Usually, when you’re modeling something in Maya, you have a rough idea of what it should be like. However, what if you have actual images of the object you are modeling and want to be as accurate as possible? This is usually the case when you create a model from scratch. This is a very basic and important modeling skill to have.

In this tutorial, I will teach you how to set up a basic reference plane to model your, for lack of better words, model after.

Settings

Remember to always check your settings before starting any new Maya file! In this tutorial, I used FEET for the linear option, DEGREES for the angle option, and NTSC 30fps for the time option.

Creating Reference Planes

Starting in the top bar, go to CREATE > POLYGON PRIMITIVES > PLANE > OPTION BOX.

Or alternatively, you can click on the PLANE icon in the POLYGONS shelf tab.
If you created the plane through the top bar, your option box should be open. Set your settings to the ones below (assuming you used the same LINEAR setting as me .. .feet).

I set the Width and Height settings to the dimensions of an average human being (ballpark). You can change these accordingly to how large your model is. We set the subdivisions along the width and height to be 1 because we only want 1 face on either side of the plane. This is because we are going to apply an image to the plane and we only want the image to show up once in the single face we specified.

Your window should look like this now (after choosing the SMOOTHSHADE option).
Name this plane either in the CHANNEL BOX or in the OUTLINER to `frontPlane`.

Next, switch to the 4-WINDOW view (remember to apply SMOOTHSHADE to all or it will be difficult to see the plane wireframe). Select the plane, and in the CHANNEL BOX, under the ROTATE X setting, type in `90` and hit enter.

You should notice that the plane is facing forward in the FRONT view panel and you can barely see the plane in the side view.

Now repeat the process with another plane. However, this time name the plane "`sidePlane`" and rotate it 90 degrees in both the X and Y direction.
You should notice that now you have planes visible in both your FRONT and SIDE panel view.

**Applying Images**

Now that you have your reference planes set up, you can apply your reference images to them and start modeling!

Good reference images have a clear FRONT and SIDE view that are lined up proportionally. For example, the eyes in the front image should line up with the eyes from the side image. You can find images for characters like this using the keyword **MODEL SHEETS**. Artists usually draw the character in the front, side, and back view lined up. Here is a model sheet I found on Flash Gordon. [http://www.graphiccollectibles.com/catalog/images/1126371862.jpg](http://www.graphiccollectibles.com/catalog/images/1126371862.jpg)

I opened the entire image in photoshop, enlarged it, cropped the front and side image, darkened the lines, and saved it as separate files. The results are the images found below. [http://cloud.cs.berkeley.edu/~cnm190/gold_team/files/cnm190websites/gary/flash_front.jpg](http://cloud.cs.berkeley.edu/~cnm190/gold_team/files/cnm190websites/gary/flash_front.jpg)  [http://cloud.cs.berkeley.edu/~cnm190/gold_team/files/cnm190websites/gary/flash_side.jpg](http://cloud.cs.berkeley.edu/~cnm190/gold_team/files/cnm190websites/gary/flash_side.jpg)

Save these onto your desktop and I’ll show you how to apply them onto your reference planes.

Back in Maya, select your **frontPlane**. Hold your RIGHT MOUSE BUTTON down, hover over MATERIALS, hover over ASSIGN NEW MATERIAL, and then select LAMBERT.
This may require some nimble mouse maneuvering. 😊

Your screen should look like this now.
This is the beginning of texturing ... but we'll talk more about that later. For now, don't worry about it.

In the upper textbox, you will find the name of the texture you are applying. Rename this to “flashFront” Next, click the black and white checkered OPTION BOX next to COLOR. A menu should pop up. Select FILE.

A new menu should appear to your right. Now click on the folder icon next to IMAGE NAME.
Select the flash_front.jpg from your desktop. The image should appear in the TEXTURE SAMPLE box at the top of the menu.

Now, in your FRONT view panel (bottom left panel), select SHADING and make sure that HARDWARE TEXTURING is checked. If it isn’t, select it to check it. Your image should now appear on your plane. Now, to make the image show up in all the windows, under SHADING, select APPLY CURRENT TO ALL. Your image should now appear in your perspective view as well.
Great! You've just finished your frontal reference image. Now repeat the same process with the sidePlane, except this time, use the flash_side.jpg instead of the front one. Your window should look like this.
Now, under SHADING, select X-RAY. Your planes should turn transparent. You may now notice that in the FRONT view, the reference plane isn’t exactly lined up ... and in the SIDE view the plane isn’t exactly centered. Feel free to tweak these planes by moving them around so that they match up with each other. Make sure they match up by rotate around the planes in your PERSP view (upper right panel). Your window should look like this.

The most important thing to remember here is to make sure that the front and side views match up proportionally. The eyes, ears, nose, head, shoulder, arm, waist, knees, and feet should match up (just to name a few).

Before you start to model, it’s a good idea to put these planes in layers so that you wont accidentally click them while you’re modeling. To do this, click on the NEW LAYER icon in the middle-bottom right of your screen.
A new layer called “layer1” should appear. Double-click that and a EDIT LAYER window should pop up. Rename the layer to “refImages” You can change the display type and color of the plane here as well .. but for now ... don’t touch them. Hit SAVE.

To add objects to this layer, select both the front and side planes then hold the RIGHT MOUSE BUTTON over the “refImages” layer, (a new menu should pop up) and select ADD SELECTED OBJECTS.

Notice the little boxes next to the “refImages” layer name. The first box controls the visibility. Click to toggle the box on and off and you should notice your reference planes disappearing, then reappearing. The middle-box locks your layer. This is what we want. Click the middle box until a big R appears. Now try clicking your reference
planes in any of the windows. Notice that you are unable to select them. Perfect! The last box is the color scheme of the layer .. but you don’t need to use that for now ... unless you like having pretty colors on your screen .. I do 😊

You have just finished creating your very first reference plane. Now go start modeling! Peace!