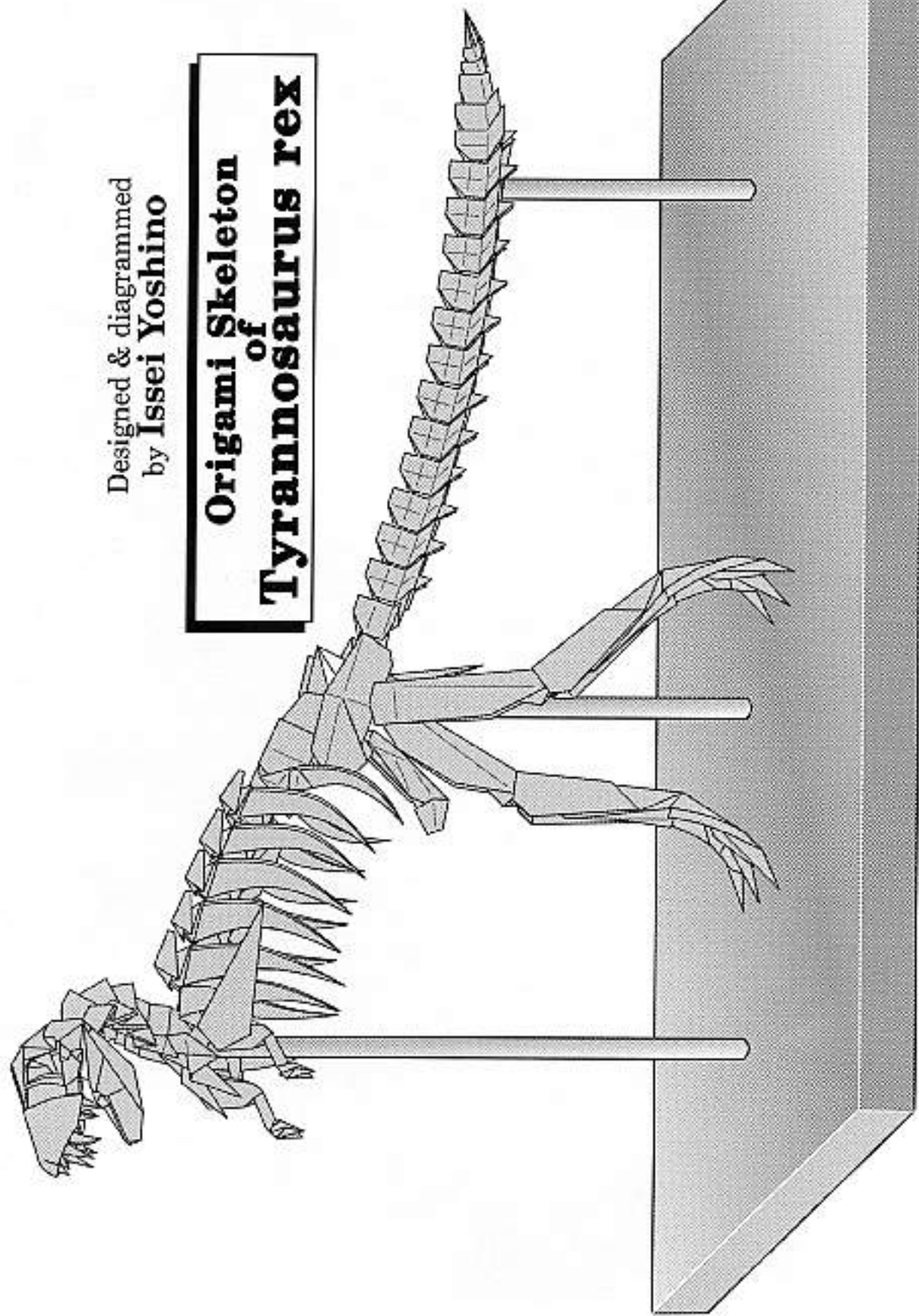


Designed & diagrammed
by **Issei Yoshino**

**Origami Skeleton
of
Tyrannosaurus rex**



Origami Maple, Toronto 1992

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Origami Skeleton of Tyrannosaurus rex

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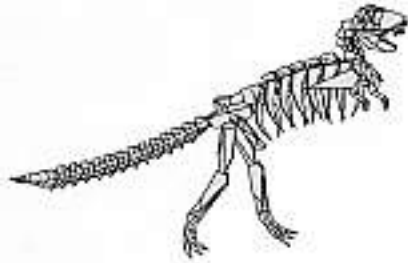
Assistant Editors : Claire Loshak, Steve Matheson

Articles written by Steve Matheson

Illustration of Mr. Yoshino by Yoshitisa Kimura

Chapter 1

Introduction



1 Introduction

1.1 About the design

This design requires 21 equally sized squares of paper. It is recommended to use paper approximately 8 inches square. Using paper any smaller than 6 inches square when initially folding the model may cause some difficulty. The designer recommends wetfolding (dampening the paper and folding it while wet) and to this end it is advisable to use a durable paper to prevent any ripping and tearing, such as handmade Japanese paper (washi).

"Origami Skeleton of Tyrannosaurus rex" is a very advanced design and some experience with folding complex models will be of assistance. Even for the experienced folder there are a number of interesting surprises and unknown maneuvers that should prove challenging. The notation used here is based on the well known Yoshizawa-Randlett system and as the book has been designed primarily for advanced folders no explanation of the folding symbols is included. "Origami Skeleton of Tyrannosaurus rex" was designed in 1989 for the Origami Dinosaur Exhibition at Gallery Origami House, Tokyo. The diagrams were originally drawn on a Macintosh LC using Aldus Freehand 2.0J and first appeared in serial form in *The Origami Tanteidan (Detectives) News* in the February to December 1991 issues. This book is the first English version of the design and Mr. Yoshino's international debut.

1.2 About the designer, Issei Yoshino

Issei Yoshino wants to take the art of origami design to its limit and beyond. Though not yet 30 years of age he has already gained considerable notoriety for his innovative designs, in particular his dinosaur skeletons.

Mr. Yoshino was born in Kawaguchi, a city north of Tokyo, on August 3rd, 1964. Graduating from Kawaguchi Technical High School he began studies in an aeronautical institute with the intention of becoming an aeronautical engineer. Although he subsequently decided to pursue a career in computers, aircraft continue to hold an interest for Yoshino and he has designed many spectacular origami jet fighters.

When he was fifteen Yoshino first began to design original origami models. His first design was an eagle in flight. Unlike some contemporary designers who carefully plot out crease patterns before actually folding, Mr. Yoshino works almost exclusively with the paper alone until the design is complete. He begins with a strong image of the finished model and then proceeds to fold sections of the design (for example, the head and mane of a horse). Eventually the different folding sequences for the various parts all come together. Naturally, working in this manner, finished designs only evolve after considerable time and effort, a finished model taking as much as a year to complete.

"Origami Skeleton of Tyrannosaurus rex" began with simply the creature's skull. Dissatisfied with the design Yoshino realized to accomplish what he really wanted to do, create a full skeleton, would require a number of sheets of paper.

Mr. Yoshino is one of the founding members of the Origami Detectives, a group of young origami designers, formed in 1989. He is also one of the pioneer designers in Japan to begin using computers to diagram origami models. Mr. Yoshino's other interests include marathon jogging. He is currently employed by Digital Service Corp. in Tokyo.



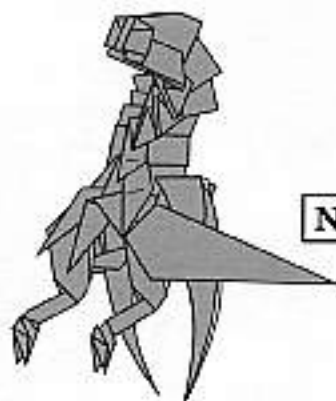
1.3 Structure : Five sections



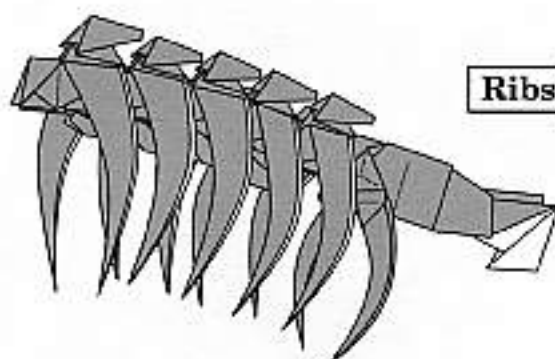
Head : out of
two pieces of paper

Structure

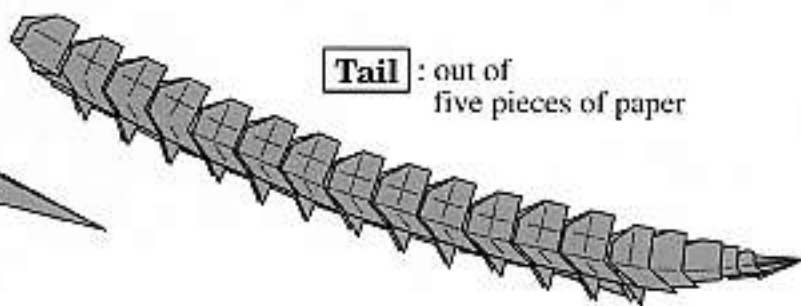
The model is constructed from these five sections. Each section is folded out of several pieces of paper. The following diagrams will illustrate the folding sequence according to these sections.



Neck & Arms : out of
four pieces of paper



Ribs : out of
six pieces of paper



Tail : out of
five pieces of paper



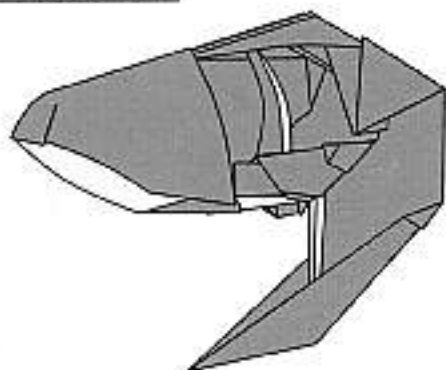
Hip & Legs : out of
four pieces of paper

1.4 Parts of each section

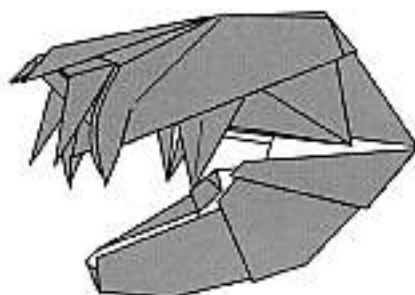
Parts of Head

Head is constructed by two parts: Upper Jaw and Lower Jaw.

Upper Jaw



Lower Jaw



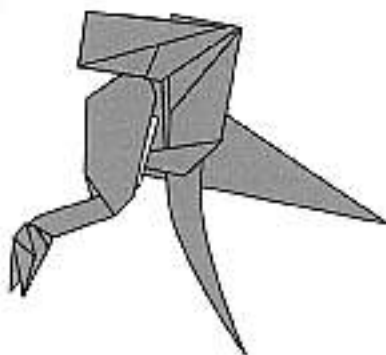
Parts of Neck & Arms

Neck is out of two sheets,
but they will be combined in the middle of the folding sequence.
Right Arm and Left Arm are symmetrical.

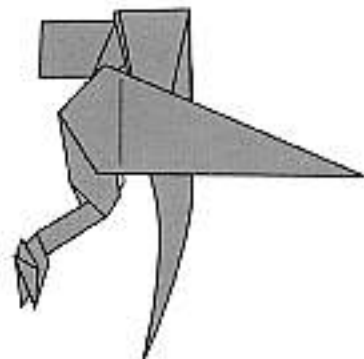
Neck



Right Arm

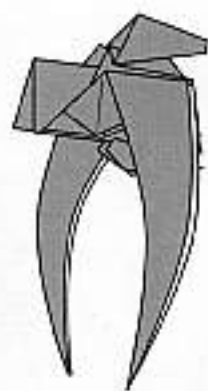


Left Arm



Parts of Ribs

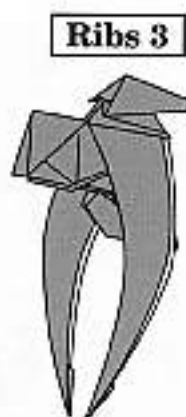
The section of Ribs is constructed from six sheets of paper. With the exception of Ribs 6 the folding sequences are all the same, but the edges of the papers are folded in to make the ribs shorter and shorter towards the tail.



Ribs 1



Ribs 2

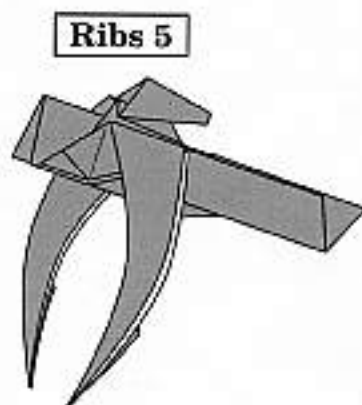


Ribs 3

Ribs 2 and Ribs 3 are identical.



Ribs 4

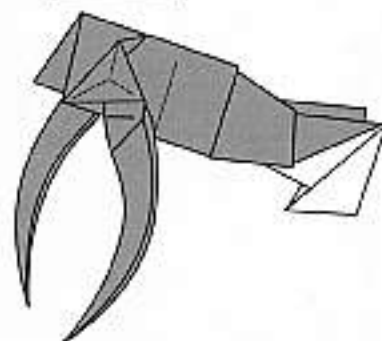


Ribs 5

Ribs 4 and Ribs 5 are the same except for the finishing.

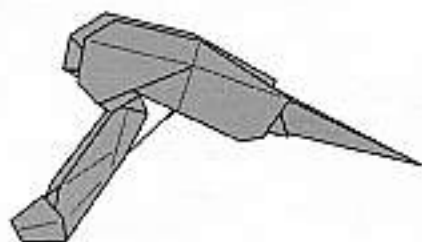
Ribs 6

The folding sequence of Ribs 6 is completely different from the others.



Parts of Hip & Legs

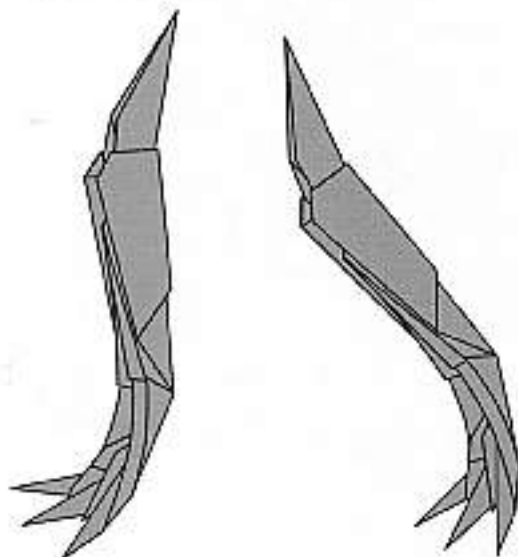
Hip Bone



Thigh Bone



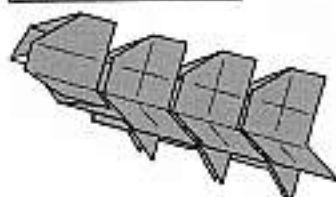
Shank & Foot



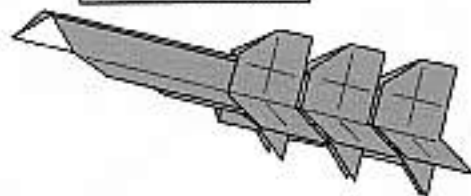
Parts of Tail

Tail Bones 1 to 4 are basically the same except the top of Tail Bones 1 and Tail Bones 5 is different.

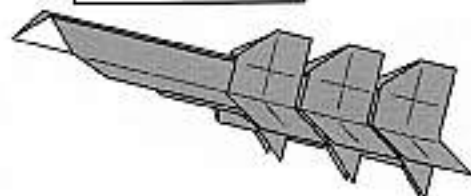
Tail Bones 1



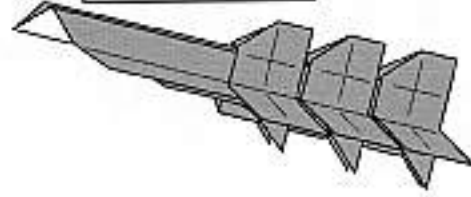
Tail Bones 2



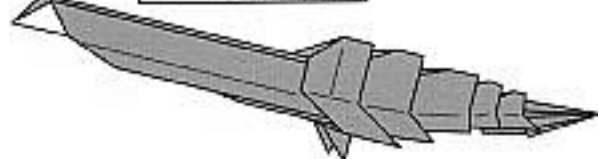
Tail Bones 3



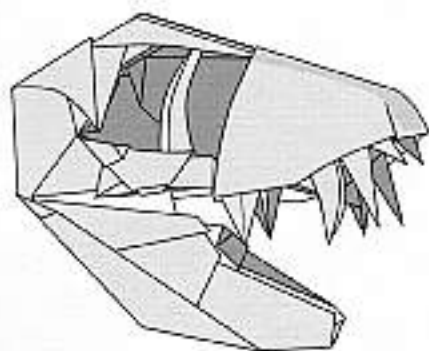
Tail Bones 4



Tail Bones 5

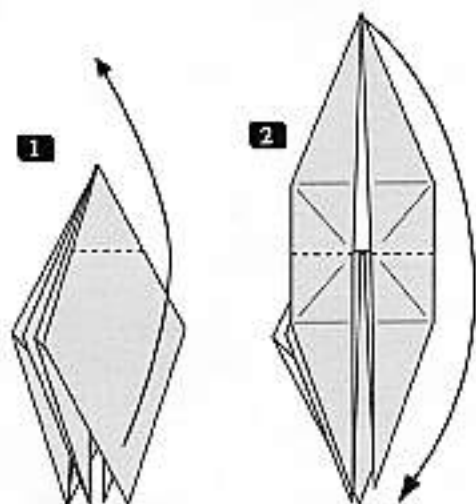


Chapter 2 Head

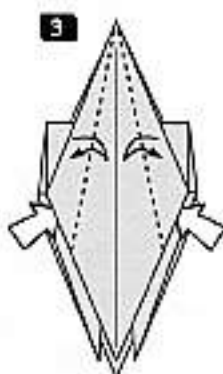
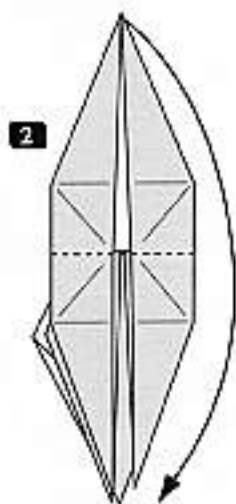


2 Head

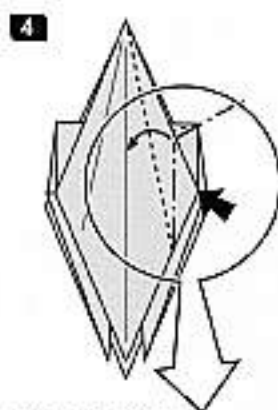
2.1 Upper Jaw



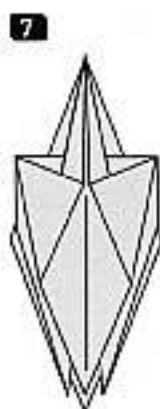
Start with the Frog Base.
Stretch the top layer.



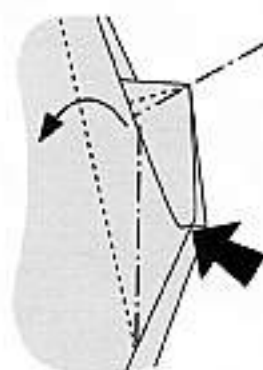
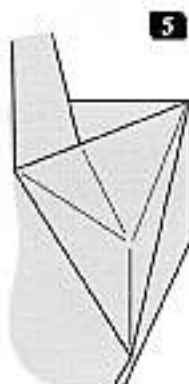
Make creases.



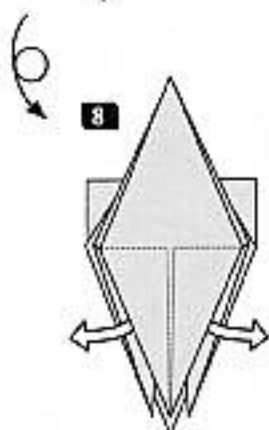
Spread-sink,
using the creases
from **3**.



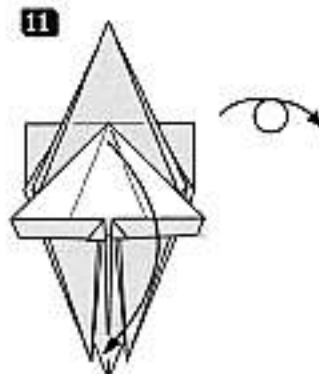
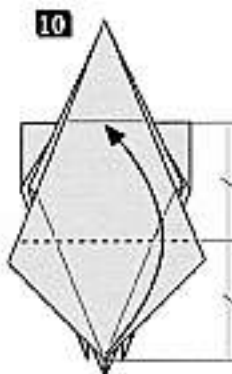
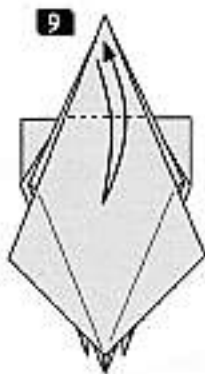
Repeat **4** to **5**
on the left.

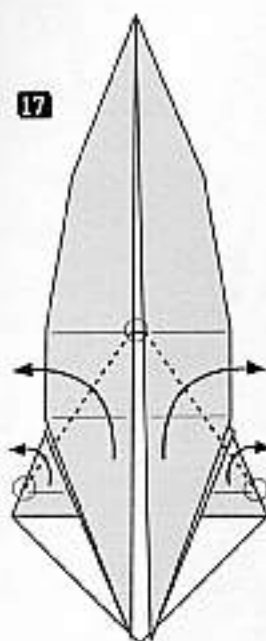


Step **4** in progress.

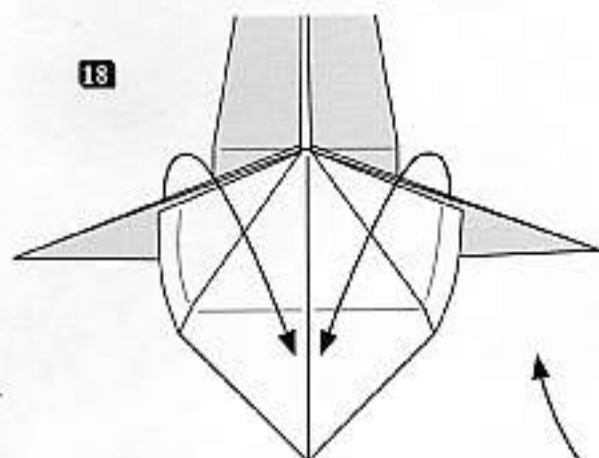
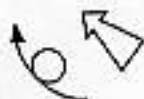


Pull out
the hidden sheets.

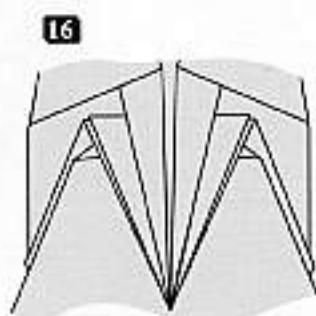




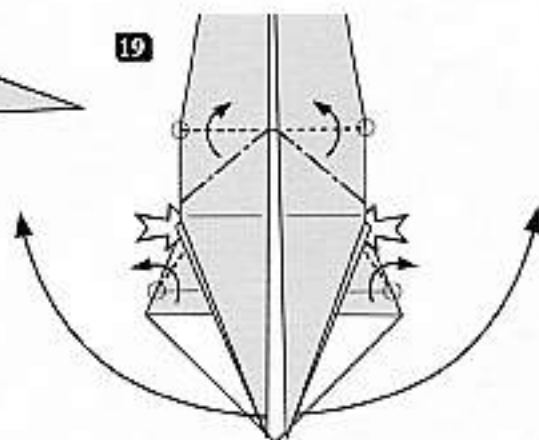
Make creases.
Note the landmarks.



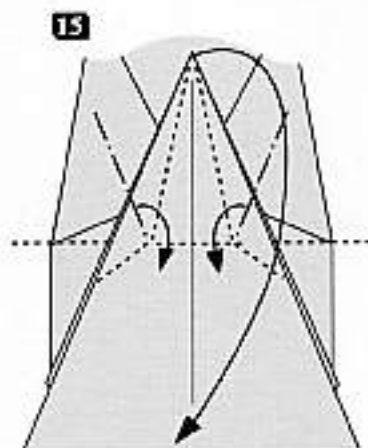
Close.



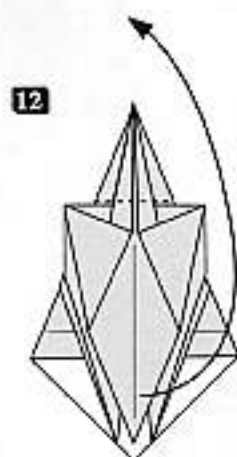
Step 15 completed.



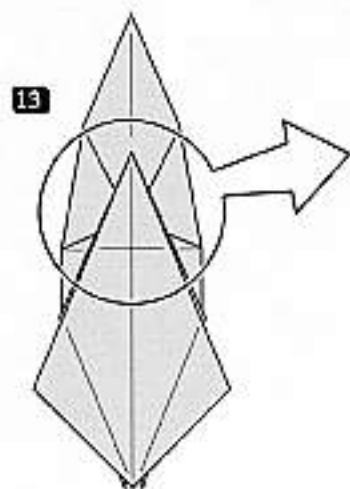
Split the two points,
lifting two layers.
Use the creases from 17.



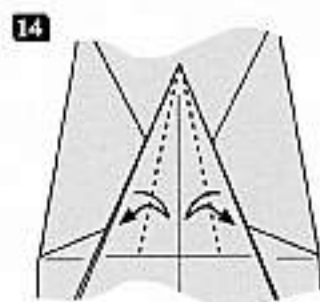
Fold the point down,
thinning the top layer.



12



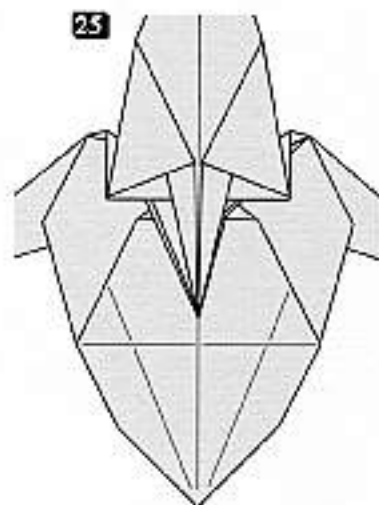
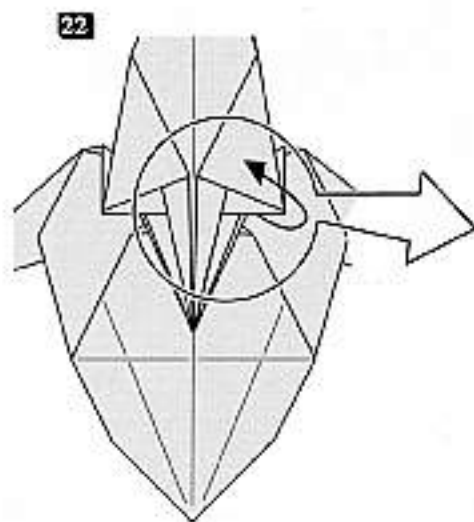
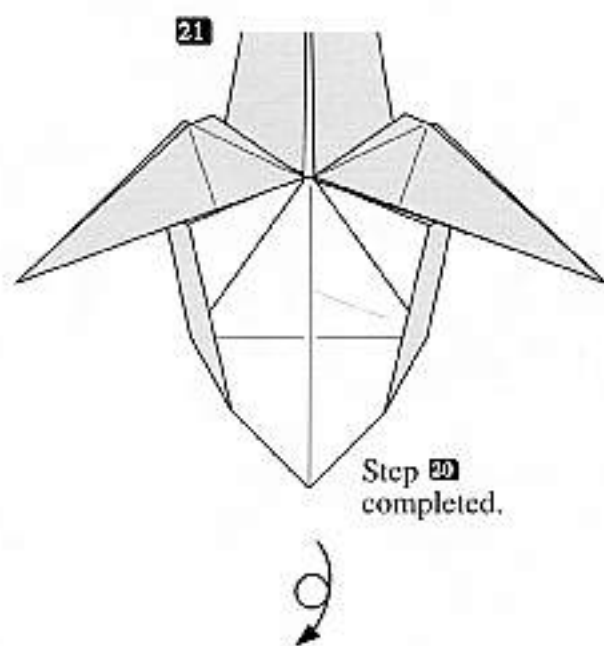
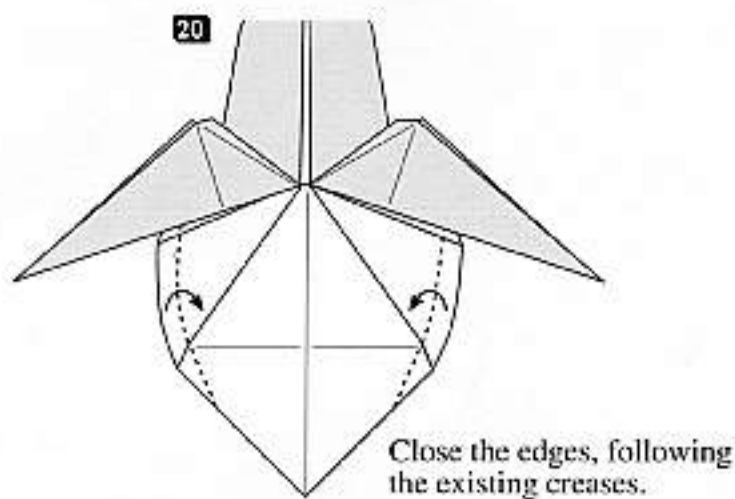
13



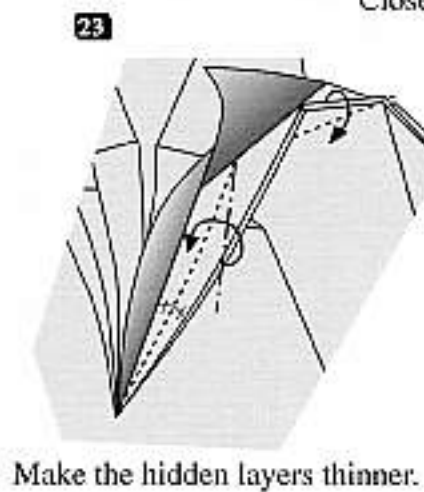
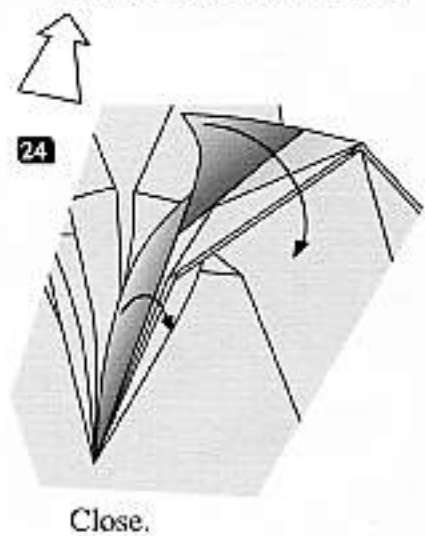
14

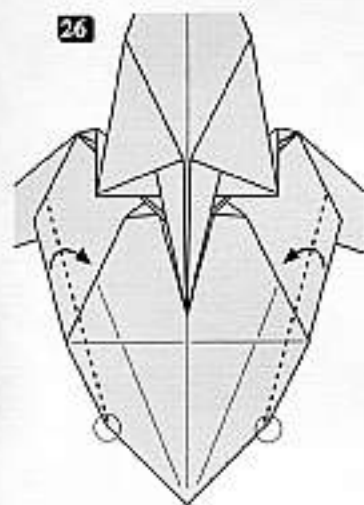
Crease the top layer only.



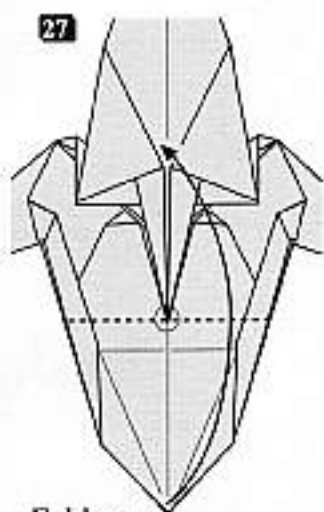


Repeat **22** to **24** on the left.

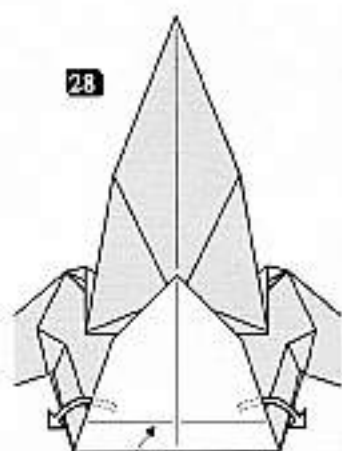




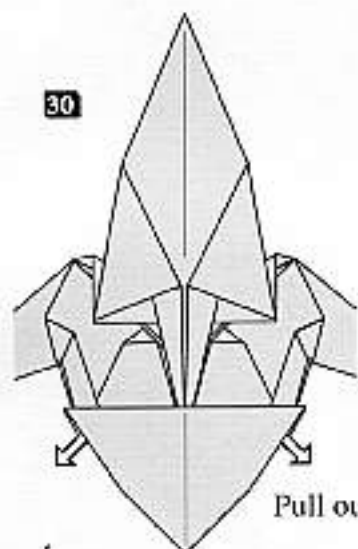
26
Fold along the edges from 20.
Note the landmarks.



27
Fold up.
Note the landmarks.

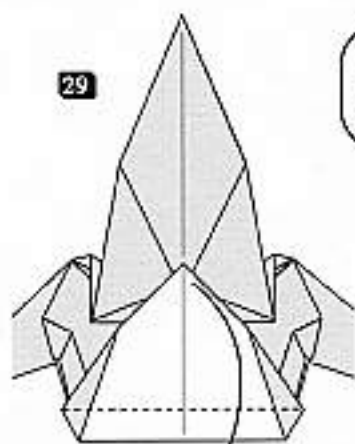


Pull out the trapped sheets,
placing the corners
on the extension of this crease.



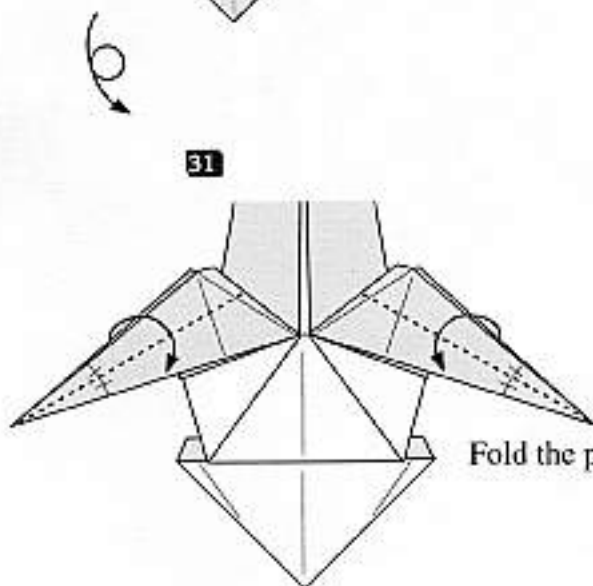
30

Pull out.



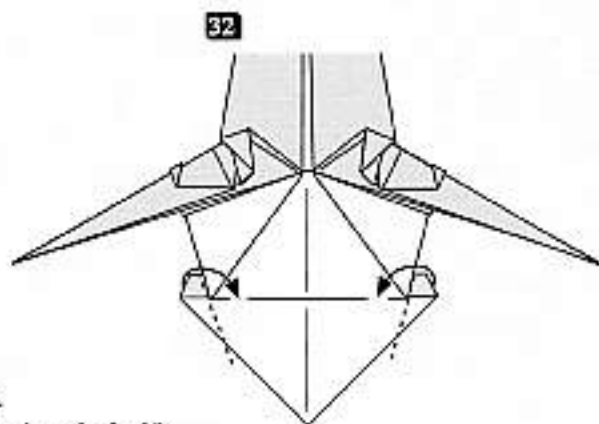
29

Fold down,
using the existing crease.



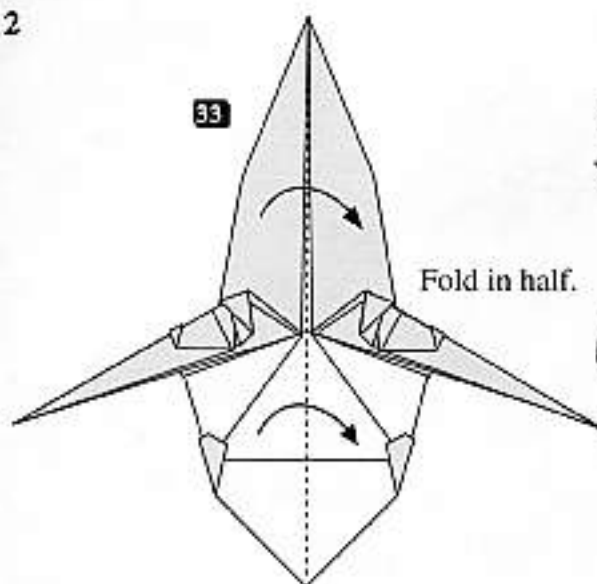
31

Fold the points in half.

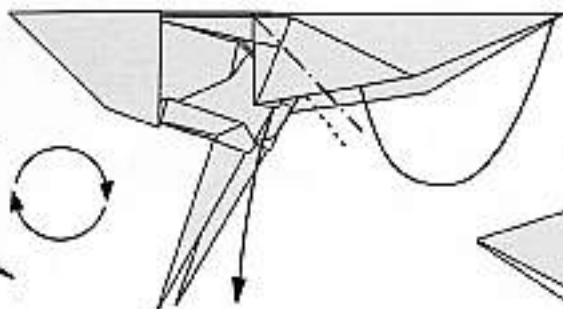


32

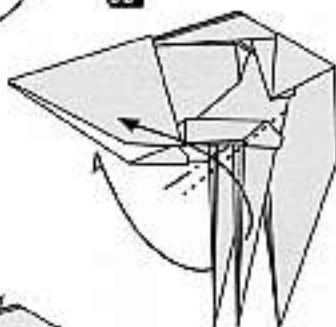




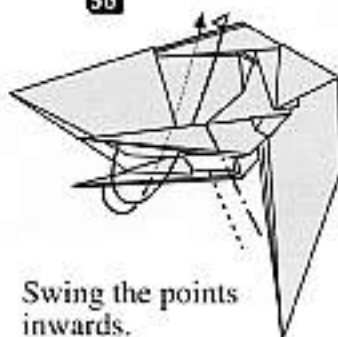
34 Inside reverse.



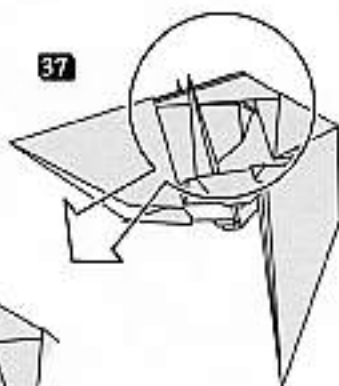
35



36



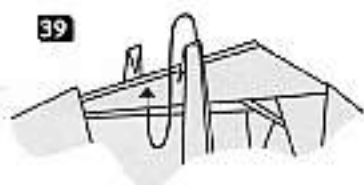
37



38

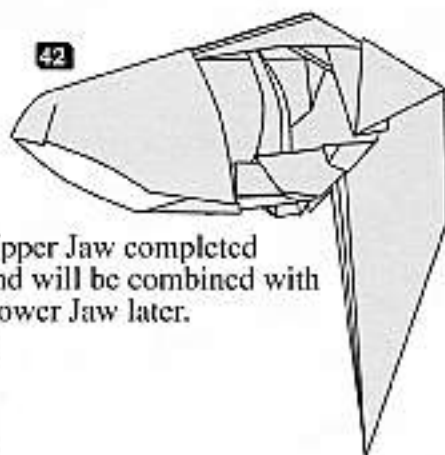


39

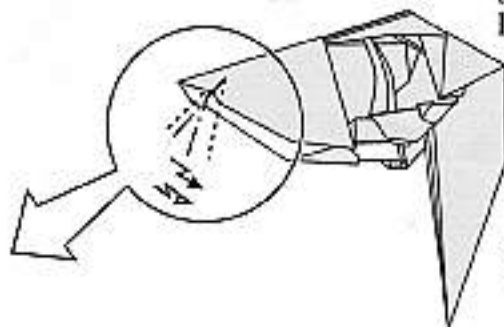


Tuck the top under the layer.
Repeat behind.

42



40



Make the top
of the nose
three dimensional.

41



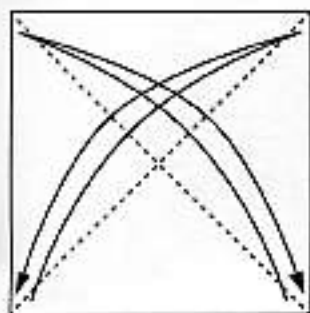
Fold the excess paper
inside.



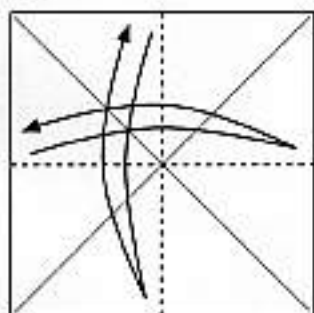
2.2 Lower Jaw



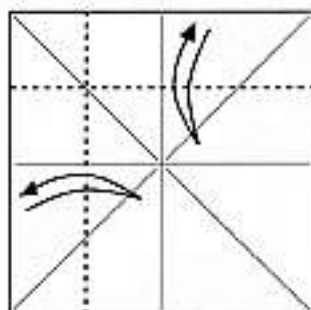
1



2



3



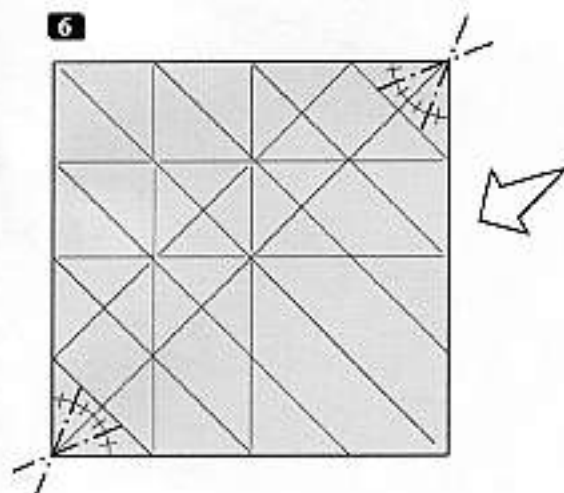
Make creases.



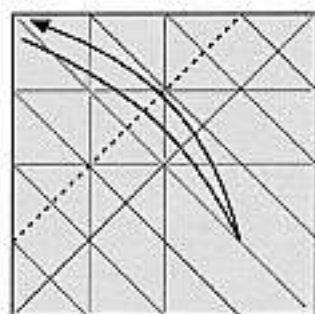
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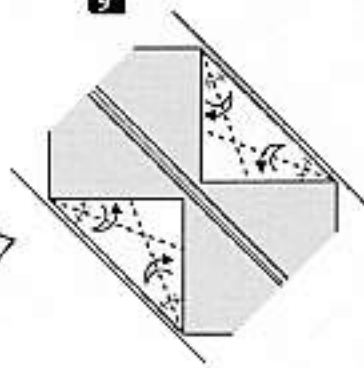
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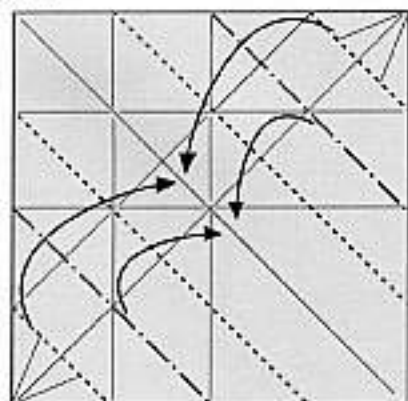
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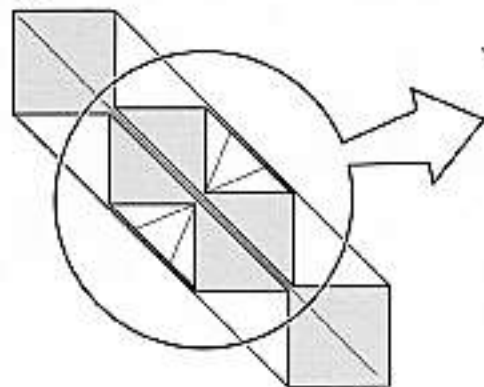
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7

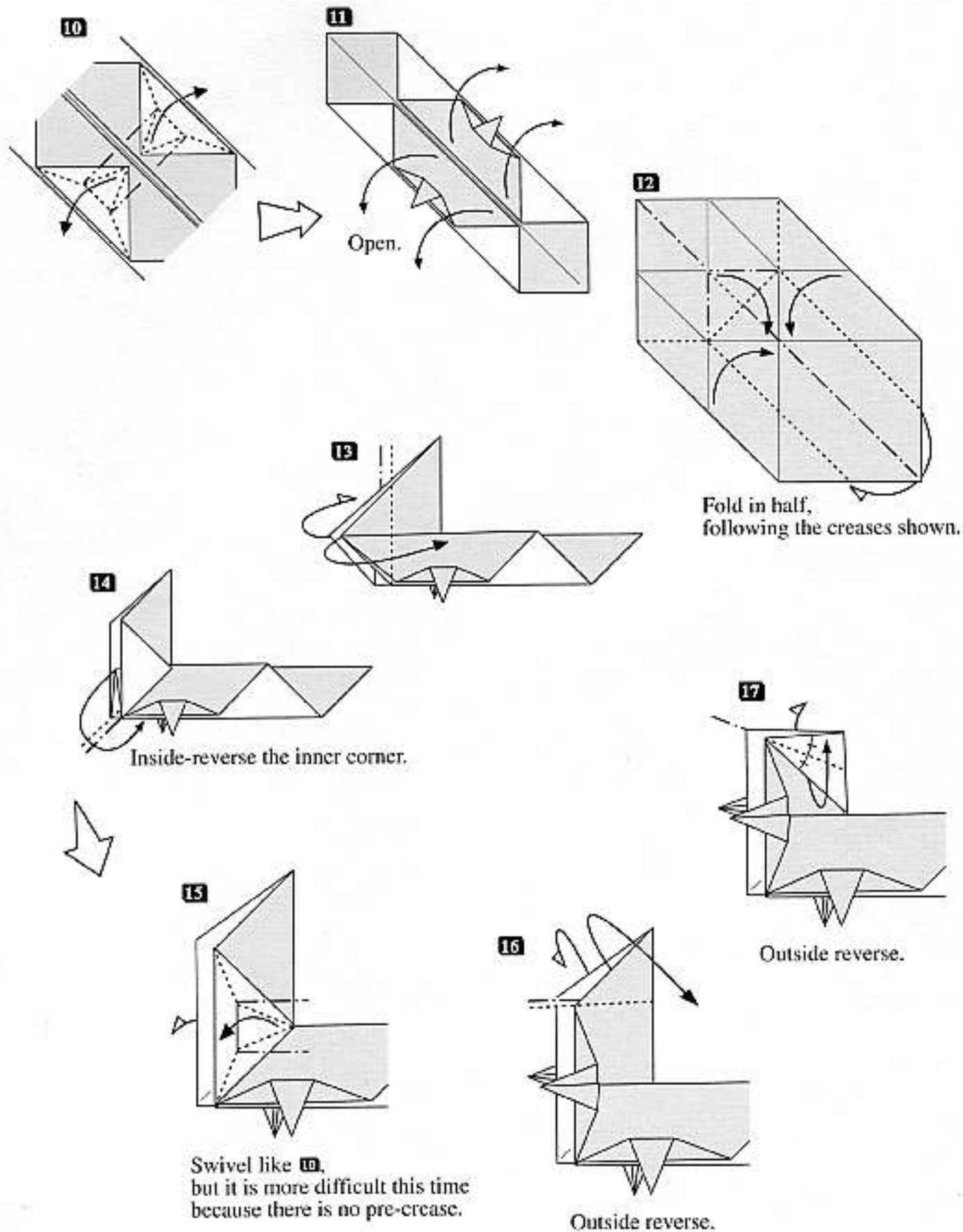


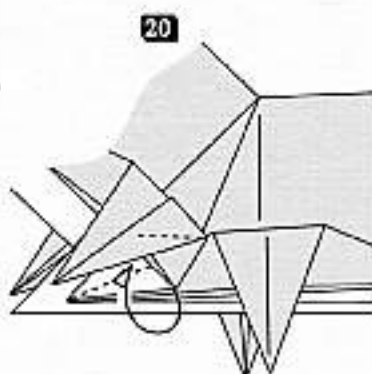
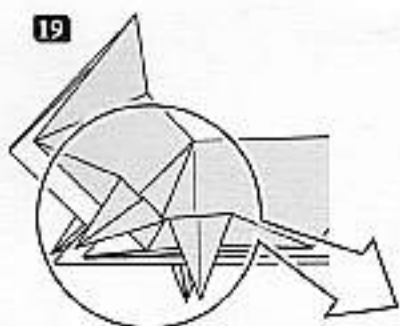
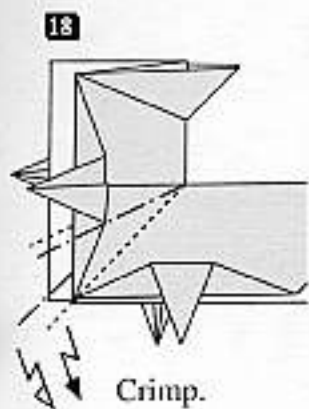
8



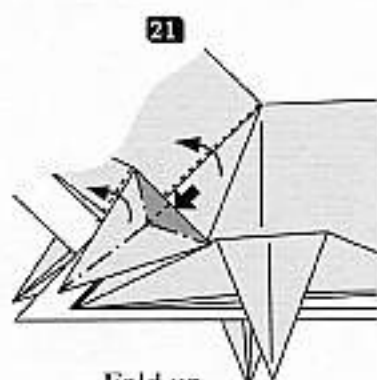
Close, using the creases from 4.



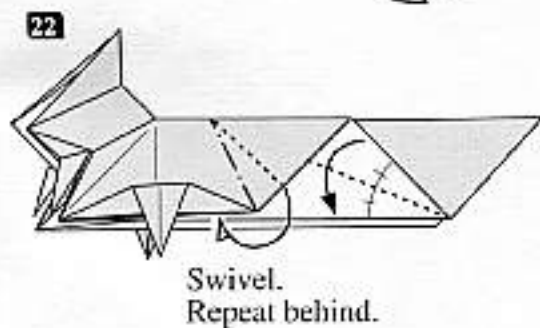




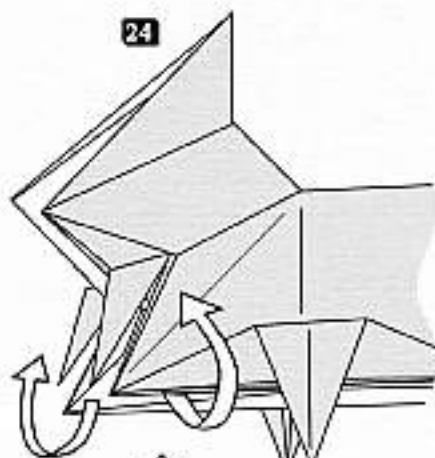
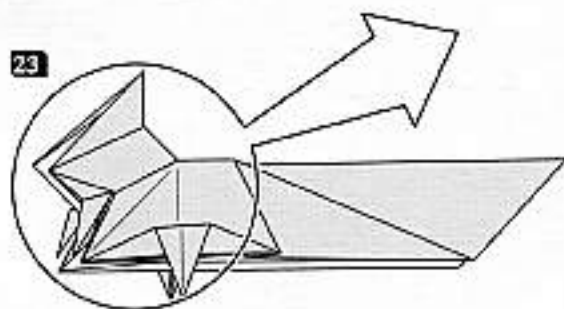
Inside reverse.
Repeat behind.



Fold up
the triangular layer,
sinking the shadowed part.
Repeat behind.

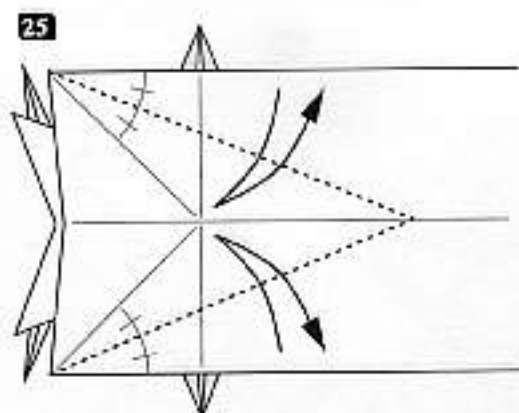


Swivel.
Repeat behind.

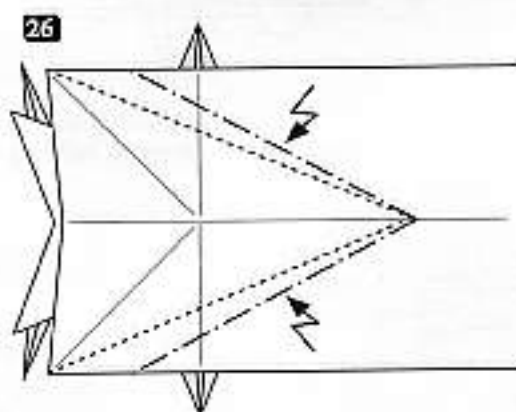


Open to look
at the model
from the bottom.

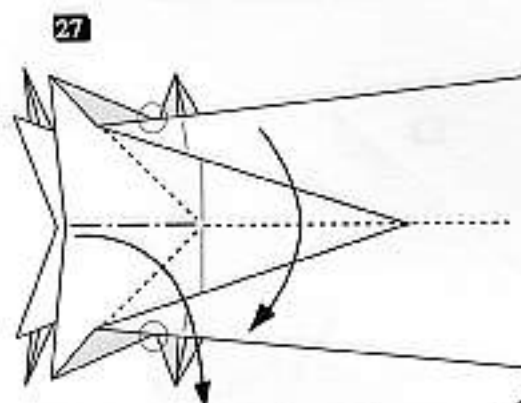




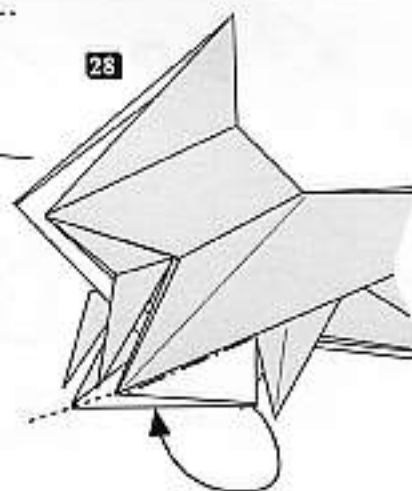
Make creases firmly.



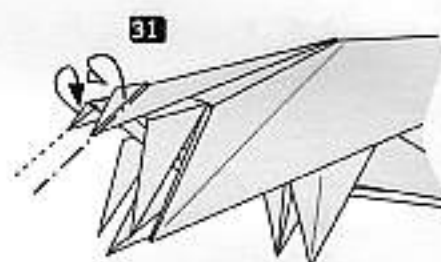
Pleat both sides, using the creases from 25 as the valley folds. The mountain creases here should hit the landmarks shown in the next step.



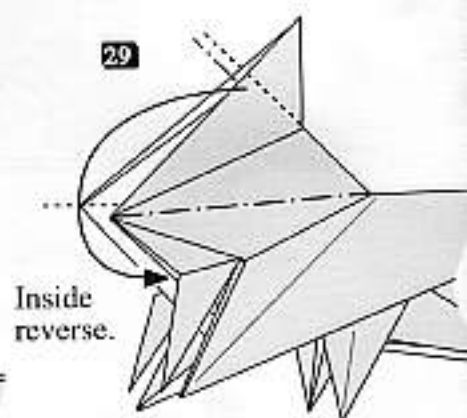
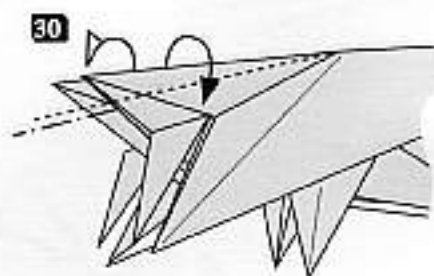
Check the landmarks again, then close.

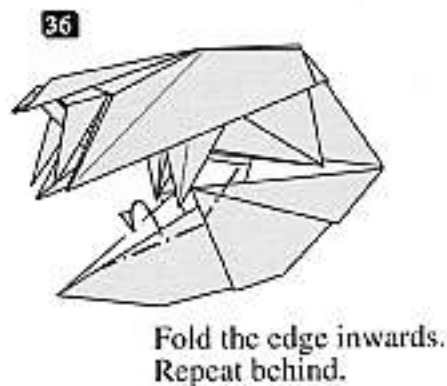
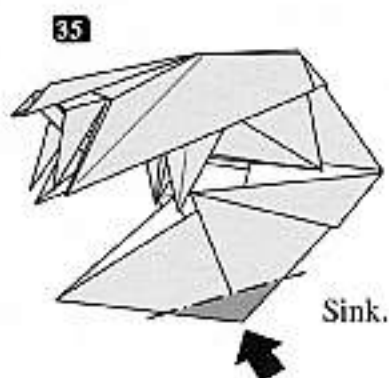
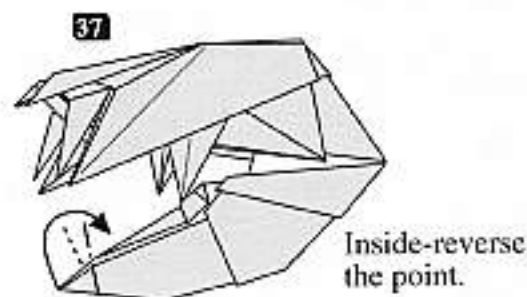
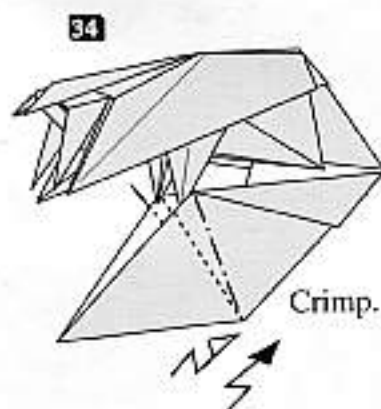
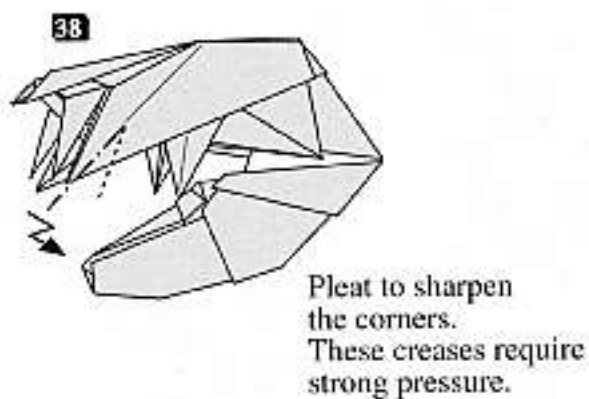
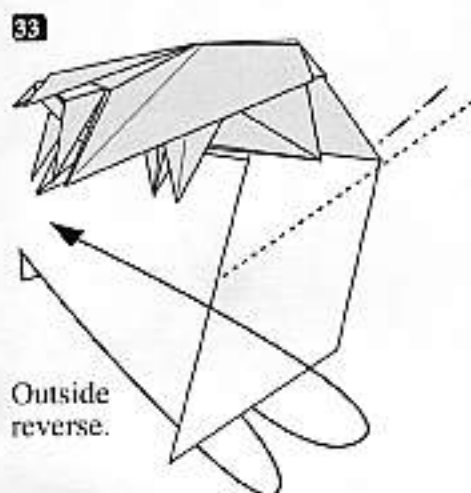
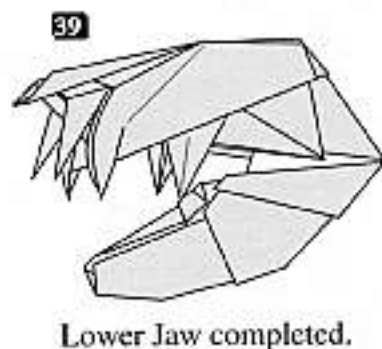
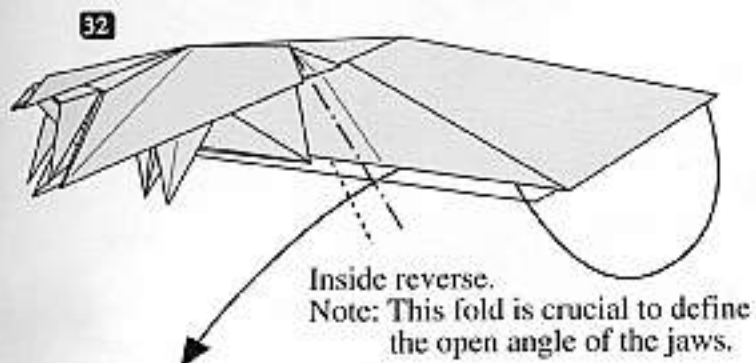


Inside reverse to hide the colour of the back.

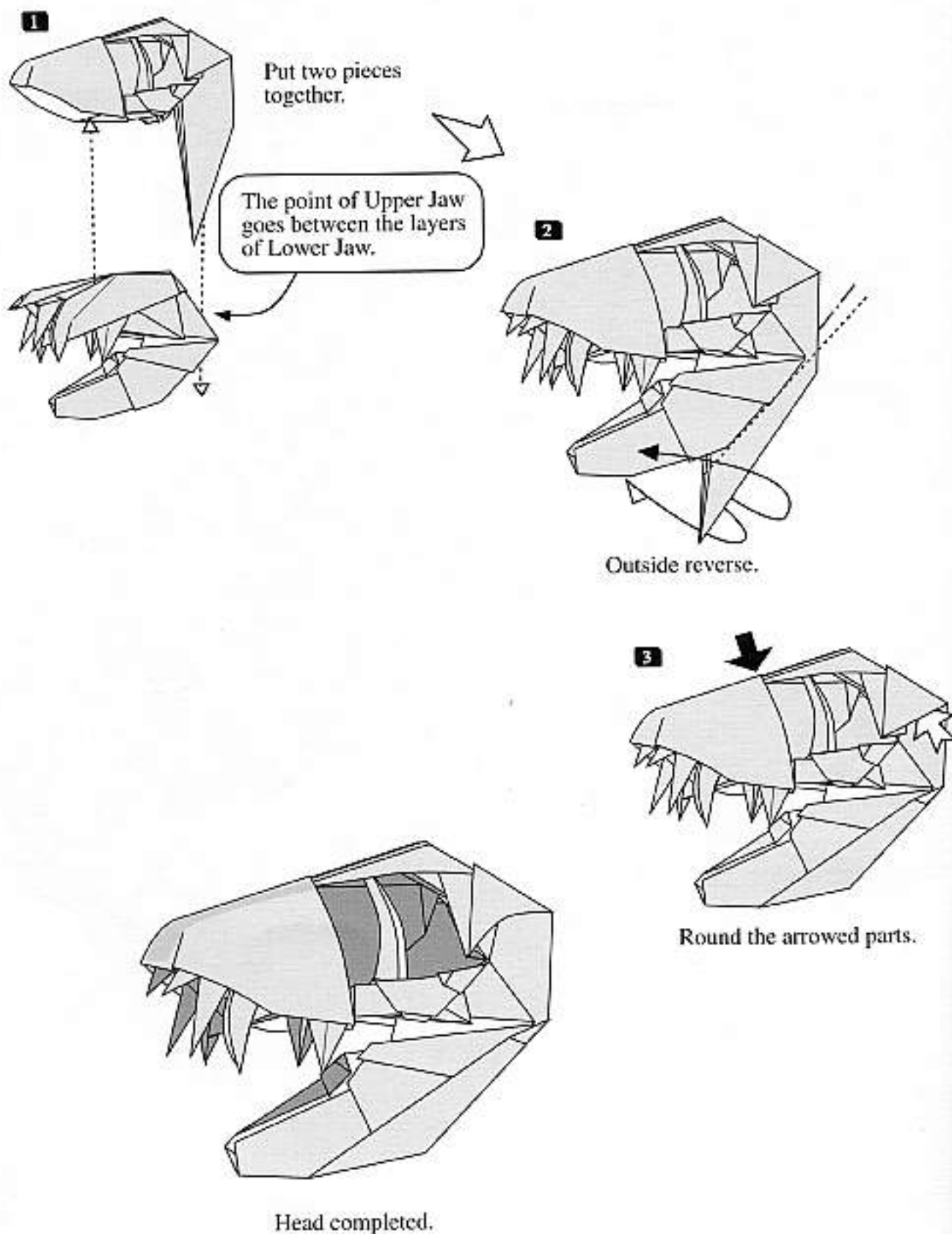


Make the points thinner.





2.3 Assembly of Upper Jaw and Lower Jaw



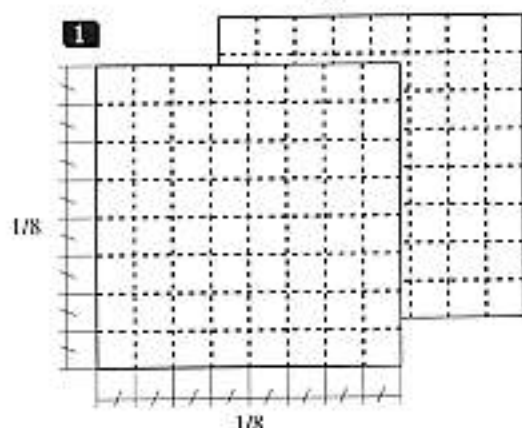
Chapter 3

Neck & Arms

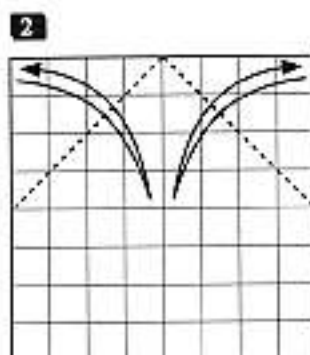


3 Neck & Arms

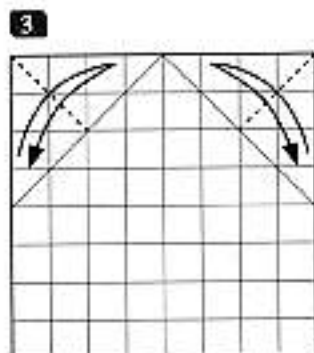
3.1 Neck



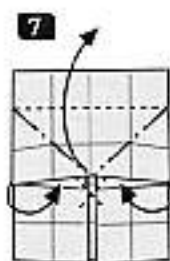
Make two sheets of 8x8 grid.



Start with one sheet.
Make creases.



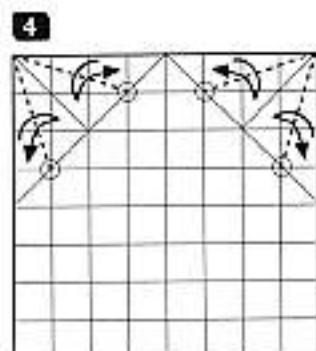
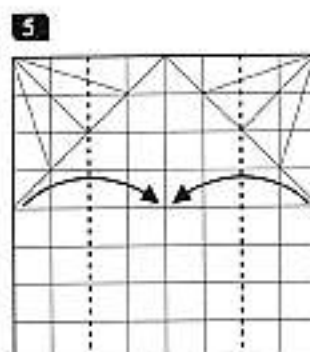
Make creases.



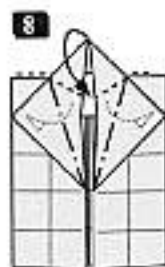
Squash right and left.



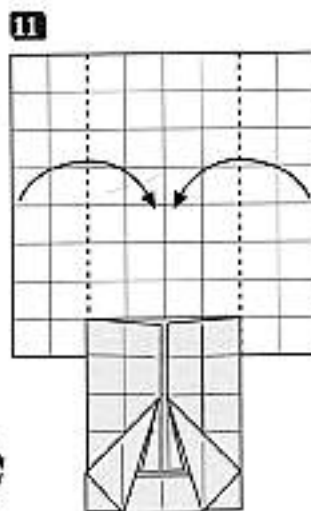
Use the third crease from the top.



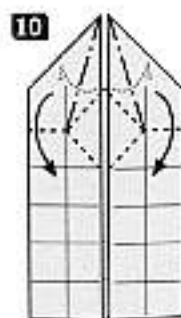
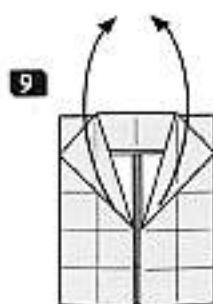
Make creases.
Note the landmarks.



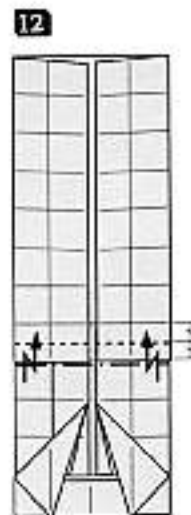
Fold the top sheet inside, using the existing creases.



Wrap the model with another grid.



Close the model, folding the top sheets inwards. Use the existing creases.



Pleat.



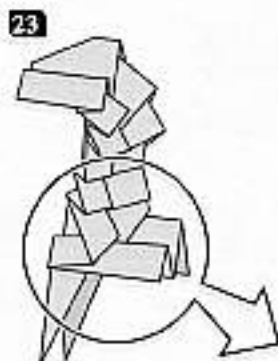
Repeat **19** behind.



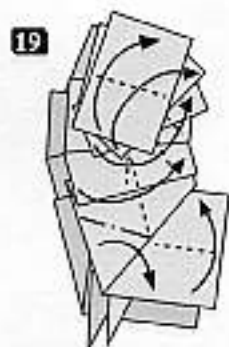
Fold the plates
in half again.
Repeat behind.



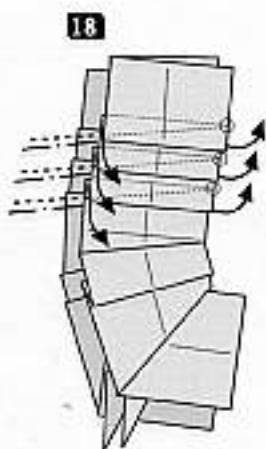
Inside reverse.



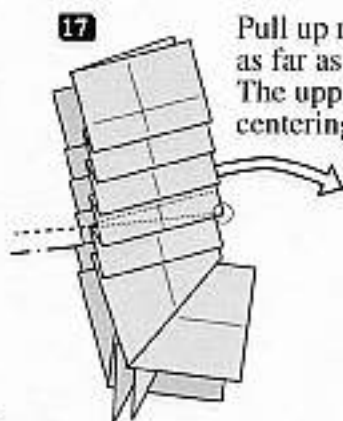
Pull out point **A**.
Repeat behind.



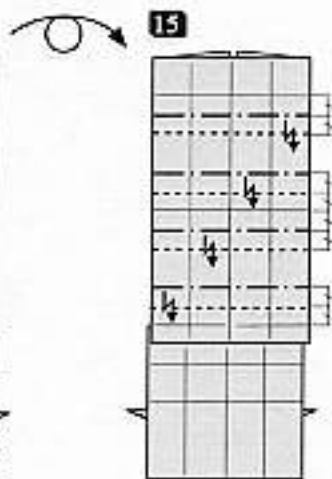
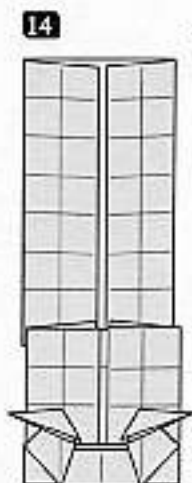
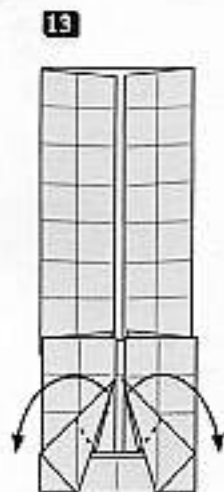
Fold each plate
in half.



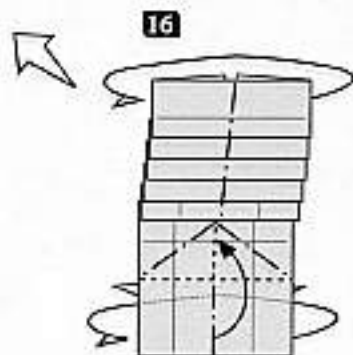
Rotate the three plates,
centering the circled points.
Every third layer gets valley creased
and the fourth gets mountain folded.



Pull up right
as far as possible.
The upper layers revolve,
centering the circled point.

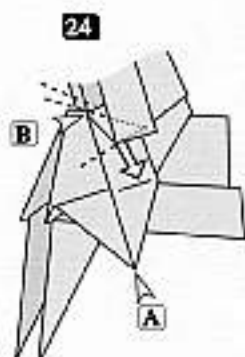


4 Pleats.
Note their positions.

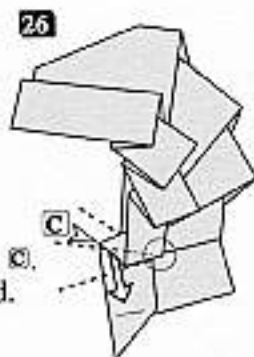
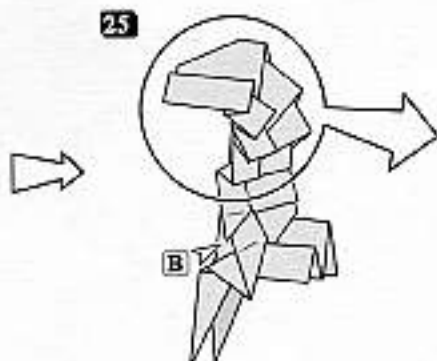


Fold in half,
crimping.





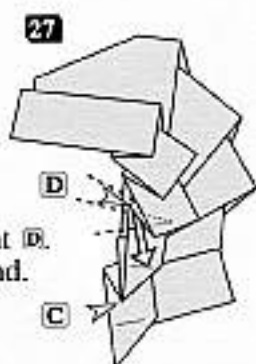
24
Pull out point **B**.
Repeat behind.



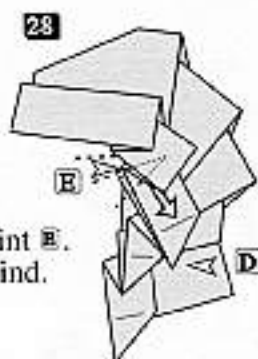
26
Pull out point **C**.
Repeat behind.



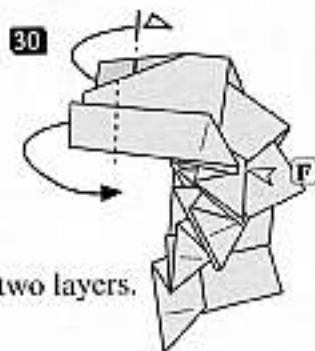
Neck completed.



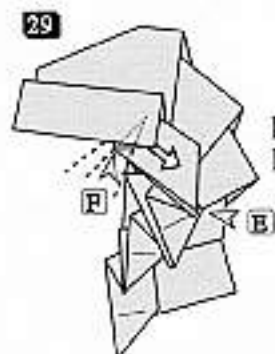
27
Pull out point **D**.
Repeat behind.



28
Pull out point **E**.
Repeat behind.



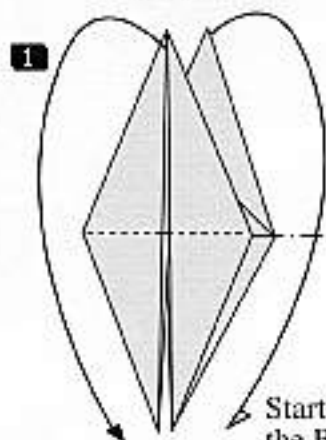
30
Open
the top two layers.



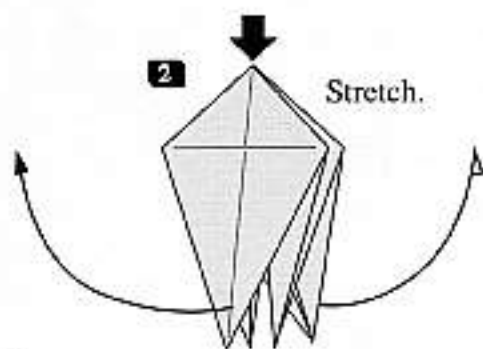
29
Pull out point **F**.
Repeat behind.



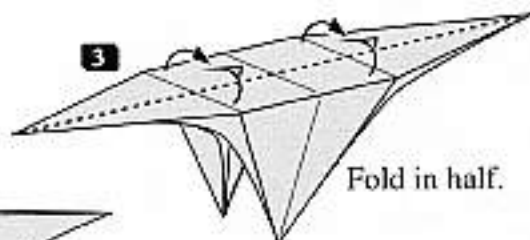
3.2 Arms



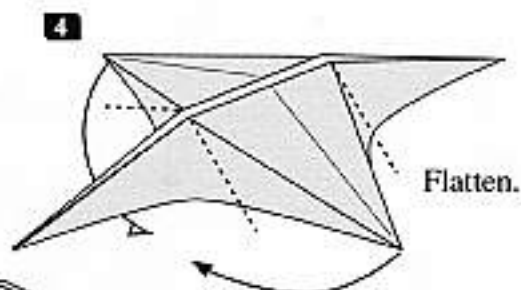
Start with
the Bird Base.



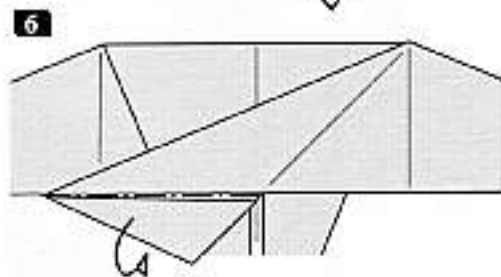
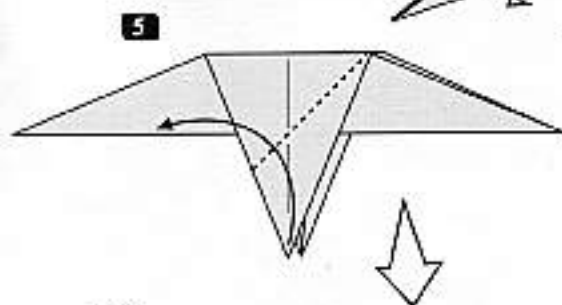
Stretch.



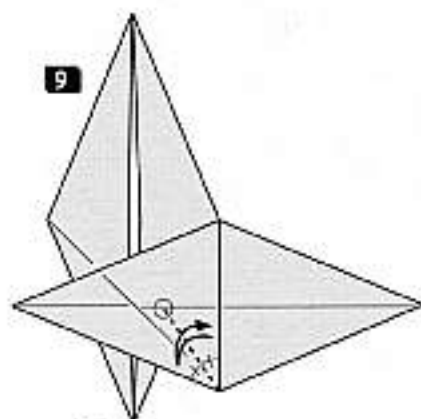
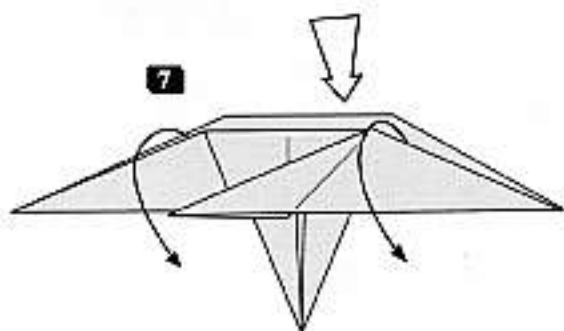
Fold in half.



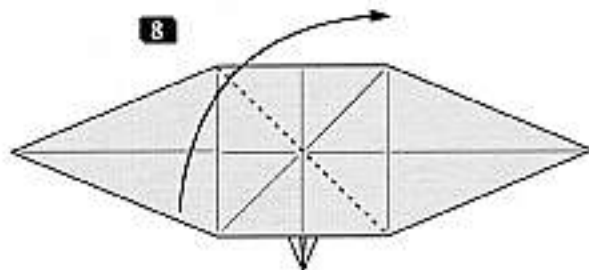
Flatten.

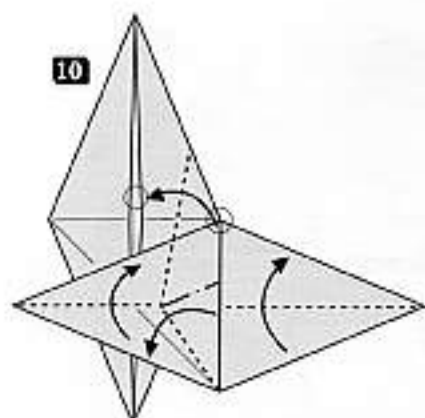


Fold behind the layers.

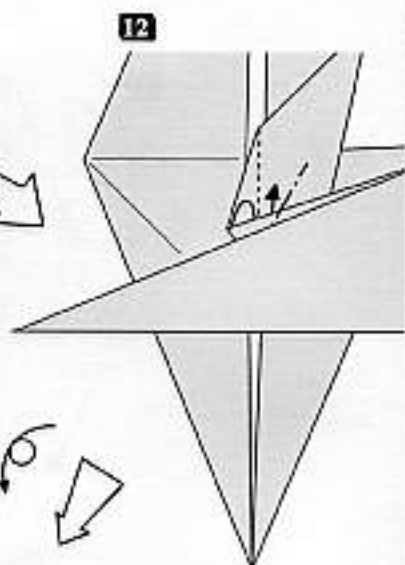
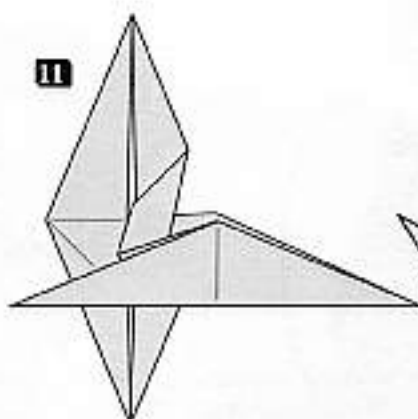


Make a crease
to divide the angle shown
in half.

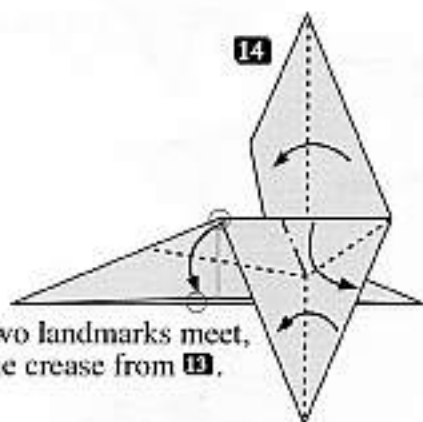




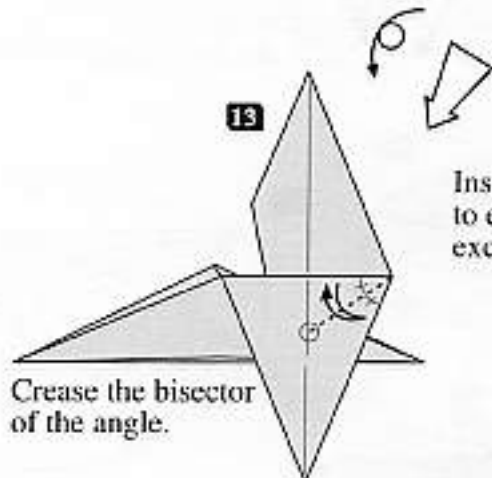
Make the two landmarks meet, using the crease from **9**.



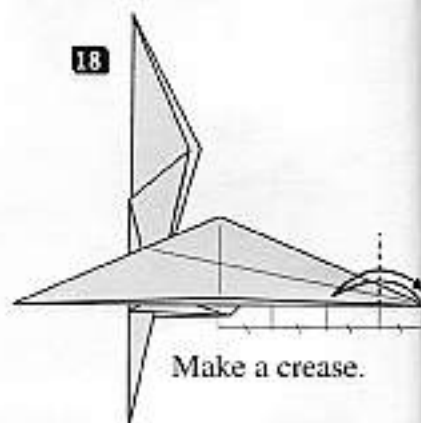
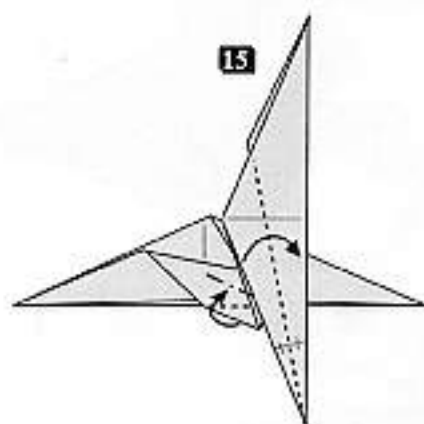
Inside reverse to eliminate the part exceeding the centre line.



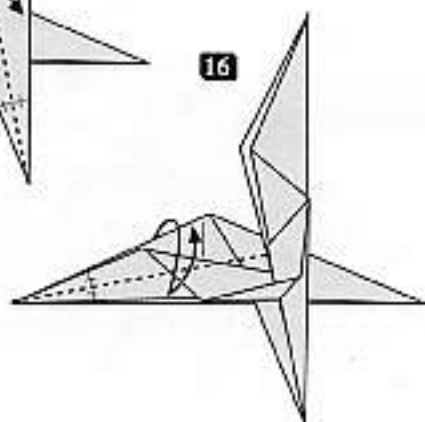
Make two landmarks meet, using the crease from **13**.



Crease the bisector of the angle.

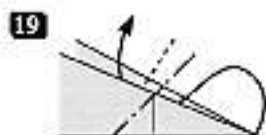
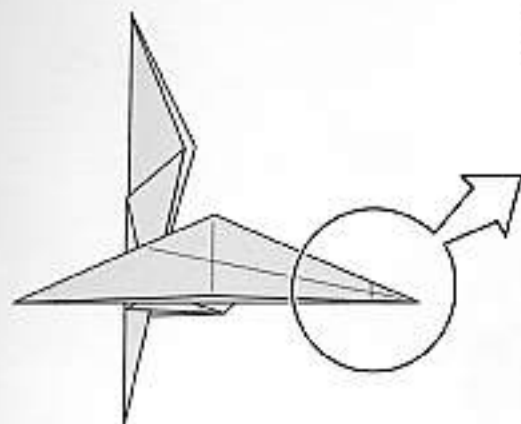


Make a crease.

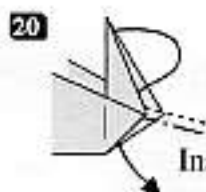


Make it thinner.





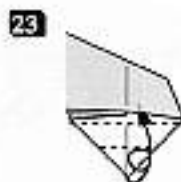
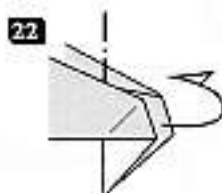
19 Inside reverse, using the crease from 18 as a guide line



20 Inside reverse.



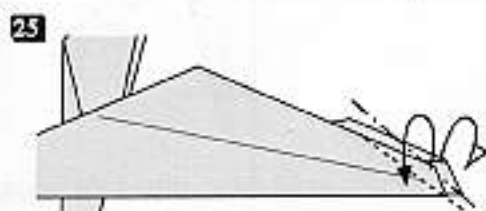
21 Pull out the trapped sheets.



23 Roll in.

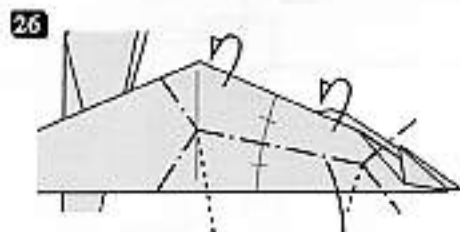


24



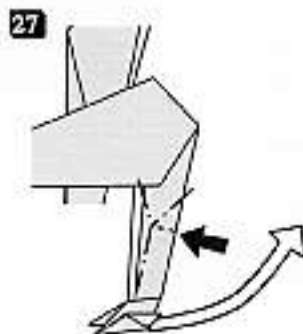
25

Make the points sharper.



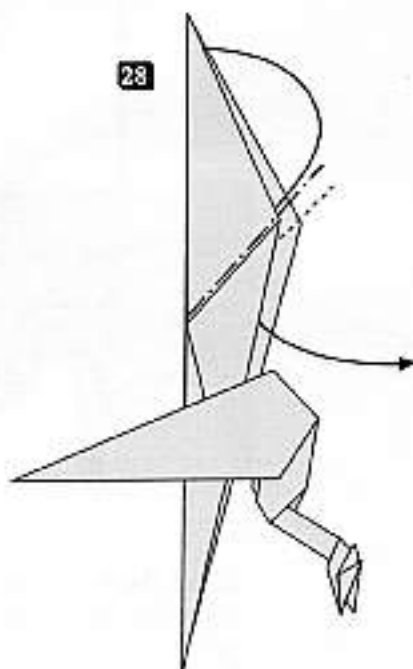
26

Two rabbit ears, folding all layers.



27

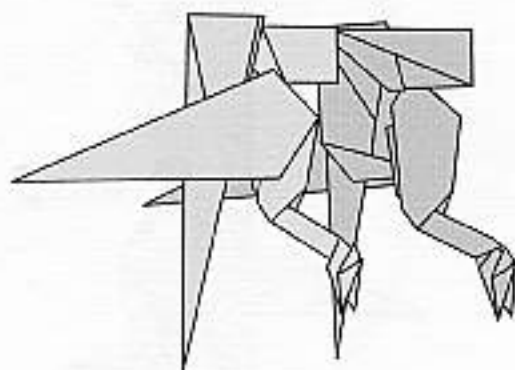
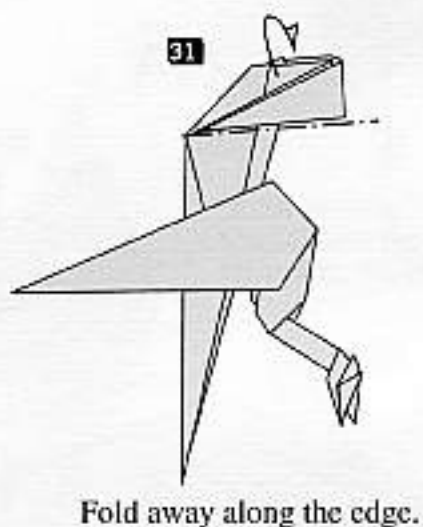
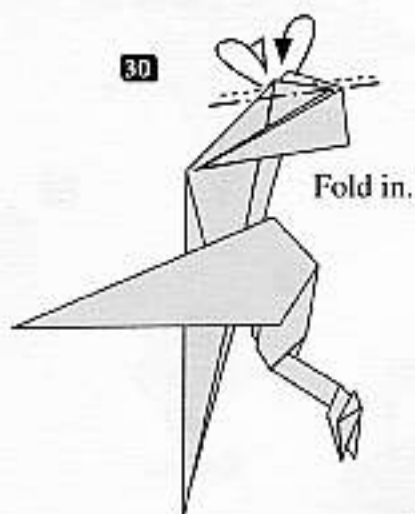
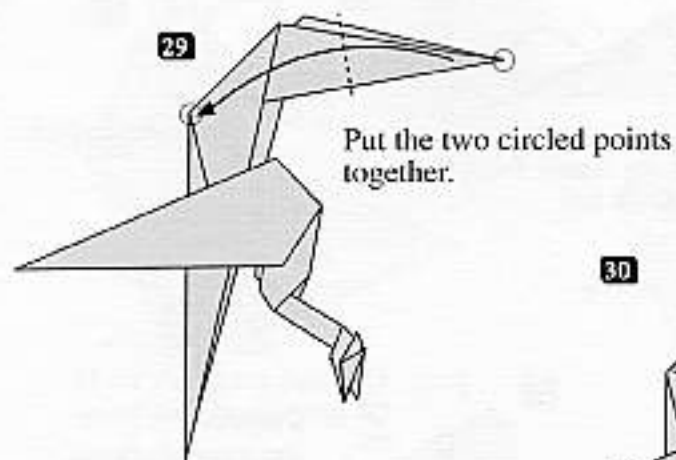
Double rabbit ear.



28

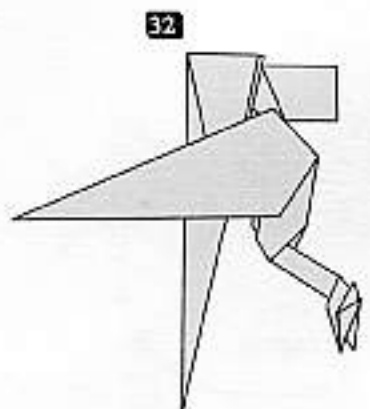
Inside reverse along the edges.





Make the left arm,
reversing all maneuvers
symmetrically.
It is a little difficult.

Arms completed.
Ribs with arms will get curves
later when they are assembled.



The right arm completed.



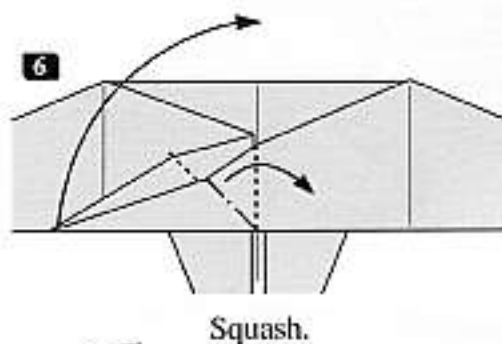
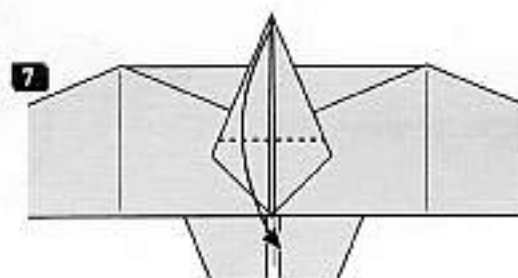
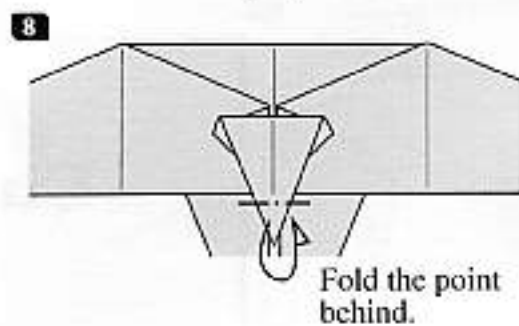
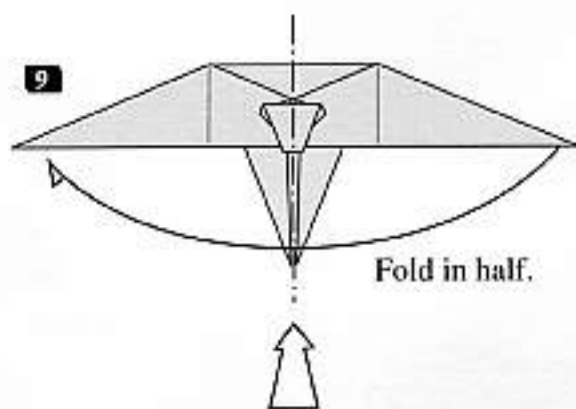
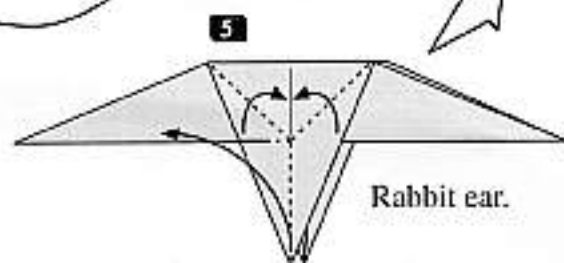
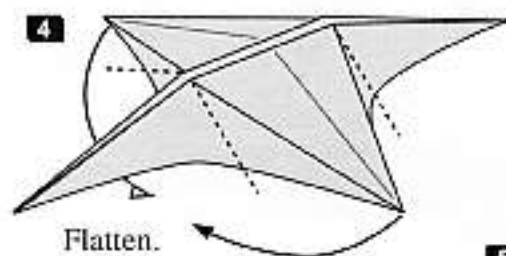
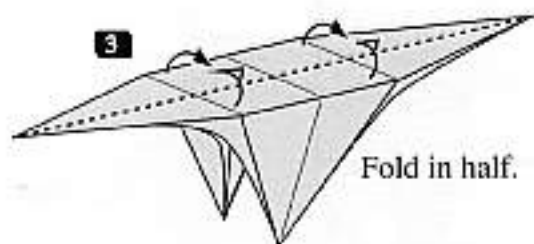
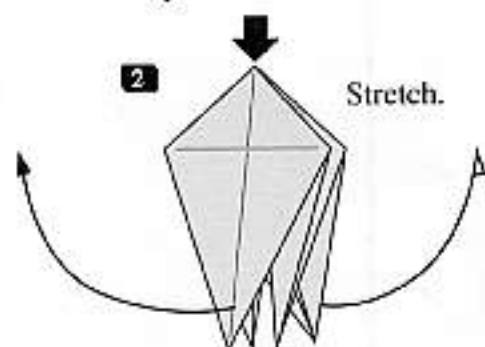
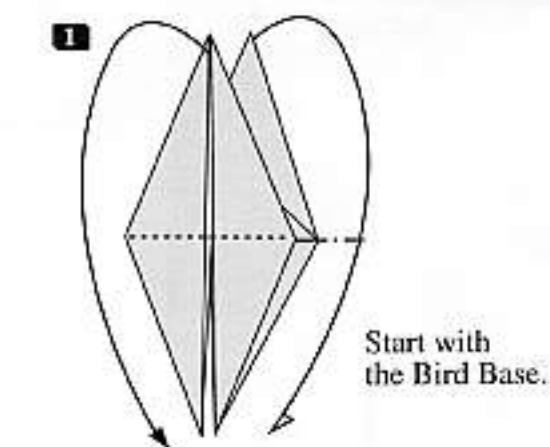
Chapter 4

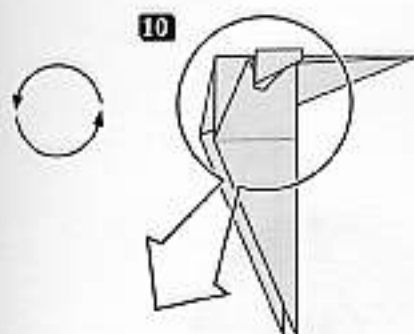
Ribs



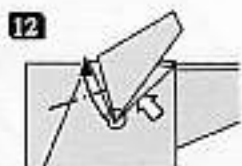
4 Ribs

4.1 Ribs 1

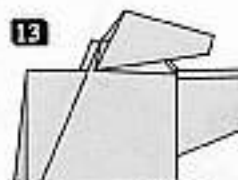




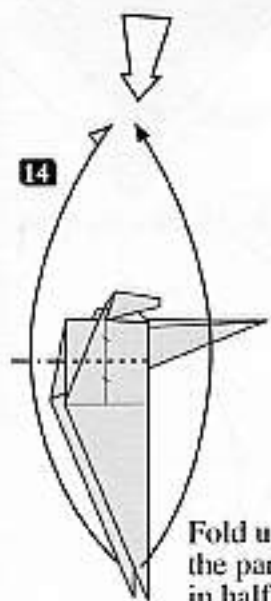
Pull the top layer up as far as possible, pinching its right end.



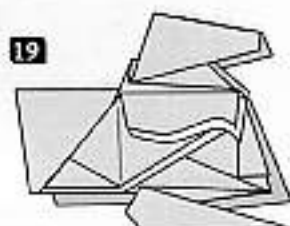
Lift up the top layer, pinching its bottom corner.



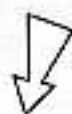
13 completed.



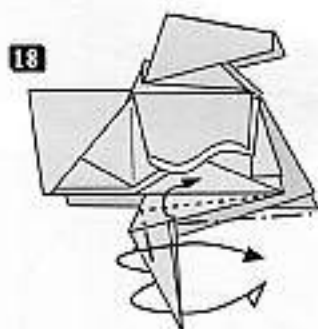
Fold up, dividing the parts shown in half.



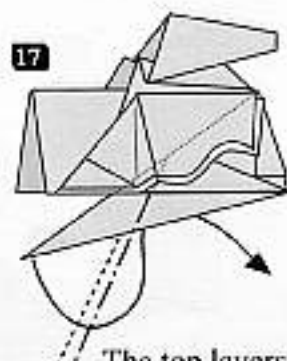
18 completed.



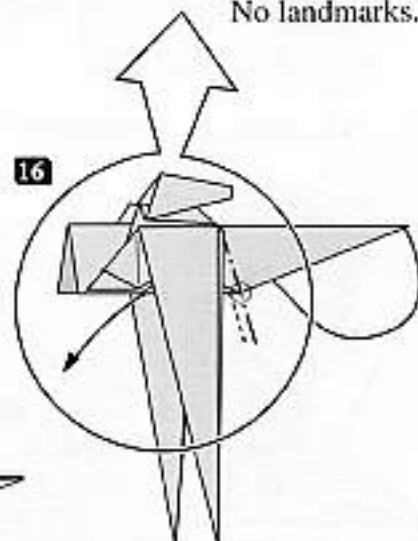
Ribs 1 completed.



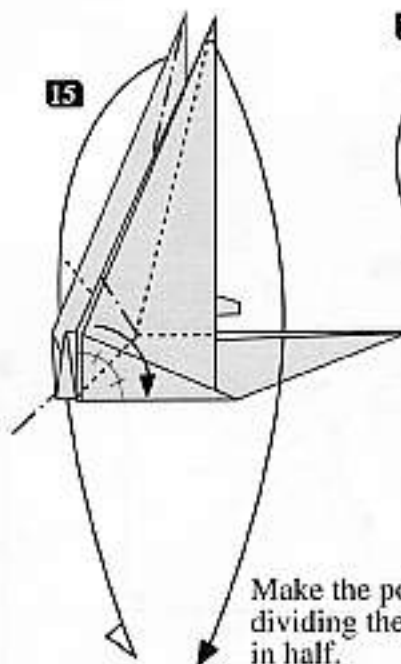
Turn the point inside-out.



The top layers are not shown. Inside reverse. No landmarks.



Inside reverse. Note the landmarks.



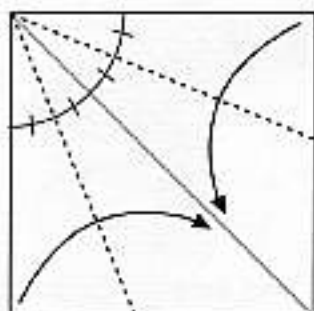
Make the points thinner, dividing the angles shown in half.



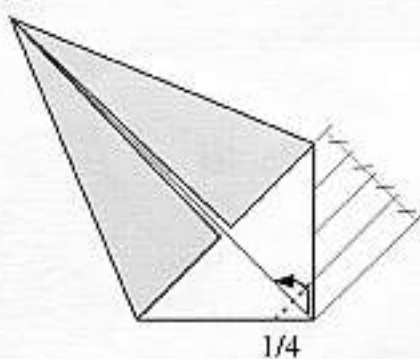
4.2 Ribs 2 and Ribs 3



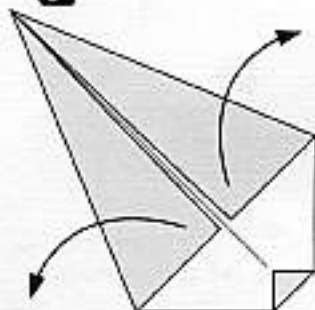
1



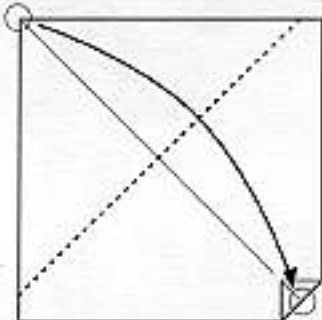
2



3

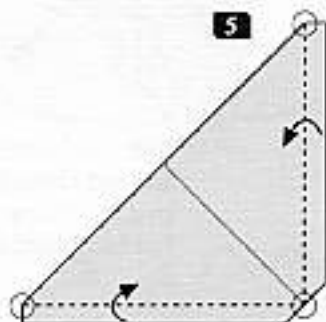


4



Put the two circled points together.

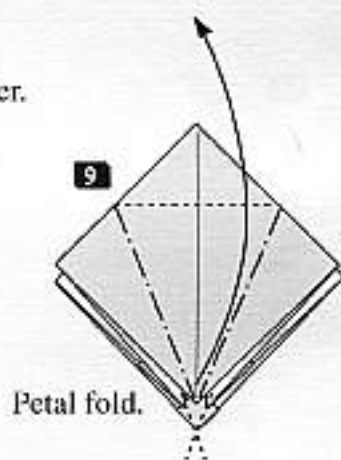
5



Fold along the edges behind.



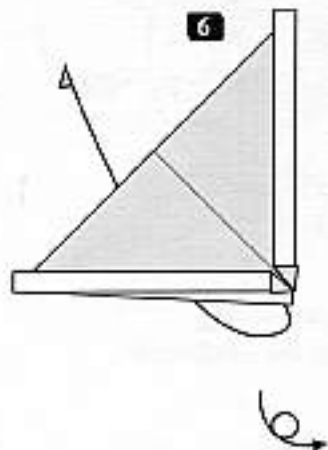
9



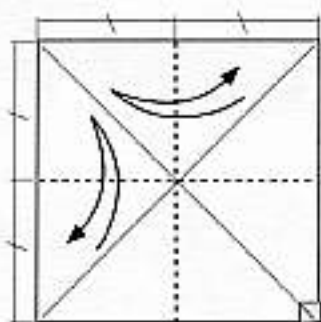
Petal fold.



6

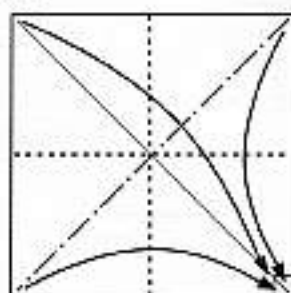


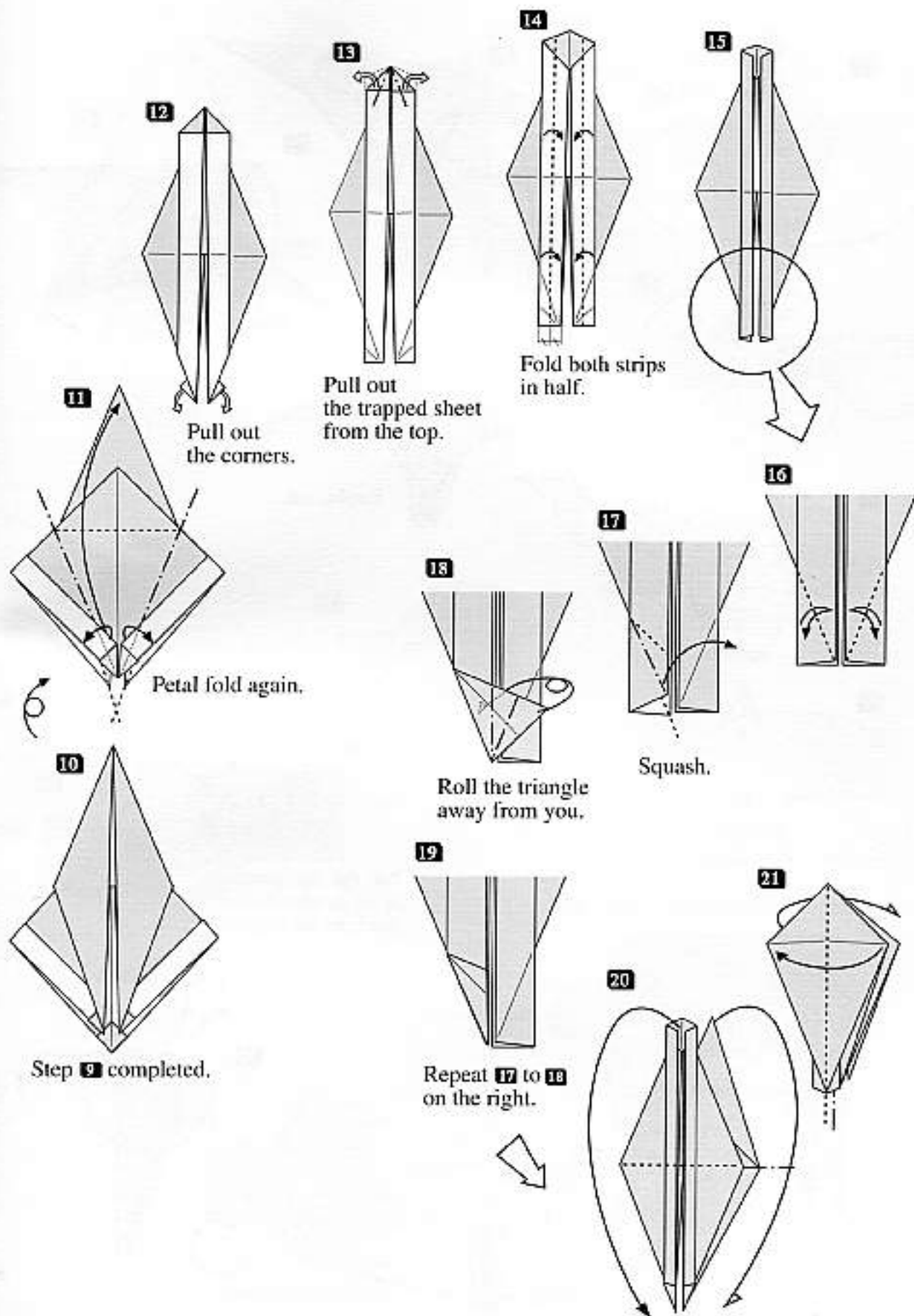
7

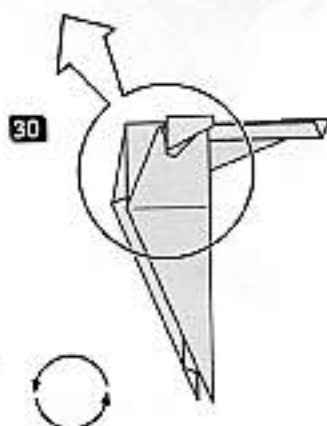
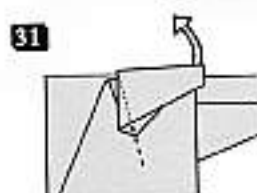
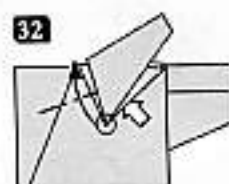
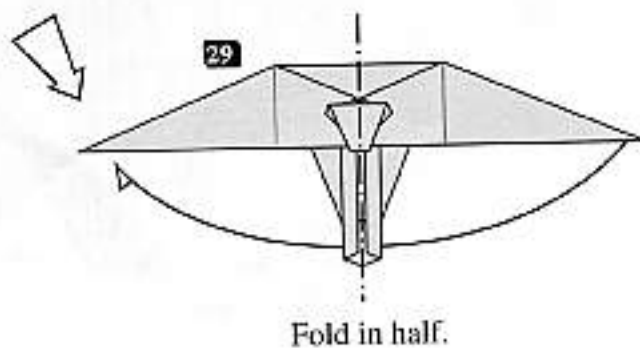
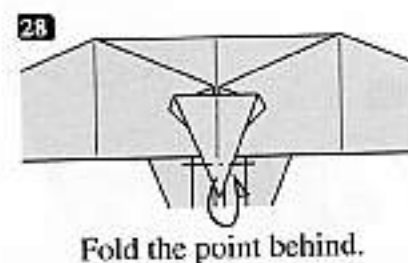
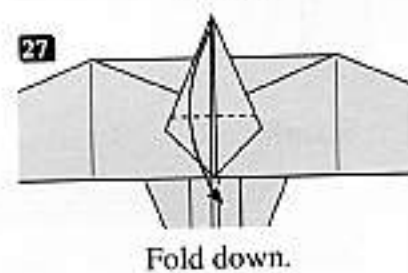
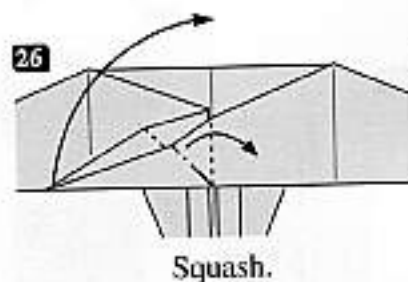
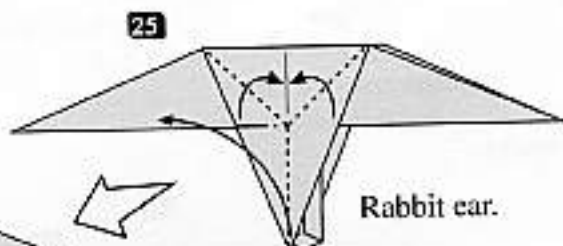
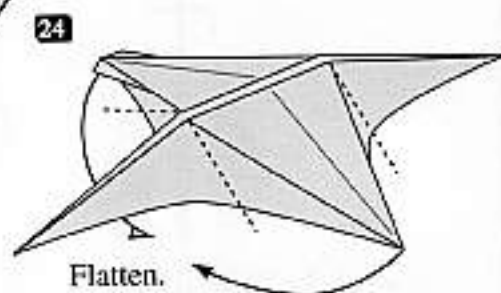
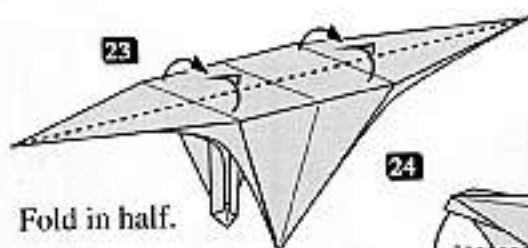
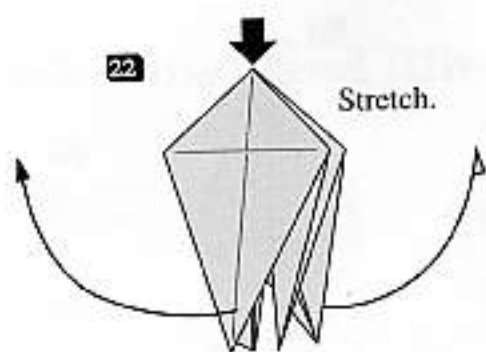


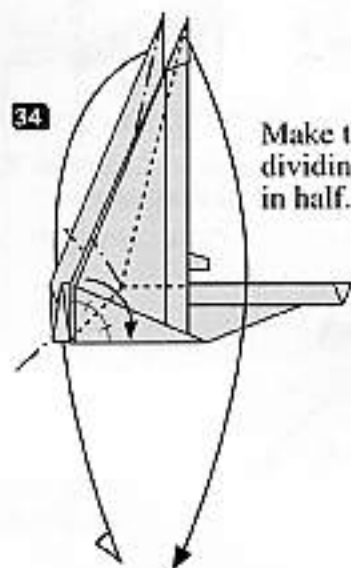
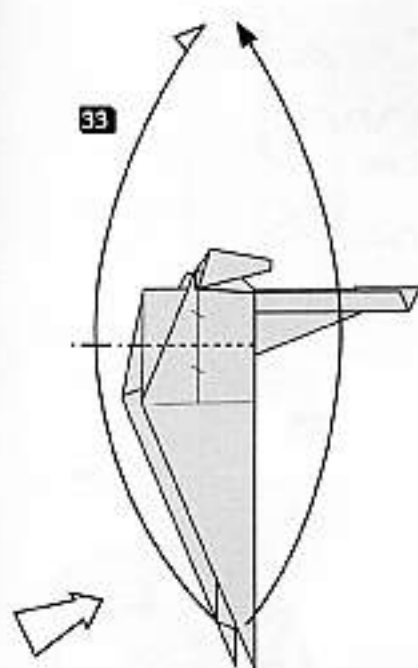
Make creases.

8

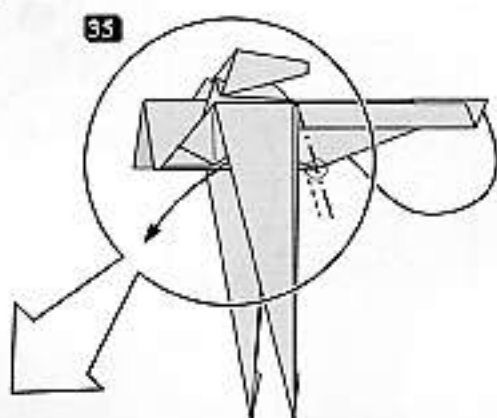




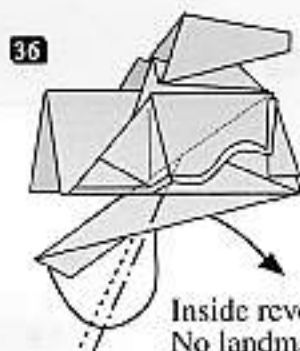




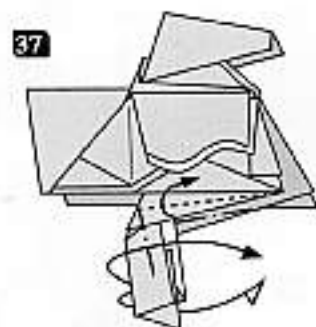
34 Make the points thinner, dividing the angles shown in half.



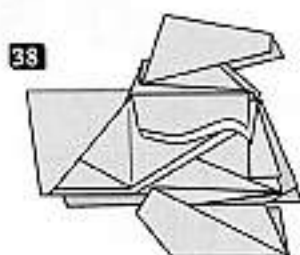
35 Inside reverse. Note the landmark.



36 Inside reverse again. No landmarks.

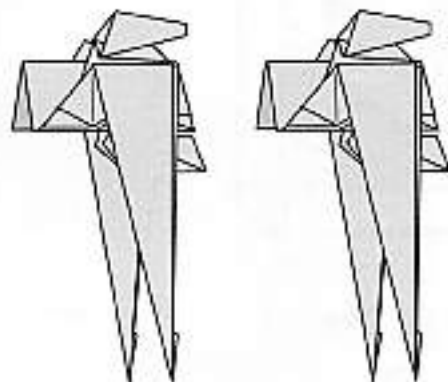


37 Turn inside-out.



38 Step 37 completed.

39 Ribs 2 and Ribs 3 completed.



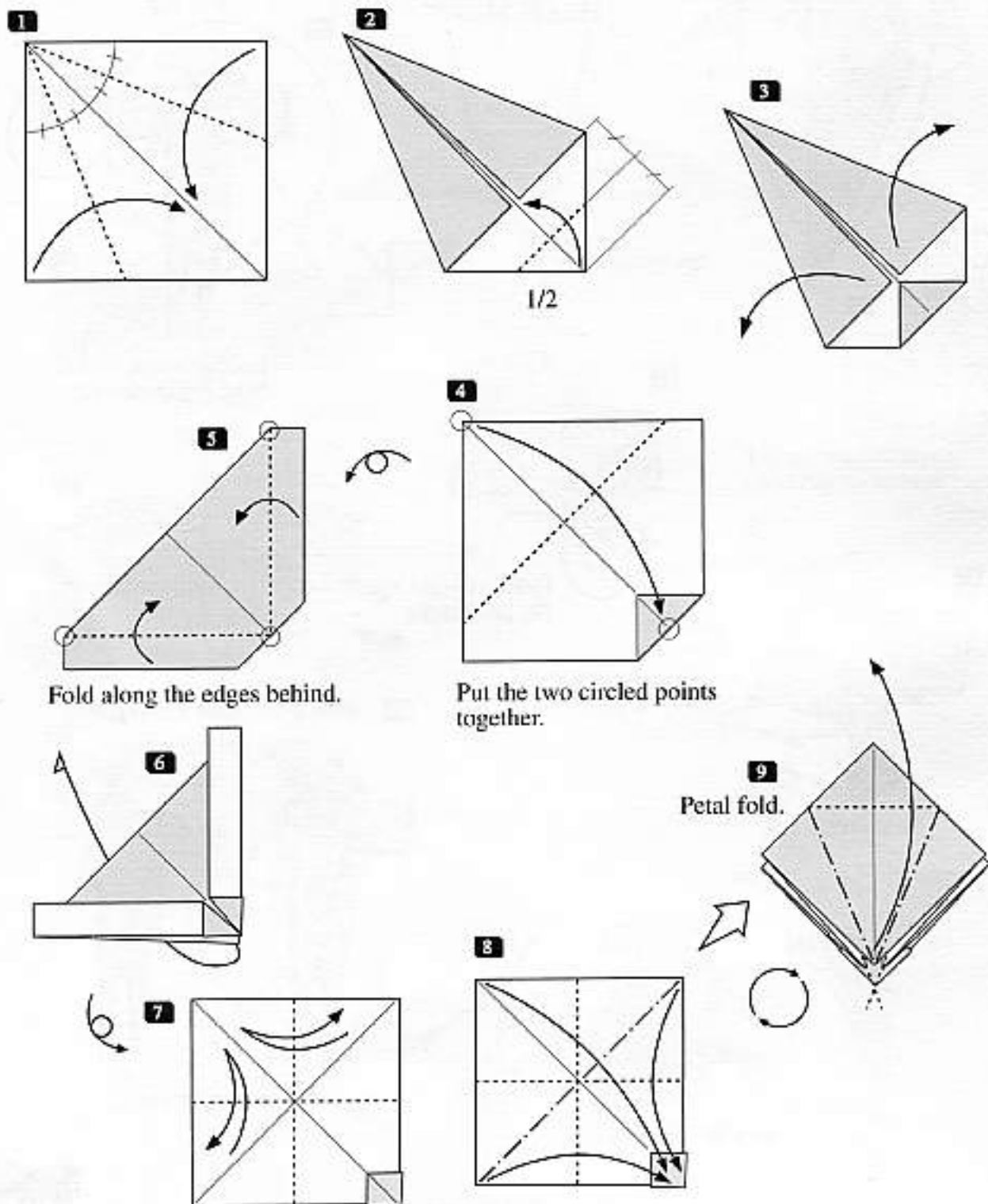
39 Make two the same.

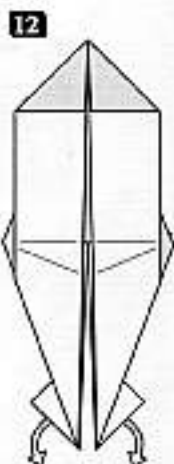


4.3 Ribs 4 and Ribs 5

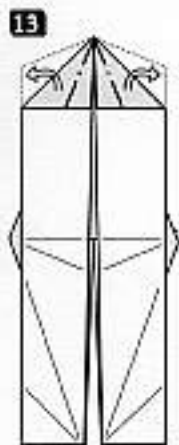


The folding sequence of Ribs 4 and 5 are almost same as Ribs 2 and 3 except the amount folded in **2** and the finishing steps.

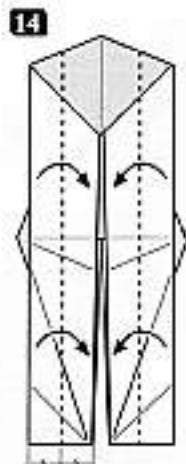




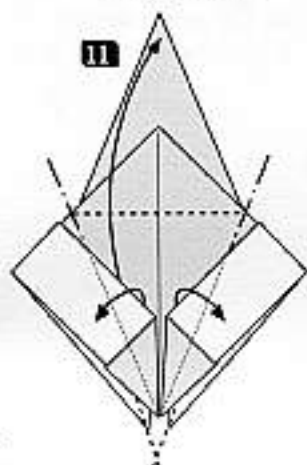
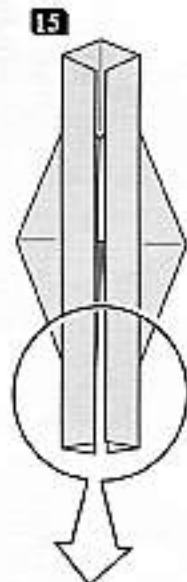
12
Pull out
the corners.



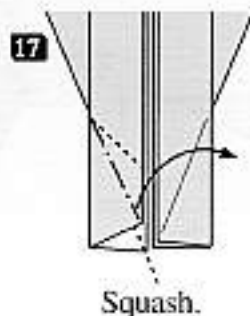
13
Pull out
the trapped sheet
from the top.



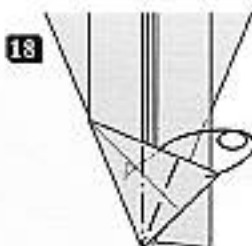
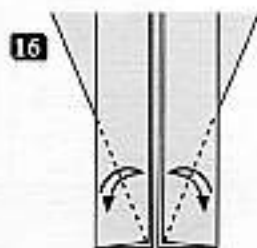
14
Fold both strips
in half.



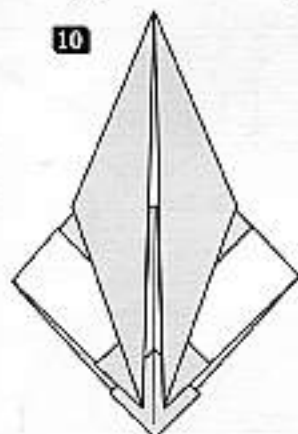
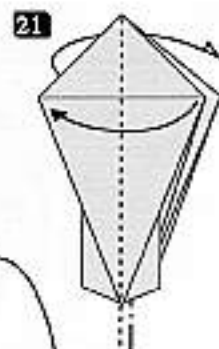
11
Petal fold again.



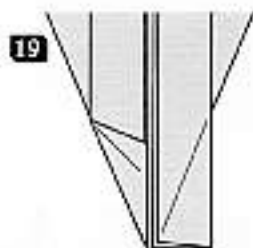
17
Squash.



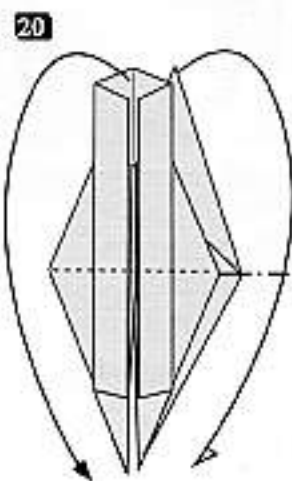
18
Roll the triangle
away from you.

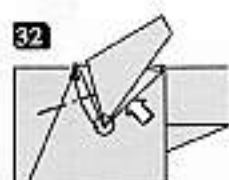
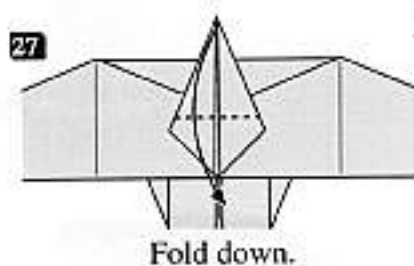
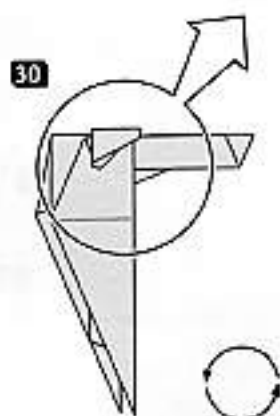
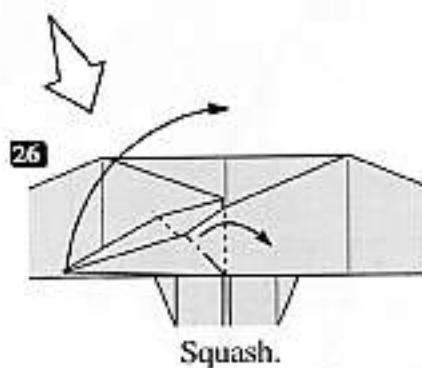
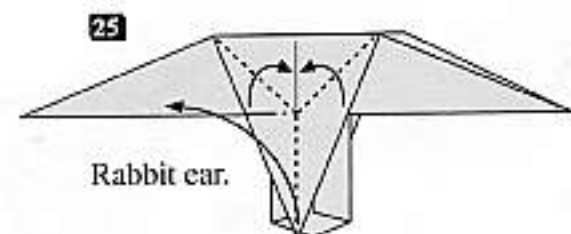
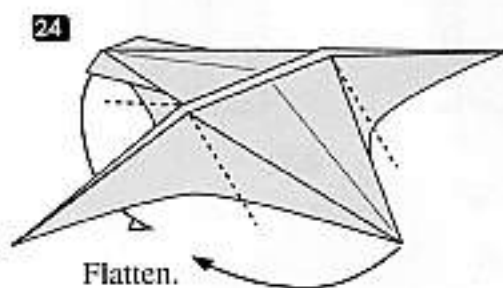
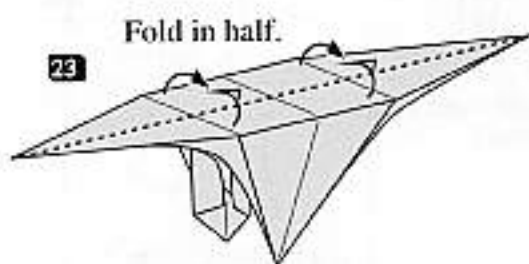
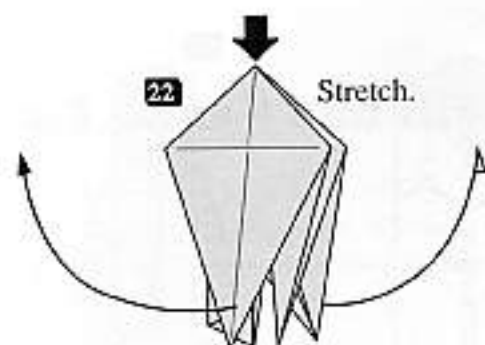


10
Step 9 completed.

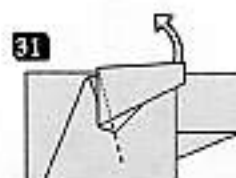


19
Repeat 16 to 18
on the right.

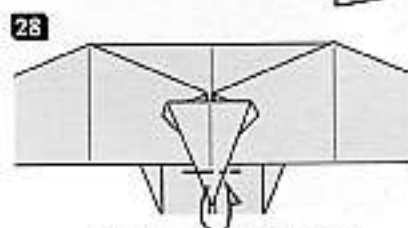
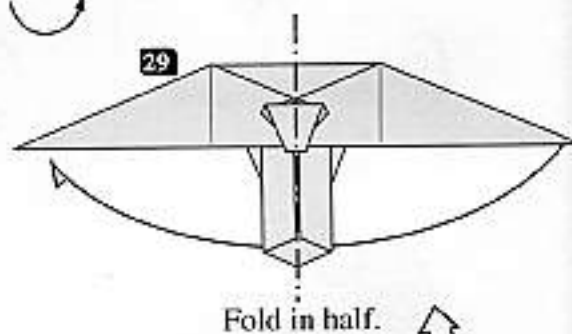




Lift up the top layer,
pinching its bottom corner.

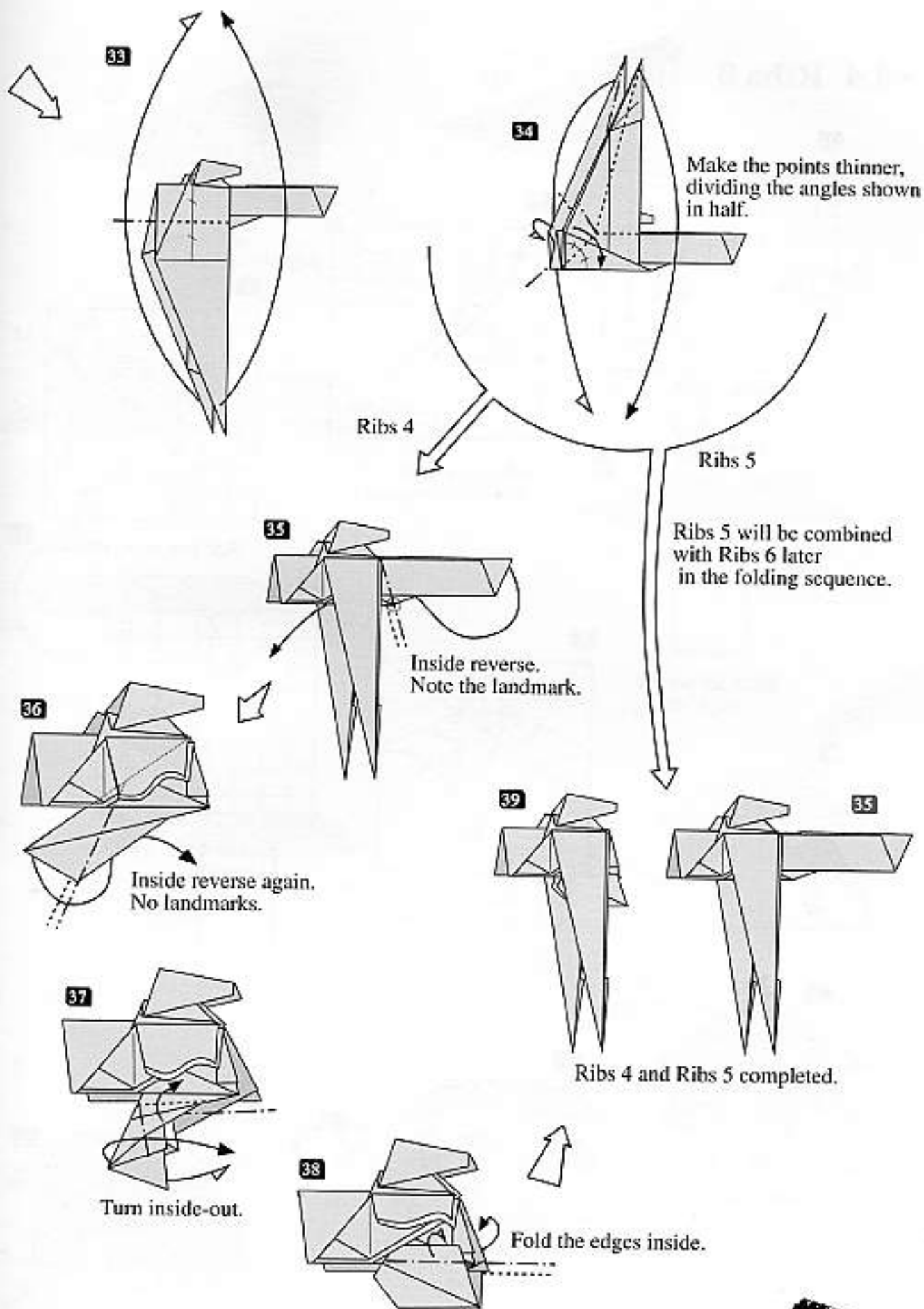


Pull the top layer up
as far as possible,
pinching its right end.

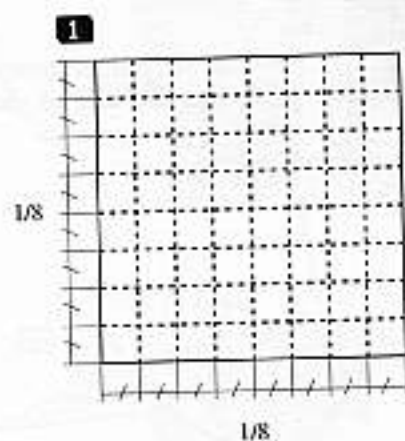


Fold the point behind.

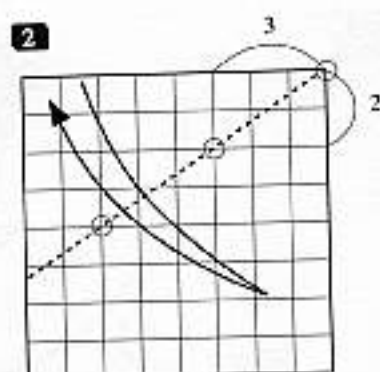




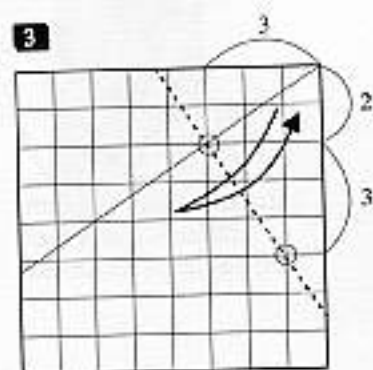
4.4 Ribs 6



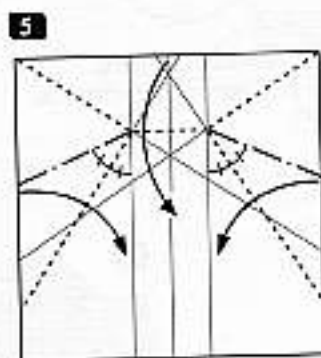
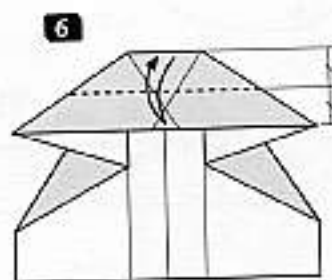
Make creases.



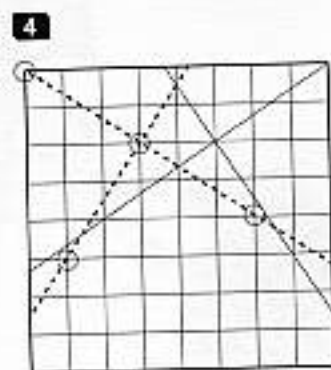
Make a crease.
Note the landmarks.



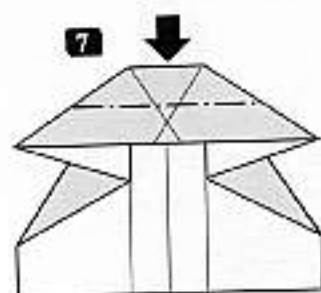
Add one more crease.



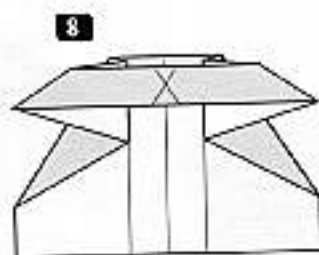
Assemble,
using the pre-creases.



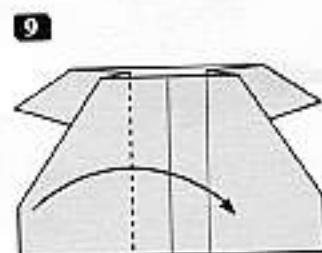
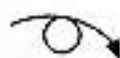
Repeat **2** to **3**
on the left.

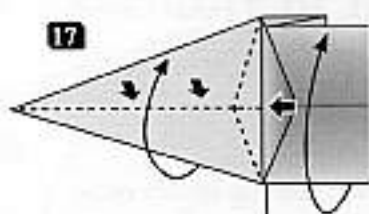


Open-sink.

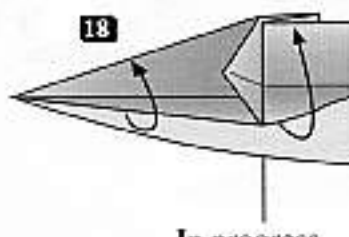


Step **7** completed.

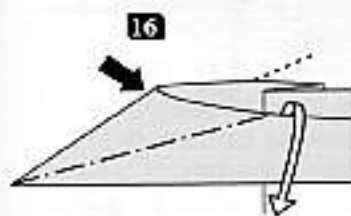




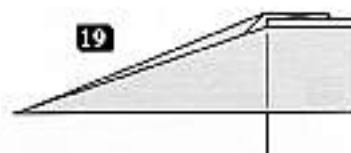
17
Close back,
sinking the triangle.



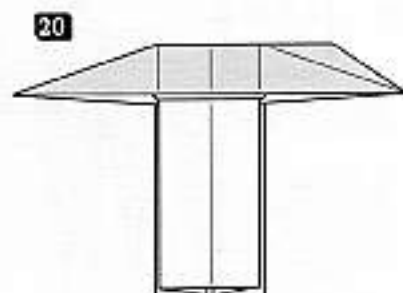
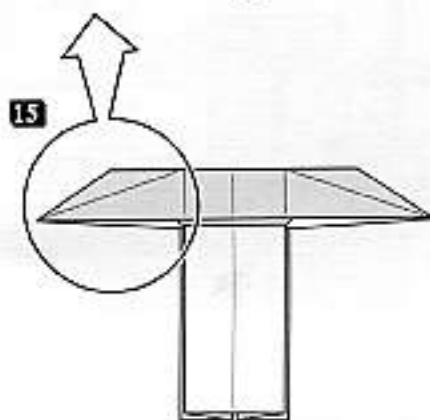
18
In progress.



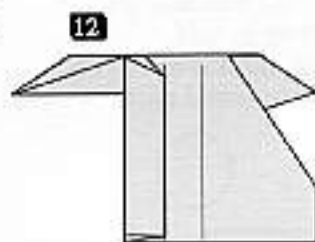
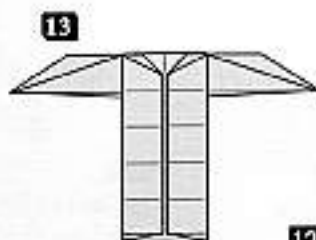
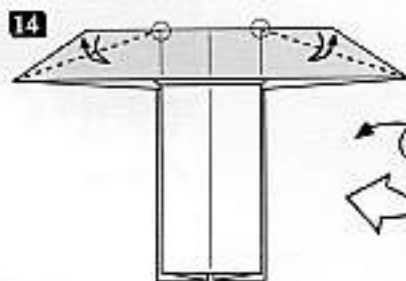
16
Spread-sink,
opening the top layer.
Use the creases from 14.



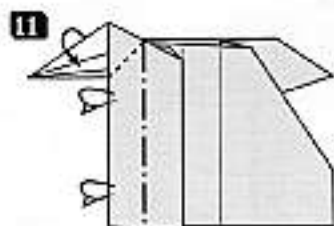
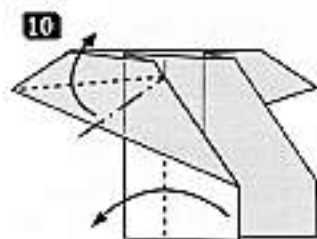
19
Completed.

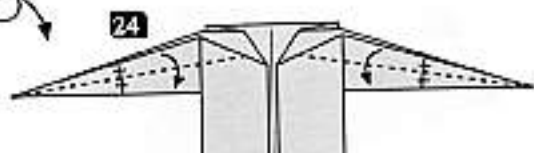
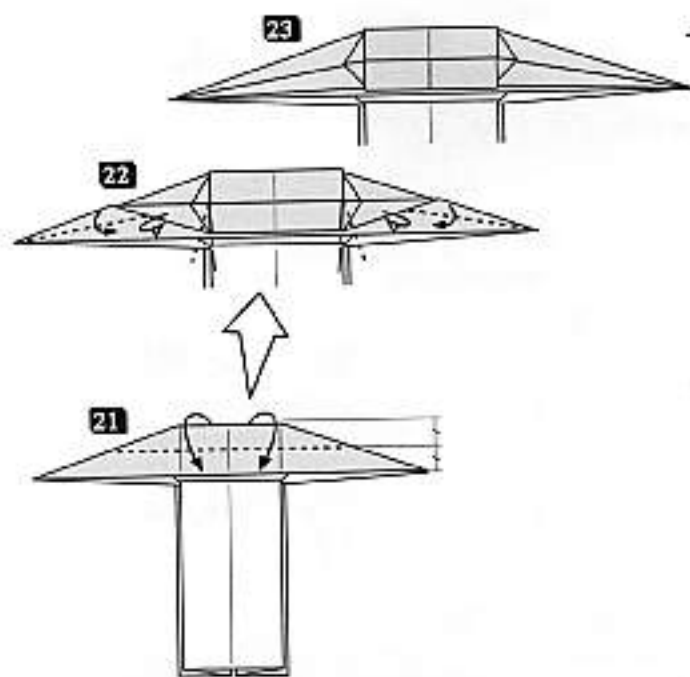


20
Repeat 16 to 19
on the right.



12
Repeat 9 to 11
on the right.

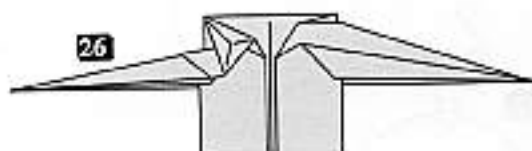




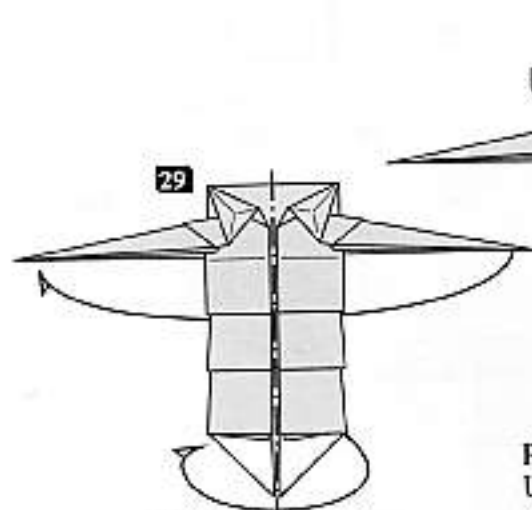
Fold the top layers only.



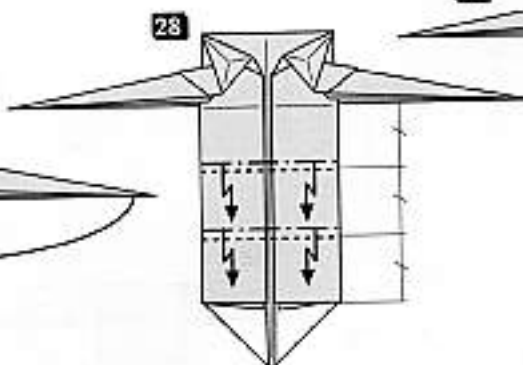
Make the point thinner, spread-sinking the corner beside the centre line.



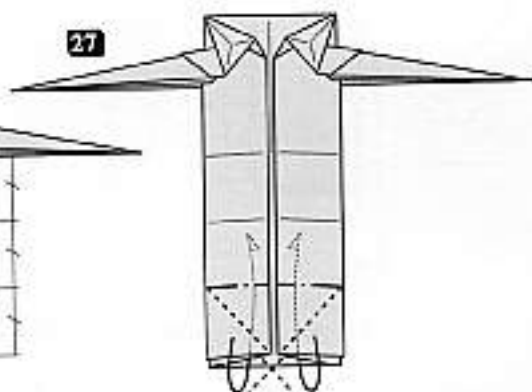
Repeat 25 on the right.



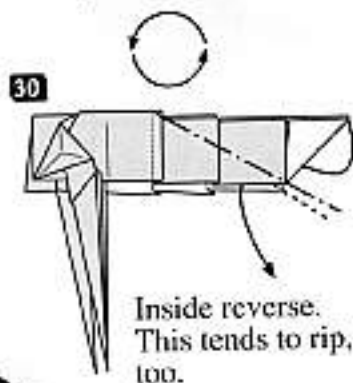
Fold in half.
Be careful not to rip
the pleated part.



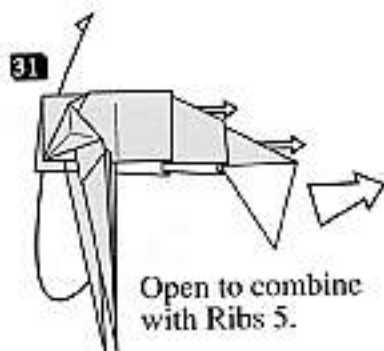
Pleat.
Use the existing creases
as valley folds.



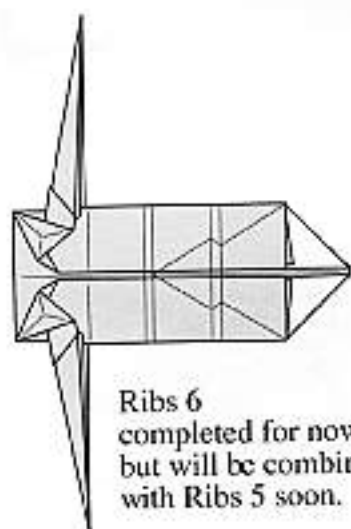
Fold in.



Inside reverse.
This tends to rip,
too.



Open to combine
with Ribs 5.



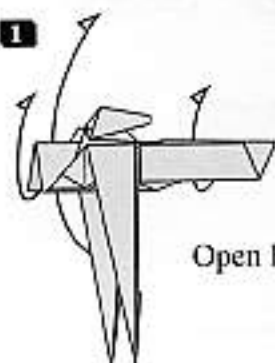
Ribs 6
completed for now,
but will be combined
with Ribs 5 soon.



4.5 Assembly of Ribs 1 - 6



1

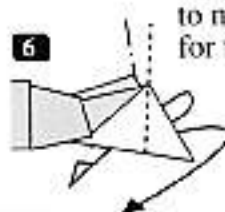


Open Ribs 5.

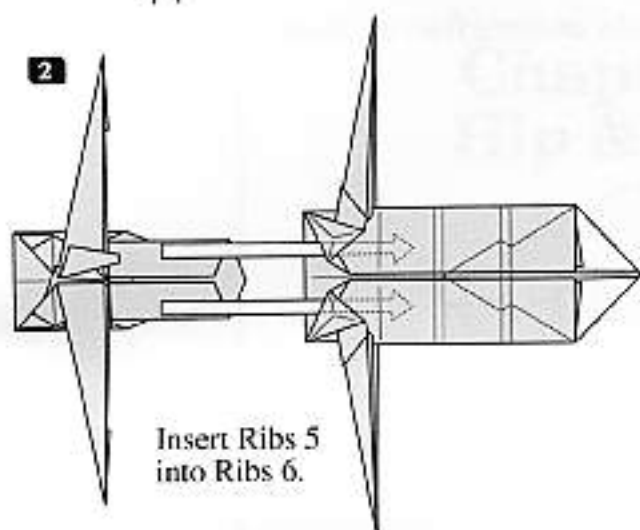
7

Outside reverse
to make the hook
for the Hip Bone.

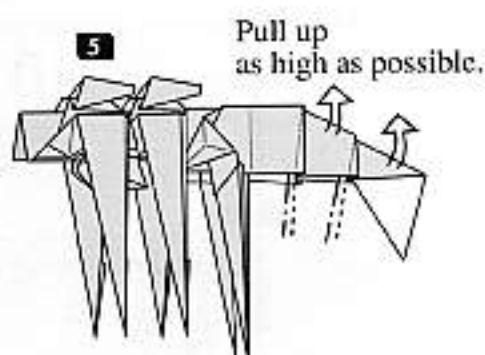
6



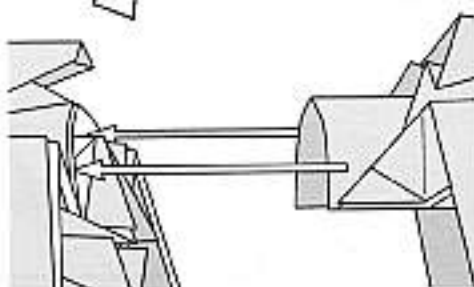
2

Insert Ribs 5
into Ribs 6.

5

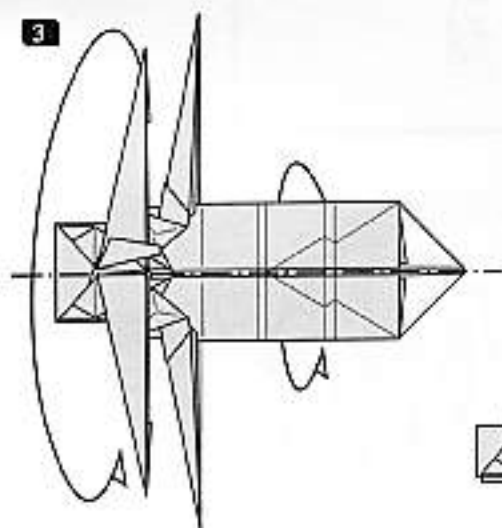
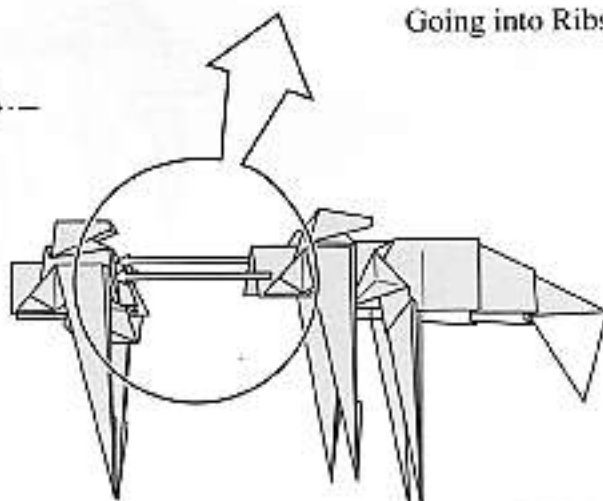
Pull up
as high as possible.

4



Going into Ribs 4.

3

Do 29 to 31 of Ribs 6 again,
keeping two parts together.

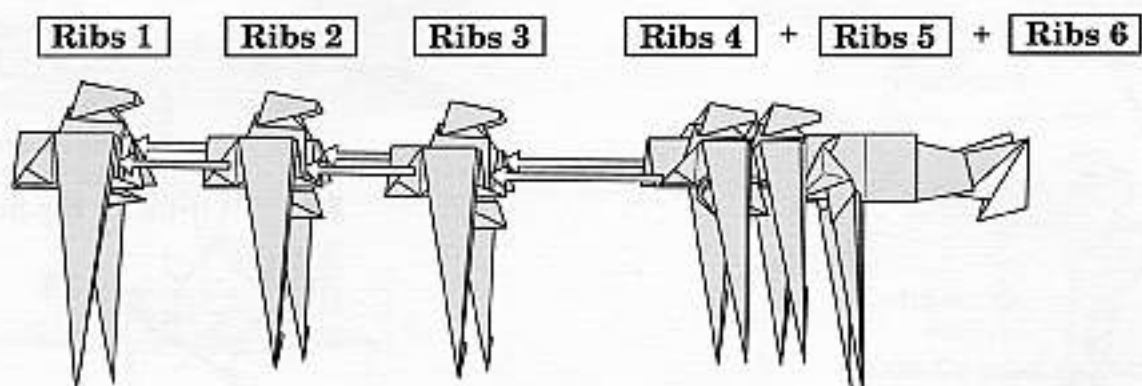
Ribs 4

Ribs 5

+

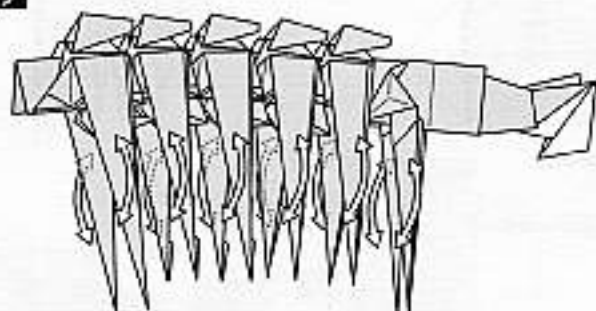
Ribs 6

8

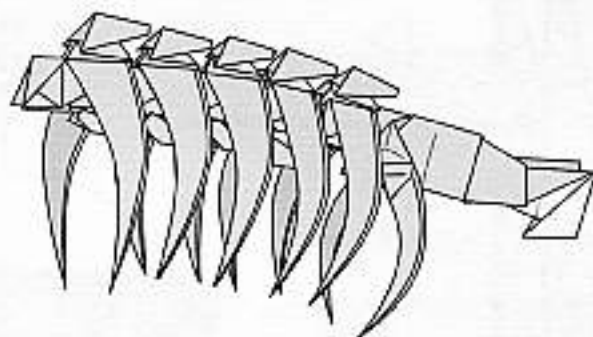


As in 4 assemble the remaining parts by inserting from the back.

9



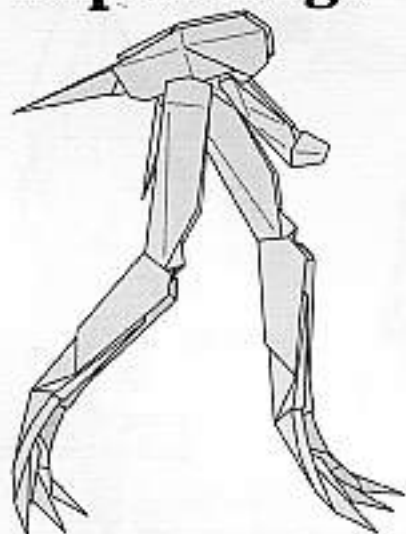
Give a nice curve to each rib.



Ribs completed.

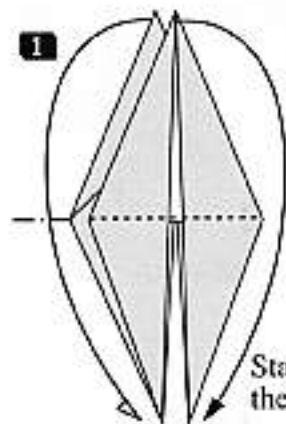


Chapter 5 Hip & Legs

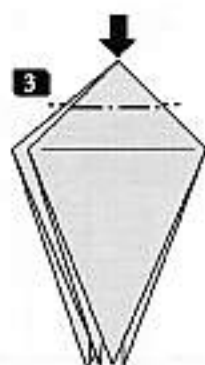
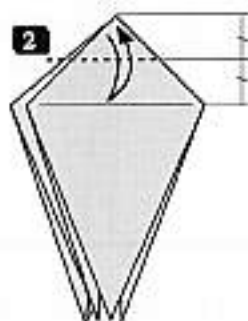


5 Hip & Legs

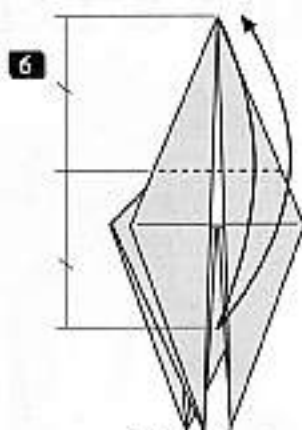
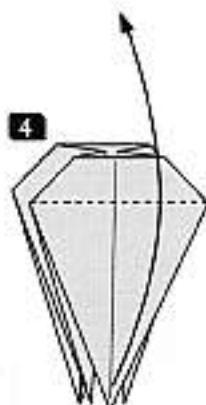
5.1 Hip Bone



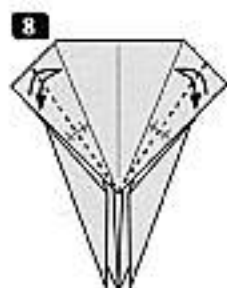
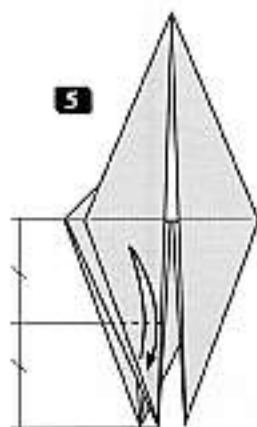
Start with the Bird Base.



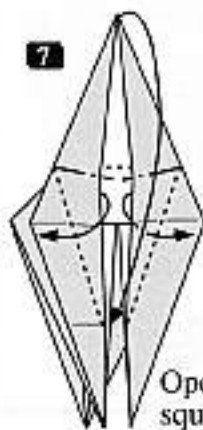
Open-sink.



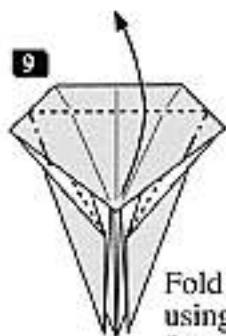
Bring the top to the crease from 6.



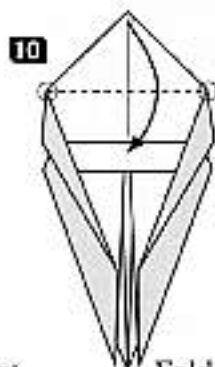
Crease two sheets on each side.



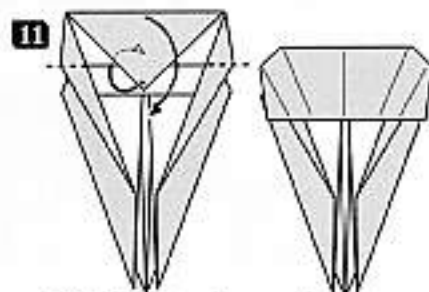
Open the diamond, squashing the top sheets.



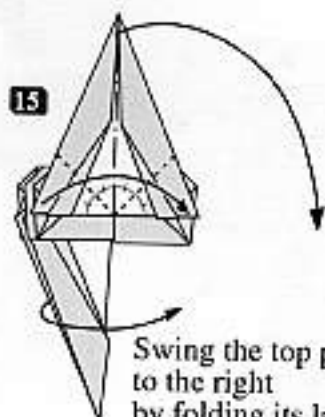
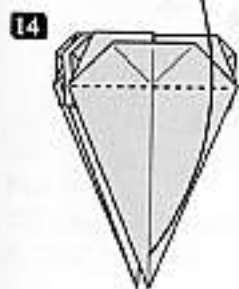
Fold up the top sheet, using the creases from 8.



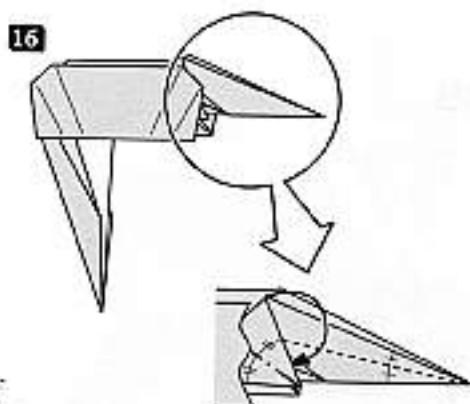
Fold down. Note the landmarks.



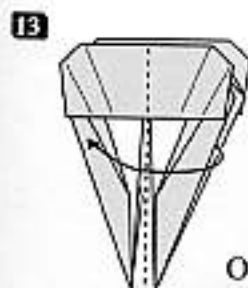
Fold the top layer down, tucking the tip of the triangle into the pocket.



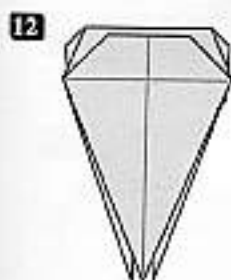
15 Swing the top point to the right by folding its layer in half and by closing back the left layer opened in 13.



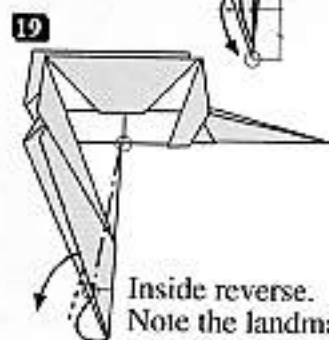
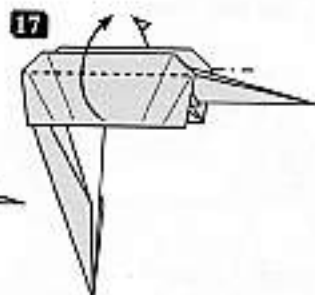
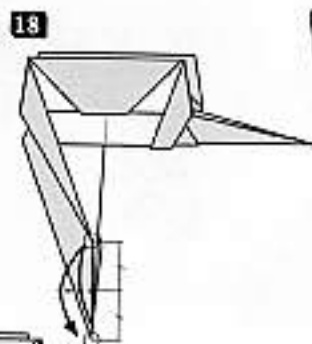
16 Inside-reverse on both sides to narrow the point.



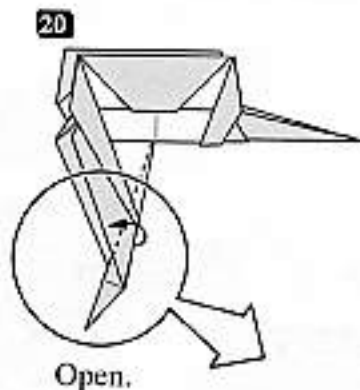
Open the right half.



Repeat 4 to 11.



19 Inside reverse. Note the landmarks.



Open.



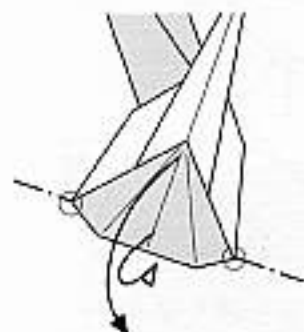
Note the landmarks.



Pull out the trapped sheets.

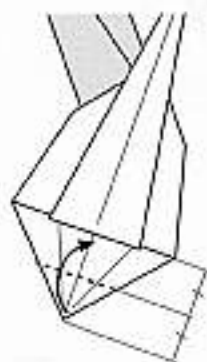


23

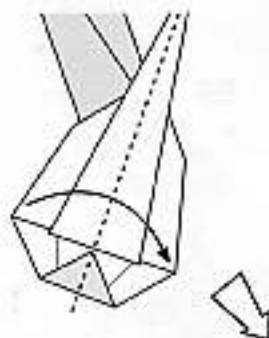


Fold back without creasing the top sheet.

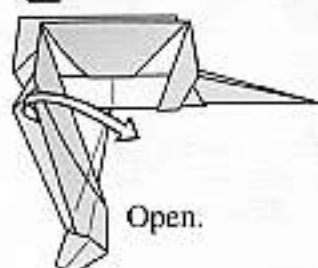
24



25



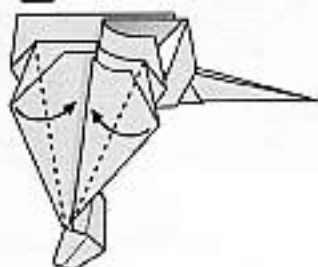
26



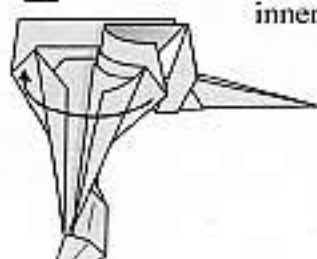
Open.



27

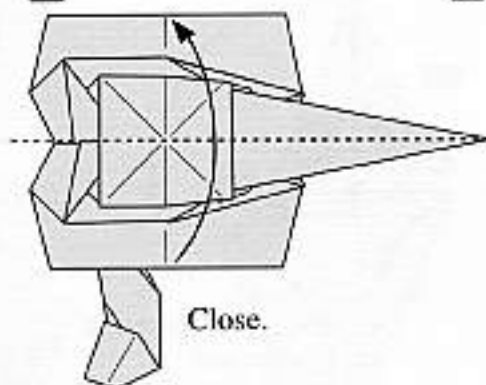


28



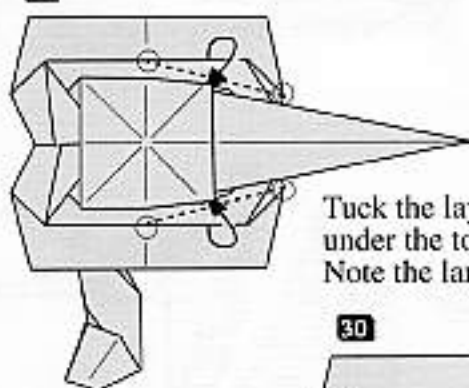
Close.

32



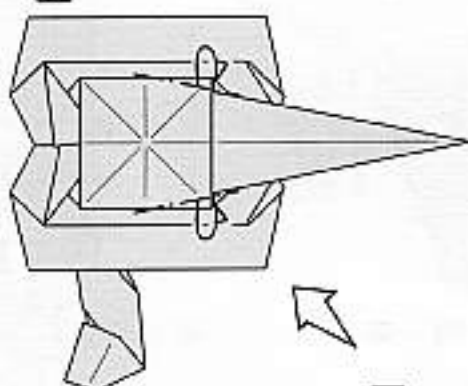
Close.

31



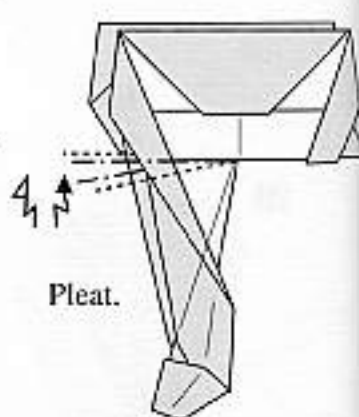
Tuck the layers under the top one. Note the landmarks.

30



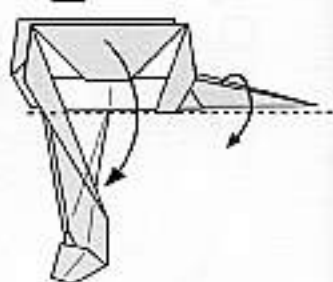
Fold in the corners.

33

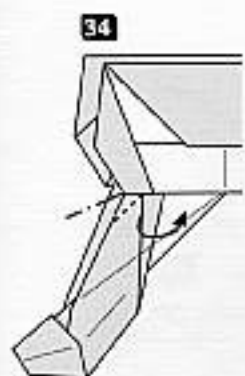


Pleat.

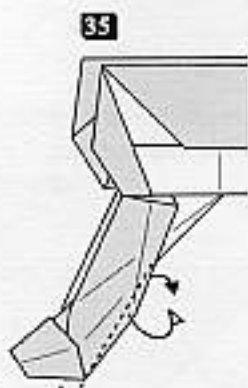
29



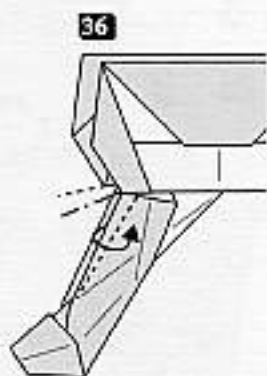
Open the top part, flattening out inner sections.



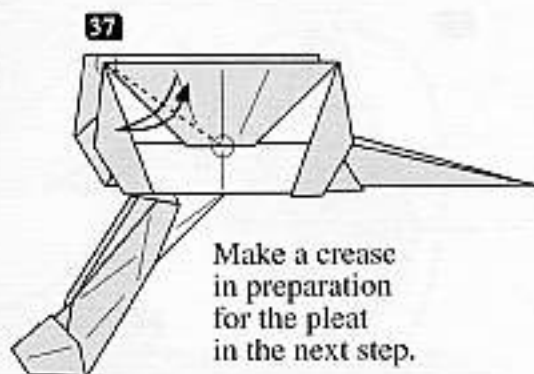
34
Pull out
the trapped paper.
Repeat behind.



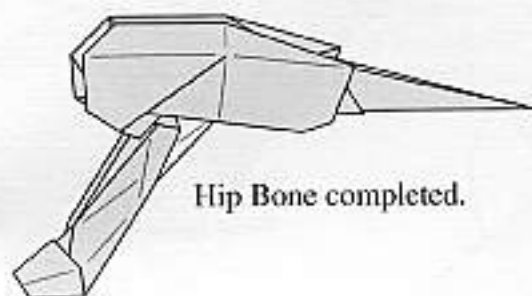
35
Fold the edges
inside.



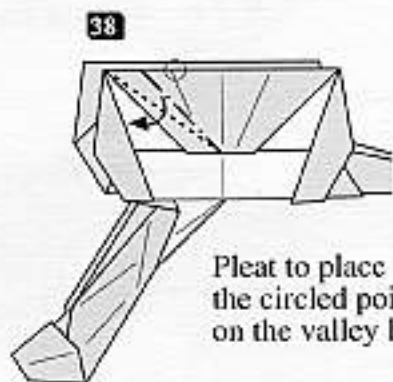
36
Make it thinner
again.



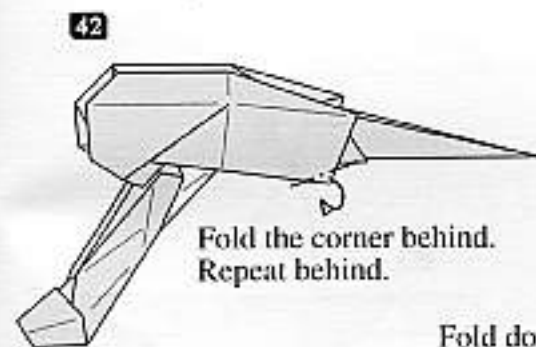
37
Make a crease
in preparation
for the pleat
in the next step.



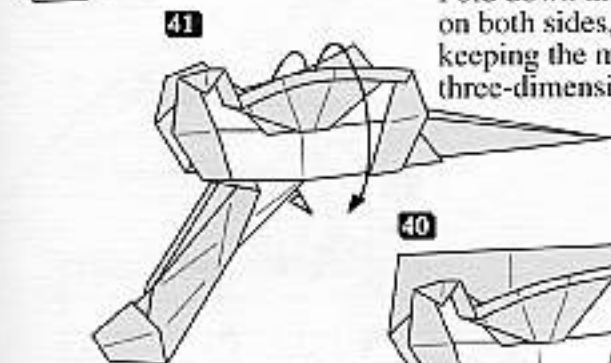
Hip Bone completed.



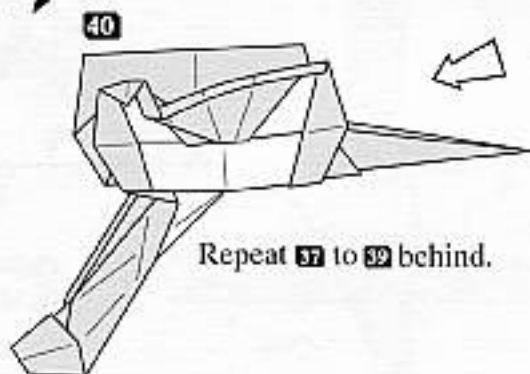
38
Pleat to place
the circled point
on the valley line.



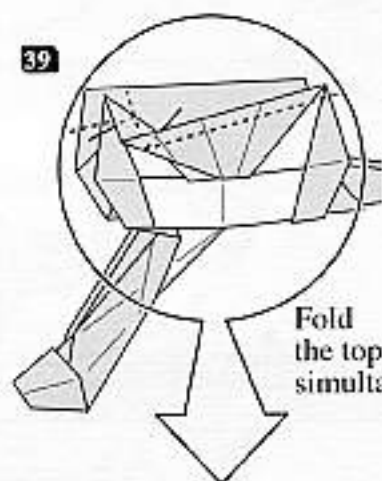
42
Fold the corner
behind.
Repeat behind.



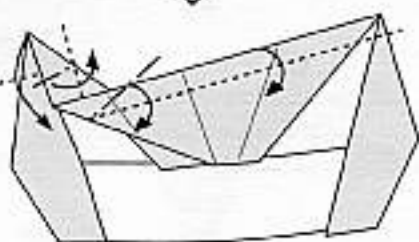
41
Fold down the top layers
on both sides,
keeping the model
three-dimensional.



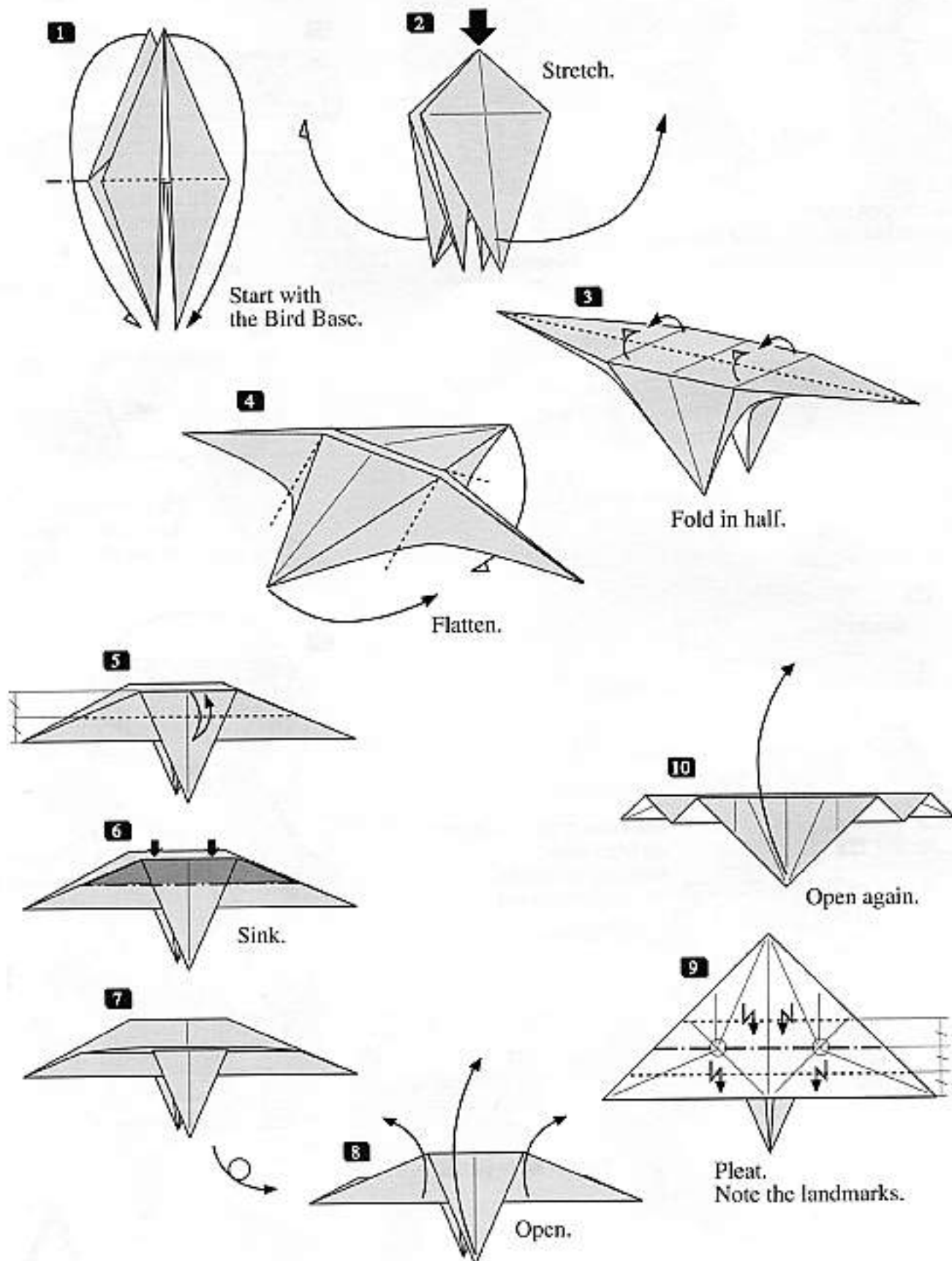
Repeat **37** to **39** behind.



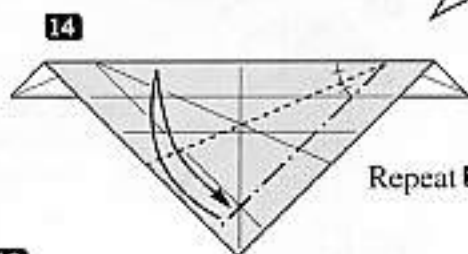
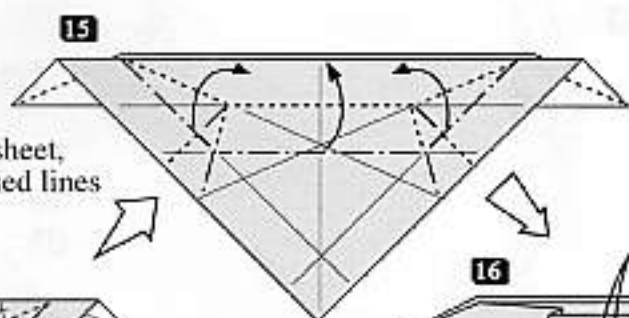
39
Fold
the top edges
simultaneously.



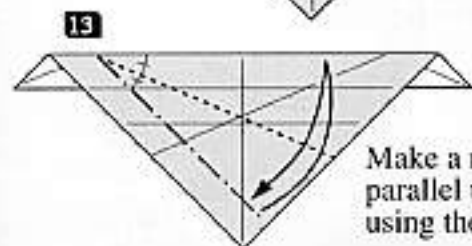
5.2 Thigh Bones



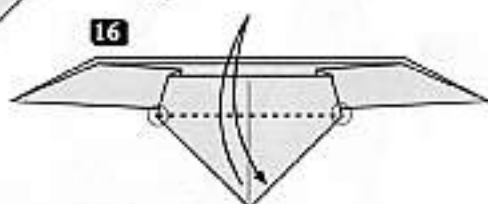
Assemble the top sheet,
using the pre-creased lines
as shown.



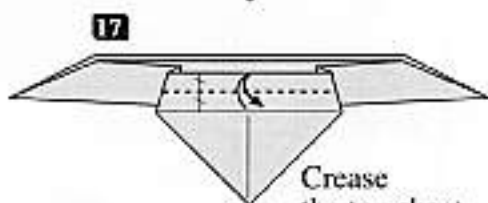
Repeat **13** on the right.



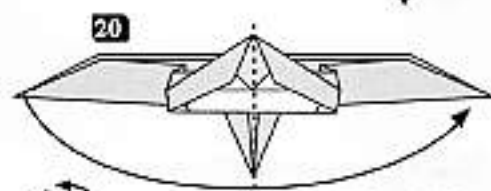
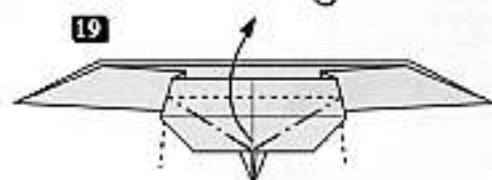
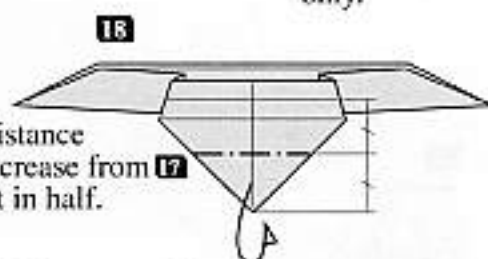
Make a mountain crease
parallel to the outside edge,
using the crease from **11**.



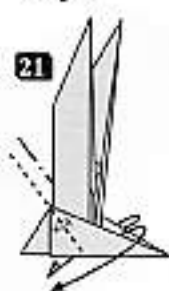
Crease
the top sheet
only.



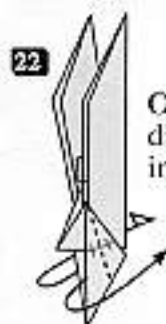
Divide the distance
between the crease from **17**
and the point in half.



Fold in half.

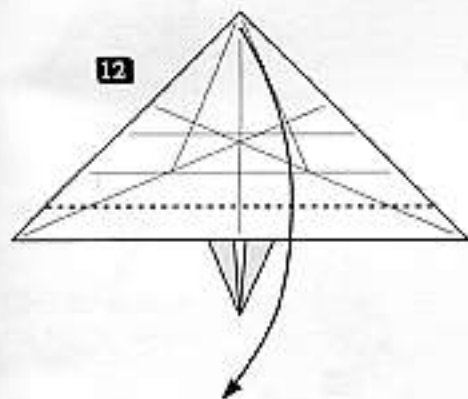
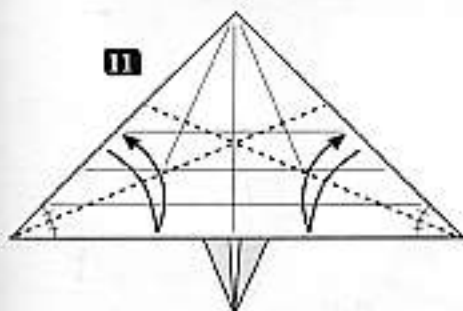


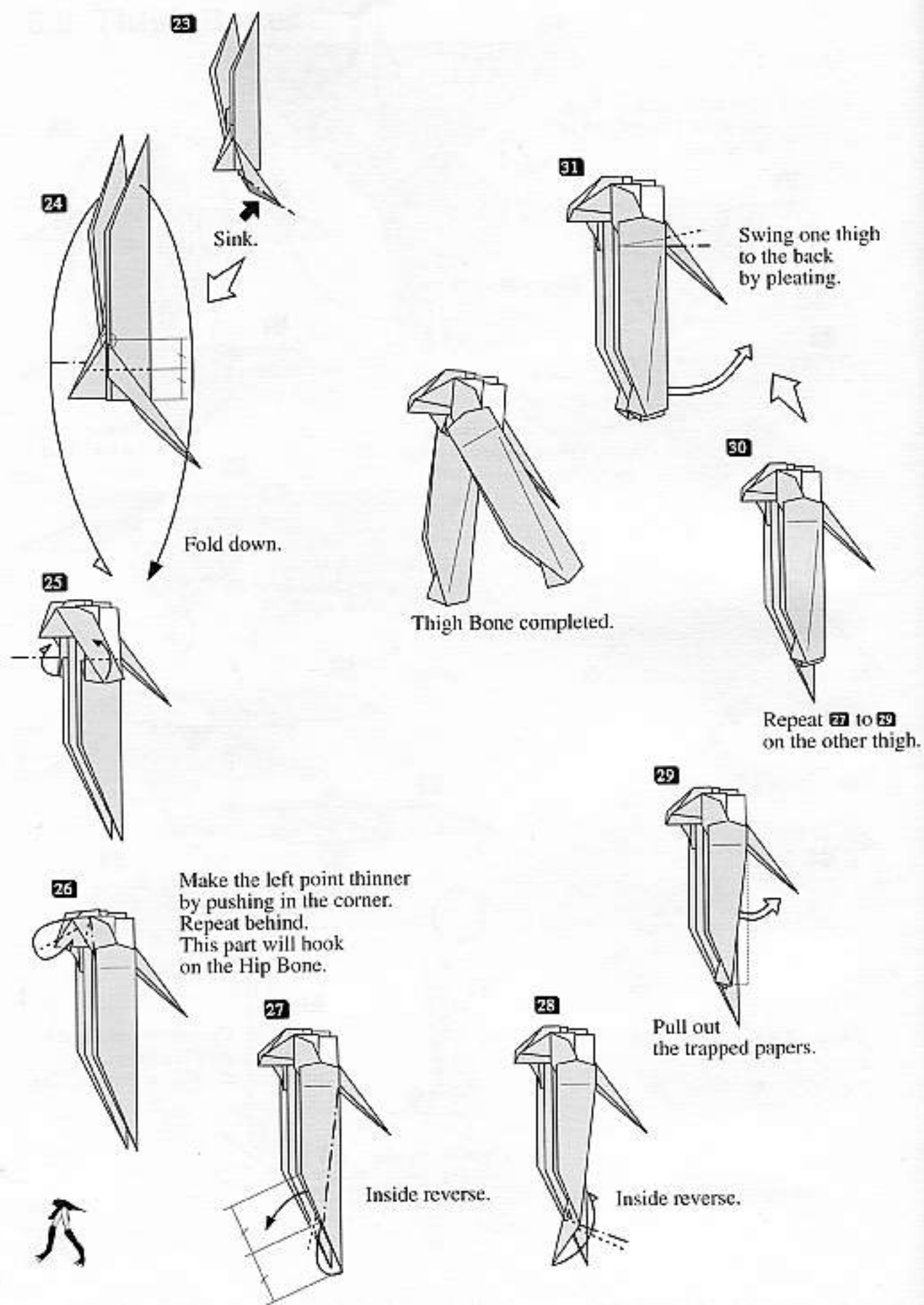
Outside-reverse,
dividing the angle
in half.



Outside-reverse again,
dividing the angle
in half.

Extend the existing creases.

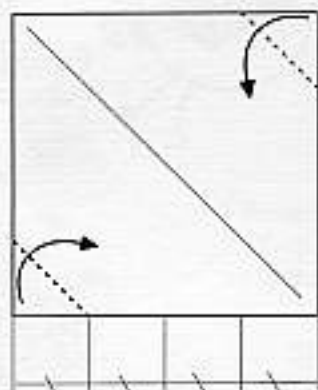




5.3 Shank & Foot

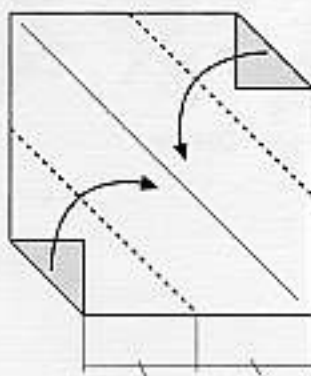


1



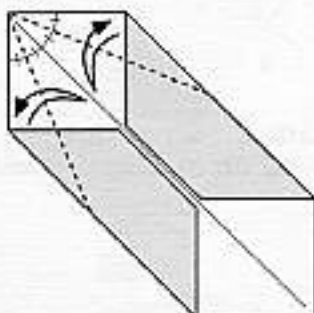
Fold two opposite corners.
Note the proportion.

2

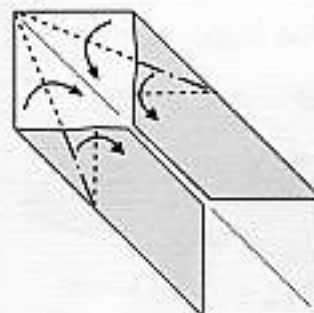


Bring folded edges
to the centre line.

3

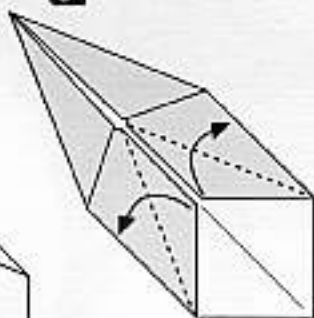


4

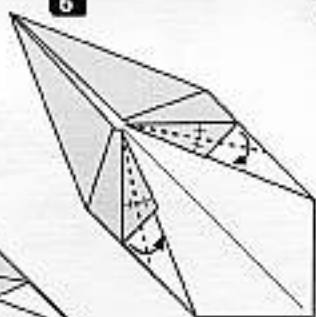


Close it again,
inverting the two valley creases
from 3
into mountain folds.

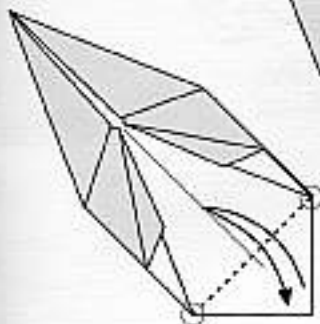
5



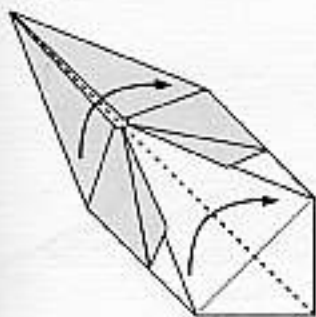
6



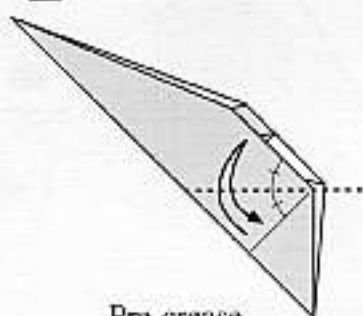
7



8

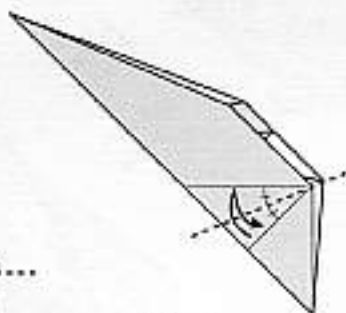


9



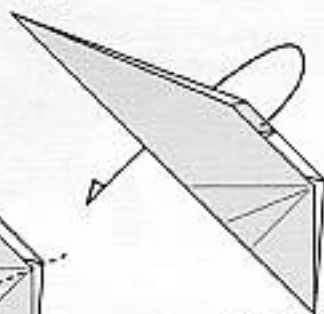
Pre-crease
the whole thing.

10



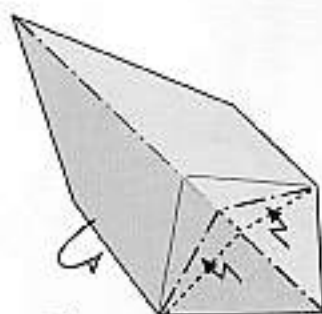
Divide the angle
in half again.

11



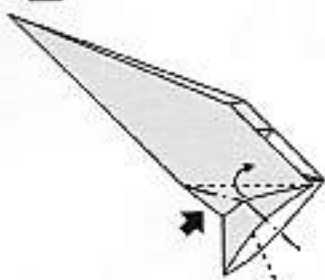
Open.

12



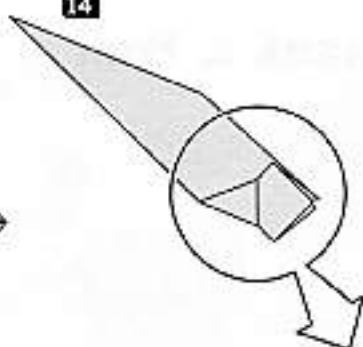
Crimp,
using the existing creases.

13

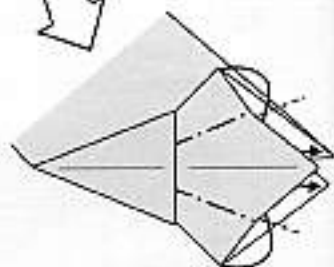


Squash.

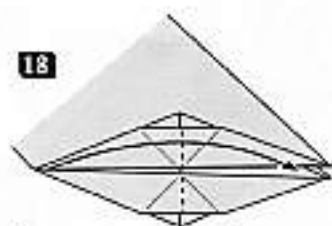
14



Inside reverse
to the centre line.

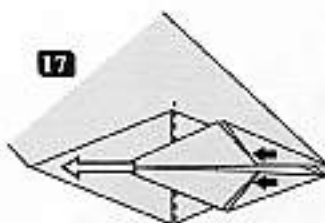


18



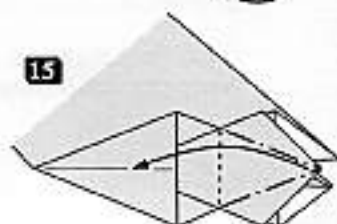
Close.

17



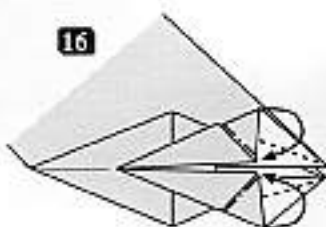
Stretch.

15

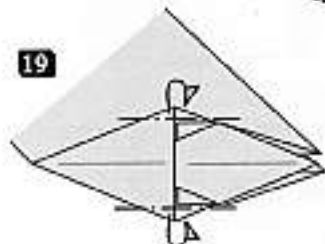


Petal fold.

16

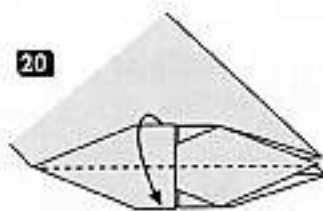


19



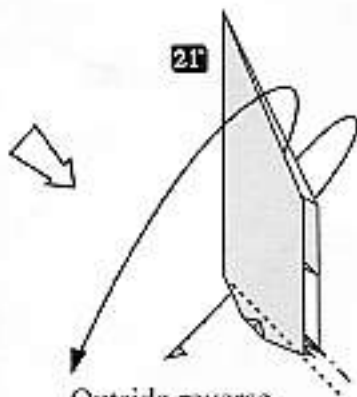
Fold the corners of
the diamond in
along the front layers.

20



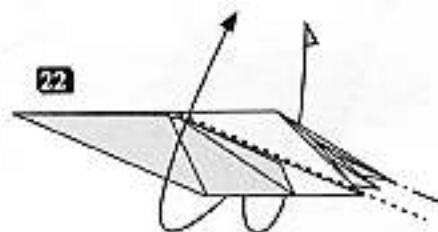
Fold in half.

21



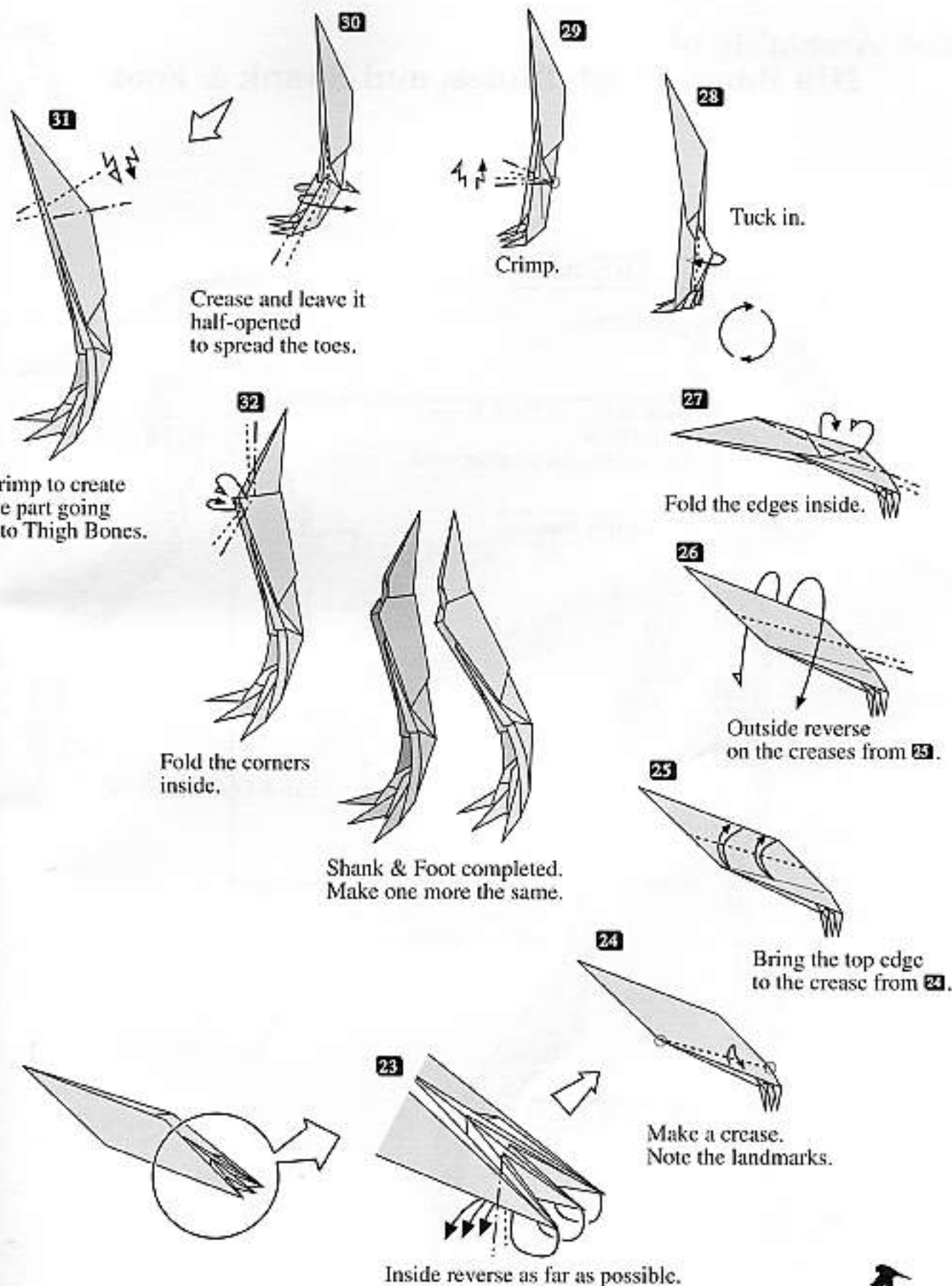
Outside reverse.

22

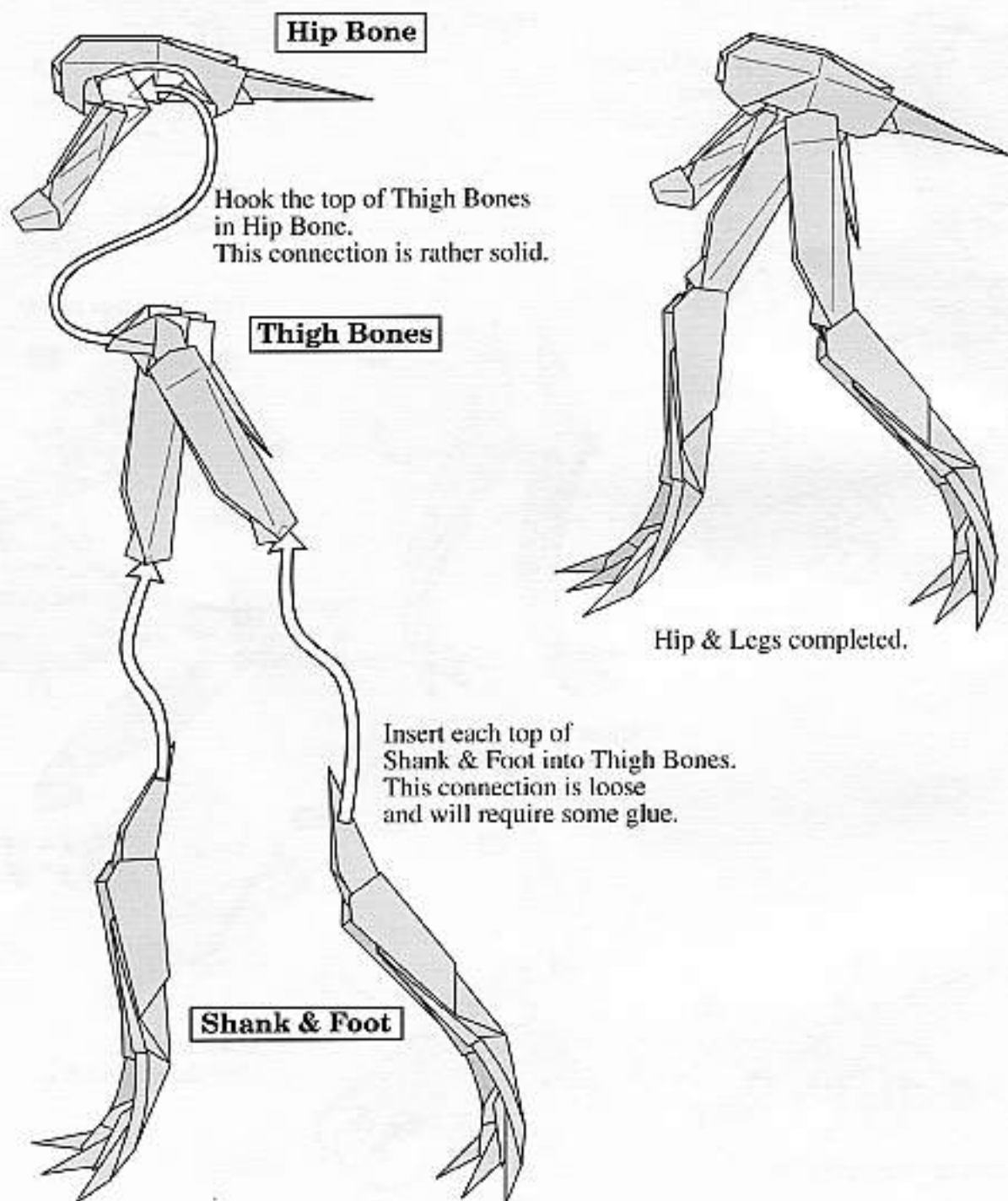


Outside reverse again.





5.4 Assembly of Hip Bone, Thigh Bones, and Shank & Foot

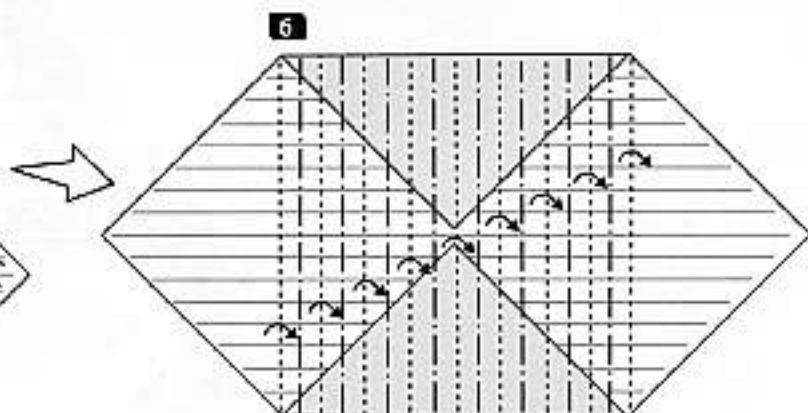
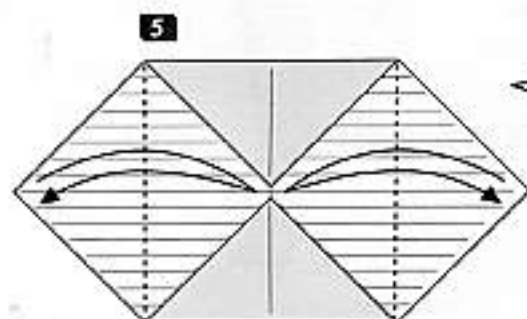
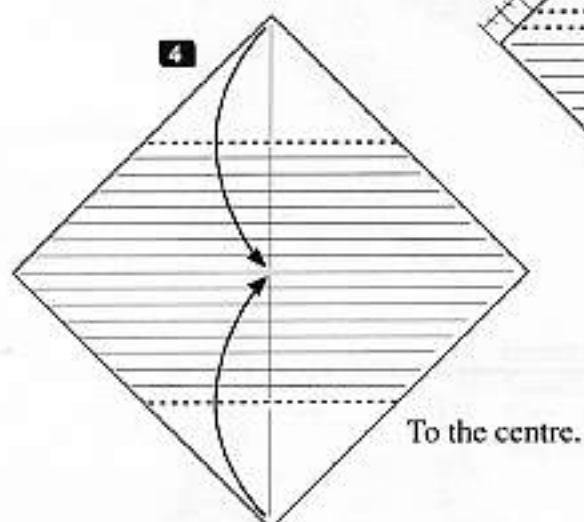
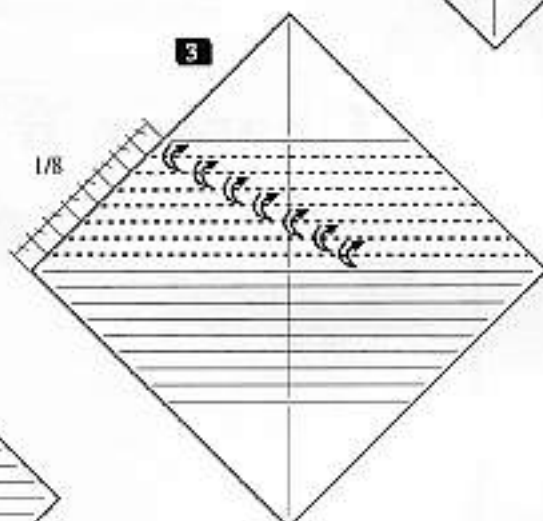
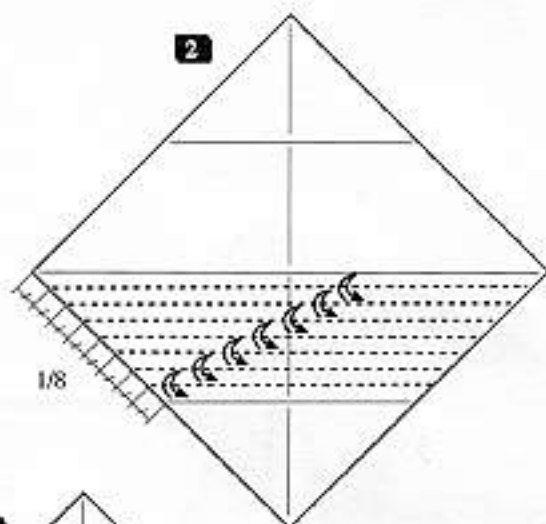
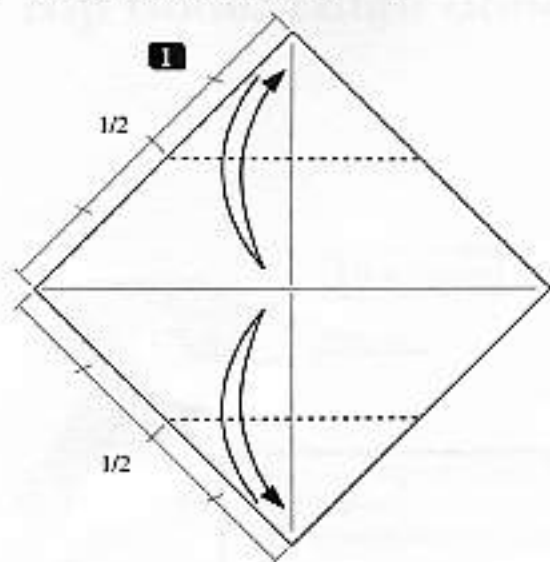


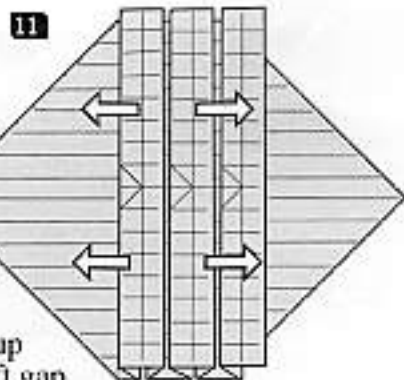
Chapter 6 Tail



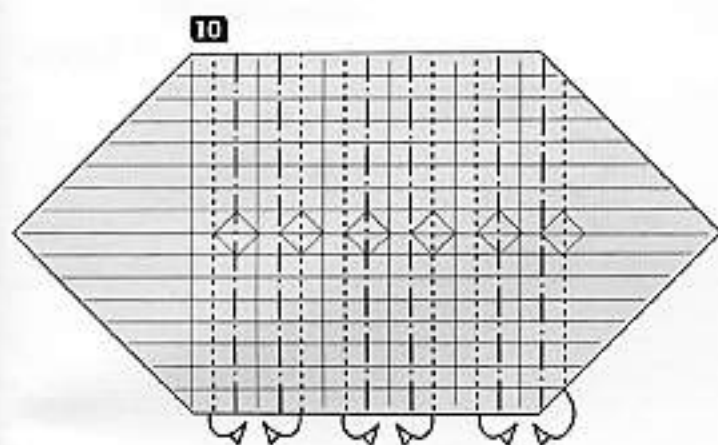
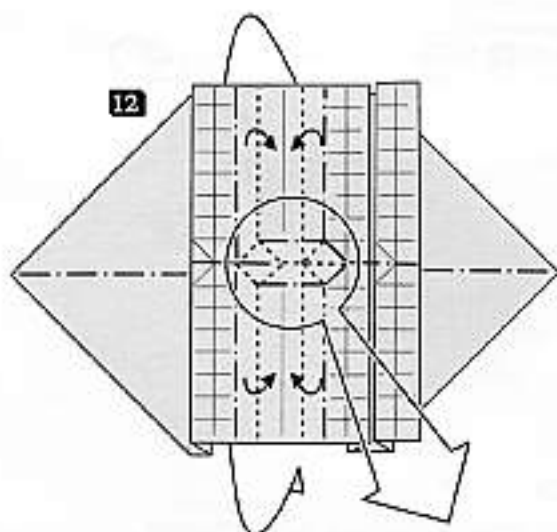
6 Tail

6.1 Tail Bones 1 - 4

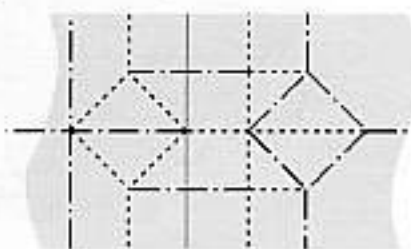




Open up
the left gap.

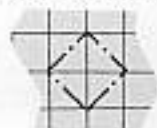


Pleat.

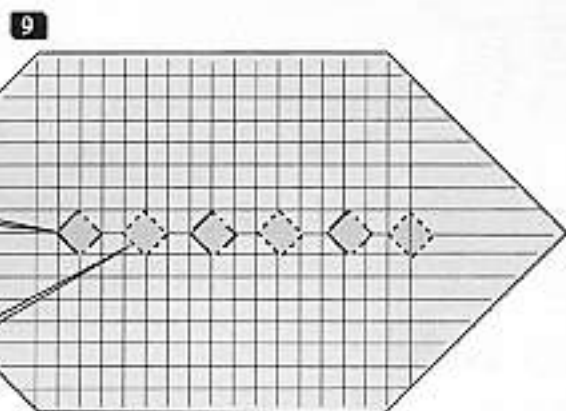
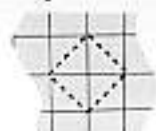


Fold the paper in half
and sink the middle part,
using the creases shown.

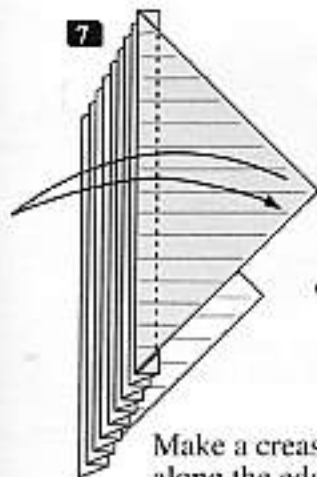
Mountain creases.



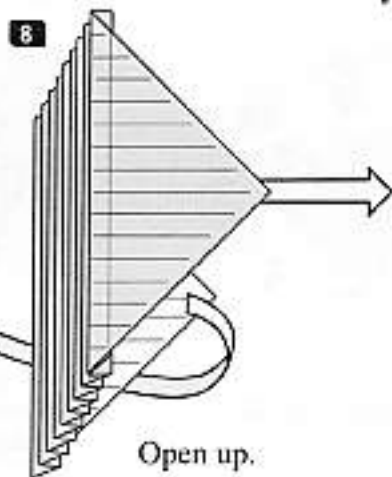
Valley creases.



Make creases of diamond shapes.
Mountains and valleys are alternated.

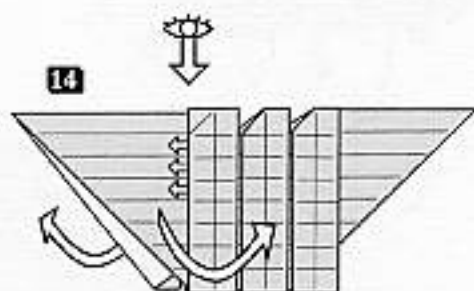
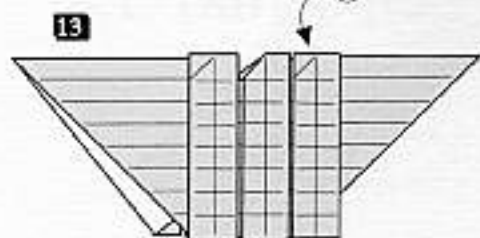


Make a crease
along the edge behind.

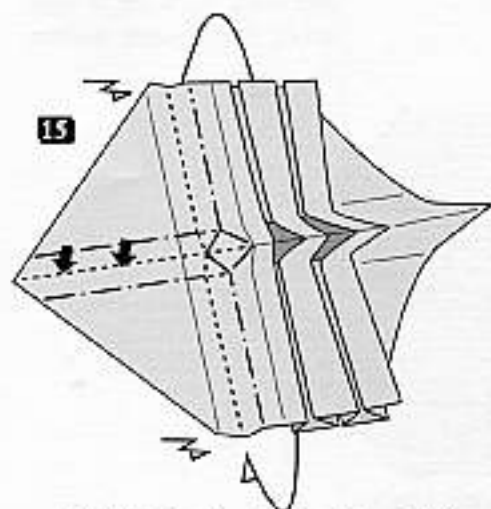


Open up.

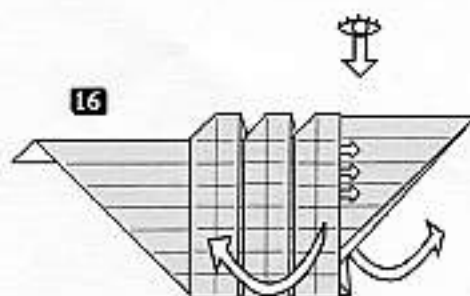
Repeat **11** to **12** with the second gap.



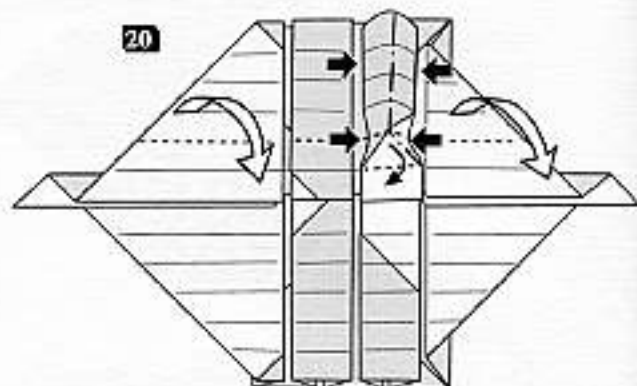
Open up to unfold the pleat on the left.



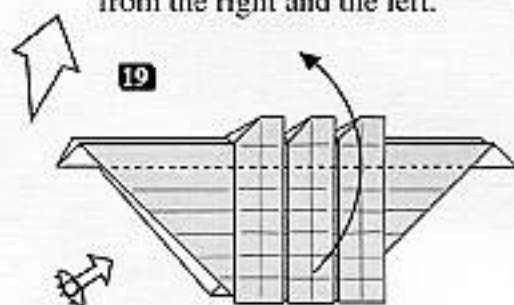
Fold in half, sinking the middle part.



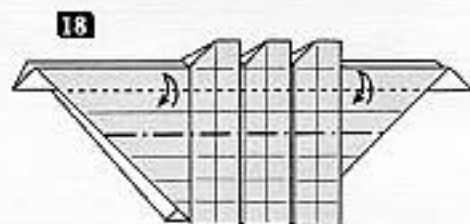
Unfold the pleat on the right as well.



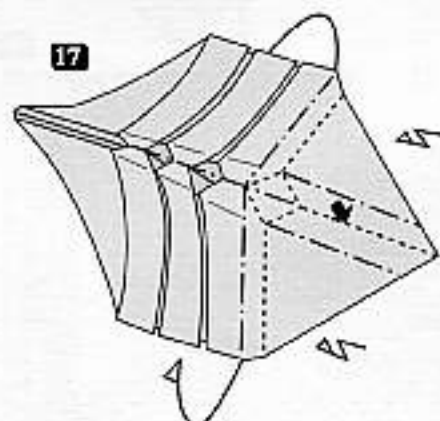
Make the top layer stand up 90 degrees, while pinching one of the tubes from the right and the left.



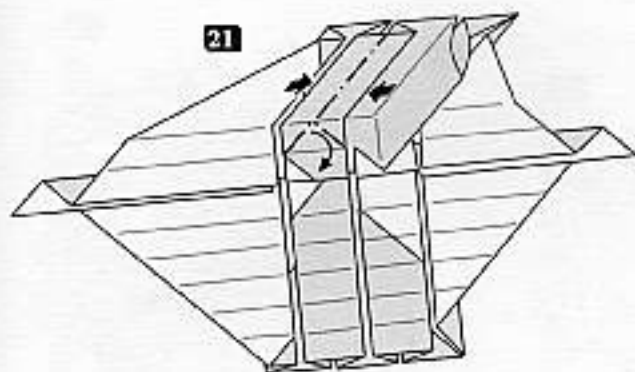
Fold the front layer up.



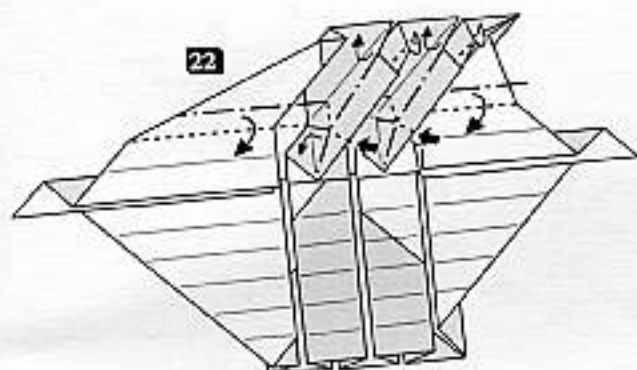
Reinforce the creases.



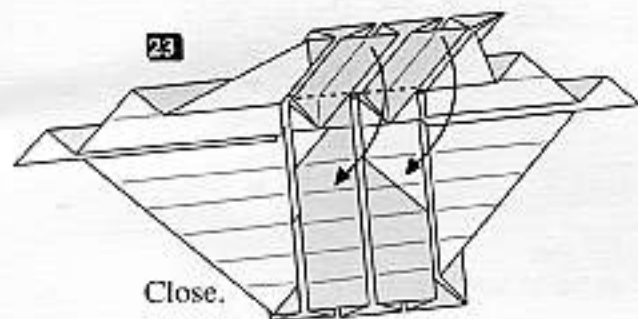
Fold in half, sinking the middle part, again.



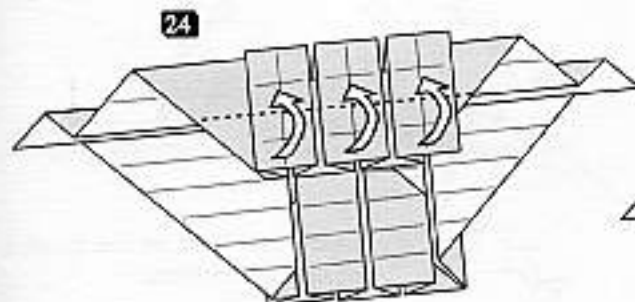
Pinch the other tube as well.



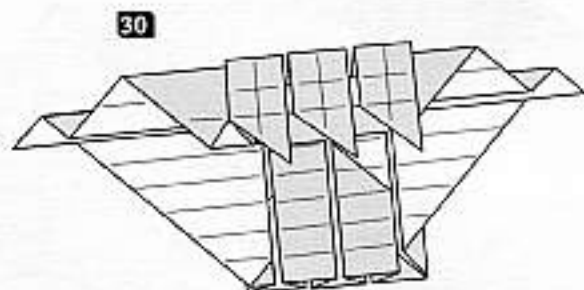
Pleat the standing layer, pinching the tubes from front and back now.



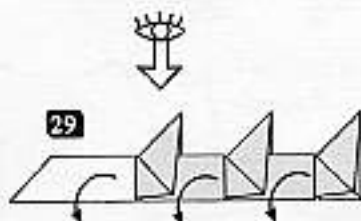
Close.



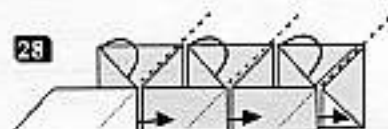
Make the top layer stand on the line in the middle.



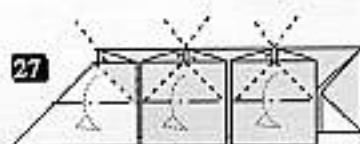
See the model from above again.



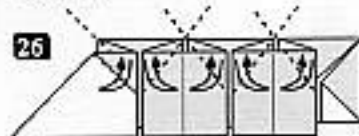
Lay down the standing layer.



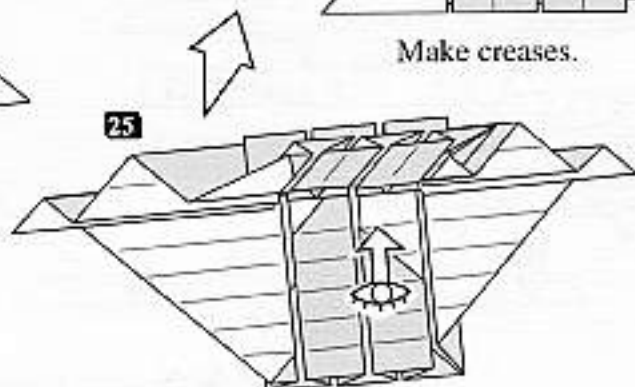
Three inside-reverse-folds.



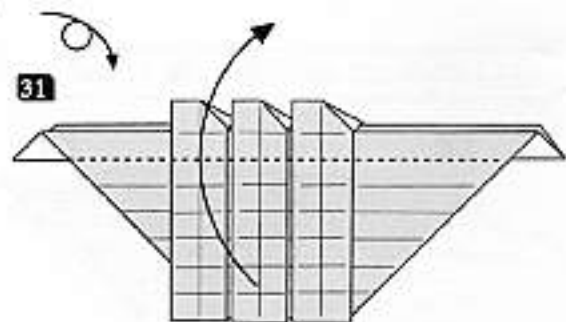
Fold in.



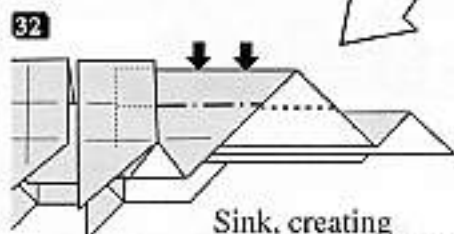
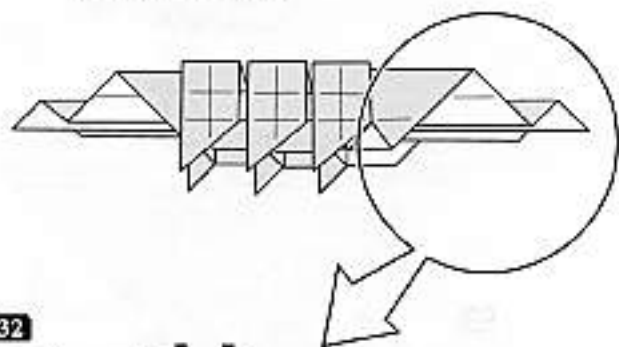
Make creases.



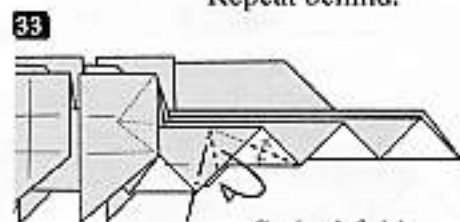
See the model from the side.



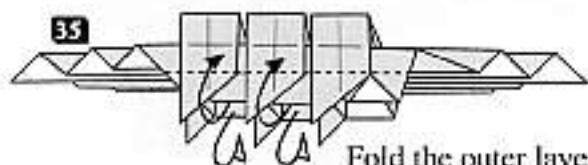
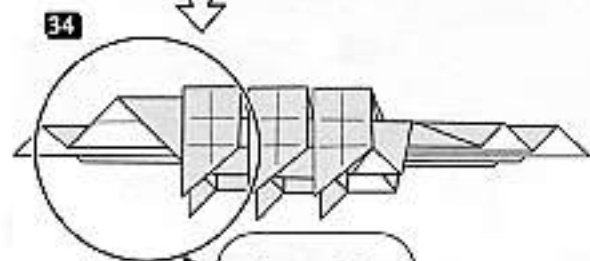
Repeat 19 to 29.



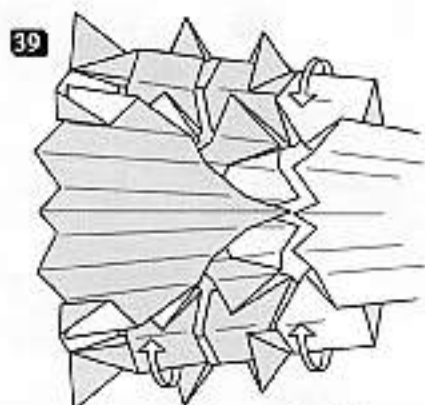
Sink, creating a diamond shape in the pocket. Repeat behind.



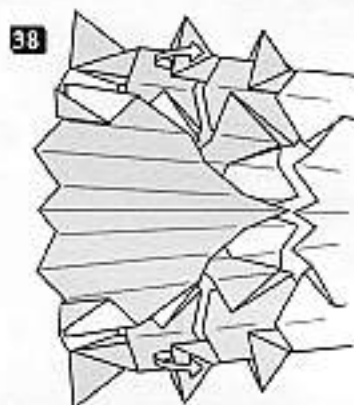
Swivel-fold. Repeat behind.



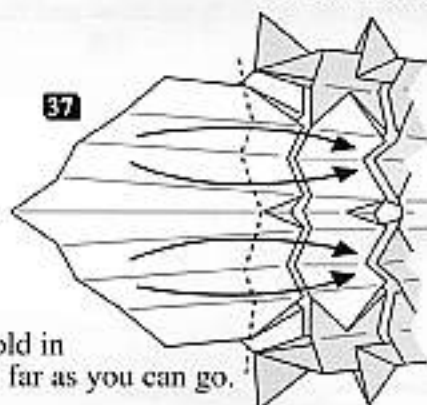
Fold the outer layers up.



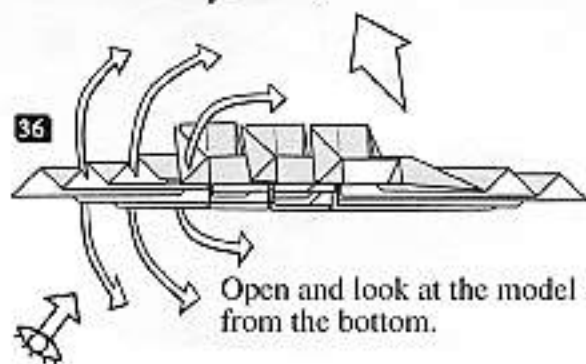
Turn the layers inside-out in only 3 spots.



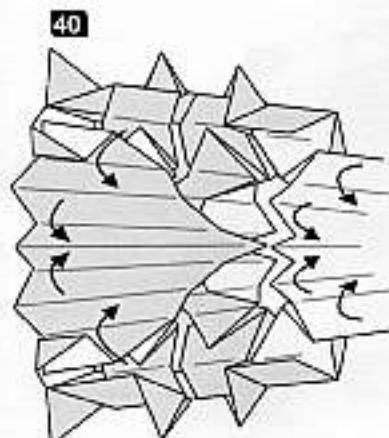
Pull out the hidden layers.



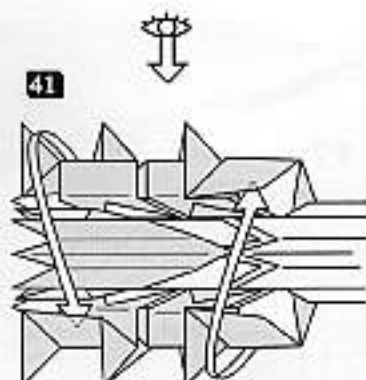
Fold in as far as you can go.



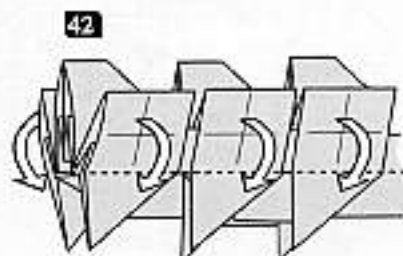
Open and look at the model from the bottom.



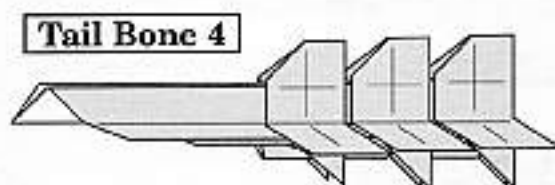
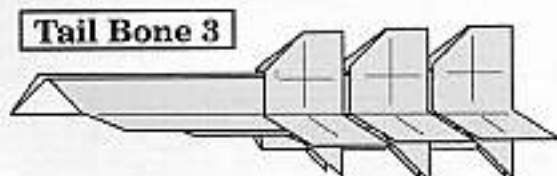
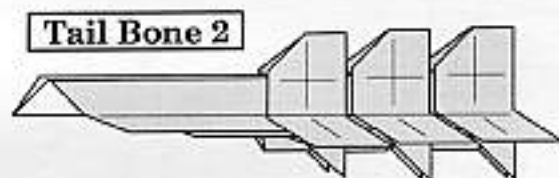
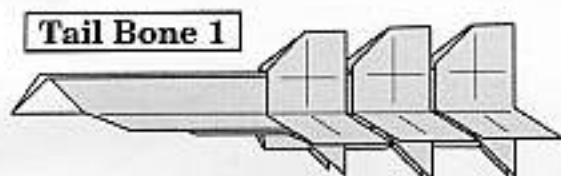
Close.



Alternately
tuck the outer layers
inside each other.

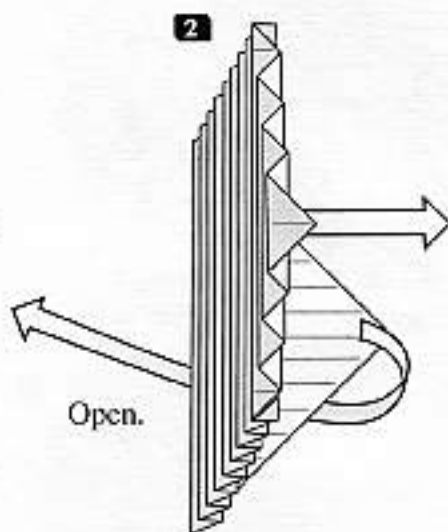
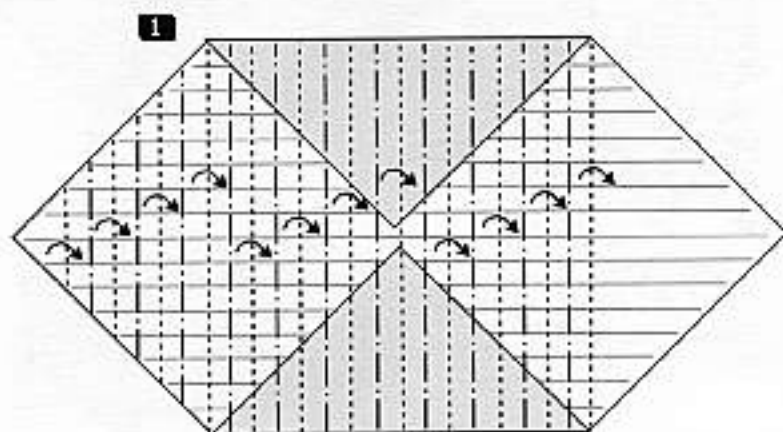


Pull the top layers
down horizontally.

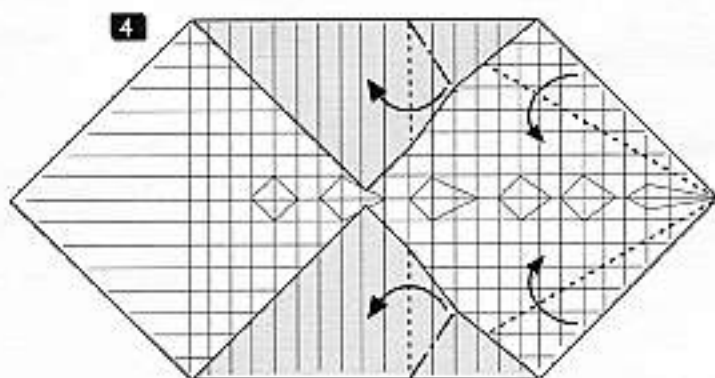
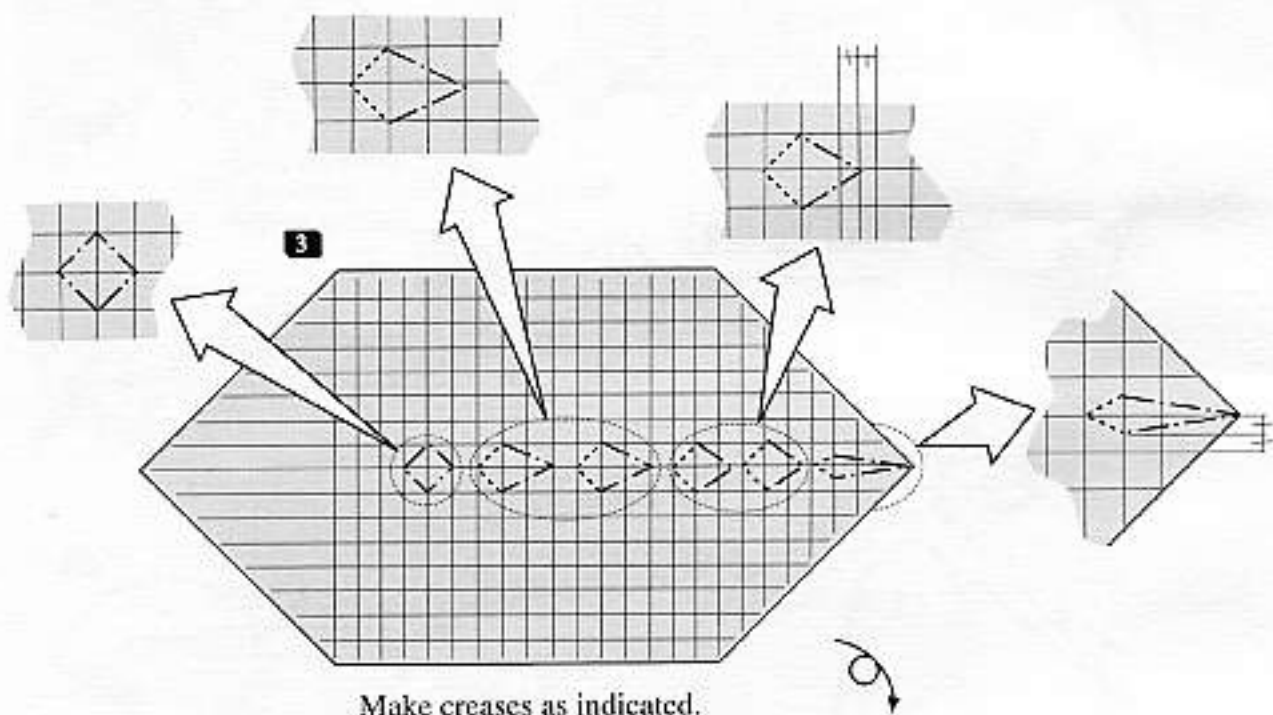


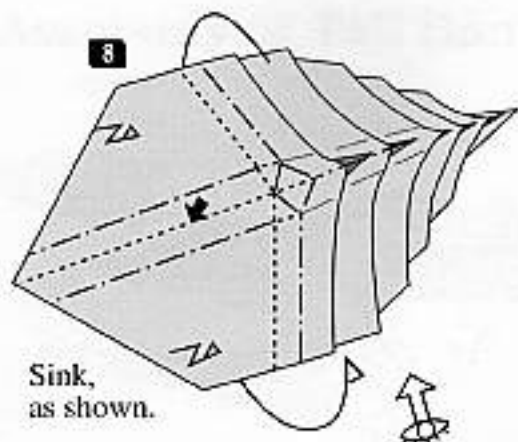
Make 4 of the same.

6.2 Tail Bone 5

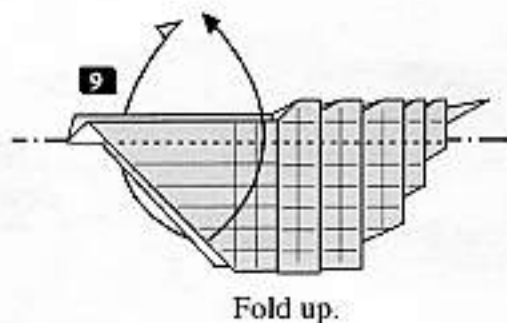


Repeat **1** to **2** of Tail Bones 1-4.
Then Accordion Fold as shown.

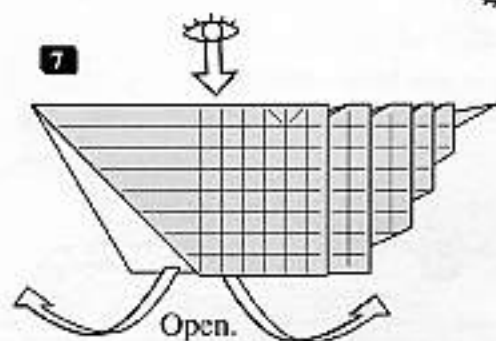




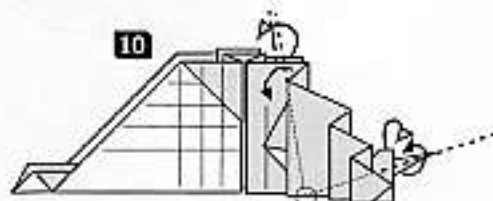
Sink,
as shown.



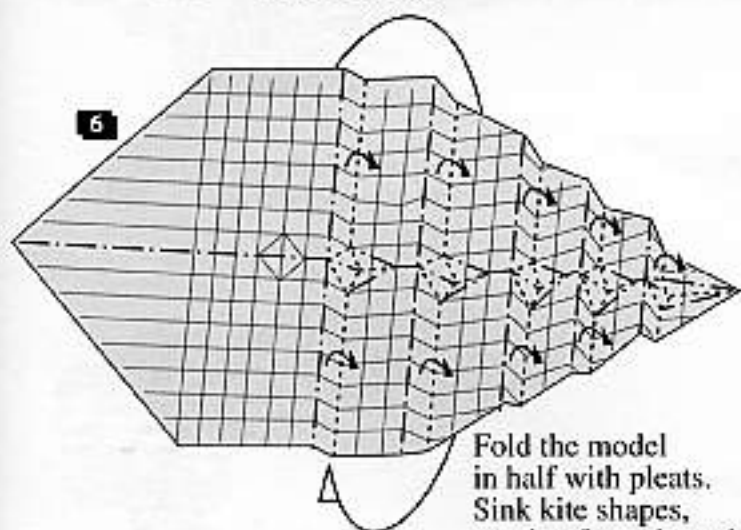
Fold up.



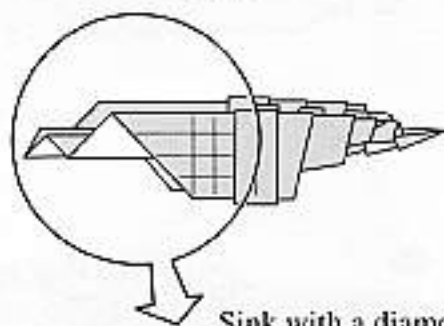
Open.



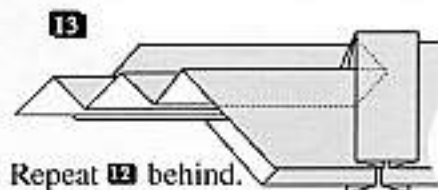
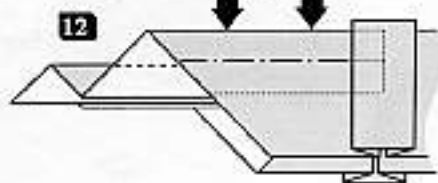
Swivel both sides.
Note the landmark.



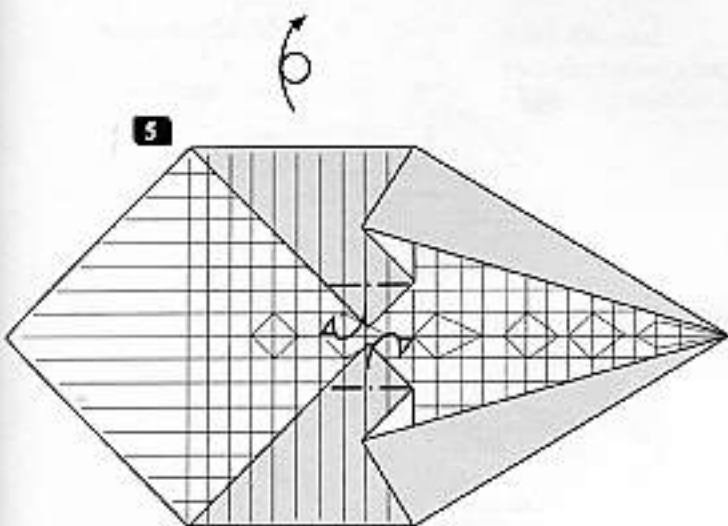
Fold the model
in half with pleats.
Sink kite shapes,
starting from the point.



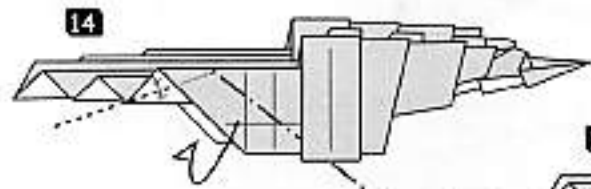
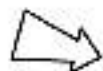
Sink with a diamond shape
in the pocket.



Repeat **12** behind.

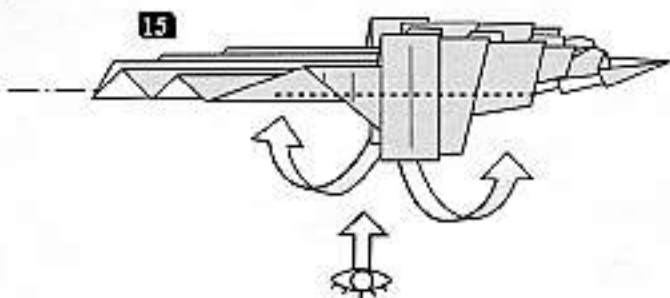


Fold in.



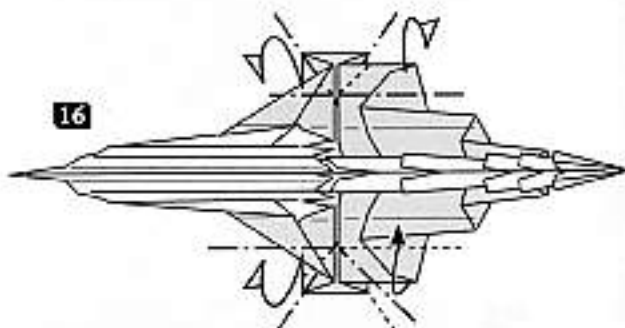
14

Swivel. Repeat behind.



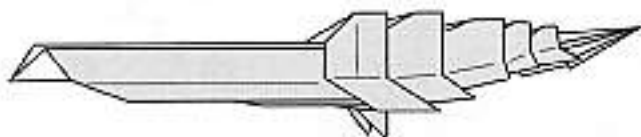
15

Fold up the top layers horizontally.
Then look at the model from the bottom.

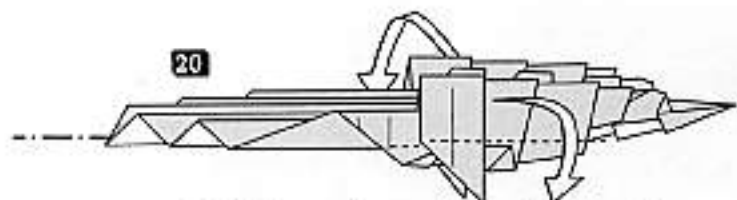


16

Swivel 3 parts to the back
and one to the front.

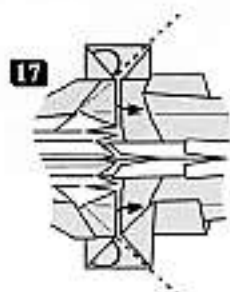


Tail Bone 5 completed.



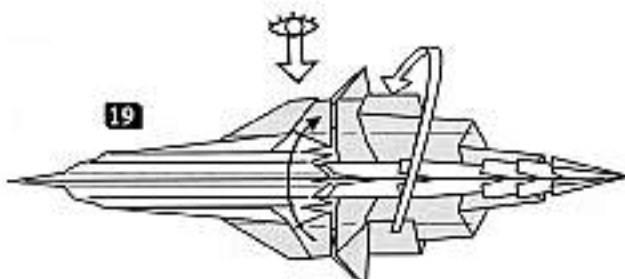
20

Fold down the top layers horizontally.



17

Inside reverse.



19

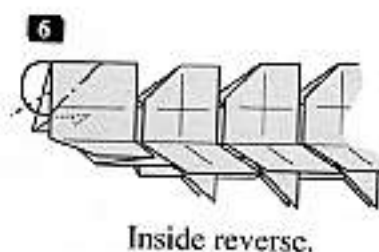
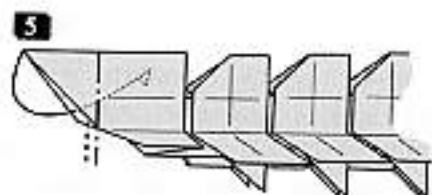
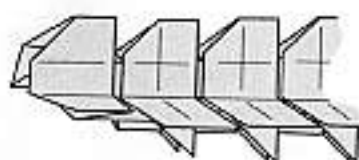
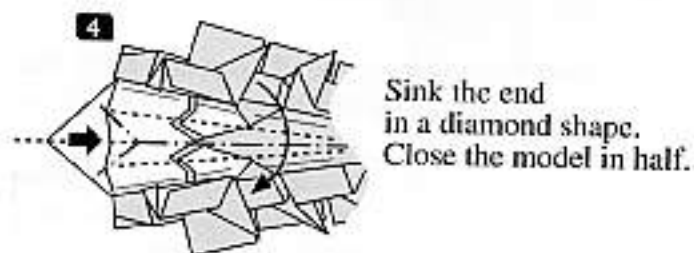
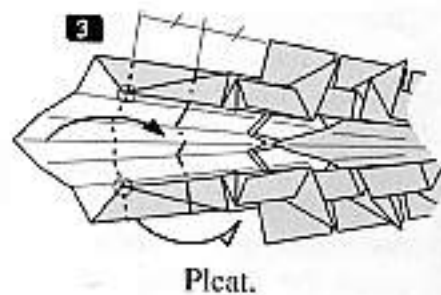
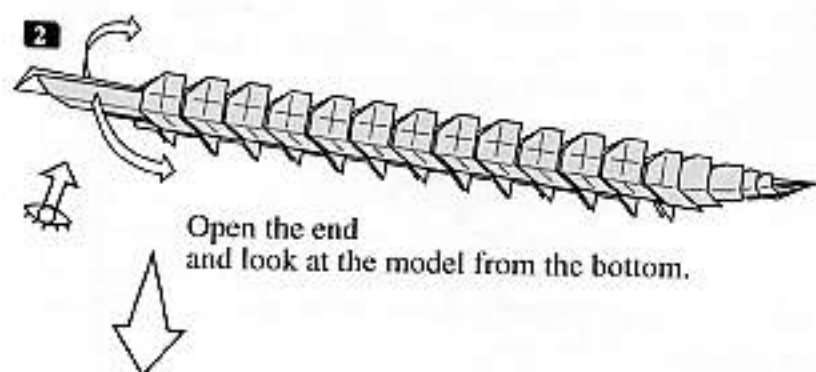
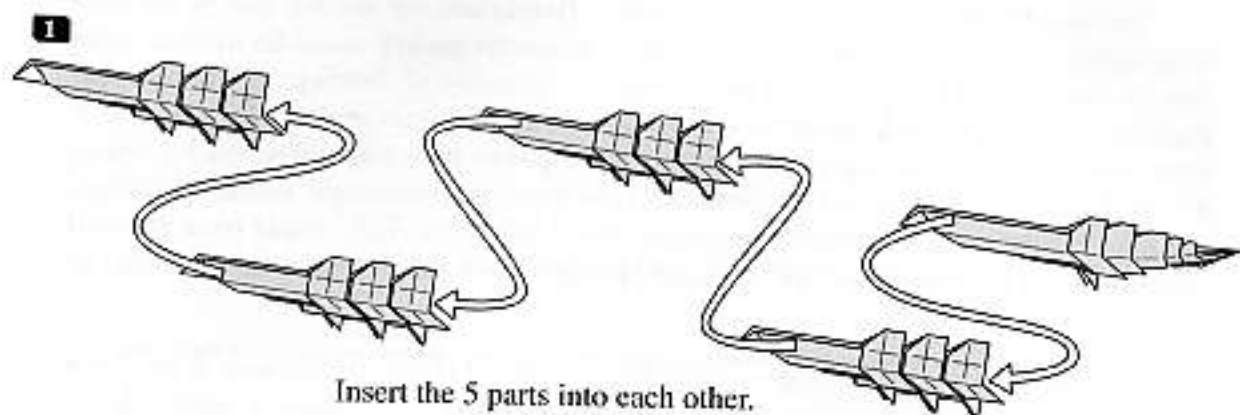
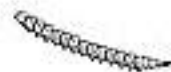
Lock the model, folding it in half.



18

Pull out the hidden layers.

6.3 Assembly of Tail Bones



Tyrannosaurus rex

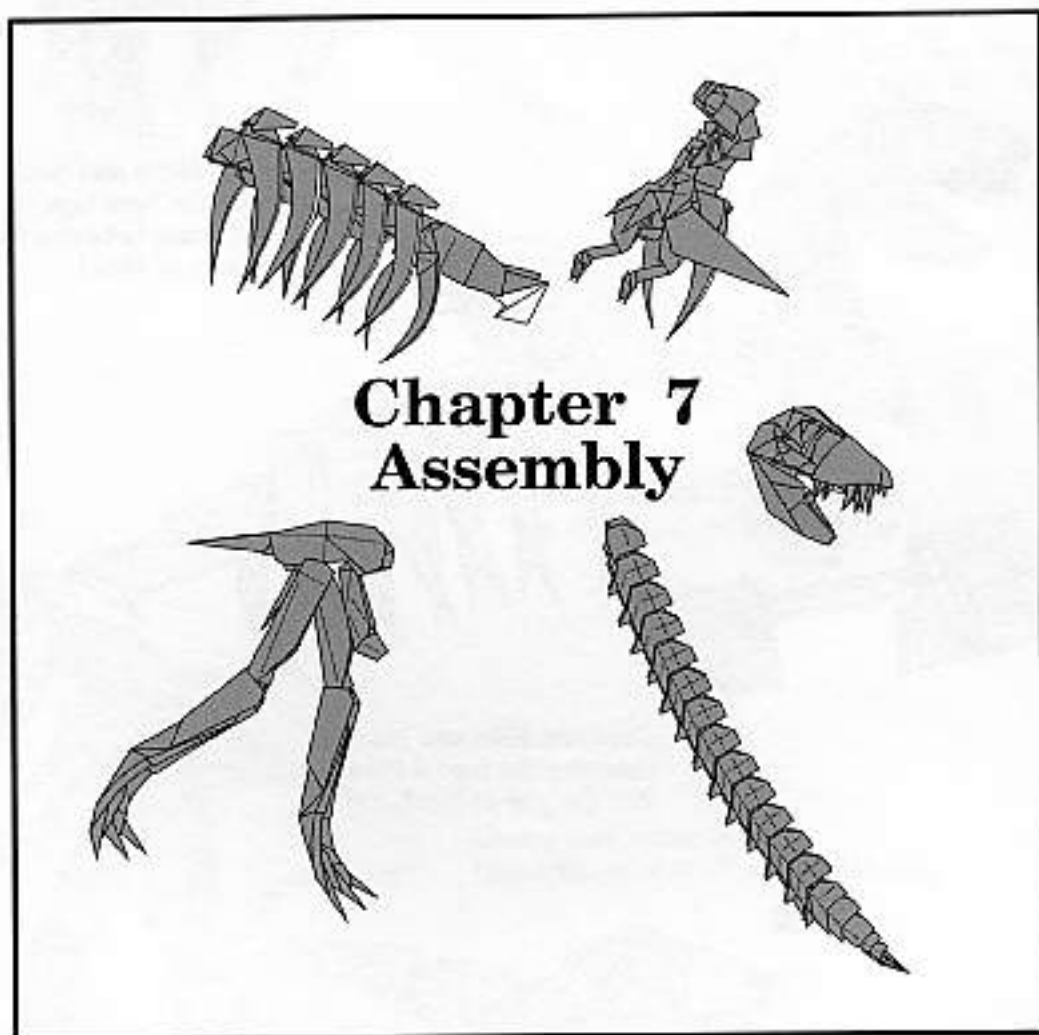
Perhaps the most familiar of all dinosaurs, *Tyrannosaurus rex* was one of the final meat eating carnivores to develop in the late Cretaceous period, some 65 million years ago. *Tyrannosaurus* represented in many ways the pinnacle of development in dinosaur predators. The huge head, powerful neck and jaws, and gigantic teeth of *Tyrannosaurus* represented more killing force and raw predatory power than was possessed by any of his predecessors. Forward facing eye sockets allowed for stereoscopic vision which was not possible for early predators whose eyes faced sideways. This would have allowed *Tyrannosaurus* to more accurately appraise his opponent's movements and the timing of his own attack.

Tyrannosaurus walked on its hind legs and stood about 18 feet tall. It has been suggested by some researchers that *Tyrannosaurus* may have walked with a more horizontal posture than has been traditionally thought and some fossil records showing *Tyrannosaurus rex* tracks without the appearance of a dragging tail appear to support this theory. *Tyrannosaurus rex* was approximately 50 feet in total length and weighed around 5 tons and in contrast to its otherwise massive proportions possessed two short forearms approximately 30 inches long which may have been used to prevent slipping forward when it arose from a resting position. It was recently discovered that a significant skeletal feature of *Tyrannosaurus* is the presence of only the first two fingers on each hand. This distinction has proved useful in distinguishing between skeletal remains of *Tyrannosaurus* and some of its similar relatives which have an additional bone (the third metacarpal) not present in *Tyrannosaurus*.

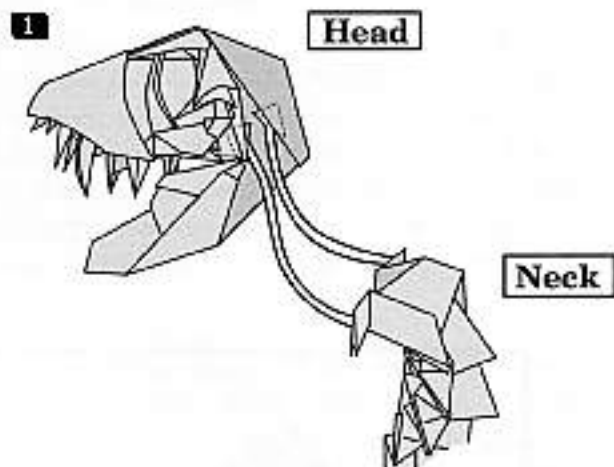
Although often characterized as a slow moving, lumbering creature who stalked rather than pursued its prey, some recent theories postulate that *Tyrannosaurus* was instead a graceful and slender limbed giant, capable of swift thrusts, feints and darting movements which would have made it a successful hunter against slower but more heavily armoured opponents like *Triceratops* or *Ankylosaurus*. However, as a hunter it is more than likely that *Tyrannosaurus* would have primarily pursued the slower and more vulnerable juvenile dinosaurs of various species rather than risking a potentially lethal encounter with dangerous adults. In this *Tyrannosaurus* would not be unlike contemporary predators like the lion. It is also probable given the physiology of *Tyrannosaurus* that it would have only been capable of relatively short dashes at high speeds.

Tyrannosaurus finds have been almost exclusively in North America (with the exception of a somewhat questionable find in Asia). Locations where *Tyrannosaurus* skeletons have been found include Montana, Wyoming and South Dakota in the United States, and Alberta and Saskatchewan in Canada. Two almost complete skeletons were found in 1990, one in South Dakota and the other in Montana. Information from research on these two finds is unavailable to date but it is hoped that they will yield still more clues to help answer some of the many unanswered questions about *Tyrannosaurus*.

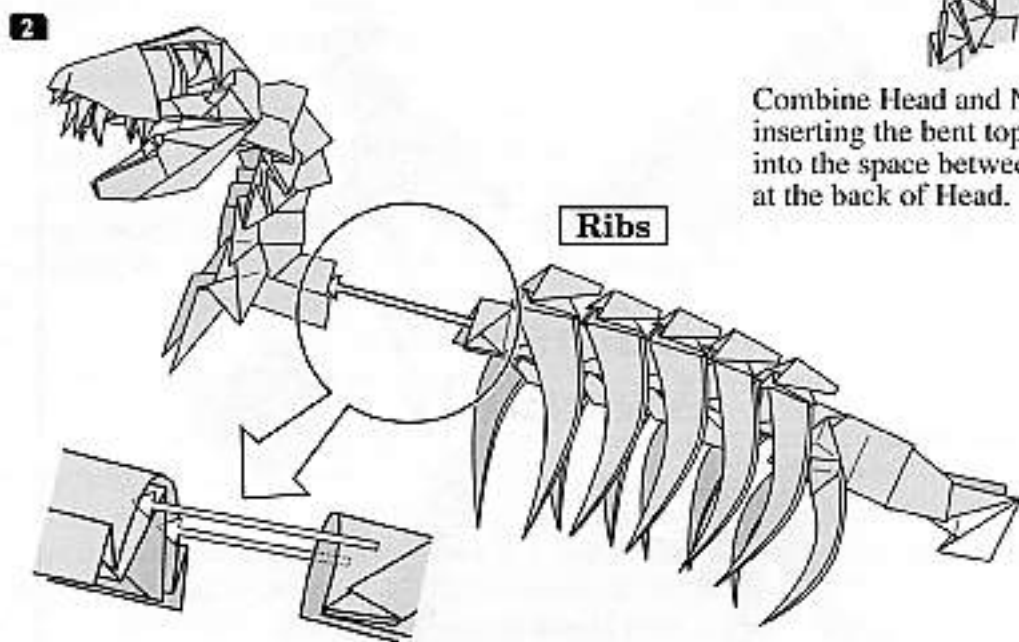
Although it may never be possible to answer all the questions with certainty there is no question that *Tyrannosaurus rex* was a dramatic and extraordinary creature. Though the species perished along with others of its kind the "Tyrant King of the Lizards" has earned an enduring place in the minds and imaginations of people everywhere.



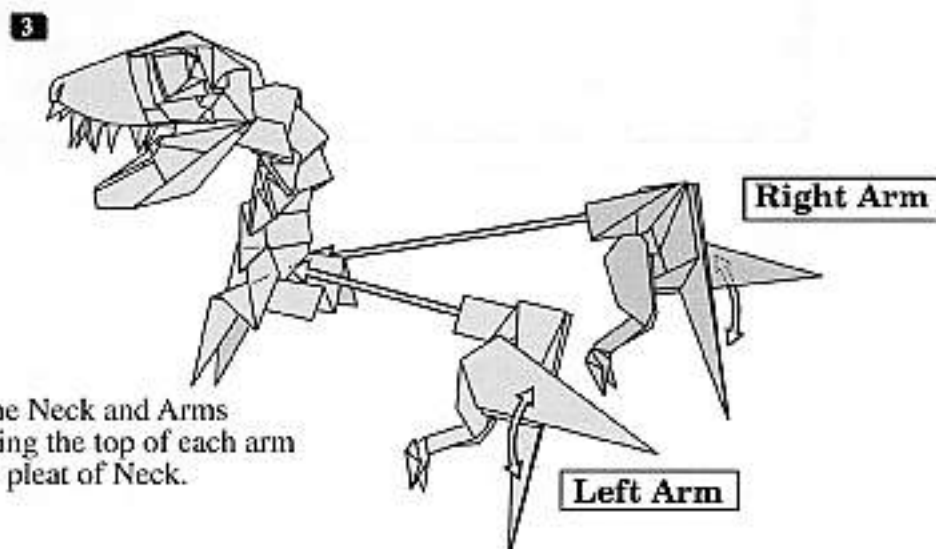
7 Assembly of the sections



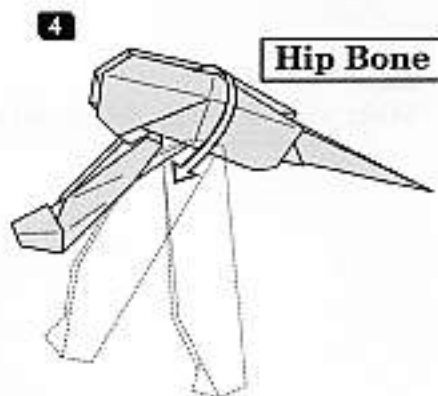
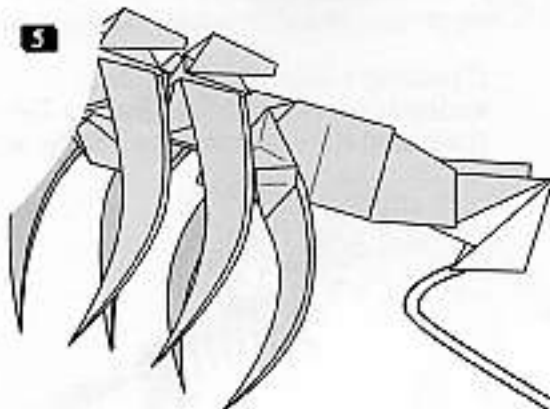
Combine Head and Neck, inserting the bent tops of Neck into the space between the layers at the back of Head.



Combine Ribs and Neck, inserting the top of Ribs into the gap of Neck.



Combine Neck and Arms by tucking the top of each arm into the pleat of Neck.



Open Hip Bone a little
to show the inside.



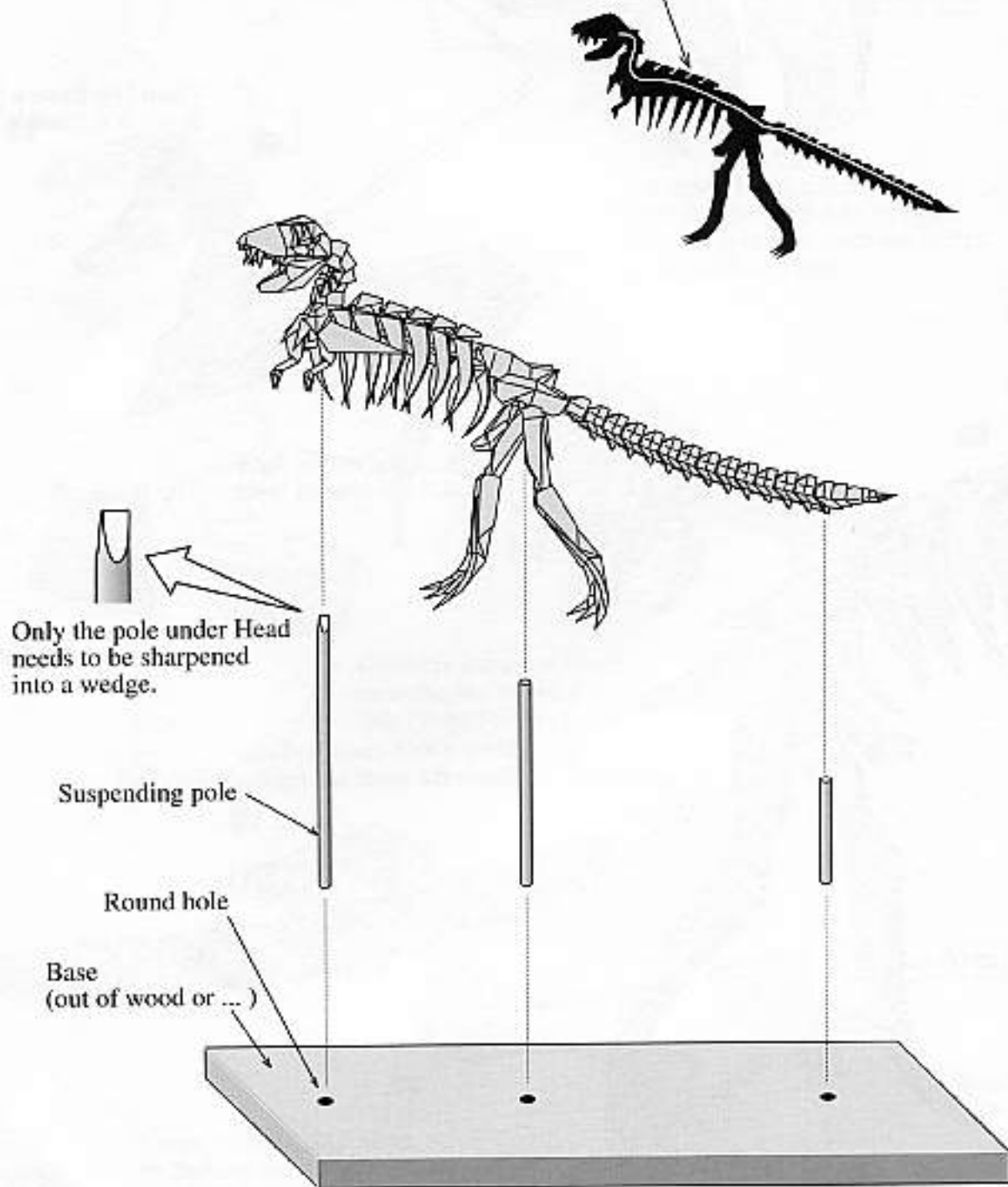
Give a nice curve to Tail.
Insert the point of Hip Bone into Tail.

Tail

7

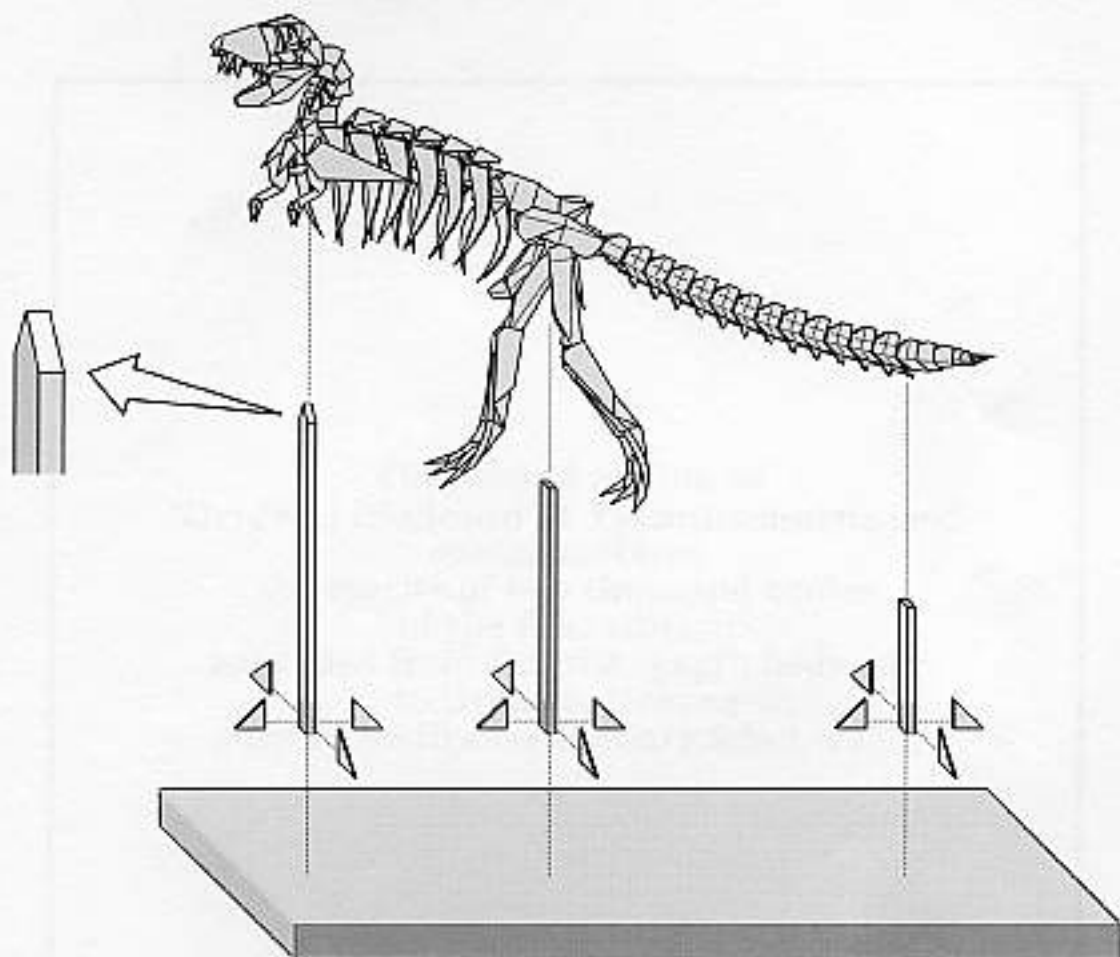
Make a stand and fix the model on it with glue.

If making a larger scale model,
wiring is necessary from Head to Tail.
(Legs and Ribs may require wiring, too.)

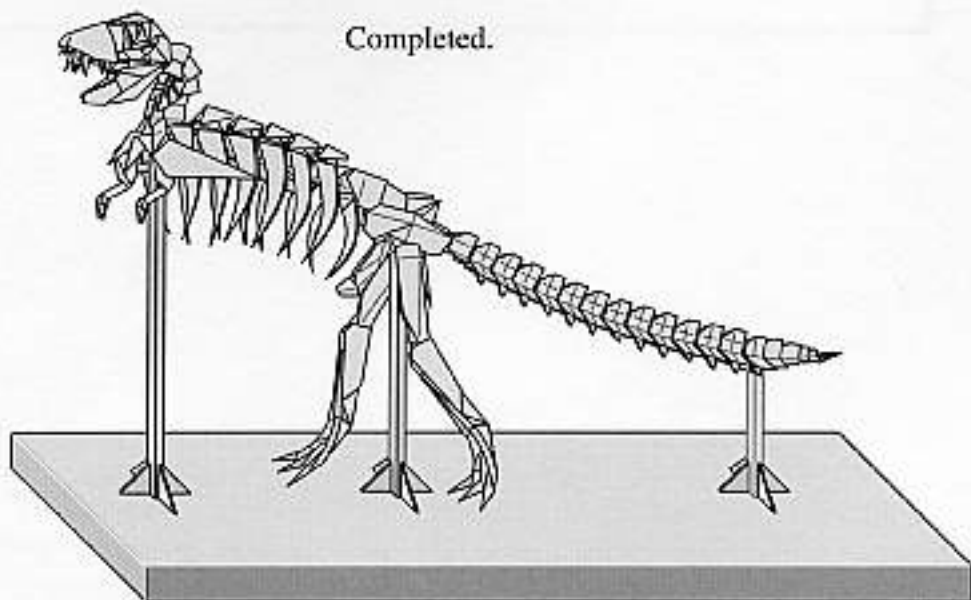


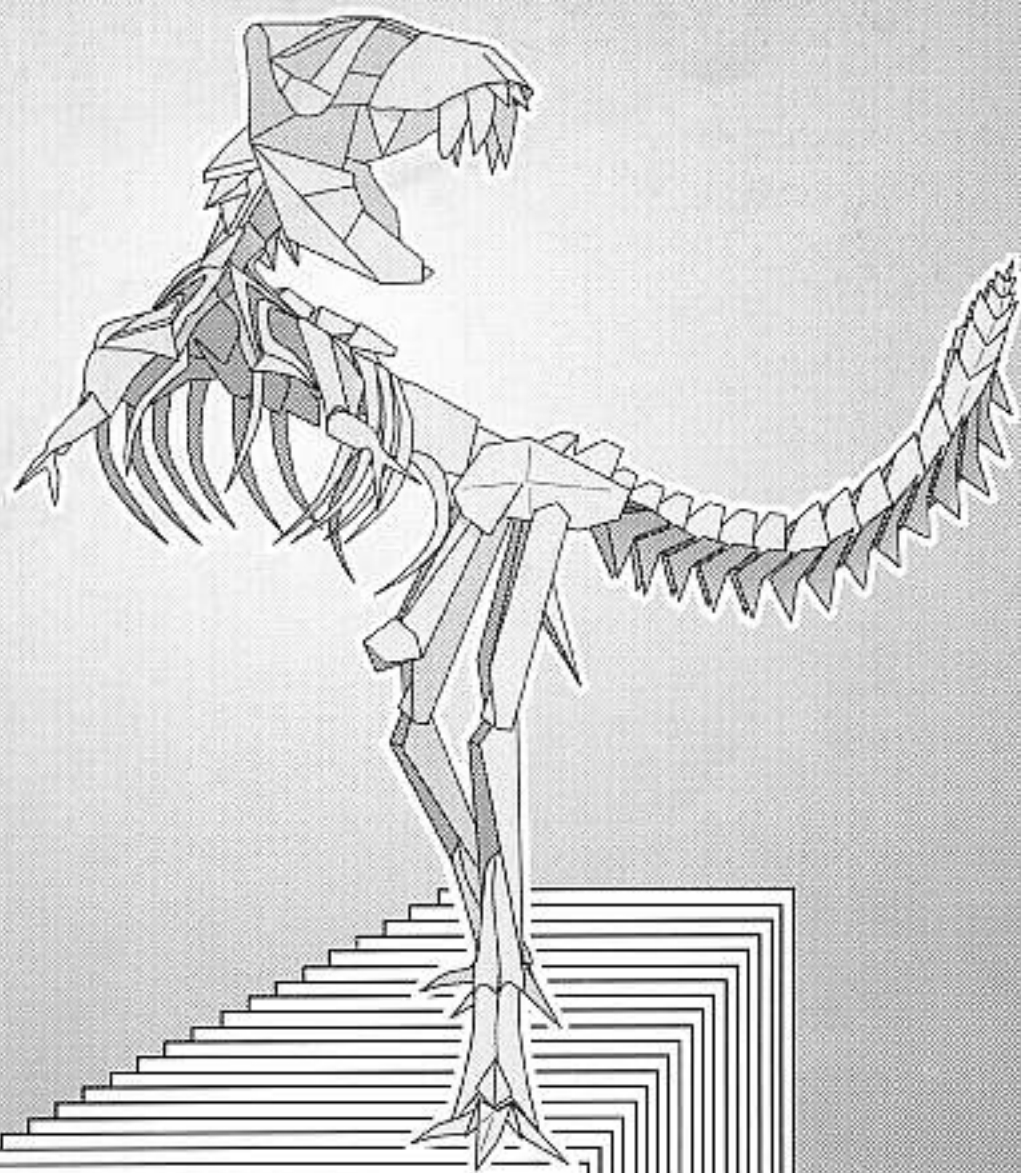
7

If it is too difficult to make round holes use rectangular pieces of wood and support them with small triangular boards.



Completed.





Designed & diagrammed
by **Issei Yoshino**

Out of 21
equally sized
square sheets
of paper.

Origami Skeleton of Tyrannosaurus rex

Origami Maple, Toronto