CHARACTER RIGGING IN MAYA

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Rigging

- Rigging is the sometimes excruciatingly technical art of articulating a character for animation. It involves creating a skeleton structure out of joints and bones that will deform the model. The animator sets keyframes on the controls, and the animation process continues from there.

- Maya joints are a type of deformer that are designed to transfer rotational values to points on a model based on each joints influence on those points. Joints are most often arranged in a hierarchy–meaning that one joint is a child or farther down on the hierarchy than the parent.

- Each child of a parent exists in the local space of that parent. This means that the translate values of the child are listed as distances from the parent. This is important to understand where joints are concerned. Zeroing out a joint's translate attributes will cause the joint to snap back to the location of the parent. The ultimate parent is the World space as defined by the world origin at 0, 0, 0.

- The three joints shown below were created with the X axis pointing down the bone, the Y axis pointing up and the Z axis pointing forward in space. Knowing this is important to understanding what comes next.
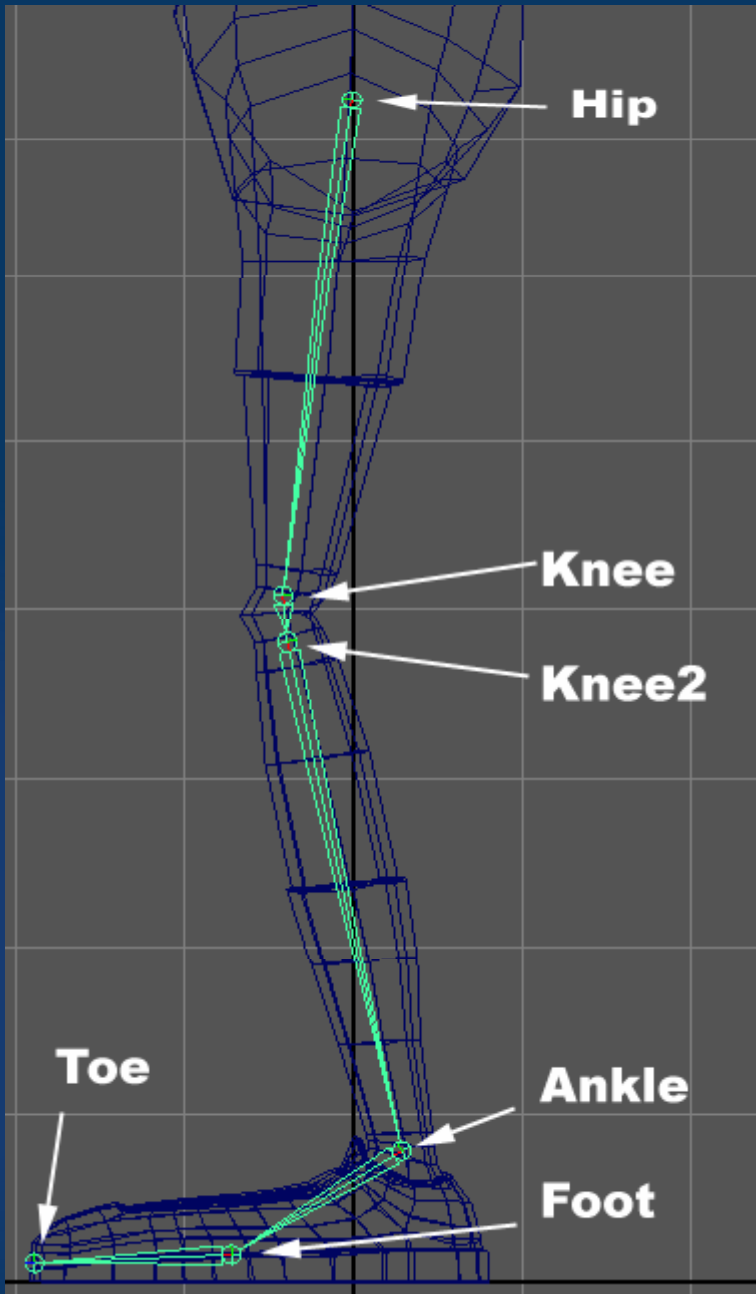
There MUST be a slight bend in the chain from the Hip to the Ankle. A completely straight chain will not bend with the IK.
Also, you should be diligent in placing joints in the middle of geometry that will deform as seen in the knee and ankle areas. This is contrary to actual anatomy, but is crucial to getting smooth deformations.
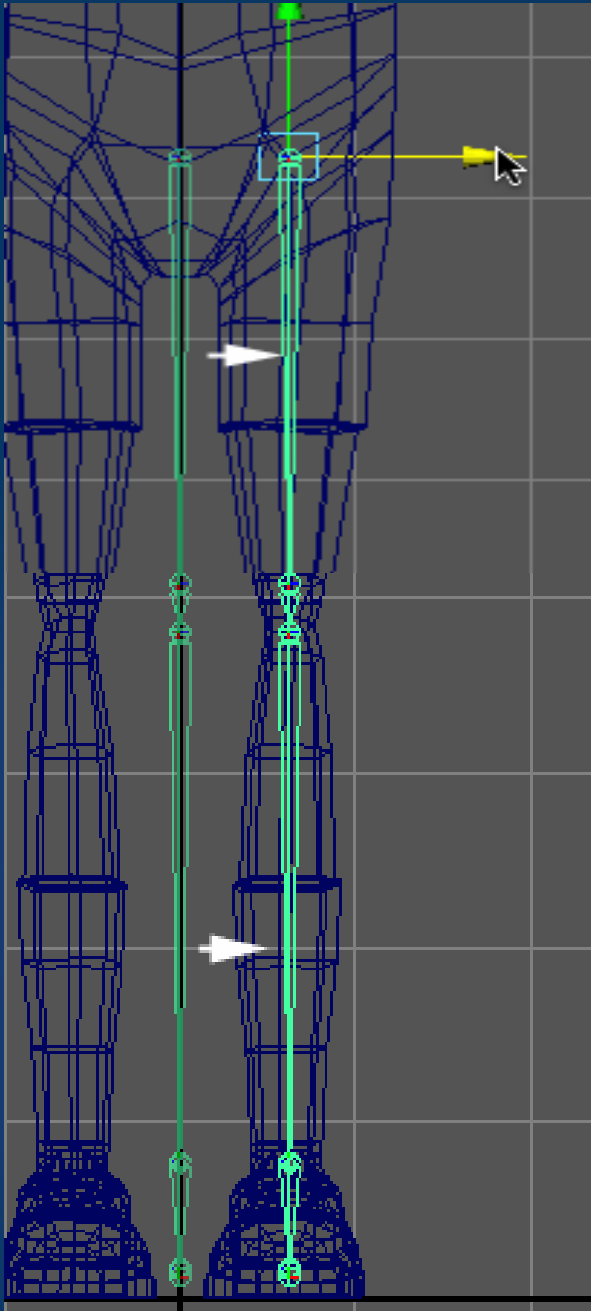
When modeling your characters, it will behoove you to model your characters with legs parallel to the YX plane because this will make lining up your leg
joints much easier. Making characters that are bowlegged or pigeon-toed, while possible, are unnecessarily complicated at the beginning of your character design efforts.
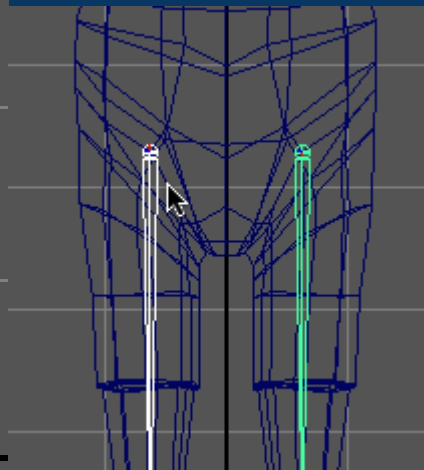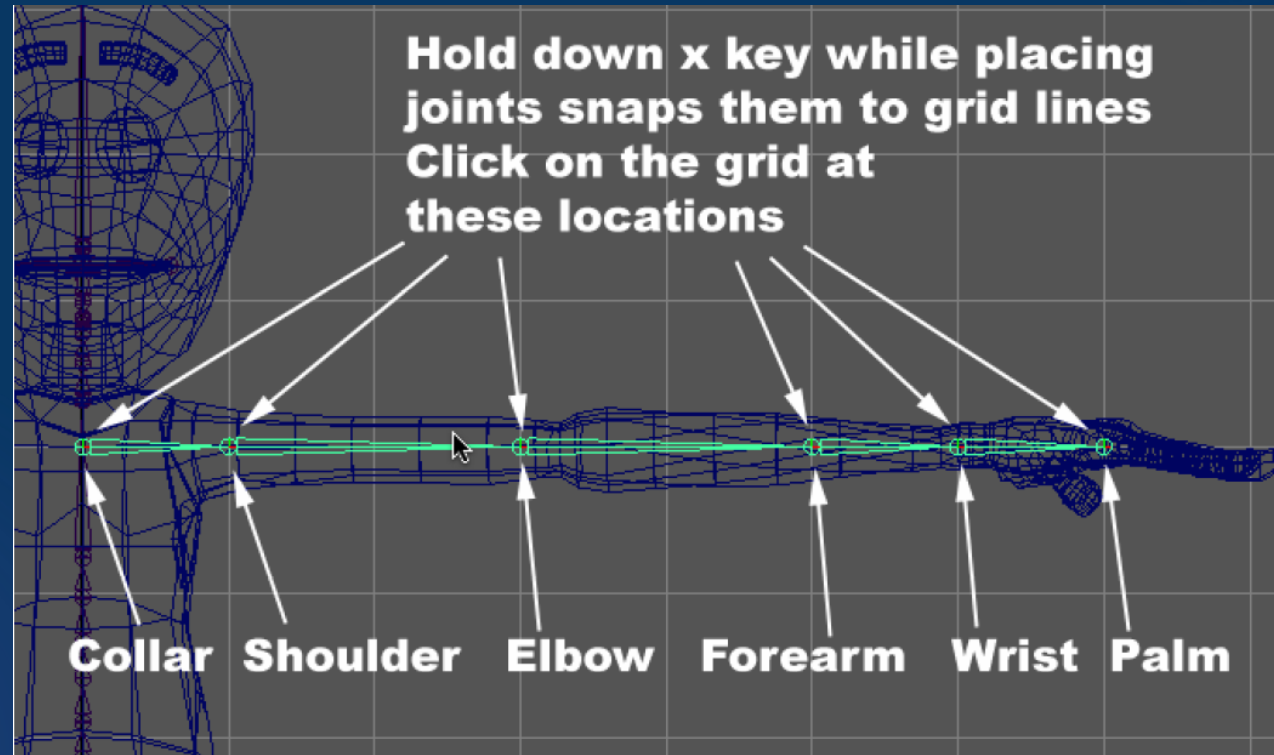
Click Mirror, and your joints will mirror across the YZ plane and be suffixed with the _R designator.

Creating The Spine
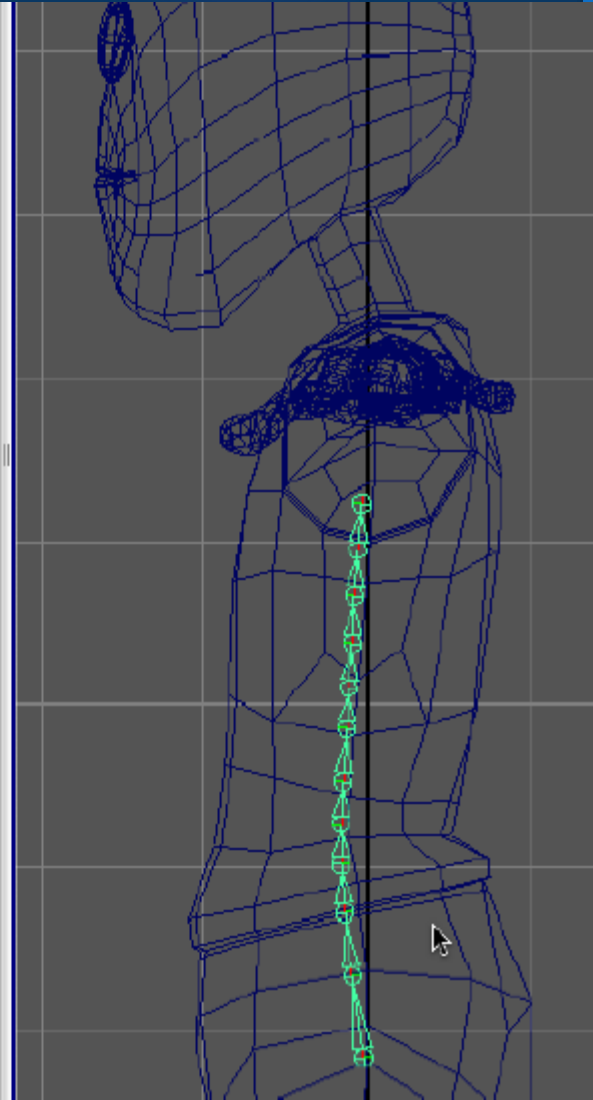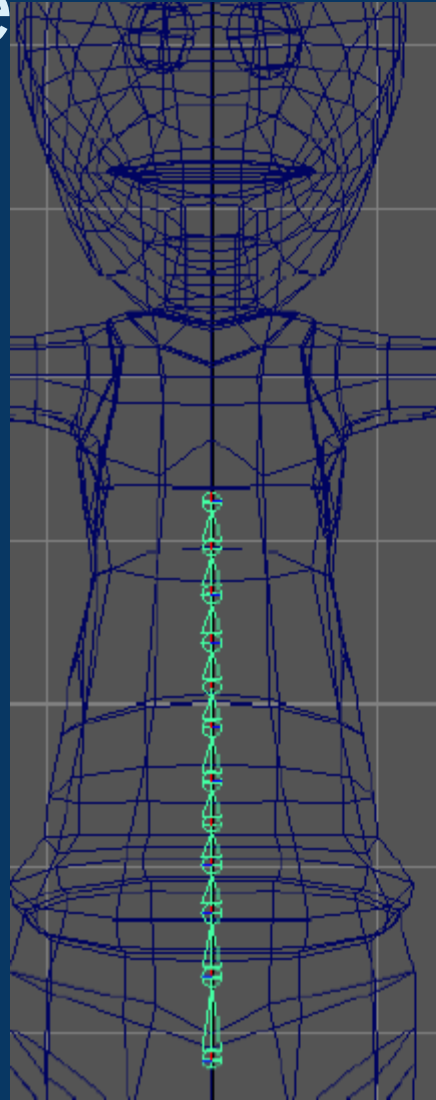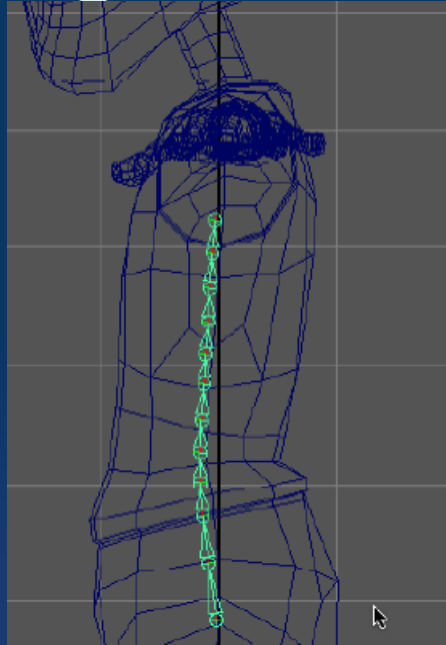
Unlike a "real" spine, you should place the joints in the middle of the character. This will aid the deformation of the torso and abdomen.

Creating the Arm Joints

Hold down x key while placing joints snaps them to grid lines Click on the grid at these locations

Collar   Shoulder   Elbow   Forearm   Wrist   Palm

When modeling, create the arms of your
characters facing straight out from the body in what is called
the crucifix pose. This allows you to place joints much more
easily.

Finishing the Skeleton
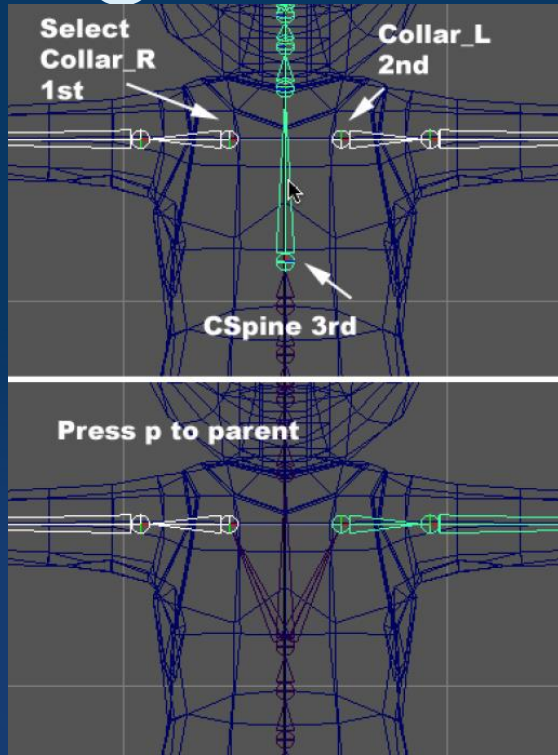
To finish up the back, we must create a
root joint and parent the spine
and legs to it. This joint is the top of the
hierarchy for the entire
skeleton, so it is important. Also, it is not
oriented like all the other
joints in that it is aligned to the world
rather than having its X axis
pointing at its child (it has three
children, so that would be impossible
anyway.