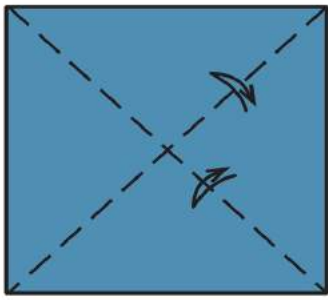
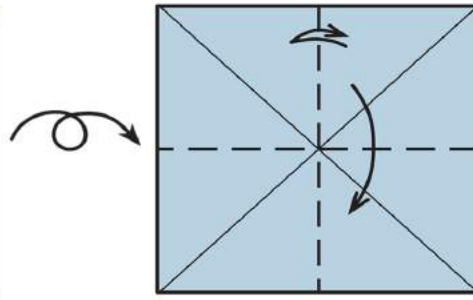


# Origami Organs: The Cell

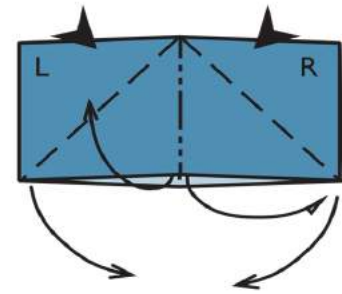
1/2



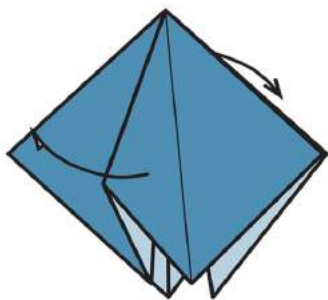
1. Start with a square, coloured side up. Fold each diagonal of the square. Unfold back to the square after each fold.



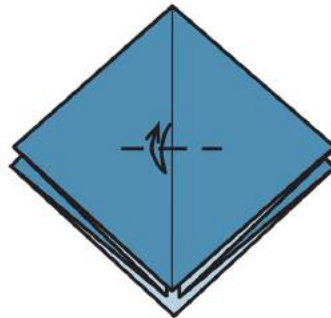
2. Fold in half vertically and unfold. Then fold in half by bringing the top and bottom edges together.



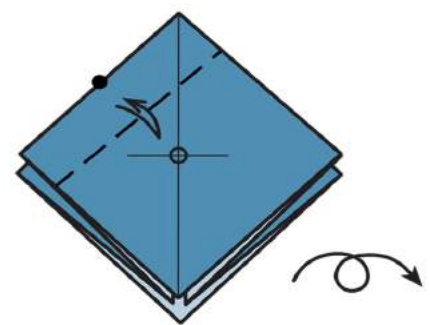
3. Hold the the points labelled L and R with your left and right hands. As you bring the four corners of the square together, the front and back paper will form flaps like the ones that you are holding.



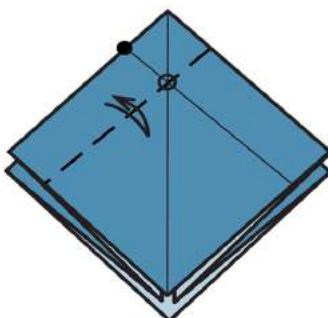
4. Continue collapsing the paper. Arrange the flaps so that you have two on the left and two on the right.



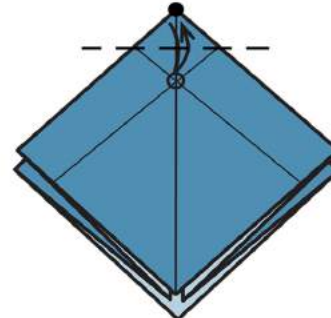
5. Mark the midpoint of this smaller square by lifting the bottom corner, placing it on the top point, pinching the centre and then unfolding.



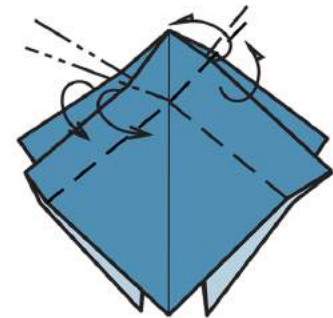
6. Fold the top left edges to the centre and unfold. Turn over.



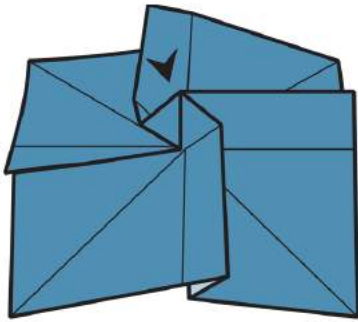
7. Fold the top left edges to the centre using the location marks show. Unfold.



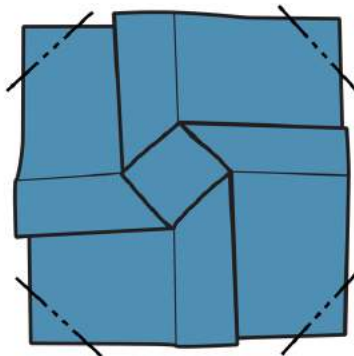
8. An optional fold that might help with the next step: fold the top point down to the quarter mark. Make the creases strong by unfolding and folding behind.



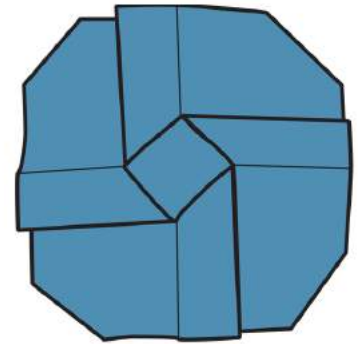
9. Separate the layers at the top and spread the layers clockwise, when viewed from above.



10. Spread the four corners so that they lie flat. Twist the central peak clockwise, spreading and flattening the centre. The peak will flatten on the creases made in step 8 and shown in the crease pattern below.

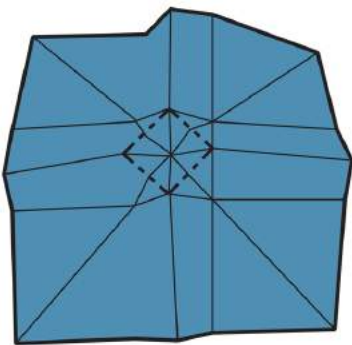


11. Fold the corners behind to round off the cell.

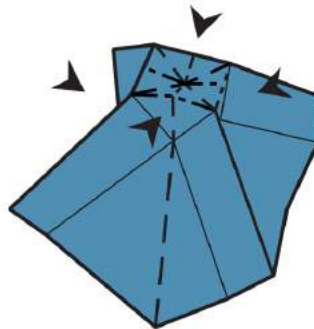


12. Complete. If you found the twist and collapse awkward, try again but use these extra steps below to help you.

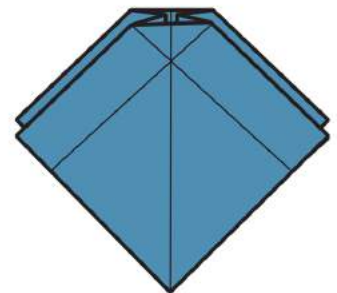
## Optional steps to ease the twist and collapse



8b. After making the crease in step 8, *sink* the top point. Do this by opening the paper and making the new crease mountain (convex) folds.

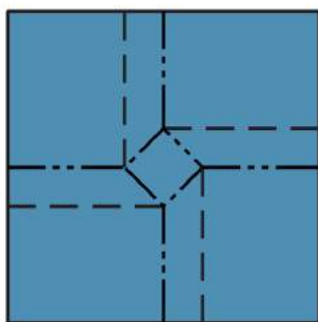


8c. Reform the shape with the top point pushed in.



8d. Continue with step 9. You will still twist the centre but will not need to flatten it as it is already flattened.

## Analysis and variations



Opened up, the *crease pattern* shows the essential creases. The late Shuzo Fujimoto pioneered this technique of *twist folding*.

You can vary this single twist by changing the proportion of the folds in step 6 and 7. You can also use polygons other than squares—or even a circle. If you use a regular hexagon or octagon, you can make a three dimensional nucleus by twisting two flaps together in step 9.

