

# Dinosaur Origami

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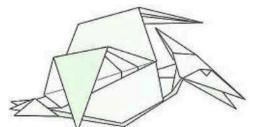
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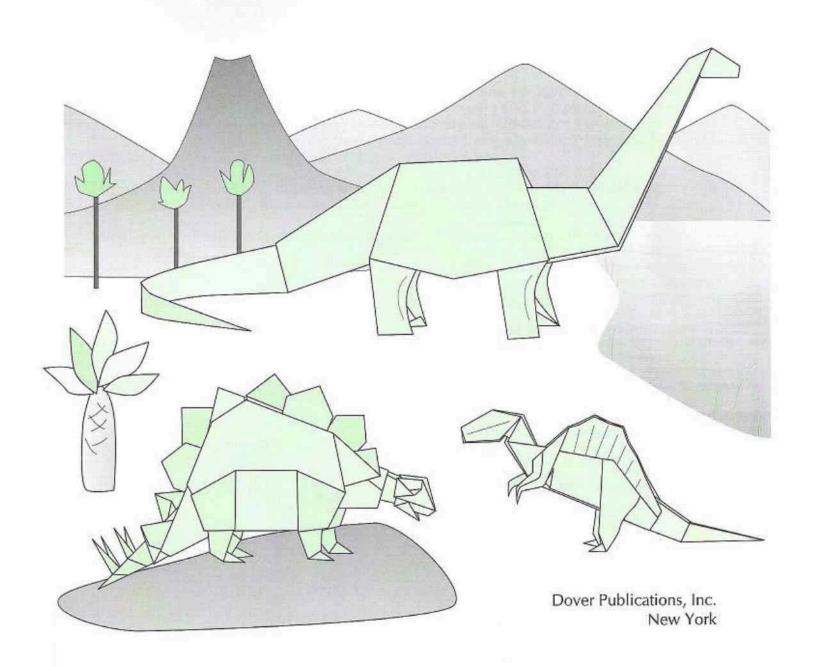
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Easy Christmas Origami



# Dinosaur Origami

John Montroll



### To Carol Ann, Kathleen, Martha, Mark, Jan, and Mark

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#### Bibliographical Note

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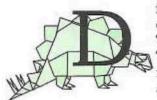
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### Introduction



inosaurs are very interesting creatures. It is fun to create them through origami. This collection is a revision of the former book *Prehistoric Origami*. Ten models from that book remain here along with twenty new ones. The models, each folded from a single uncut square, were designed to reflect an accurate and aesthetically pleasing rendition of these prehistoric animals.

You can fold the flying reptiles such as pteranodon, marine reptiles, and an assortment of favorite dinosaurs including tyrannosaurus, apatosaurus, triceratops, stegosaurus, and more. The models are roughly ordered from simple to difficult. There is also information about each animal.

The diagrams conform to the internationally approved Randlett-Yoshizawa style. Although any square paper can be used for the projects in this book, the best material is origami paper. Origami supplies can be found in arts and craft shops, or visit Dover Publications online at www.doverpublications.com, or OrigamiUSA at www.origami-usa.org.

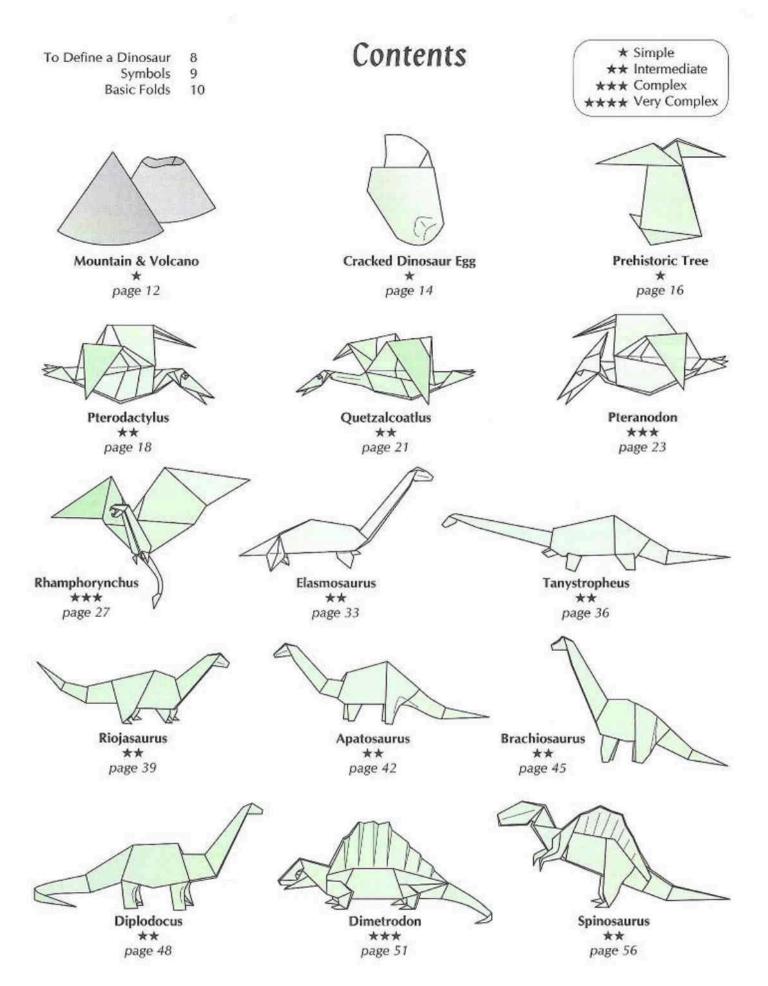
Martha Landy has provided an excellent introduction and background notes on the animals. Ms. Landy teaches students with special needs and has produced "Dinosaur Day" for many years. Her students research and explain dinosaurs and celebrate them. She continues to love discovering new things about these Mesozoic friends and believes that they are one of the most motivating educational tools.

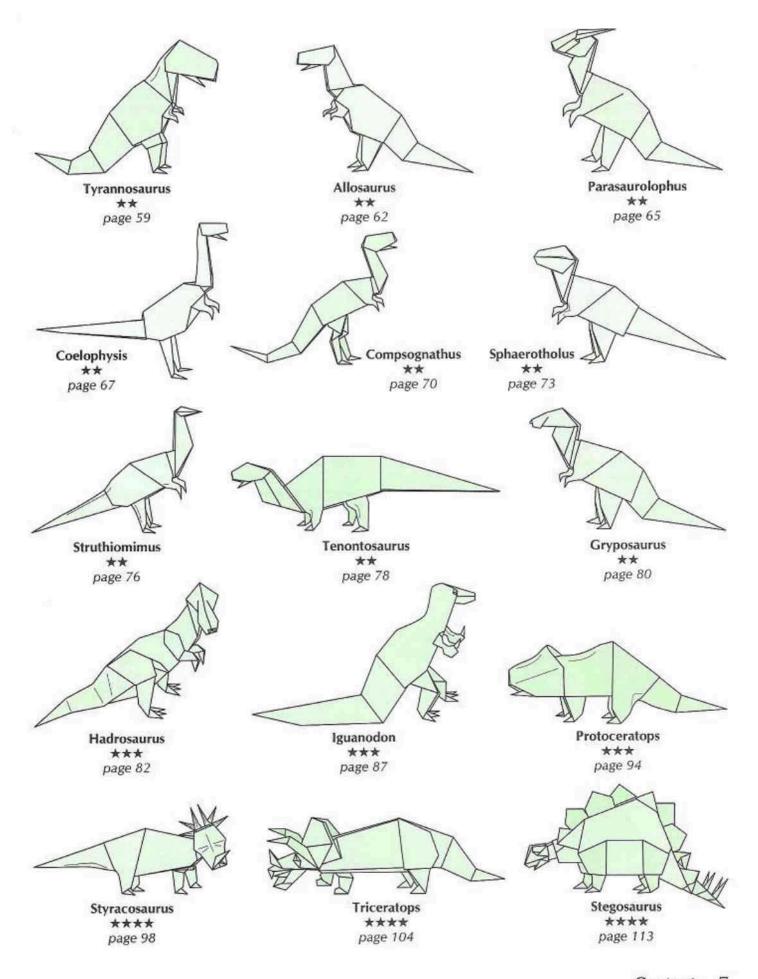
I thank Martha Landy for bringing this work to life with her articles. I thank Robert Lang for use of his software, ReferenceFinder, used in folding the triceratops.

I hope you will enjoy folding and making scenes of these ancient creatures.

John Montroll

www.johnmontroll.com





### To Define a Dinosaur

To call an animal a dinosaur there are three specific criteria that must be met. These are when the animal lived, the structure of the hip and jaw bones, and where the animal spent its time.

Dinosaurs lived in the Mesozoic (mezz-oh-ZO-ik) Era which began 225 millions years ago and lasted for 155 million years. Mesozoic means "middle life". The era is divided into three periods.

Dinosaurs appeared on Earth during the Triassic (try-AS-ik) Period. It lasted for 45 million years. All the continents were connected in one giant land mass. There were only a few kinds of dinosaur. These were mostly small, quick, meat eaters.

The Jurassic (joo-RAS-ik) Period began 180 million years ago and lasted for 45 million years. The continents began to move apart and shallow seas and swamps formed. The climate was tropical. The largest dinosaurs lived at this time.

The Cretaceous (kre-TAY-shus) Period is the time the most varieties of dinosaurs lived. It was 65 million years long. The continents were well separated. The climate was seasonal and flowers appeared on earth for the first time.

To be a dinosaur an animal must have a specific skull and hip structure. One way scientists classify reptiles is by the number of holes in the back of the skull. These holes may be to accommodate jaw muscles. They lighten the weight of the skull. All dinosaurs are diapsids (di-AP-sids), having two holes in their skulls.

The Ornithischian (orn-i-THIS-kee-an) dinosaurs have the two lower bones of the hip pointing towards the back. They have a beak-like addition to the jaw bone. Ornithischian means "bird hipped".

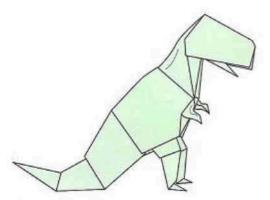
The Saurischian (saw-RIS-kee-an) dinosaurs have each hip bone pointing in a different direction. They have a solid jaw. Saurischian means "lizard-hipped".

All true dinosaurs were land dwellers. However, some dinosaurs, like many other land dwelling animals, would sometimes wade or swim. Hollow-boned, feathered dinosaurs may have used their aerodynamic structure to glide from trees or cliffs but did not "flap" their wings and could not fly.

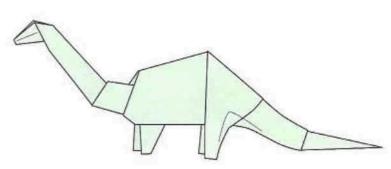
Recent discoveries have shown that although some dinosaurs laid eggs, some actually gave birth to live offspring. There is also evidence that some dinosaurs raised their young and lived in multi-aged family groups.

It has been over 60 million years since the last living dinosaur walked the earth but paleontologists are continuing to uncover clues that increase our understanding of the world of dinosaurs.

Martha Landy



The Tyrannosaurus is an Ornithischian dinosaur which lived during the Cretaceous Period.



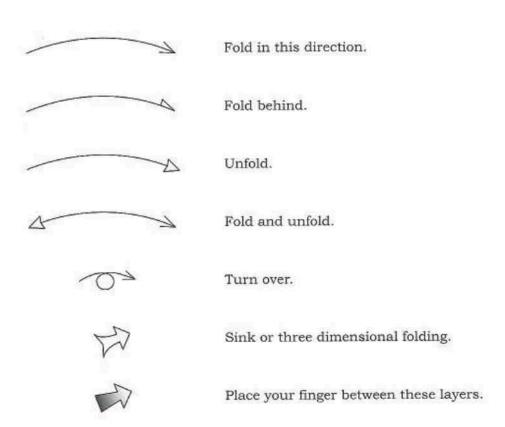
The Apatosaurus is a Saurischian dinosaur which lived during the Jurassic Period.

# Symbols

### Lines

Valley fold, fold in front. Mountain fold, fold behind. Crease line. X-ray or guide line.

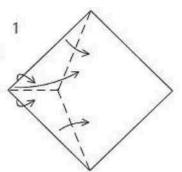
#### Arrows



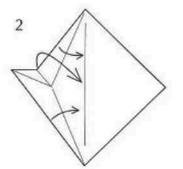
### Basic Folds

#### Rabbit Ear.

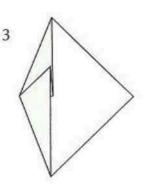
To fold a rabbit ear, one corner is folded in half and laid down to a side.



Fold a rabbit ear.



A 3D intermediate step.

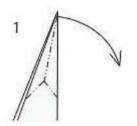


#### Double Rabbit Ear.

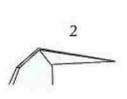
If you were to bend a straw you would be folding the double rabbit ear.



(Straw)

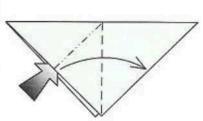


Make a double rabbit ear.

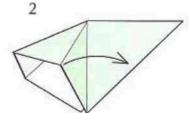


### Squash Fold.

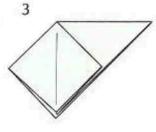
In a squash fold, some paper is opened and then made flat. The shaded arrow shows where to place your finger.



Squash-fold.

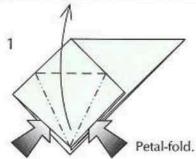


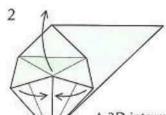
A 3D intermediate step.



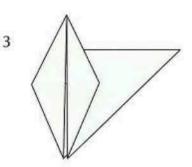
#### Petal Fold.

In a petal fold, one point is folded up while two opposite sides meet each other.





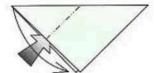
A 3D intermediate step.



#### Inside Reverse Fold.

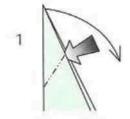
In an inside reverse fold, some paper is folded between layers. Here are two examples.



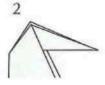


Reverse-fold.



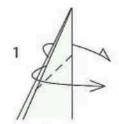


Reverse-fold.



#### Outside Reverse Fold.

Much of the paper must be unfolded to make an outside reverse fold.

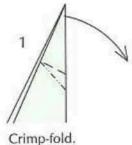


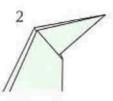




#### Crimp Fold.

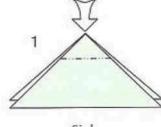
A crimp fold is a combination of two reverse folds.





#### Sink Fold.

In a sink fold, some of the paper without edges is folded inside. To do this fold, much of the model must be unfolded.

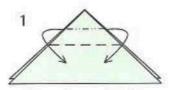


Sink.

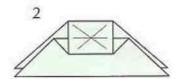


### Spread Squash Fold.

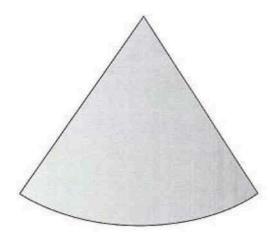
A cross between a squash fold and sink fold, some paper in the center is spread apart and then made flat.



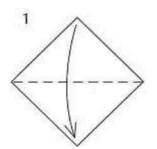
Spread-squash-fold.

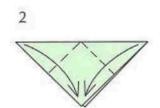


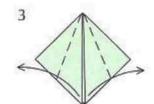
# Mountain and Volcano

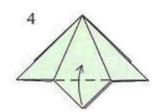




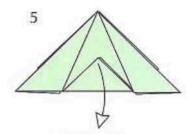




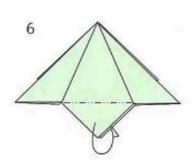




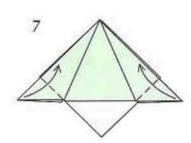
Fold both layers up together.

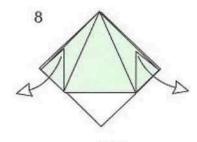


Unfold both layers.

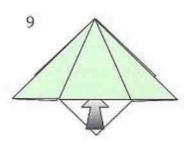


Fold the top layer inside.

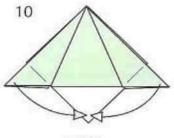




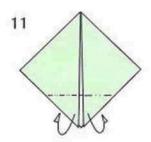
Unfold.



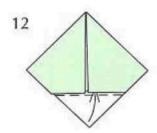
In step 11, some paper will be tucked inside this pocket.



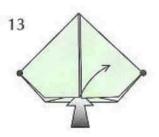
Unfold.



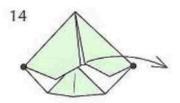
Tuck inside the pocket.



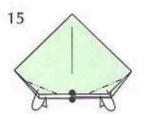
Tuck inside the pocket.



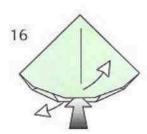
Place your finger inside to open and flatten the model so the dots meet.



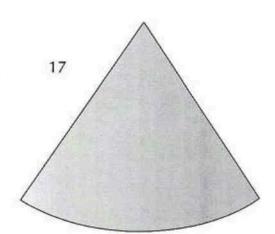
An intermediate step.



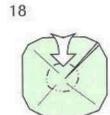
Fold the corners inside, repeat behind.



Open.



Mountain

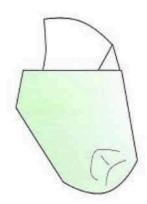


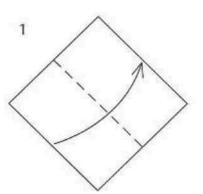
This is the top view of the mountain. To fold a volcano, push the top inside. This is a sink fold.

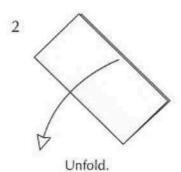


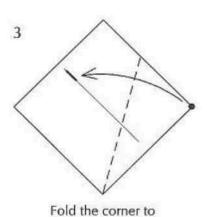
Volcano

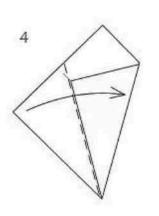
# Cracked Dinosaur Egg



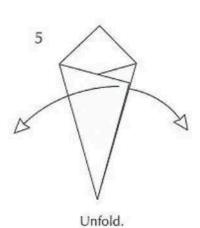




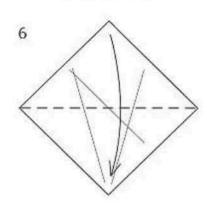




7



8

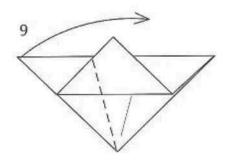


the center line.

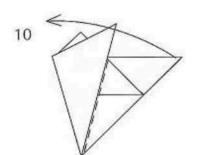
Fold the top layer to the dotted lines so it meets the dots.

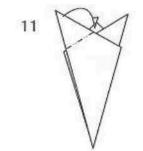


Place your finger between these layers. Let's call this the prehistoric pocket. In step 11 some paper will be folded into it.



Fold along the crease.

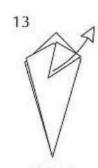


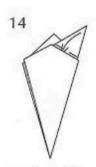


Tuck inside the prehistoric pocket.









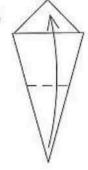




Unfold.

Tuck inside.

16

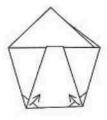




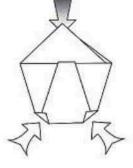


Tuck inside.

18

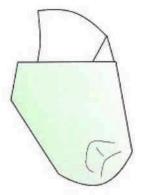


19



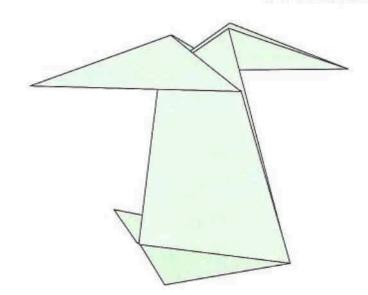
Place your finger all the way inside and squeeze at the bottom. Make the egg round and 3D.

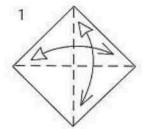
20



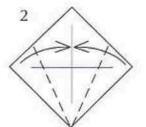
Cracked Dinosaur Egg

## **Prehistoric Tree**

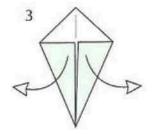




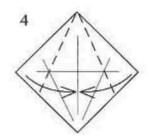
Fold and unfold.



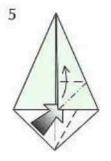
Kite-fold.



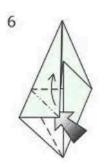
Unfold.



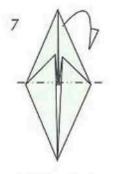
Kite-fold.



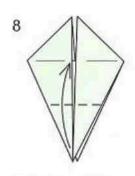
Squash-fold.



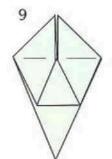
Squash-fold.



Fold behind.

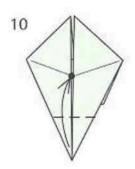


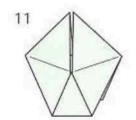
This is the Fish Base.



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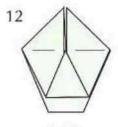
Turn over.



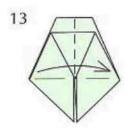


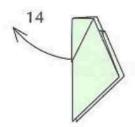
107

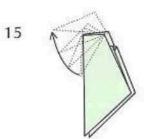
Turn over.



Rotate.

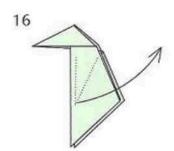




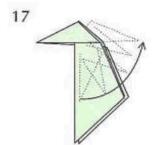


Slide up.

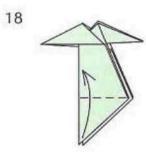
An intermediate step.



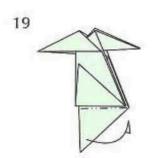
Slide the inside paper up.



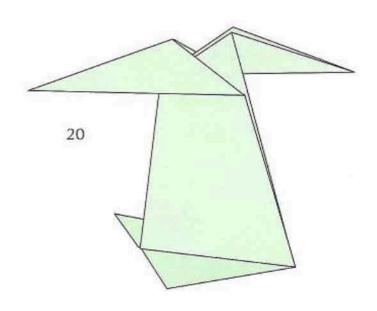
An intermediate step.



Fold the root up.

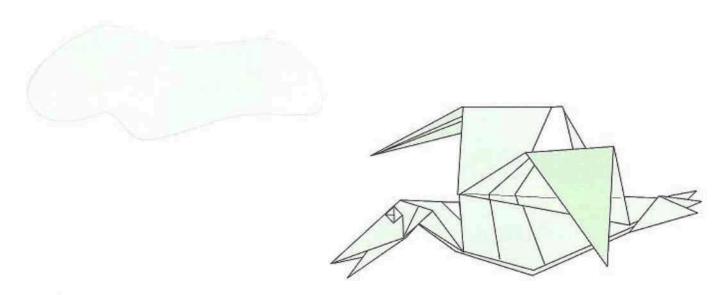


Fold behind. Fold the roots half way down so the tree can stand.



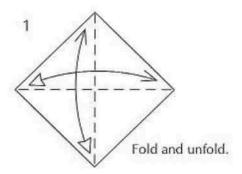
Prehistoric Tree

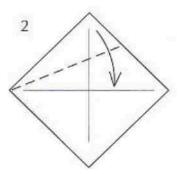
# Pterodactylus

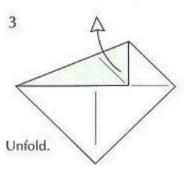


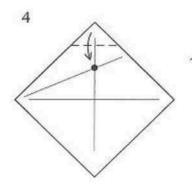
#### ter-oh-DAC-til-us

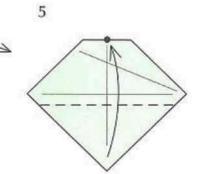
This tiny Jurassic reptile had an 18 inch wing span. It could have actually flapped its wings to fly. It ate insects and fish with its toothed beak. Fossils of Pterodactylus have been found in Europe.

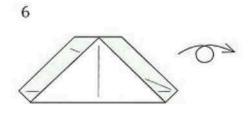


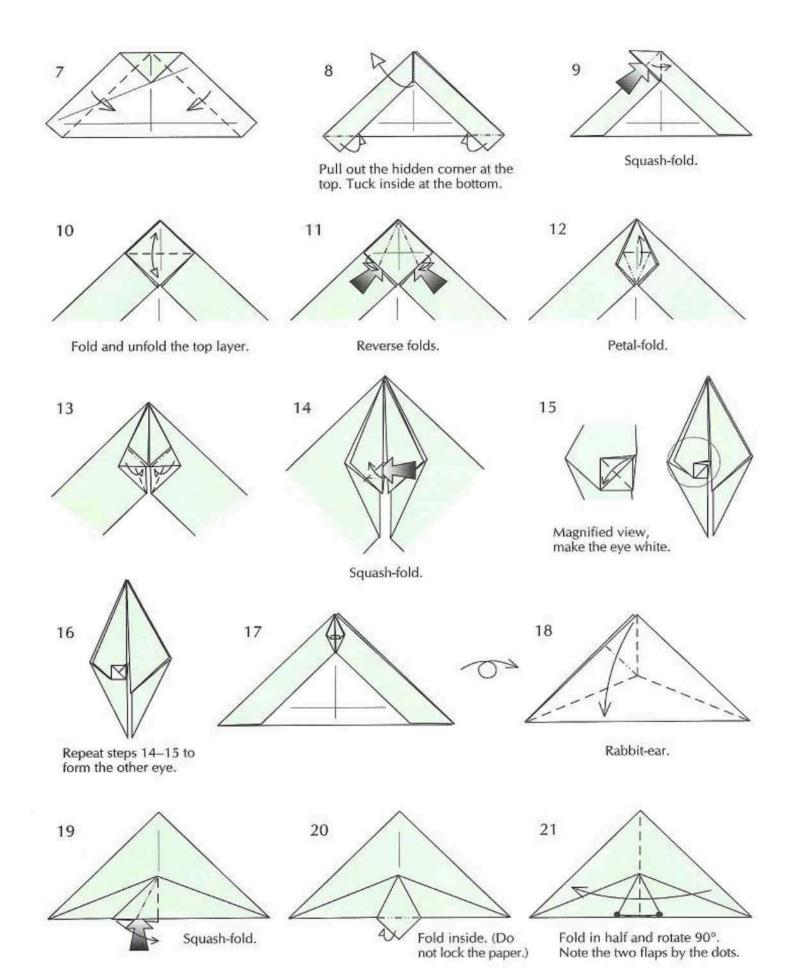


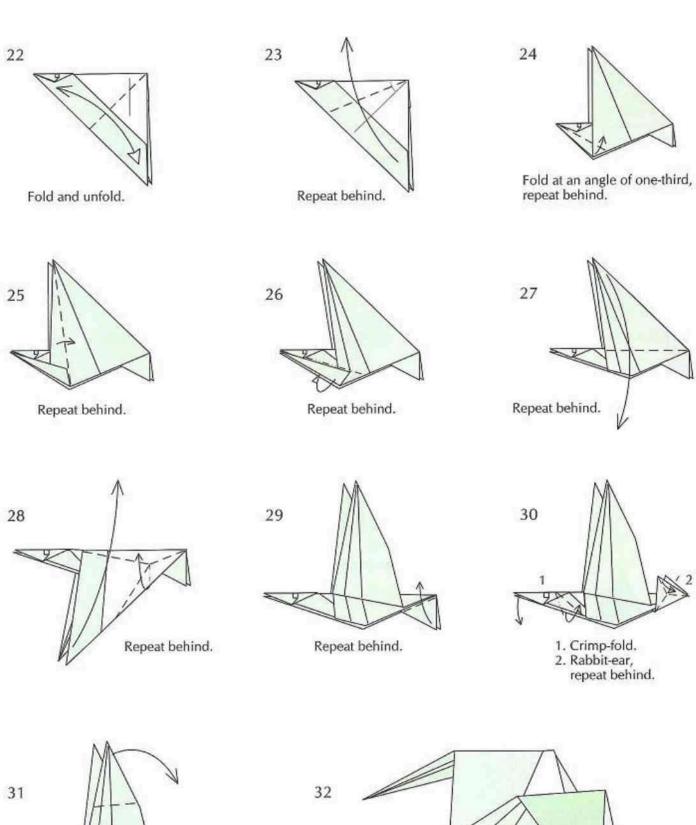






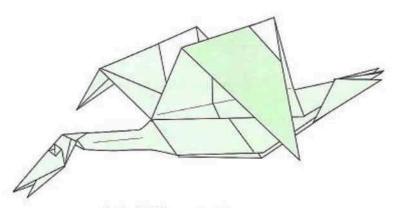






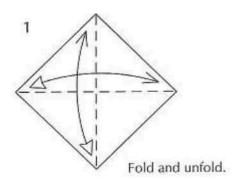
Pterodactylus

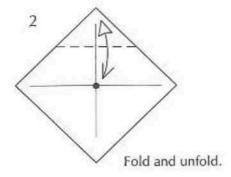
### Quetzalcoatlus

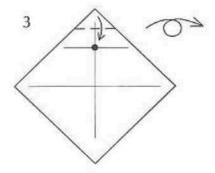


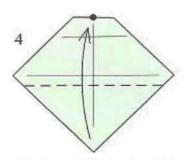
ket-SAT-co-at-til-us

Named for the Aztec God who was represented by a feathered serpent, this was the largest gliding reptile ever discovered. It had a 40 foot wing span. Because of its hollow bones, it was light enough to soar over Cretaceous seas for fish. Fossils were found in Texas.

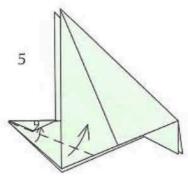




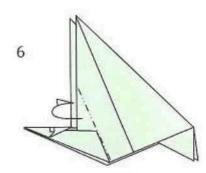




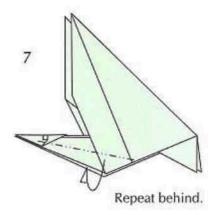
Continue with steps 5-23 of Pterodactylus (page 18).

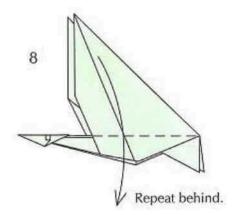


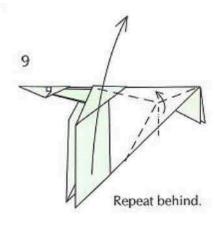
Tuck under the head. Repeat behind.

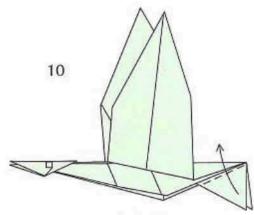


Repeat behind.

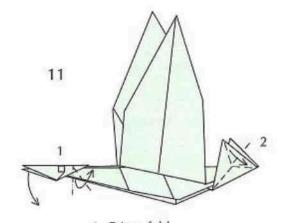




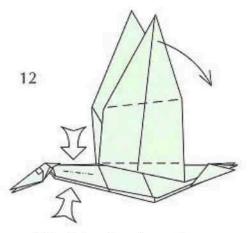




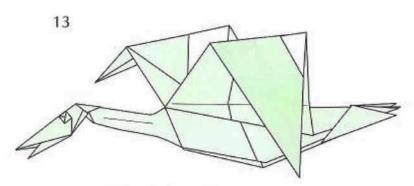
Repeat behind.



 Crimp-fold.
 Rabbit-ear, repeat behind.

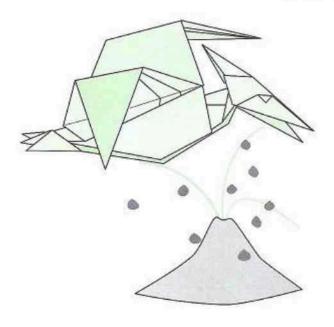


Thin the neck and spread the wings. Repeat behind.



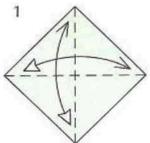
Quetzalcoatlus

### Pteranodon



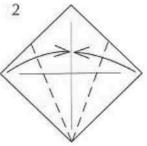
ter-RAN-oh-don

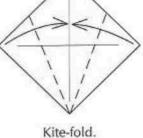
With a 20 foot wing span, this gliding reptile swooped over Cretaceous seas picking up fish to eat. Its name means "toothless wing". The skin stretching across its "wings" was probably covered with hair. It glided off ocean cliffs in the western U.S.

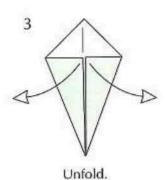


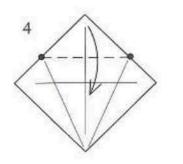
Fold and unfold along the diagonals.



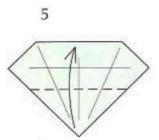


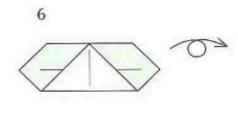


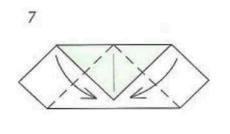


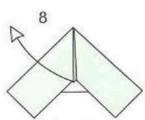




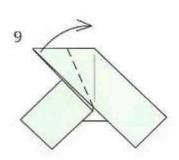


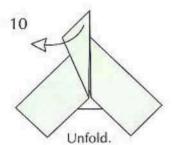


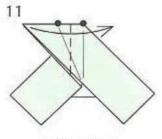




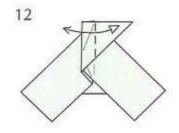
Pull out the hidden corner.



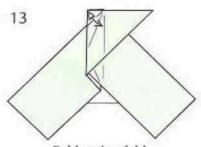




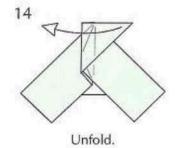
Fold so that the dots meet.

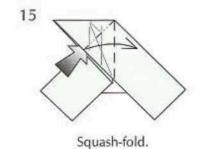


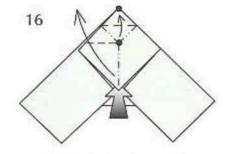
Fold and unfold.



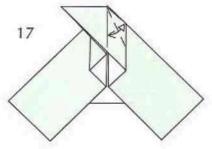
Fold and unfold.



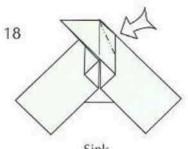


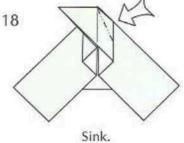


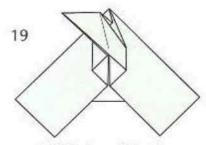
This is similar to a petal fold. The dots will meet.



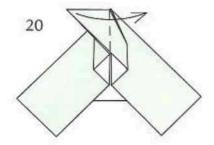
Fold along the crease line and unfold.

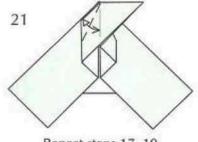




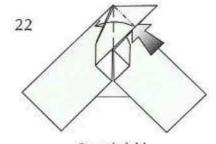


A 3D intermediate step.

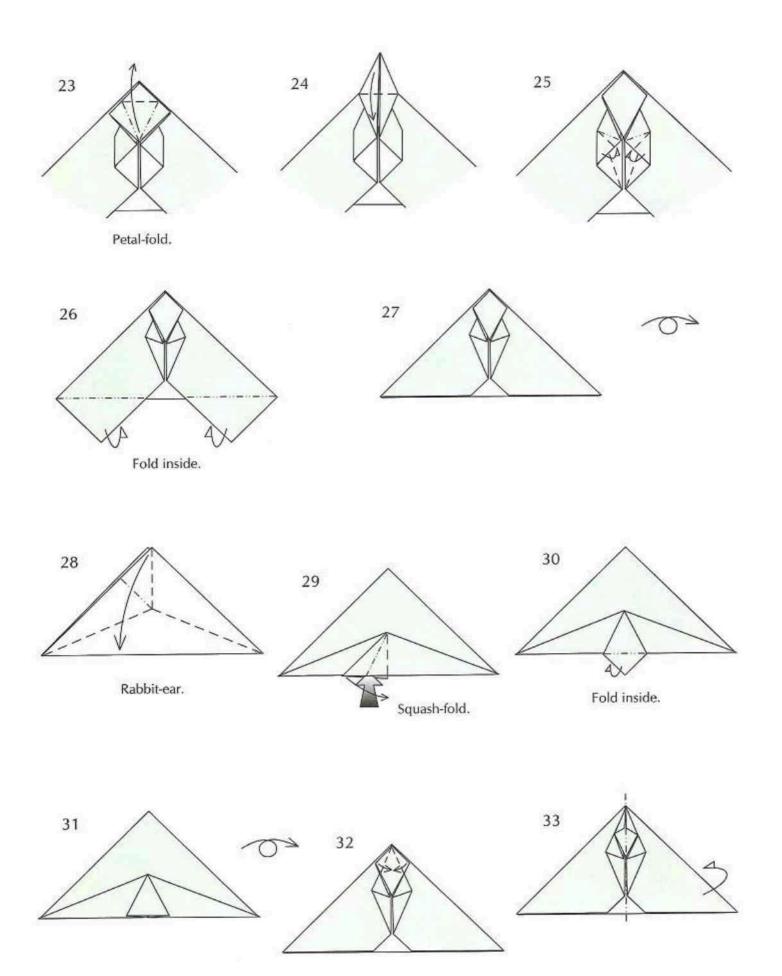




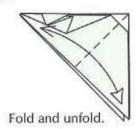
Repeat steps 17-19 on the left.



Squash-fold.



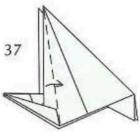




Repeat behind.



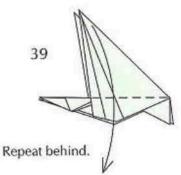
Fold at an angle of one-third, repeat behind.

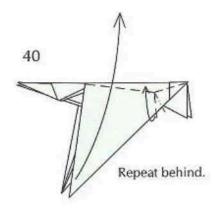


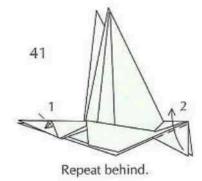


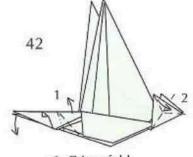


Repeat behind.

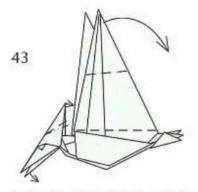




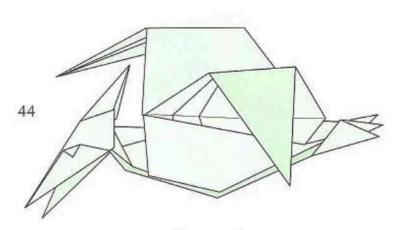




 Crimp-fold.
 Rabbit-ear, repeat behind.

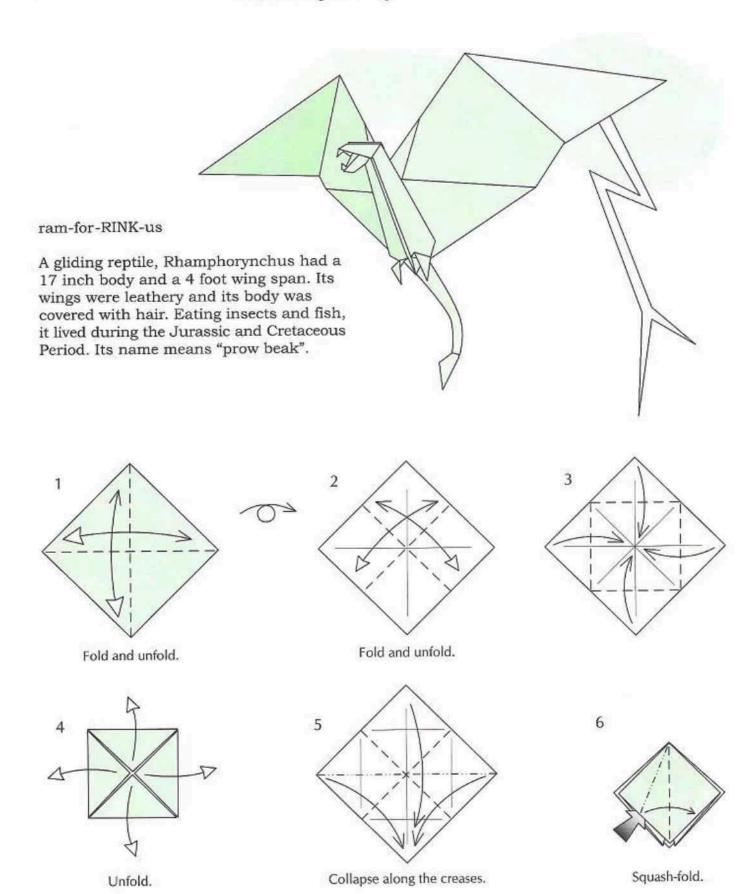


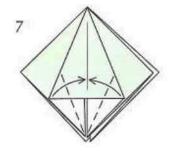
Crimp-fold the crest. Spread the wings and beak. Repeat behind.

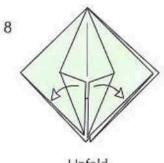


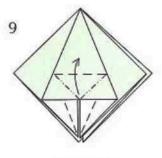
Pteranodon

# Rhamphorynchus



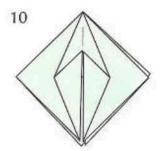




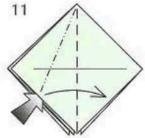


Unfold.

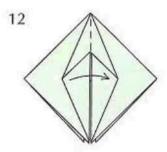
Petal-fold.



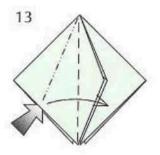




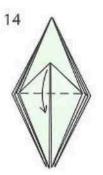
Repeat steps 6-9.



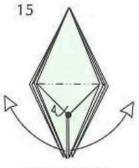
Repeat behind.



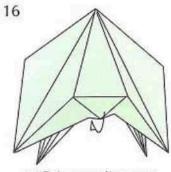
Repeat steps 6-9 in front and behind.



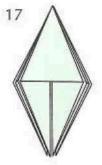
This is the Frog Base.



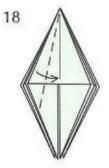
Spread to fold the dot inside.

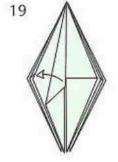


A 3D intermediate step.

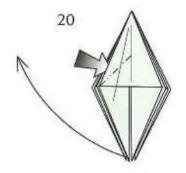


Repeat steps 14–16 three more times on the back and sides.

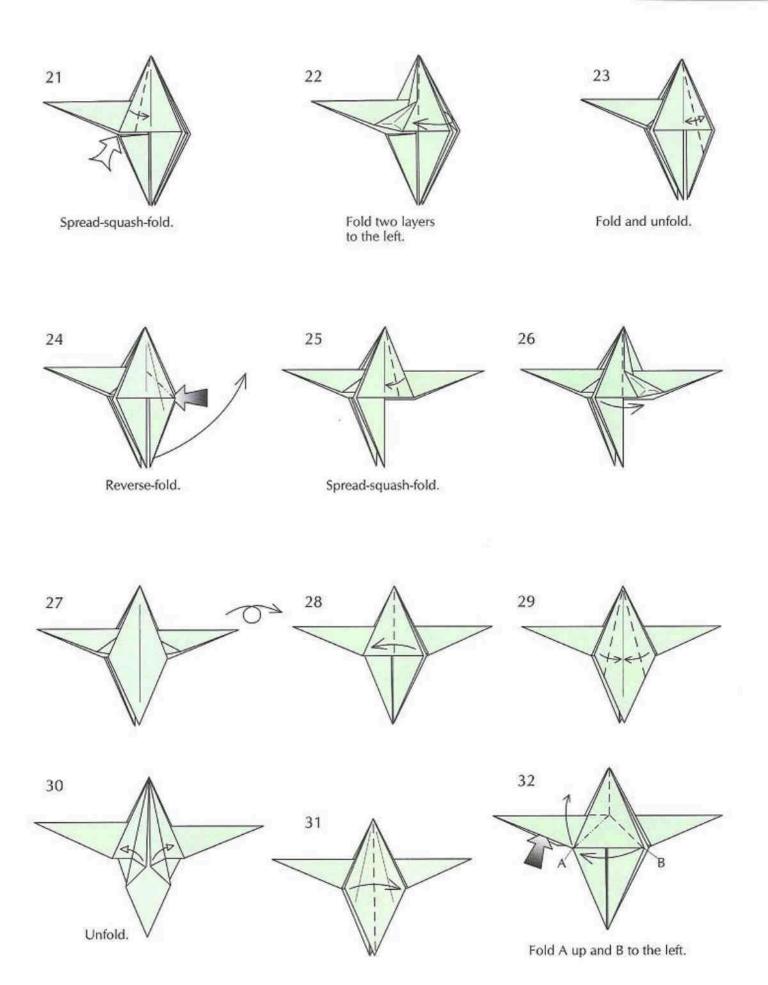


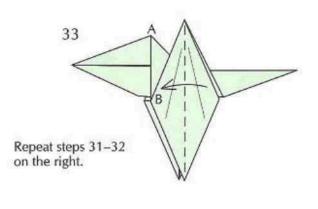


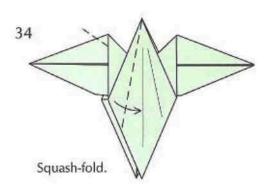
Unfold.

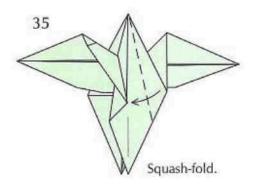


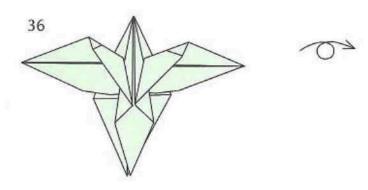
Reverse-fold.

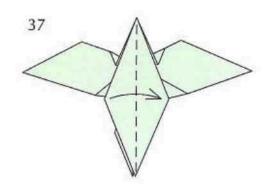


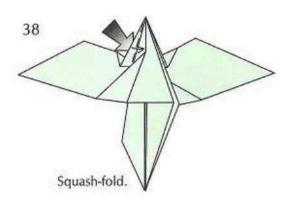


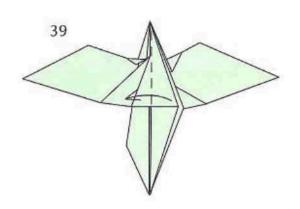


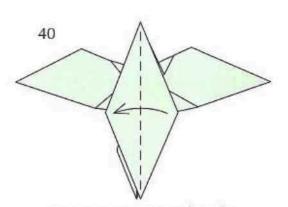




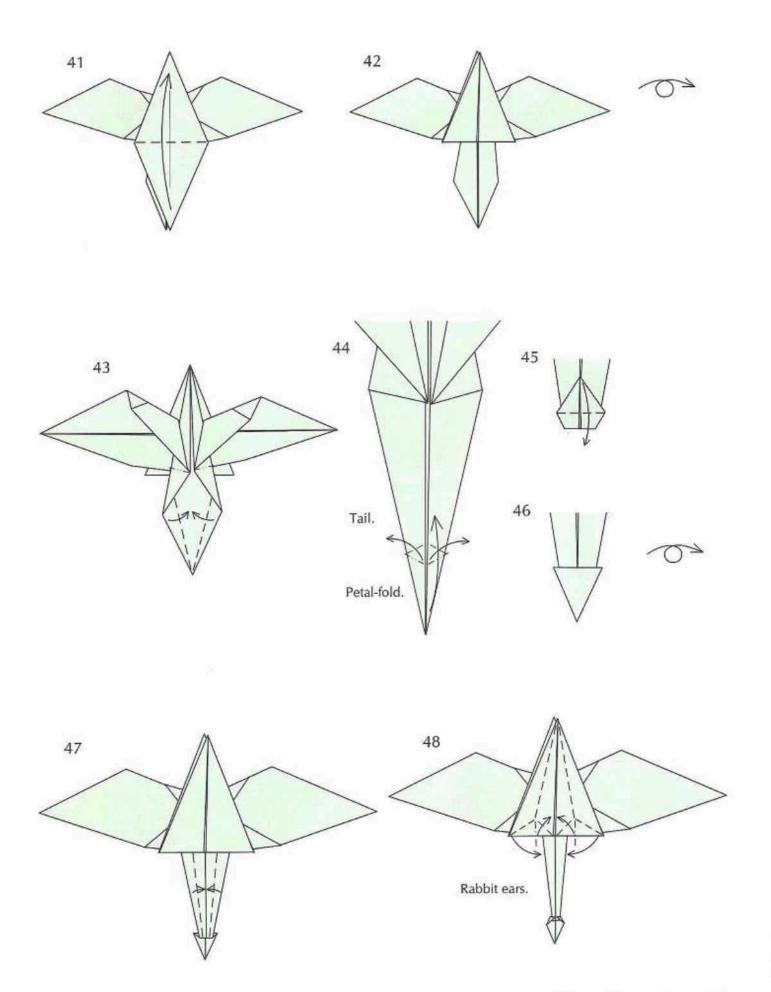


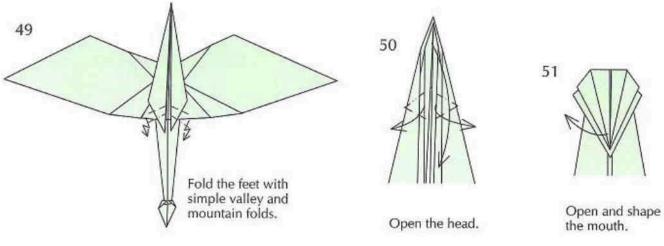


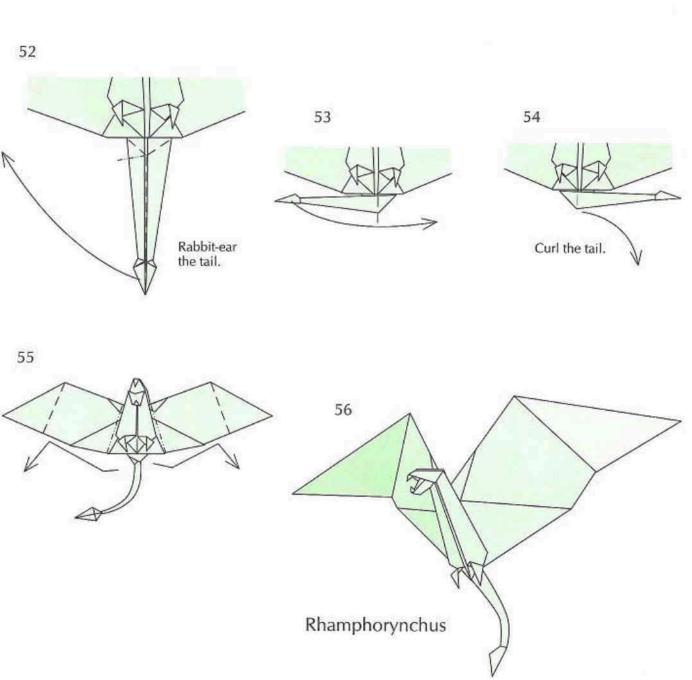




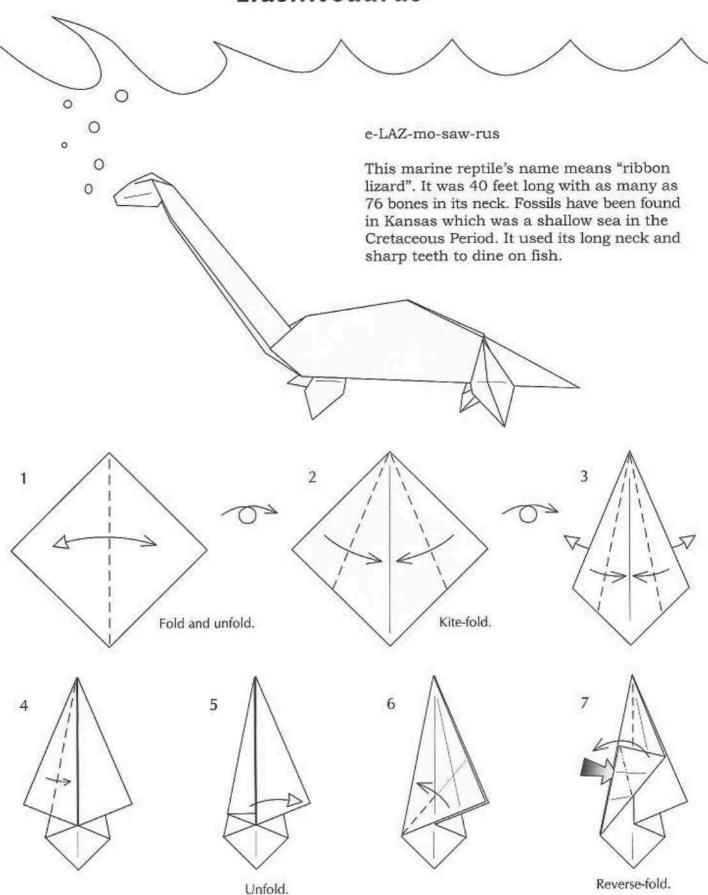
Repeat steps 37-39 on the right.

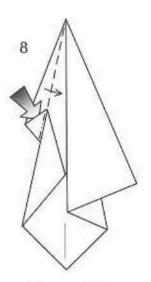




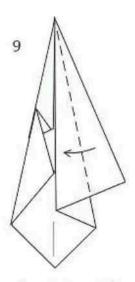


## Elasmosaurus





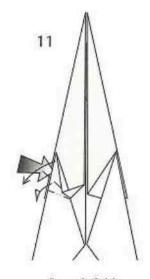
Reverse-fold.



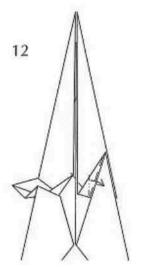
Repeat steps 4–8 on the right.



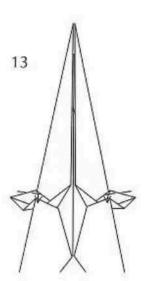
Only part of the model is drawn. Make a thin squash fold.



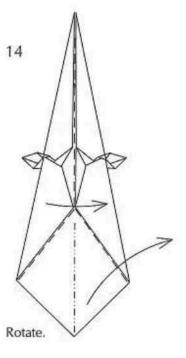
Squash-fold.

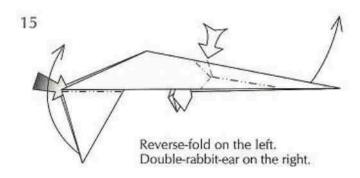


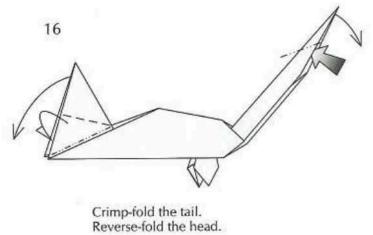
Repeat steps 9–10 on the right.





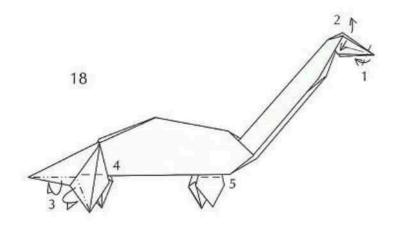




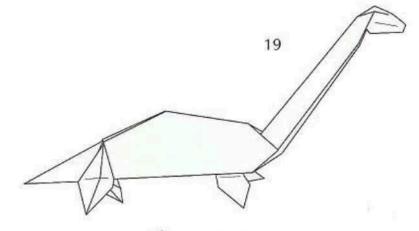


17

Crimp-fold the tail. Fold down one of the layers at the head. Repeat behind.



- Reverse-fold.
   Spread and open the head.
   Fold the back feet and tail.
- 4 and 5. Bend the feet. Repeat behind.

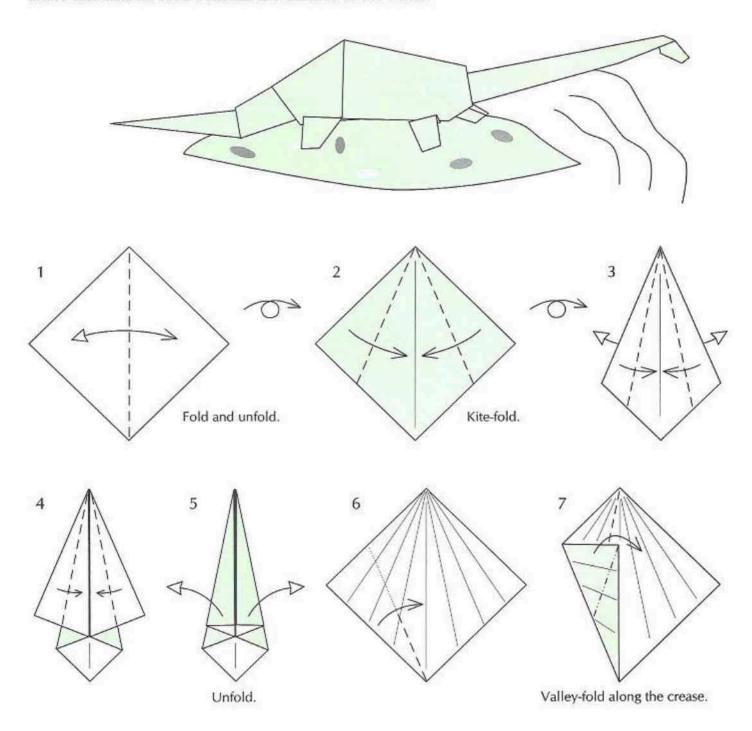


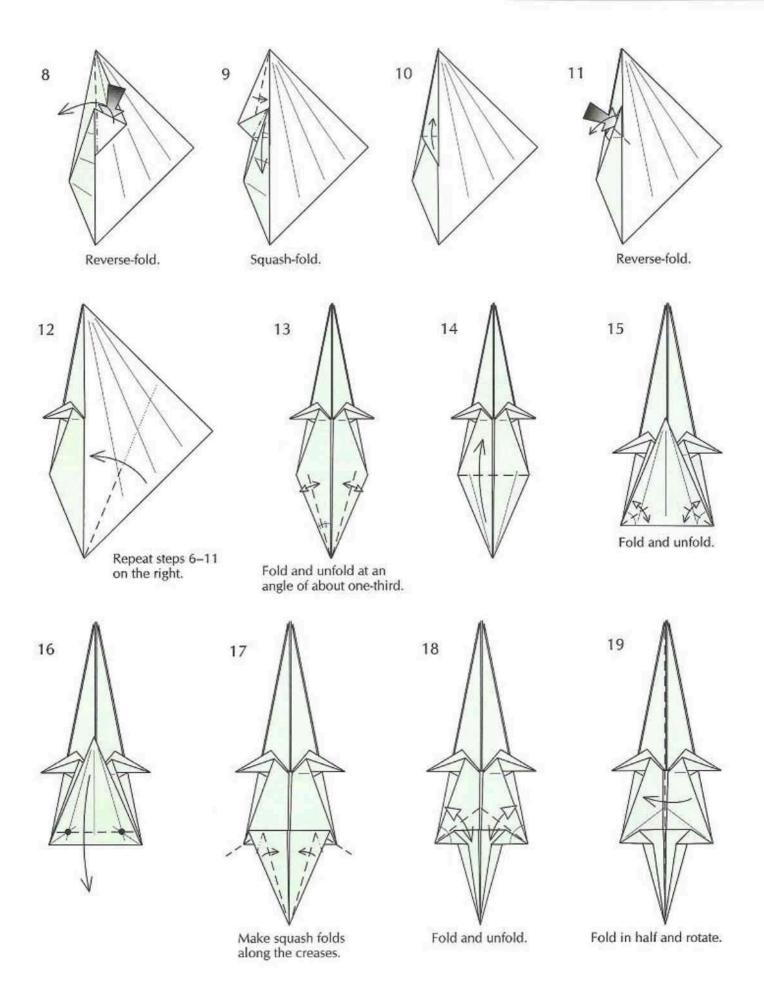
Elasmosaurus

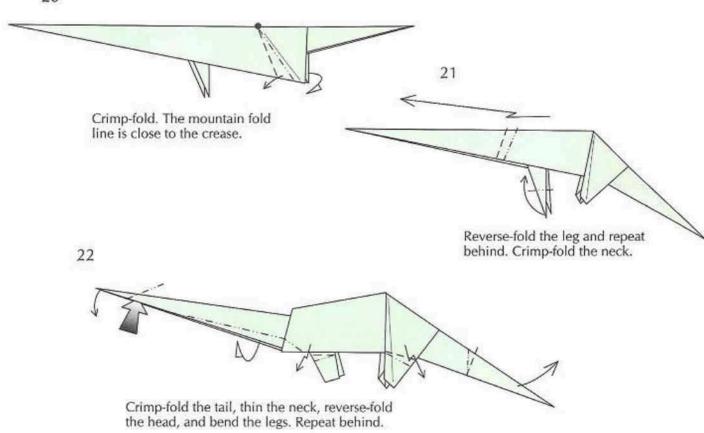
## **Tanystropheus**

### tan-e-STRO-fee-us

This lizard lived on the shores of Triassic seas in Germany. The hip structure clearly prevents it from being called a dinosaur. Its 9 foot long neck was more than half its total 15 foot length. It could remain on the shore and fish for food beneath the surface of the water.



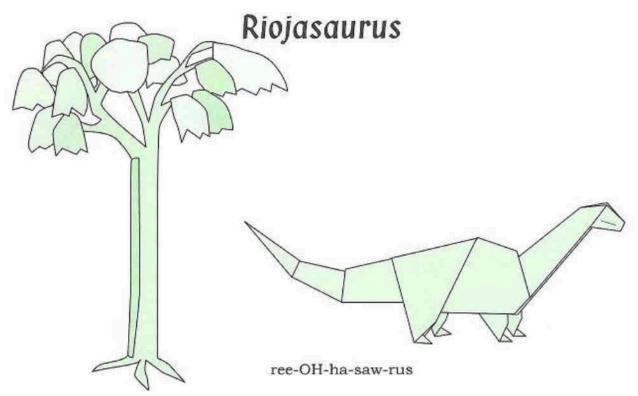




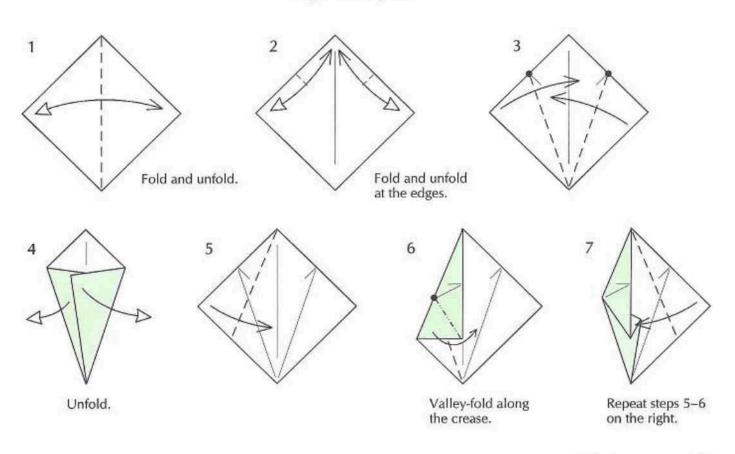


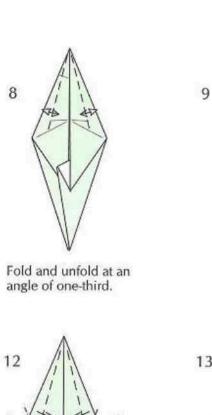
Tanystropheus Tanystropheus

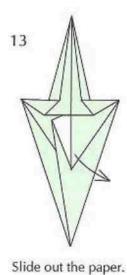
the layers at the head. Repeat behind.

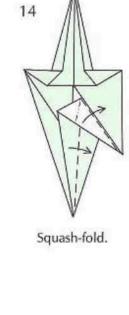


This plant eating dinosaur lived at the end of the Triassic Period. It was 30 feet long and kept its four elephant-like legs on the the ground all the time. It is named for La Rioja Provence in Argentina where its fossils were found. It was a relative of the later, larger sauropods.



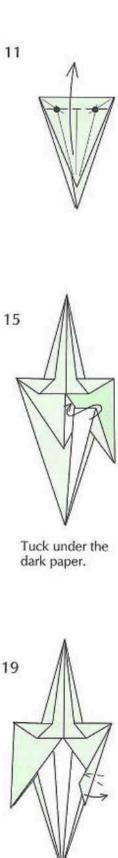


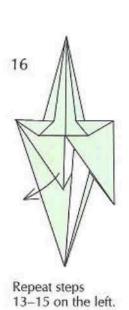




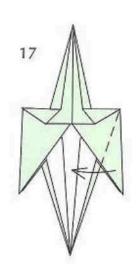
Fold and unfold the top layer.

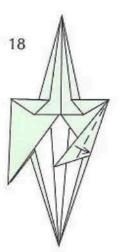
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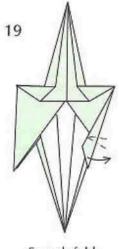




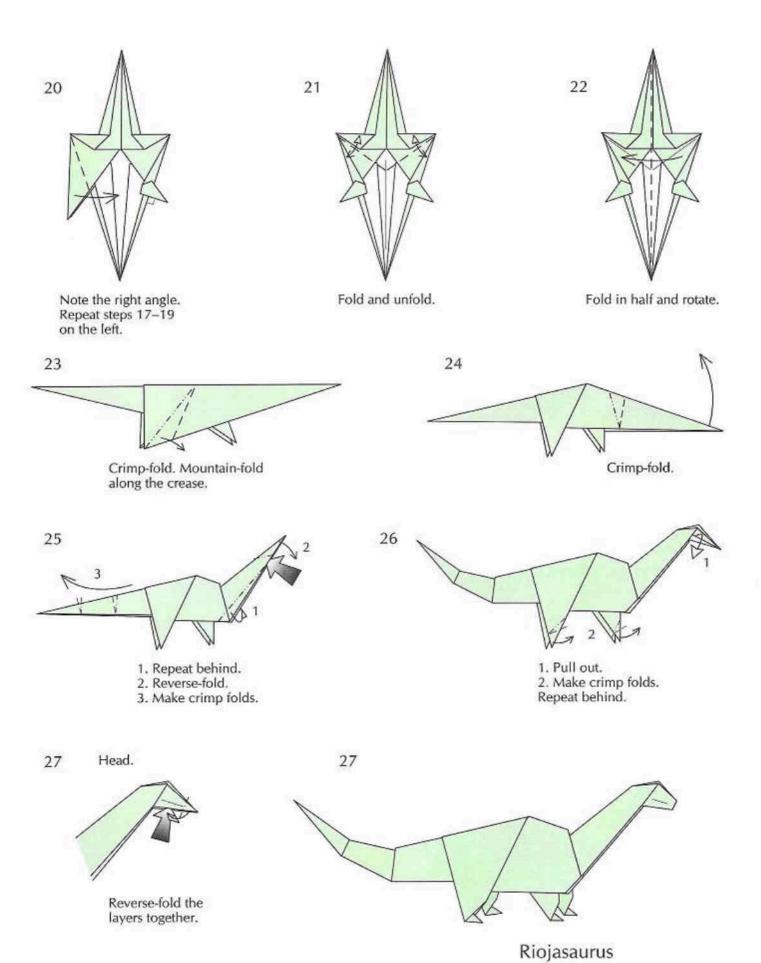
Valley-fold along the creases for the squash folds.

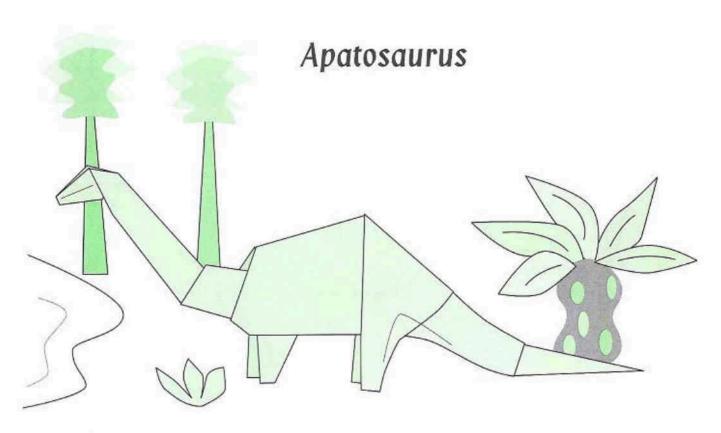






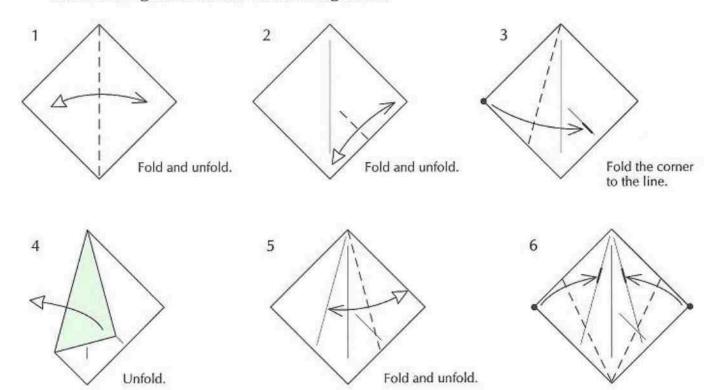
Squash-fold.

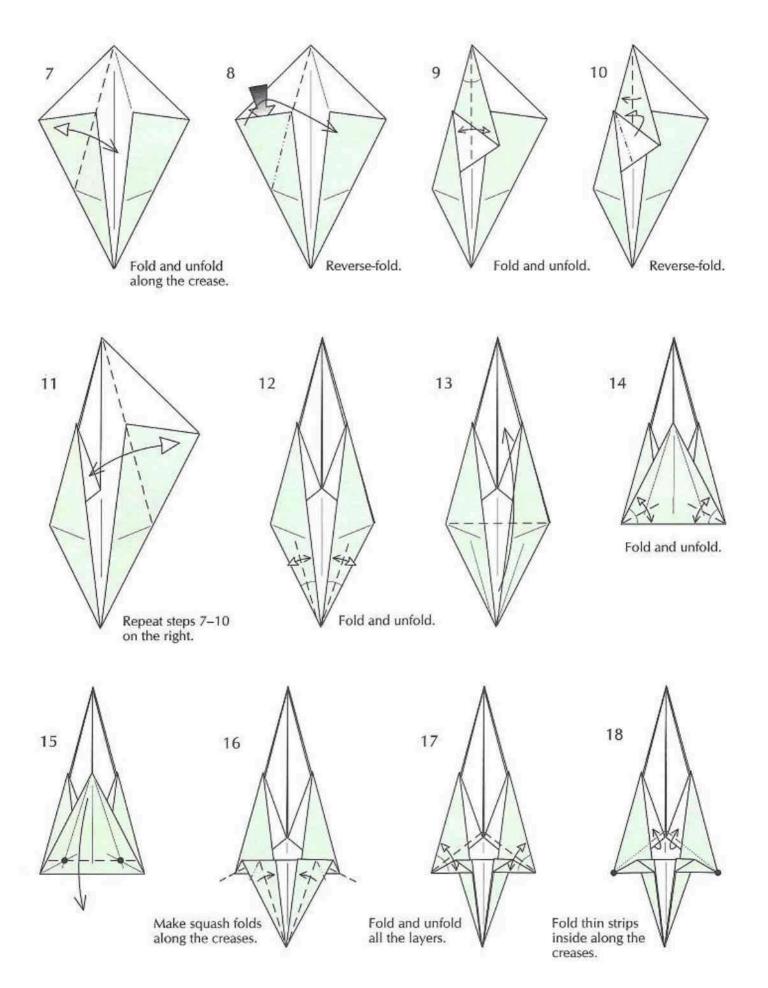


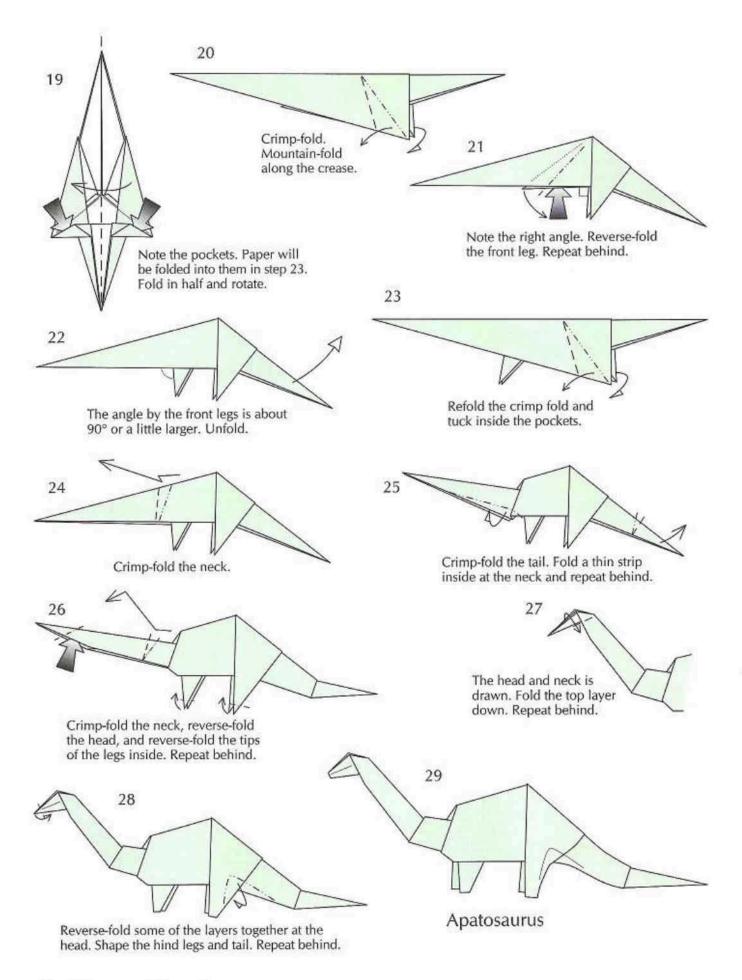


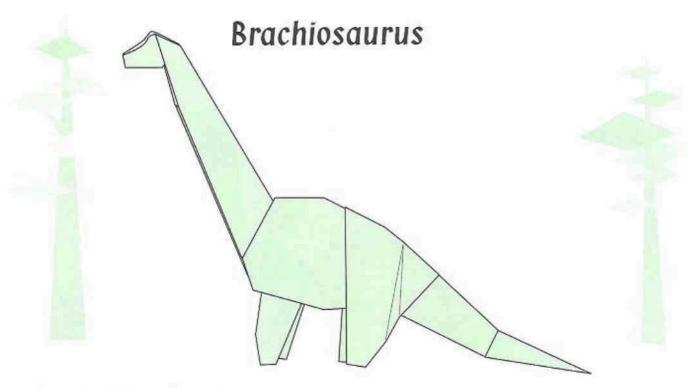
#### a-PAT-oh-saw-rus

This dinosaur is better known as Brontosaurus, the "thunder lizard" but more correctly named Apatosaurus, the "headless lizard". It was 70 feet long and very heavy. The front legs were shorter than the back legs. Its fossils were found in the western U.S. with other Jurassic dinosaurs. Its small flat teeth could not have ground up all the food required to fuel this animal so it relied on "gizzard stones" to aid in digestion.



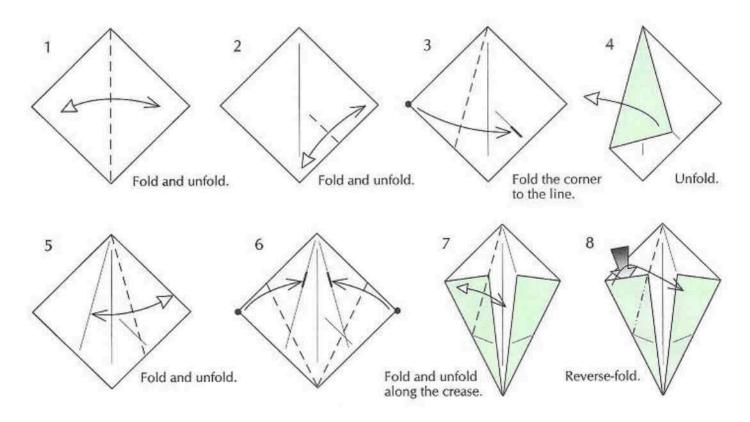


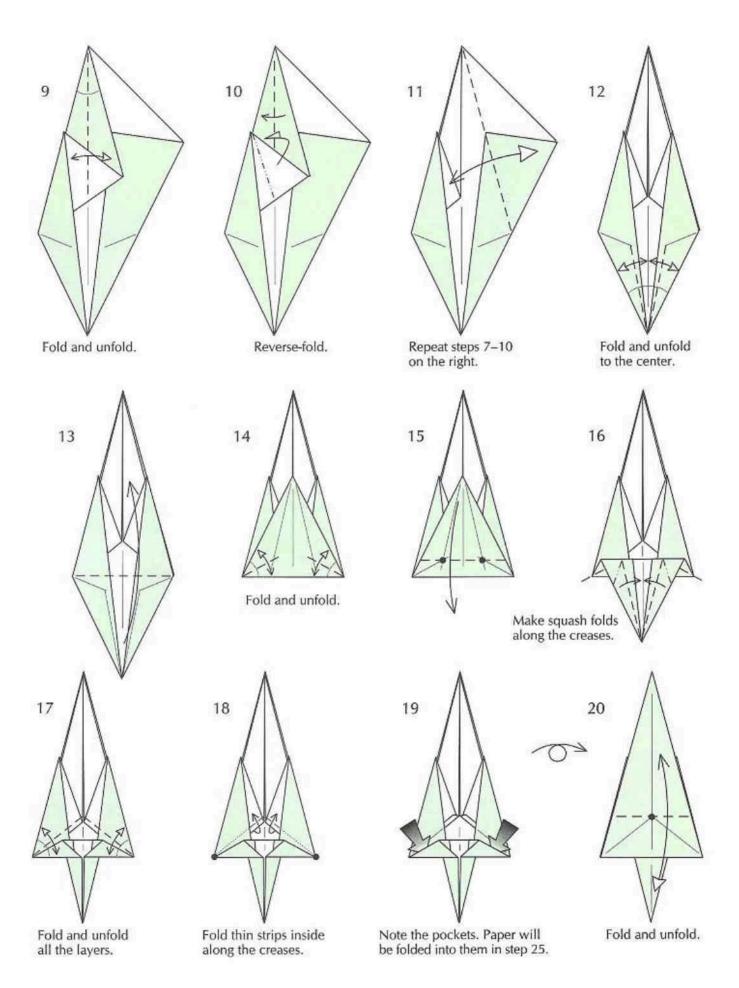


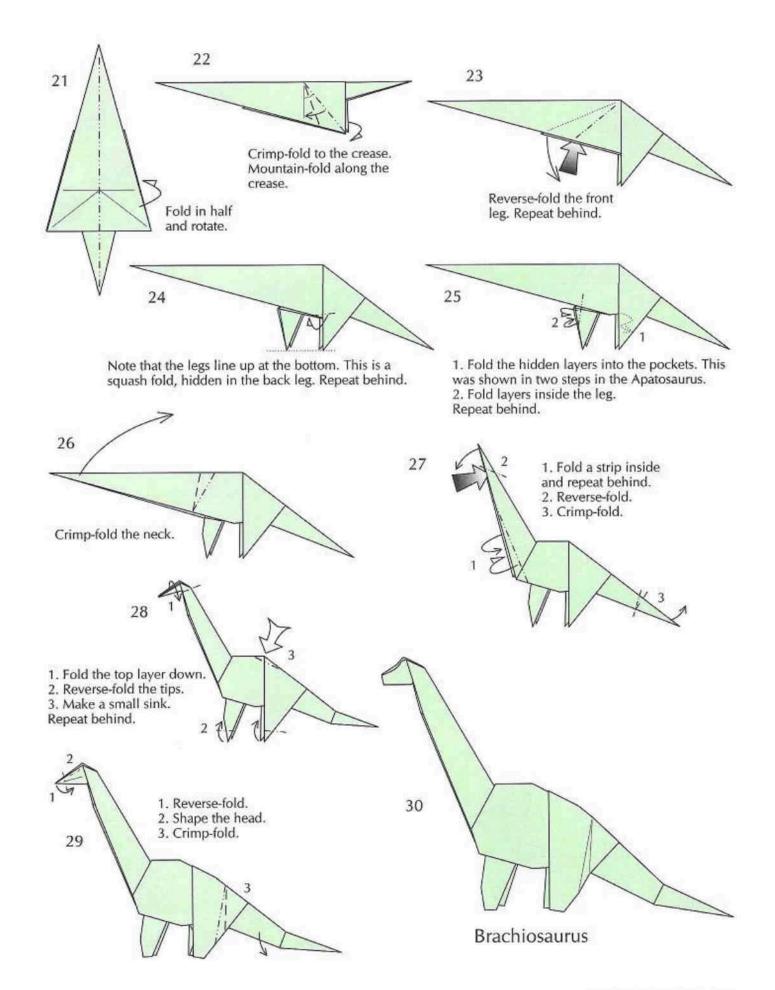


#### BRAKE-ee-oh-saw-rus

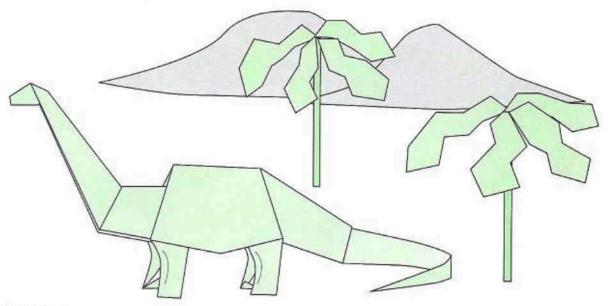
This 75 foot long Jurassic dinosaur was called "arm lizard" because its front legs were longer than its back legs. The placement of the nose on top of its head was once thought to aid in breathing when submerged in deep water. Now some paleontologists believe it lived on high ground, eating pine needles, since the skeleton could not have withstood the pressure of deep water. Fossils were found in Colorado.





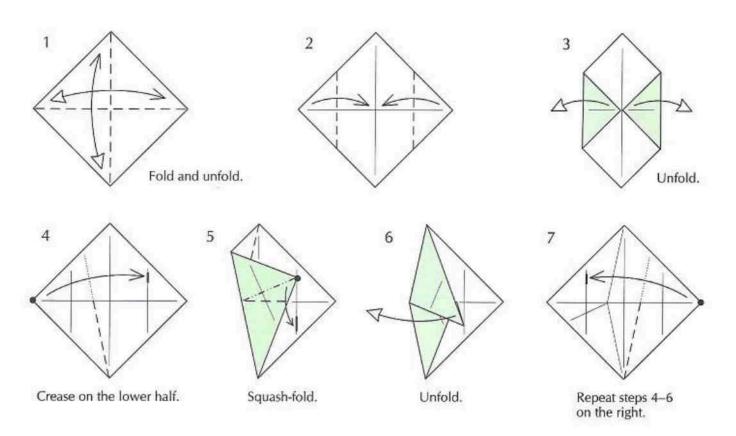


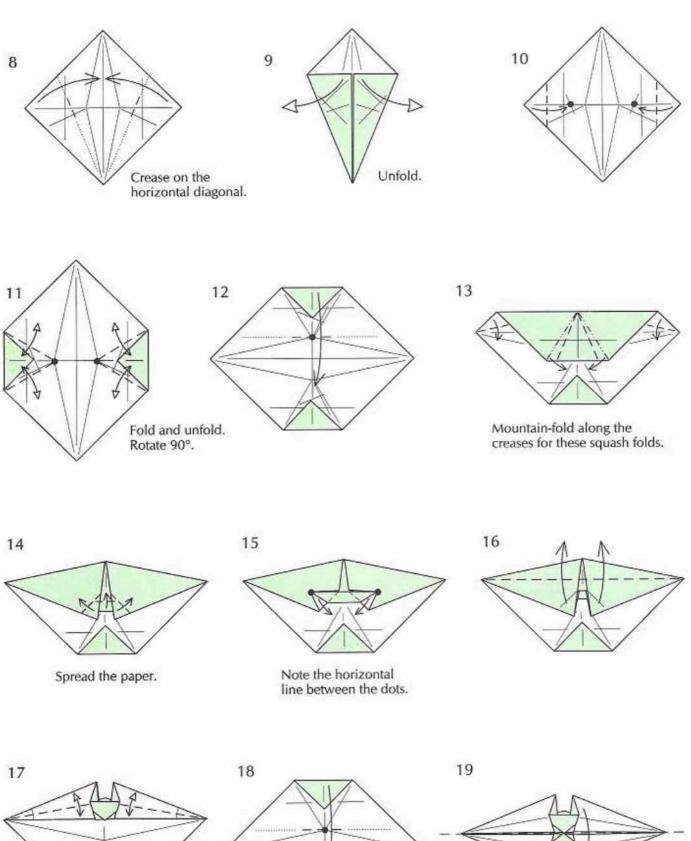
## Diplodocus



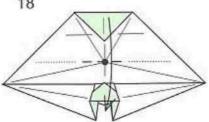
dih-PLOD-u kus

One of the longest dinosaurs ever found, this Jurassic creature was 90 feet from is head to its tail tip. Its name means "double beam" because of the double "Y" shaped vertebrae in its tail. This provided for more place for muscle attachments and made the tail a whip-like weapon. Fossils were found in the Rocky Mountain States.

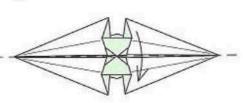


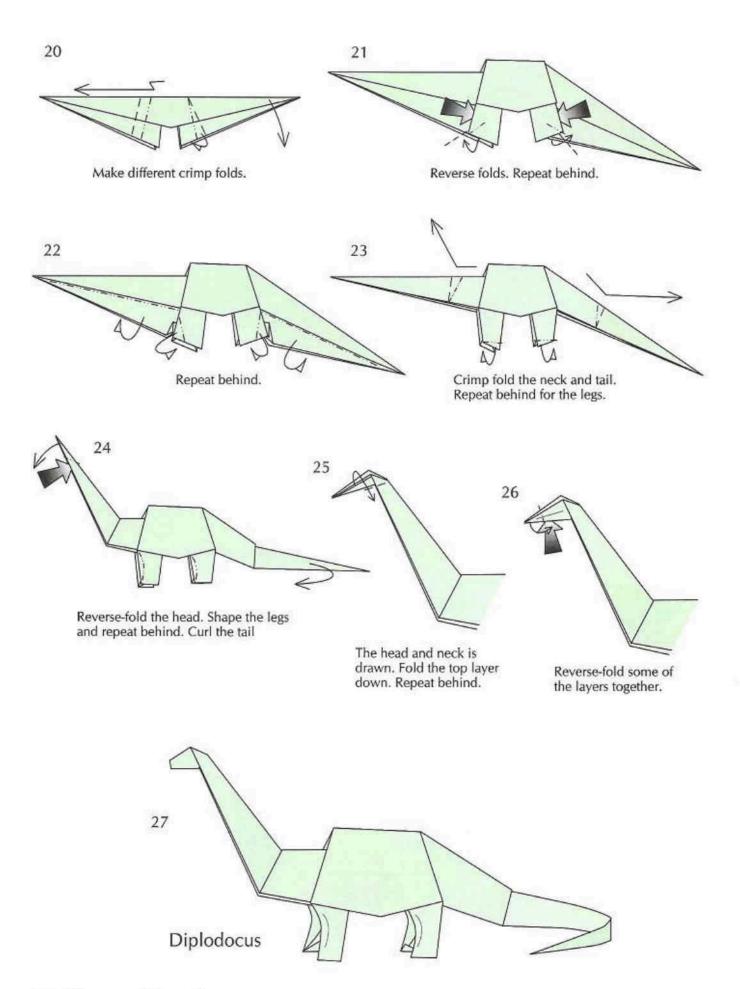


Fold and unfold the top layers to bisect the angles. Rotate 180°.

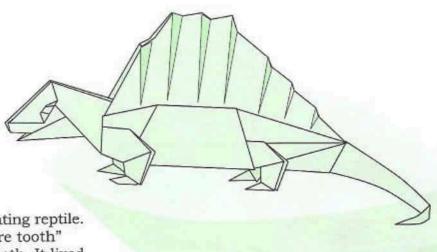


Repeat steps 12-17.



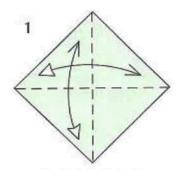


## Dimetrodon

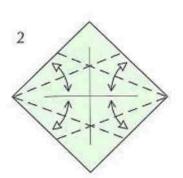


di-ME-tro-don

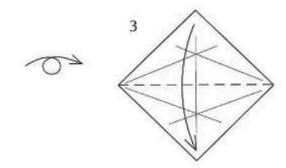
This was a very powerful meat eating reptile. Its name means "double measure tooth" because of its many knife-like teeth. It lived in the Permian Period immediately preceding the Mesozoic Era. It was about 10 feet long and the "sail" on its back helped regulate its body temperature.

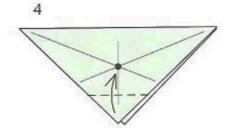


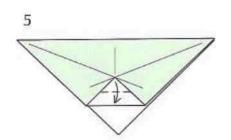
Fold and unfold.

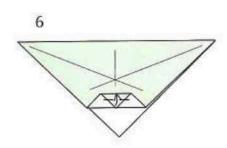


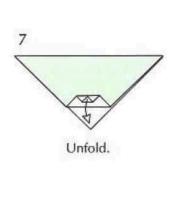
Kite-fold and unfold.

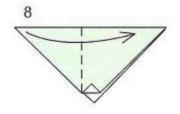


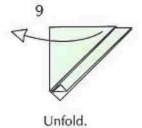


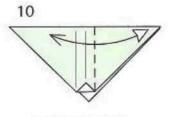




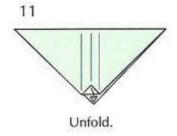


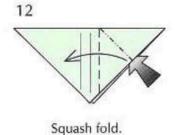


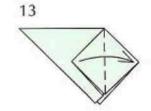


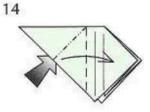


Fold to the left and unfold.

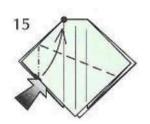




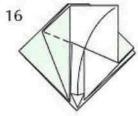




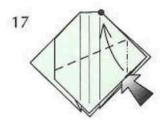
Repeat steps 12–13 on the left.



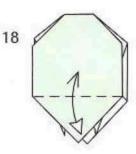
Squash fold.



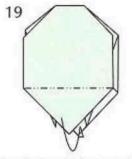
Unfold.



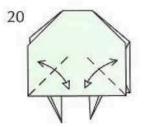
Repeat steps 15–16 three more times on the right and back.



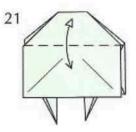
Fold up and unfold. Repeat behind.



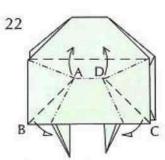
Mountain-fold along the crease. Repeat behind.



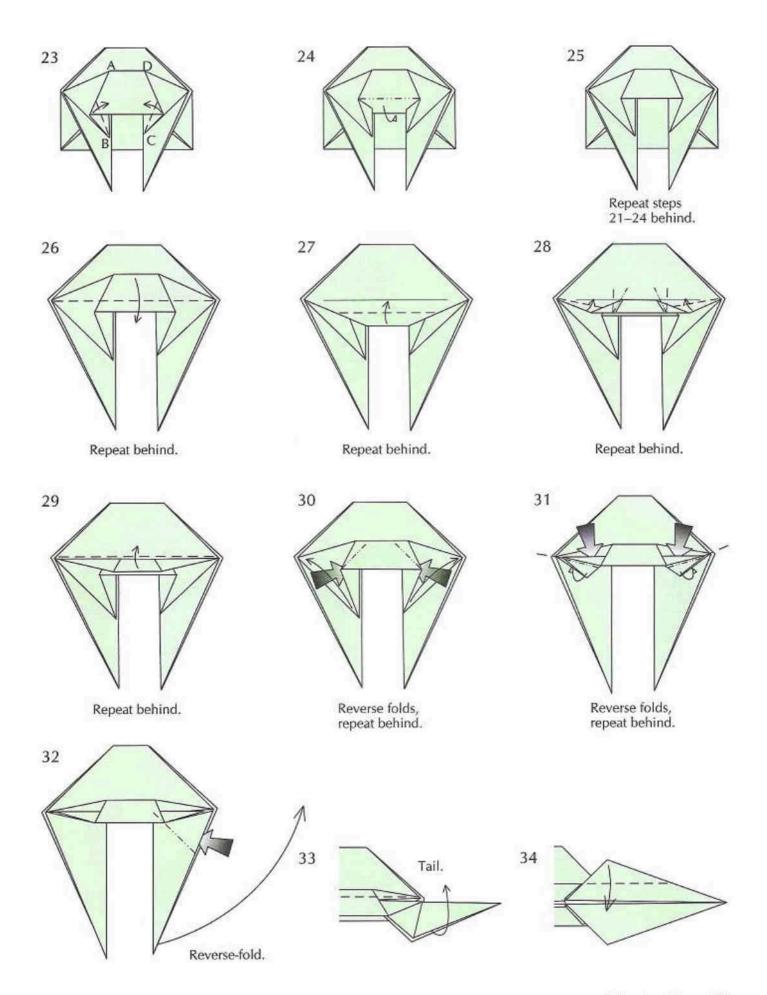
Fold and unfold. Repeat behind.

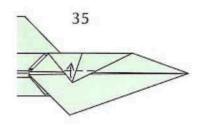


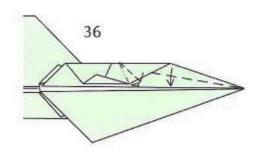
Fold down and unfold.

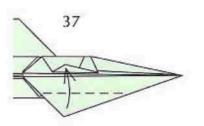


This is a tricky fold! Lift A–D up while bringing B and C closer together.

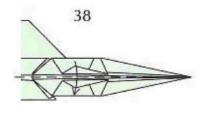


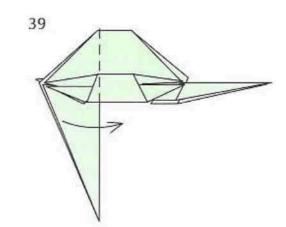


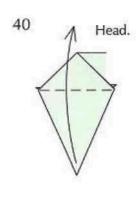


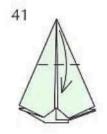


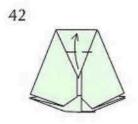
Repeat steps 34-36.

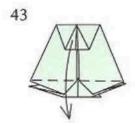


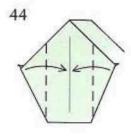


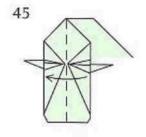


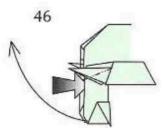




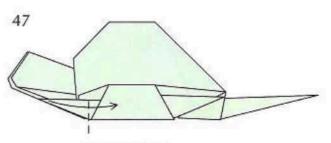




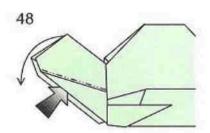




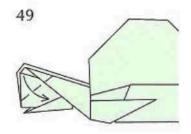




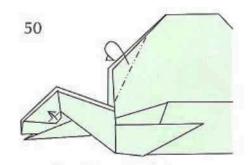
Repeat behind.



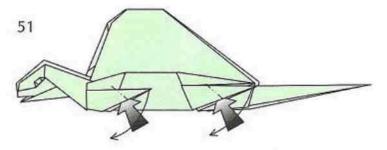




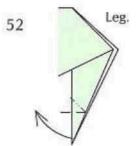
Repeat behind.



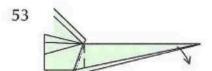
Form the eye and shape the back. Repeat behind.



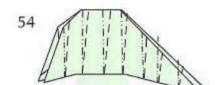
Reverse folds, repeat behind.



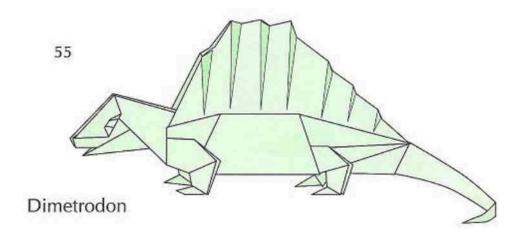
Crimp-fold the four legs.



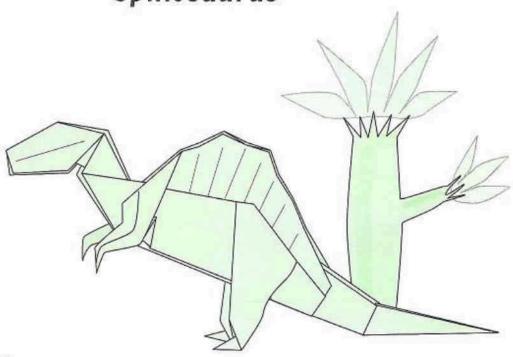
Crimp-fold and curl the tail.



Pleat Dimetrodon's sail.

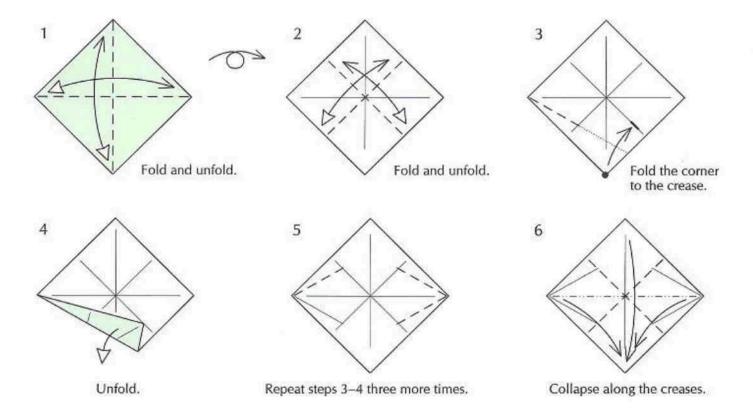


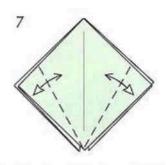
# Spinosaurus



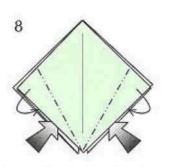
#### SPINE-oh-saw-rus

This 40 foot long dinosaur was a fierce meat eater. The sail down its back helped control its body heat. Fossils were found in Egypt. It lived at the end of the Cretaceous Period. Spinosaurus means "spine lizard". Despite the sail, Spinosaurus was not related to Dimetrodon.

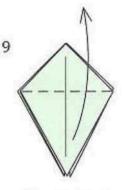




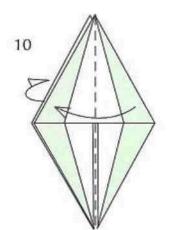
Fold and unfold along hidden creases. Repeat behind.

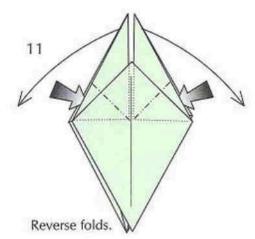


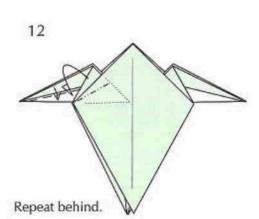
Reverse folds. Repeat behind.

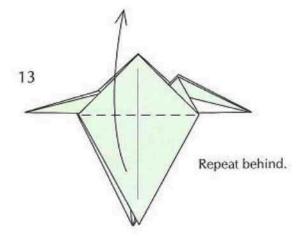


Repeat behind.

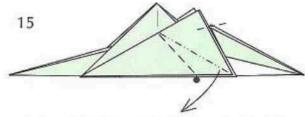




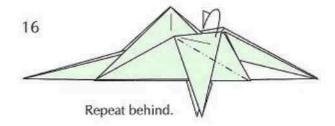


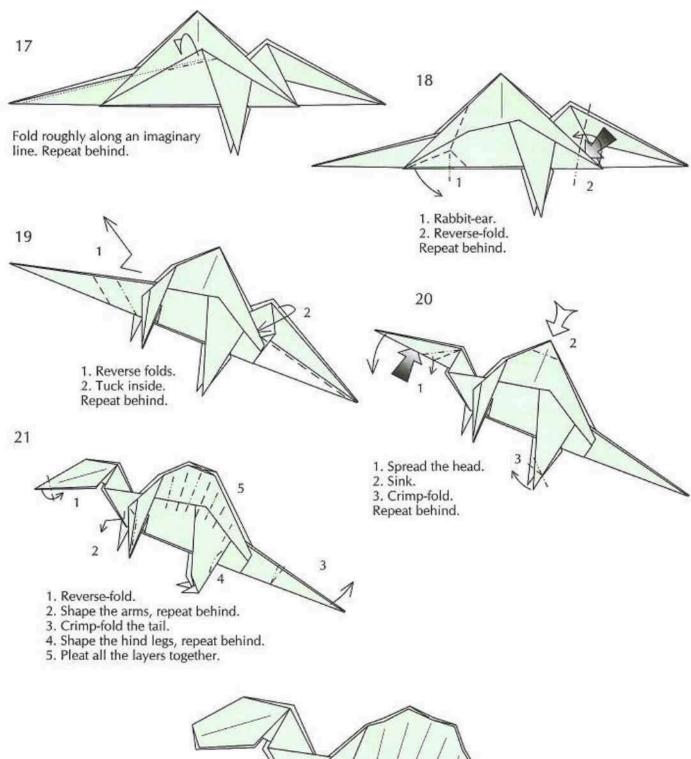


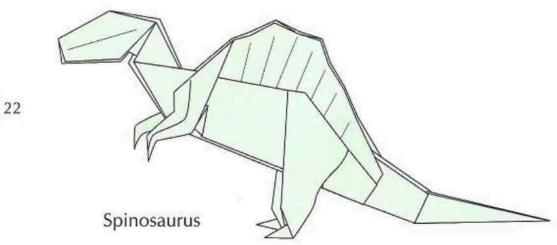




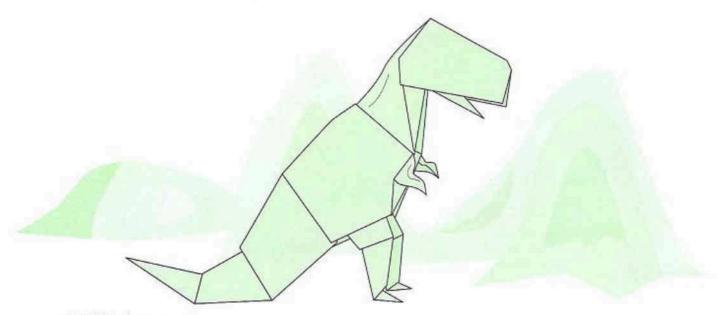
Squash-fold. The dot is at the color change on a hidden layer. Repeat behind.





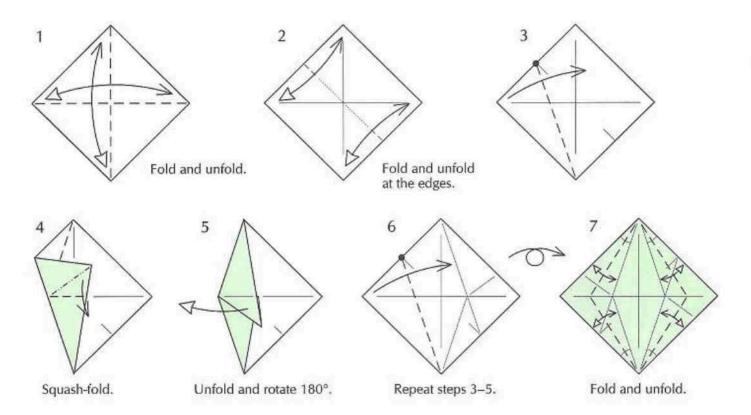


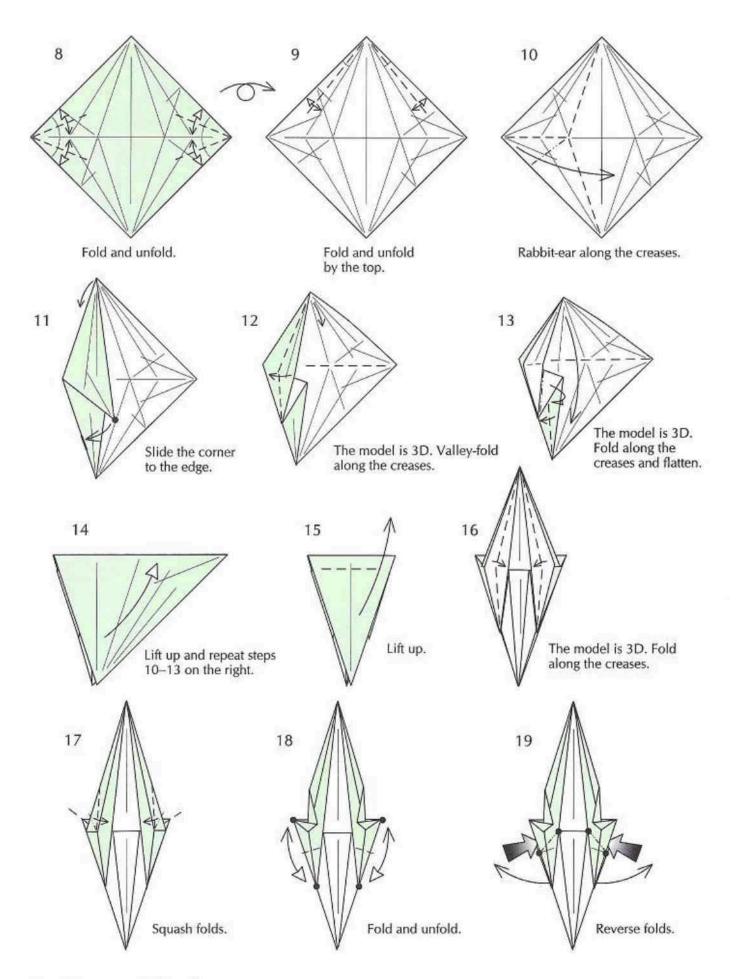
### Tyrannosaurus

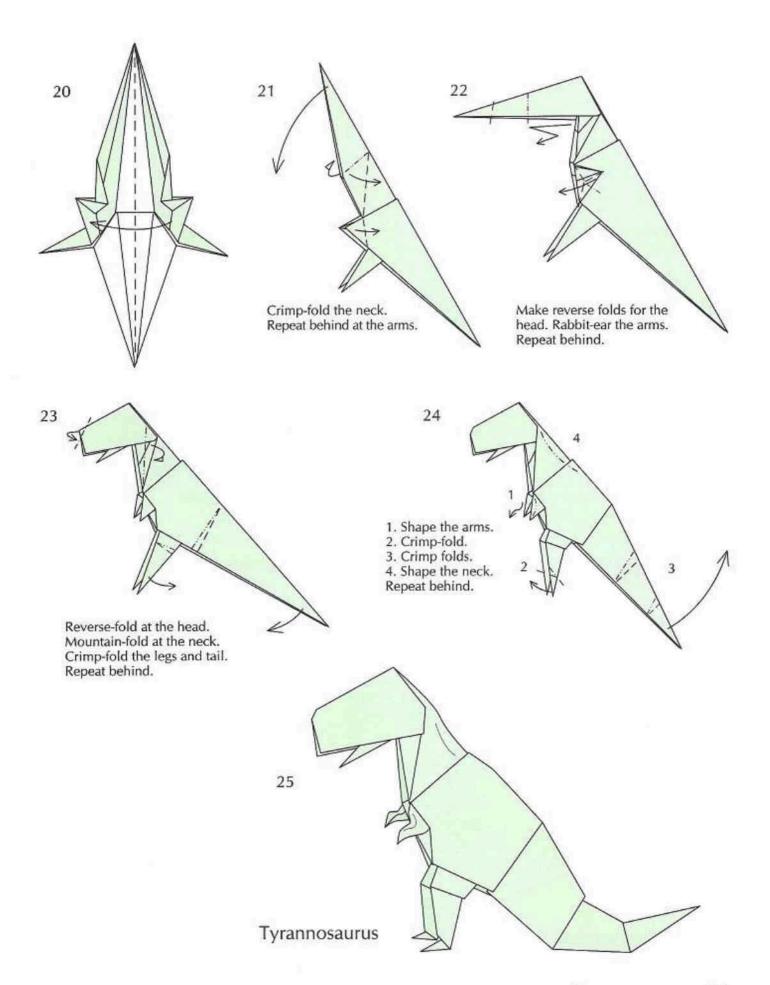


ti-RAN-oh-saw-rus

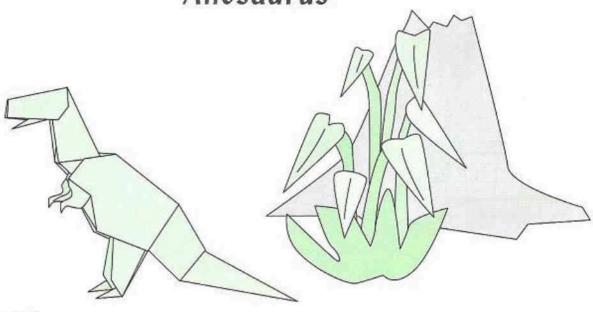
Probably the largest meat eater ever to walk the earth, this "tyrant lizard" was up to 50 feet long. The 6 inch dagger-like teeth were perfect for eating other Cretaceous animals. Once thought to be feared, some paleontologists now believe it was a scavenger, and could be easily beaten in a fight. Its arms were so small and weak that it probably could not get up if knocked over by the swing of a heavy tail. It used its claws like knives but could not reach its hand to its mouth.







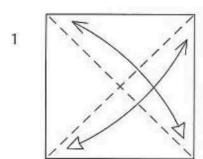
### Allosaurus



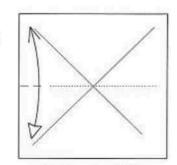
### AL-us-saw-rus

This was the main meat eating dinosaur of the Jurassic period. It was 35 feet long. With a massive head and strong neck, it was able to unhinge its jaws like a snake does today and swallow huge hunks of meat. Also known as Antrodemus, fossils were found in Africa, Asia, and North America.

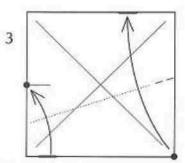
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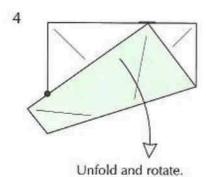
Fold and unfold.

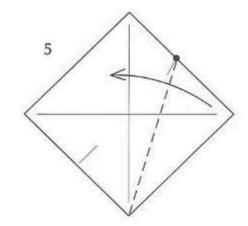


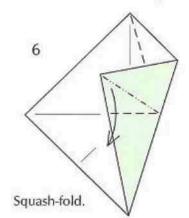
Fold and unfold on the left.

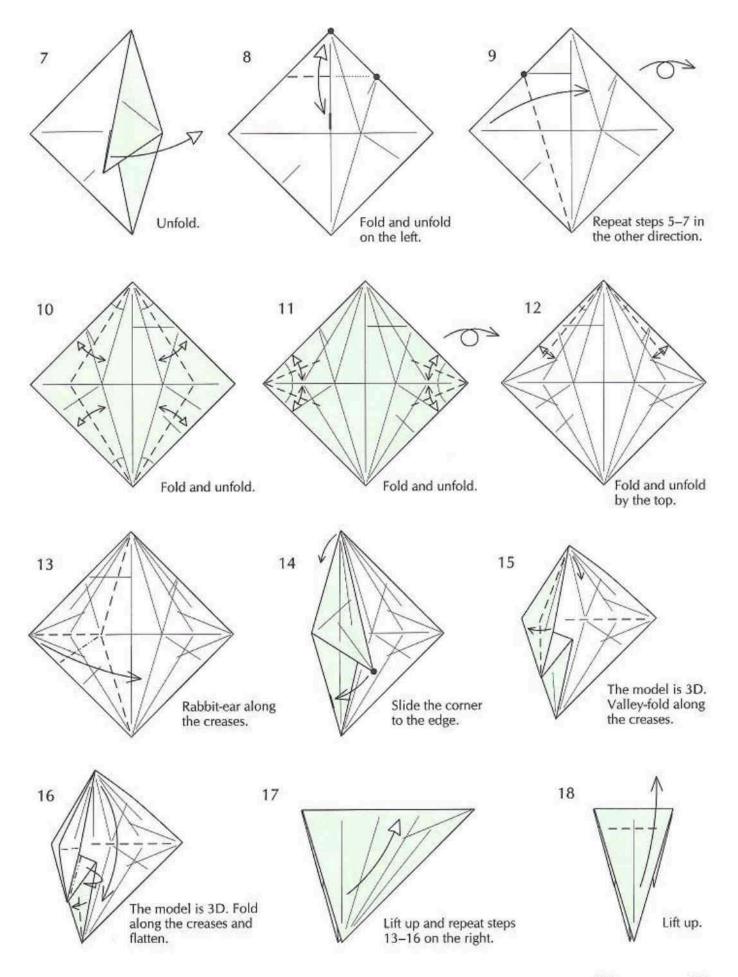


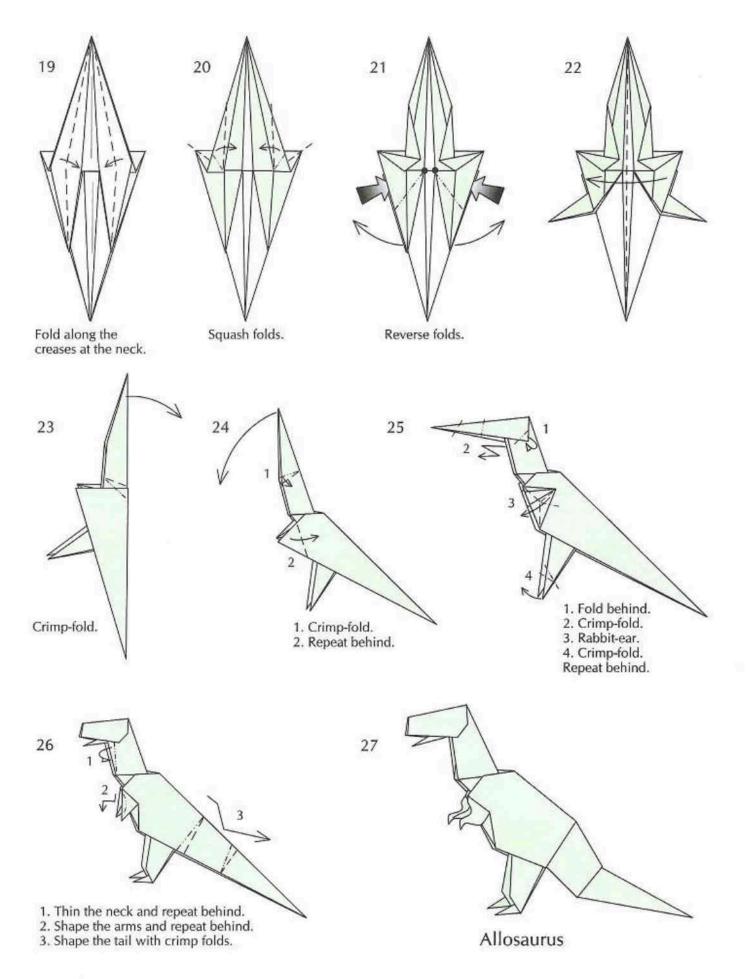
Bring the lower right corner to the top edge and the bottom edge to the left center. Crease on the right.



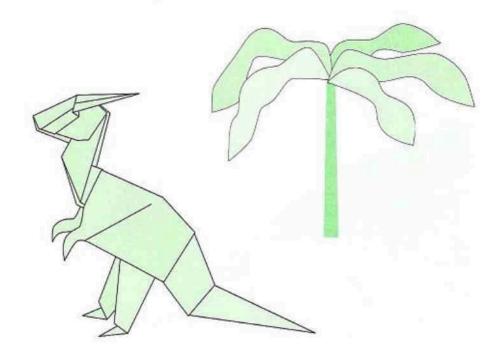








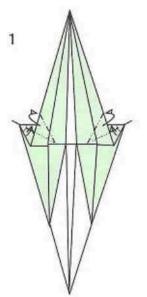
## Parasaurolophus

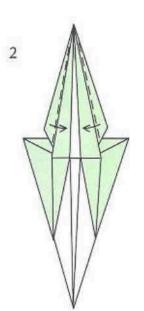


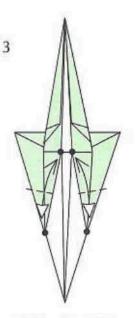
par-a-SAUR-oh-loaf-us

A swamp dwelling, Cretaceous plant eater, this dinosaur was 33 feet long. The webbed feet and bill were not the only similarities to ducks. The long tubular crest on the top of the head may have enabled it to honk like a goose. It had grinding teeth in the back of the mouth. Parasaurolophus means "almost crest head" and it may have been the female to Corythosaurus.

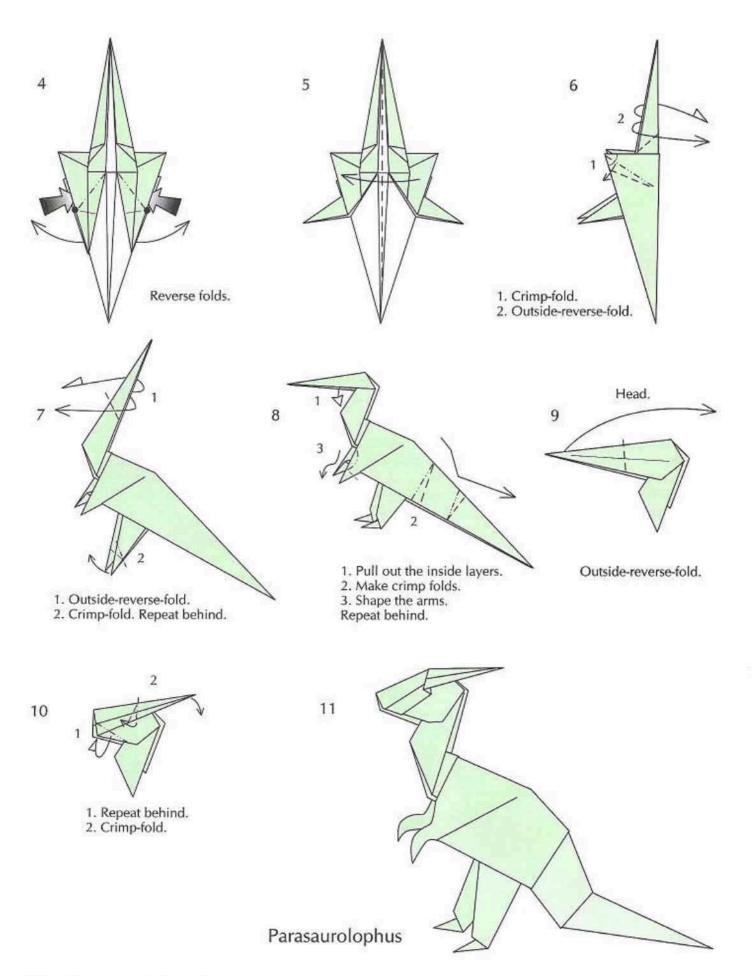
Begin with step 20 of Allosaurus (page 62).



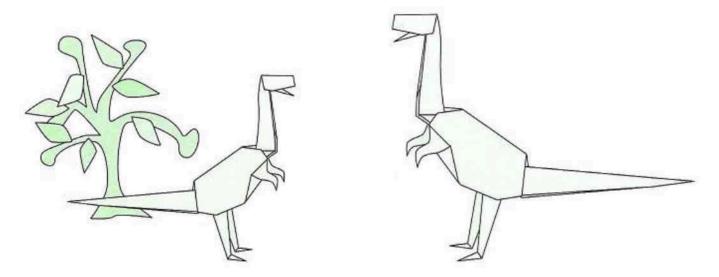




Fold and unfold.

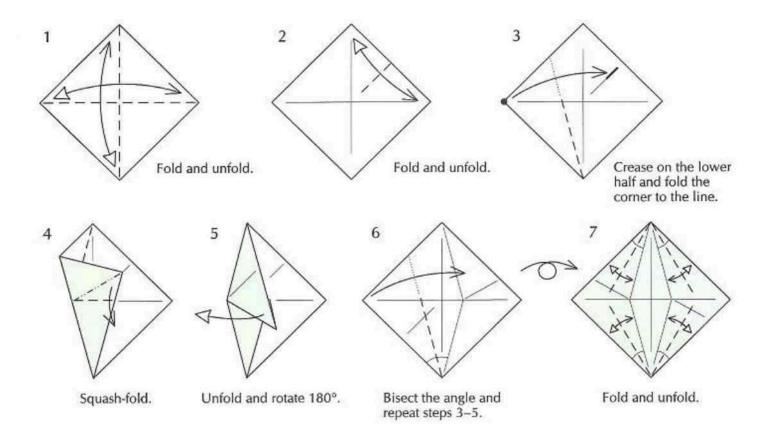


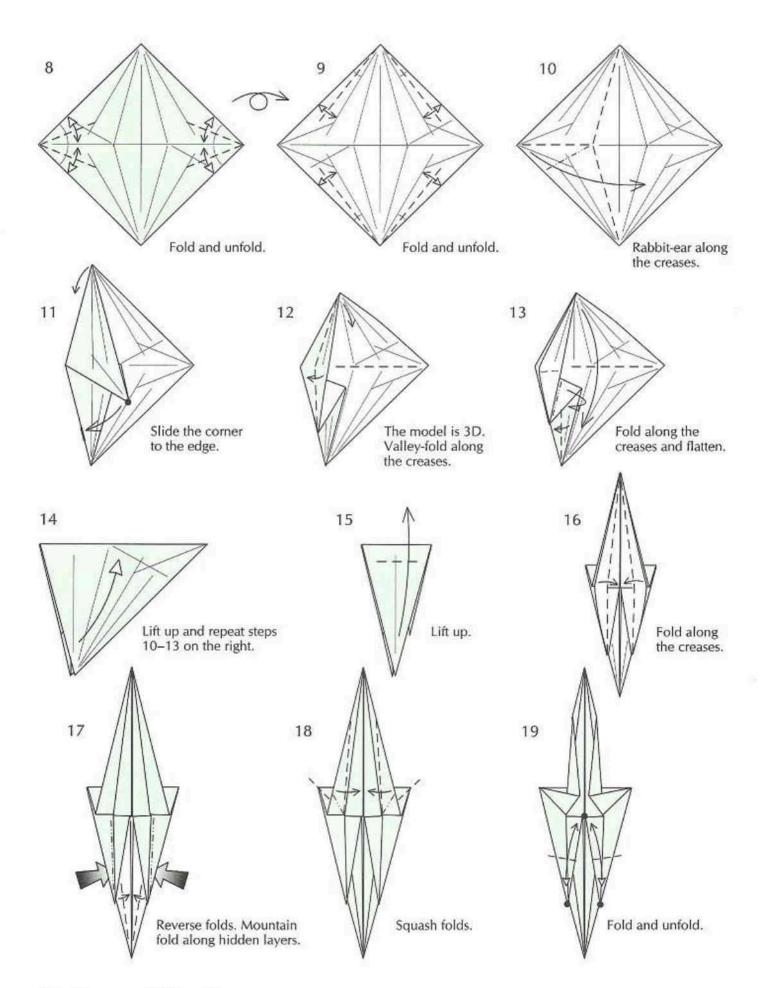
## Coelophysis

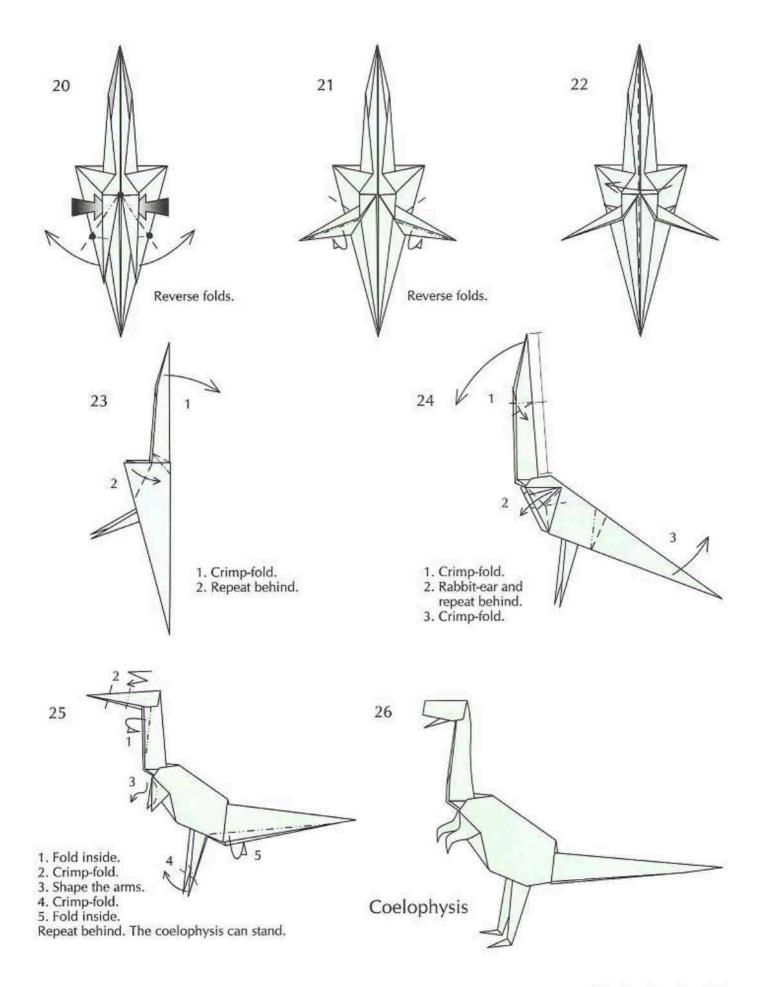


see-low-FY-sis

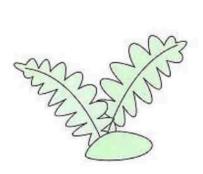
This dinosaur has many characteristics of birds today. It had feathers, is believed to have been warm blooded, and had hollow bones, hence its name means "hollow form". It probably lived in family groups. It was 10 feet long and weighed 100 pounds. Fossils have been found in New Mexico and the eastern United States.

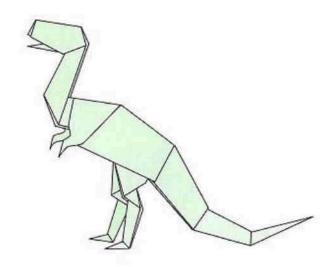






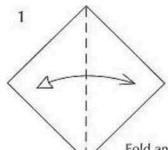
## Compsognathus



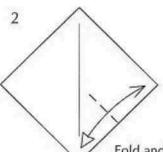


### komp-so-NAY-thus

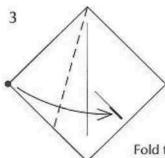
This tiny dinosaur was the size of a chicken and is one of the smallest dinosaurs ever found. It had hollow bones and bird-like legs. It ran swiftly around Jurassic Germany catching small reptiles and insects with its sharp claws. Its name means "elegant jaw".



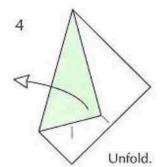
Fold and unfold.

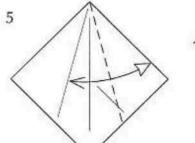


Fold and unfold.

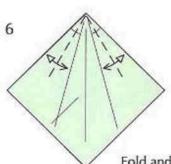


Fold the corner to the line.

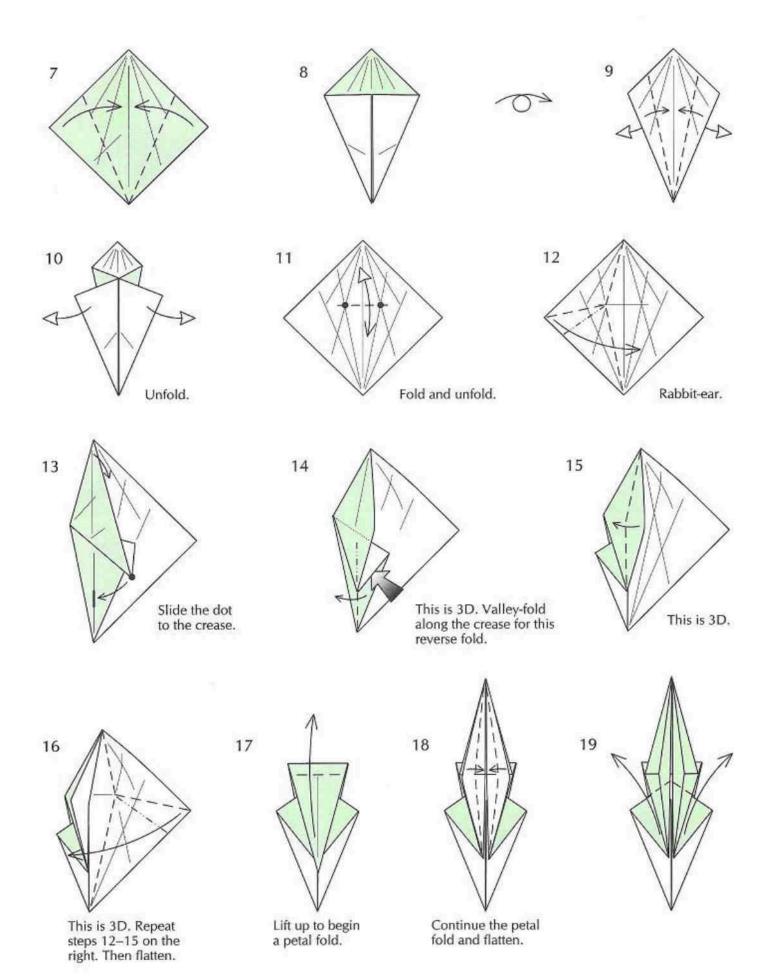


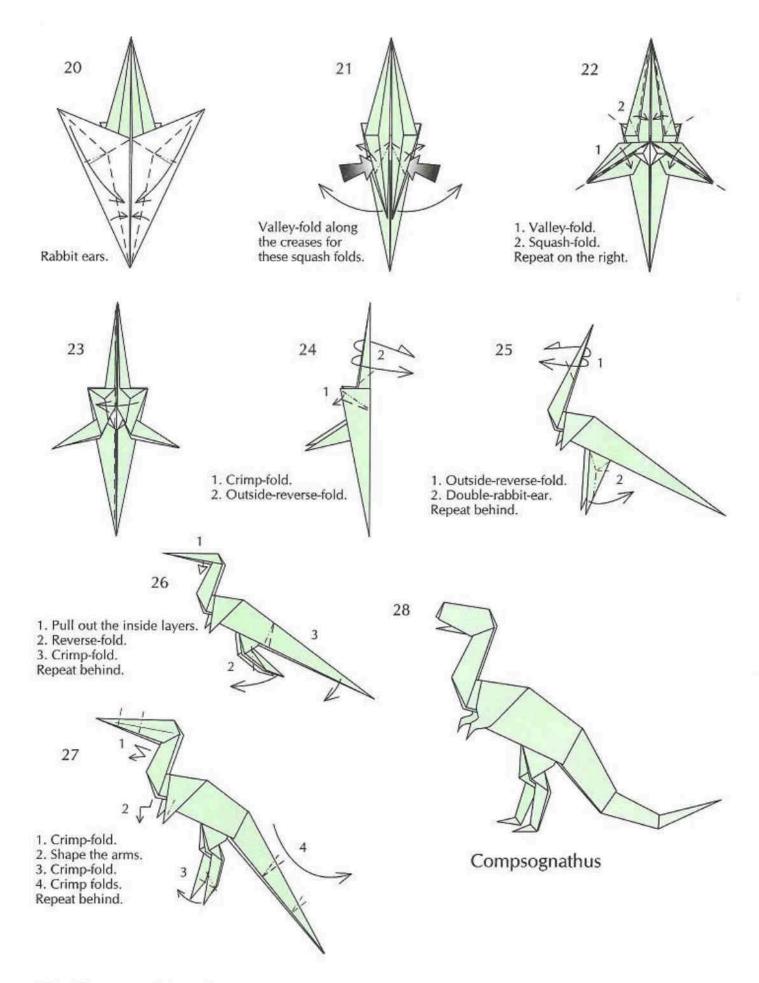


Fold and unfold.

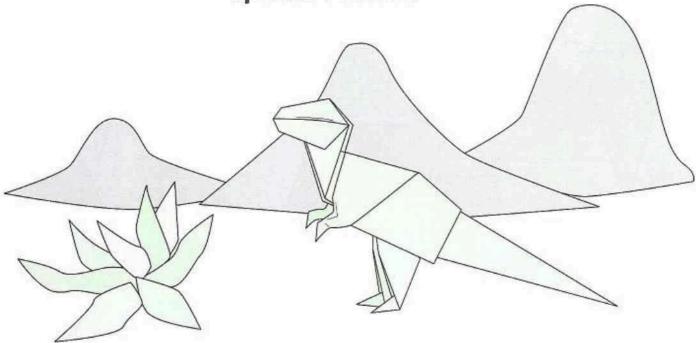


Fold and unfold.



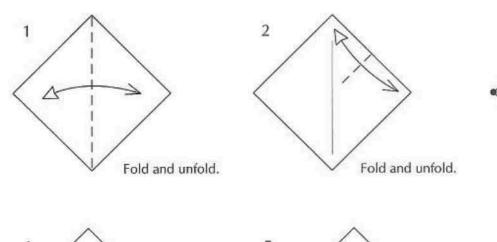


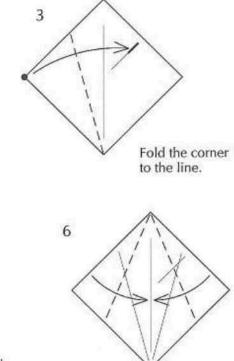
# Sphaerotholus

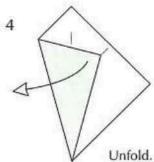


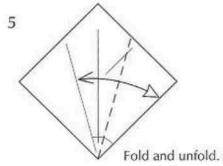
SPHERE-oh-THOLE-us

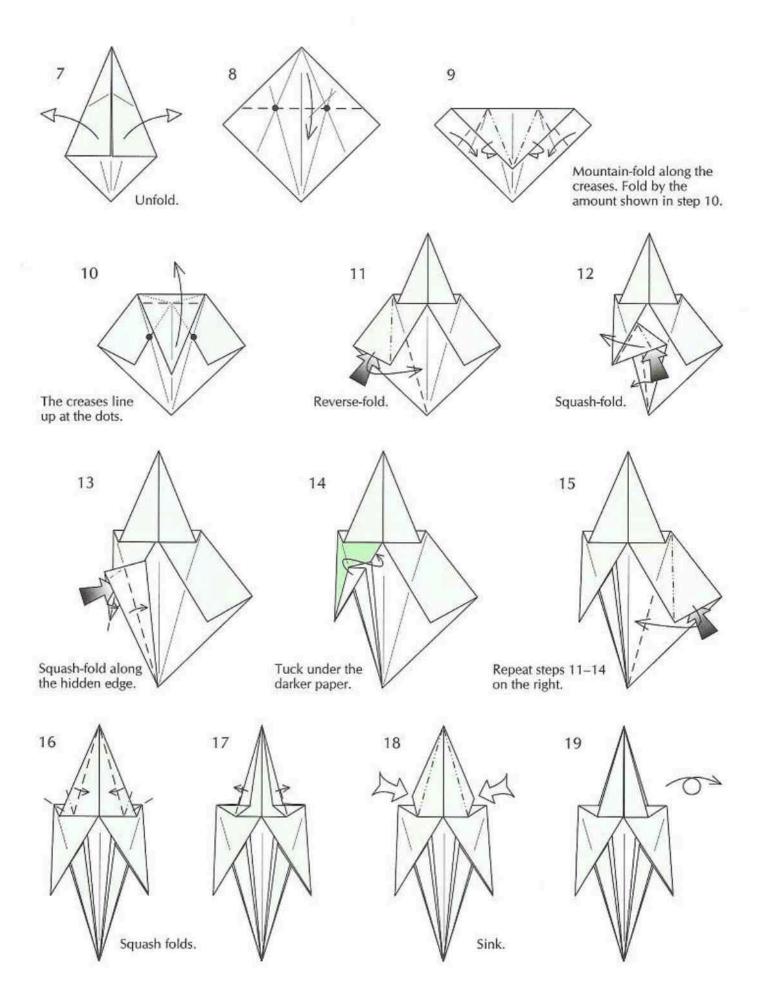
This dinosaur belongs to the pachycephalosaur family of bone-headed dinosaur known for their thick skull bones. Sphaerotholus means "ball-dome". They traveled in herds and may have butted their heads together to compete for territory. It is a plant eater and lived in the Cretaceous Period. Fossils have been found in the western US.



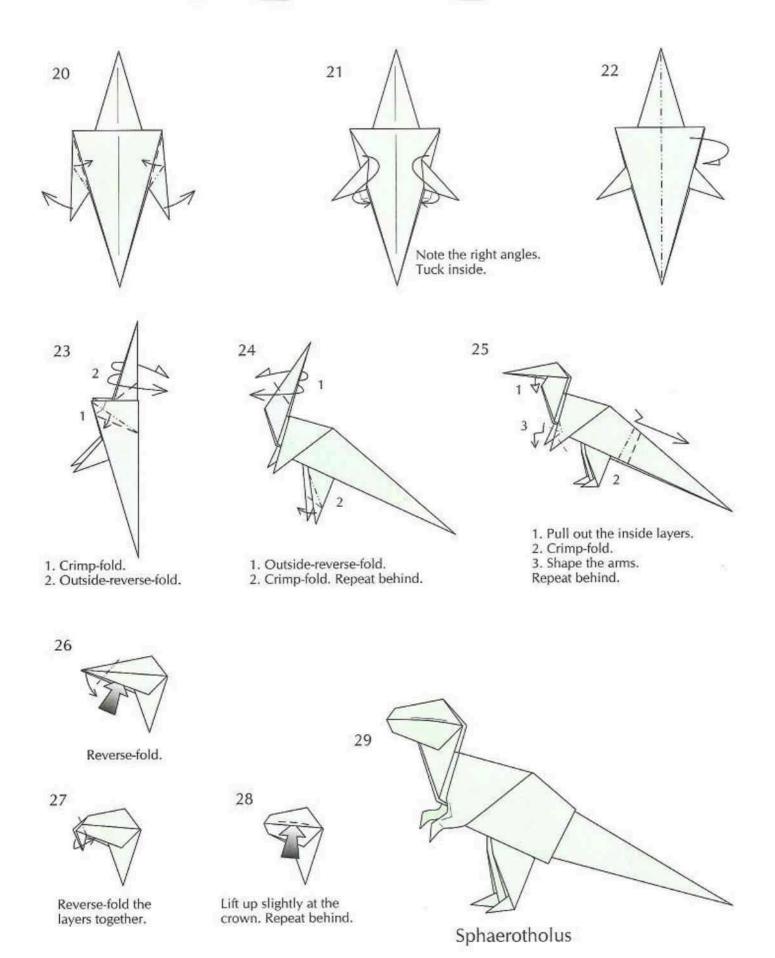




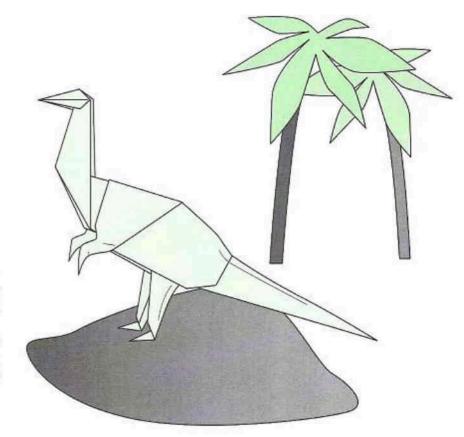




74 Dinosaur Origami



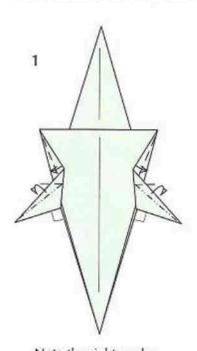
### Struthiomimus



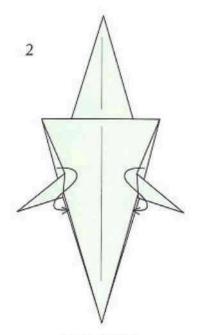
#### strooth-ee-oh-MIM-us

This 12 foot long Cretaceous dinosaur was probably as swift as an ostrich. The name means "ostrich mimic". It had no teeth in its beak and used its three-fingered hands to dig and grasp food. The tail helped it balance. Fossils were found in New Jersey and Canada.

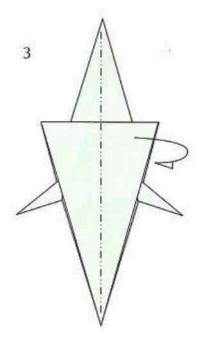


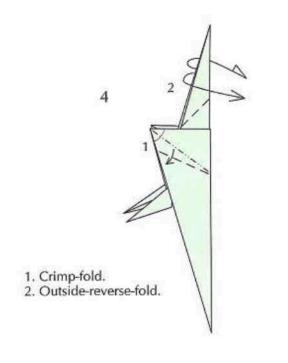


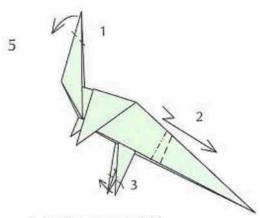
Note the right angles.



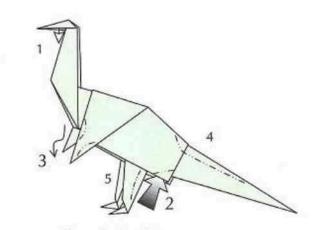
Tuck inside.





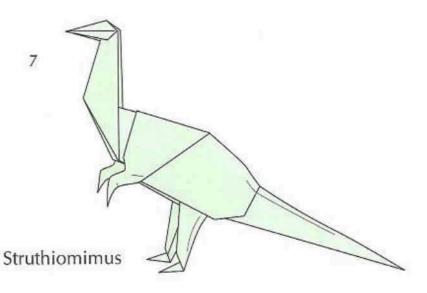


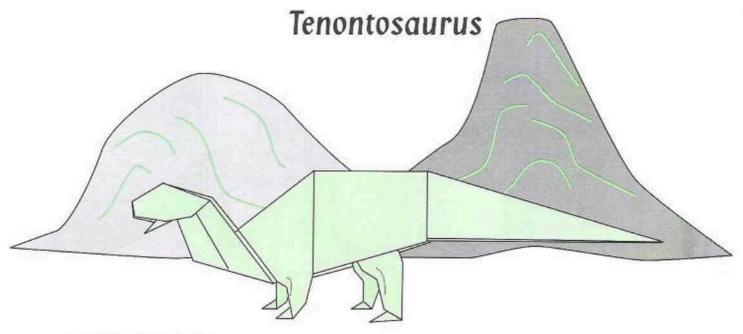
- 1. Outside-reverse-fold.
- 2. Crimp-fold.
- 3. Crimp-fold. Repeat behind.



- Pull out the inside layers.
   Reverse-fold.

- 3. Shape the arms.
  4. Shape the back and tail.
  5. Shape the legs.
  Repeat behind.

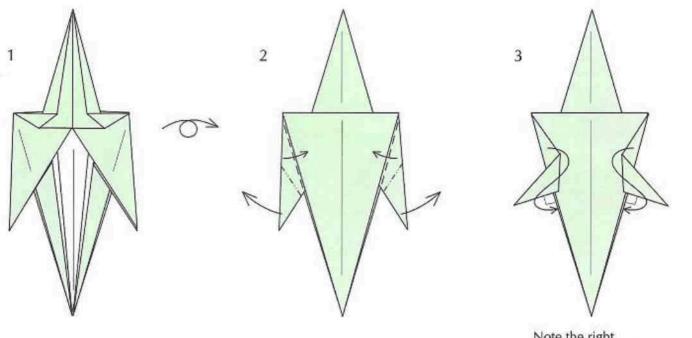




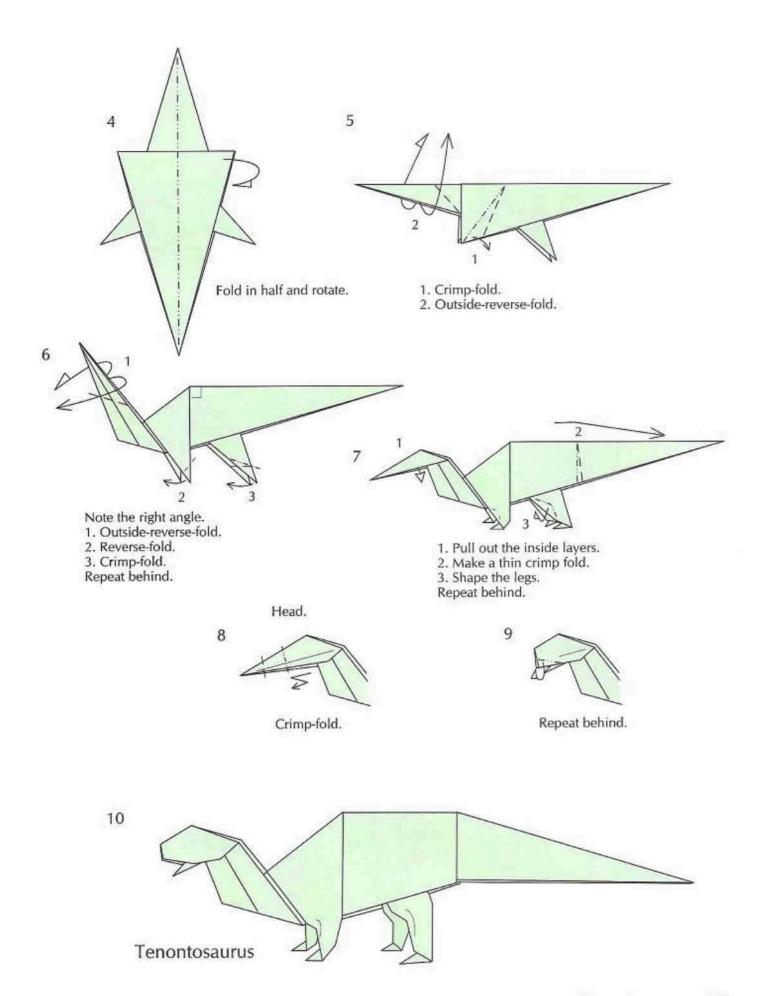
ten-ON-tuh-sawr-us

This 20 foot long Cretaceous plant eater resembled Iguanodon but did not have spiked thumbs. His name means "tendon lizard" because it had rod-like tendons, tendons that held its tail rigid when it ran. Fossils have been found in Montana, Wyoming, Texas, and Oklahoma.

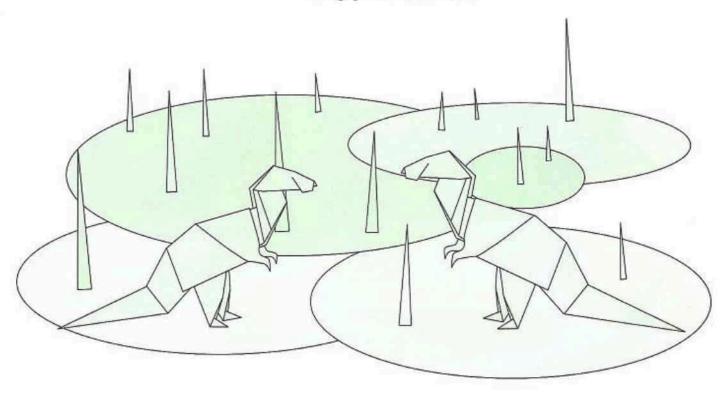
Begin with step 17 of Sphaerotholus (page 73).



Note the right angles. Tuck inside.



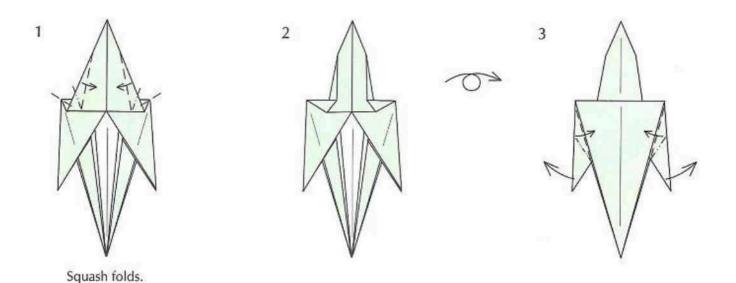
## Gryposaurus

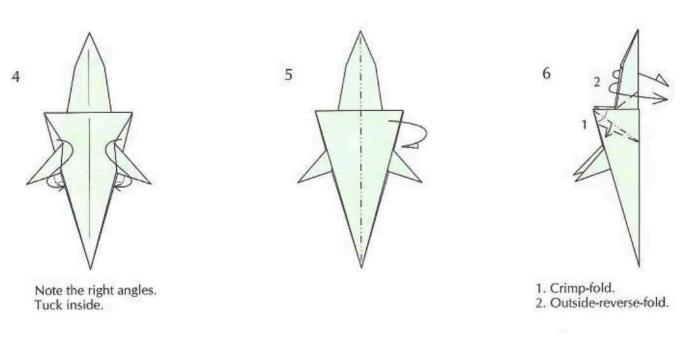


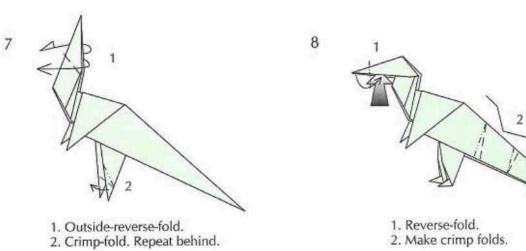
#### GRIP-oh-SAWR-us

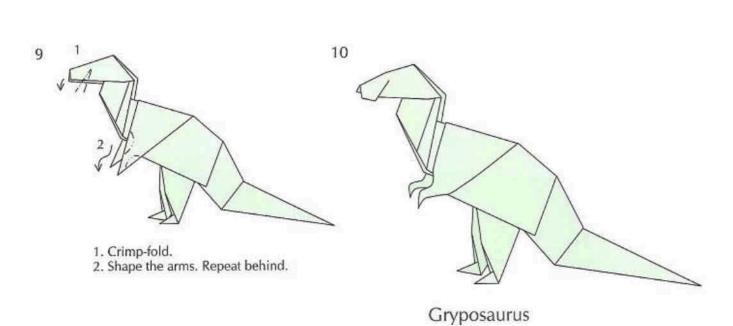
This 30 foot long dinosaur lived near rivers where it ate water plants. Its name means "hook-nosed lizard". When this member of the hadrosaur family's teeth in its duck bill ground down and fell out, new teeth took their place. Fossils have been found in Alberta, Canada. It lived in the Cretaceous Period.

Begin with step 16 of Sphaerotholus (page 73).



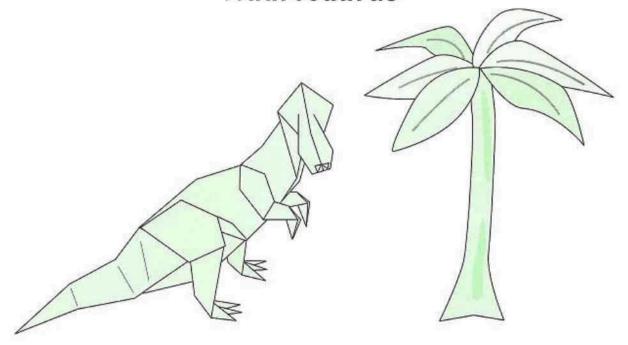






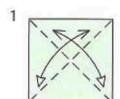
2. Make crimp folds.

## Hadrosaurus



had-ro-SAW-rus

Formerly known as Trachodon, the "rough tooth", this duck billed dinosaur was 33 feet long. Behind the bill were 2000 teeth used for grinding water plants. Hadrosaurus means "bulky lizard" and it was the first dinosaur skeleton ever excavated in the U.S. It was found in New Jersey in 1858. Mummified skin of this Cretaceous creature has also been found.



Fold and unfold.

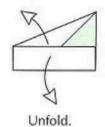


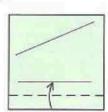
Fold and unfold.



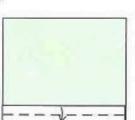


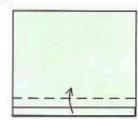
5



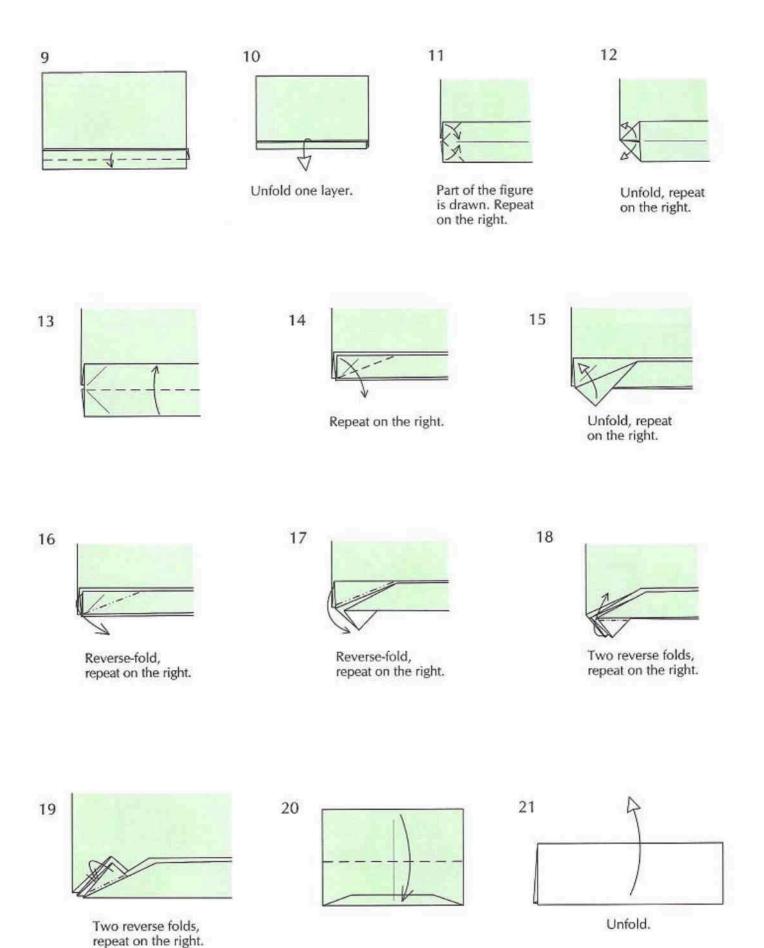


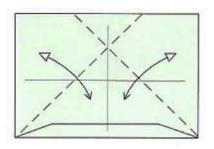
7



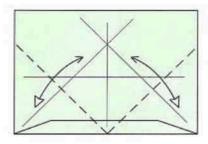


Fold along the existing crease.

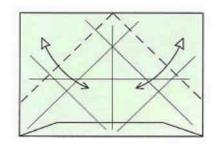




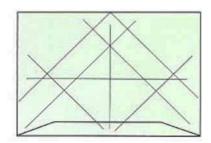
Fold and unfold.



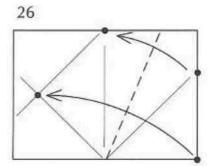
Fold and unfold.



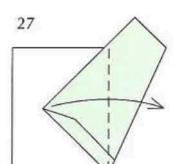
Fold and unfold.



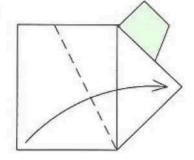




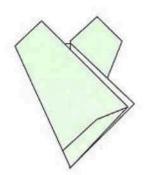
The dots will meet.



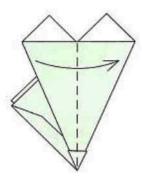
28



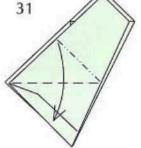




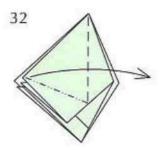
30



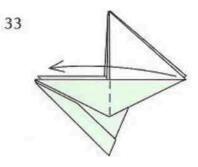
31



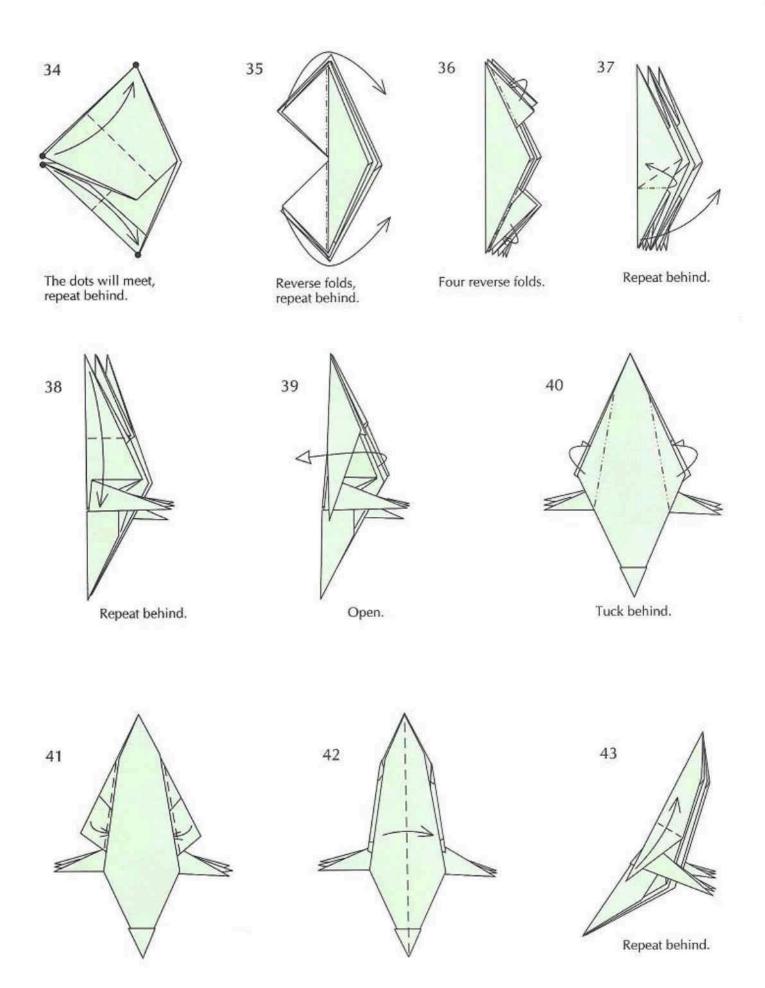
Squash-fold.

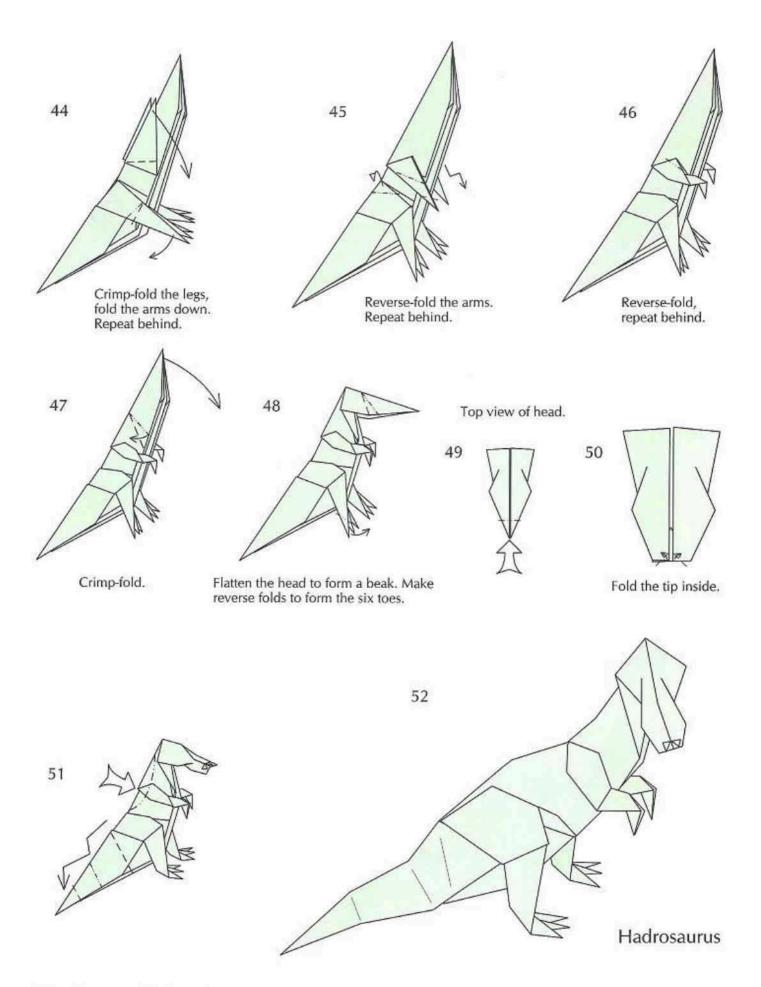


Repeat behind.



Repeat behind.

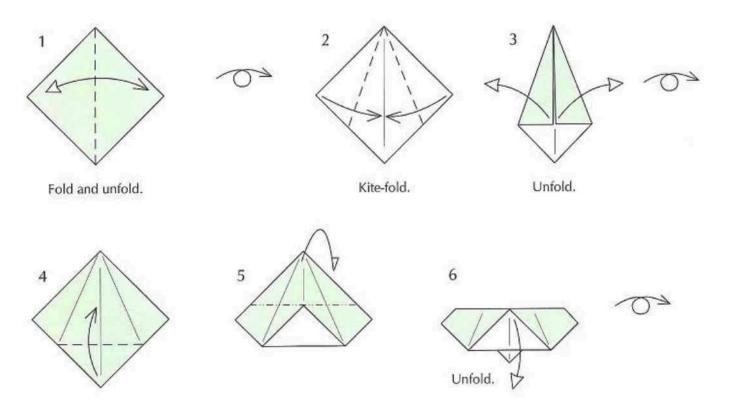


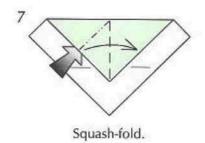


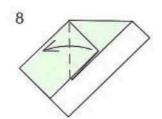


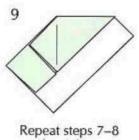
i-GWA-no-don

The most distinguishing feature of this Cretaceous dinosaur is the spikelike thumbs on its front legs. Standing on its hind legs, this reptile stood 16 feet tall. However, it could also have walked on four legs. It had grinding teeth in the back of its mouth and a strong beak to break off plants. One of the first dinosaurs ever discovered, fossils were found in Belgium and North Africa. Iguanodon means "iguana tooth".

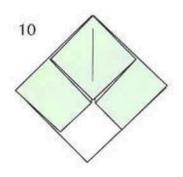




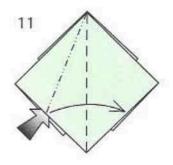


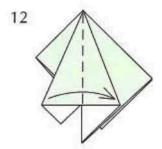


Repeat steps 7–8 on the right.

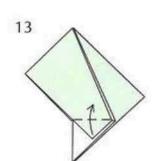


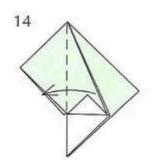


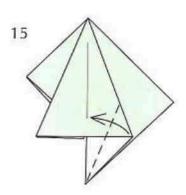


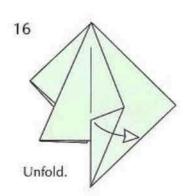


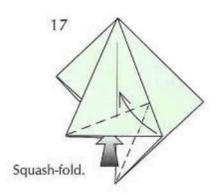
Squash-fold.

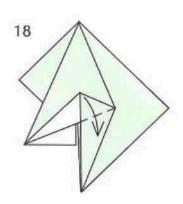


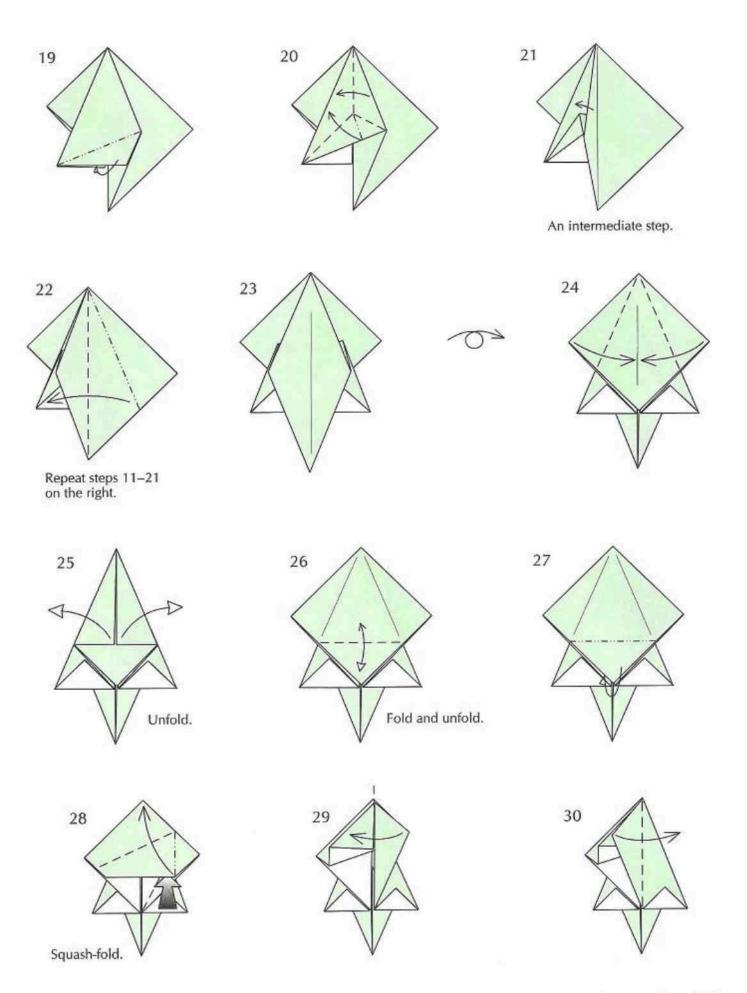


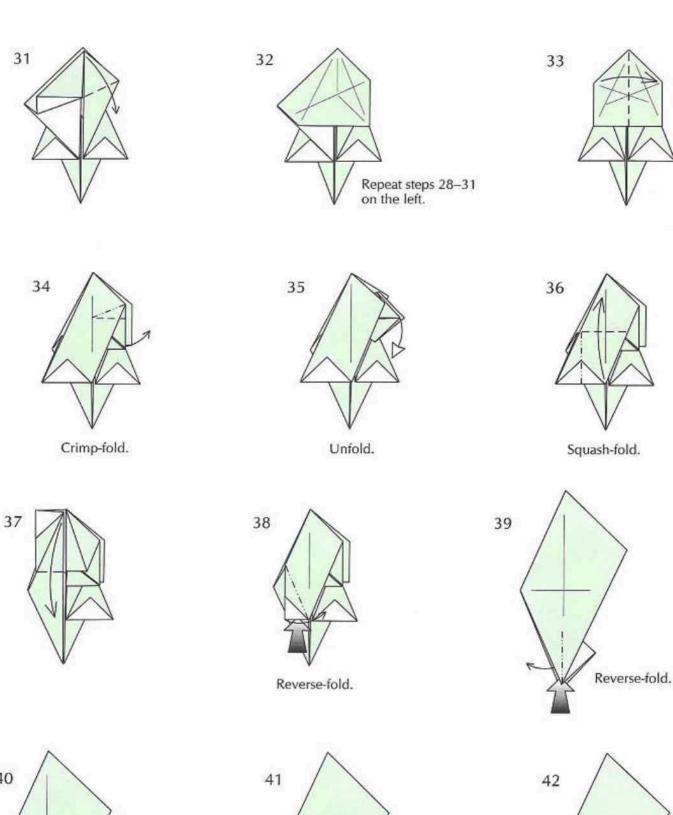


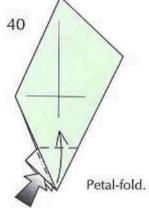


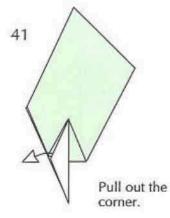


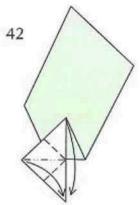








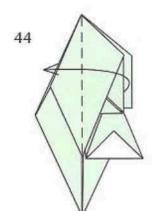




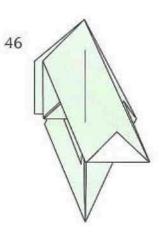




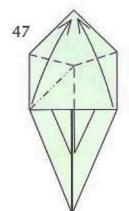
Reverse folds.



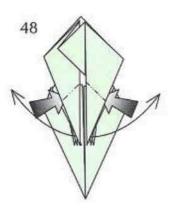
45



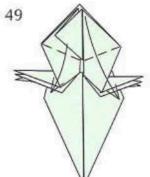
Repeat steps 36-44 on the right.

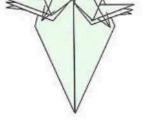


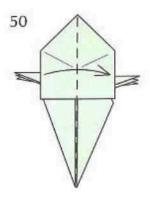
Bring the corners to the top.



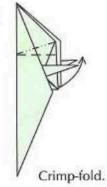
Reverse folds.

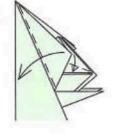




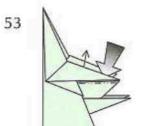


51

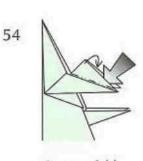




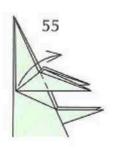
Repeat behind.



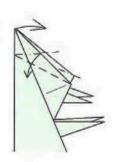
Reverse-fold.



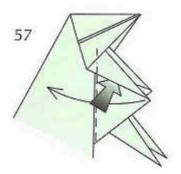
Reverse-fold.



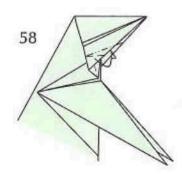
Repeat behind.



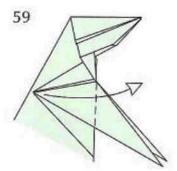
Crimp-fold.



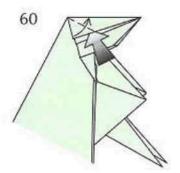
Reverse-fold, repeat behind.



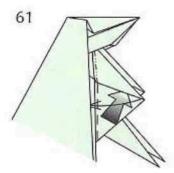
Repeat behind.



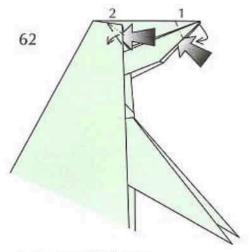
Unfold, repeat behind.



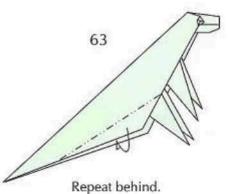
Unlock the top layer, repeat behind.

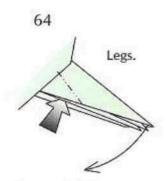


Reverse-fold, tuck under the top layer. Repeat behind.

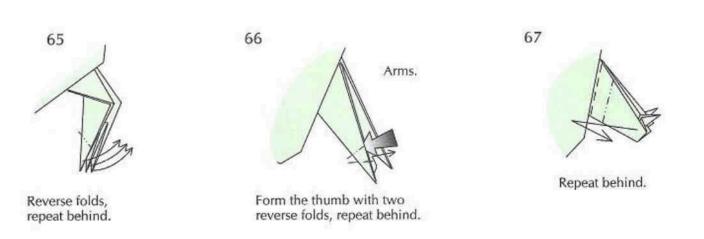


- Reverse-fold the tip.
   Squash-fold the eye, repeat behind.

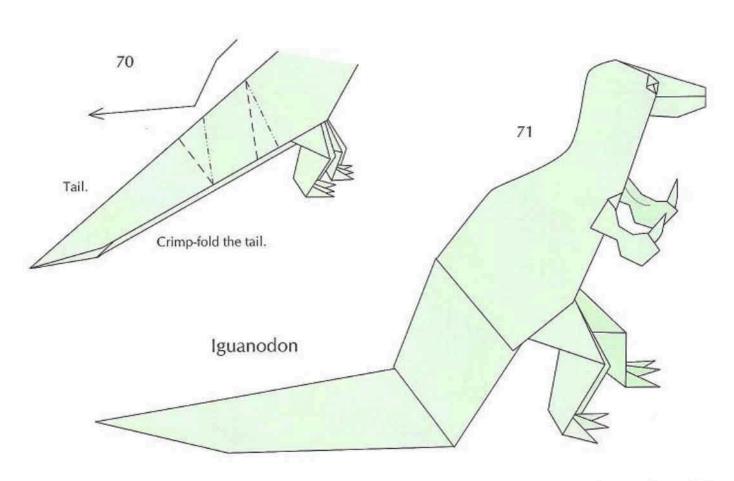




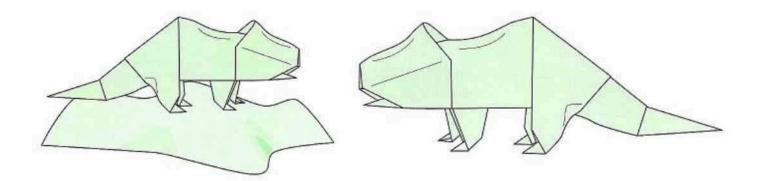
Reverse-fold, repeat behind.





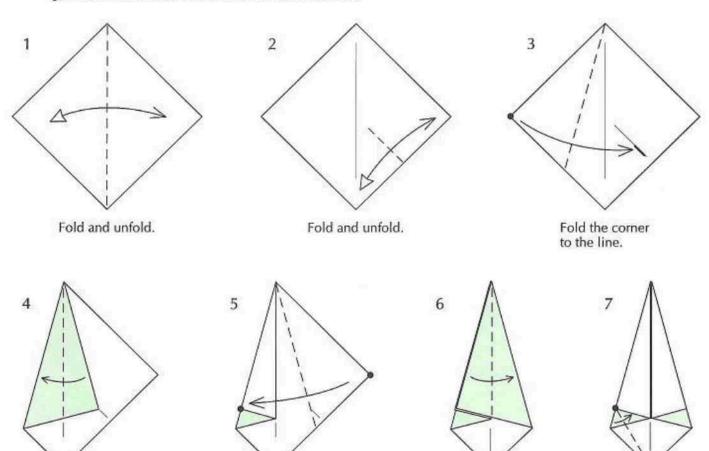


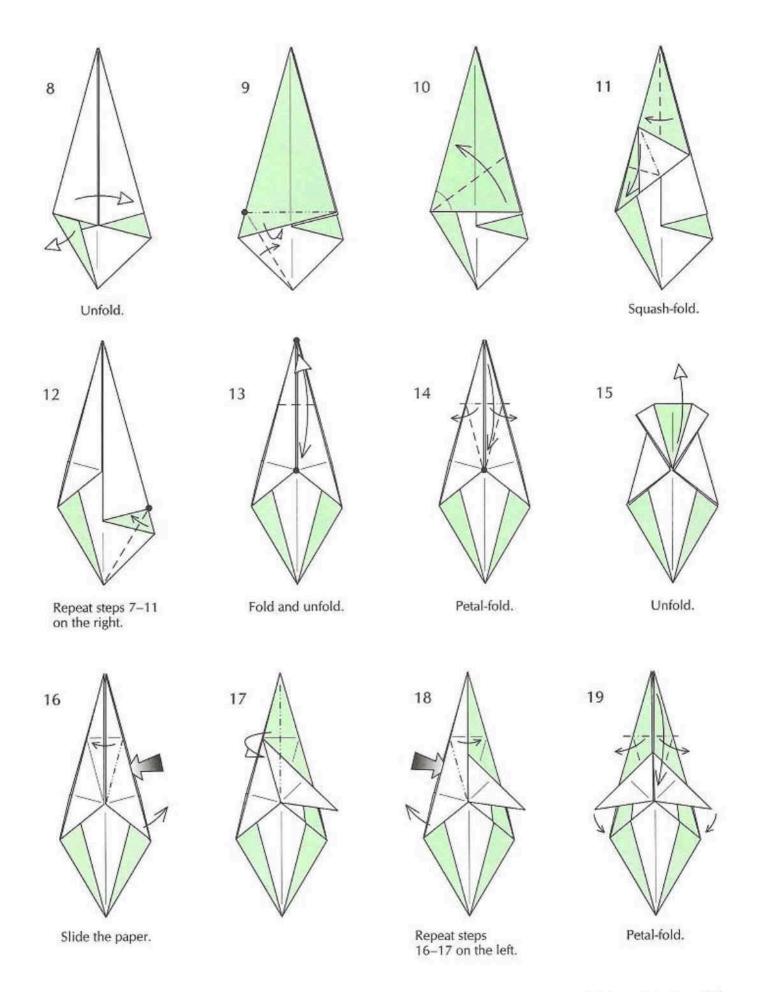
### Protoceratops

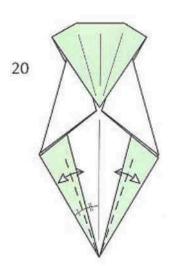


pro-toe-SER-a-tops

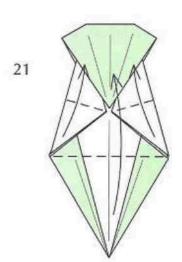
The "first horn face" fossils were discovered in Mongolia and showed paleontologists how dinosaurs may have cared for their young. The nests included unhatched eggs as well as skeletons of babies. The adults grew to 6 feet long. These were Cretaceous plant eaters with parrot-like beaks and bone covered faces.



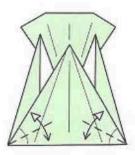




Fold and unfold at an angle of about one-third.

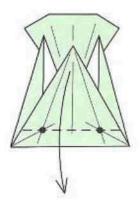


22

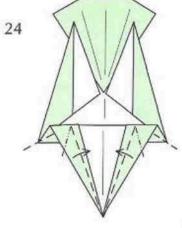


Fold and unfold.



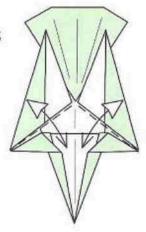






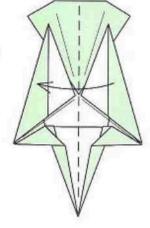
Squash folds.

25



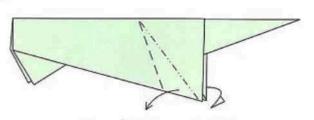
Fold and unfold.

26



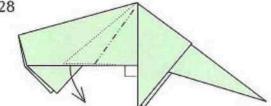
Fold in half and rotate.



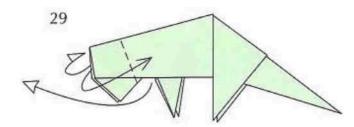


Crimp-fold, Mountain-fold along the crease.

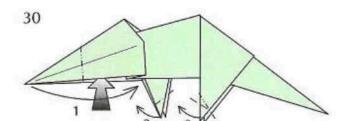




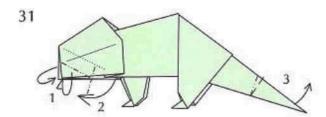
Note the right angle. Reverse-fold the front leg. Repeat behind.



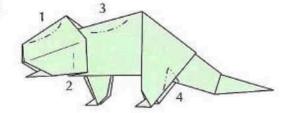
Outside-reverse-fold the head and pull out the hidden corner.



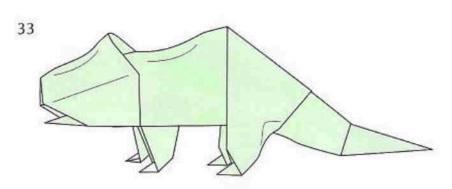
- Reverse-fold.
   Reverse-fold.
- 3. Crimp-fold. Repeat behind.



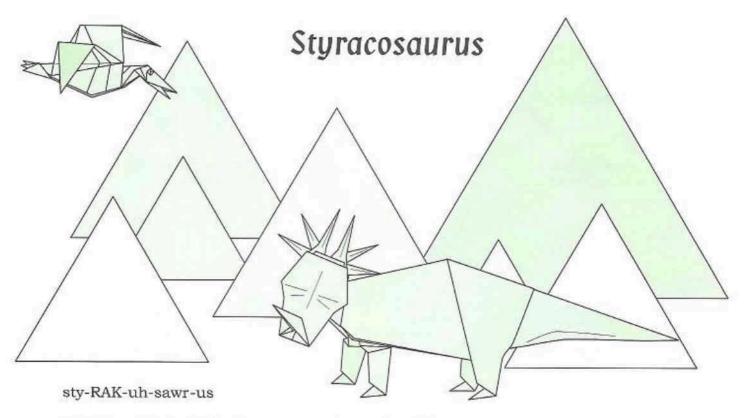
- Repeat behind.
   Reverse-fold the mouth.
- 3. Crimp-fold the tail.



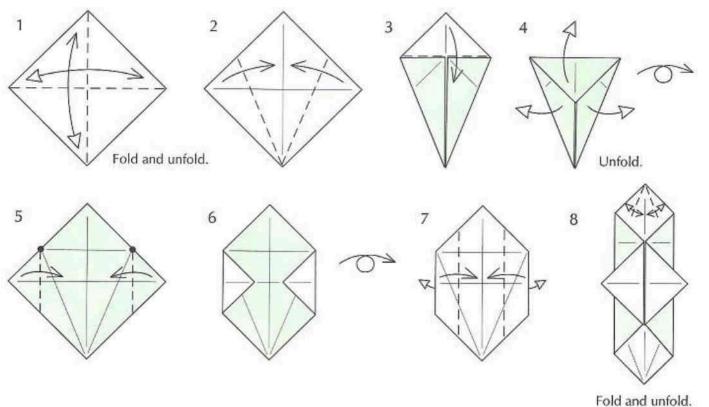
Shape the model.

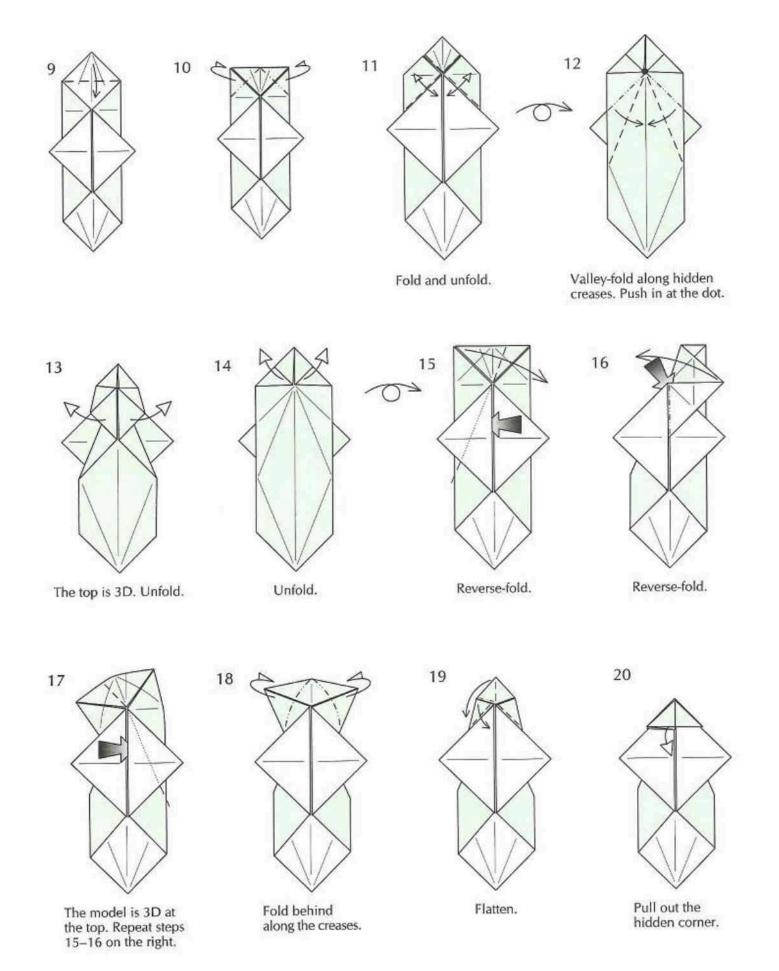


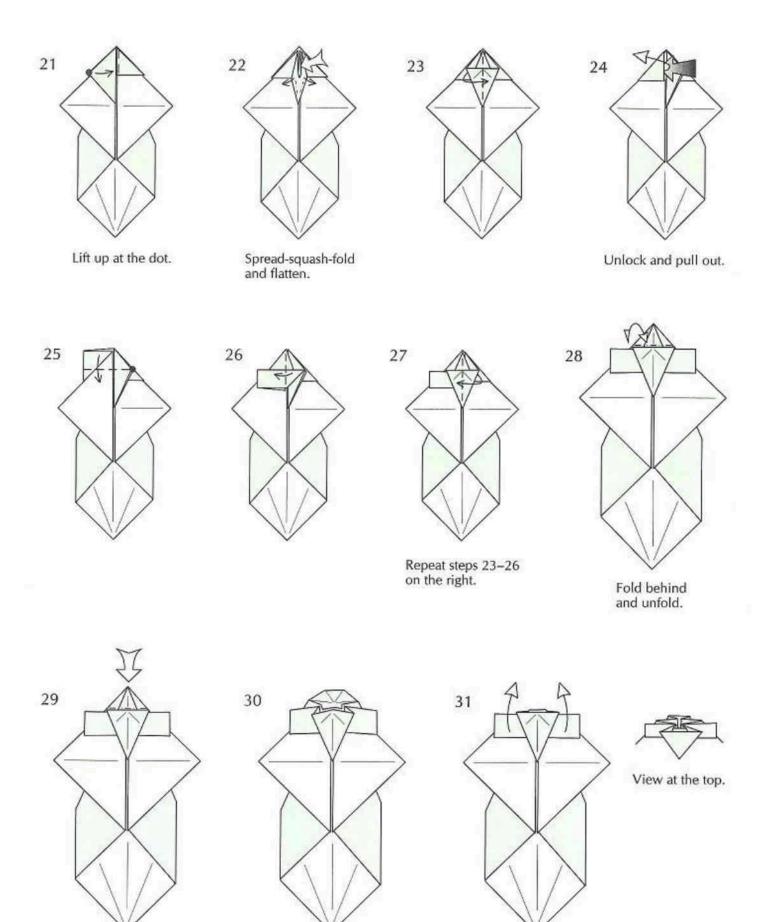
**Protoceratops** 



Even though this 18 foot long ceratopsian weighed 3 tons, scientist believe it was a good runner. It may have gone as fast as 20 miles an hour. It lived at the end of the Cretaceous Period and its fossils were found in Alberta, Canada. Styracosaurus means "spiked lizard".



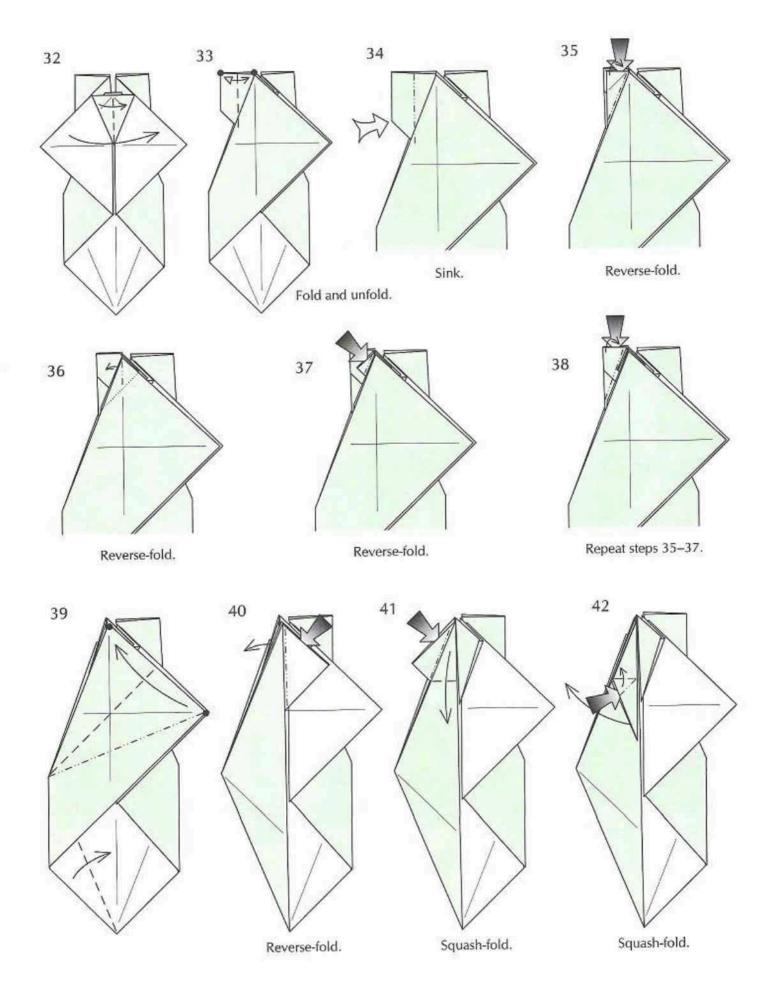




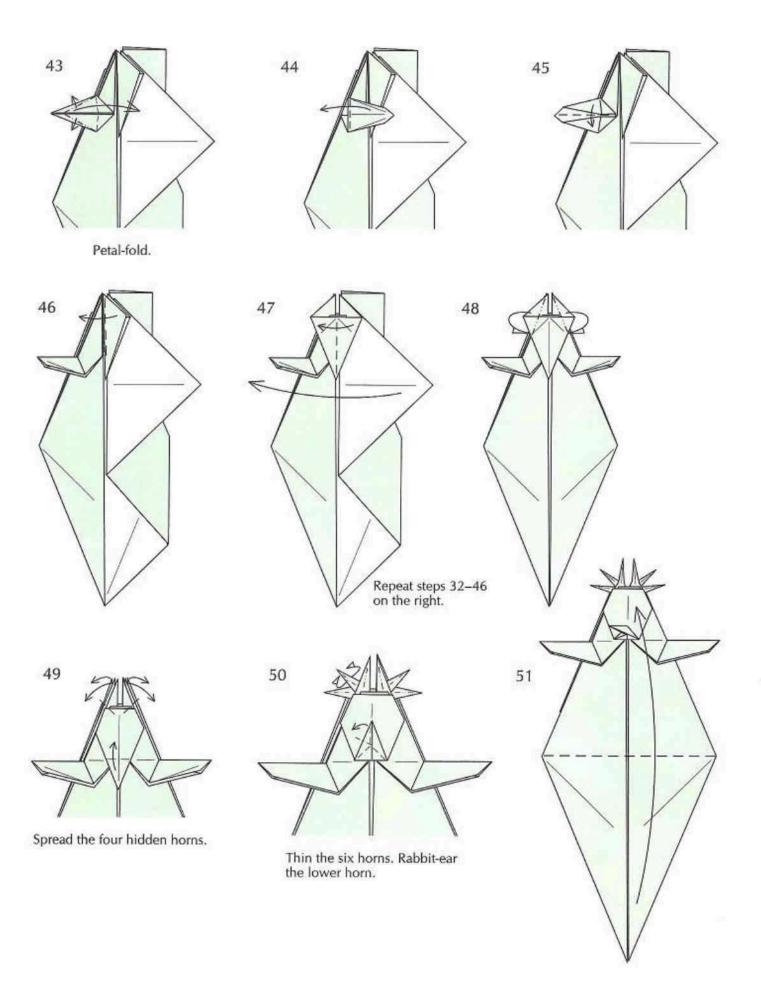
Intermediate step.

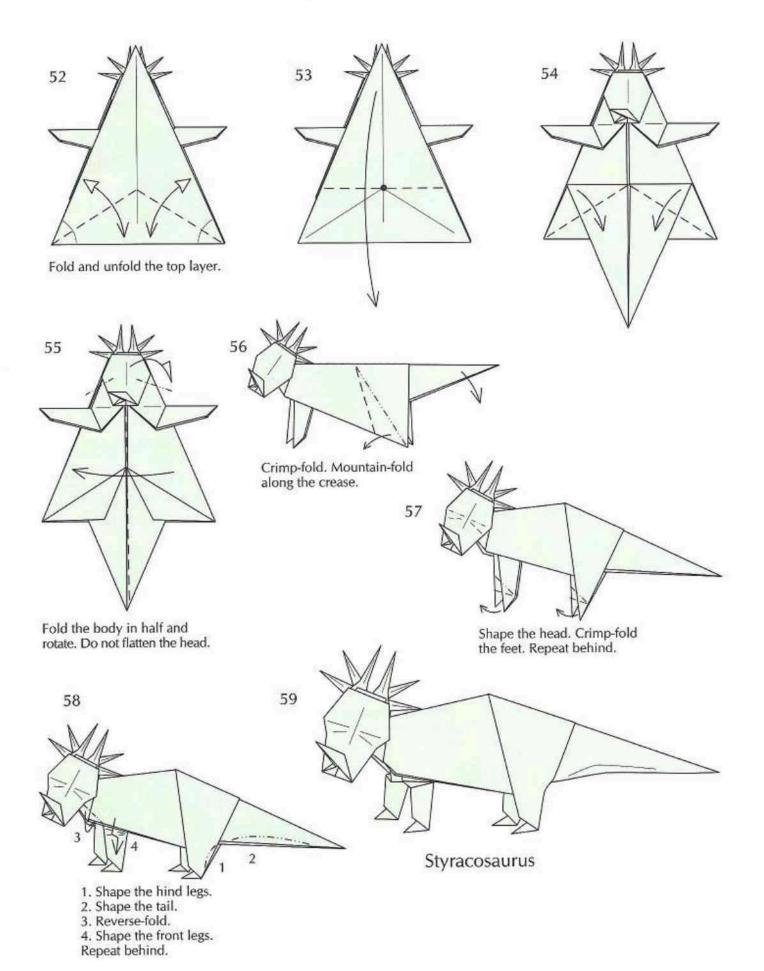
Unfold.

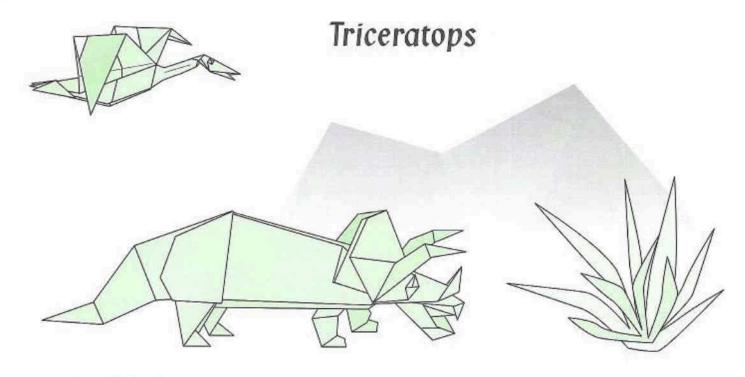
Sink.



Styracosaurus 101

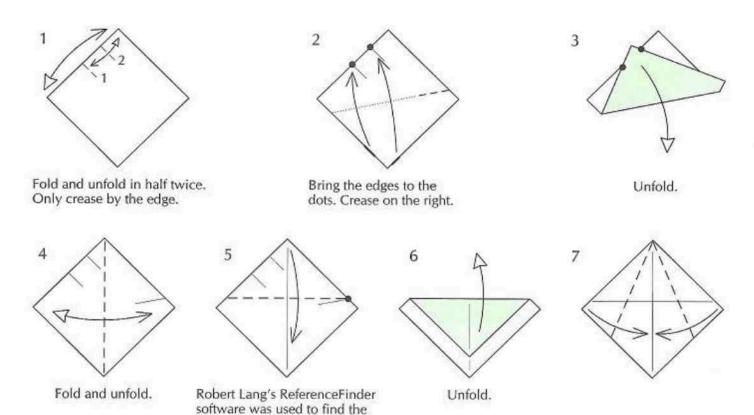




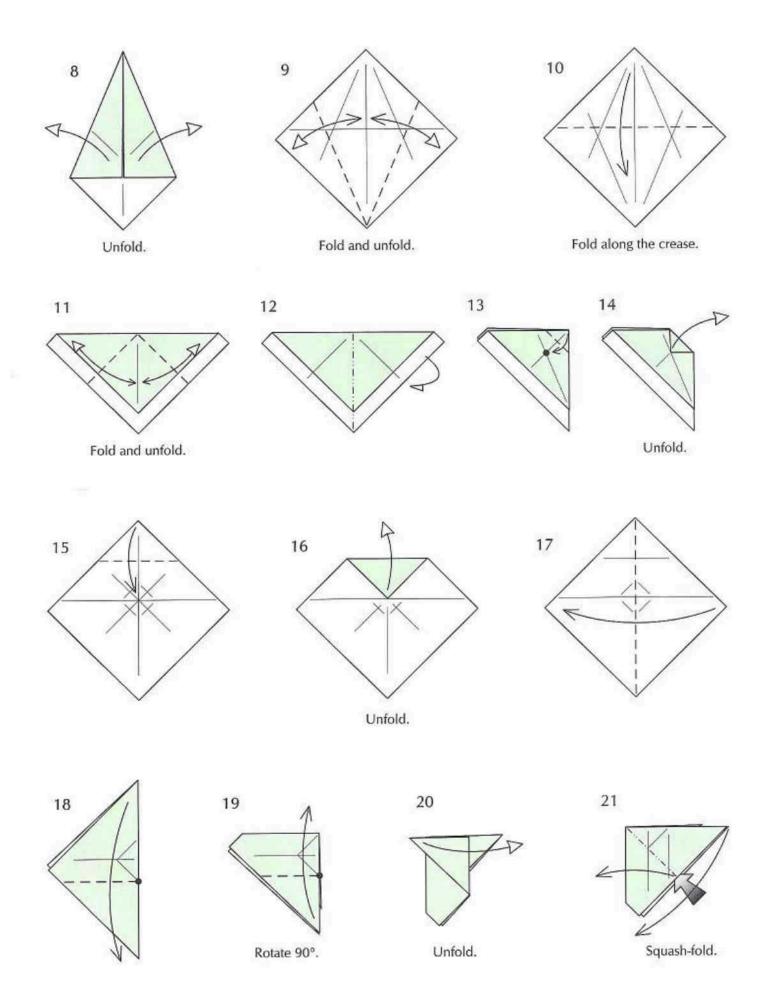


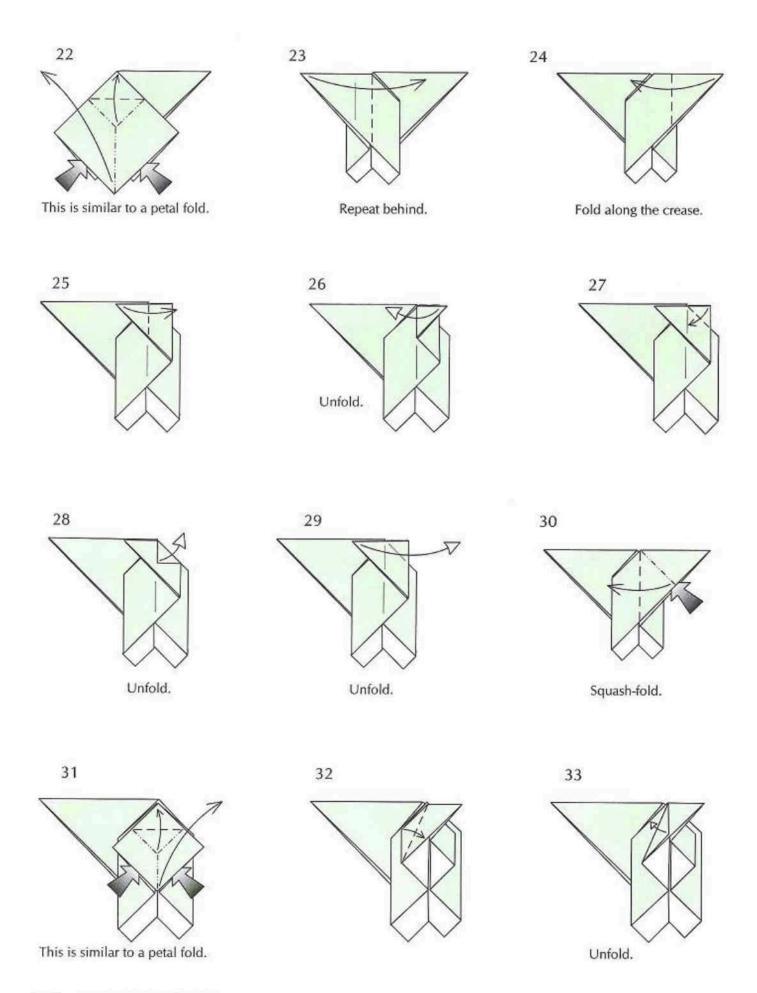
#### try-SER-a-tops

A peaceful plant eater, Triceratops was 30 feet long. It had a beak like a parrot. Its name means "three horn face" and the horns over its eyes were 3 feet long. The tough, leathery skin and the bony frill protecting its neck made Triceratops one of the best protected dinosaurs. It is thought to be the last one to succumb to extinction at the end of the Cretaceous.

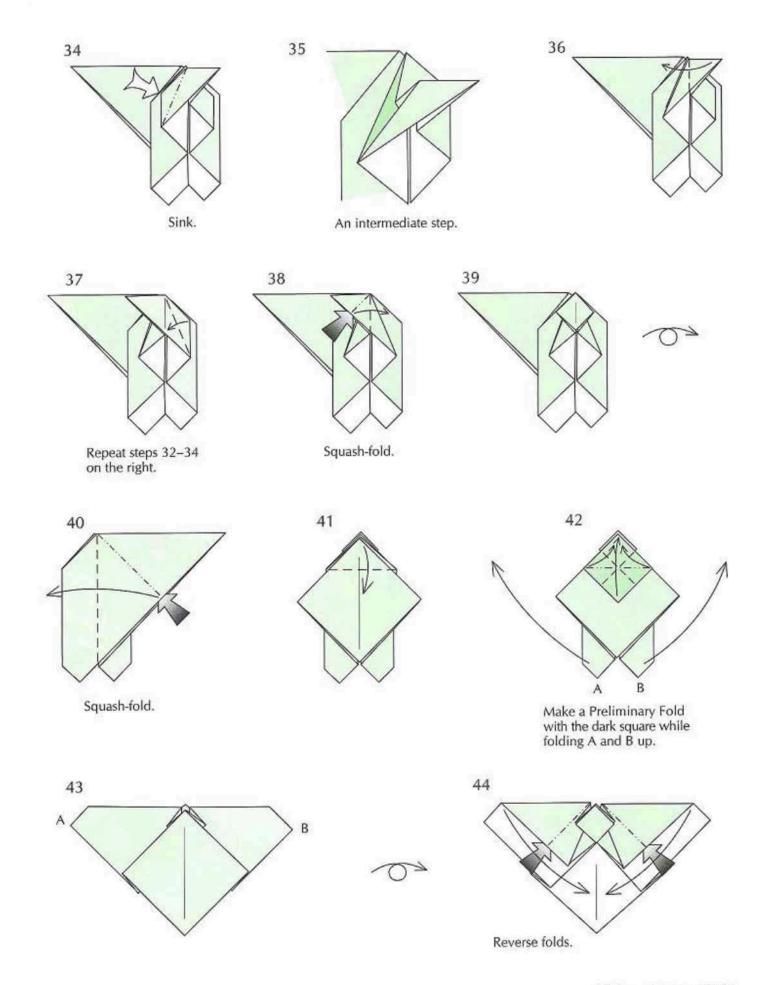


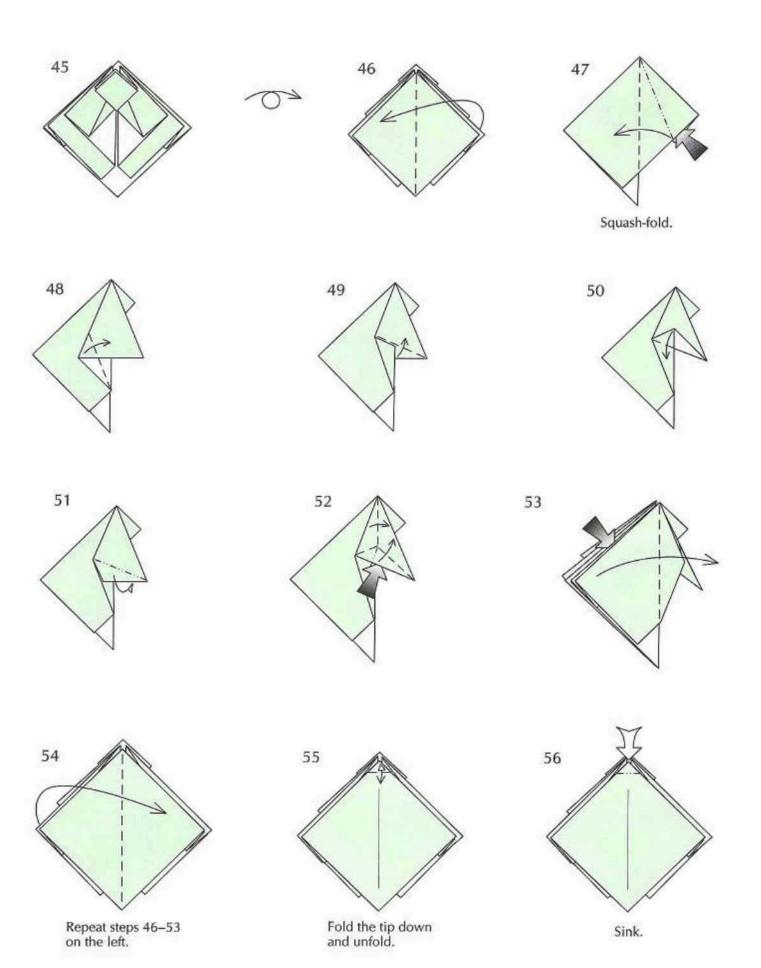
landmark at the dot.

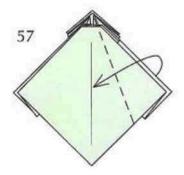


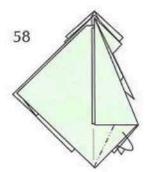


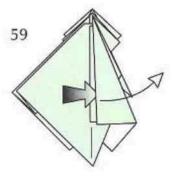
106 Dinosaur Origami



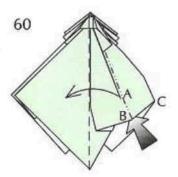




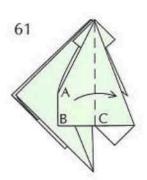


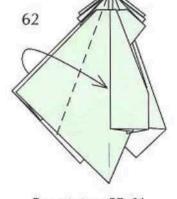


Unfold the top layer.

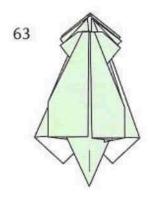


This is 3D. Puff out at A.

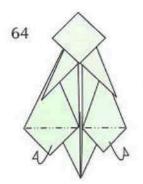


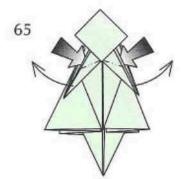


Repeat steps 57-61 on the left.

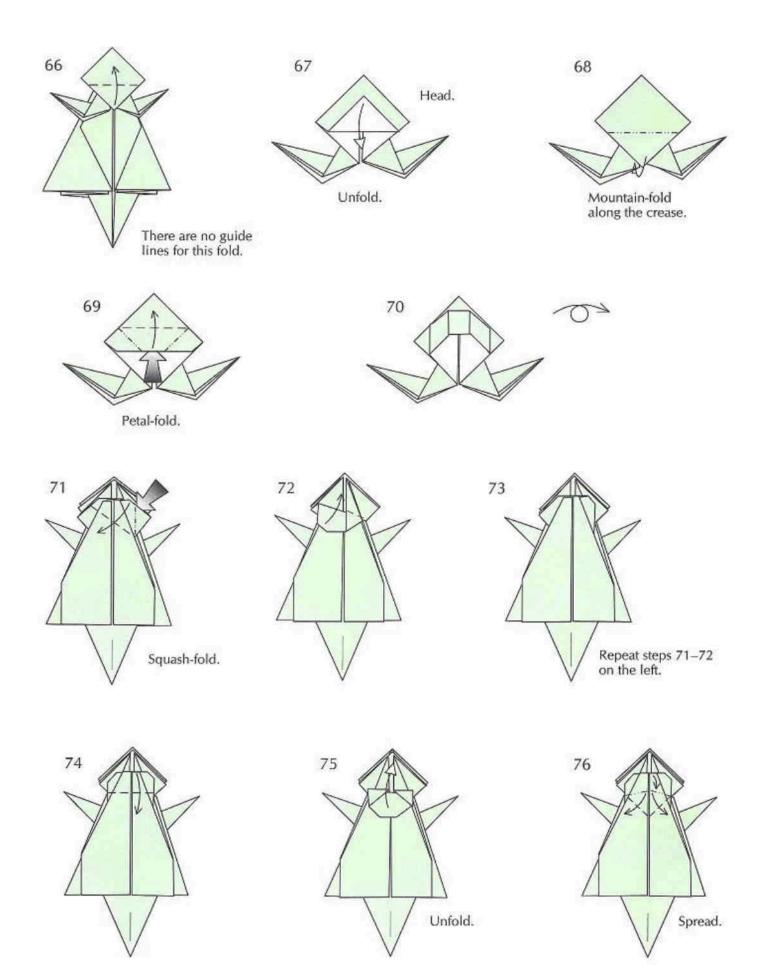




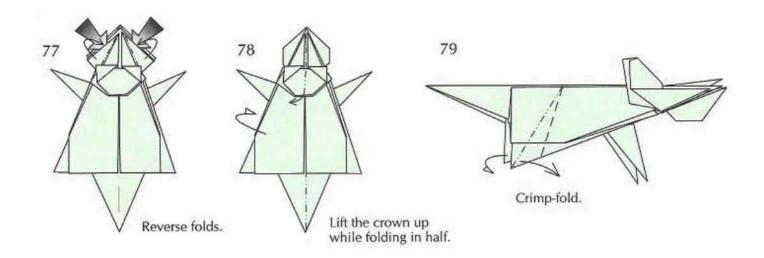


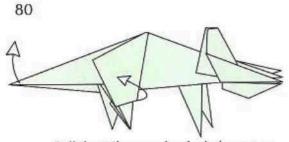


Reverse folds.

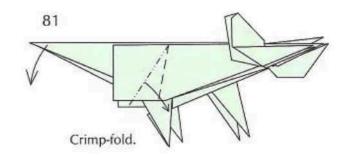


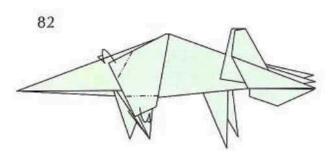
110 Dinosaur Origami



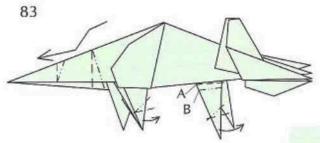


Pull the tail out and unlock the paper by the hind legs. Repeat behind.



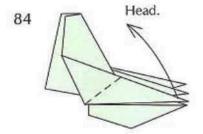


Repeat behind.

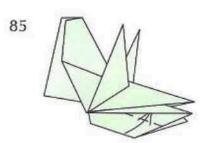


Repeat behind. Note that lines A and B are simple folds, not reverse folds. See the drawing of the finished front leg.

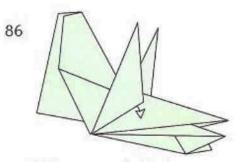




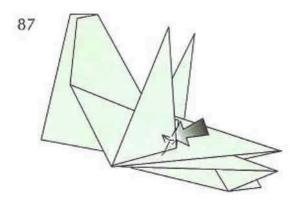
Repeat behind.



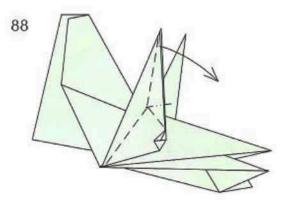
Repeat behind.



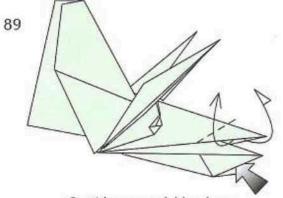
Pull out, repeat behind.



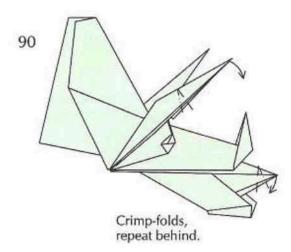
Squash-fold to form the eye, repeat behind.

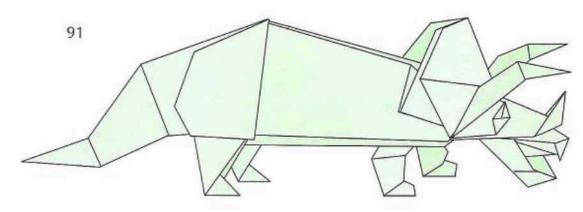


Rabbit-ear, repeat behind.

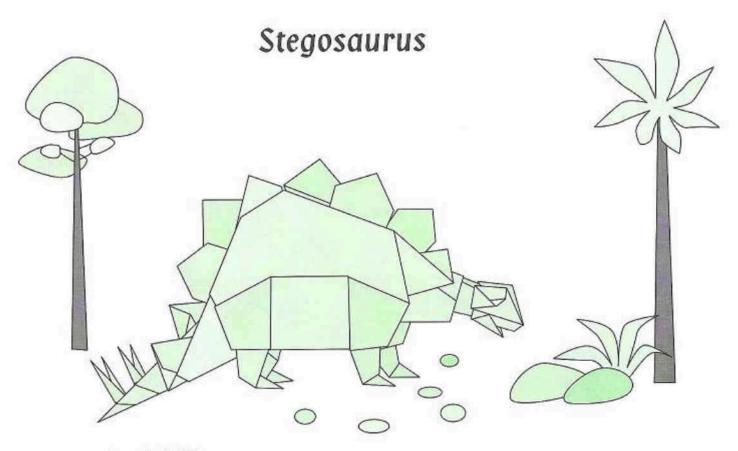


Outside-reverse-fold to form a horn. Open the mouth.



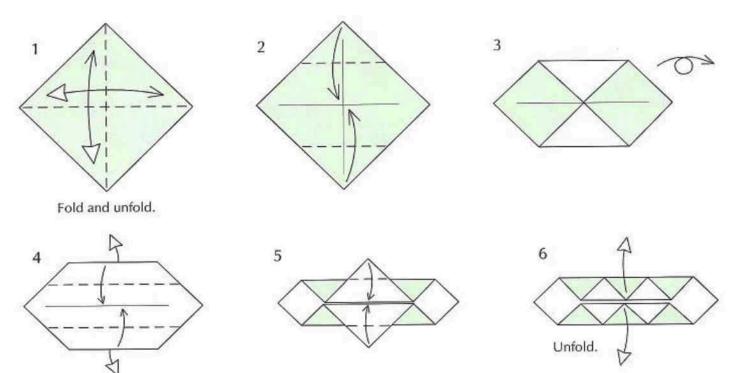


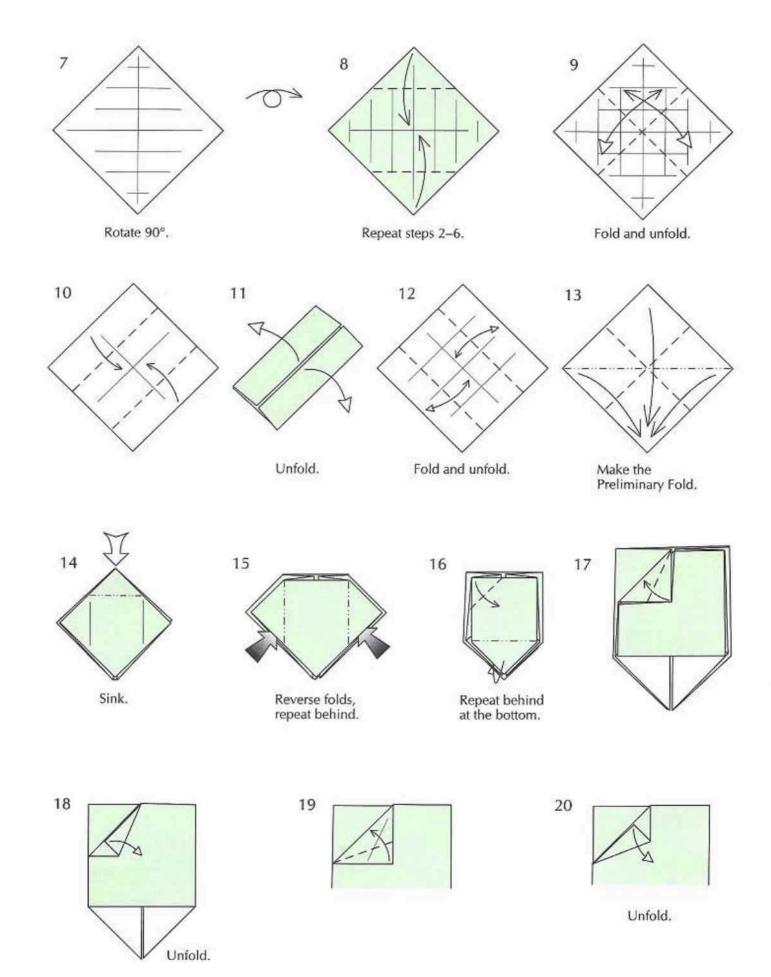
Triceratops

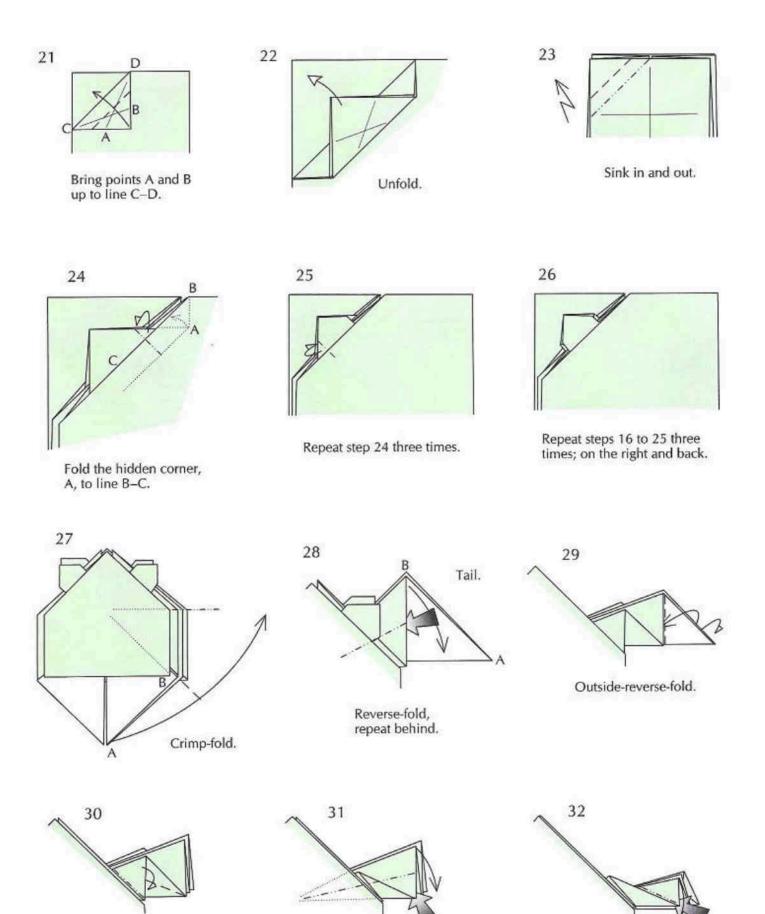


steg-oh-SAW-rus

This unique dinosaur was 29 feet long and lived in the Jurassic and early Cretaceous. The plates on its back were to regulate its body heat. It had two walnut size brains. One brain was in its head and the other was at the base of its tail. This "roof lizard" was found in the western U.S. and ate plants.







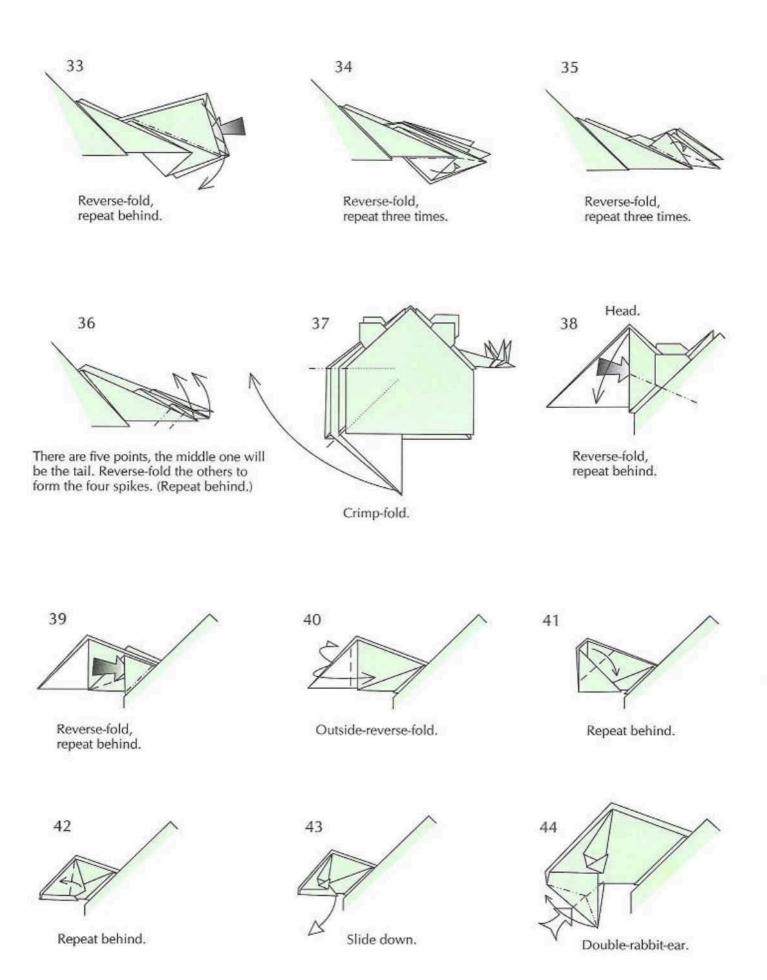
Reverse-fold,

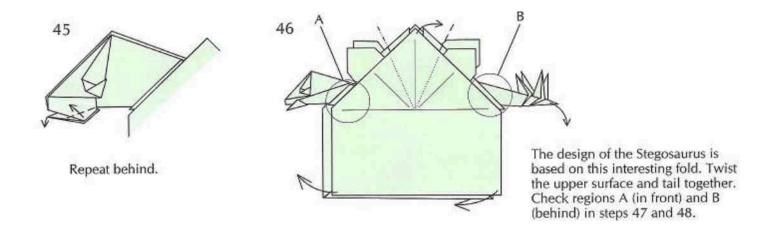
repeat behind.

Reverse-fold, repeat behind.

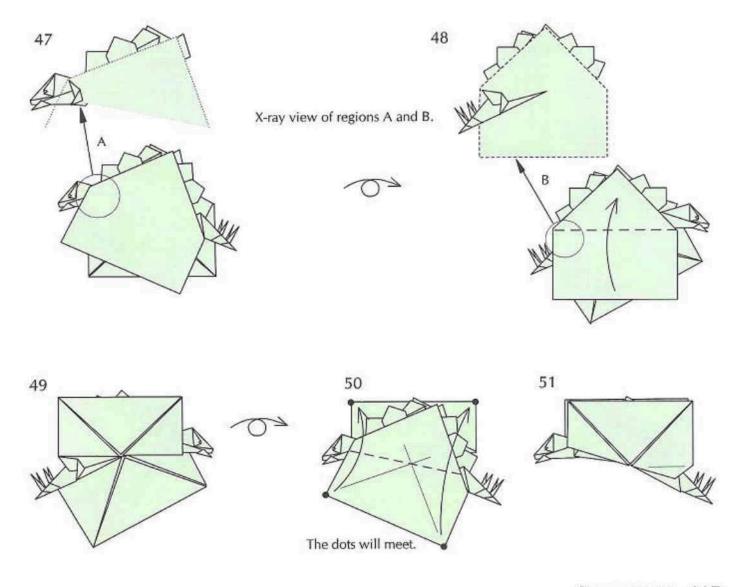
Reverse-fold,

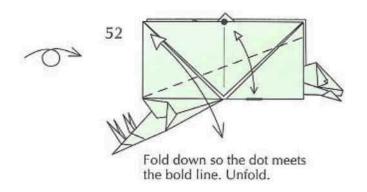
repeat behind.

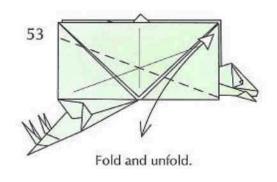


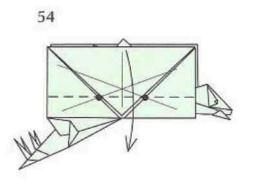


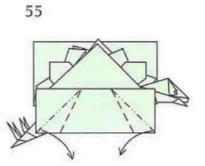
Since the folding is no longer symmetrical, be sure to orient your model according to the drawings.

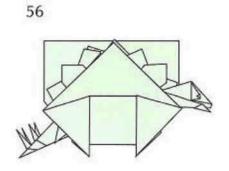


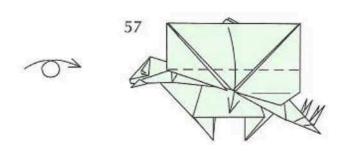


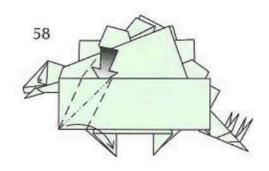


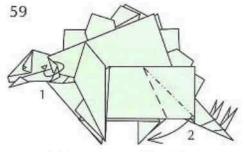


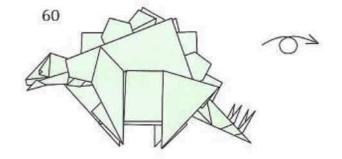




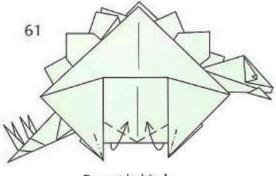








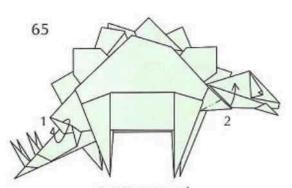
- Fold inside-out to form a plate near the head.
   Form a leg.



Repeat behind.

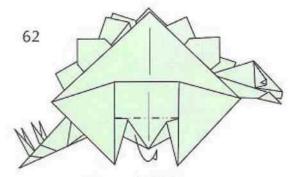


Mountain-fold on the x-ray line, repeat behind.

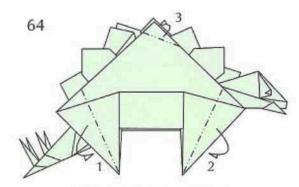


Wrap around.
 Form a plate.

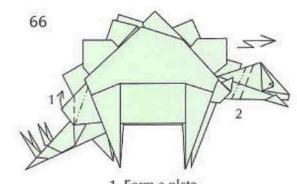




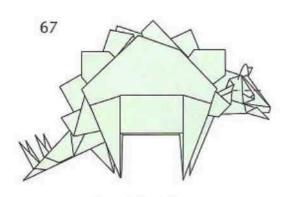
Repeat behind.



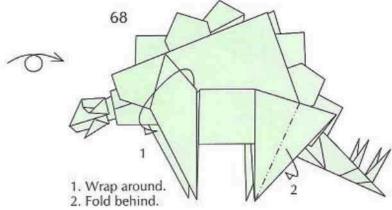
Fold behind at 1, 2, and 3.

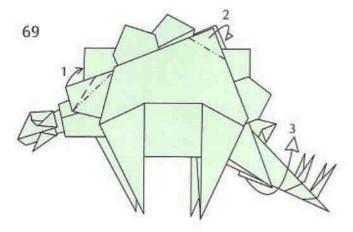


Form a plate.
 Crimp-fold.

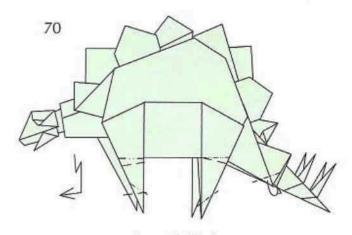


Repeat behind.

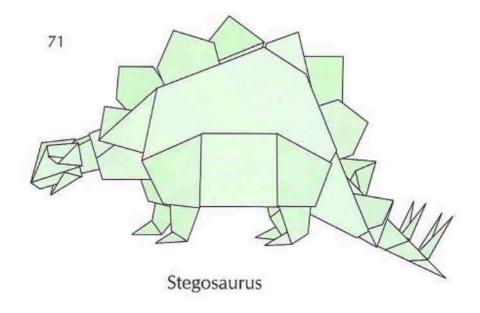


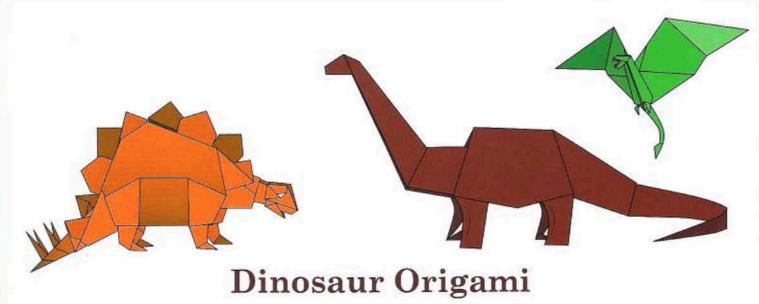


- Form a plate.
   Fold behind.
   Pull out.



Repeat behind.





## John Montroll

In this fascinating collection of origami projects, John Montroll, one of America's foremost origami artists, teaches you to create models of the world's most celebrated extinct animals, each folded from a single square sheet of paper. Paper crafters can make amazingly detailed paper replicas of the Tyrannosaurus, the Stegosaurus, the Pterodactylus, the Triceratops, the Apatosaurus, and many of the other monsters that seize the imaginations of children and adults alike.

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