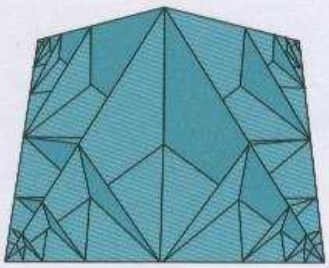
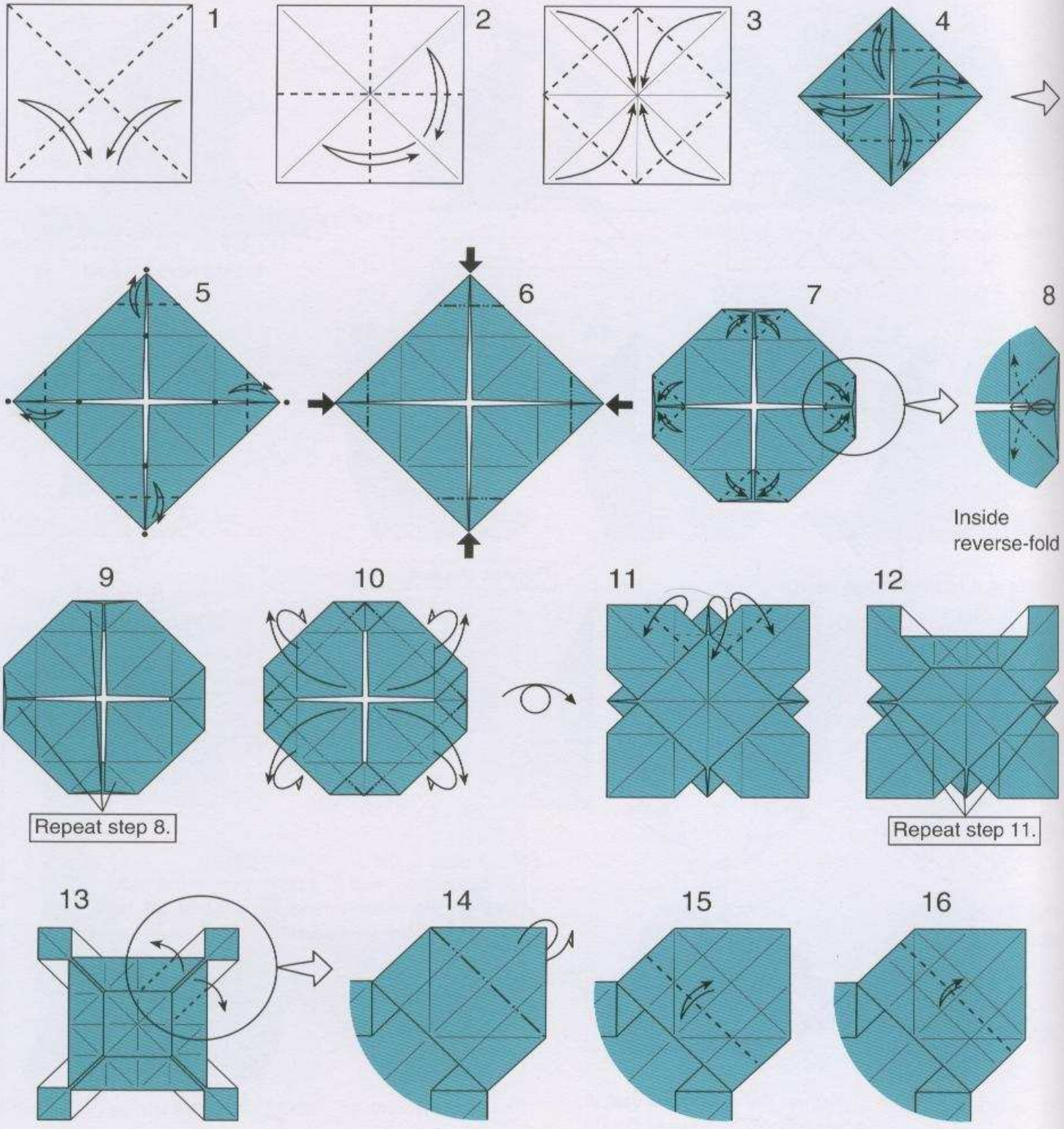
# Pyramid

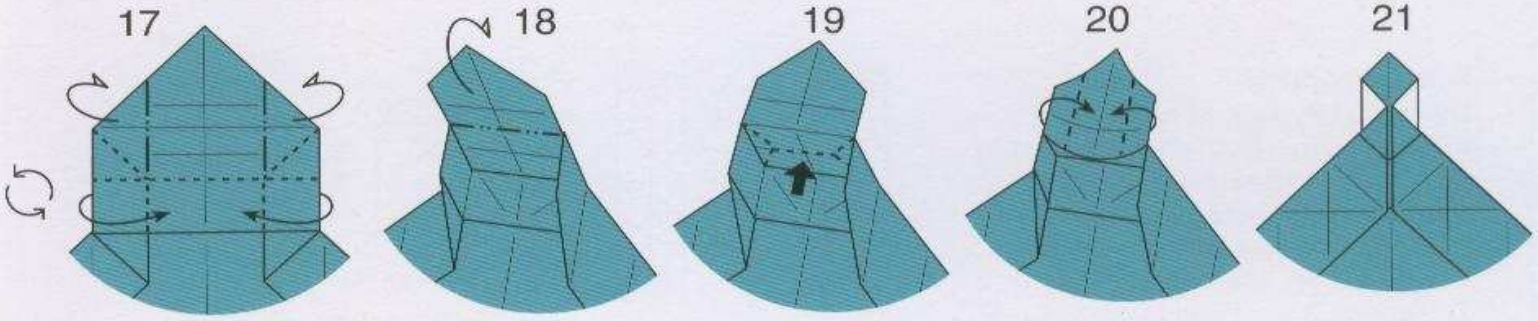
## Theme: Infinite folding

Fold using 6" (15 cm) or preferably larger origami paper.

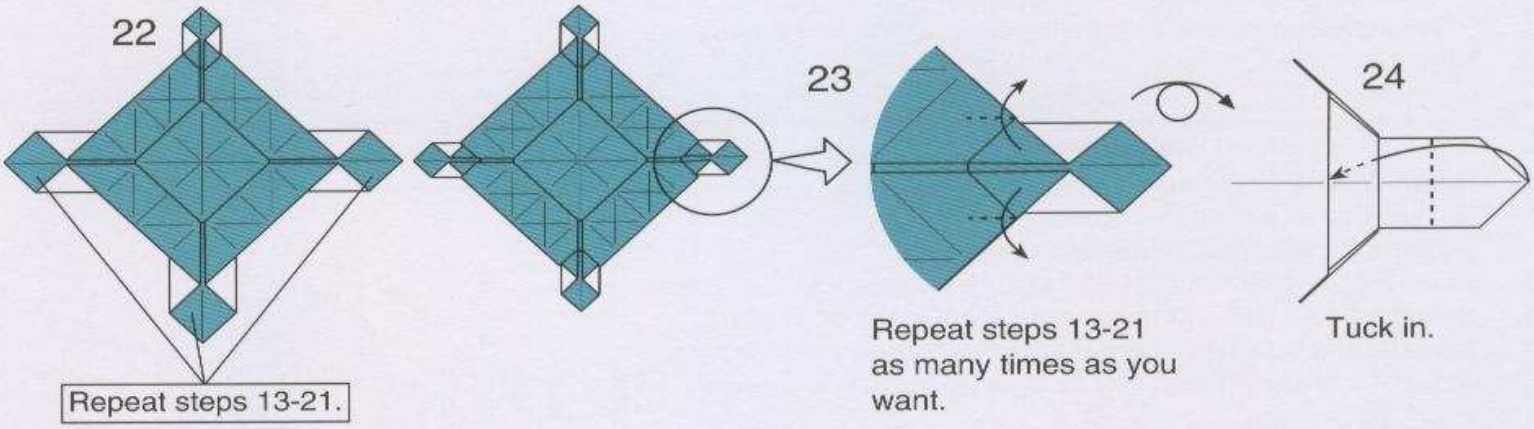


Although the sequence is diagrammed in 33 steps, you can, in theory, repeat the steps as many times as you want.





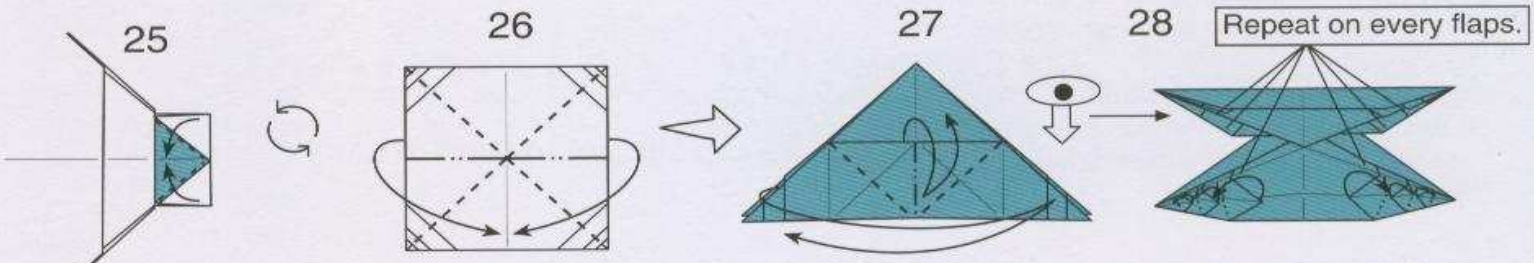

Form a box-like shape.




Repeat steps 13-21.

Repeat steps 13-21 as many times as you want.

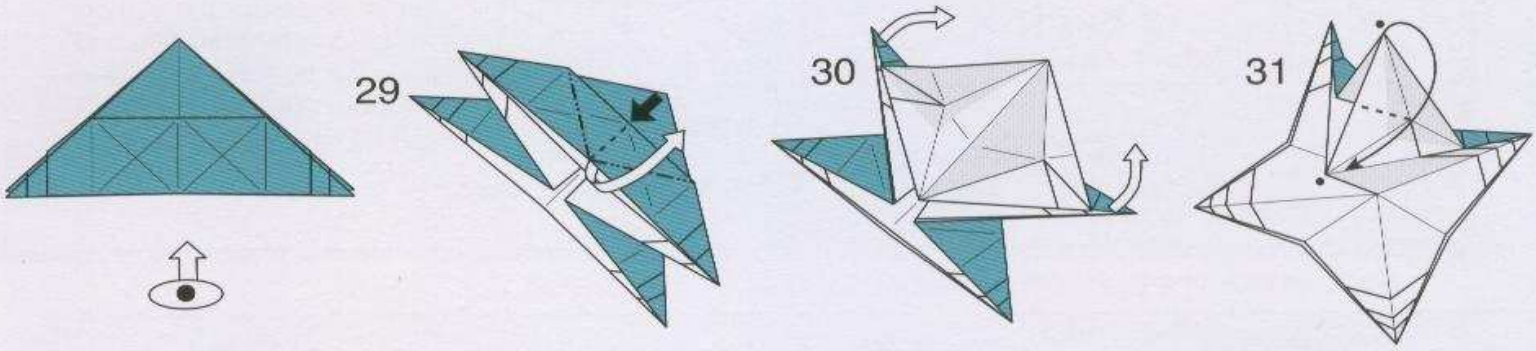
Tuck in.

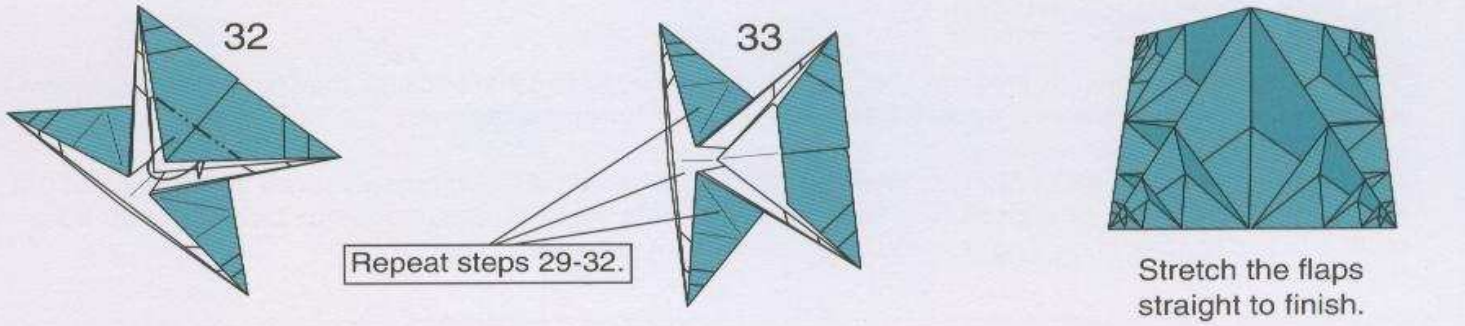



A Water-bomb base

Repeat on the other three flaps.

Turn the flaps to the other side.



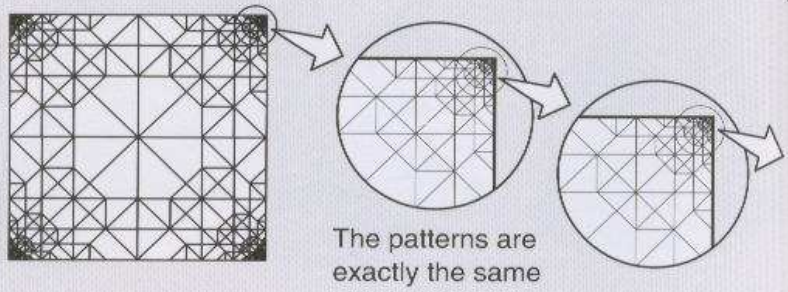




Repeat steps 29-32.

Stretch the flaps straight to finish.

**Folding infinitely**

This model Pyramid consists of four similar patterns, each one consisted by smaller and smaller triangular plates converging to one point.
Though it may look like branches of a tree, no branch has a sub-branch, unlike *Turkey* that is introduced later.



The patterns are exactly the same when enlarged.

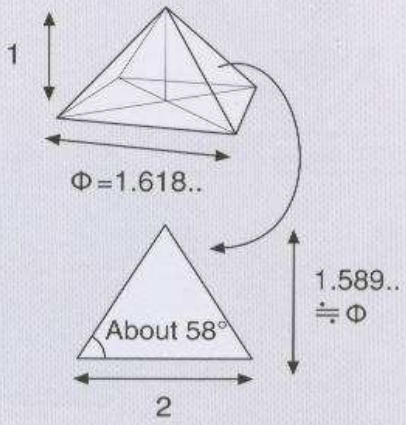
Ushio Ikegami extended this model and achieved a crease pattern that branches both infinitely and recursively. Its structure is highly complex but very interesting.

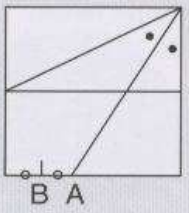
**Folding a mathematically-correct pyramid**

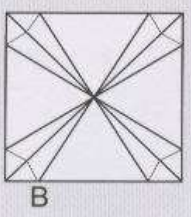
In the real pyramids in Giza, the ratio of the height to the base is said to be 1 : 1.618... or the golden ratio. On the other hand, the ratio in this model, where the sides are equilateral triangles, is 1.414... or $\sqrt{2}$, which is slightly different from "true pyramid."

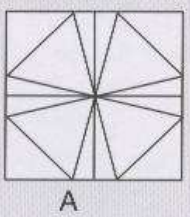
Interestingly, if the ratio of the base to the height in a square pyramid is the golden ratio, the ratio in the side is 2 : 1.589..., which is nearly equal to the golden ratio.

I found an article "Folding true pyramids" in my own old design notes, where I assumed that the ratio of the base to the height in the side should be 2 to the golden ratio. Some sketches from the article are shown below.

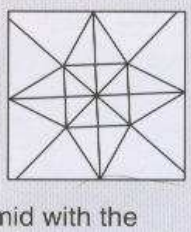



Two types of pyramid without the bottom



A pyramid with the bottom, folded from a rotated Water-bomb base

If folded from a regular Water-bomb base, the vertex angle of each triangle will be greater than 60°, and there will be folded edges on the sides. But the difference can be ignored in practice.

This concludes Intermediate Models.

The next chapter is Complex Models. The models are difficult to fold just because they have detailed folds and many steps. That does not mean simpler models have lower qualities.

As I said at the end of Simple Models, there is no definitive standard for complexity levels in origami. But it is true that the models in Complex Models have a lot more detailed folds. Still, those who have completed the models in this chapter should be ready to fold them without difficulty.