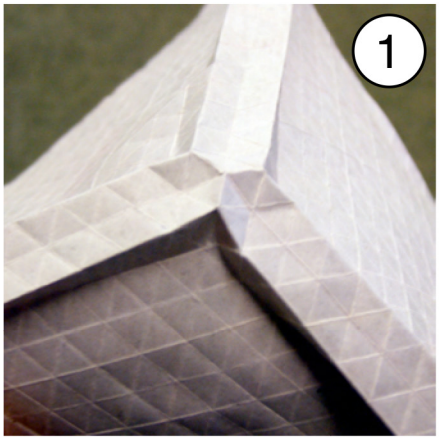
# HydRingEa

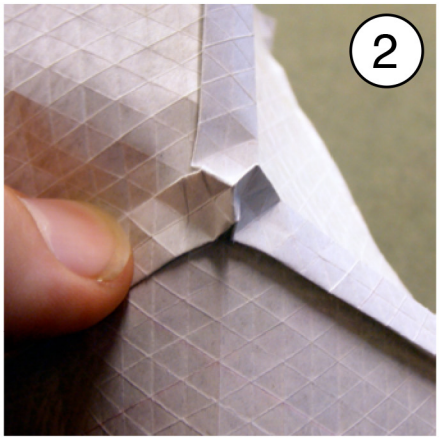
based on Shuzo Fujimoto's Hydrangea

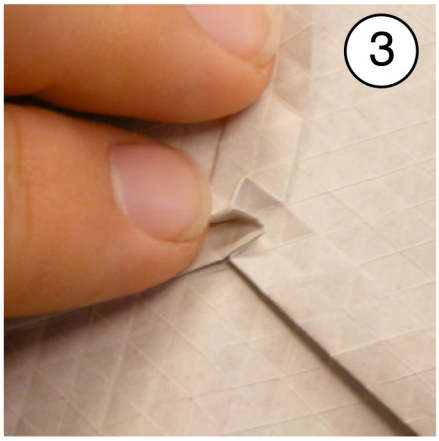
by Robin Scholz (tinyurl.com/praisepratajev)



This tesselation uses so-called double-pleats and their intersections.
The easiest case is the intersection of 3 double-pleats. It's a well-known technique explained for example in Eric Gjerde's book. On his homepage (www.origamitesselations.com) he also provides instructions for a tesselation pattern consisting only of 3-way- intersections of double-pleats. These pictures are taken from his document and show how to fold such an intersection:



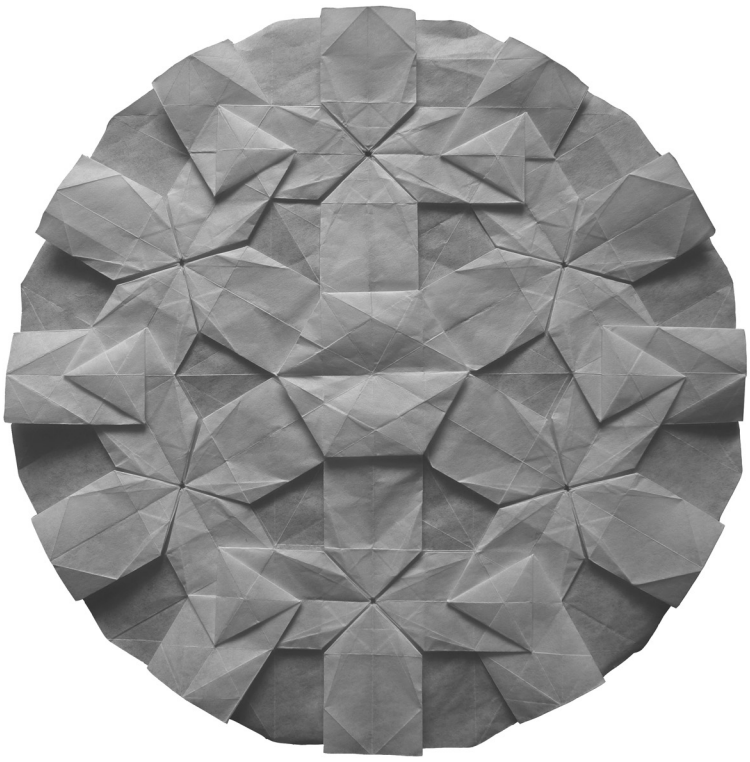



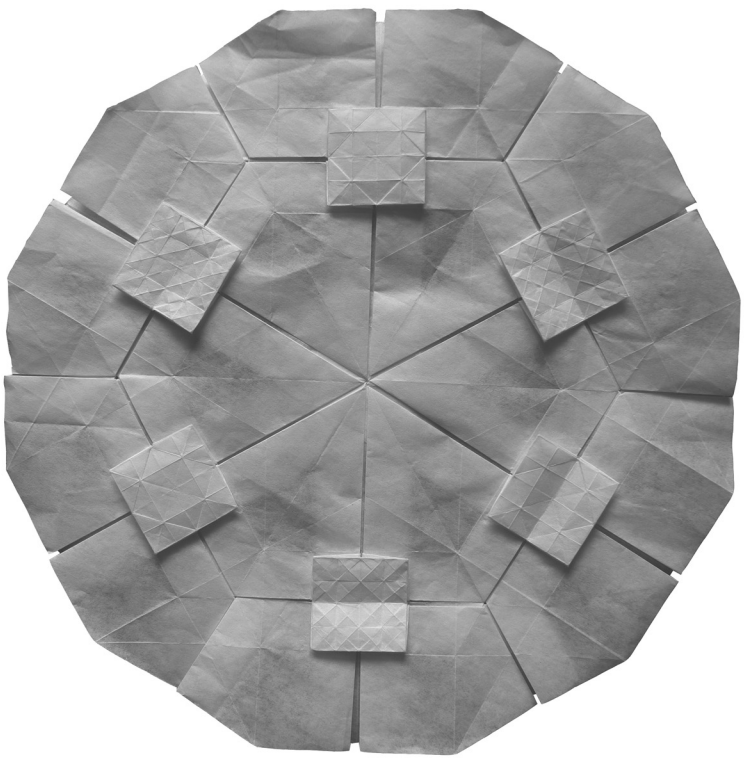

This kind of intersection is used in the triangular parts of the crease pattern.

The center of the pattern uses an analogous technique for the intersection of 6 double-pleats. It will of course result in a hexagon twist on top.

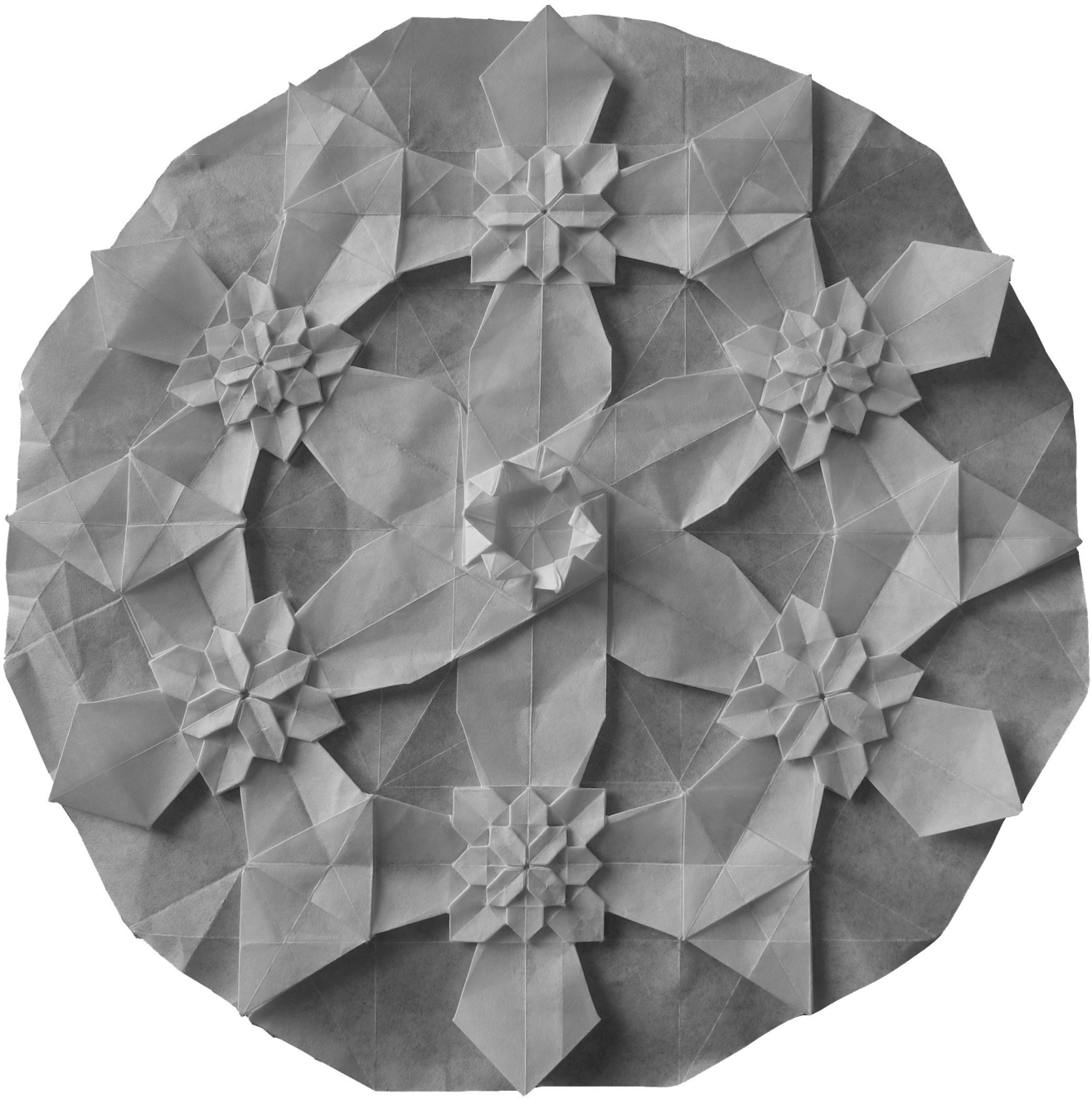
In the square parts the 4 intersecting double-pleats are used to create hydrangea bases (a.k.a. cross-box pleats) as invented by Shuzo Fujimoto.

Collapsing the crease pattern will give you the following result:





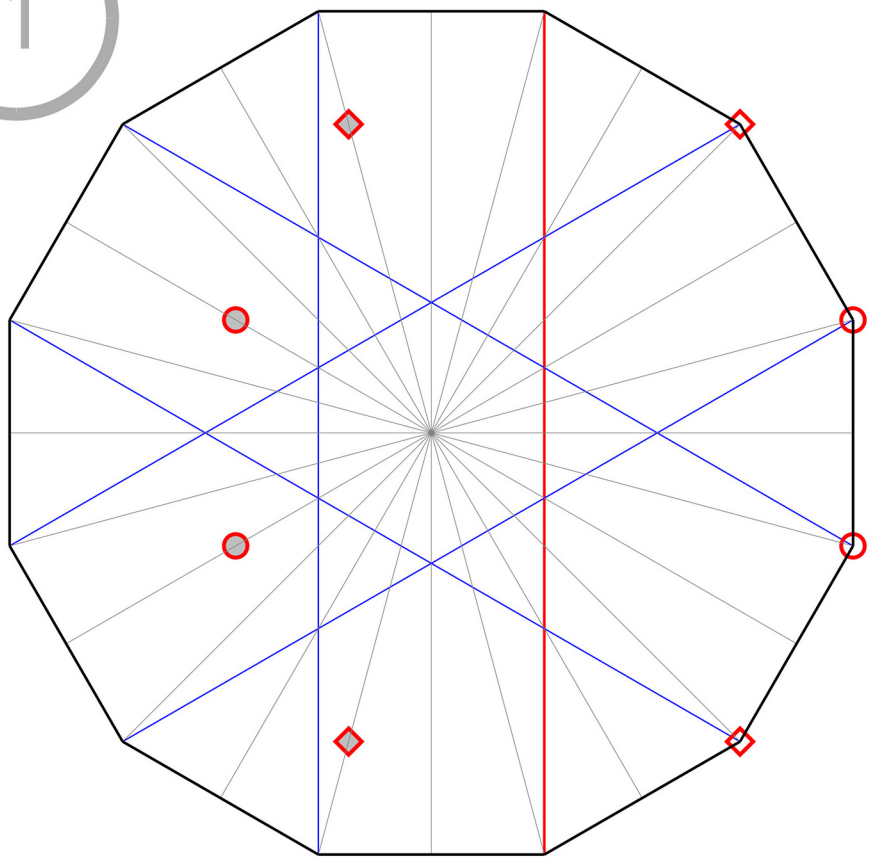
After the collapse you can add as many hydrangea levels as the paper will allow you to. You can also shape the triangle and hexagons twists a bit and get something like this:



For this model thin and big yet relatively stiff paper is needed. Kraft paper will be a good choice, normal kami should work fine, too.
The final model will be half the size of the initial dodecagon. The hydrangea flowers will be quite small, though. If you start with a 28cm wide dodecagon the model will be 14cm wide and the hydrangeas will be 2cm wide.

The following progressive crease pattern provides a folding sequence for the underlying grid of this model.
Each crease should first be folded as a valley fold and then be inverted into a mountain fold, so that finally it has no remaining orientation.

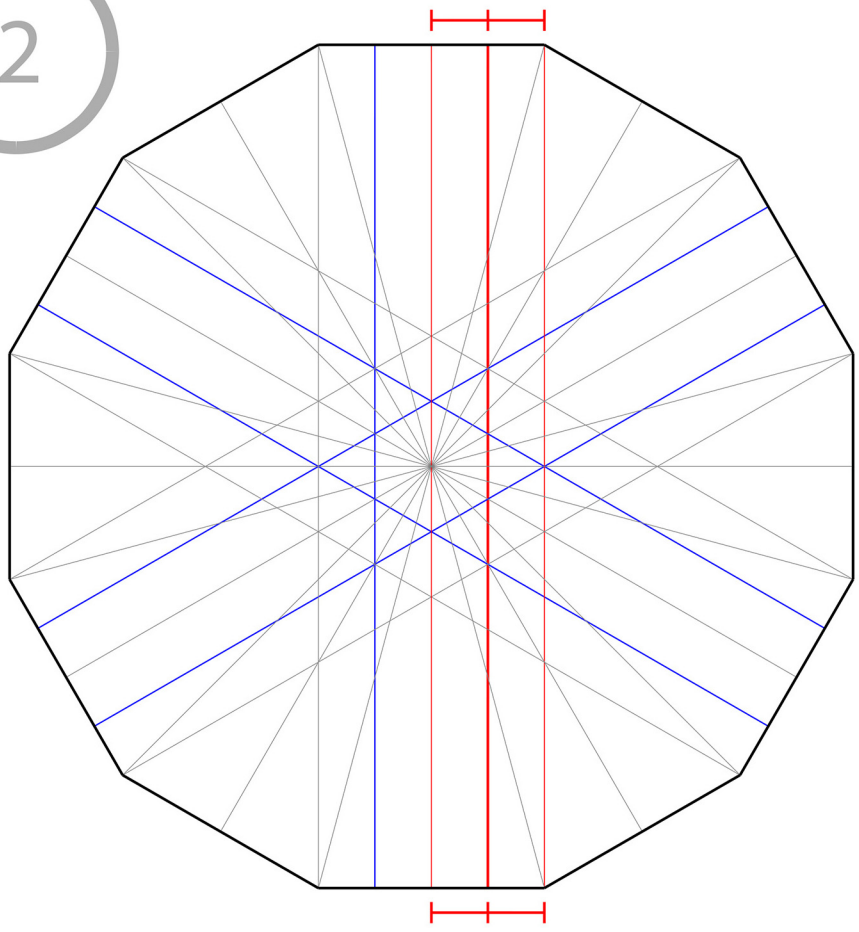
1



start with a dodecagon with all the diagonals and medians creased;

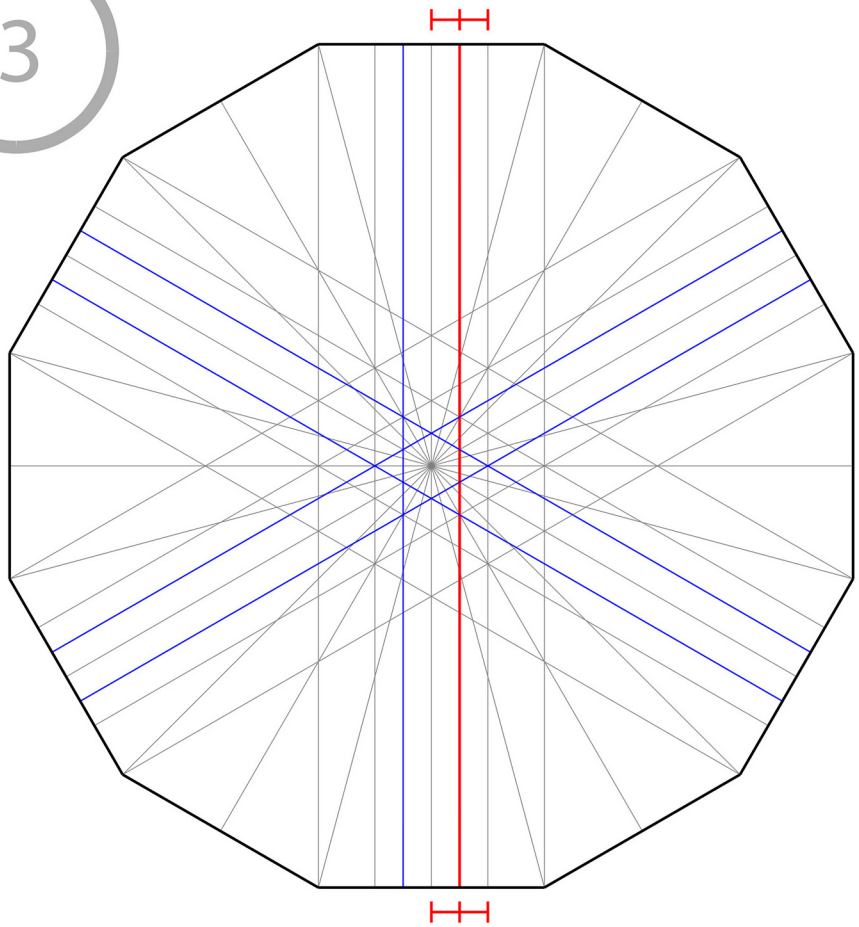
connect 3 pairs of opposing sides of the dodecagon by creases as shown, you'll form a hexagon in the center

2



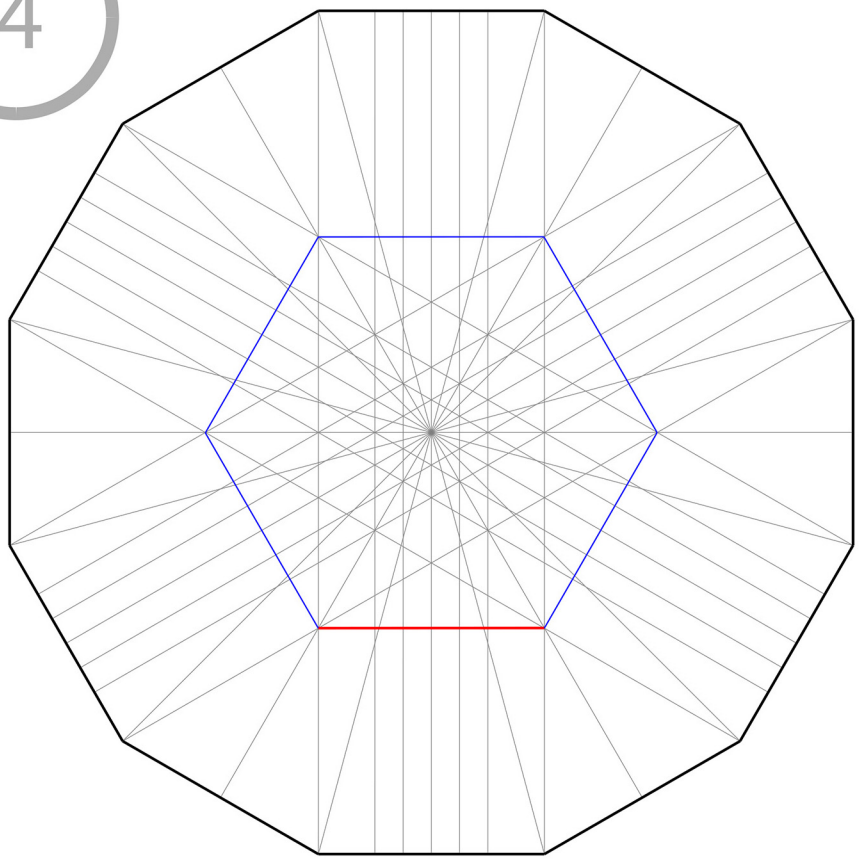
divide the the „strips" (formed by the creases from step 1 and the medians of the dodecagon) into halves

3



divide the 2 inner strips into halves

4

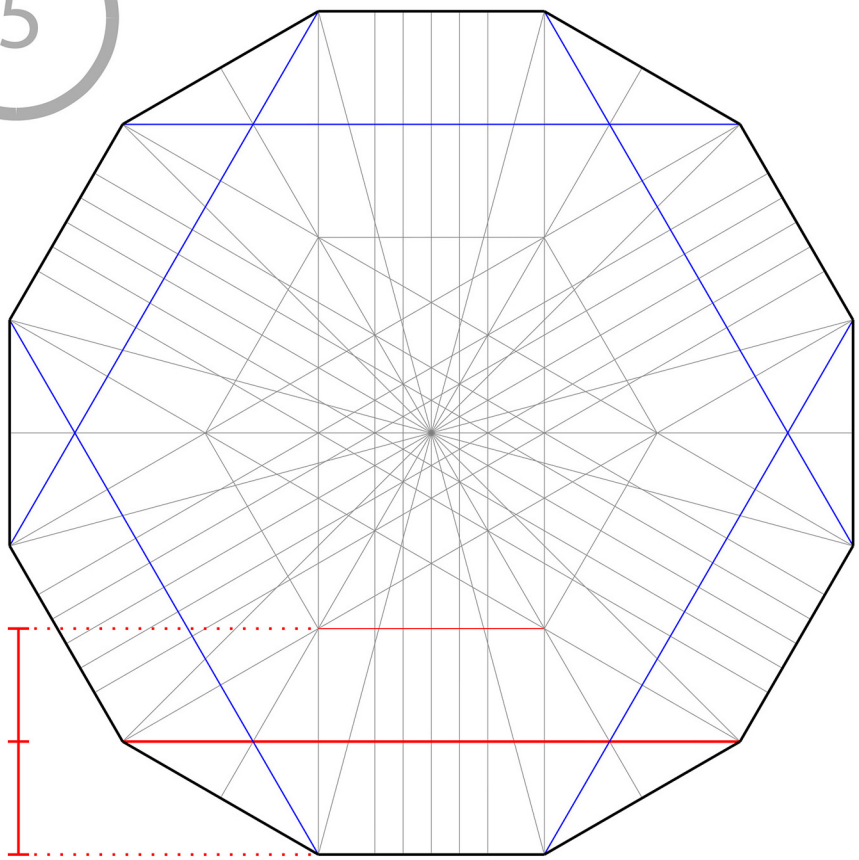


fold another hexagon in the center (rotated against the hexagon from step 1) ;

the initial dodecagon is now divided into a hexagonal part which is surrounded by square and triangular areas;

the hexagon grid is already finished,
in the square parts the grids are finished in one direction each

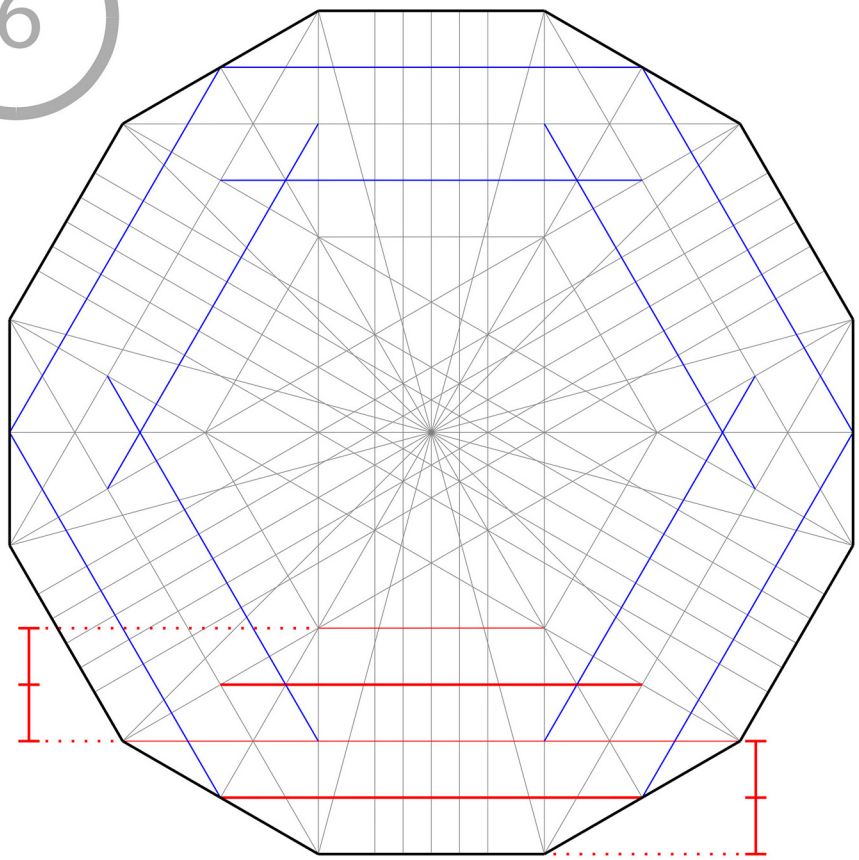
5



begin to fold the remaining creases for the square grids;

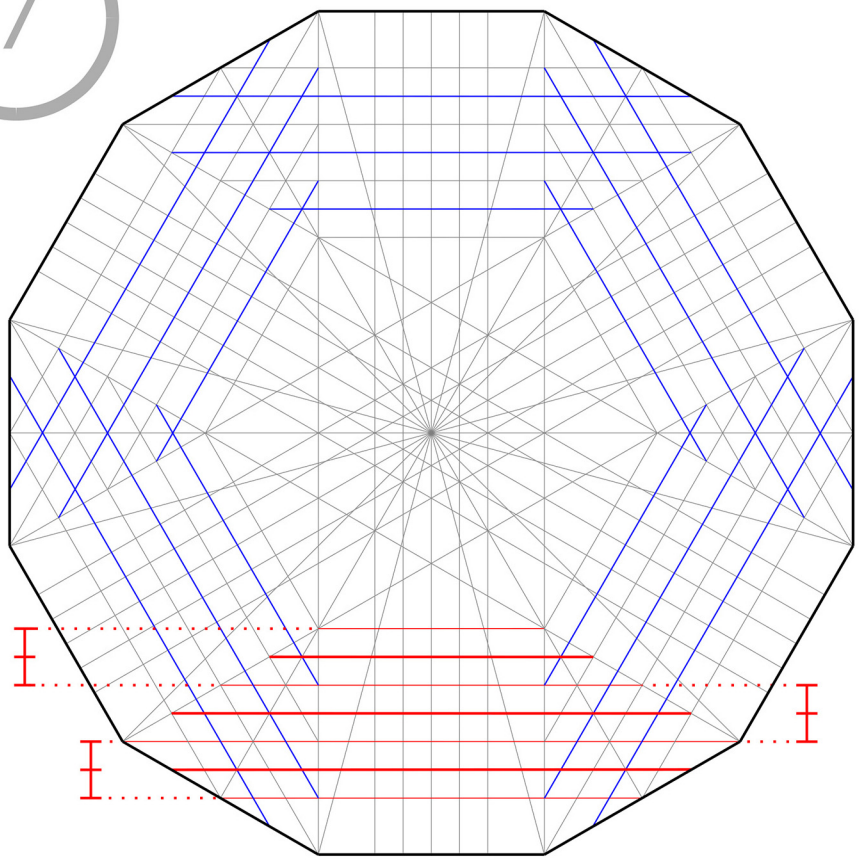
this will also form part of the triangular grids

6



continue the square grids

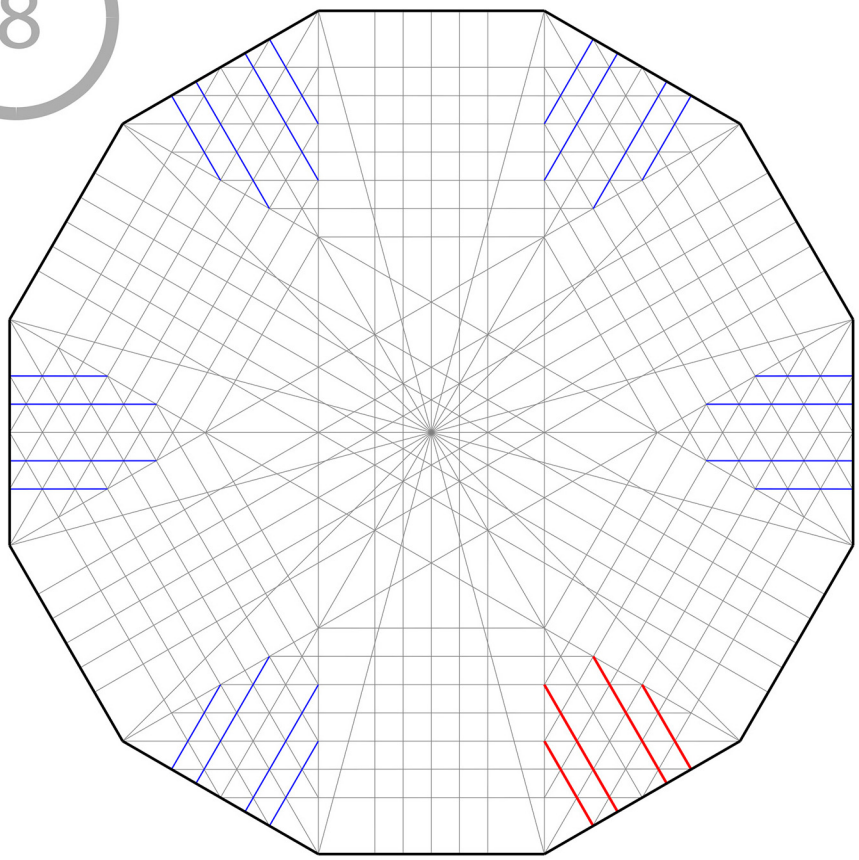
7



the last grid lines for the square grids;

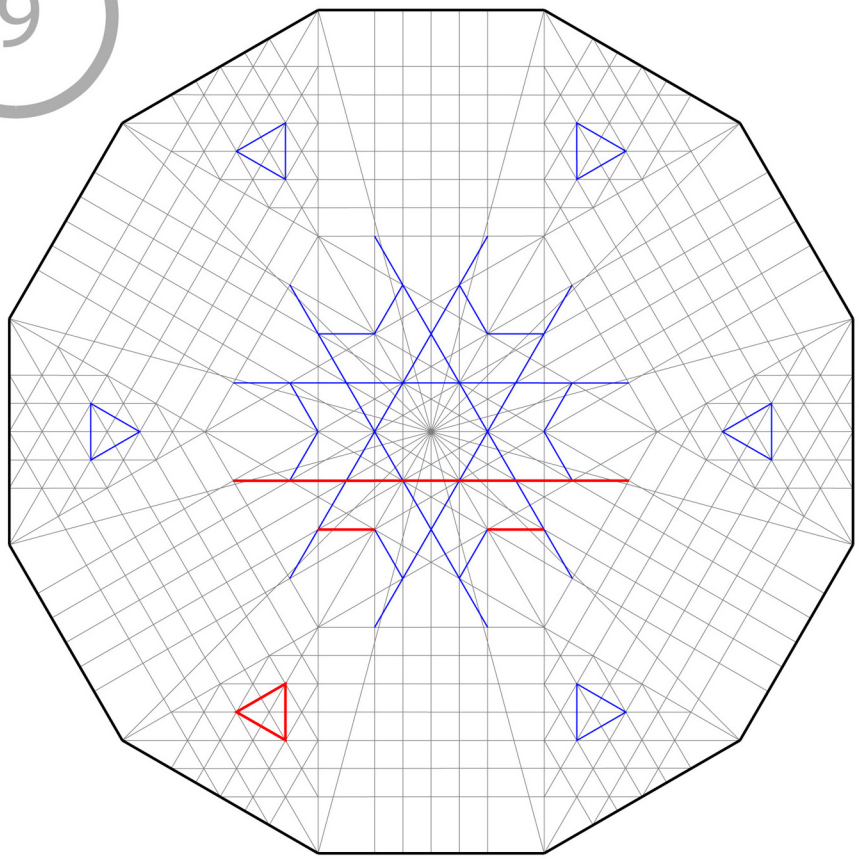
the triangular areas are almost finished, too

8



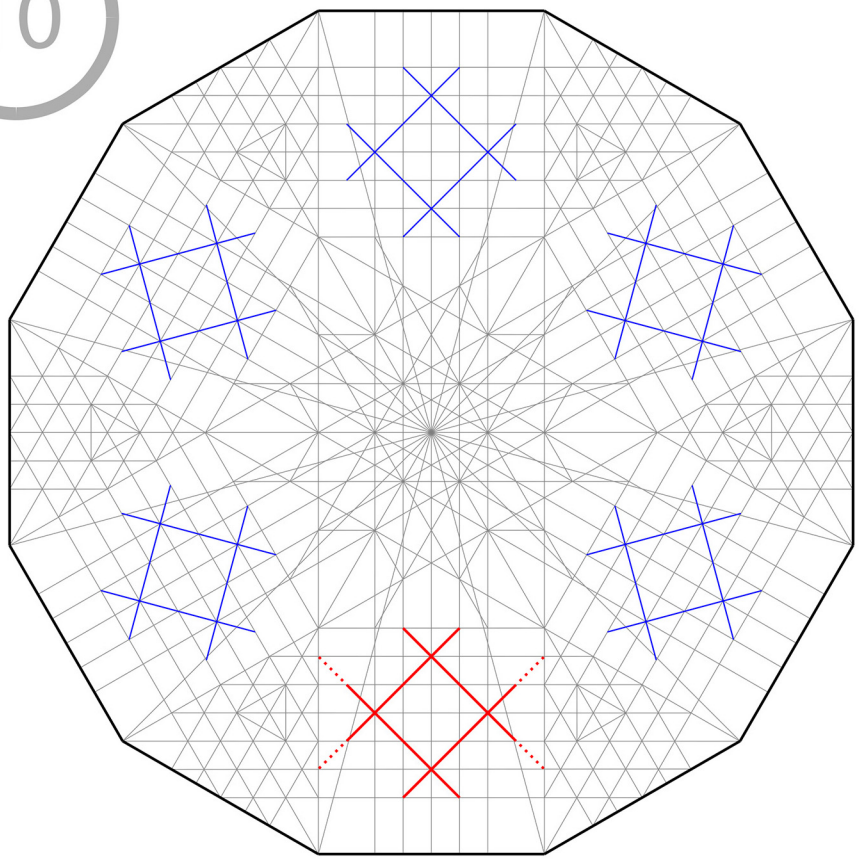
add the last creases for the grids in the triangular parts

9



precreases for the twists of the double-pleat intersections in the triangle and hexagon areas respectively

10

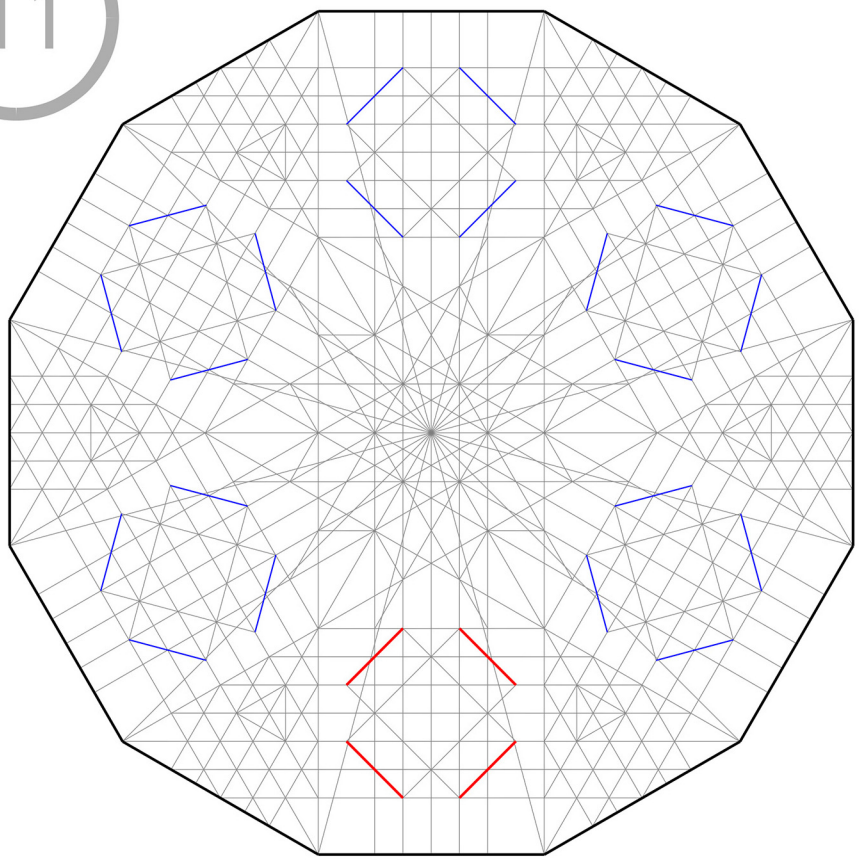


first precreases for the hydrangea bases;

**pay attention to the reference points!!**
some of the new creases only *seem* to pass through crease intersections but in truth miss them;

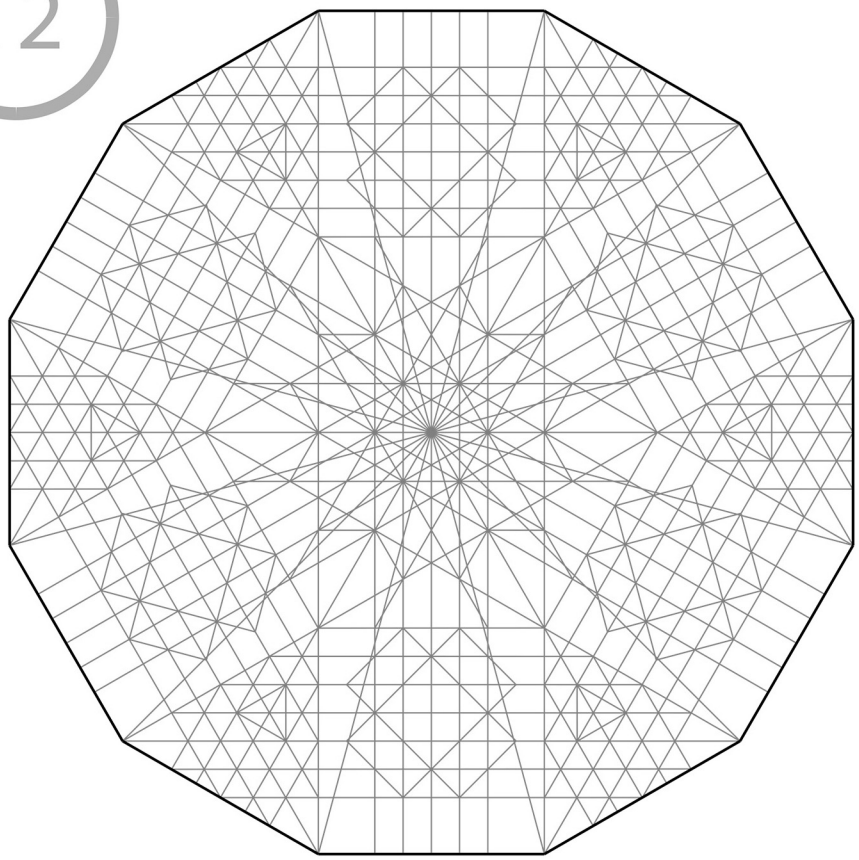
you can also continue the precreases in the dotted parts;
those are not needed for the collapse, but neither do they any harm

11



final precreases for the hydrangea bases

12

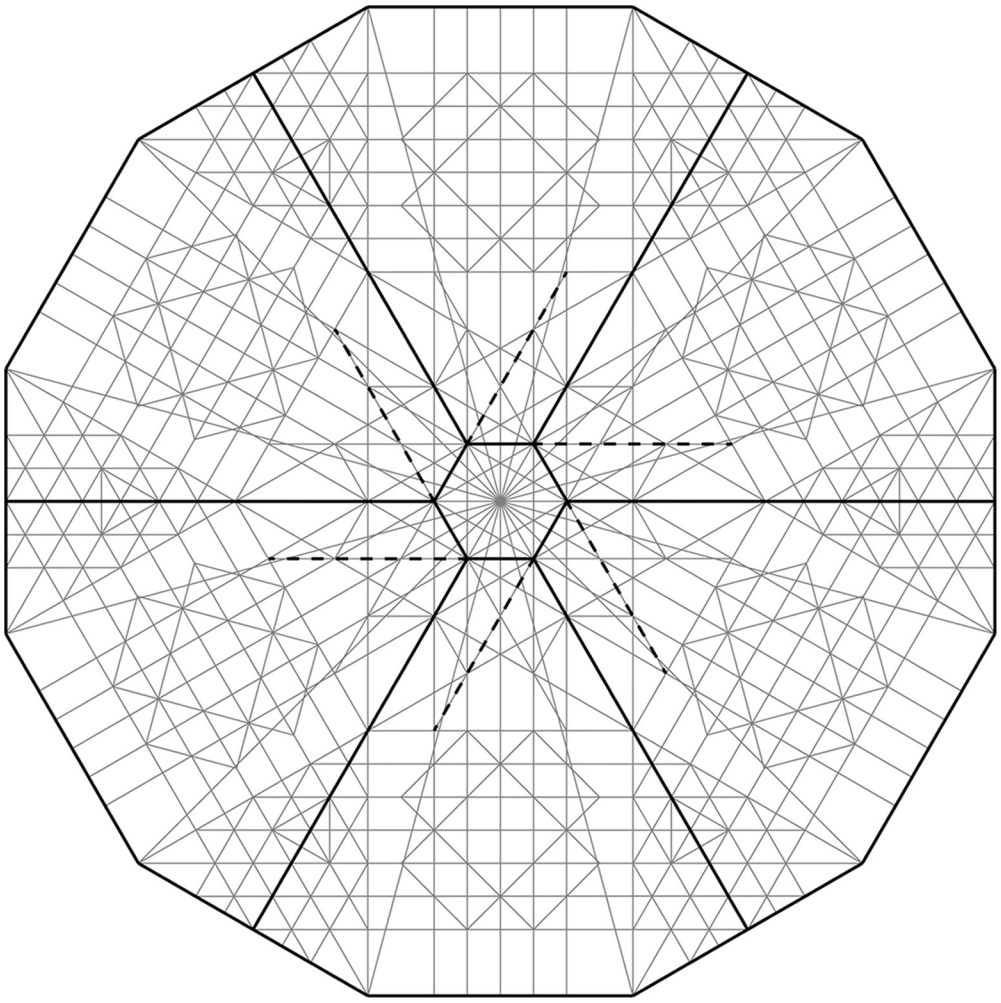


the finisehd grid, ready to collapse;

start the collapse with the central hexagon part,
this can be quite tough to execute;

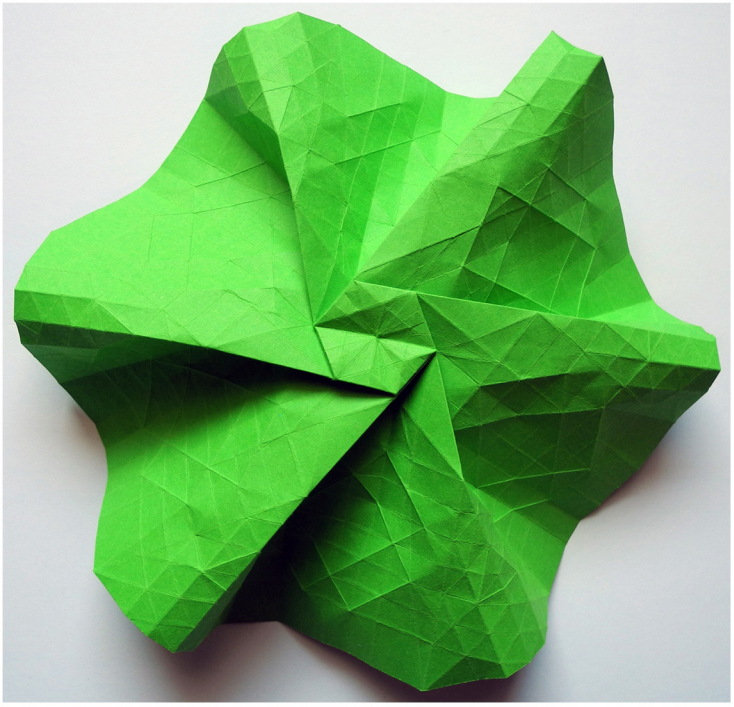
but afterwards it gets easier :-)

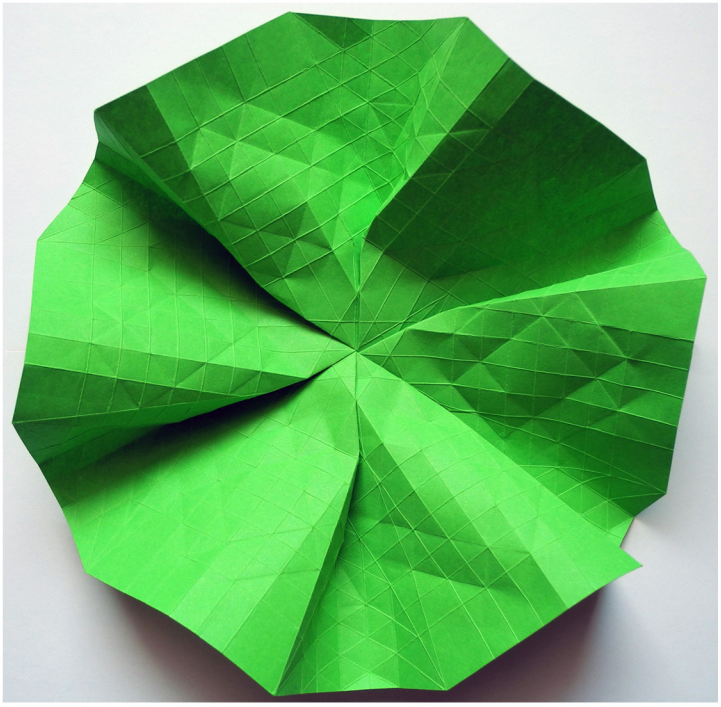
have fun!

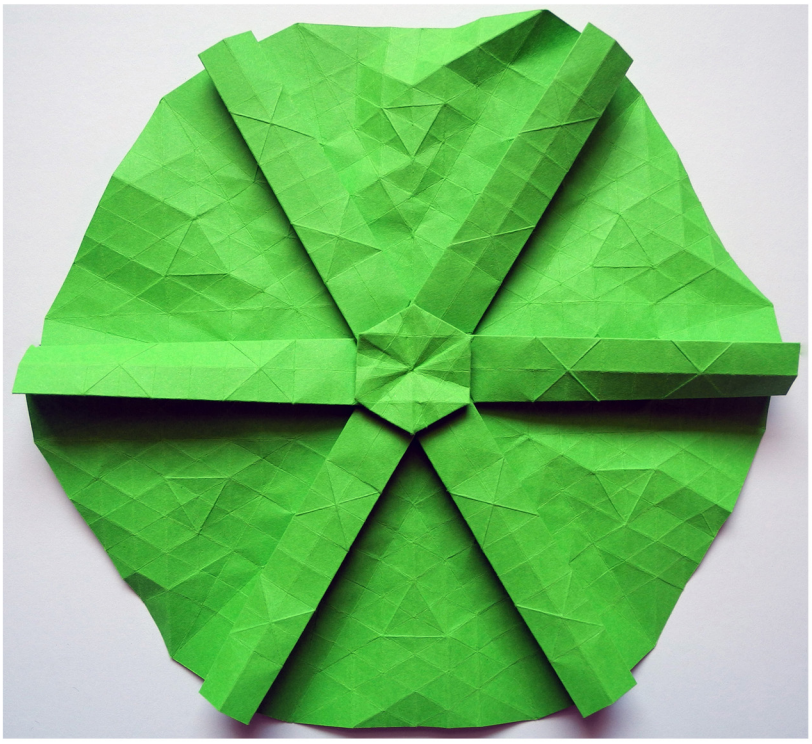


The collapse in the center of the paper is the toughest part of the folding sequence. It's a good idea to split it up into several steps.

First you fold a hexagon twist along existing precreases. Notice that the valley folds don't reach the edge of the paper. Thus the model will temporarily become three-dimensional. However, the hexagon twist and its surroundings are collapsed flat.







To create the double-pleats every mountain fold that leads away from the hexagon twist will be split into two new pleats.

Each splitting point is a corner of the hexagon. The new pleats will enclose a 60° angle.

Every line you need to fold in this manoeuvre  is already precreased.

# Appendix: Dodecagon from a square

technique by Daniel Kwan