

Summary

- 1.1 When creating your character, KEEP IT SIMPLE.
- 1.2 The easier and the simpler you make the design, the easier and the simpler the entire process will be.
- 1.3 The more you understand your character, the more believable your character will become.
- 1.4 Creating a character analysis will help you achieve greater understanding of your character's background.
- 1.5 Characteristics you should include on a bipedal character for optimal learning:
 - Two legs.
 - Two arms.
 - Two hands and two fingers, which include a minimum of a thumb and middle finger or mitt.
- 1.6 Characteristics you should include for a more predictable outcome:
 - T-pose.
 - Feet should be planted on the ground, hip distance apart.
 - Toes should be facing forward.
 - Geometry should be present in the crotch area.
 - Palms should face down.
 - Shoulders should be defined on top, arcs in the armpit.
- 1.7 Characteristics you should avoid until further experience:
 - Buttons and rigid objects.
 - Wings.
 - Four legs.
 - Poses other than a T-pose.
- 1.8 Characteristics you can include to add personality:
 - Ears.
 - Tails.
 - Antennae.
 - Teeth.
- 1.9 Design concerns:
 - Overweight characters decrease the range of motion a character has because geometry will collide, causing interpenetration.
 - Short legs equal a limited range of motion.
 - Large feet are awkward, especially with short legs.

Exaggerated proportions create a focal point.

Overlapping geometry creates interpenetrations when designing clothing.

1.10 Creating a character sheet finalizes the design and aids in the modeling process.

Assignments: Designing a Character

Assignment 1.1: Analyze Your Character

On a sheet of paper, answer the following questions about your character. Keep your sketchbook handy and draw any ideas that come to mind.

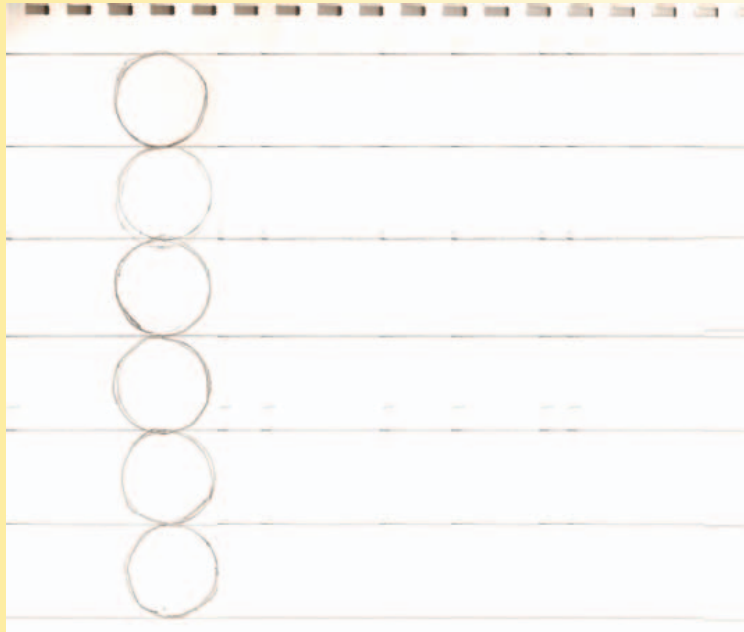
1. Where is your character from? Did your character grow up somewhere else or did they always live in the same place? Did they grow up in the city or in a log cabin on a mountain? Are they from this planet or another? Are they from a wealthy family or a poor one? Were they educated as a child? Are they an only child? Do they have siblings?
2. Where does your character live? What country, city, or planet does this character call home? Do they live in a city or the country? Alone or with a roommate? Still with their parents? Are they married? Do they have any children?
3. What is your character name and how old is your character? Is he a child? A teenager? An adult?
4. What does your character look like? What is your character's height? Are they small, or tall? Is your character thin or fat? Do they have an apple shaped torso? Is it round? Is it square? What shape is their face? Do they have big ears? How about a tail? Are they male or female? Do they have any physical abnormalities? (large nose, big feet, etc.).
5. How does your character earn a living? What is their trade or career? Are they a student? Are they a criminal?

Assignment 1.2: Create Character Model Sheets

Materials Needed:

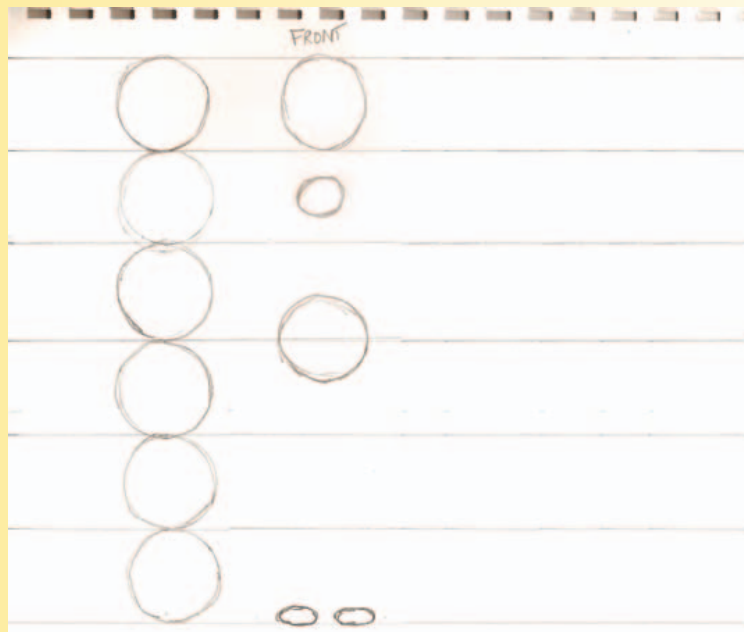
pencil
 8 ½" × 11" paper or smaller, but no smaller than 5" × 7"
 black and blue markers or pen and ink
 access to a photocopier
 access to a scanner
 Adobe Photoshop or other image editing software.

1. Draw front or side of character.
 - a. First determine proportions. Draw a circle for the size of the head. Then stack 5 to 8 of these circles to establish your character's height. Draw horizontal guidelines across the page at the top and bottom of each sphere. Begin the drawing for your character to the right of this stack of circles. Proceed to EITHER b or c.



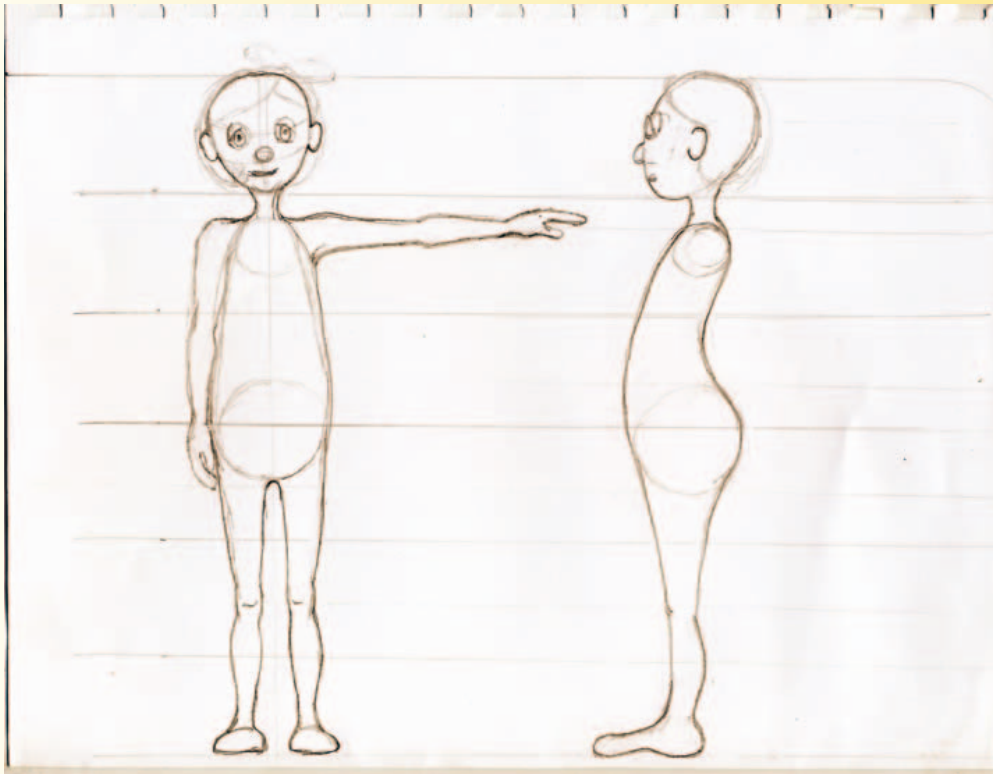
Proportional circles six heads high with horizontal guidelines.

- b. Beginning with the **FRONT** view: Draw a circle for your head. Don't worry about shape at this point – you can change that later. Think about how long the neck will be and then draw a smaller circle for the shoulder area and one for the hip area. Draw ovals to represent the feet.



Head, shoulder, torso, and feet roughed in for the front view.

Draw lines for the neck, connecting the head to the shoulders. Draw lines for the torso, then lines for the legs. The arms and hands are $3\frac{1}{2}$ heads long. The hand alone should be $\frac{3}{4}$ of a head long, about the size of the face. Make sure the character is drawn in the T stance, arms parallel to ground, palms facing down, feet should be facing forward and hip distance apart, space between legs and feet, head forward. Redefine the shape of the face if necessary.



Sketched character front and side drawings.

- c. Beginning with the **SIDE** view: The side view should be drawn so that your character is facing to the left of your computer screen. Again, begin by drawing a circle for your head. Draw a curve that represents the spine and posture of your character. Draw a smaller circle for the shoulder area and one for the hip area. Draw an oval to represent the foot.



Head, shoulder, torso, and feet roughed in for the side view.

Draw lines for the neck, connecting the head to the shoulders. Draw lines for the torso, then lines for the legs, consider if you want the legs to be bent or straight. Redefine the shape of the face if necessary.

2. Redraw horizontal guidelines.

Once the front or side drawing is complete, redefine the horizontal guidelines to indicate the positions of the top of the head, the eyes, the chin, the top of the shoulder, the top of the pelvis, the top of the thighs, knees, and the feet to ensure that they line up in the other views. These lines are helpful to ensure that your proportions are consistent from one view to the next.

3. Draw the additional images, front or side, top of arm and hand, top of foot, and back (optional).

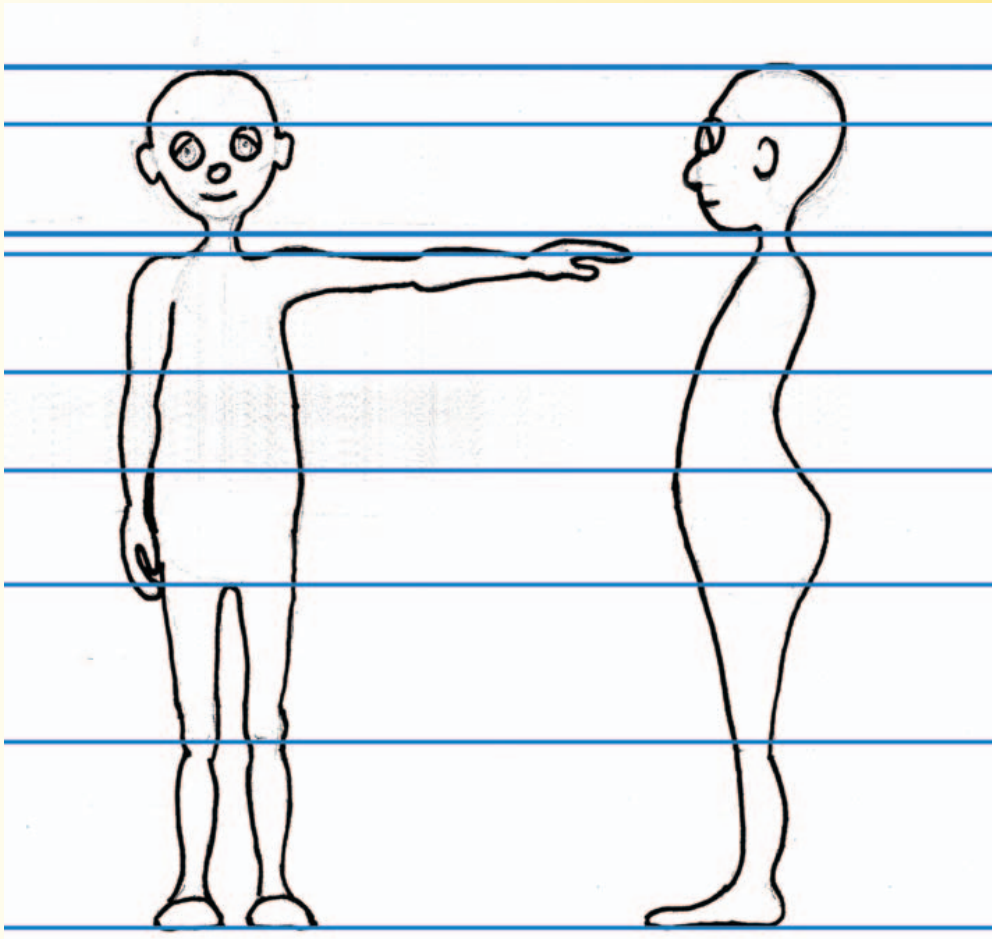
- Follow the same guidelines discussed already to complete the side or front drawing.
- On a separate sheet of paper, draw the arm and hand from the top view. Do not forget to use your proportion guidelines. The arms and hands are $3\frac{1}{2}$ heads long. The hand alone should be $\frac{3}{4}$ of a head long, about the size of the face.
- On a separate sheet of paper, draw the foot from the top view.



Arm and hand drawing, top view.

4. Photocopy the original drawings.
5. Ink the photocopy.

Using a black marker or ink, trace the photocopy outline of your character. Using a blue marker or ink, trace the horizontal guidelines in blue.



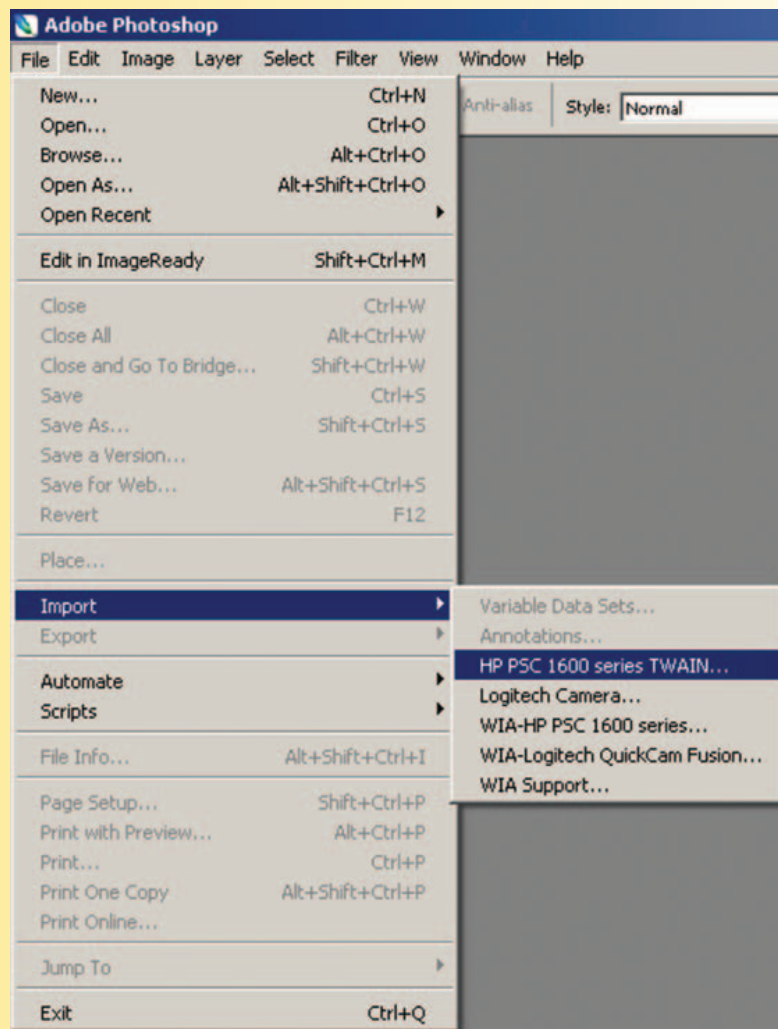
Inked photocopy with blue guidelines.

Assignment 1.3: Scan and Prepare

Materials Needed:

- access to a scanner
- Adobe Photoshop or other image editing software.

1. Open Adobe Photoshop or your scanning software.
2. Scan your drawings with a resolution no lower than 200 (dpi, ppi, etc.).
 - a. In Photoshop, go to [File > Import] and choose your scanner.



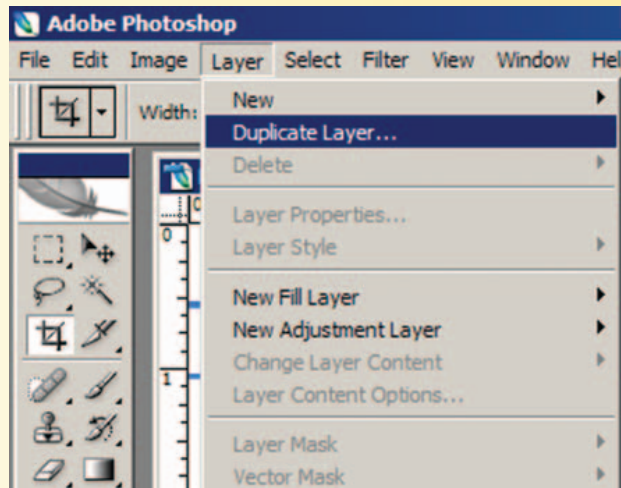
File > Import.

- b. In the scanner settings, choose the appropriate resolution.



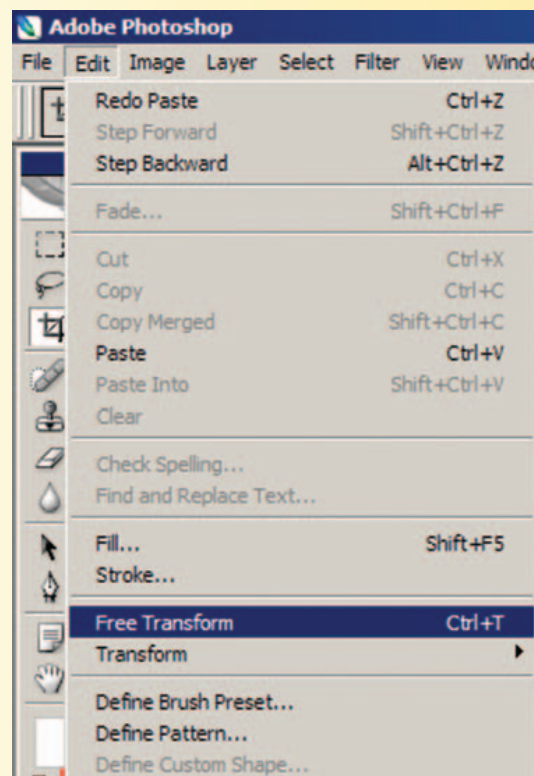
Adjust your scanner resolution to a minimum of 200 dpi.

3. Once scanned, you will need to clean up your image by doing the following:
 - a. In Photoshop, go to [Layer > Duplicate Layer ...] and click OK to create a copy of the background image. This is necessary in order to rotate in the next step.



Layer > Duplicate Layer ...

- b. Go to [Edit > Free Transform] or press (ctrl + t) on the keyboard and rotate the image so that the guidelines are perfectly horizontal across the image. If your image was placed straight on the scanner, and your drawing was not crooked, this will not be necessary.



Edit > Free Transform.

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- c. Go to [Image > Adjustments > Levels] or press (ctrl + I) on the keyboard slide by click dragging the white triangle shape to the left to set the highlights of the image and remove any dark areas.

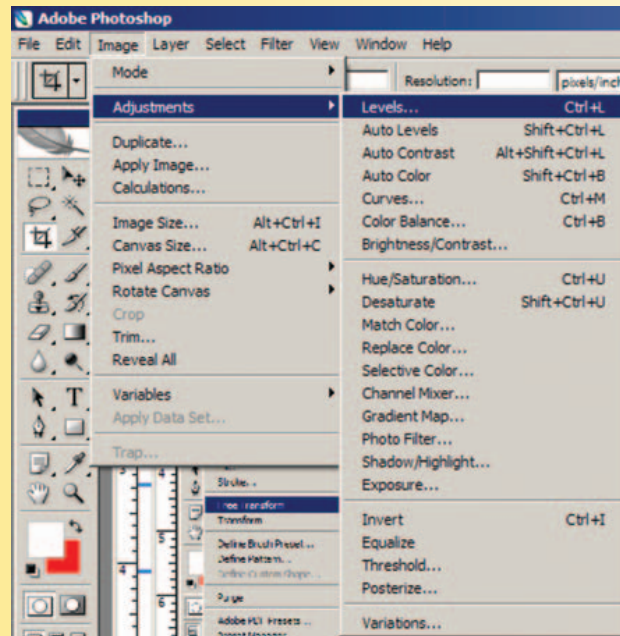
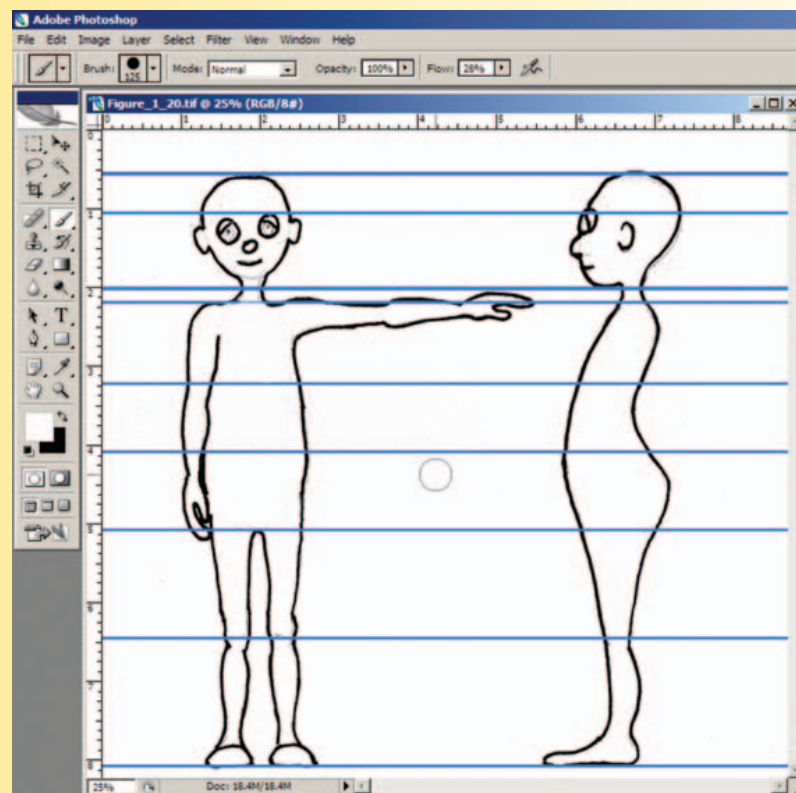


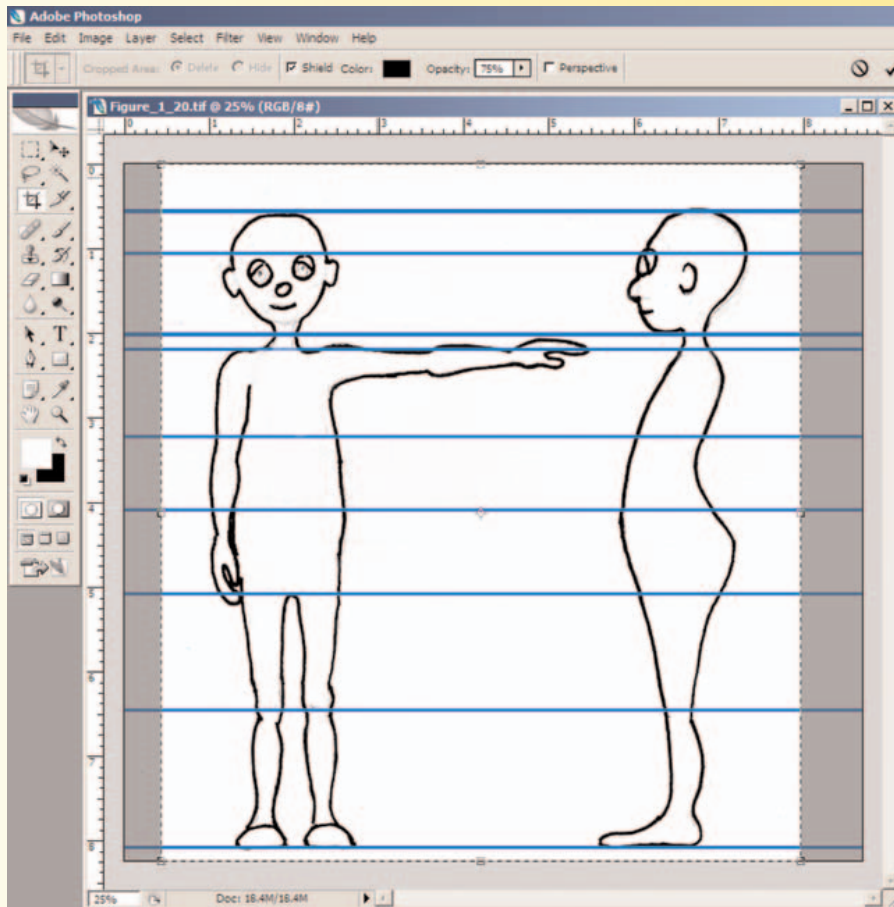
Image > Adjustments
> Levels.

- d. Choose the paintbrush tool by pressing (b) on the keyboard. Erase any stray marks if necessary.



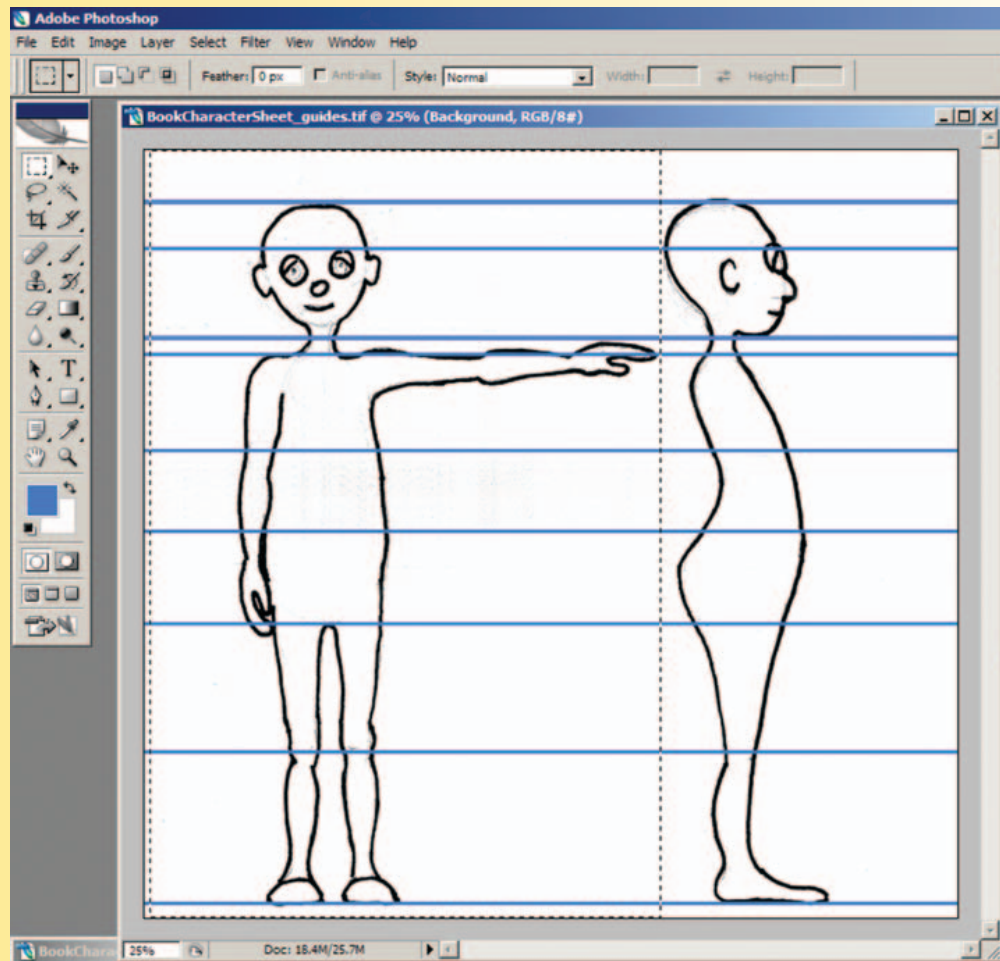
Clean up your image using a white paintbrush.

- e. Choose the crop tool by pressing (c) on the keyboard. Drag select around the front and side drawings to remove any unnecessary areas. Hit **enter** on your keyboard to execute the crop.



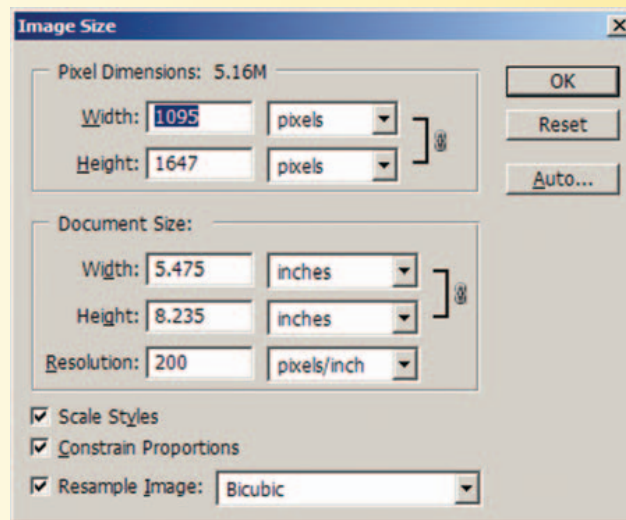
Crop any unwanted area.

- f. Go to [**Layer > Flatten Image**]. This will remove the additional layer and prepare the file for saving.
- g. Go to [**File > Save As**] and save the file in TIFF format. Type in the name of the file, something like the name of your character: *name_characterSheet.tif*. Save these files in your sourceimages folder in your Maya project file.
- h. Repeat steps a–g for the arm and hand from the top view, the foot from the top view, and any additional drawings you may have.



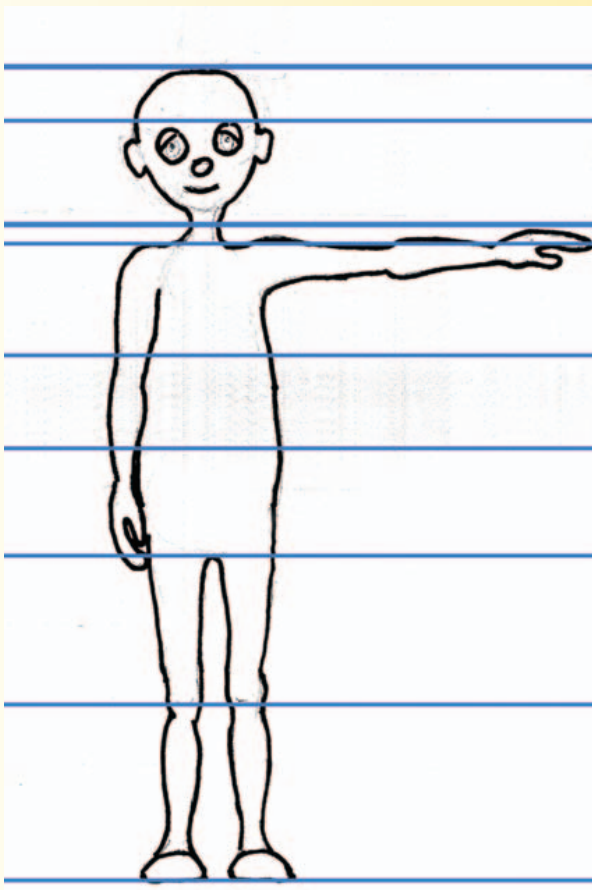
Marquee select the front view of your character.

4. Divide the front and side images into separate files.
 - a. In Photoshop, choose the rectangular marquee tool – by pressing (m). Click drag around the front view to create a selection.
 - b. Go to [Edit > Copy] or press (ctrl + c) on the keyboard to make a copy.
 - c. Go to [Edit > New] or press (ctrl + n) to make a new file. Photoshop automatically creates the new file with image dimensions based on what was copied into the clipboard. Hit Enter.
 - d. Go to [Edit > Paste] or press (ctrl + v) on the keyboard.
 - e. Go to [Layer > Flatten Image].
 - f. Before closing the file, make a note of the image dimensions. Go to [Image > Image Size ...] Under Pixel Dimensions, make a note of the width and height of the image. You can include these numbers in the file name for accessible notation.



Record the width and height of the image's pixel dimensions for use in Maya.

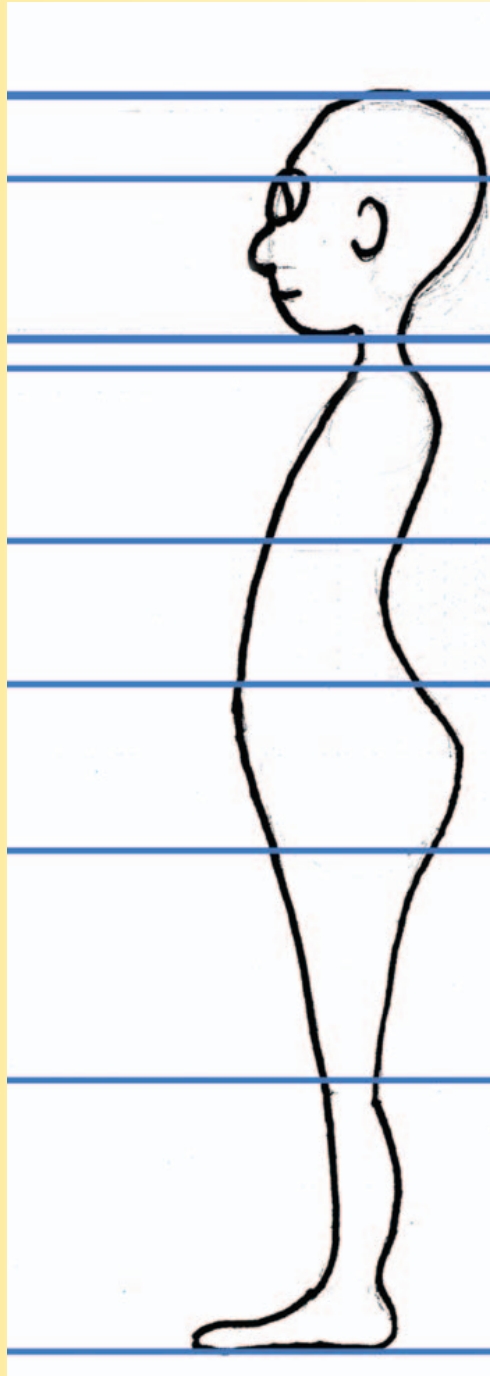
- g. Go to [File > Save As] and save the file in TIFF format. Type in the name of the file: *name_front_widthXheight.tif*. Save these files in your sourceimages folder in your Maya project file.



Front view saved as
name_front_widthXheight.tif.

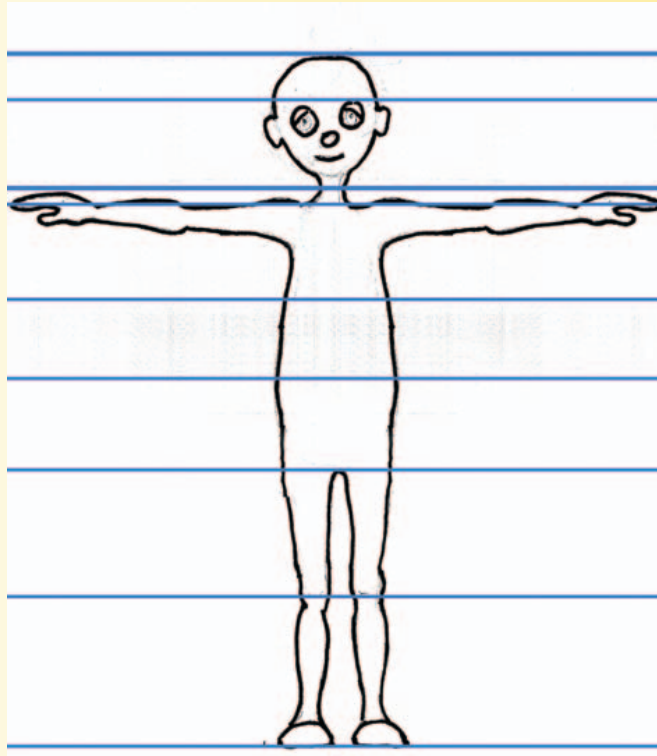
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- h. Repeat steps a–g for the side view, naming the saved file: *name_side_widthXheight.tif*.



Side view saved as *name_side_widthXheight.tif*

- i. Repeat steps a–g for the arm and hand from the top view, the foot from the top view, and any additional drawings you may have. Since I drew half a T-pose, I created a T-pose in Photoshop by duplicating and flipping the drawing horizontally.



T-pose created in Photoshop.

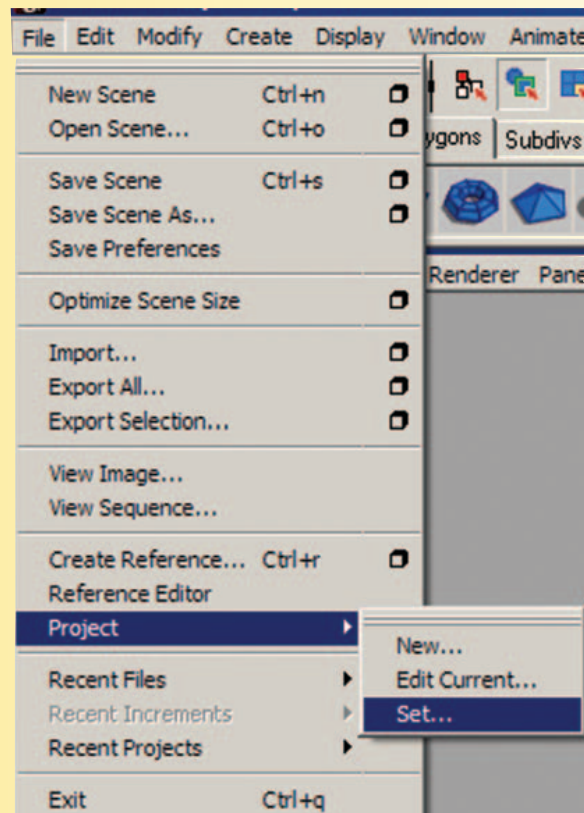
Assignment 1.4: Bring Your Drawings into Maya

When bringing an image into Maya, I recommend the use of a **NURBS** plane and a file texture that is mapped onto that plane. I do not recommend the use of Maya's image plane, which is an option for the camera. The reason for this is that it is difficult to reposition camera image planes, which may be necessary during the modeling process.

1. If you haven't created a project folder already, make sure to do so now:
 - a. From your computer's desktop, go to **START > PROGRAMS** and select Maya.
 - b. Once Maya is open go to [**File > Project > New ...**] the New Project window opens.
 - c. Enter the name of the new project in the Name text box [a]. For example, *MayaCharacterRigging*.

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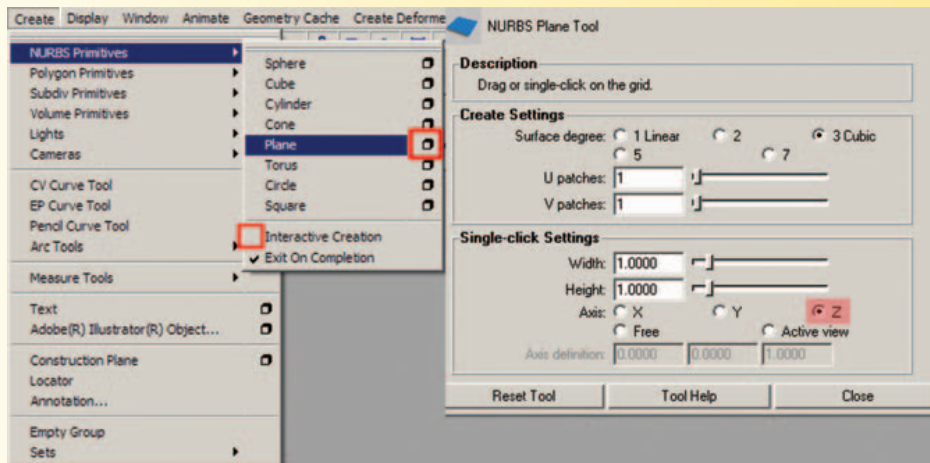
- d. In the Location text box, enter or browse to the directory that will contain the new project [b] (e.g. G:\).
 - e. Click **Use Defaults** to let Maya assign the default folder names for your project.
 - f. Click **Accept**.
2. Set your project.
 - a. Go to [File > Project > Set ...] browse to your project folder and click **OK**.



File > Project > Set ...

! The proper way to start Maya is to set your project before you begin working for the day. You should never double-click directly on a scene file in order to open Maya, as this will change the relative **paths** to absolute paths when saving your files. This will cause problems, especially with larger scene files and in larger productions.

3. Create a plane for the front view and assign a shader to it. Go to [Create > NURBS Primitives > and uncheck interactive creation].

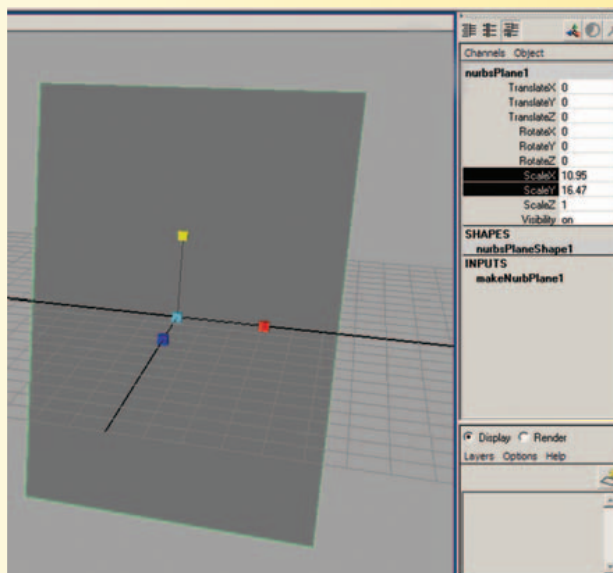


Create a NURBS plane on the Z axis.

- a. In the perspective window, go to [Create > NURBS Primitives > Plane – option box]. Name the plane: *front_reference_plane*.

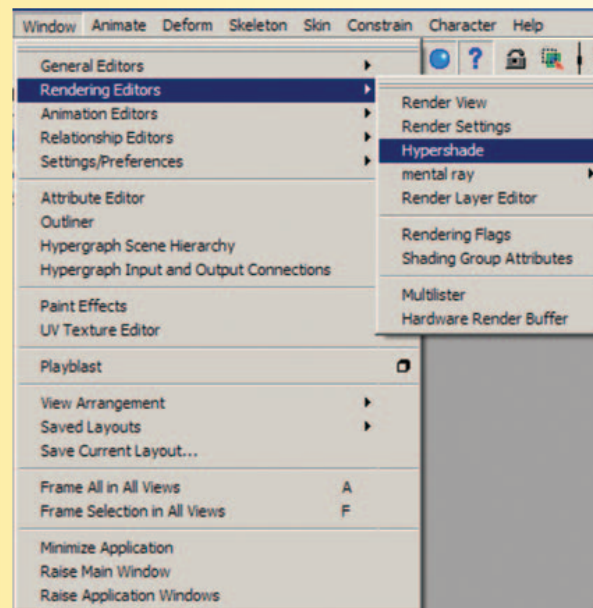
! The Maya scene uses centimeters as the default proportions. You can change this in the preferences.

- b. In the channels box, rescale the plane according to your image dimensions from Photoshop but at a 1/100 of its original value. For example, my image is 1095 pixels × 1647 pixels. My width would be 10.95, the ScaleX value. The height would be 16.47, the ScaleY value. Otherwise, your image will be incredibly large for your scene.



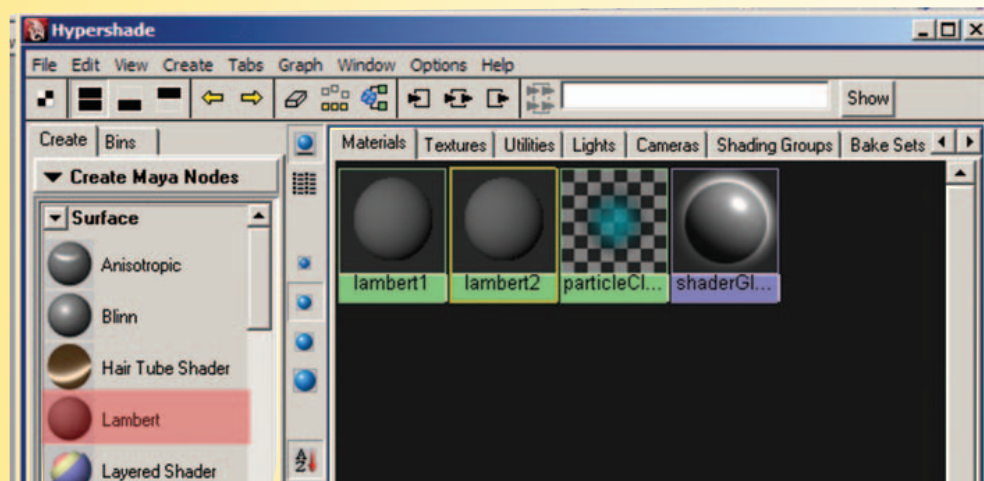
Change the Scale of the plane to match 1/100th of the pixel dimensions of the file.

- c. Go to [Window > Rendering Editors > Hypershade].



Window > Rendering Editors > Hypershade.

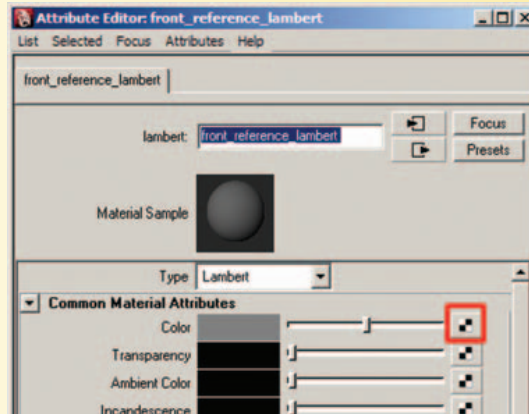
- d. In the hypershade, go to [Create > Materials > Lambert] (or click on the lambert material on the left hand side of the hypershade window).



Click on the lambert material on the left in the hypershade window.

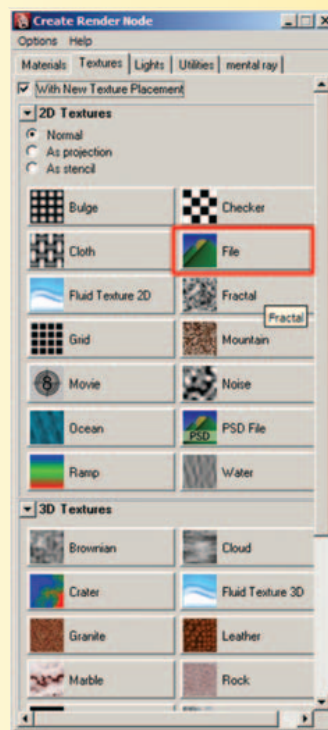
! Materials will be discussed further in Chapter 4. Lambert material isn't shiny, so it's easy to see while you are working. You don't want to use the default Lambert1 material because everything created in Maya has the Lambert1 material as a default. If you change that material, everything you create in Maya will have the changes as well.

- e. MMB (middle mouse button) click and drag the newly created lambert material onto your NURBS plane, *front_reference_plane*.
- f. Double-click on the newly created lambert material. This will open the attribute editor. Rename the material *front_reference_lambert*. It is important to take time and label everything in Maya to keep an organized scene file.
- g. Click on the checked box to the right of Color. This will open the Create Render Node window.



Click on the checked box to the right of the Color attribute in the Attribute Editor.

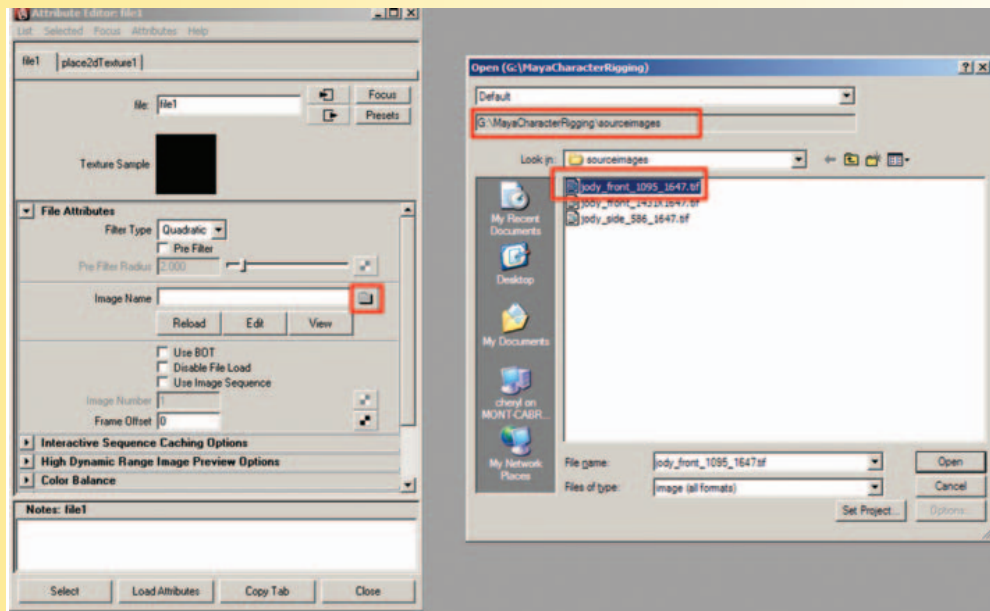
- h. Under the 2D Textures section, make sure that “normal” is selected. Then click on File. This will connect a File node to the color inputs of the shader.



Click on File under 2D Textures in the Create Render Node window.

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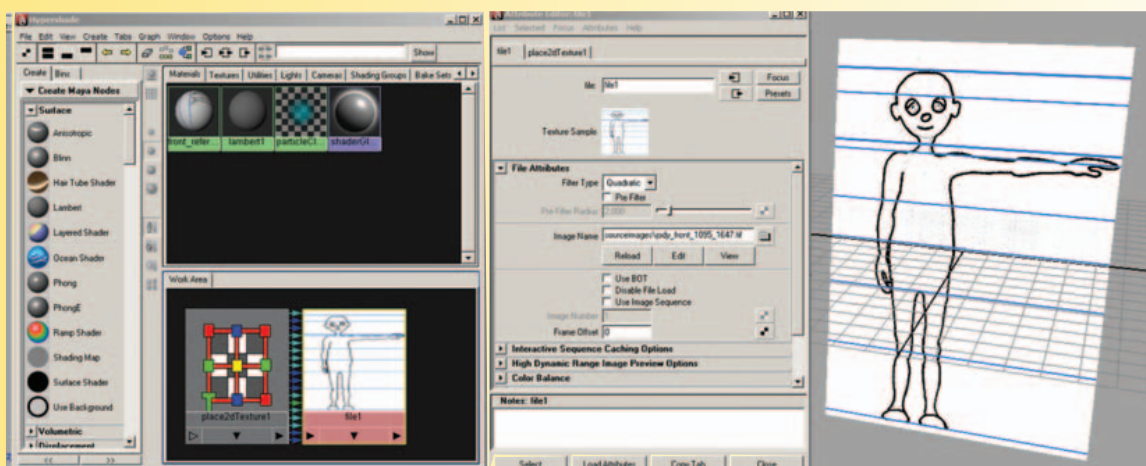
- i. Click on the **Folder icon** to the right of “Image Name”. This should open the sourceimages folder (assuming you set the project as in step 1). Choose *name_front_widthXheight.tif* which tells Maya where to find the file we would like to display on our plane, then click “open”.



Click on the folder icon in the Attribute Editor for file1.

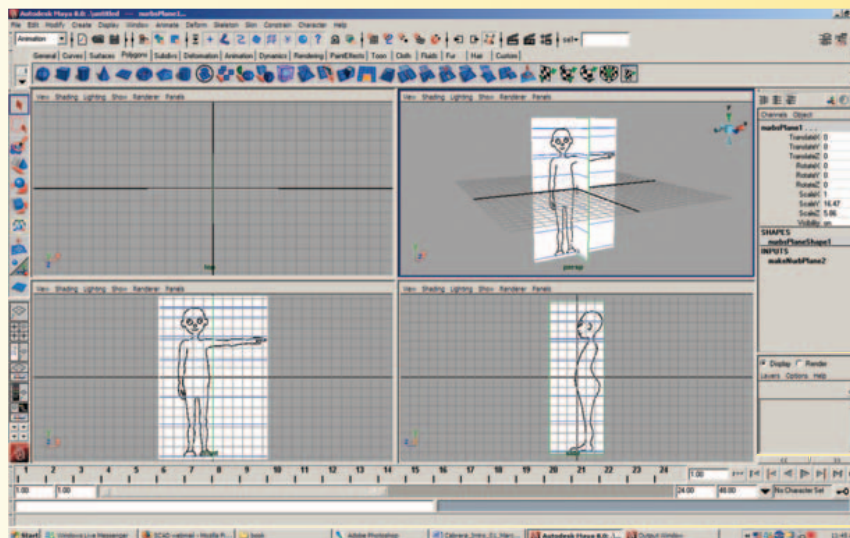
This file does NOT exist inside the Maya scene file. We have simply created a **path** to the file.

- j. You should now see the image appear in your Maya view panel if you move your cursor over a view panel and press (6) on your keyboard, which turns Hardware Texturing on.



Your image appears on the NURBS plane if you press (6) on the keyboard while your cursor is over a view panel.

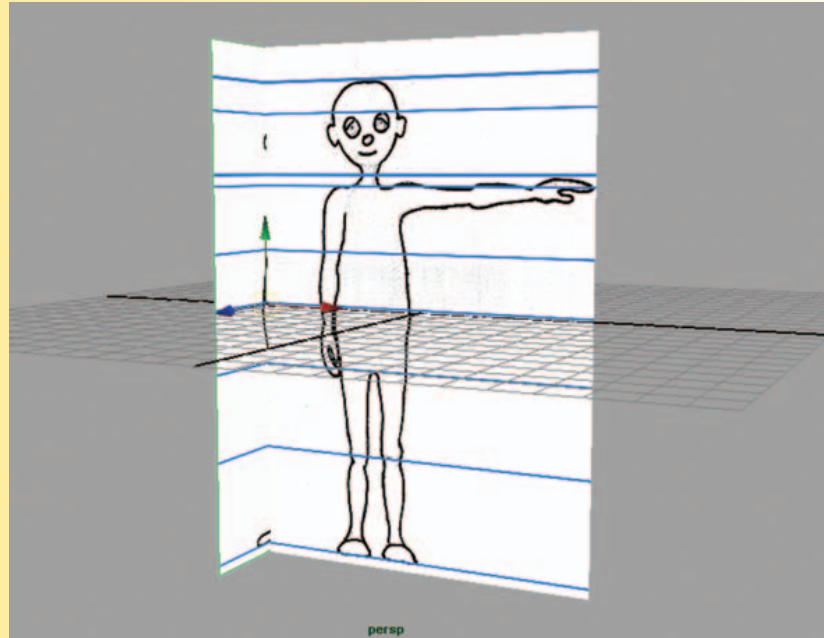
4. Create a plane for the side view and assign a shader to it. These steps are similar to those for the front view, but changes have been made to the plane axis and the scale axis.
 - a. In the perspective window, go to [Create > NURBS Primitives > Plane – option box]. Change the axis to the X axis, then hold down the x key on the keyboard and click on the center of the grid. Name the plane: *side_reference_plane*.
 - b. In the channels box, rescale the plane according to your image dimensions from Photoshop. My image is 586 pixels × 1647 pixels. My Width would be 5.86, the ScaleZ value. The Height would be 16.47, the ScaleY value.
 - c. Go to [Window > Rendering Editors > Hypershade]. In the hypershade, go to [Create > Materials > Lambert]. MMB click and drag the newly created lambert material onto your NURBS plane, *front_reference_plane*.
 - d. Double-click on the newly created lambert material. Rename the material *side_reference_lambert*.
 - e. Click on the **checkered box** to the right of Color, and then click on **File** listed under 2D Textures.
 - f. Click on the **Folder icon** to the right of Image Name.
 - g. Choose *name_side_widthXheight.tif*.
5. Repeat steps a–i for your top arm and hand view, top foot view, and any other views you may have. Remember, you will have to change the axis that the plane is created on and scaling axis will be different for each view. Experiment to see which one should work.
6. Reposition the images and make them non-selectable.
 - a. Your side image should be facing toward the left of your screen. If not, you can rotate it simply by clicking on the *side_reference_plane* and in the channel box, type 180 for rotateY.



Make sure your side image faces toward the left side of your screen.

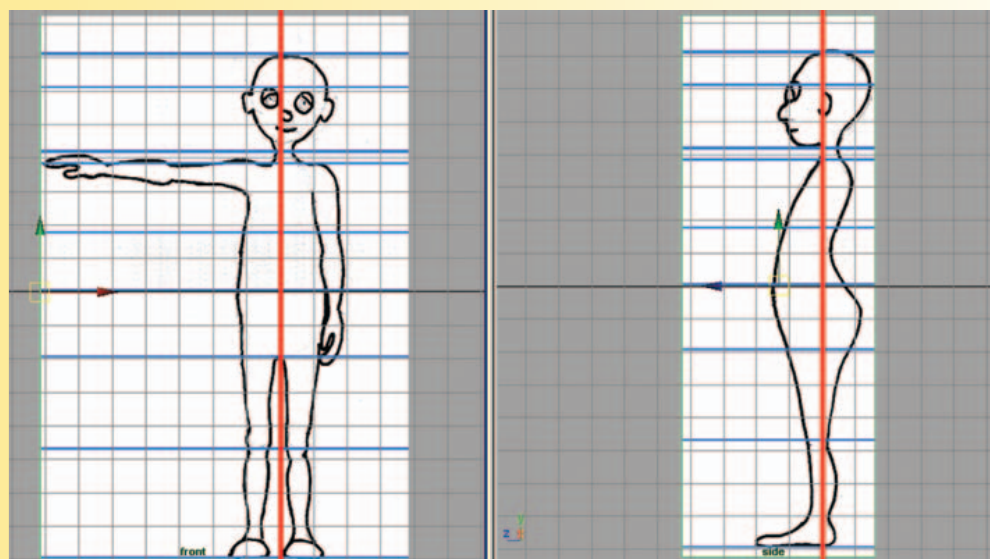
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- b. Click on your side image and using the Move tool – by pressing (w), click only on X (red arrow) and Z (blue arrow) to align the *side_reference_plane* with the left edge of the *front_reference_plane*.



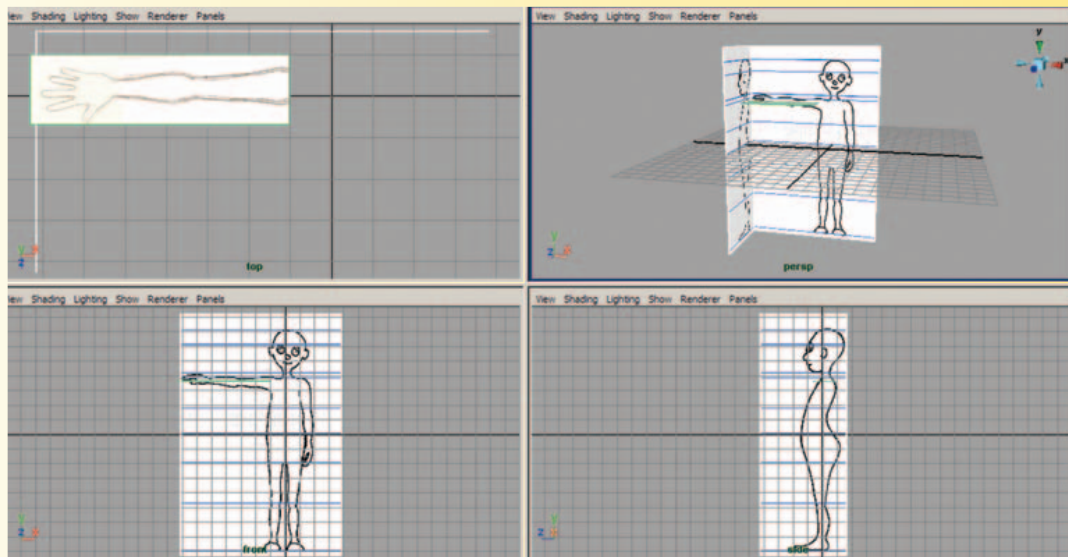
Reposition the side plane to line up with the left edge of your front plane.

Shift select both planes, then using the grid as a guide and your move tool, make sure the *front_reference_plane* is centered in the front view and the *side_reference_plane* is centered in the side view.



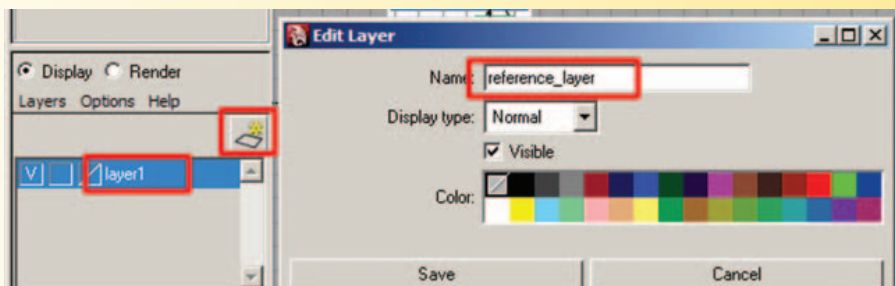
Reposition your front and side planes to be centered on the grid.

- c. The height of the planes should automatically line up. If not, use the move tool or press (w) and click only on the Y (green arrow) to adjust their positions. It is okay if your drawings do not line up exactly. These images are going to be used as a starting point when modeling, not the “be all and end all” of your design.
- d. Reposition any other images as necessary.

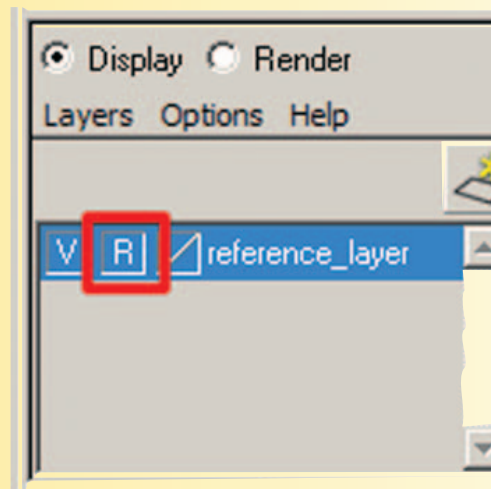


Reposition other planes, such as the top arm view.

- e. In the Layer Editor of the Channel Box, click the “create a new layer” box. Double-click on the new layer (layer1) and rename this layer *reference_layer*, then click **save**. Shift select all of the planes you have made, **RMB** click and hold on top of the *reference_layer* and choose Add Selected Objects. To make the objects non-selectable, click two times in the **empty** box between the V (visibility) and the layer name. An R (reference) should appear. This keeps any objects assigned to a layer visible but not selectable.

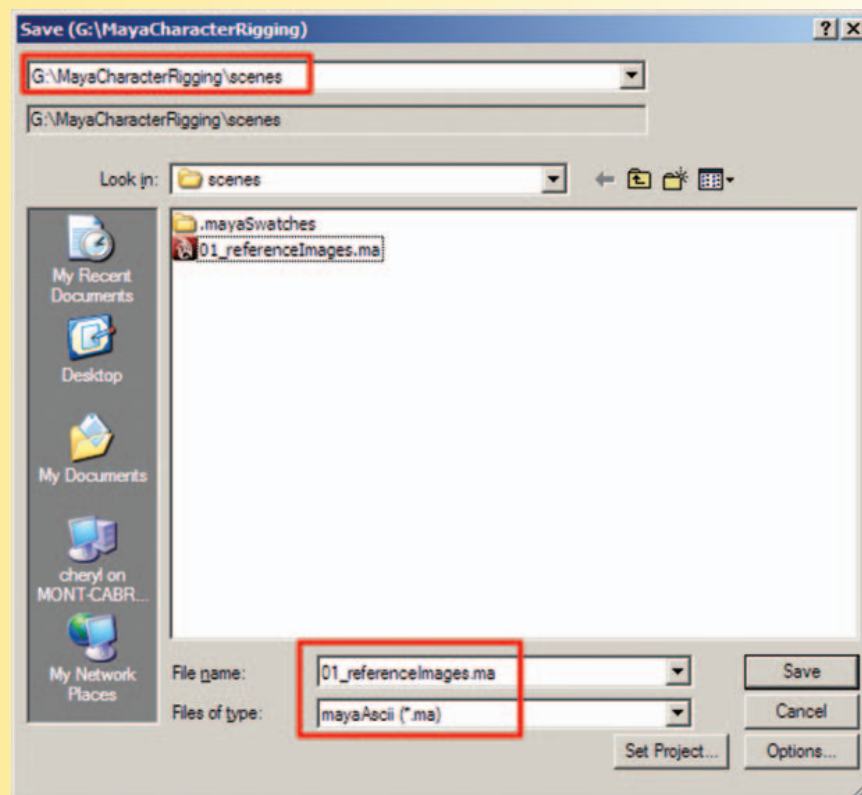


Click on the create a new layer button in the Layer Editor and rename it *reference_layer*.



Assign all of your planes to the layer and make it a referenced layer R.

7. Save your scene file.
 - a. Go to [File > Save As]. This should open the scenes folder of your project (assuming you set the project as in step 1).
 - b. Name your scene *01_referencelImages.ma*.



Name your scene *01_referencelImages.ma*.

**.mb or .ma?**

Maya binary files (.mb) are stored using the binary code and are smaller in file size. Maya ascii files (.ma) are stored using text and can be opened for editing. It really does not matter which type you use, however, if you need to open a newer file in an older version of Maya, you can edit the ascii file in Wordpad, or another text editing program, to state the earlier version.

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