



PRINTING:

Should be printed in ABS to ensure stability and 0.2mm or lower to ensure the hooks are exact enough.

The default size is pretty much the smallest size possible.

Want it as a toy or not sure if your printer is precise enough?

- Just print it larger.

You could also try the testbed .stl first.

You could also print everything at once but it is recommended to print it as those 4 predefined batches so there is not a lot of time between each layer getting printed. The bones are also already orientated in a way so that hooks get the most stability. (Layer orientation is very important for it, don't matter much when up scaled.)

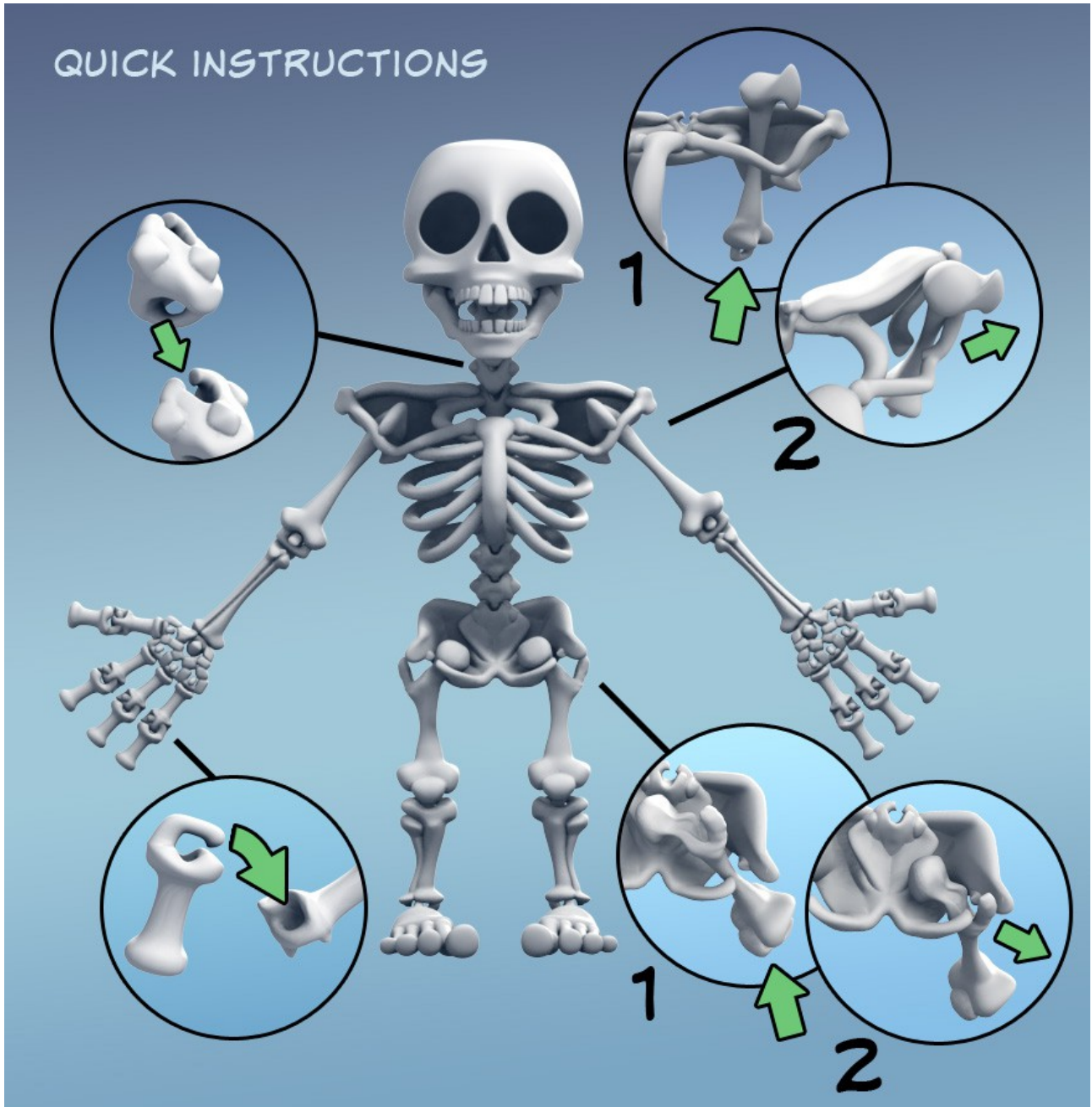
When scratching the finished prints of the platform and when breaking supports be careful not to break any hooks/rings, especially with the ribs (includes shoulders) since there they are orientated not very favorable because of the complexity of these pieces.

The .zip contains all the bones as separate files. Arm and leg are the right side version. (Viewer POV) For the left side simply mirror them in your printer program. (scale x -1)

ASSEMBLING:

Most bones snap together pretty straightforward with hooks, some force has to be applied though. You should also rotate it a bit back and forth while pressing them together which makes it easier.

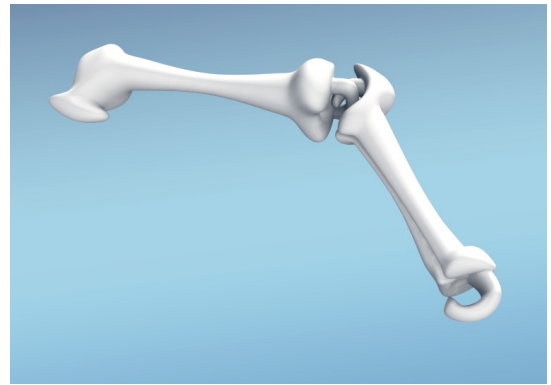
While the assembling of most bones are pretty obvious there are some special cases and orientation has to be right. Here are the quick instructions:



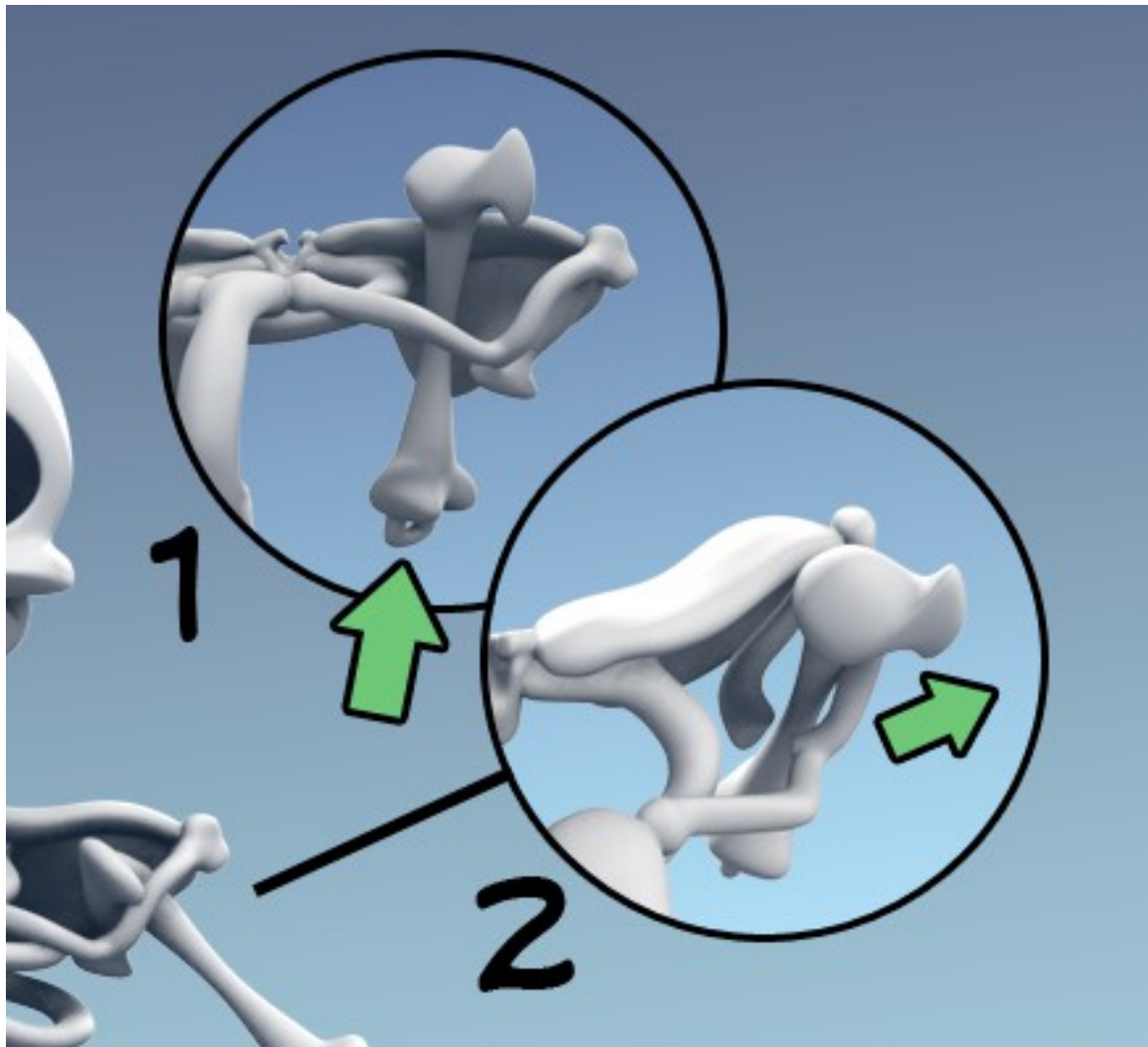
You will find more detailed instructions on the following pages.

Arms:

Lower arm rotates towards the same direction the axe looking end seems to point to. Or: the cap of the lower arm points to the opposite of the axe sheath of the upper arm.

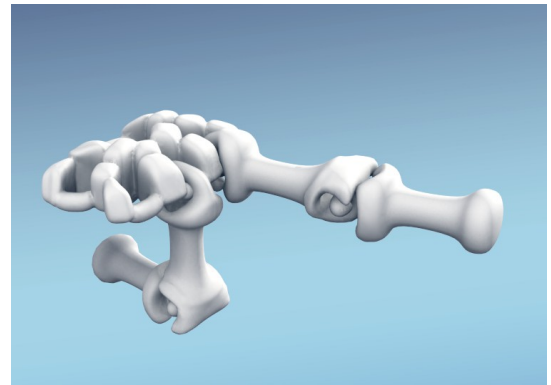
**Arms on Shoulders:**

- 1: First the upper arm needs to be pulled halfway through beside the open ring connection of the shoulder.
- 2: The thin part of that bone can then be pulled through the open ring.

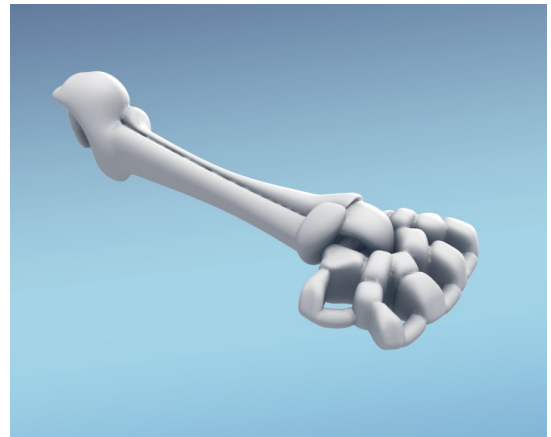


Fingers:

Make sure you have the correct side of the hand/palm. The hand ring/girder connections should be planar with the palm pointing down. Then the finger pieces connected on top of that. So they will rotate 90 degrees downwards. When looking on the front view graphic earlier the arms, palms and fingers will rotate towards the viewer. The thumb is a little smaller.

**Hands:**

Again, palm rotates downwards. The cap at the end of the lower arm points up.

**Torso:**

The spine pieces have all usual hooks. On top of the pelvis belong 2 spine pieces and then the rip piece with the highest bow. Then the bows get less bend over the 4 rip pieces. Use the spikes/knobs at the back of the spine pieces for orientation.

Note: It is better to put it together starting in the middle of the rip cage so you will have to reach less inside of it. Always push 2 pieces together. Do not try pushing against a whole chain.

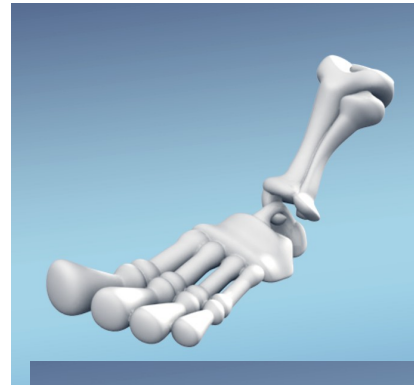
On top of the 4th rip piece belongs the shoulder piece then 3 spine pieces as the neck. Lastly the head on top of that.

The rip pieces are lock able in place with the front bow of the shoulder piece.

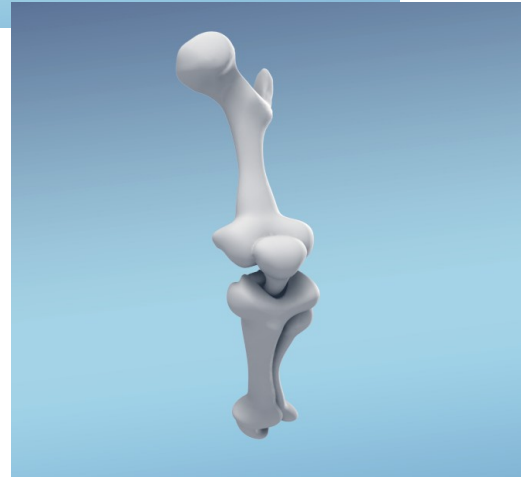


Foot:

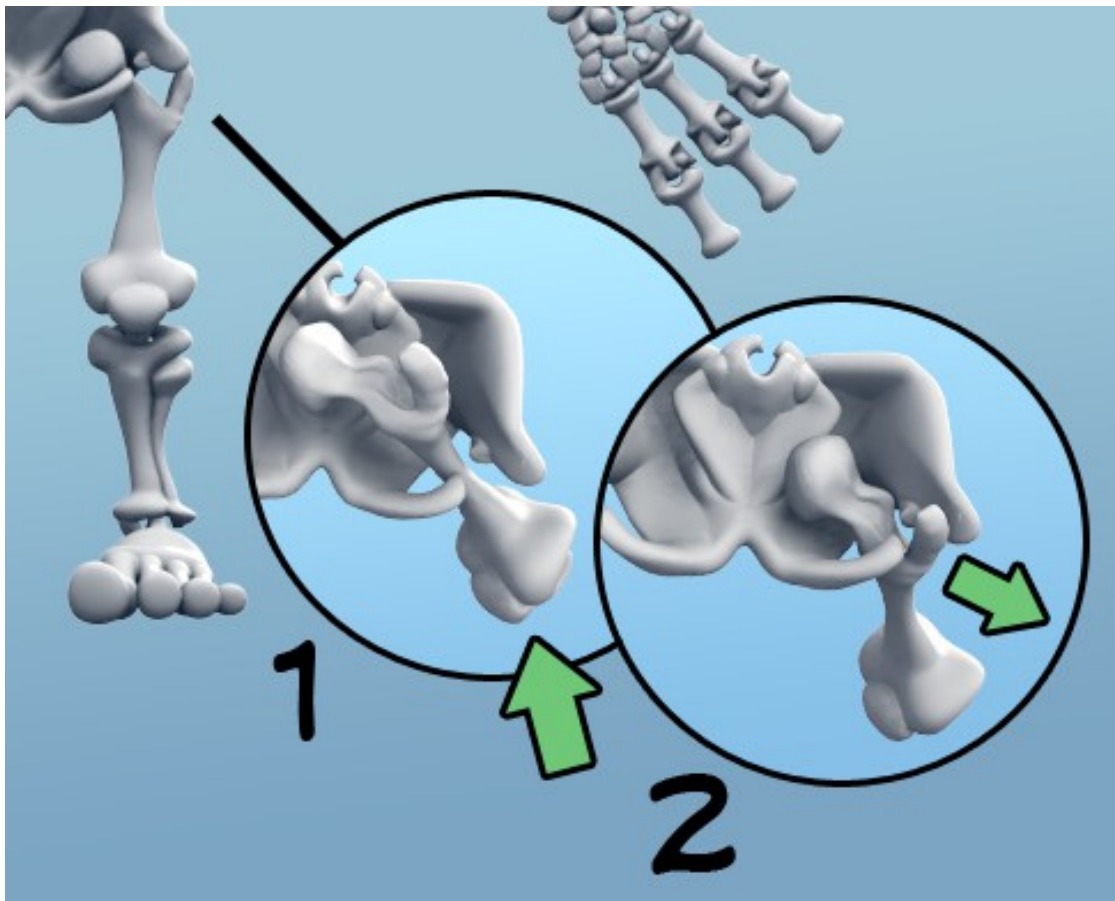
The fatter chunk of the lower leg points inwards. (To the other leg)

**Leg:**

Same here, chunky bits point inwards. The leg can then make a rotation backwards.

**Leg on Pelvis:**

- 1: Pull the thin area of the upper leg through the open ring of the pelvis.
- 2: Then pull that small stick on top back out.



Head:

The jaw connects pretty straightforward with 2 hooks on the head. The little knobs in front are just for holding the jaw also in a closed position. *You have to move it a bit towards you or away when rotating the jaw.* The centered ring below is for connecting the spine on it.



Eyes:

Eyes are optional and when you put them in you most likely **won't get them back out of it**. So make sure that you always want your skeleton to have eyes. You can put some black ABS in the holes or simply some black paper.

Here is a little assemble animation:



<http://i.imgur.com/mP1RNn7.gif>

It obviously won't be that smooth but it shows where which piece belongs of the 4 batches.

Problems?

Warping or the printer not being precise can make it too hard to snap the pieces together. If it really not work the hooks can be carefully trimmed with a nipper cutter or a sharp scissor. If it gets always too imprecise better make it larger which allows for more tolerance and makes it all also more stable. Already broke a hook? - Then only the good old glue will fix it or just printing a replacement bone. All the bones as single files can be found in the zip.

Please excuse any spelling mistakes made in this instructions, English is not my first language.

Bests,
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More of my designs: <http://www.thingiverse.com/Davision3d/designs>