

Spine setup with IK/Bones unders 3dsmax5.

Ok, it's time now to create the spine ! Then you will be able to assemble the arm and the leg with the body ! We will first create the spinal column, with the new 3dsmax5 IK Spline solver, then the head, and clavicles/hips.

If you haven't read the previous articles, this doesn't matter, but be sure to be familiar with IK/bones, or maybe go [here](#).

Let's go for some bones creation ! Go into Character | Bone tools, then create in the left viewport a chain of bones like this : Start from the bottom side to the top. Create five bones, and keep the end one.

Now, draw a spline (with smooth vertices) from bottom to top, which follow the bones chain. You can even snap the vertices on the start of each bone.

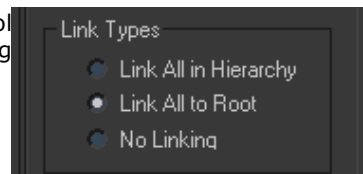
■ *A bit of method* : If you put an IK_Spline solver on the chain now, it will create some dummy along the spline to manipulate the spine. These dummies are placed on vertices of the spline. Here, we have placed the vertices on each bone, so no problem. The spline is "homogeneous", I mean with evenly spaced vertices. But in some cases, you will need different splines, with vertices anywhere. For such a spline, you now have a modifier to make the vertices evenly spaced : the Normalize Spl modifier ! Just enter the space between vertices, and you get it, without deforming the shape of the spline ! Maybe you should look on your own to know when using it.

So, we will put this funny solver on our spine now : Select the bottom spine (Bone01), go in menu Animation | IKSolvers | SplineIK solver, then click on the end of the chain (bone06). 3dsmax creates the IKGoal. Then, you have to select the Spline you want to use as reference for the SplineIK solver. Ok, now you see these 6 box helpers along the spline. Select/move one to see how the solver works.



Now select the spline, and go to the modify panel. You can see that 3dsmax has put a Spline IK Control modifier on top of the spline's stack. This modifier allows us to control the display of the helpers along the spline, but also how the links work.

- Link All in Hierarchy : This will link each helper to the previous one.
- Link All to Root : This links all the helpers to the first one
- No Linking : no link between helpers



For our example, we will choose "Link All in Hierarchy", which is my favorite for the spine, (-). But once more, it depends on your needs.

Ok, now redesign a bit the spine bones, with fins etc, with Bone tools windows into Character menu.

■ Such geometries for the bones have two advantages : First, this is a visual aid to better see the orientation of the bones. In some cases, it can also seem more anatomical. Second, the 3dsmax bones are volumetric ! What's that mean ? Simply that when you will add a skin modifier, the default envelopes will be attributed according to the geometry of the bones. Better geometry, better start for your skinning !

Ok, now we have the spine, so go a ... head !

The Bone06 will be our neck. So we will create another bone, which will be the head. For the head bone, you can create a new one, or either create a low poly mesh of your head mesh, and use it as bone. Then, you will have to place it right on the neck, and just link it to the neck !

Now, we will have to put two things : the clavicles, and the hips.

Create the bones and place them like this. Then link the clavicles to the Bone05 of the spine, and the hips bones to bone01 of the spine.

Now you have to construct the arm and the limb. These steps are described here :

- [The arm](#)
- [The limb](#)

Then you will get a full rigged body. I'm still working on better wrist controls and some good shoulders one, maybe future articles.

