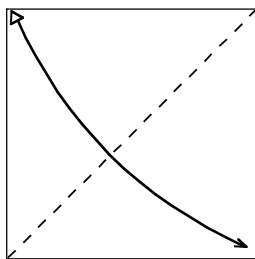
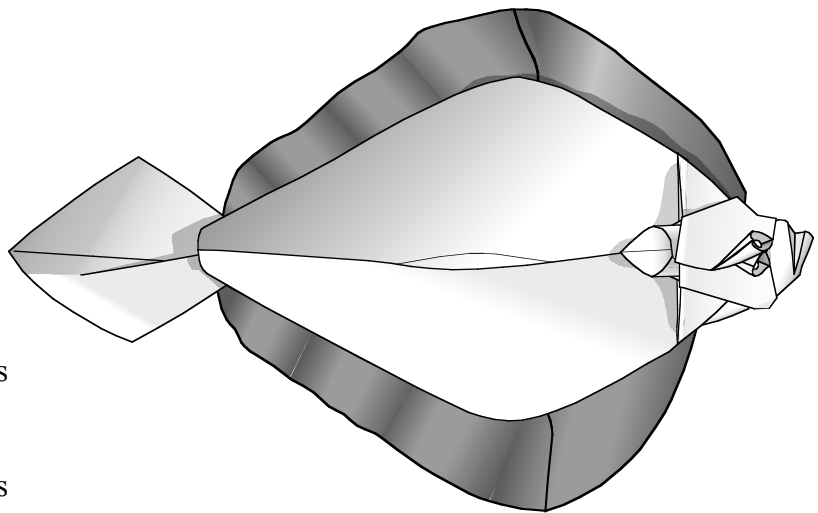


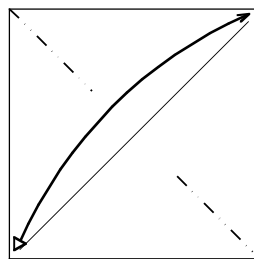
Flatfish

Designed by Bernie Peyton in 2014
 Difficulty / High Intermediate
 Time to fold / 1 hour.
 Dimension / R=0.92 for length

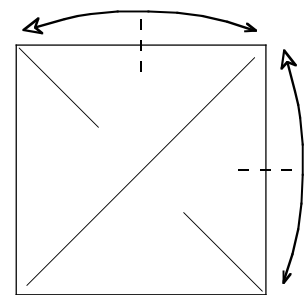
Author's advice: Use a bi-colored square 15 cm to a side or larger. This model often is not flat and involves folding and unfolding. I encourage you to find your own folds for the fins after you have mastered these.



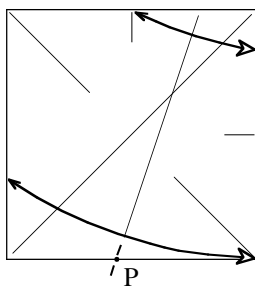
1. Valley-crease the diagonal on the light side of the square.



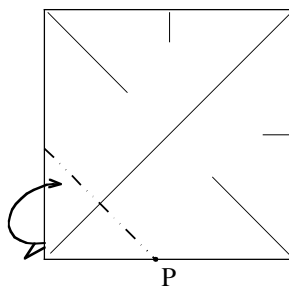
2. Mountain-crease the other diagonal except for its middle third.



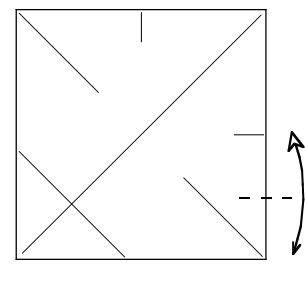
3. Valley-crease midpoints on two sides.



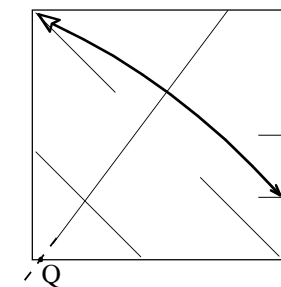
4. Place the bottom right corner on the left edge and right edge at the midpoint of the top edge. Crease the bottom edge at point P.



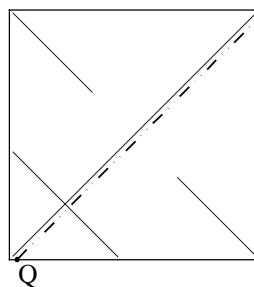
5. Mountain-fold and unfold the bottom left corner through point P.



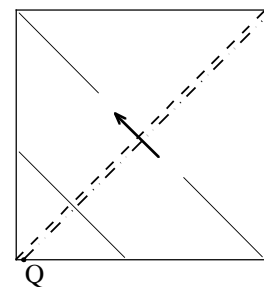
6. Bisect a distance with a crease on the right edge.



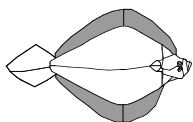
7. Place the top left corner on the right edge at the last crease and crease the bottom edge at point Q.

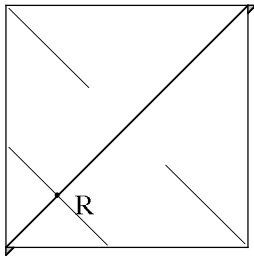


8. Mountain-fold and unfold through point Q parallel to the diagonal.

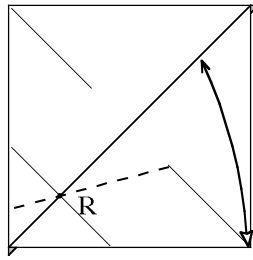


9. Pleat the square on the diagonal with this last mountain fold.

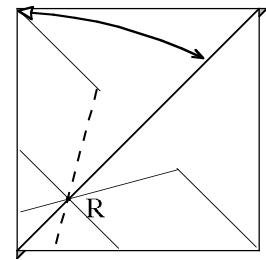




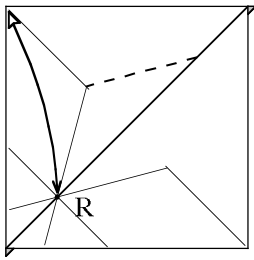
Define point R as the intersection of step 5 and the folded edge of the last step. This edge is the midline of the flatfish.



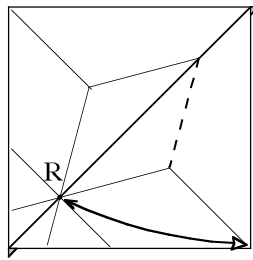
10. Place the bottom right corner on the flatfish midline and valley-crease through point R to the diagonal crease of step 2.



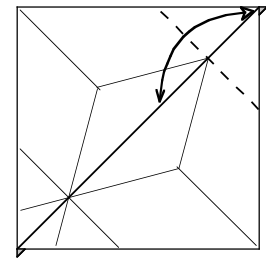
11. Do the same crease by placing the top left corner on the flatfish midline.



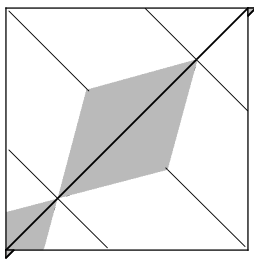
12. Place the top left corner on point R and valley-crease from the diagonal of step 2 to the flatfish midline.



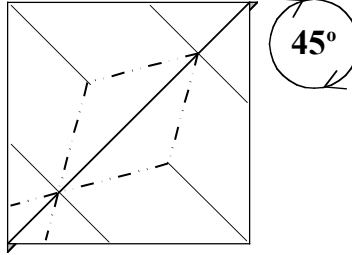
13. Do the same crease by placing the bottom right corner on point R.



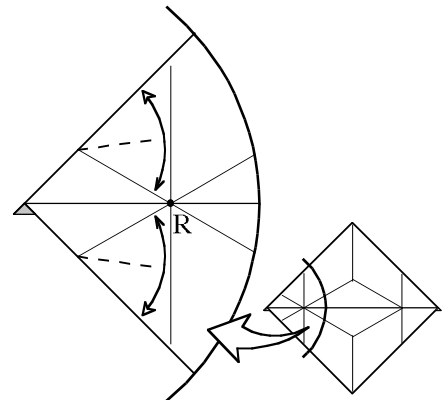
14. Valley-fold and unfold the top right corner through the intersection of the last two creases.



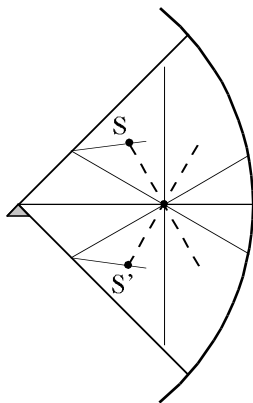
The shaded areas between the last 4 creases define the flatfish body and its tail.



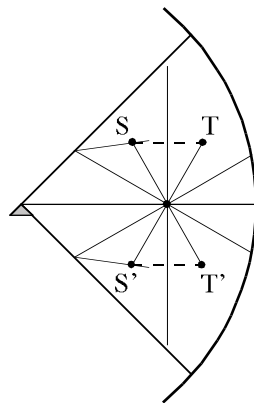
15. Change valley creases to mountain creases. Rotate 45 degrees clockwise.



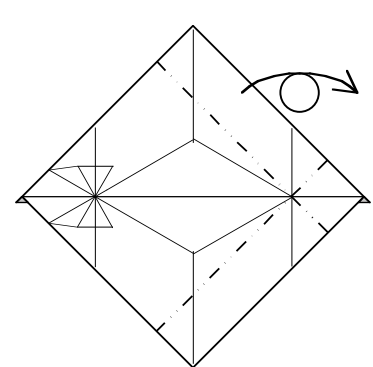
16. Valley-crease angle bisectors at the tail end.



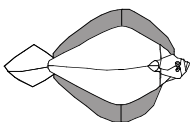
17. Valley crease other angle bisectors. The intersection of these and last two creases are points S and S'.

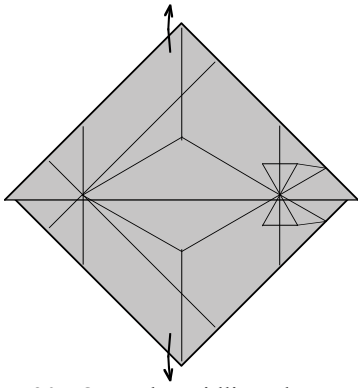


18. Valley-crease parallel to the midline from points S and S' to the angle bisectors at points T and T'.

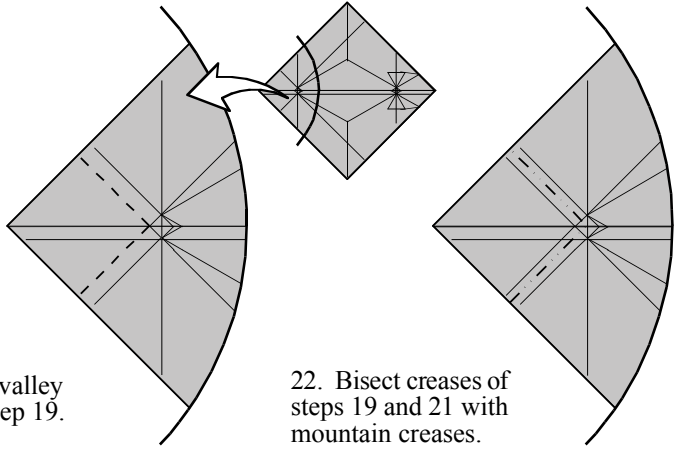


19. Mountain-crease through the intersection of steps 12 to 14. Turn the paper over side to side.



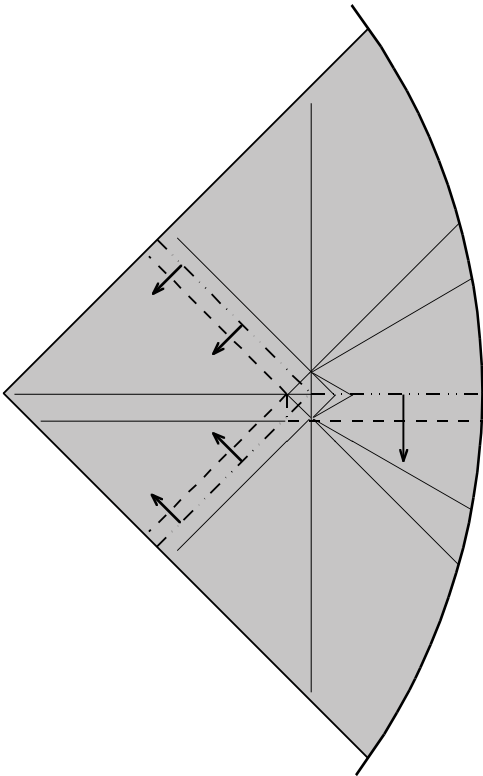


20. Open the midline pleat.

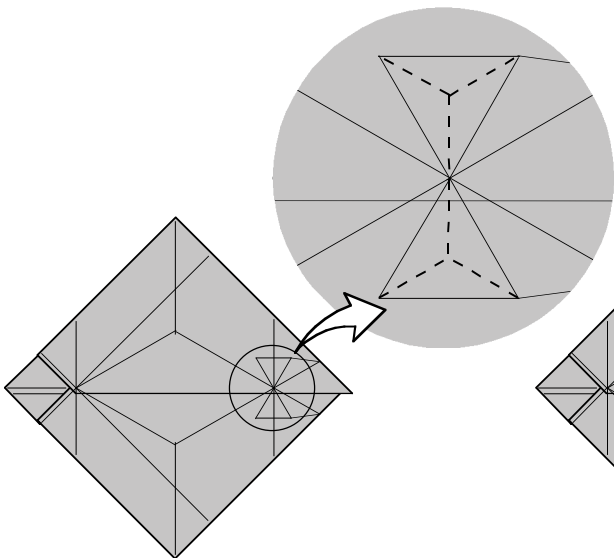
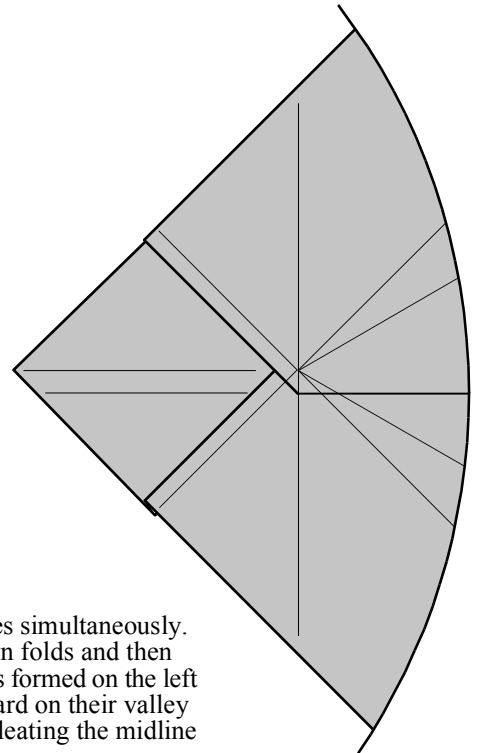


21. Extend valley creases of step 19.

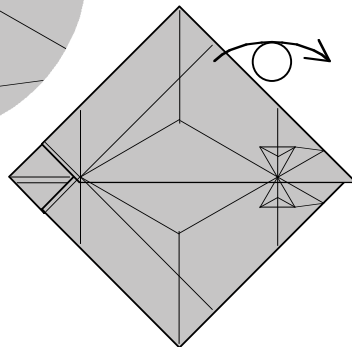
22. Bisect creases of steps 19 and 21 with mountain creases.



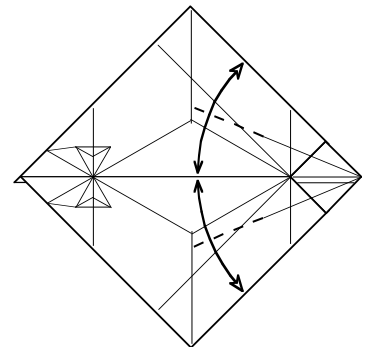
23. Pleat in three places simultaneously. First pinch the mountain folds and then push the two ridges thus formed on the left side of the model forward on their valley folds, followed by re-pleating the midline of the model.



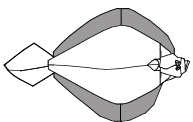
24. Bisect angles in the triangles formed by steps 17 and 18 with valley creases.

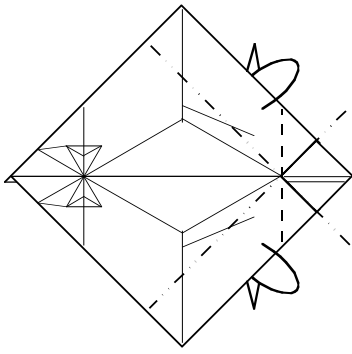


25. Turn the model over side to side.

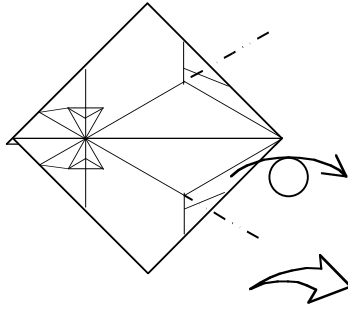


26. Bisect angles by placing the raw paper edges on the midline and valley-creasing from the diagonal of step 2 part way to the right corner.

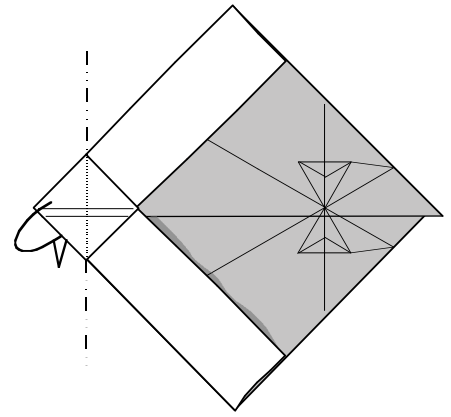




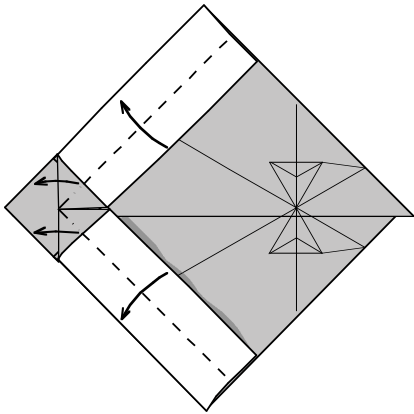
27. Preliminary-fold the right side on existing creases.



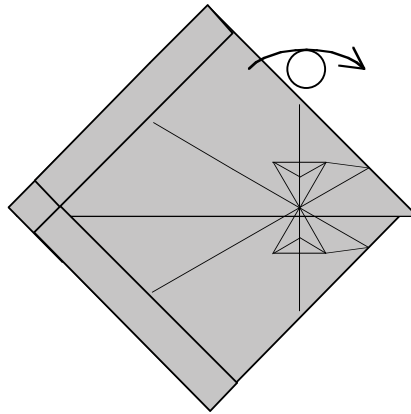
28. Extend mountain creases of step 15. Turn the model over side to side. The next view is enlarged.



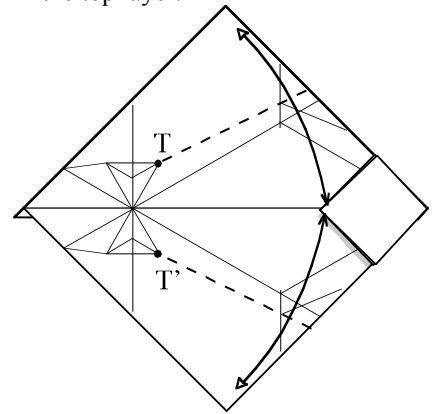
29. Mountain-fold the corner behind through all layers except the top layer.



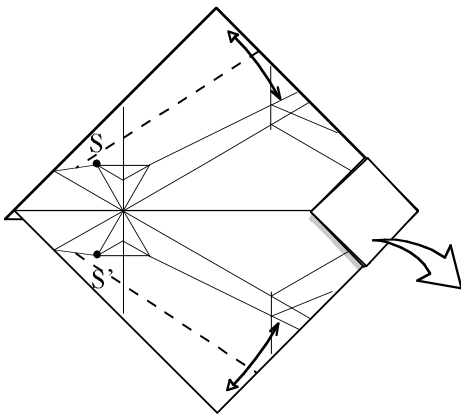
30. Fold the raw paper edges to the outside edges. Open up the pockets on the left side of the model and flatten them.



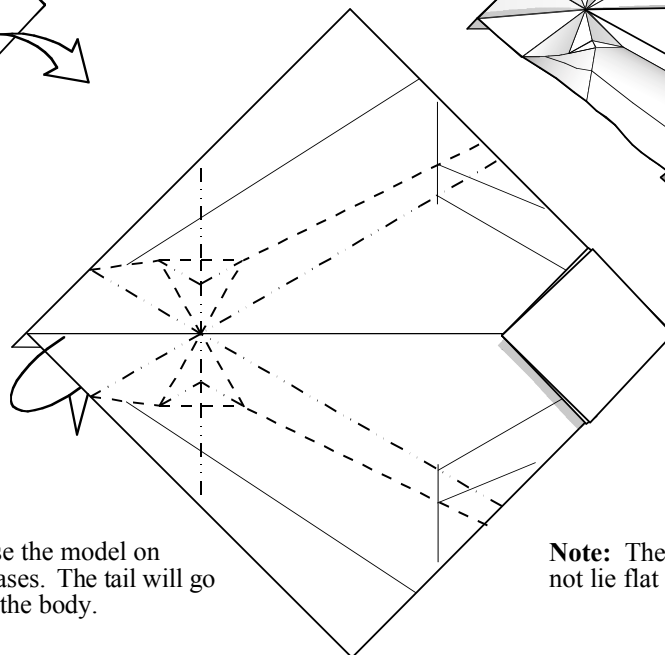
31. Turn the model over side to side.



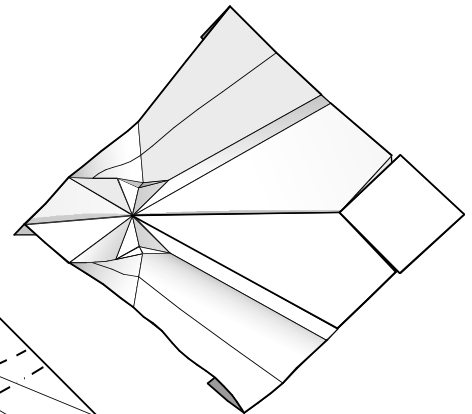
32. Place the corners to the midline and valley-crease through points T and T'.



33. Valley-fold and unfold the same corners to the creases of the last step. The left side of these valley creases lie midway between the raw paper edges and points S and S'.

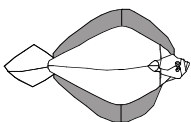


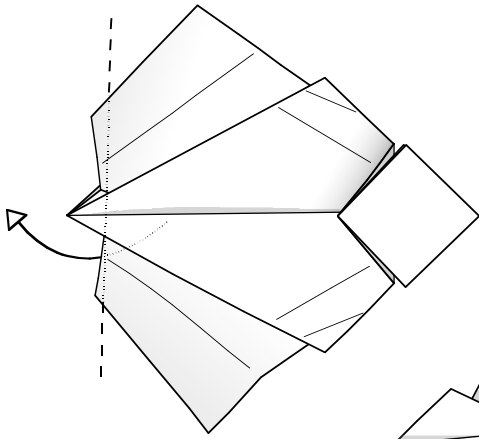
34. Collapse the model on existing creases. The tail will go underneath the body.



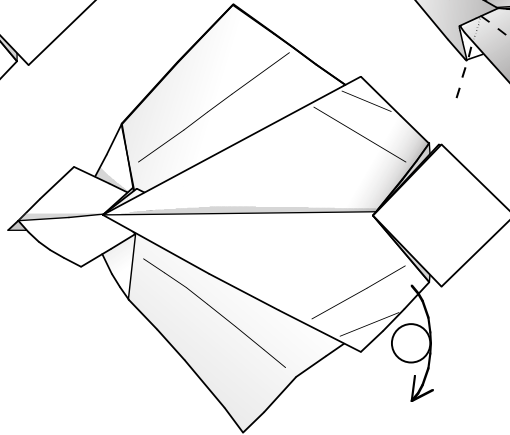
In Progress.

Note: The model will not lie flat until step 40.

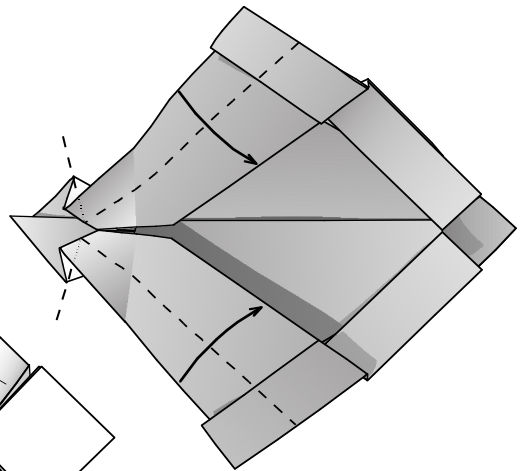




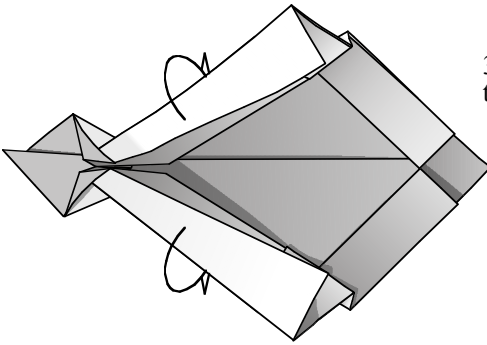
35. Swing the tail out with a small valley fold under the end of the flatfish body.



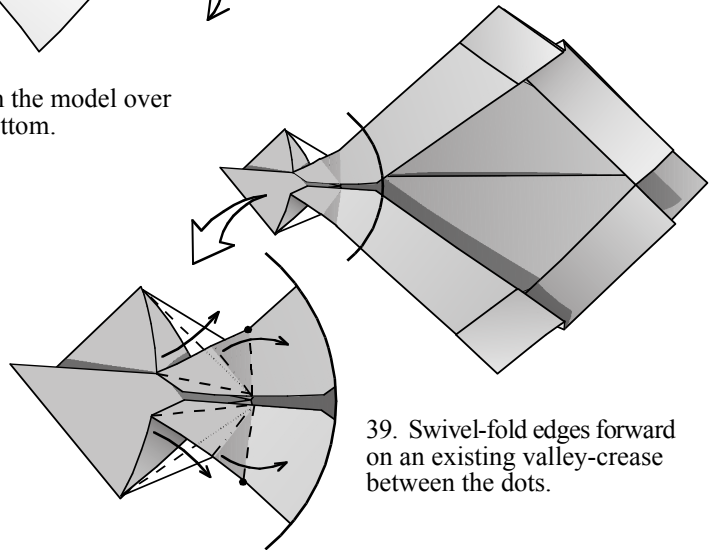
36. Turn the model over top to bottom.



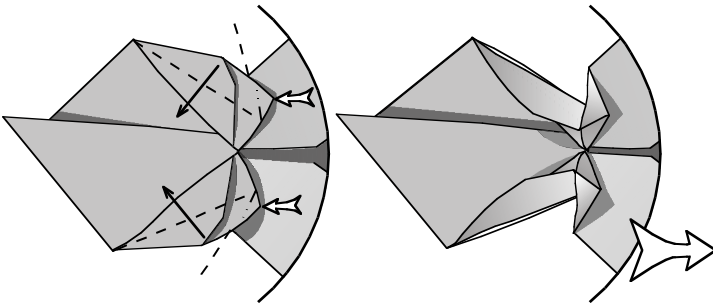
37. Swivel-fold on the crease of step 33.



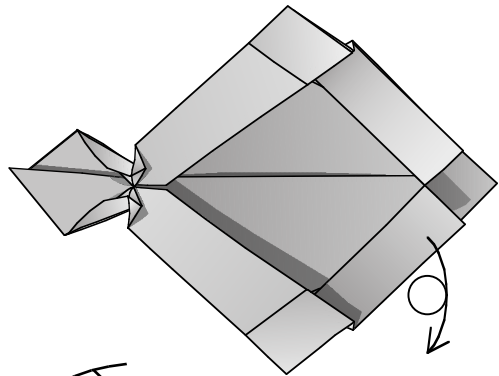
38. Wrap the raw paper edges behind and tuck them under the flatfish body.



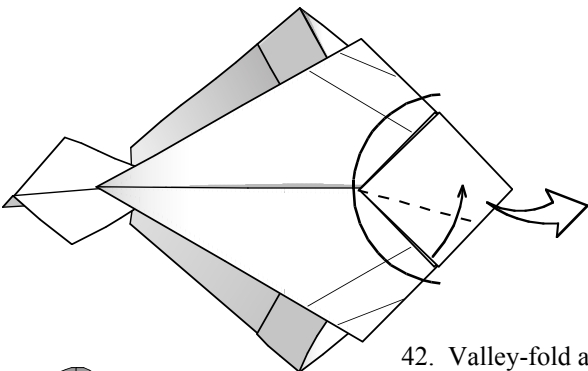
39. Swivel-fold edges forward on an existing valley-crease between the dots.



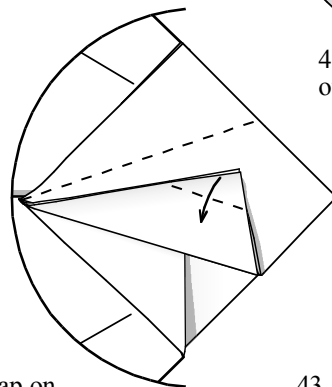
40. Swivel-fold edges so that they remain inside the boundaries of the tail.



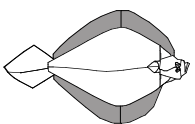
41. Turn the model over top to bottom.

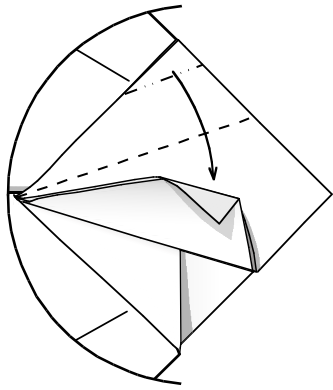


42. Valley-fold an eye flap on the head as far up as it will go.

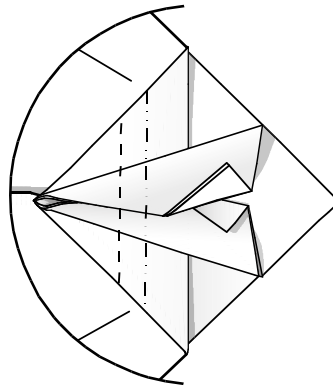


43. Valley-fold an eye down.

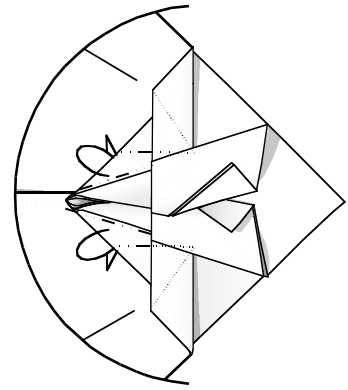




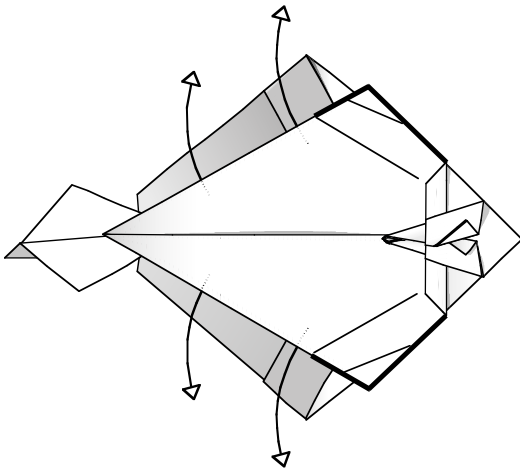
44. Repeat the last two steps on the other eye flap.



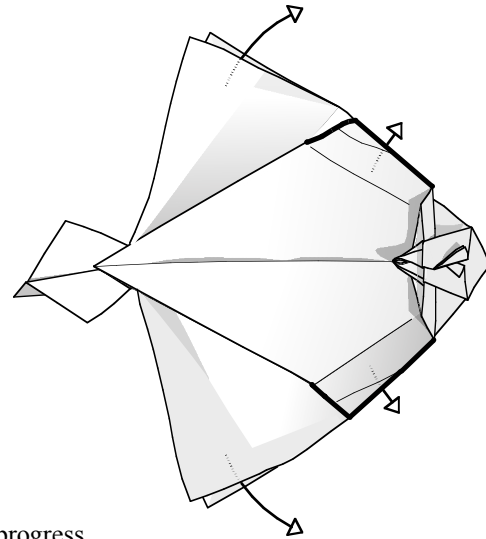
45. Pleat the pectoral fin.



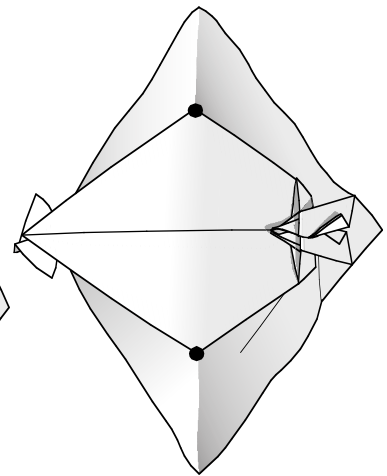
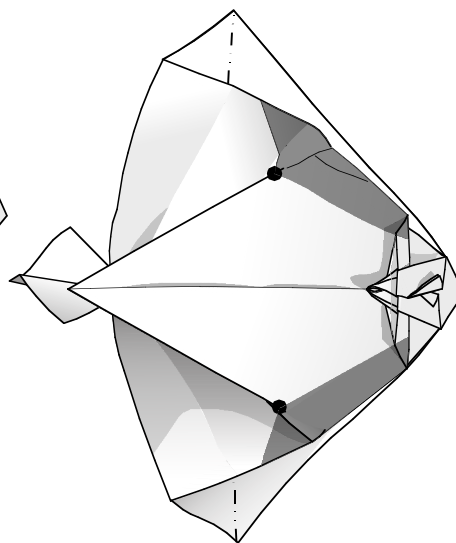
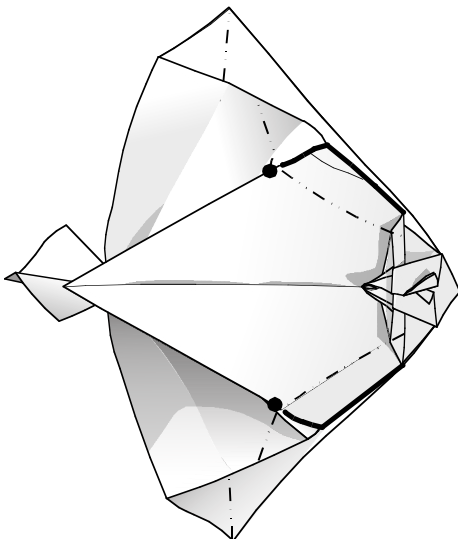
46. Swivel-fold to narrow the pectoral fin.



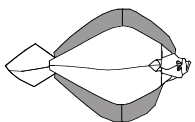
47. Pull out the paper under the flatfish body. The **dark lines** marks ridges you will close-sink in subsequent steps.

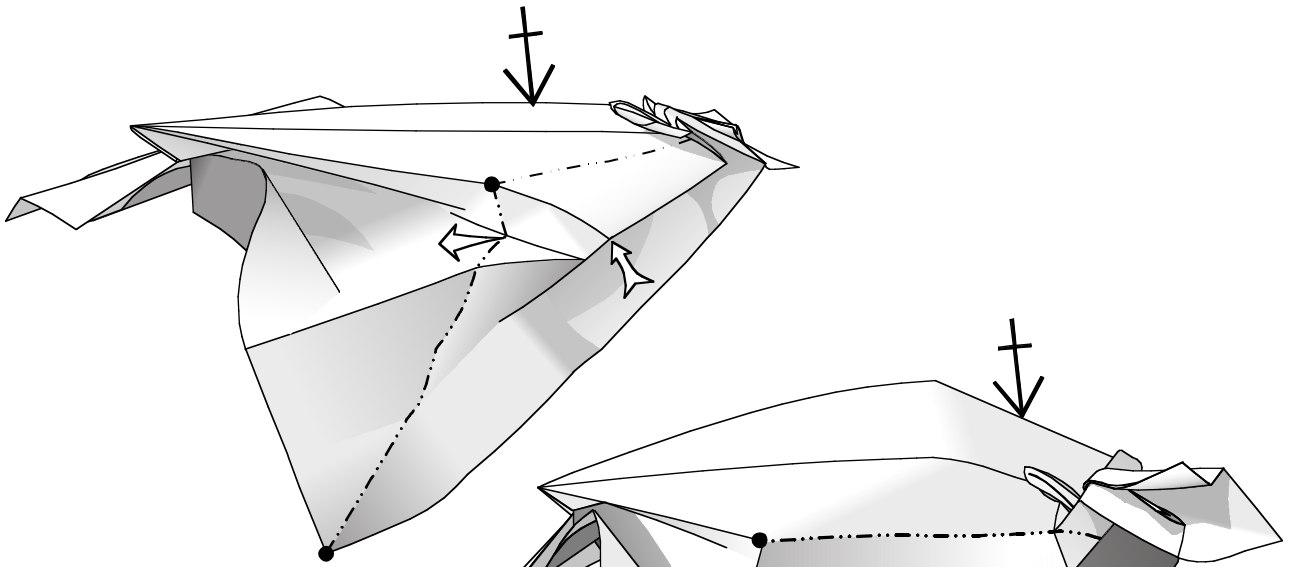


In progress.



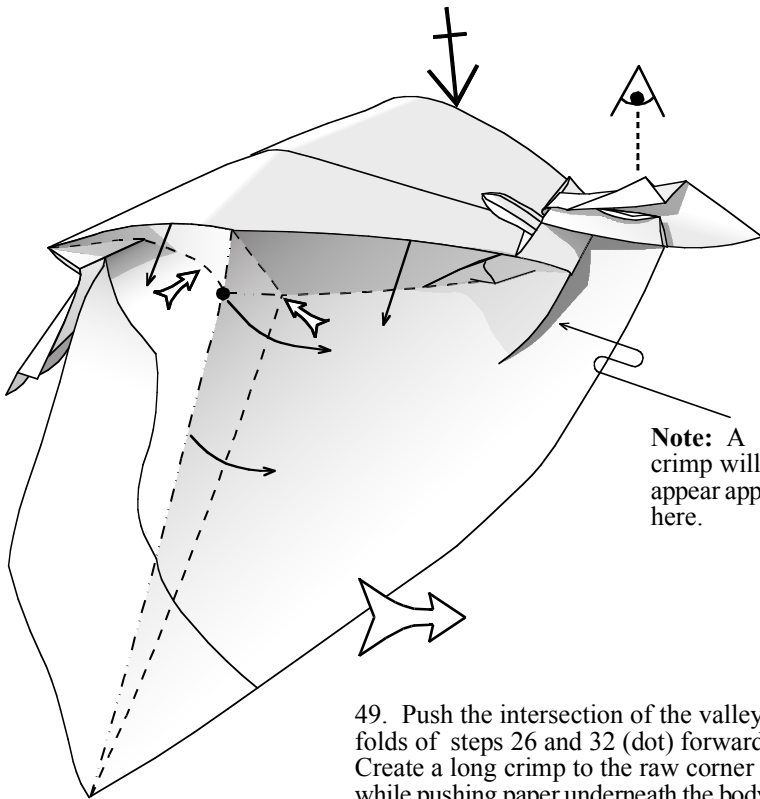
Note: In the next step you will re-create the mountain folds of step 2, 12, and 13 that meet at the dots, and sink the dark shaded paper to define the body of the flatfish. The result is seen at the right. Let us look at this step from the side.





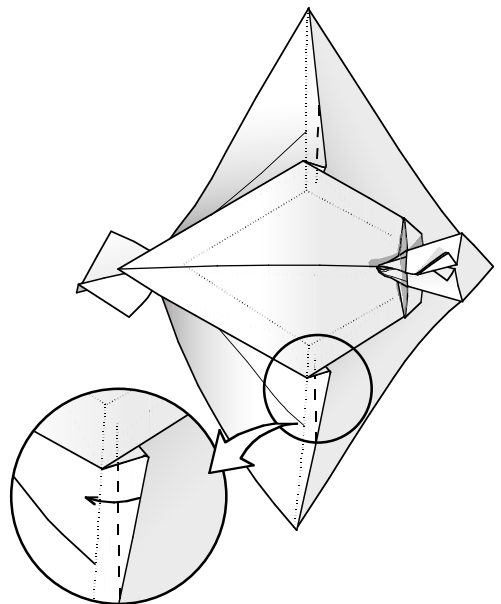
48. Start the sink by pushing in the paper at the white arrow with a tail. Straighten and pinch the mountain crease between the dots. This will start to pinch the mountain crease of step 13. Do this to the other side of the model.

48 continued: Sink the other side of the ridge on the mountain crease of step 13. **Note the continuation of this mountain fold across the gill cover.** Do this on the other side.

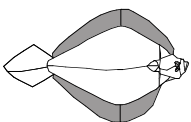


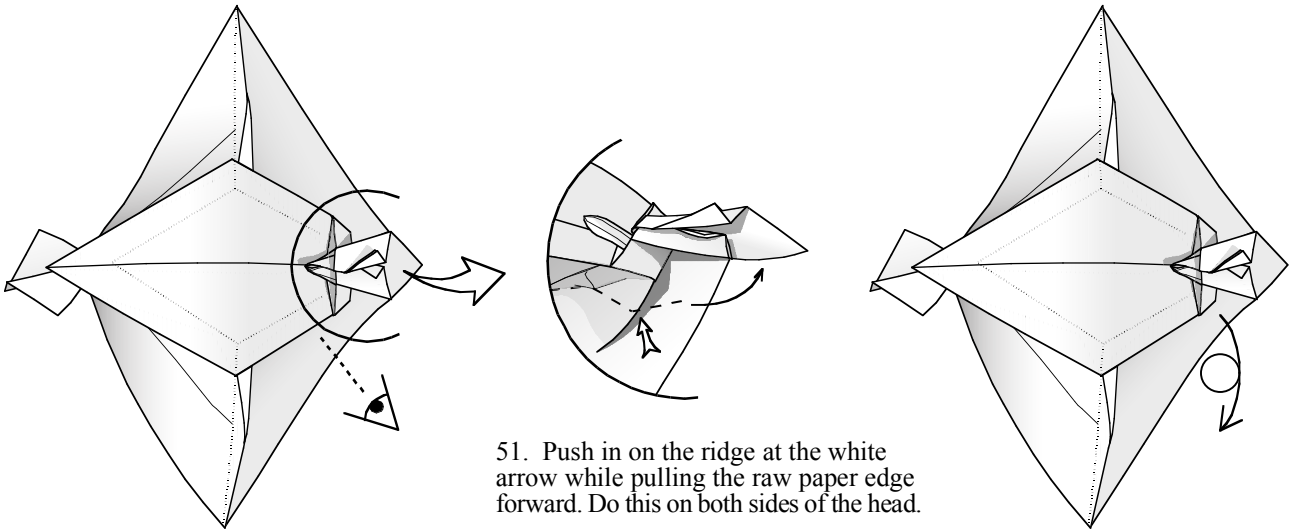
Note: A crimp will appear here.

49. Push the intersection of the valley-folds of steps 26 and 32 (dot) forward. Create a long crimp to the raw corner while pushing paper underneath the body. Do this on the other side. The model is not yet flat.



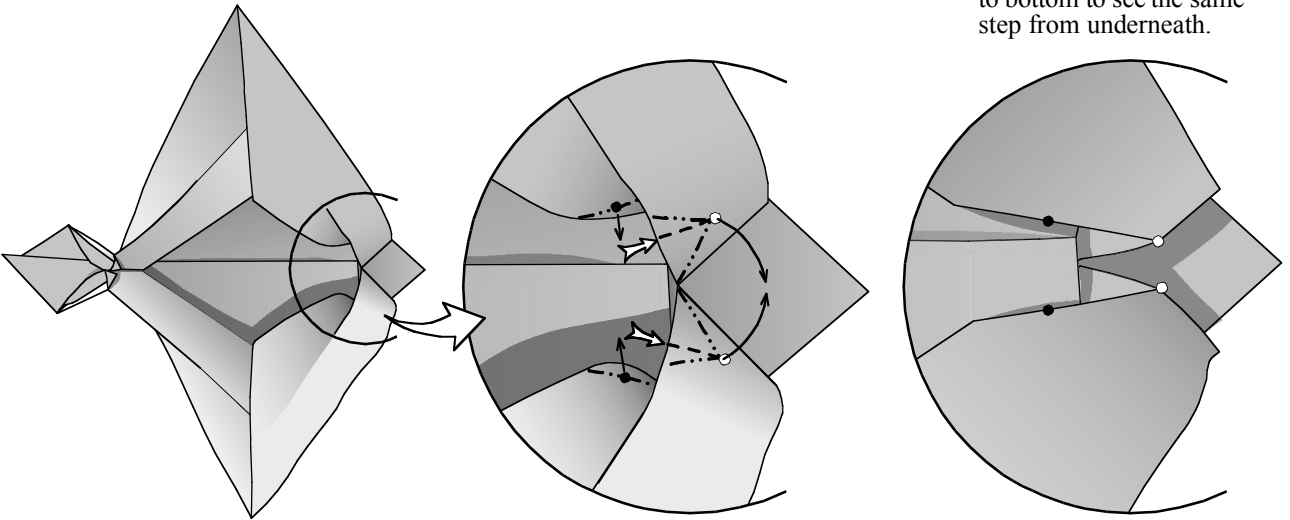
50. Inside reverse-fold edges. X-ray lines indicate hidden edges.



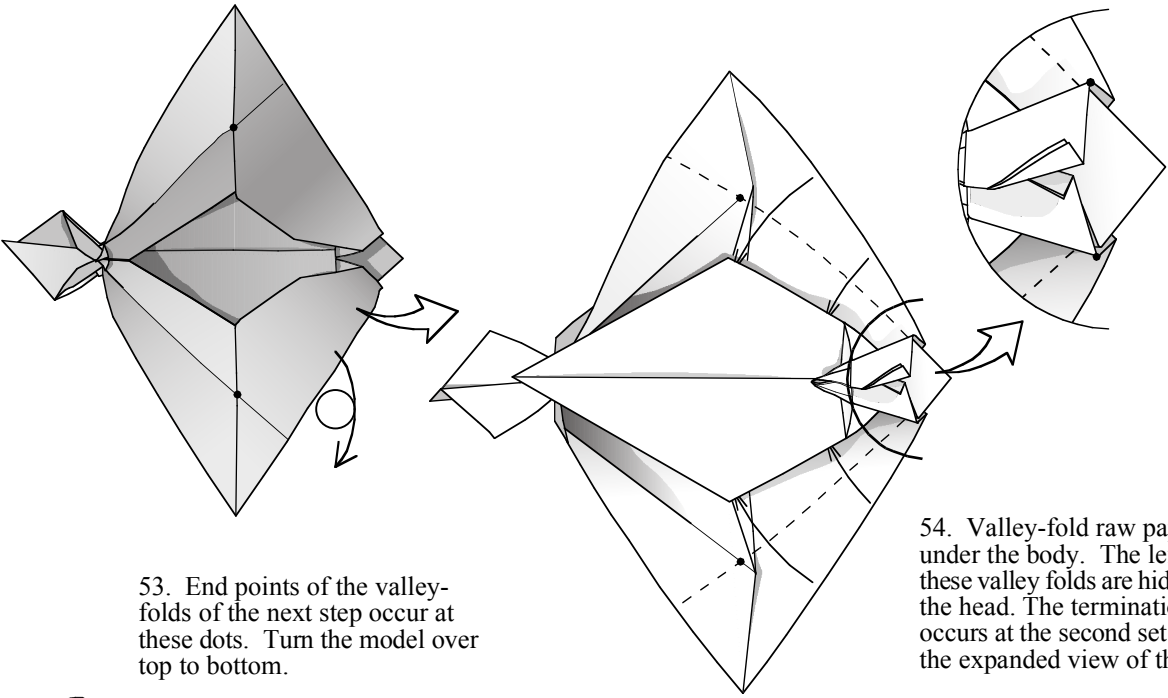


51. Push in on the ridge at the white arrow while pulling the raw paper edge forward. Do this on both sides of the head.

Turn the model over top to bottom to see the same step from underneath.

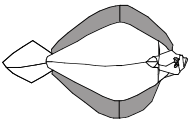


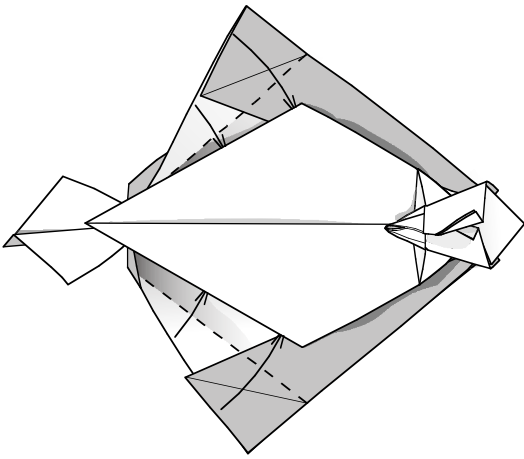
52. As you push the areas at the black dots inward (step 51), dent the edges by the white arrows and bring the spots marked by white dots toward the front of the head.



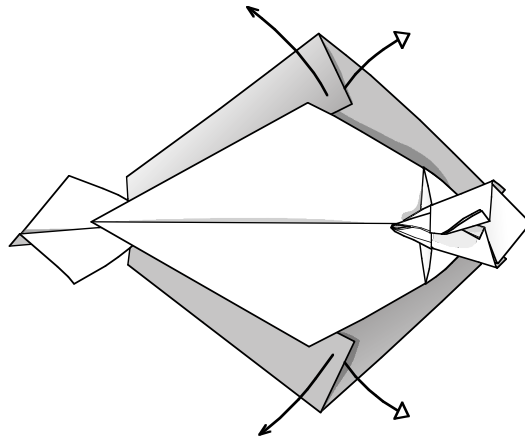
53. End points of the valley-folds of the next step occur at these dots. Turn the model over top to bottom.

54. Valley-fold raw paper edges under the body. The left end of these valley folds are hidden under the head. The termination point occurs at the second set of dots in the expanded view of the head.

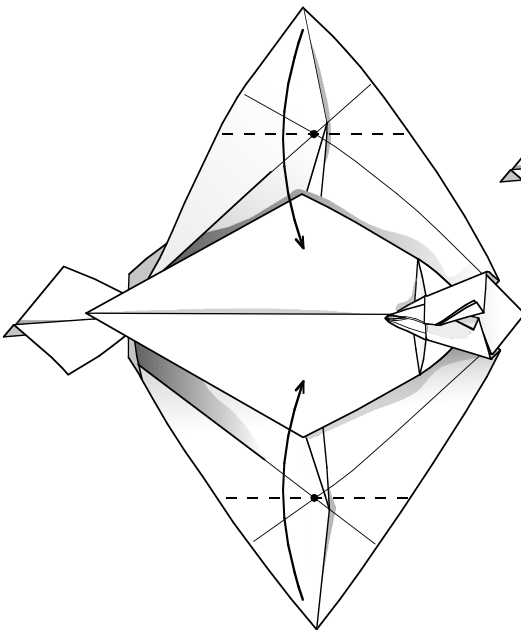




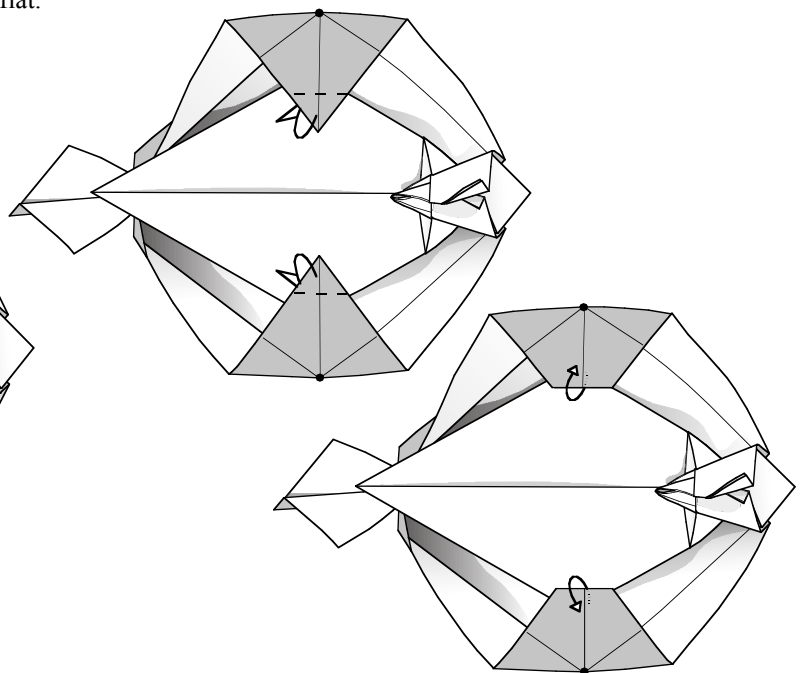
55. Redo the valley folds of step 33. Adjust folds if needed to enable the dorsal and anal fins to fit under the body. The model should now be flat.



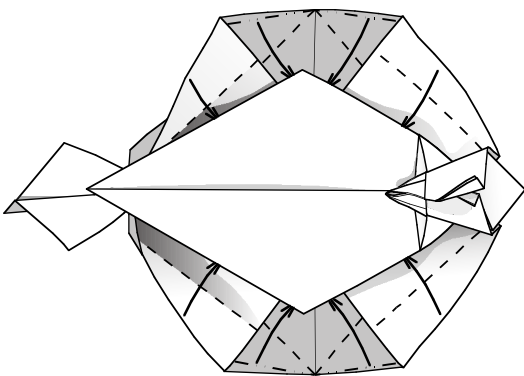
56. Unfold the last two steps.



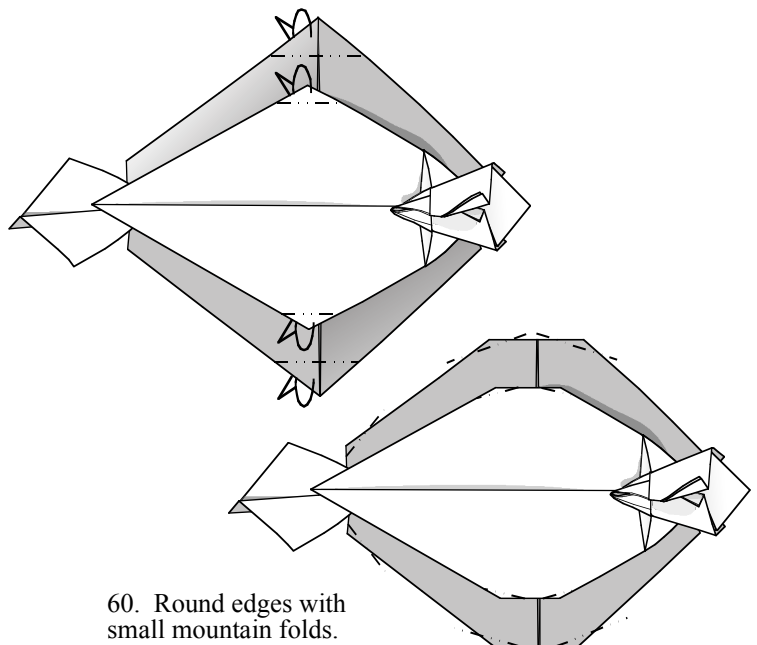
57. Valley-fold the corners through the intersection of the folds of steps 54 and 55.



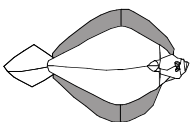
58. Valley-fold corners behind, and tuck the folded edges under the body. Adjust the valley-folds as needed.

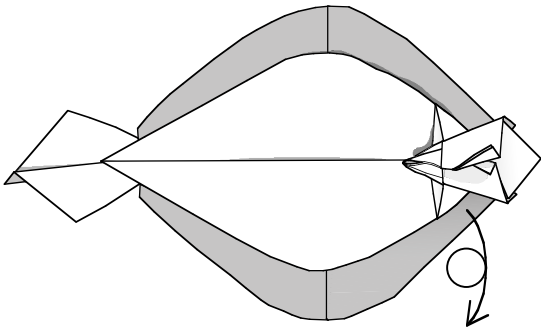


59. Redo steps 54 and 55 so that the new mountain folds meet.



60. Round edges with small mountain folds.

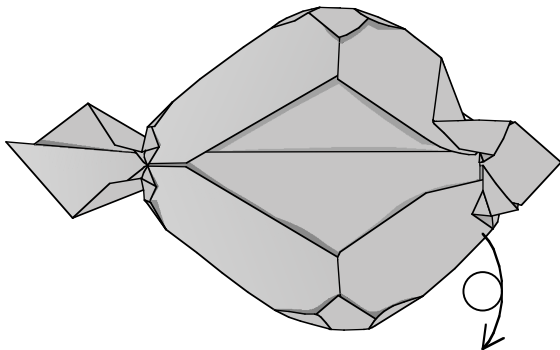
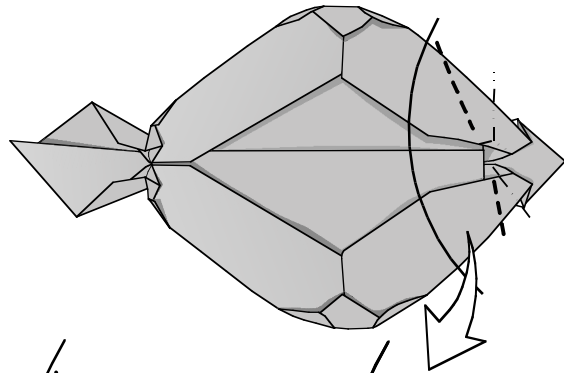




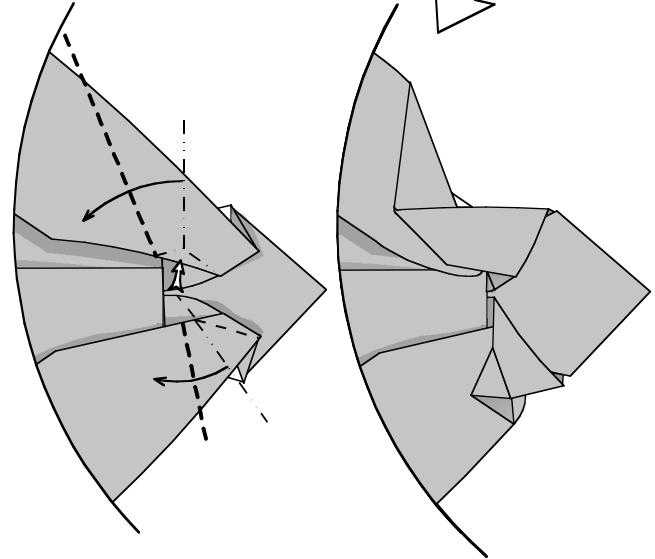
61. Turn the model over top to bottom.

62. Swivel-fold the pockets of the head to the left.

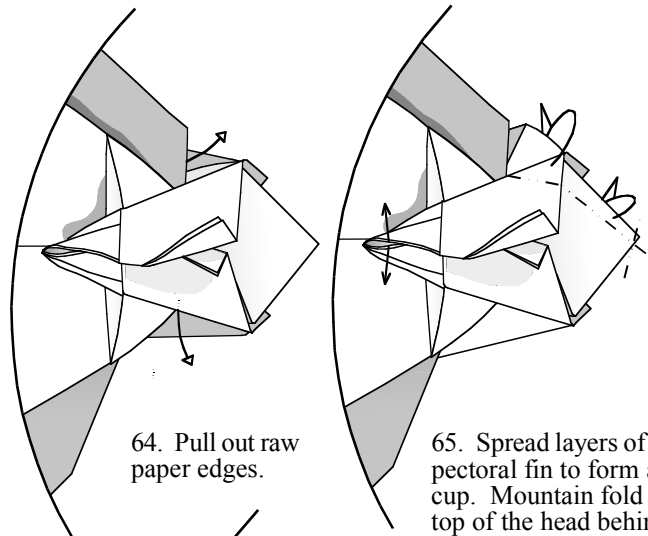
Note the asymmetric configuration of the bold valley folds.



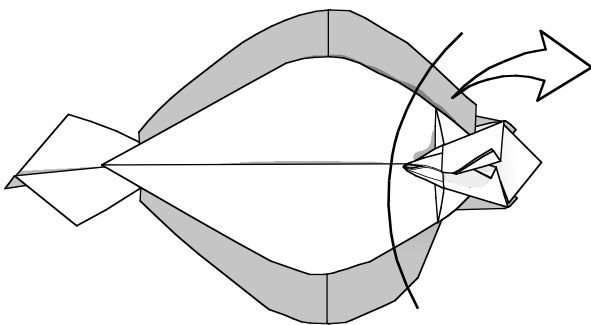
63. Turn the model over top to bottom.



64. Pull out raw paper edges.

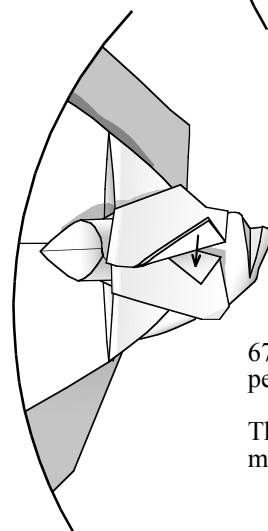
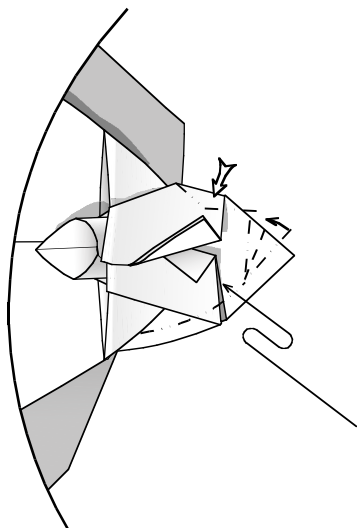


65. Spread layers of the pectoral fin to form a cup. Mountain fold the top of the head behind.



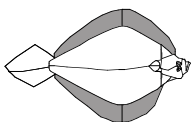
66. Crimp the top of the head and jaw. Round the bottom of the head.

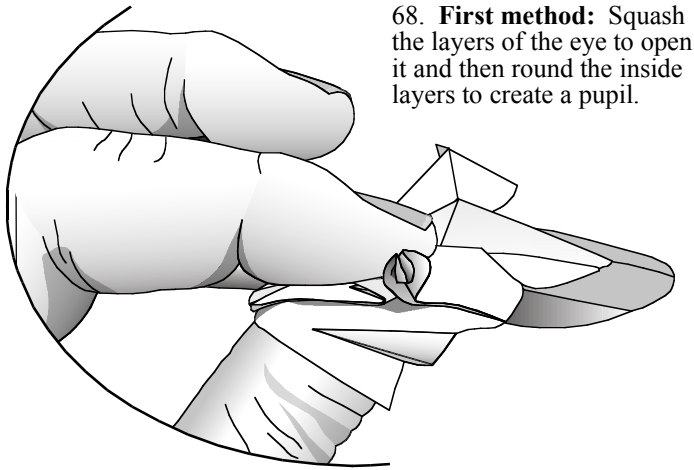
Hide any dark paper that appears along the vertical edges of the eye flaps (dark arrow).



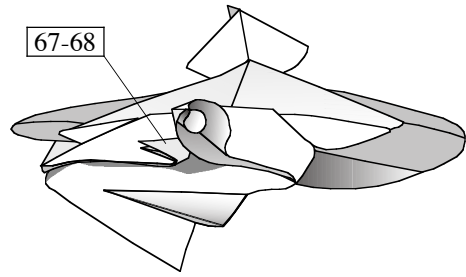
67. Raise an eye flap perpendicular to the head.

Then do one of the following methods to open the eyes.

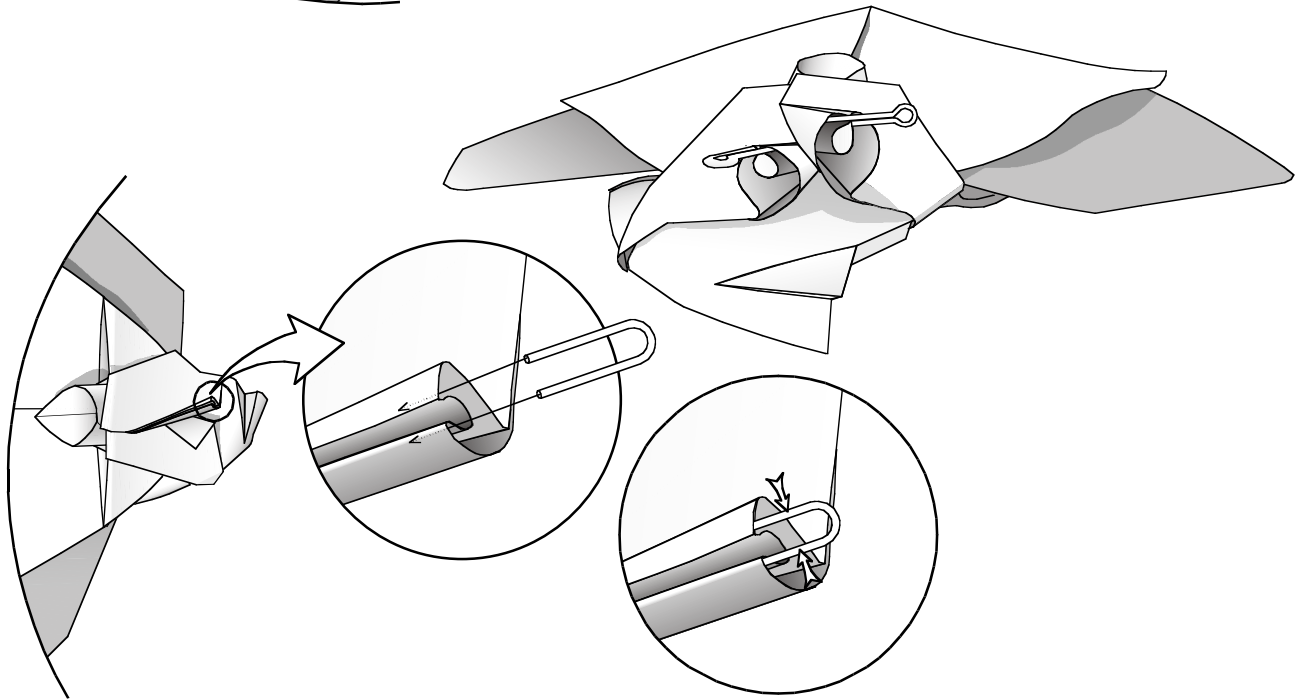




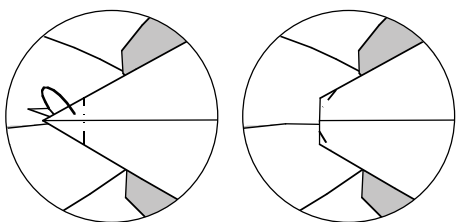
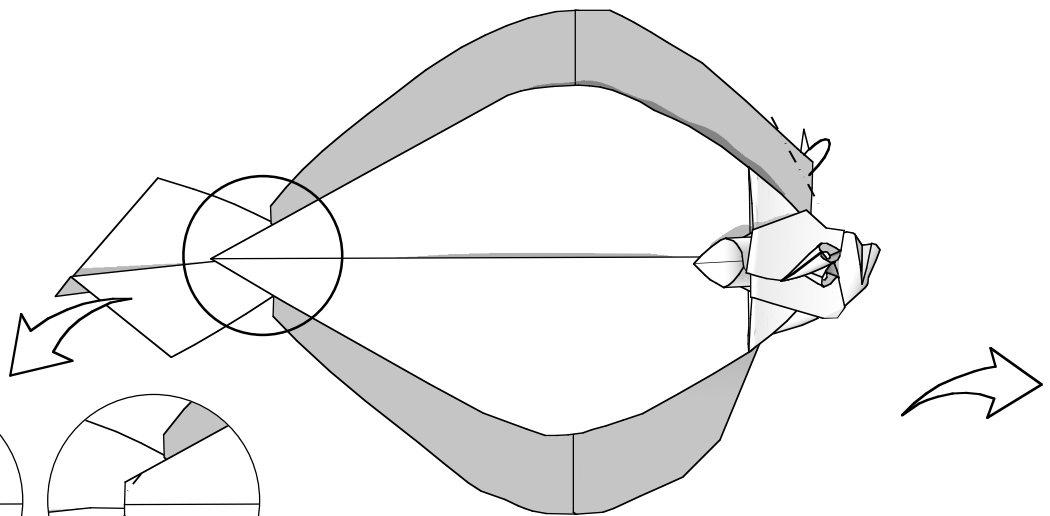
68. **First method:** Squash the layers of the eye to open it and then round the inside layers to create a pupil.



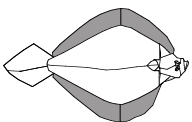
69. Repeat steps 67 and 68 on the other eye.

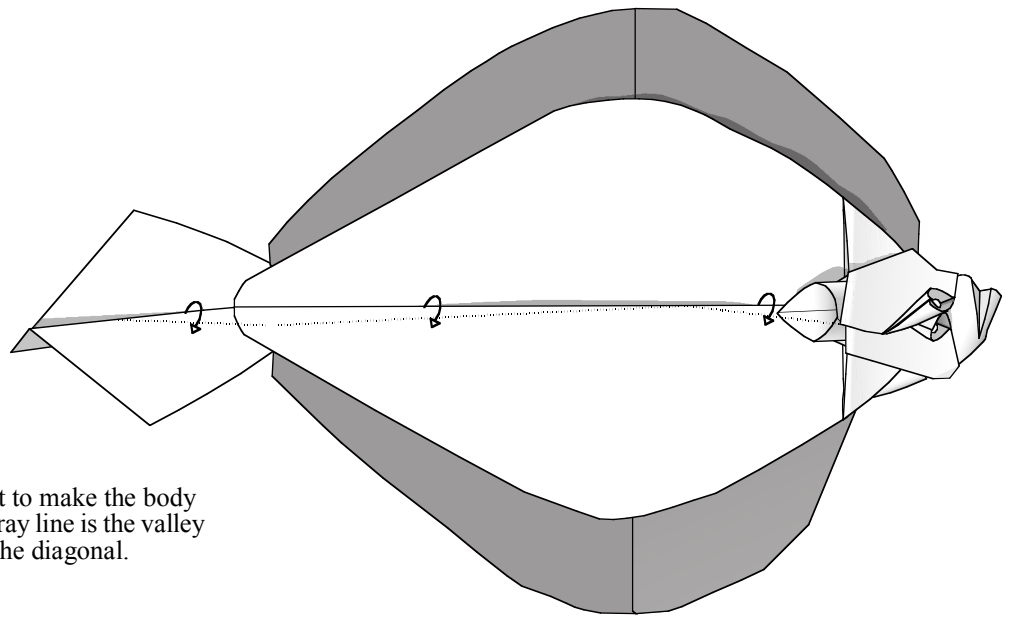


Second method: Insert a wire loop on either side of eye's inner pleat. Squeeze it shut and then shape the pupil by placing a round instrument inbetween its layers. Squash the back end of each eye as in the step above and shape the outer eye layers. I spray it lightly with water. Remove the wires when it is dry.

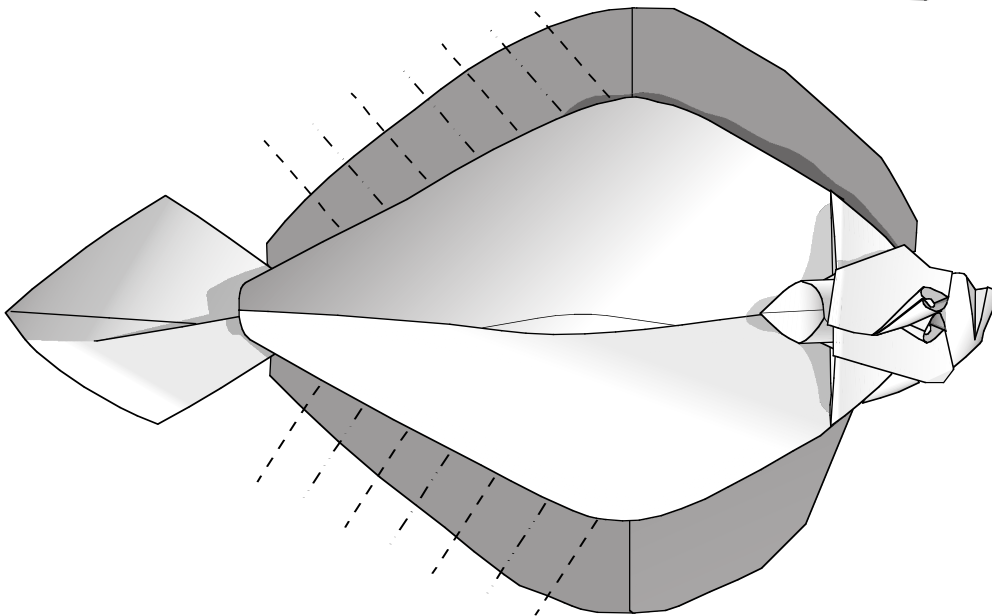


70. Round the back of the body and the front end of the dorsal fin with mountain folds.





71. Undo the pleat to make the body and tail 3D. The x-ray line is the valley fold that replaces the diagonal.



Optional: Curve the fins to make your flatfish swim. Be careful not to put wrinkles in the body when doing this.

