Modeling a skull of Raeticodactylus

11/08/2017

Raeticodactylus filisurensis Stecher 2008, Reptilia - Pterosauria - Campylognathoididae.Il a vécu entre - 212.0 MA et -201.6 MA.C'était un petit ptérosaure de la période du Trias (entre 252 et 200 millions d'années BP). Il fut découvert en Suisse dans le canton des Grisons à Fil da Stidier (proch...

Raeticodactylus filisurensis Stecher 2008, Reptilia - Pterosauria - Campylognathoididae.
It lived between -212.0 Ma and -201.6 Ma.
It was a small pterosaur from the Triassic period (between 252 and 200 million years ago).
It was discovered in Switzerland in the canton of Graubünden at Fil da Stidier (near Tinzenhorn).
PTEROSAURS: (Order of) Flying reptiles of the Mesozoic Era that first appeared in
the Lower Jurassic and became extinct at the end of the Cretaceous...

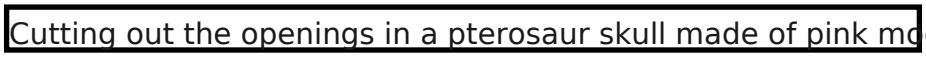
The wing surface consisted of a membrane held taut solely by the phalanges of the fourth finger, located at the leading edge of the wing. Pterosaurs were the only reptiles truly adapted to life in the air; their external appearance differed completely from that of all other archosaurs.
Their diet consisted mainly of fish...

Raeticodactylus filisurensis Stecher 2008, Reptilia - Pterosauria - Campylognathoididae.

Scientific illustration plates showing the fossil skull of Raeticodactylus in side views

To create this sculpture, it is first necessary to conduct a bibliographic search of the paleontological literature available online and in books accessible at specialized libraries (museums, universities, etc.)...

In particular, we need to find and print full-scale models of the specimens we come across (skeletal fossils, reconstructed skeletons, etc.); this
will make 3D printing much easier...


Cutting out the openings in a pterosaur skull made of pink modeling clay with a scalp

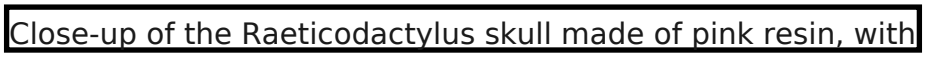
Using a sheet of modeling wax, I cut out the outlines on the full-size print...


Two pink resin skull profiles of Raeticodactylus placed on a study surface

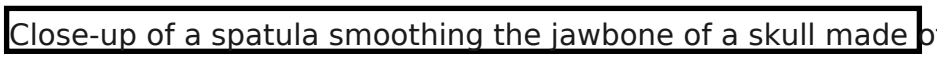
I then cut out a second sheet of wax. This second strip of wax (note: approximately 1.5 mm thick) will be cut without the ridge by
on the other hand, which is thinner...


Holding the translucent pink cutout of the openwork skull profile in front of a blowtor

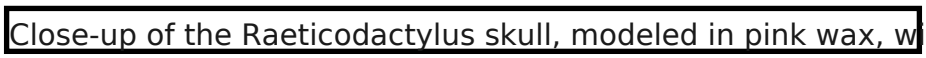
I heat the wax by quickly holding it over a flame so I can work with it and stick it to the other side, adding a small piece of wax between the two to give it some volume...


Close-up of the Raeticodactylus skull made of pink resin, with openwork jaws current

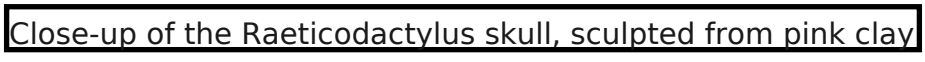
For most of the shaping, a wax knife will suffice...

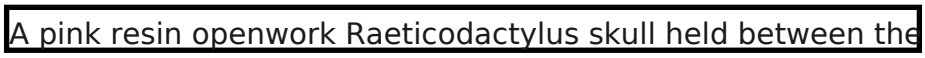

Close-up of a spatula smoothing the jawbone of a skull made of pink clay

Using the back of the waxing knife, I make the seams, add wax, fuse the pieces together, and dip the knives into the wax block to apply wax.
and I fill in the holes. I smooth it out as I go, running the knife over it again...


Close-up of the Raeticodactylus skull, modeled in pink wax, with fenestrations and ar

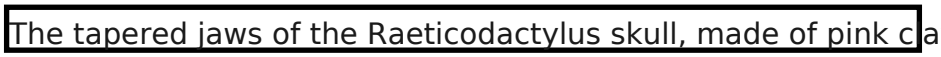
Don't hesitate to blow on it at the same time to cool the wax...

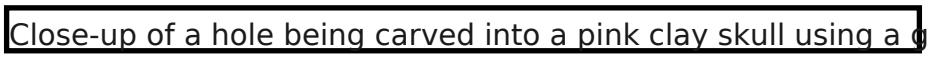

Close-up of the Raeticodactylus skull, sculpted from pink clay using a metal spatula

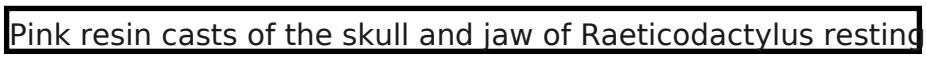

A pink resin openwork Raeticodactylus skull held between the fingers, modeling spat

Do the same thing for the jaw...

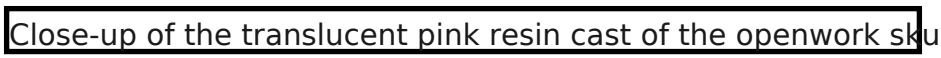

Two long jawbones made of pink modeling clay resting on a metal work surface


The tapered jaws of the Raeticodactylus skull, made of pink clay, held between the fi

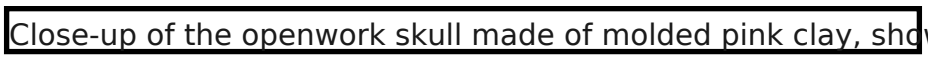

Close-up of a hole being carved into a pink clay skull using a gouge

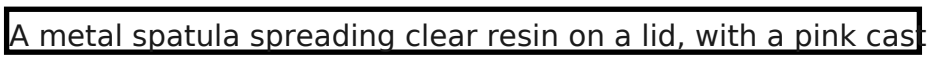

Pink resin casts of the skull and jaw of Raeticodactylus resting on the workbench


Raeticodactylus skull cast in translucent pink resin, held between the fingers

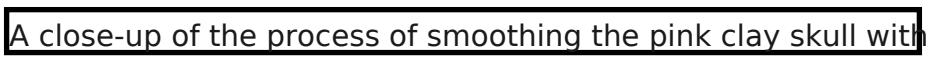

Close-up of the translucent pink resin cast of the openwork skull held between two fi

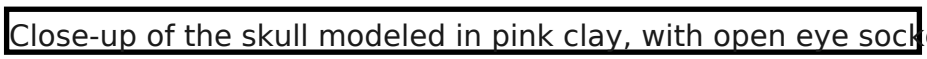
I start adding more volume to the skull by heating a piece of wax so I can shape it by hand, like modeling clay. I insert it and seal the joint, as always, with the wax knife. Be sure to seal the internal joints in the same way and smooth them out...

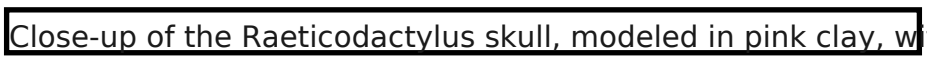

Close-up of the openwork skull made of molded pink clay, showing the bony opening

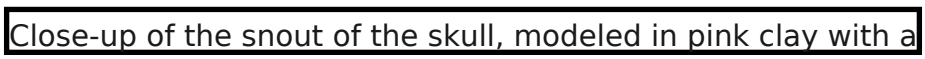

A metal spatula spreading clear resin on a lid, with a pink cast in the background

Once I’ve shaped the bulk of the skull, I add a thin layer of modeling wax in a different color that’s less translucent. This will allow me to add the small details and finish the piece. It’s always the same process: heat the knife, apply it to the block of wax; once the wax is on the knife, heat it again for better adhesion or to melt it, and then apply it...

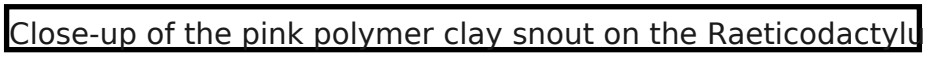

A close-up of the process of smoothing the pink clay skull with a metal spatula

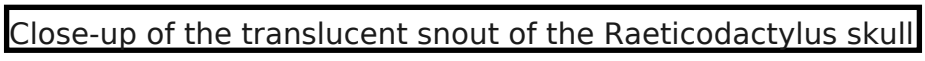

Close-up of the skull modeled in pink clay, with open eye sockets and white putty ad

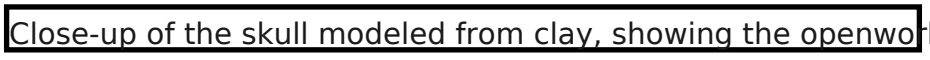

Close-up of the Raeticodactylus skull, modeled in pink clay, with carved fenestrations


Close-up of the snout of the skull, modeled in pink clay with a sculpted, bony texture

The same goes for the interior...


Close-up of the pink polymer clay snout on the Raeticodactylus skull model


Close-up of the translucent snout of the Raeticodactylus skull held between the finge


Close-up of the skull modeled from clay, showing the openwork orbital and nasal ope

Close-up of liquid glue being applied with a fine brush to the pink, hand-sculpted sku

At a certain point, I use the heated spatula to add small amounts of wax; it's small and precise. Thanks to this tool, I can apply wax fairly quickly, since the tip is constantly heated...

...I dip it in, add the wax while blowing on it—this helps shape it and guide the wax as it hardens. The spatula can also be used to smooth it out...

A Close-Up of Sanding a Pink Resin Pterosaur Skull with a Rotary Bit

Once enough wax has been added, I start using the sculpting tools. I can also use heating tools to remove wax and smooth it out as I go. Don’t hesitate to go back to the heating tools to make adjustments to your work. That’s the major advantage of wax! You remove some, add some—over and over again!...

Close-up of the elongated snout of the sculpted skull, held between the fingers

A Closer Look at the Tool-Based Cleaning of the Cranial Windows in the Modeled Sku

Raeticodactylus skull made of modeling clay held between the fingers, with openwor

Close-up of the eye sockets of the skull model, carved with a spatula

Cleaning the resin skull model with a toothbrush; close-up of the cranial windows

Brushing with a toothbrush to clean not only has a pleasant effect on the wax but also helps prepolish it...

Raeticodactylus skull modeled from pink clay and held in the hand, with openwork ey

A small black-and-red gas torch resting on a metal work surface

Using a small rechargeable torch, I smooth everything out. You need to move the torch back and forth very quickly, but for long enough to melt the outer surface of the sculpture. It takes some practice to get the hang of it, so it’s best to practice beforehand...

Sanding the openwork pink resin skull with a router (handheld)

A pink polymer clay Raeticodactylus skull held in the hand on the workbench

Close-up of the skull sculpted from clay, showing the carved orbital and antorbital wi

Close-up of the Raeticodactylus skull, sculpted from polymer clay and held between

Preparing the interior for the future palatal bones. Another wax piece will be made once the skull is finished in resin, to ensure a better fit... Here, I’m simply placing a cold metal instrument on a drop of heated wax as it cools...

Hand-held carved skull of Raeticodactylus, featuring a nasal crest and openwork cran

Close-up of the sculpted upper jaw of the Raeticodactylus skull, with the teeth painte

I'm still working on the details... I'm making corrections, smoothing things out, and so on. Finally, I'm starting to work on the teeth...

Close-up of the skull's jawbone held in the hand, with a row of carved brown t

For this, I'm using modeling wax again, but this time it's very hard and a different color. This time I'm using the PKT (same shape as the heated spatula but heated manually with a Bunsen burner or an alcohol lamp)...

A carved skull of Raeticodactylus held in one hand, in front of the reference fossil ph

This tool is much more precise because it doesn't stay hot all the time, so the wax cools and hardens faster—I'm not sure if I'm making myself clear....
This makes it easier to apply and shape the wax, but also more precisely and quickly...

Close-up of the sculpted lower jaw, with rows of brown teeth, held between the finge

A tapered Raeticodactylus skull held in the hand, with painted teeth and the metal fr

Now I can start on the jaw, which I won't finish until I've finished the resin skull—for an even better fit, one more
times. I prepare a piece of wire and shape it to stiffen the wax...

Welding of a bent brass wire held in place by a clamp, technical close-up

Then I insert it inside after heating it up first. Not too much, though, or it’ll go right through the wax... If it’s not hot enough, you can heat the wax knife and apply it to the wire. The heat will spread, and the wire will slide easily into the wax...

Close-up of a thin strip of pink dough shaped with a spatula, with a visible metal fran

Same process as for the skull: apply modeling wax, shape the general form, and begin the finishing touches...

The skull is finished and ready to be cast...