Quick Tips for the Maya Pipeline

Modeling:

- **A clean, evenly distributed, quad mesh is essential for good deformations**. More edge loops/geometry are good for places that will stretch: elbows, knees, shoulders, etc.
- The smaller your poly count (Display>Heads Up Display>Poly Count) the faster the render time and the faster your animations will run on your computer.
- **For a quick polygon model:** Start with Create>Polygon primitives>Cube with option box. Set it to have 2 divisions in width, height, and depth. Extrude arms, legs, head or whatever necessary from this cube. Models should always face the positive Z-axis. Add edge loops where necessary. Add geometry and round out your model to look less boxy. If you are doing a human model, start it in a T pose.
- **Don't use Smooth Geometry until you've got a good, clean base mesh**. Cleaning up vertices and edge loops after smoothing is a nightmare. Try to get away with not using triangles and vertices that converge from 5 edges (sometimes these are necessary). If you plan on rendering with smoothing (how it looks when you hit "3" on your keyboard) you don't even need to use the smooth geometry tool.
- **If your edges or faces look weird** and you don't know why, it's probably your normals. Make your normals look good by going to Normals>Set to Face and then Normals>Soften Edge.
- Here's the idea of the pipeline: http://www.3dtotal.com/index_tutorial_detailed.php?id=359#.T4NvTpnbARI

UVs:

- **For a quick UV layout**: Start with Create UVs>Planar Mapping❑ and make sure to choose the option box. Project from the axis your model is facing (Z-axis). The other options can remain default. After projecting, click in your Viewport to finish the tool. Select edges that divide the front and back of your model. In the UV Texture Editor, go to Polygons>Cut UV edges. This cuts the front and back of your model into two UV shells. To grab a UV shell in the UV space, enter UV mode in your viewport (RMB+hold>UV) and click on a UV. Go back into your UV Texture Editor and do RMB+hold>Select>Select Shell. Now use your move tool (W) to move your shell.
- **Make sure your UV shells/faces do not overlap**. This is important if you want to paint your texture.
- Make sure your UVs are all contained in **the upper right quadrant** in the UV texture editor.
- **To take a snapshot of your UVs** to paint over them in Photoshop, go to Polygons>UV Snapshot in your UV Texture Editor. You can specify where the snapshot image is saved.
- Editing your UVs does not edit your 3D model and vice versa. If you add geometry to your model after laying out UVs, Maya will do a crappy job of trying to fit them into your UV space so you will have to lay out the new geometry. So, it is better to **finish modeling before doing UV layout**.
- If you have complex protrusions, you need to make more UV edge cuts.

Texturing:

- **To set a new material to your object,** first select your object, then in your Rendering menu, go to Lighting/Shading>Assign New Material. The Blinn material is a good default if you're not sure what to use.
- **To select this material and change its attributes**, select your object and go into the Attribute Editor. There will be a bunch of tabs. Scroll over until you find "blinn1".

- **If you have a texture image you'd like to apply** to your model, look for "Color" in your Blinn material attributes and select the little checker box next to the slider. This time, select the "File" node. In your attribute editor, click the little folder to choose the location of your image. Now your image should appear on your mesh. **To view textures in the viewport, hit "6" on your keyboard.**
- **If you don't want the material to be shiny,** go into the Blinn attributes and under the Shading section, decrease the Eccentricity and Specular Roll Off. Also drag down the Reflectivity to zero.

Rigging:

- Once you are completely done with modeling, go to **Edit>Delete All by Type>History**. You can't undo anything once you do this. Now select your objects and go to **Modify>Freeze Transformations**. If you go to your channel box, all of the channels will now be set to zero (or 1 for scale). Doing this to objects makes it so you can reset their position by setting the channels to zero.
- **Do not make bones in the perspective view**. Use your orthogonal views and switch between them to make bones. This will make placement easier.
- Selecting a joint will select its hierarchy. If you move a joint, you will also move the bones after it. **To move a single joint**, hold D and move the joint you want.
- **If your joints are too big or small**, go to Display>Animation>Joint Size and change according.
- **To use Mirror Joints**: make bones for one side, select the joint chain(s) you want to mirror, and then go to (Animation menu) Skeleton>Mirror Joint❐ and choose the option box. If your model is facing the Z-axis, then choose YZ. If you named your joints (which you really should do, like leftKnee), you can do search and replace, like replace left with right or R_ with L_. Keep your outliner organized!
- Bind the skin by using the **Smooth Bind**. Do not use Rigid bind.
- **To control the influence of the bones on the skin**, use the Paint Skin Weights tool. You must select your mesh first in object mode. You can select the joint in the tool options that you want to paint. Change your brush size by holding
- **Once you make bones and bind skin to them, you should not move the bones themselves**. We use IKs to control the bone movement. However, you may rotate them without problems. Do NOT delete all history after you bind skin-- this is a deformer attribute. Use Delete by type>Non-deformer history.
- If you want to move more than one bone (make a bend, such as elbow or knee) then use the RP solver. If you want to move one bone, use the SC solver. These options are available when you do IK Handle Tool option box.
- **If you want to control the direction of the IK bend**, then you have to create a pole vector. First, make a Locator (Create>Locator) and snap it (hold V and use move tool) to the joint that is bending. Move it in the direction of the bend so it's not on top of the joint but in line with the bend. Do Modify>Freeze Transformations on the Locator. Now select the Locator, then Ctrl+select the IK (use the Outliner to do this). Go to Constraint>Pole Vector. If you move the locator around, you'll notice that the bend moves with it.
- **To do a constraint, select the controlling object and shift+select the controlled object- the order of selection is important**. Then apply the constraint from the Animation menu.

Lighting/Rendering:

- Use the lights that best simulate the look you're trying to accomplish. Do not use a full value Ambient light unless you want your scene to look flat and cartoony.

- **Make sure your lights have Quadratic Decay** in the attributes.
- Artificial lights will have a slight yellow color.
- **Important lights should have shadows turned on**. Turn on Ray Trace shadows in the light's attributes. Ray Trace shadows are better but more expensive (higher render time) than Depth Map. You need mental ray for Ray Tracing. If you want drop-off on your shadows, change the light angle to small value and increase your shadow rays to 5. Lighting is all about tweak, render, tweak, render.
- **If you are ready for your final render**: Go into your render settings  . If mental ray isn't loaded, go to Windows>Settings/Preferences>Plug-in Manager and check Loaded and Auto load for "Mayatomr.mll". Now back to your render settings. You start in the Common tab. If you are rendering more than one frame, change the Frame/Animation ext to "name#.ext" . Look at your Frame Range and enter the applicable numbers for start and end. Make sure your Renderable camera is the one you are using for your scene ("persp" cam is default). Change your image size to the resolution you desire. Higher res = more render time. Now go to your Quality tab at the top. Change Quality Presets to "Production". Now that your render settings are set, you may go to Render>Batch Render. This will make a Maya IFF image for each frame.

Animation:

- Is your animation playing way too fast? **Set your Frames Per Second to real time** by going to your Animation settings  at the bottom right of your Maya window and selecting the dropdown menu for Playback speed. Go to Real-time (24 fps).
- **Block out poses first** by setting your tangents to Stepped. At the top of your graph editor, click this button ->  . When you are done with blocking and timing, switch tangents to  .
- **If you want to repeat a movement**, shift+select the control curves that you want to repeat movement. Shift+LMB+drag on your timeline for the keyframes you want to repeat and hit Ctrl+V. Now right click on the last keyframe and go to Paste>Paste.
- **If you want a looping animation**, your first and last keyframes must be the same for all control curves. You can copy and paste keyframes by right clicking the keyframe on the timeline and do Copy, then right click the frame you want to paste, and do Paste>Paste.

Other stuff:

- Use your hotbox for efficiency! This is done by holding space bar in your viewport. If your hotbox doesn't show all of the menus, open your hotbox and go to Hotbox Controls on the right, then select the menu you want to display. I like to have quick access to all menus.
- Maya Help (F1) is *actually* really useful. It has mini tutorials for a lot of things so be sure to browse it if you're looking for a quick how-to or description of tools or settings.
- Get to know your shortcuts! You should know your tool hotkeys (Rotate=E, Move=W, Scale=R). Here's a great list of them: http://www.keyxl.com/aaab24a/249/Autodesk-Maya-keyboard-shortcuts.htm

If there is something I didn't cover or want me to do an in depth tutorial for something specific, let me know.

Email me for help: ajohnst08@gmail.com