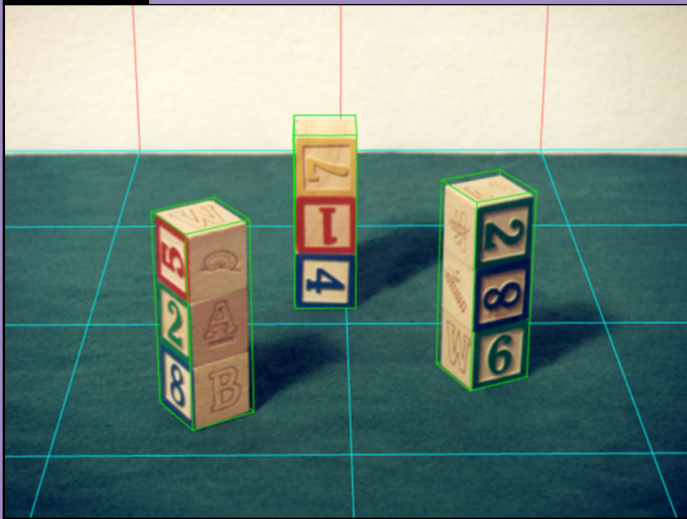


1

Setting Up the Scene Overview



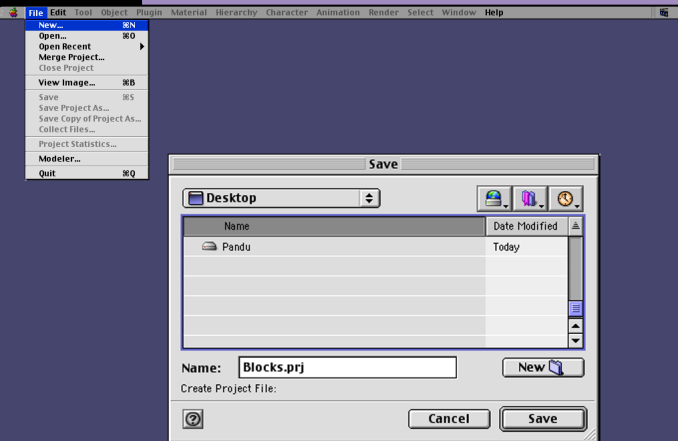
In the last tutorial, we created a new image with the blocks removed from our photograph and another by adding a mask to the original image. Now, we will use these images as camera maps to create a 3 dimensional scene. The first 3D Toolkit tutorial will guide you through the setup for the scene, which involves getting the geometry and camera position properly aligned so that our scene matches with the photograph.

Note: As you work through the 3D Toolkit tutorials, be sure to take your time and remember to save often.



Setting Up the Scene





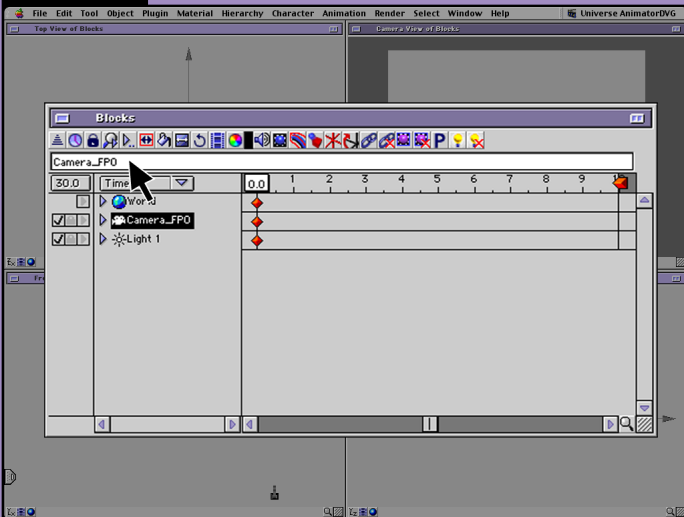
Launch the 3D Toolkit Animator.

Select FILE> NEW.

Name your project “Blocks.prj” and **[CLK]** SAVE.

Since we will not be adding any models, **[CLK]** Done in the resulting pop-up window.





Open the Project window by hitting [**CMD/CTRL+L**].

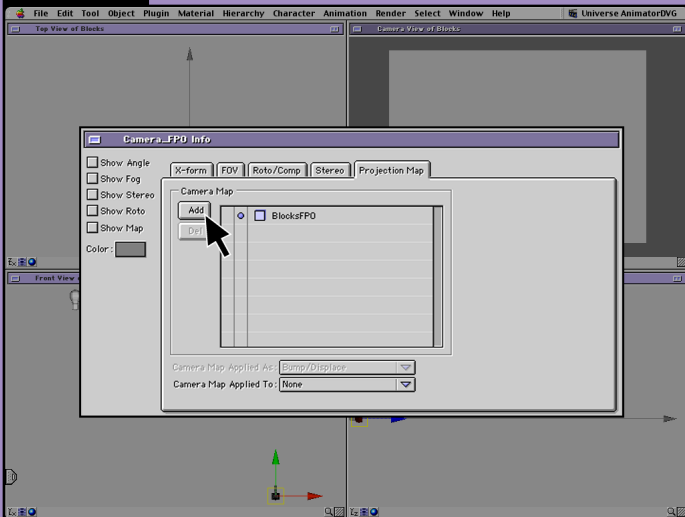
[**CLK**] on the camera icon in the Project window to rename it "Camera_FPO". This is done by selecting the camera and renaming it in the frame that appears below the tool icons.

Note: Macintosh keyboard commands are indicated in **red**. PC keyboard commands are indicated in **blue**.



4

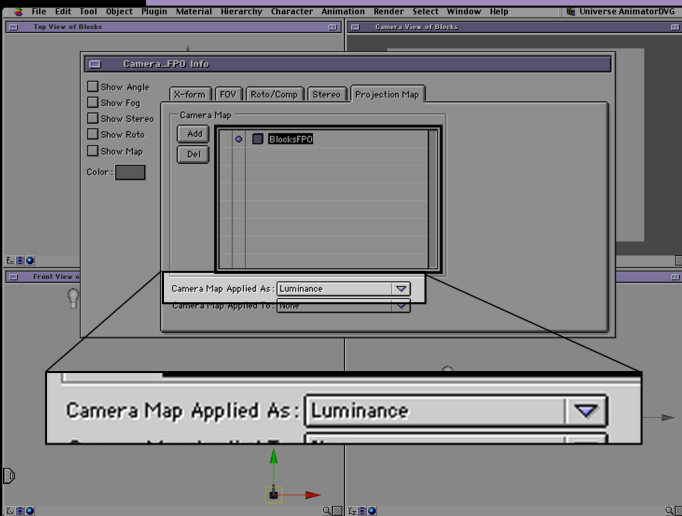
Adding a Projection Map



[DBL-CLK] on the camera to open the Camera Info window.

In the Projection Map tab, [CLK] ADD and select the "BlocksFPO.img" file that you created in Photoshop.





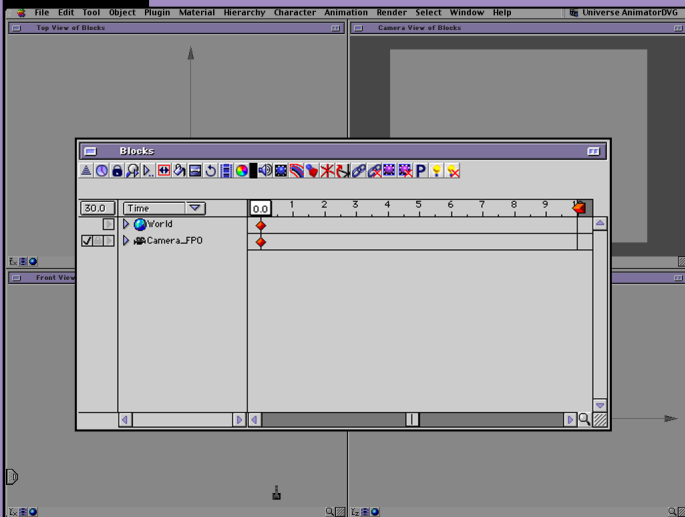
Under the Projection Map tab, highlight “BlocksFPO.img” and set the “Camera Map Applied As” pop-up menu to “Luminance”.

Note: By default, camera maps are initially set as luminance maps.



6

Deleting The Light



In the Project window, we can delete the light source. Select Light 1 and hit [**DELETE/BACKSPACE**].

Because we are mapping the image as a luminance map, we will not need to have a light in the scene at all.

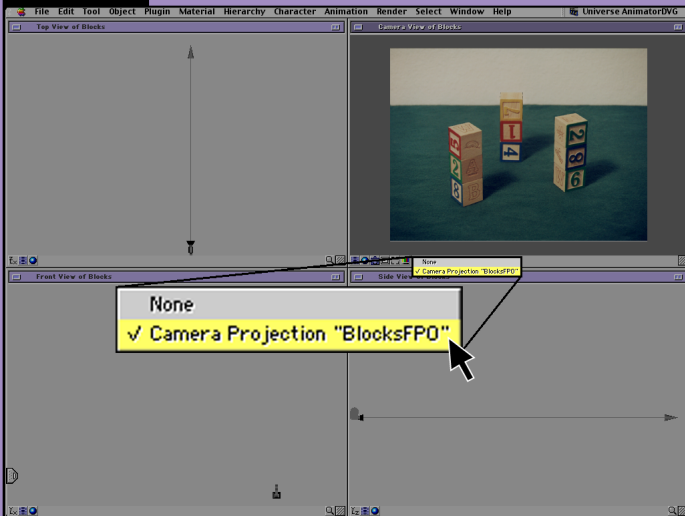


Setting Up the Scene



7

Displaying the Image in the Viewport



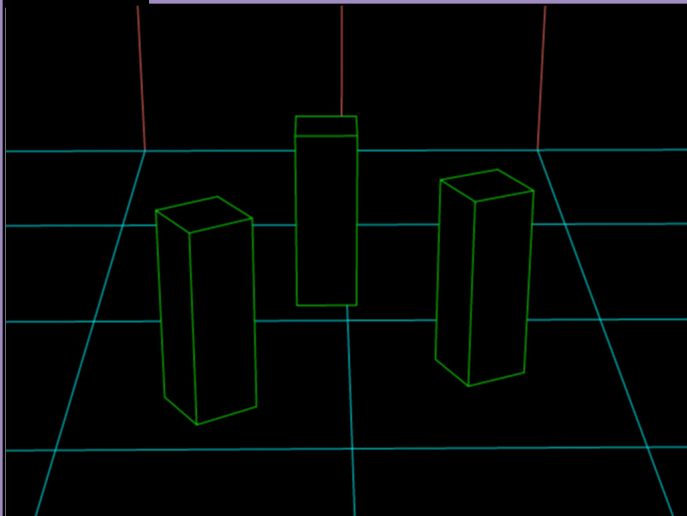
In the bottom left of the Camera View window, **[CLK]** the Rotoscope icon.

Select the camera projection "BlocksFPO.img". The image should now appear in the viewport.



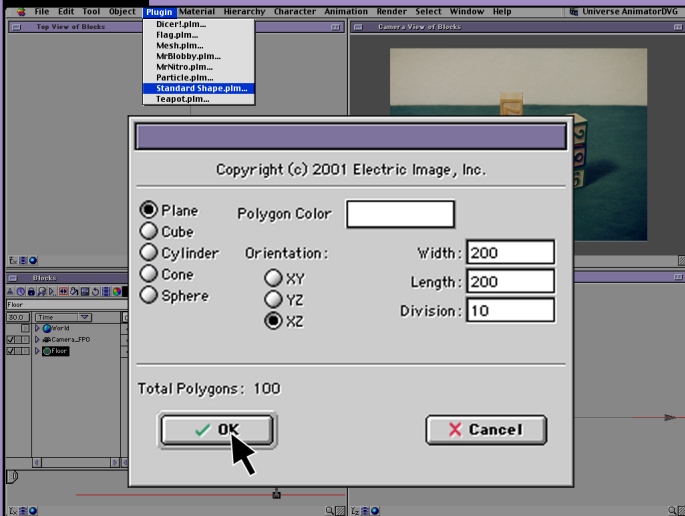
Setting Up the Scene





The next few steps will involve adding geometry into the scene. We will be using standard shapes. The goal in any camera mapping project is to try and use the simplest shapes possible. Part of the power of camera mapping is the ability to get seemingly complex models from very simple geometric shapes. Also, the size of the geometry we create will be relative. In other words, as long as our geometry fits the elements in the image, the scale and units used will not matter.





Go to **PLUGIN > STANDARD SHAPE.PLM**. Create a plane with the following attributes:

Width = 200

Length = 200

Divisions = 10

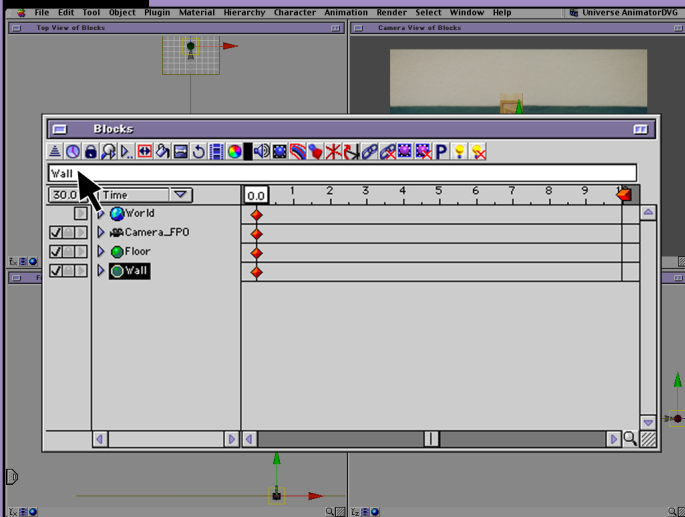
Make sure it is in the XZ plane.

In the Project window, rename it "Floor".



10

Creating the Wall Plane



In the Project window, **[CLK]** on Floor to select it.

[CMD/CTRL+D] to duplicate it.

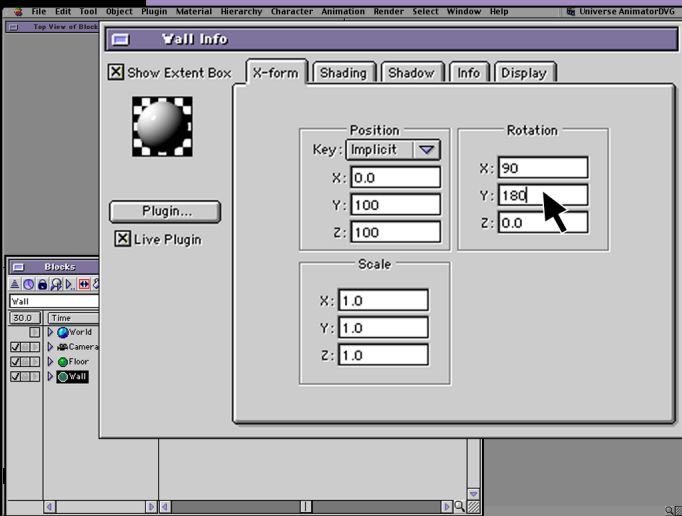
Rename this copy "Wall".

NOTE: If you are seeing shaded geometry in your views, you can change your display setting under EDIT>PREFERENCES in the “Drawing” tab. Under the Display pane, set Mode to “Wireframe.”



Setting Up the Scene



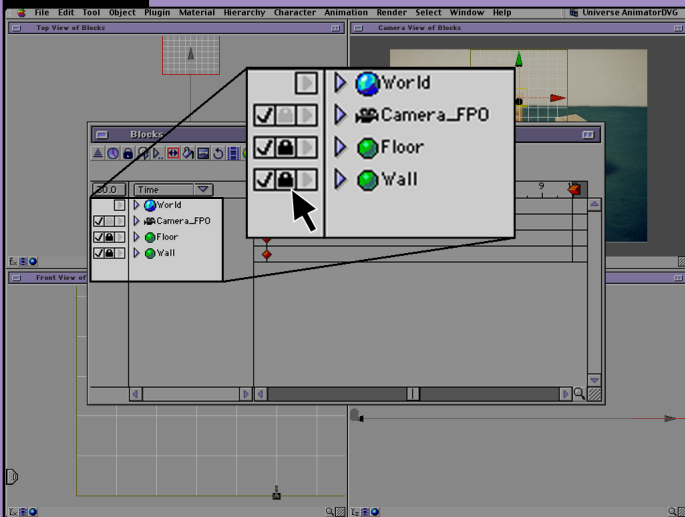


In the Project window, **[DBL-CLK]** on Wall and translate it by changing the following settings:

	X	Y	Z
Position:	0	100	100
Rotate:	90	180	0

Note: You are rotating your Y-axis so that your normals face you, which will allow you to see the divisions on your plane.





We will lock down our planes by **[CLK]**ing on the Lock icon to the left of the layers. This way we will not accidentally select and move them as we work in our view windows.



13

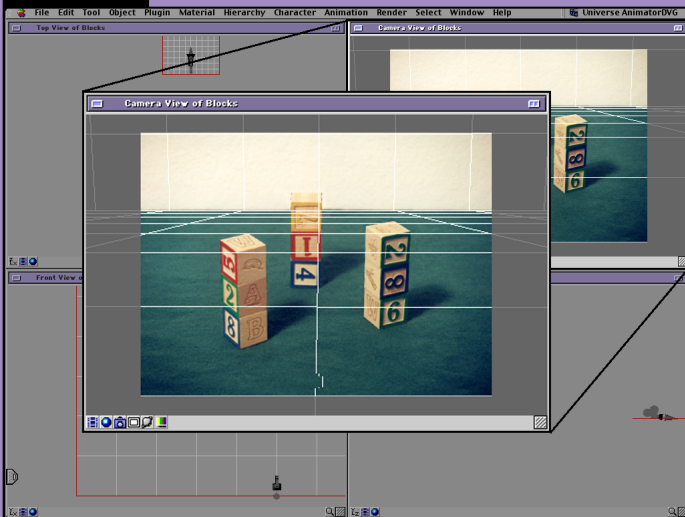
Positioning the Camera



The next few steps will involve positioning our camera in relationship to the geometry in our scene. In order to do this, we'll be repositioning the camera and viewing our progress in the Camera View window. The controls we will use are:

- TRACK** - moves the camera and focal point vertically or horizontally
- ORBIT** - rotates the camera about its focal point
- PAN** - rotates the focal point about the camera position
- DOLLY** - increases/decreases the distance between camera and focal point





Using the Camera View window, dolly the camera forward, so that the planes horizontally extend past the window. Orbit and Track the camera as needed so that the intersection of the Floor and Wall planes match the intersection of the ground and wall in the photograph.

Note: It doesn't matter how close or far we are from the planes as long as they fill the entire screen. It is usually better to cheat a little closer than farther, since this will allow us to orbit the camera a little more. **DO NOT ZOOM!** This will affect focal length and we don't want to do that yet.



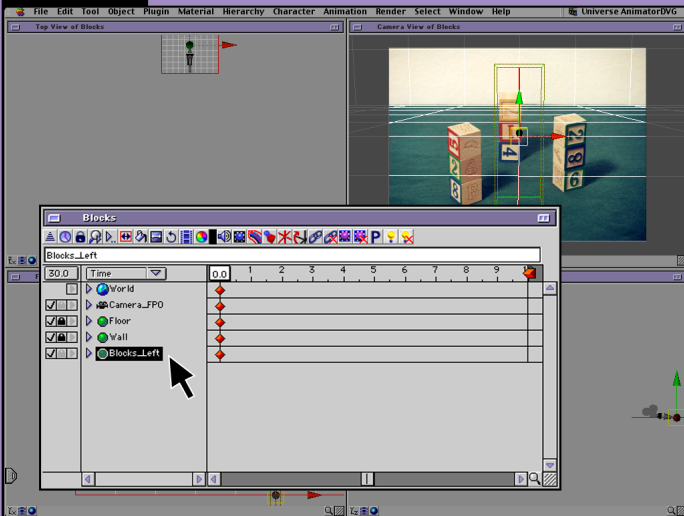


Go to **PLUGIN > STANDARD SHAPE.PLM** and create a cube with the following parameters:

Width = 5
Length = 5
Height = 15
Divisions = 1

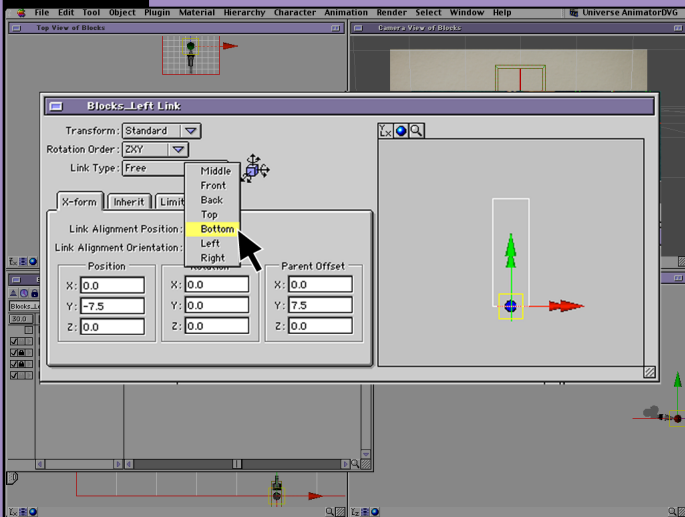
Note: The dimensions corresponds to three cubes stacked on each other. The height is three times the length of the other sides. The values aren't really too important since we'll be playing with the scale later, but we will want to keep the ratio of the dimensions the same throughout the project.





In the Project window, rename this cube “Blocks_Left”.



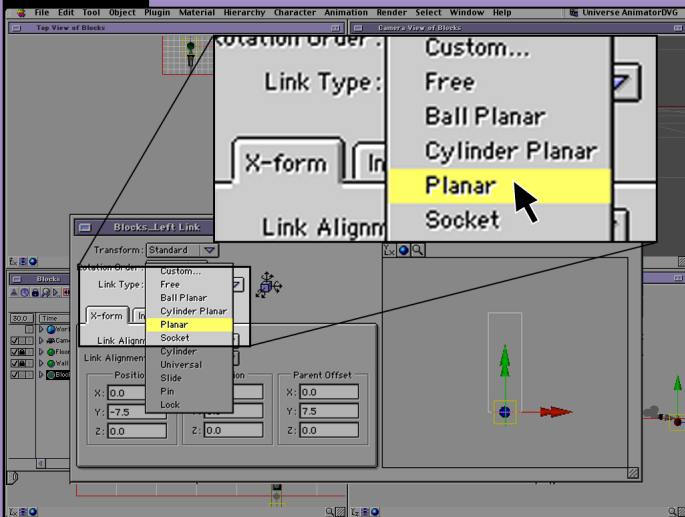


[**OPT+CMD/ALT+CTRL+DBL-CLK**] "Blocks_Left" in the Project window to bring up the Link Info window.

In the X-Form tab, change "Link Alignment Position" to "Bottom". Do not close the box.

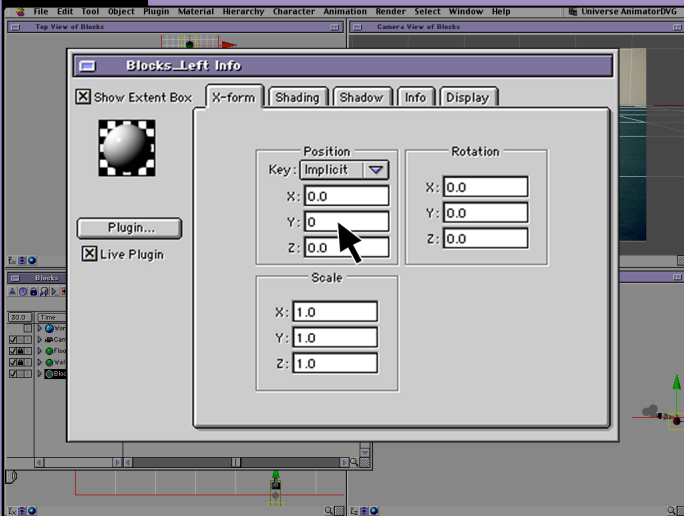
Note: The effects of this change will be apparent when we scale and move the object. The scale will be calculated from link alignment position, meaning that the block will not scale below the ground plane since it is resting ON the ground plane.





In the X-Form tab, change “Link Type” to “Planar”. This will limit the movement of the cube so that it will only move in the XZ plane. Once we have our block positioned to rest on the ground plane, we won’t want to inadvertently move it above or below it as we manipulate it in our view windows. Close this window when finished.



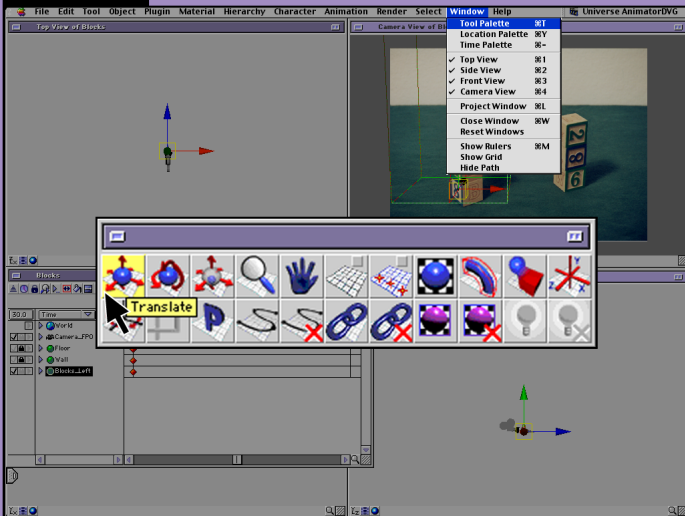


In the Project window, **[DBL-CLK]** "Blocks_Left".

Under "Position", type in "0" in the Y field. Now that our cube is sitting directly on the plane, we will not want to move it above or below the plane.

Note: With our Link Type set to Planar, we won't be able to move our object above or below the ground plane if we move it in the Camera View window. However, we can still move it in the Y-axis if we type in a translate amount in the object's Info window.





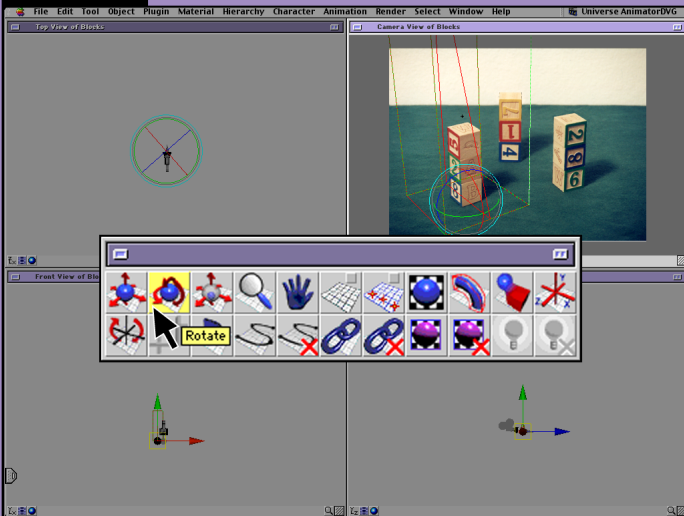
Select the “Translate” tool from your Tools palette, or press **[CMD/CTRL+T]**.

[CLK] on the cube in the Top View window.

Move the cube so that the base lines up with the base of the stack of blocks on the left in the Camera View.

Note: It may be a good idea before doing this to hide your ground and wall planes by unchecking the visibility box next to both layers in the Project window.

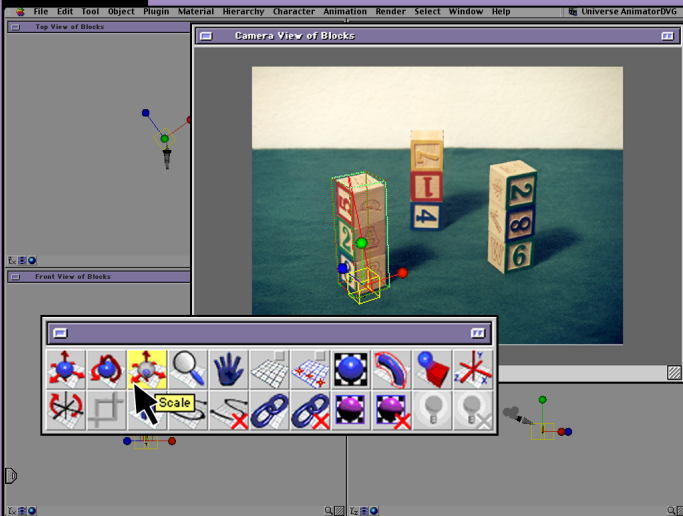




In the Top View window, rotate the cube along its Y axis, until it approximates the same rotation as the blocks in the image. You can do this via two methods:

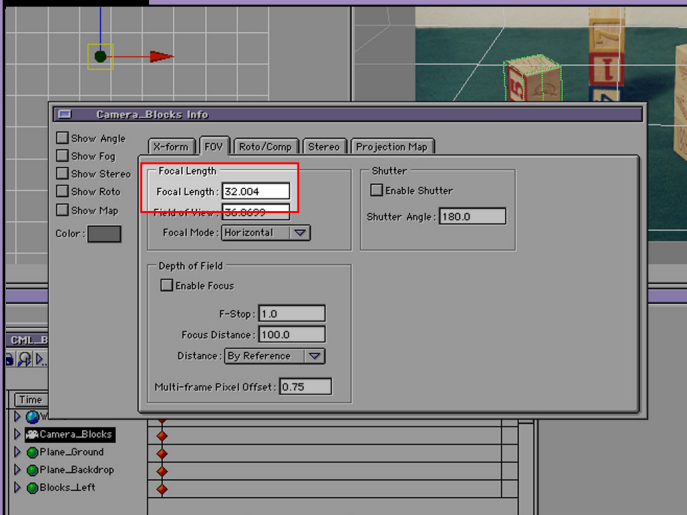
- 1) Select the Rotate tool from the Tools palette. Grab the green colored Y axis and rotate.
- 2) Go to **TOOLS>ROTATE LOCAL Y ONLY**. The colored globe will not appear as with the method above. You may move the cursor in any direction, however, the cube will only rotate along its Y axis.





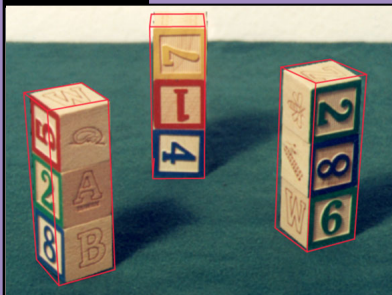
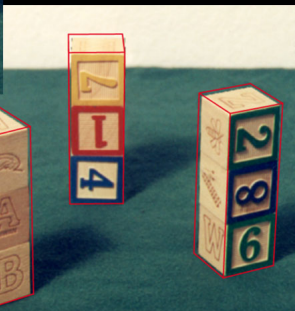
Now that the cube is approximately in the right spot, select the Scale tool on the Tools palette to scale it to the correct size. You may need to play with the position and scale to get it to fit right around the blocks. To scale the cube in proportion, **[CLK+DRG]** in the yellow box of the controller. Grabbing each colored handle will scale the cube in only one axis, so avoid doing that. Keep using the Scale tool and the Translate tool until you have it right. Don't worry too much about perspective, we'll address that later.





Now that we have our planes and one block created, we can begin to determine the focal length of our camera. Deriving the focal length will involve a combination of positioning the camera and adjusting geometry in the scene, while changing the focal length. Read over steps 24-28 in their entirety before attempting to complete them, as the information contained in them will help you with the overall process. Note that this can be time consuming and a little frustrating, especially at first, but with practice the process will become easier.

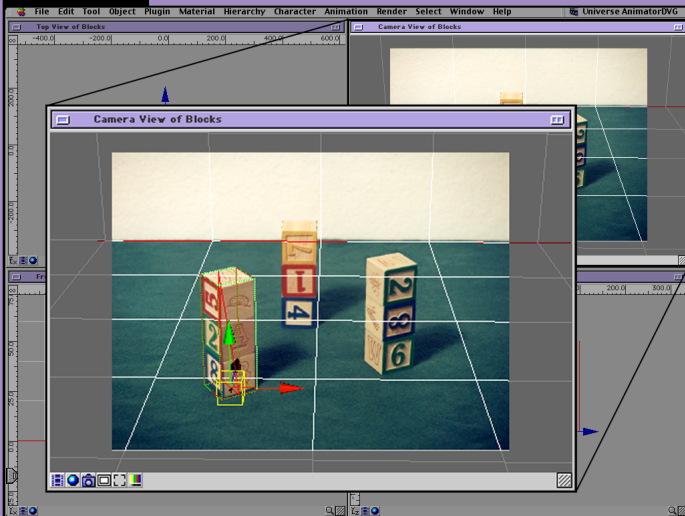


**Focal Length=25****Focal Length=50**

Finding the focal length of an image is important because if you are working with a found image, you may not have the focal length of the camera. If you are taking the picture yourself for use in camera mapping, you can save yourself the trouble of finding the focal length by noting it when you take the picture.

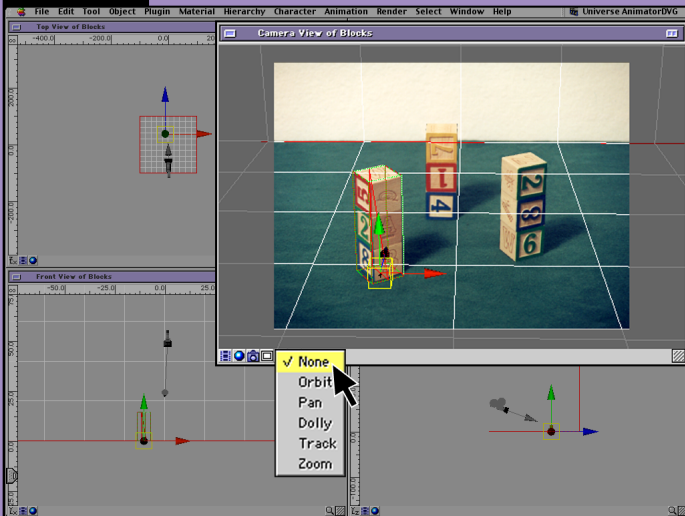
While you may not get a perfect match when attempting to find the focal length, you will want to get as close as possible to the actual focal length for the best results.





The object will be to match the distortion of the geometry in the image with the distortion you see in the scene you are creating. Since our scene is so simple, we need to have at least one set of blocks to use as a reference. We will try to match the edges of the blocks in the photo with the edges of the blocks we have just created. In order for this to happen, you will have to adjust the focal length, and then realign the geometry to the image by repositioning the camera. Don't forget we also need to keep the junction of our planes aligned with the horizon in the image.



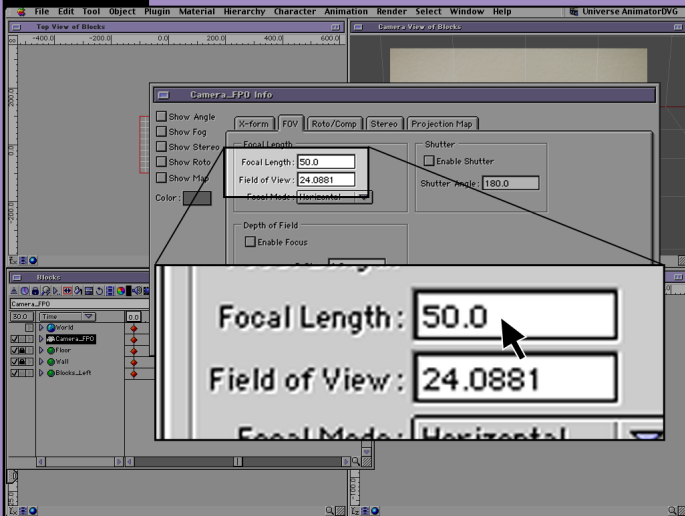


In the Camera View, start off by using the various camera transform tools: Pan, Track, Dolly, and Orbit. You will want to use zoom sparingly, since that will change the focal length of the camera. Here is a list of hotkeys which you will want to use when **[CLK+DRG]**ing in the Camera View window to interactively position your camera:

PAN = SPC+OPT/ALT
 ORBIT = SPC+CMD/CTRL
 ZOOM = SPC+SHIFT

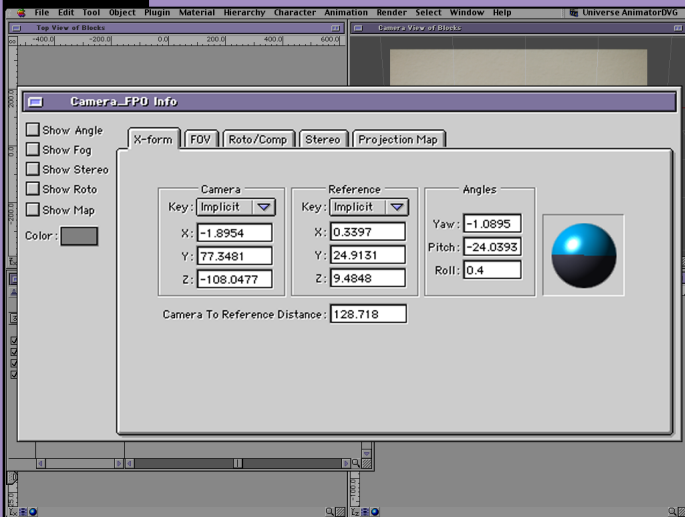
DOLLY = SPC+CTRL/RT-CLK+DRG
 TRACK = SPC





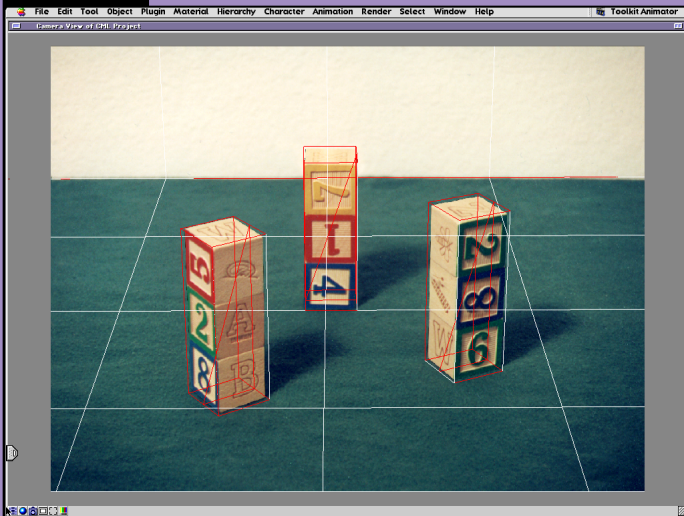
Another strategy to help will be to enter in focal lengths in the FOV Tab and then trying to match your scene to that focal length. To do this, **[DBL-CLK]** on the Camera_FPO in your Layer window to bring up the Camera Info window. Under the FOV Tab, you can type in the focal length. By using this type of feature along with the Zoom Tool, you can zero in on the correct focal length.





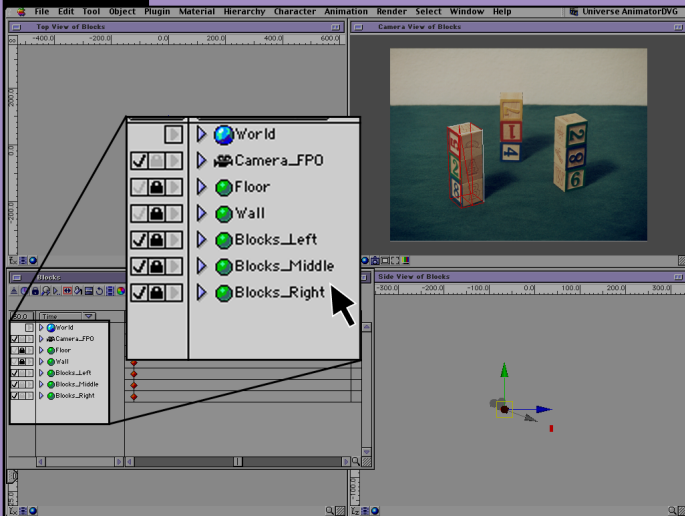
Finally, we want to reiterate that this process can be time consuming and a bit frustrating at first. It will be well worth your time to try and become comfortable with how the focal length will affect the perspective in your scene, how the various camera tools work, and how these both will affect each other. If you find that you are having too much trouble with this portion of the tutorial, you can type in the above values to position your camera (you will need to position and scale your blocks to fit the scene). Also, we found that a focal length of 50 works well.





Now that we have our camera positioned correctly, we will create the rest of the geometry for our scene. Technically, since all of the stacks of cubes are identical, we should only have to make duplicates of our first cube and simply reposition them to fit the photograph. You may find that after positioning the next block, your camera may need to be adjusted further. We found that while the pieces in the scene may not fit perfectly, they should be pretty close. If you do find major differences between the new blocks you create and the photograph, you may need to go back and adjust your camera and/or focal length.

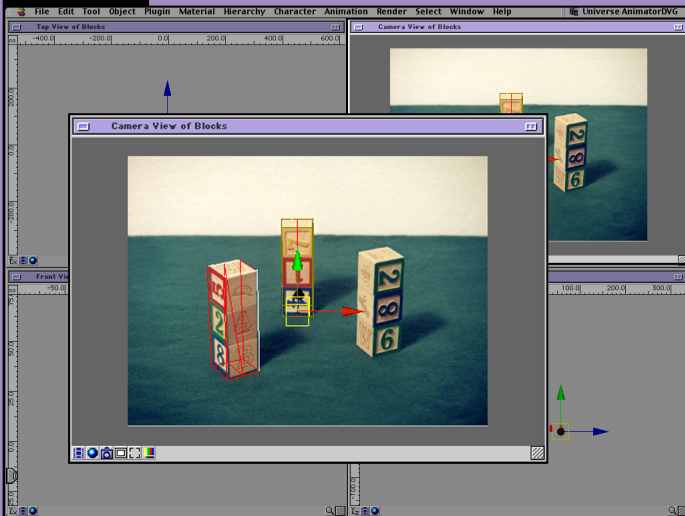




In the Project window, make two copies of your block (Select it and hit **[CMD/CTRL+D]** twice).

Rename these copies "Blocks_Middle" and "Blocks_Right".

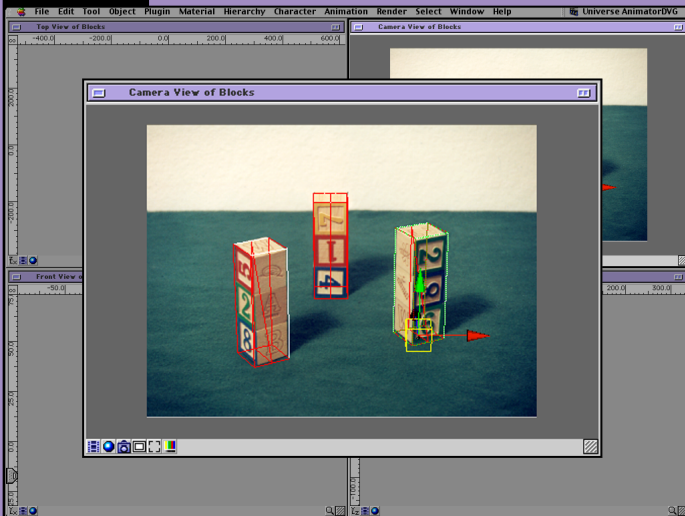




In the Camera View window, Move and Rotate Blocks_Middle so that it aligns with the middle stack of blocks. We won't use the scale tool because all of our geometry should be the same size. If you find that after positioning the box that it does need to be scaled, you may need to revisit the focal length steps to readjust your scene (you may not get a perfect fit, which is OK, but any large discrepancies may indicate a problem).

Note: If you end up resizing Blocks_Left in the process of readjusting your scene, make new duplicates for Blocks_Middle and Blocks_Right. Remember that all three cubes should be the same size.





Finally, in the Camera View window, position **Blocks_Right** so that it aligns with the stack of blocks to the right in the photograph. Again, you will not use the scale tool. Hopefully, by this step, you should not need to readjust your camera/focal length, but do so if you run into problems. Lock all of the Block objects so that they won't be moved accidentally.





Once the camera is positioned correctly, we won't want to move it. In the Project window, **[CLK]** on the Lock icon to the left of Camera_FPO.

Now that we are happy with our camera position and scene setup, we will continue with the project by creating more cameras and loading them with the proper camera maps.

