

## Autodesk 3ds Max Design 2010 tutorial

Autodesk 3ds Max Design is used primarily for rendering your drawings created in AutoCAD or AutoCAD Architecture. Even though AutoCAD Architecture has very good rendering tools, it is not as robust as Autodesk 3ds Max Design. You can do the following in Autodesk 3ds Max Design:

- Apply materials
- Create a sun for daylighting and set the building location and date correct shadow casting.
- Create artificial lights which will accurately simulate the lights you have selected for your building
- Set up cameras by which the building can be viewed
- Create animations for walk-throughs or fly-throughs by moving the cameras, or animate objects in the scene.

Autodesk 3ds Max Design uses the "mental ray" rendering engine which can generate reflections, refractions and shadows by ray tracing. Ray tracing traces the path of light rays sampled from the light source. Reflections and refractions generated this way are physically accurate.

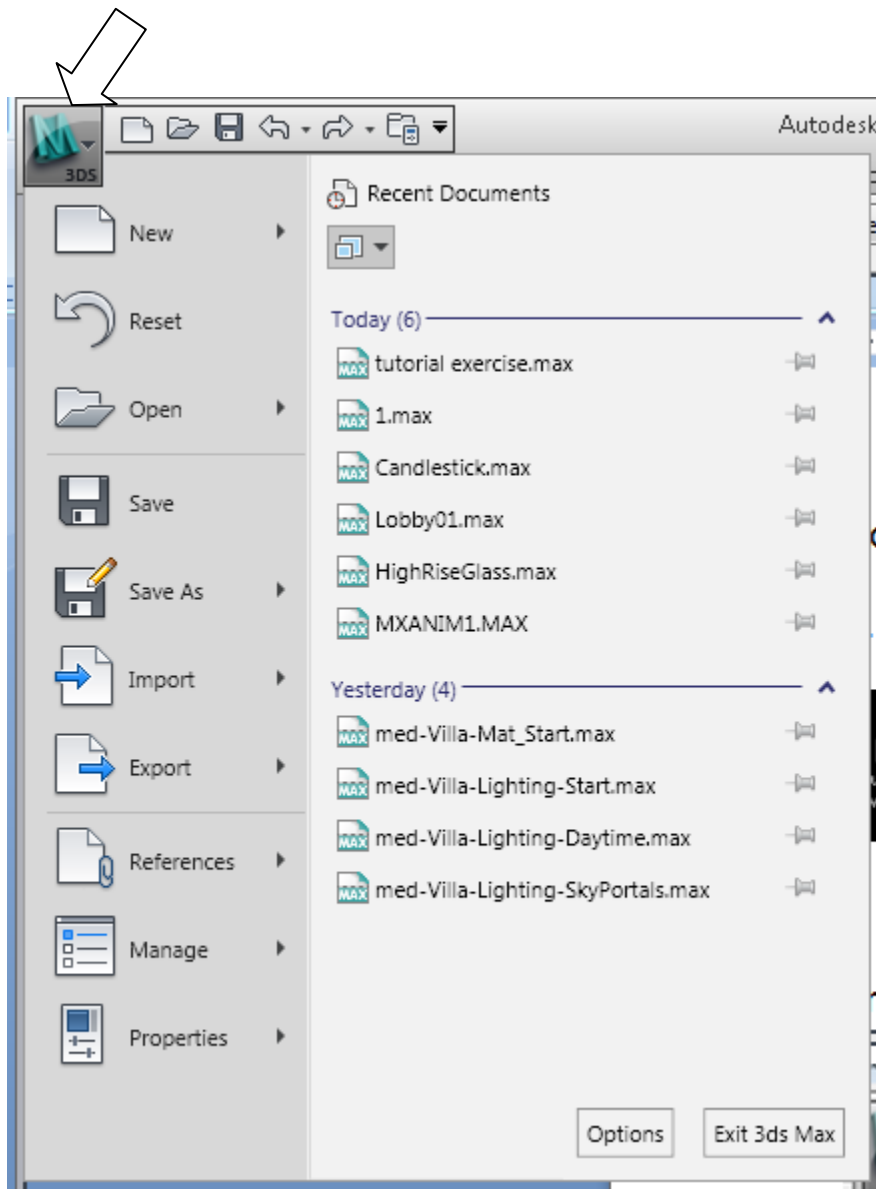
So let's do the following exercise to get you into the program quickly.

1. Open Autodesk 3ds Max Design 2010 by clicking on the icon on the desktop:

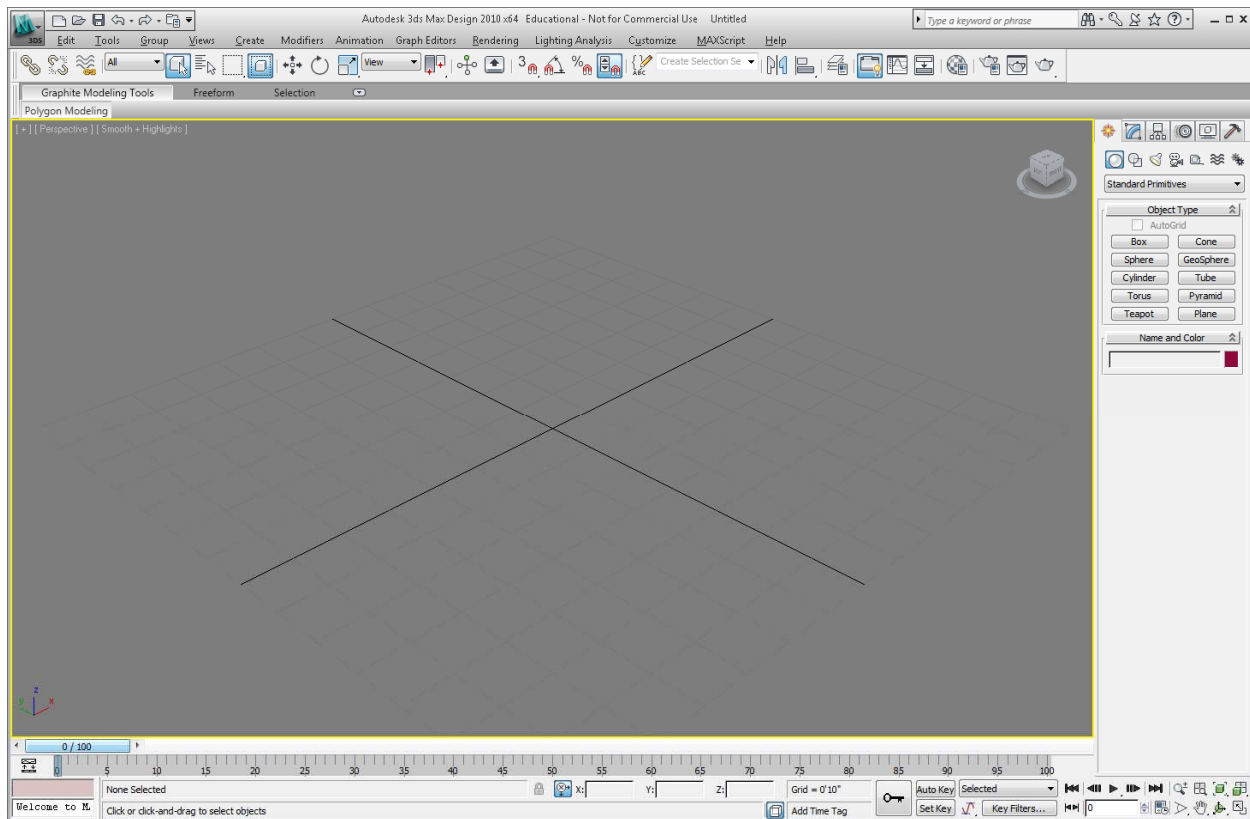


Immediately save the drawing to your H: drive, even though you have nothing drawn yet. Pull down the application menu (the big **M**) and select "Save." Browse for your H: drive, make a folder called 3ds Max, and give the drawing a name. Your file will have a filename extension of **.max**.

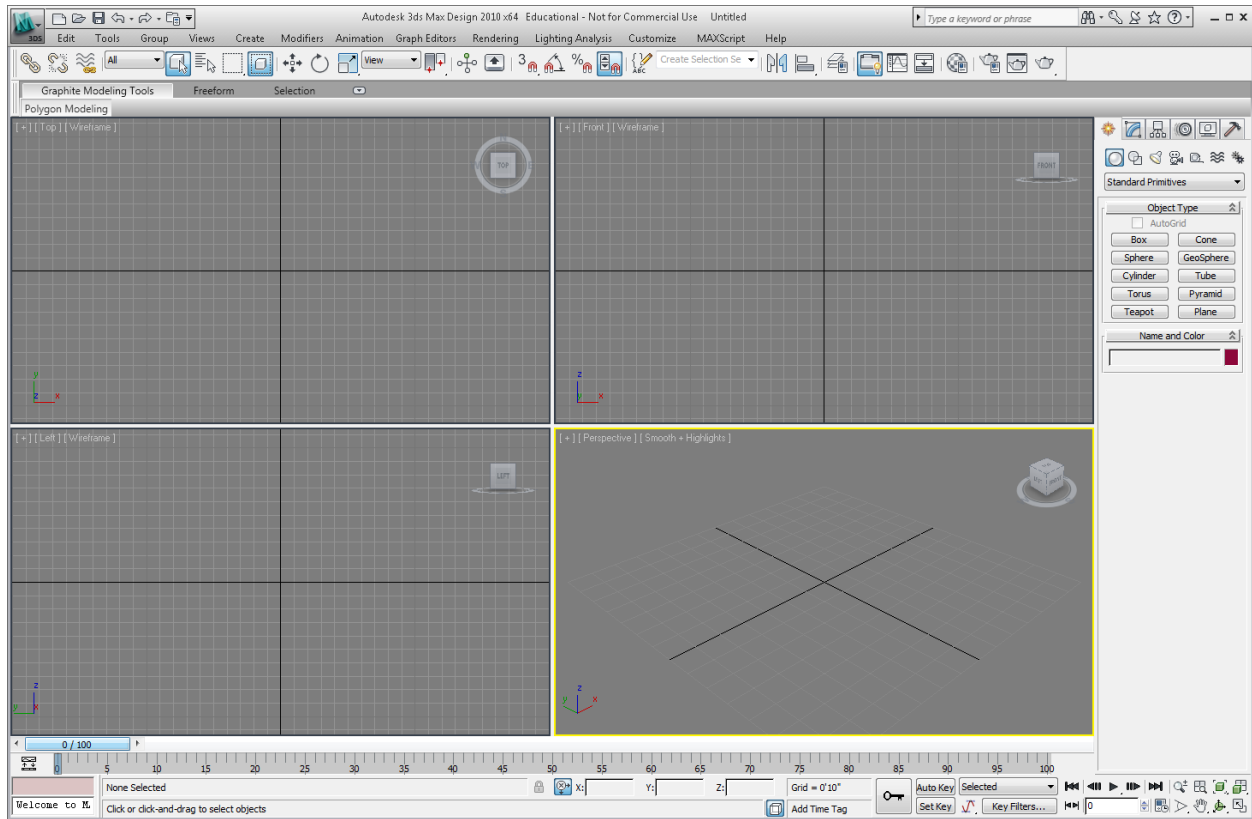
Force yourself to get in the habit of saving your drawing every 10 minutes.



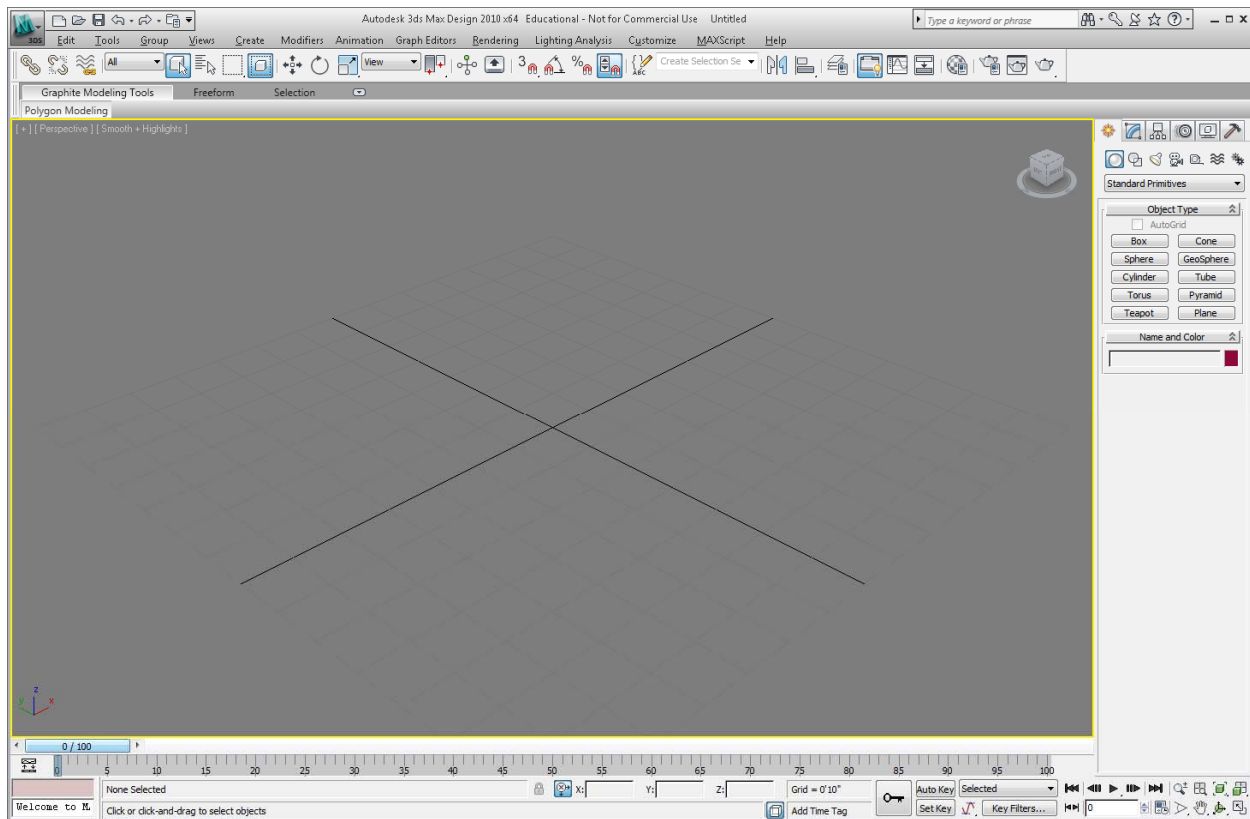
After the program opens, your screen will look something like this:



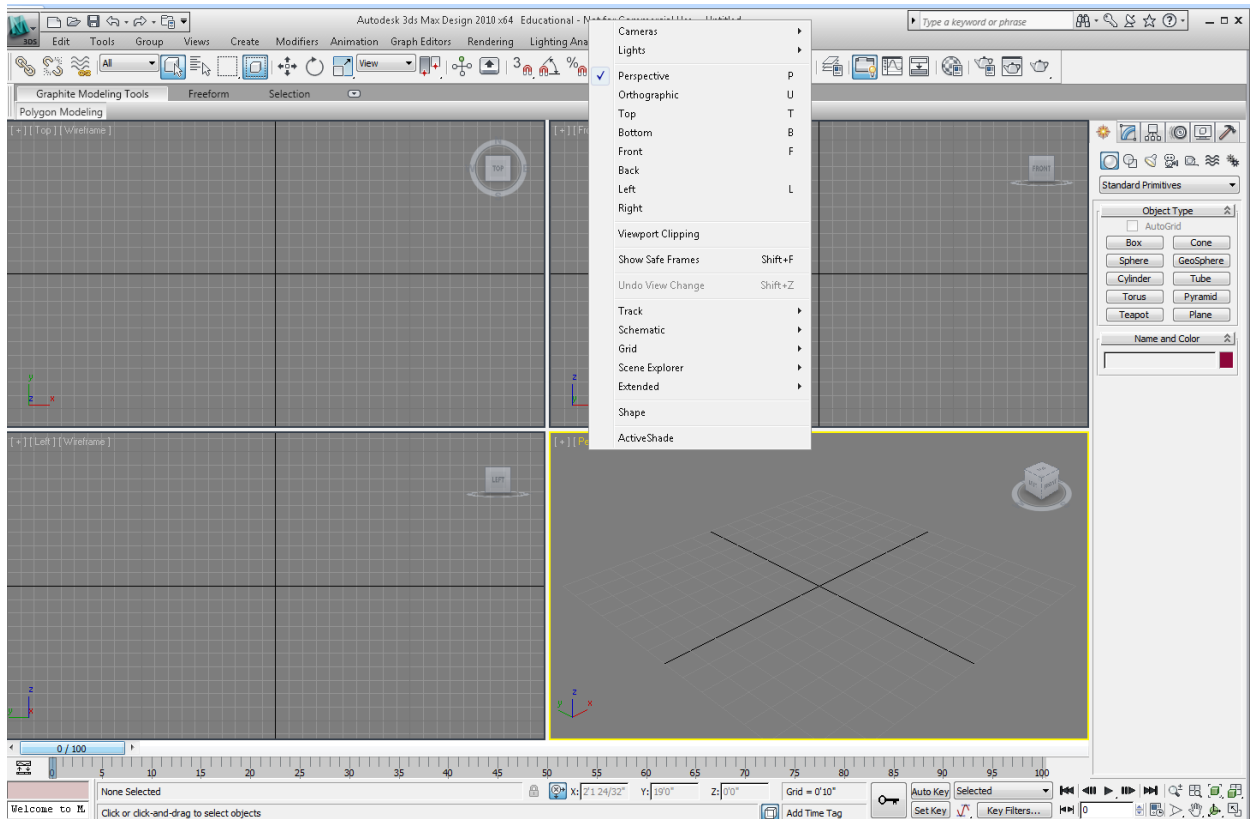
If you want to see four viewports showing the plan, front elevation, left elevation and perspective view all on the screen at once, hit <Alt>W on the keyboard.



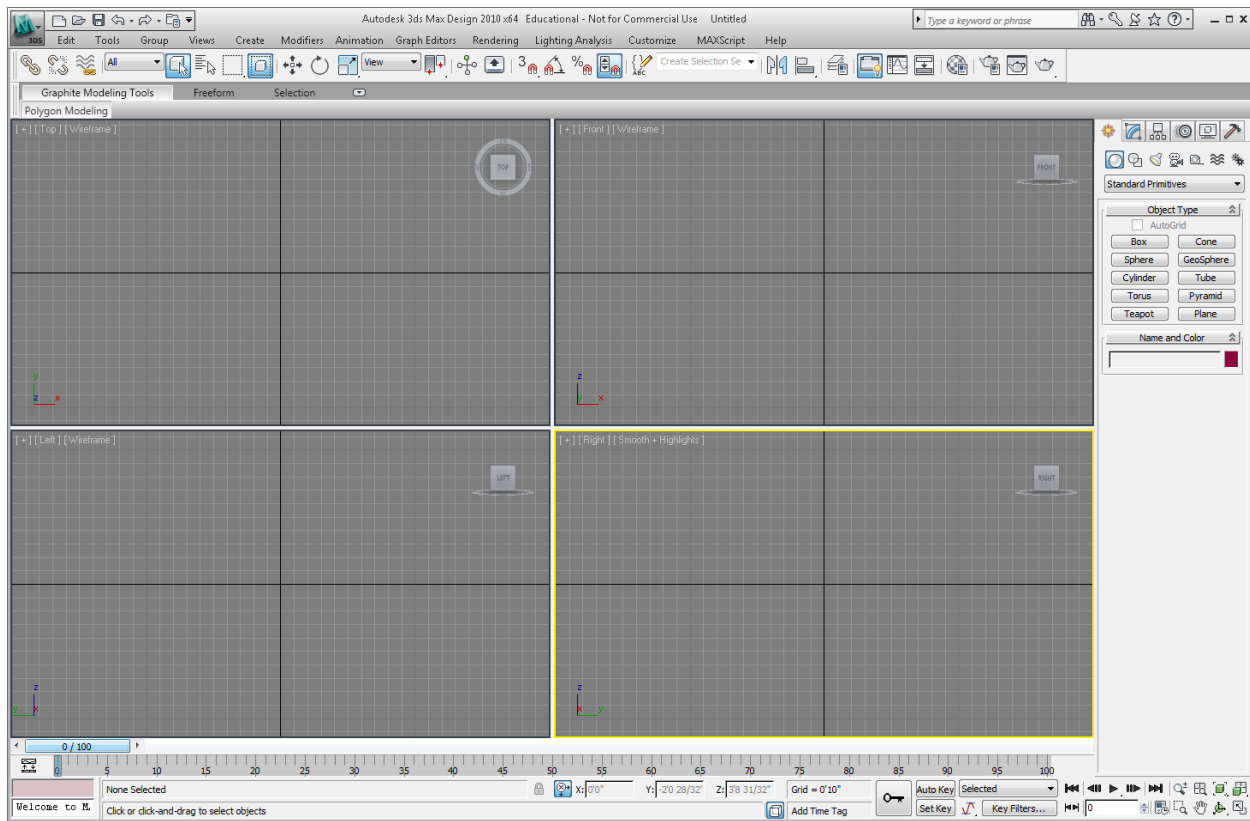
If you want to go back to the perspective view only, hit <Alt>W again



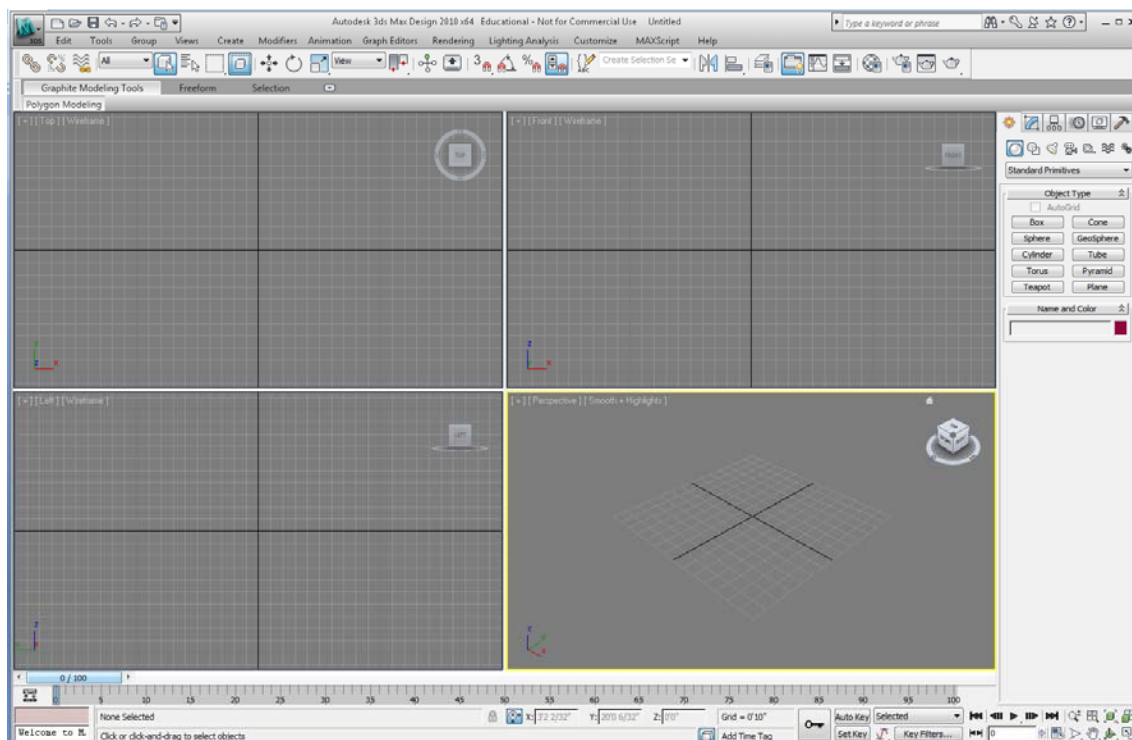
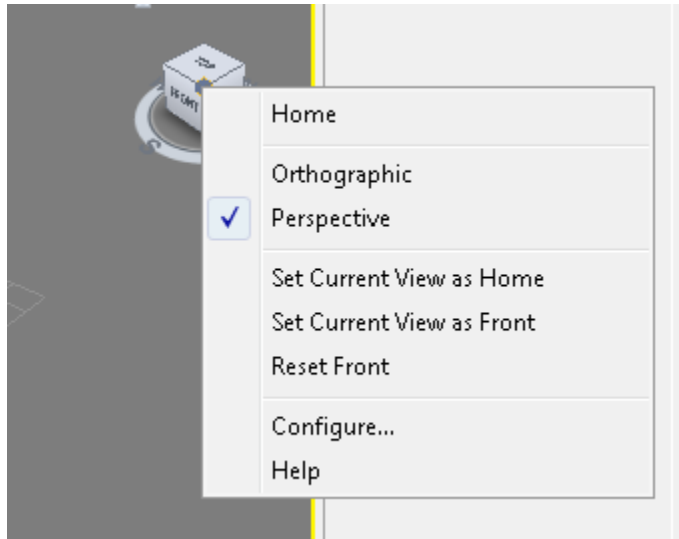
If you want to set the lower right viewport to another view, click on the word "Perspective" in the lower right viewport and select another view, such as "Right" for right side view, for example:



Now the screen will look like this:



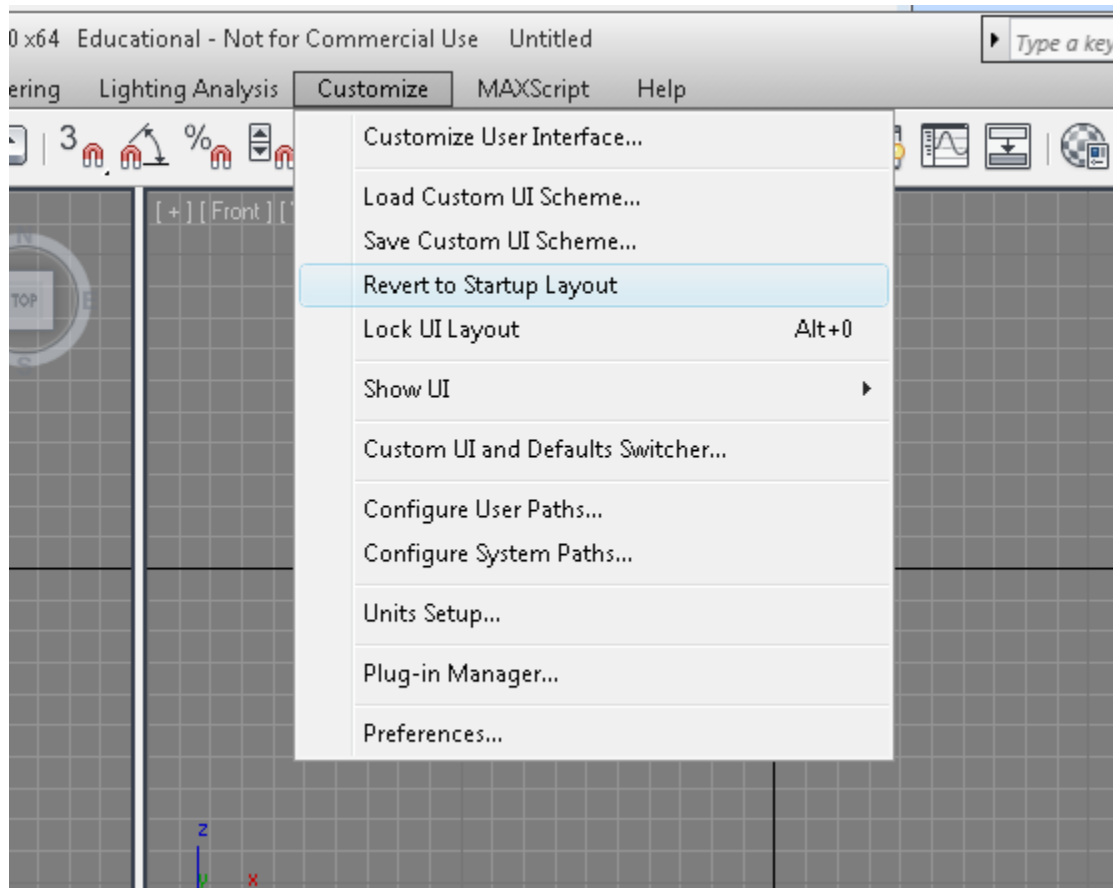
To bring the perspective view back, click on a corner of the view cube in the upper right corner of the viewport, or click on the icon next to the view cube that looks like a house. This will reset the "home" view, the isometric view. The view cube in Autodesk 3d Max Design 2010 works just like the one in AutoCAD. by right-clicking on the view cube, you can choose to see the 3d view either in isometric (orthographic) view or in perspective view. Usually you would want a perspective view in Autodesk 3ds Max Design.



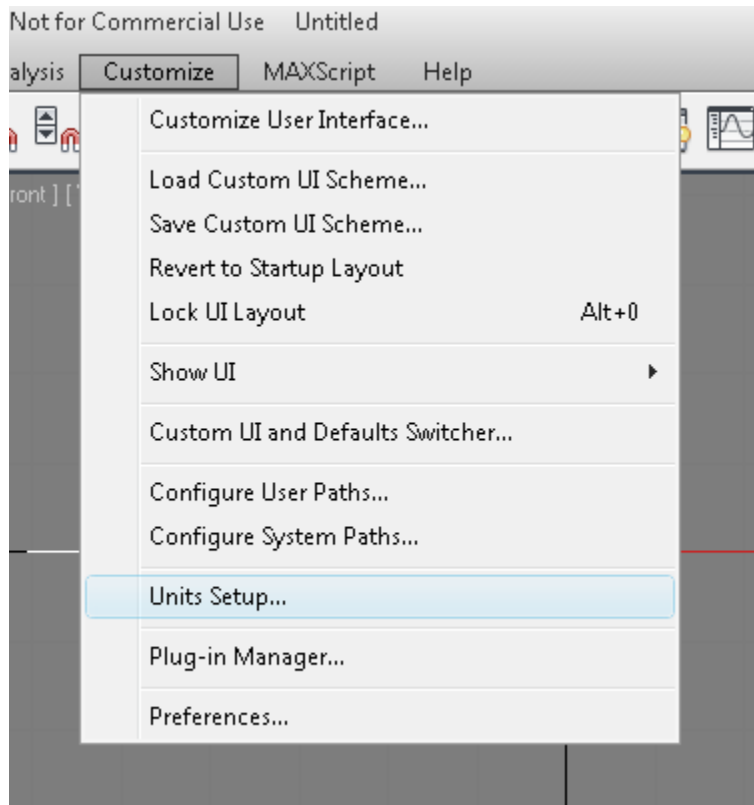
Pretty neat, huh?



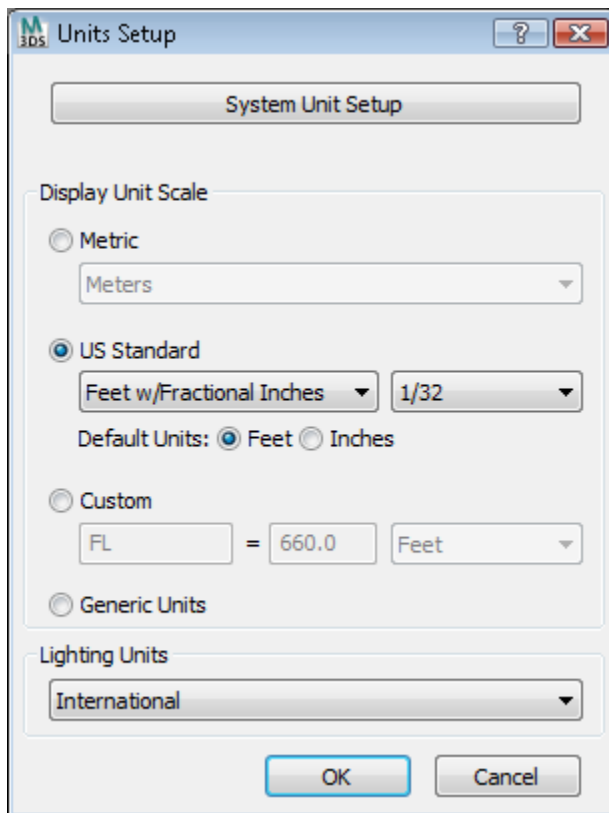
FYI, if you lose the default User Interface ("UI"), for some reason - this could happen if you get involved in changing things in the UI - simply click on the "Customize" pull down and select "Revert to Startup Layout."



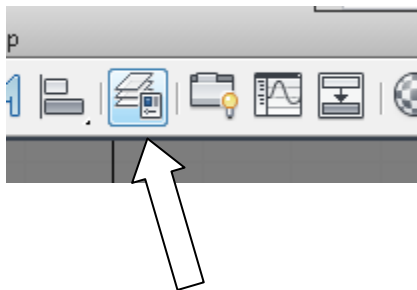
2. Change the Units settings to Architectural feet and fractional inches. Click on the Customize pull down and select "Units Setup..."



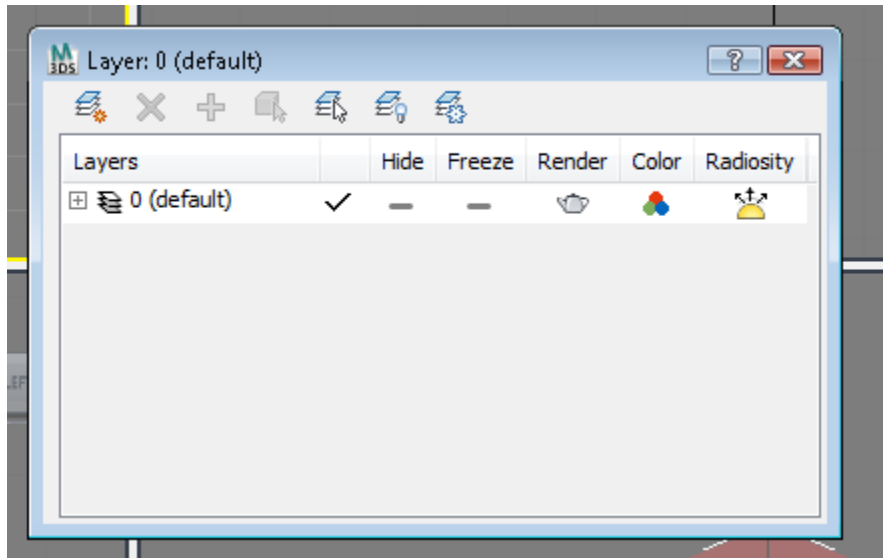
Pick "US Standard," "Feet w/Fractional Inches," and the Default Units as "Feet," click OK:



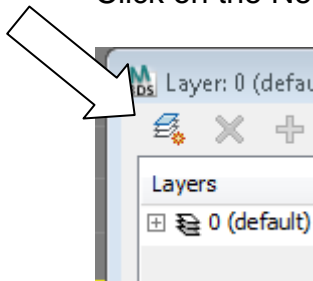
3. Set up four layers. Select the manage layers icon on the tool bar at the top of the screen:



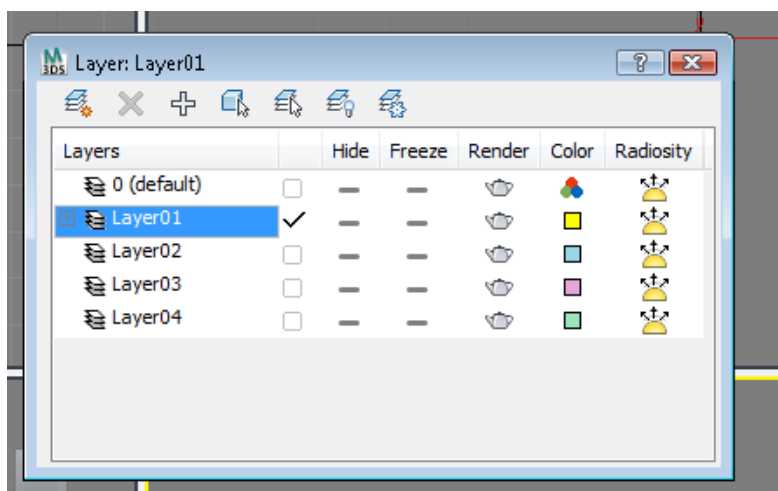
Here is how the layer manager will look to start:



Click on the New layer icon on this dialogue box (very similar to AutoCAD):



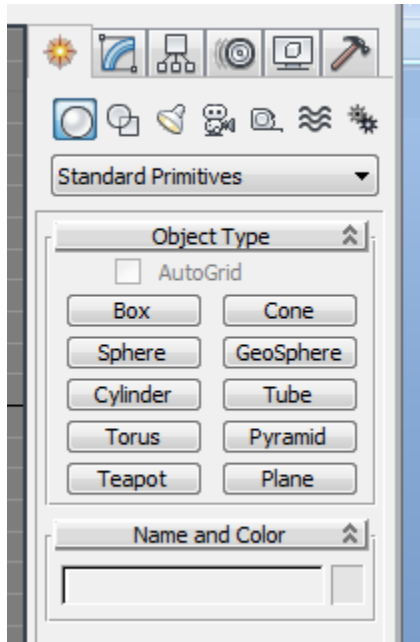
Make four additional layers:



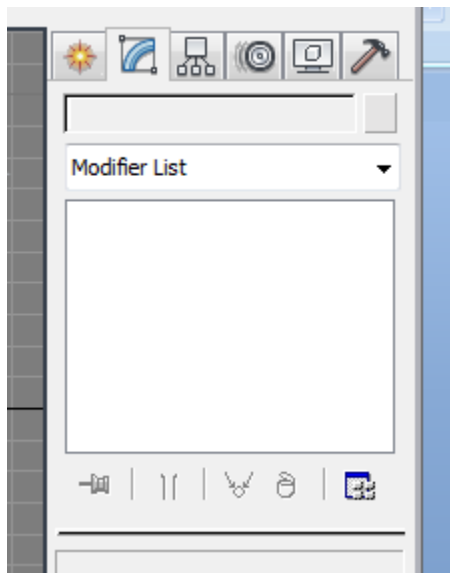
Change the color of each layer similar to those shown above by clicking on the color swatch and picking a color to assign to it. Make Layer 1 current.

4. Make the upper left viewport current by left-clicking in it. A yellow box will appear around it to show you that it is the current viewport.

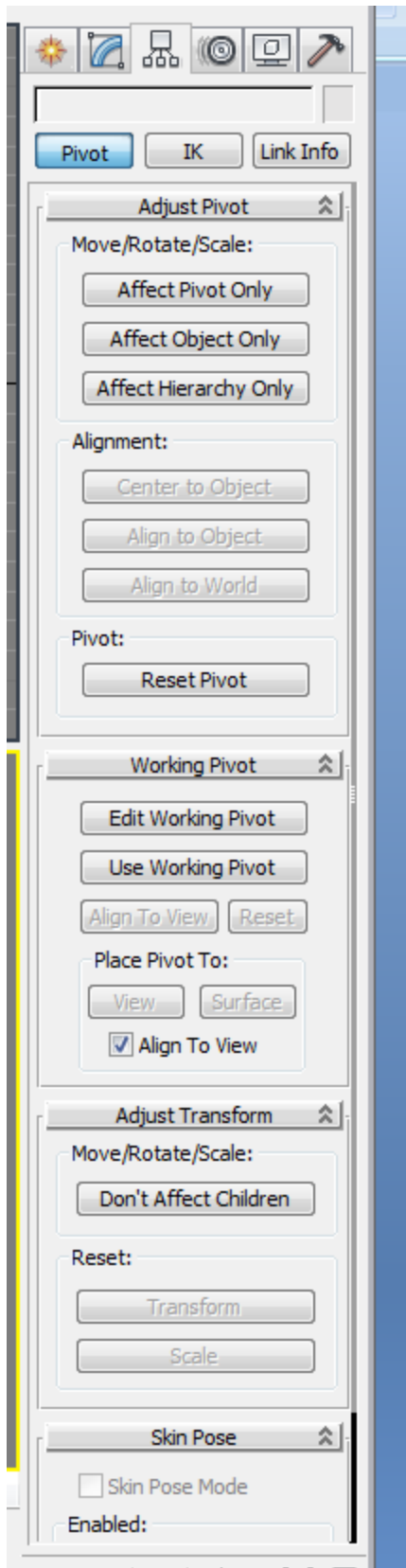
On the right side of the screen is the so-called "Command Panel." This is where most of your drawing and editing work will be done. It has 6 tabs, as follows:



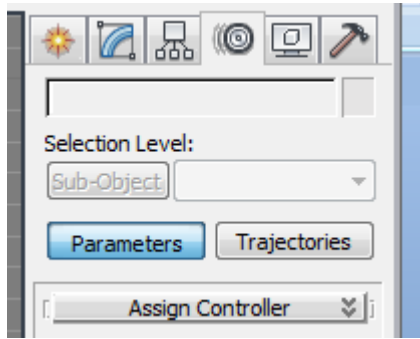
Create



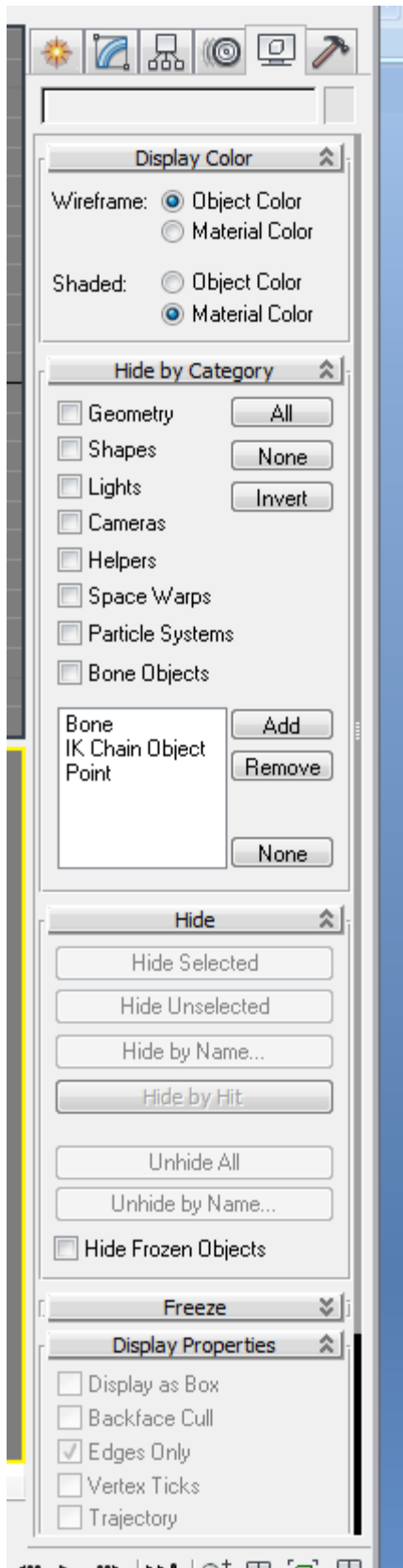
Modify



Hierarchy

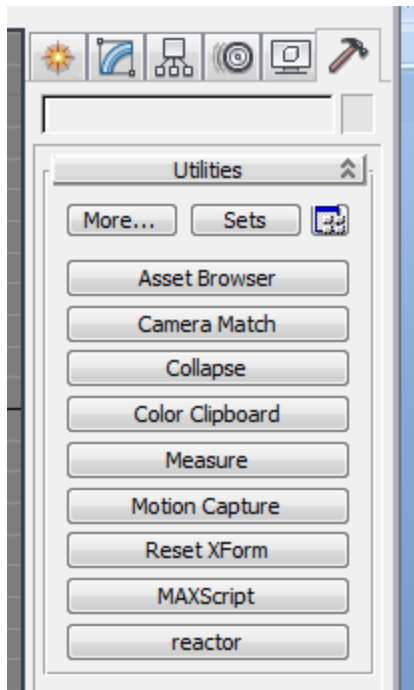


Motion



Display

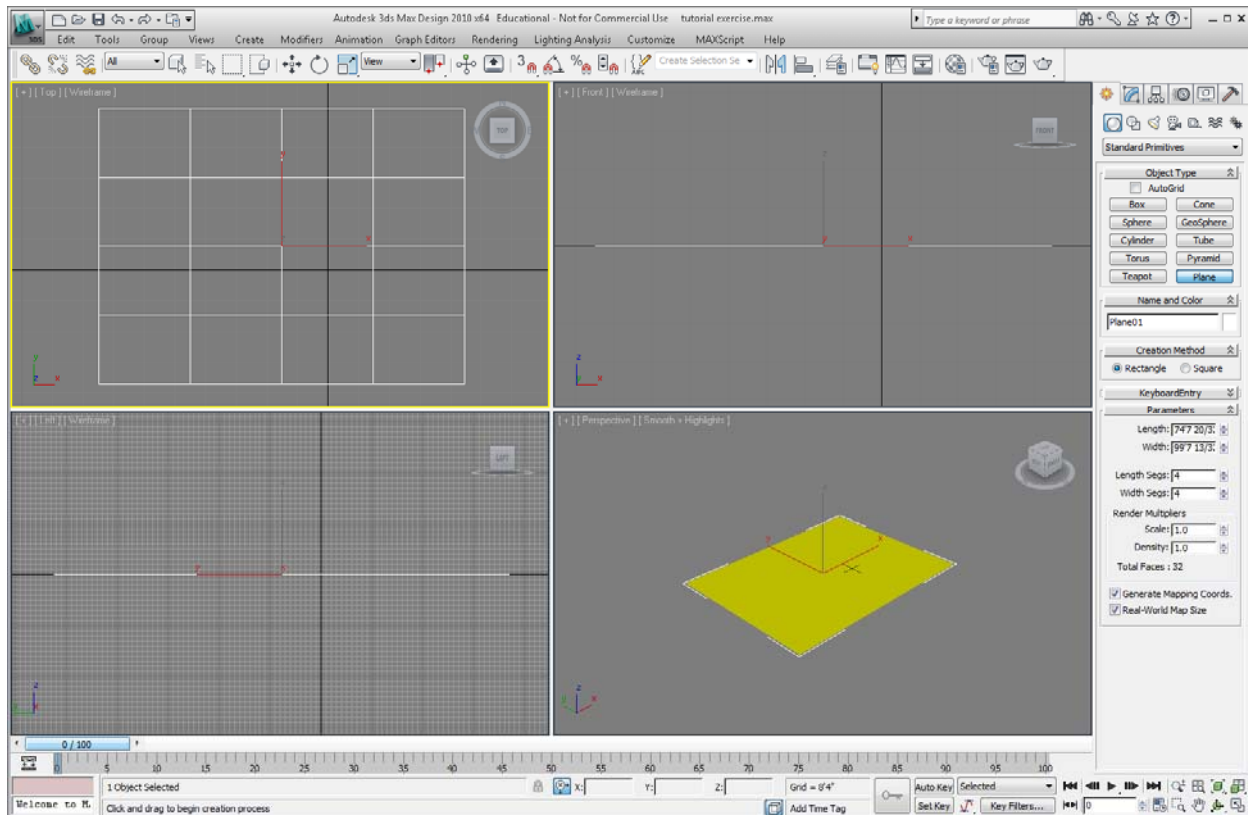




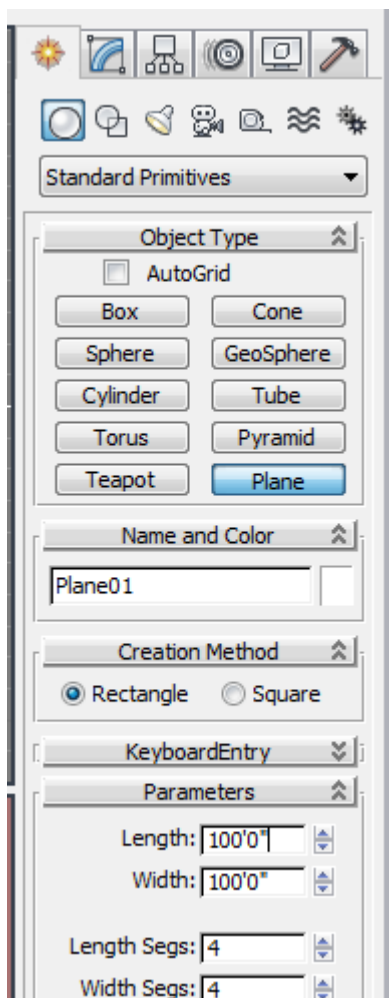
Utilities

5. Let's create a Plane. Start with the "Create" tab on the Command panel and select "Plane"

Draw a Plane in the upper left viewport (the plan view) by left-clicking on a point close to the lower left corner of the viewport and dragging to the upper right corner. It will look like this:

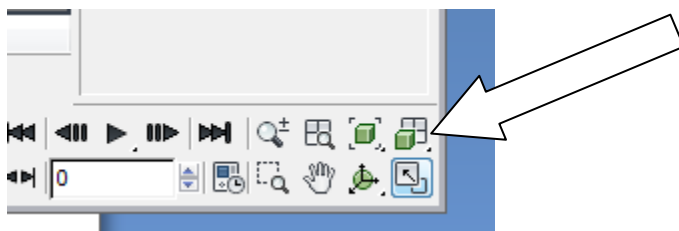


In the Control Panel, change the size to 100' x 100' by typing in the length and width parameters:

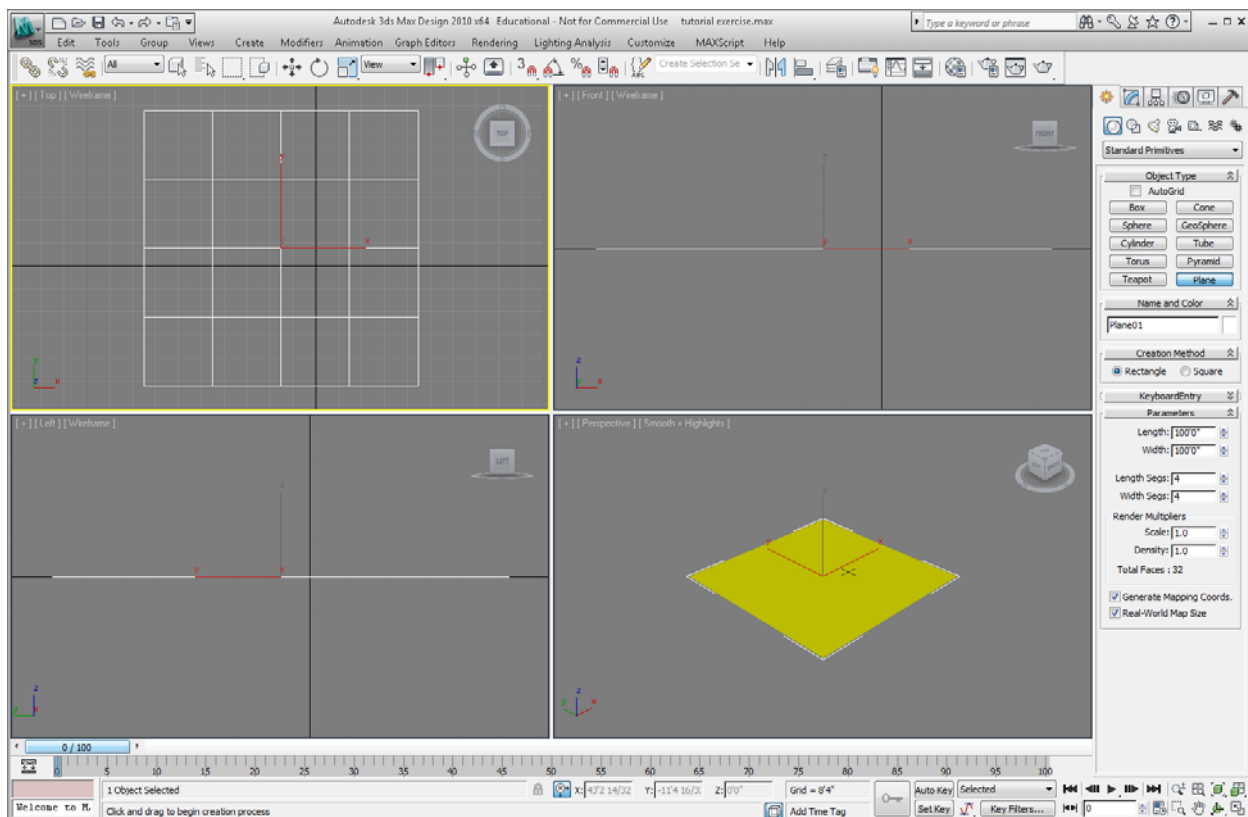


When you do this, your Plane will extend beyond the viewport. That's OK.

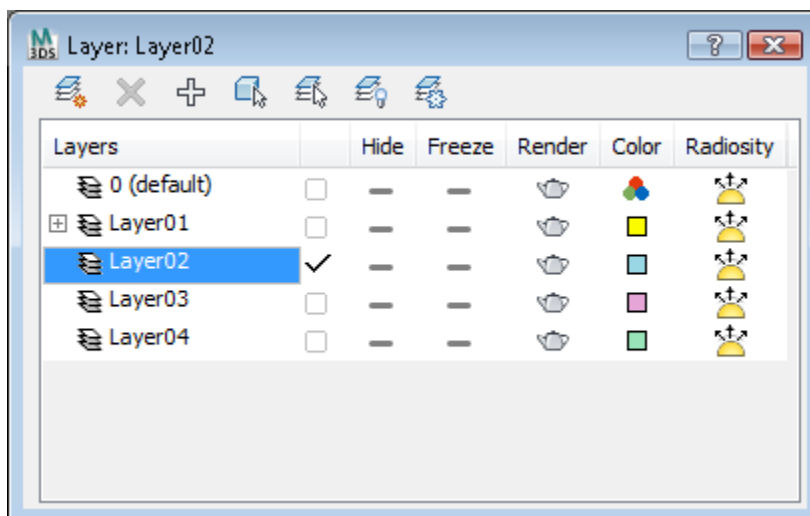
In the lower right hand corner of the screen, select the "Zoom Extents All" icon to fit the Plane in the viewports.



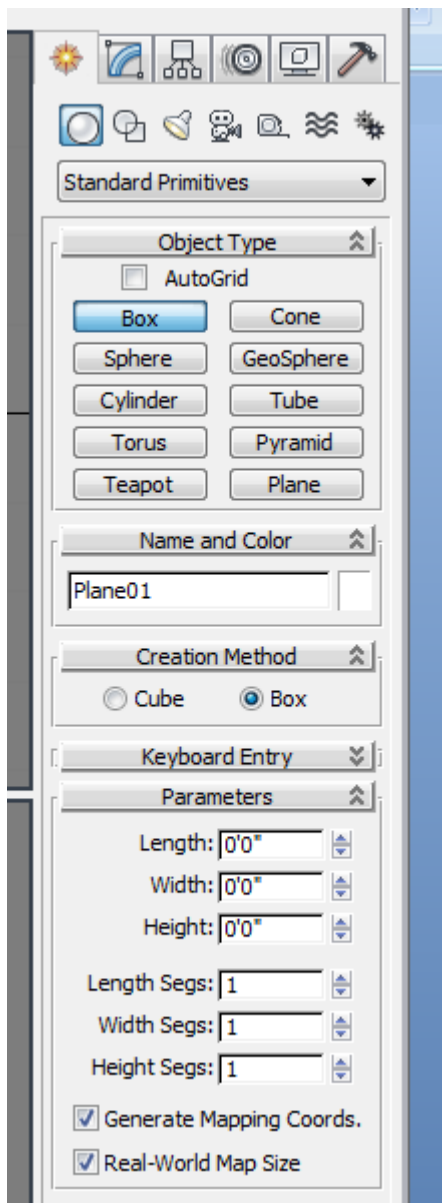
Now your screen will look like this:

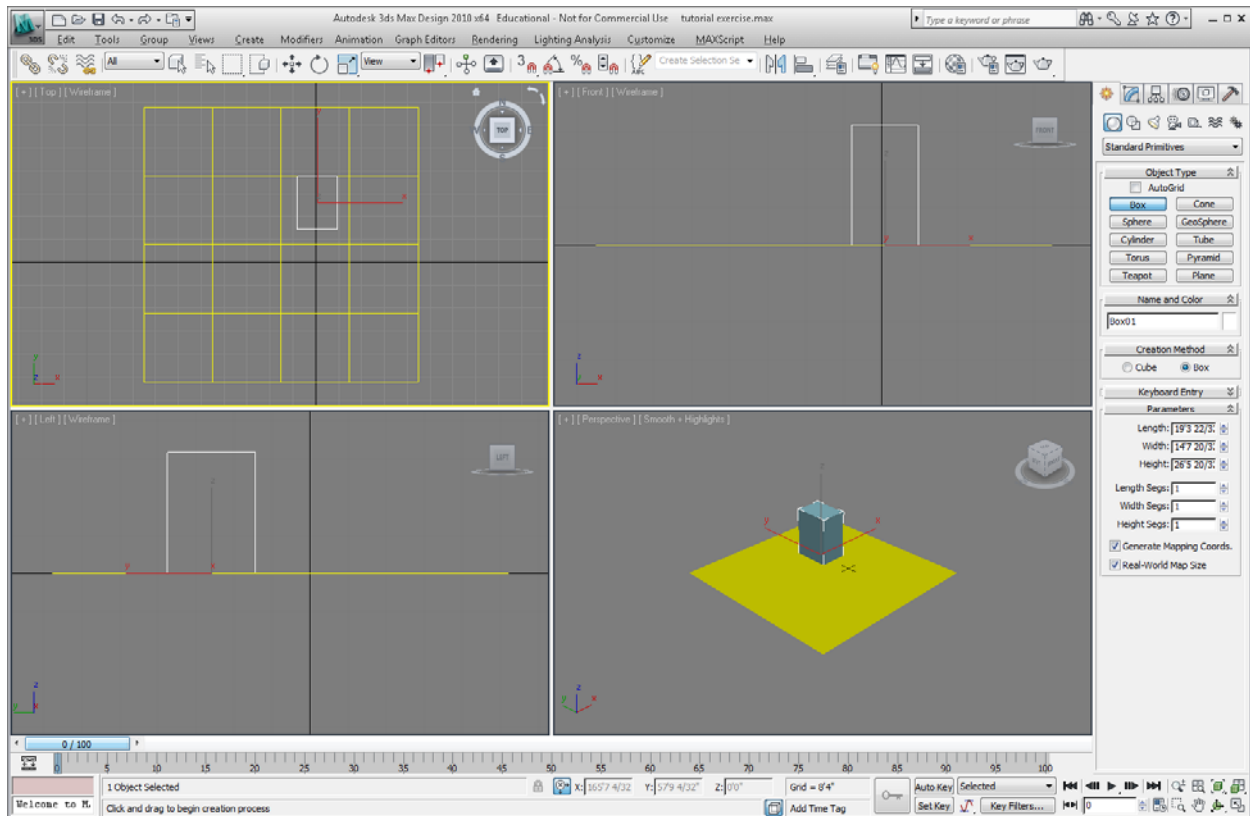


6. Change the current layer to Layer 2

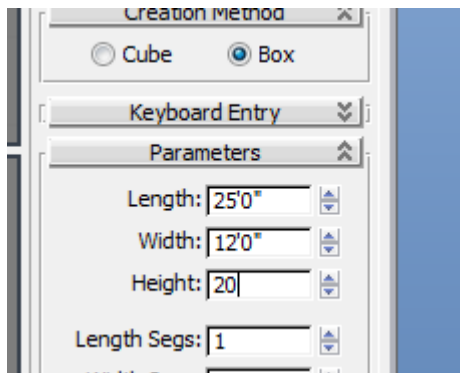


7. Create a building by using the Box command in the Command Panel.

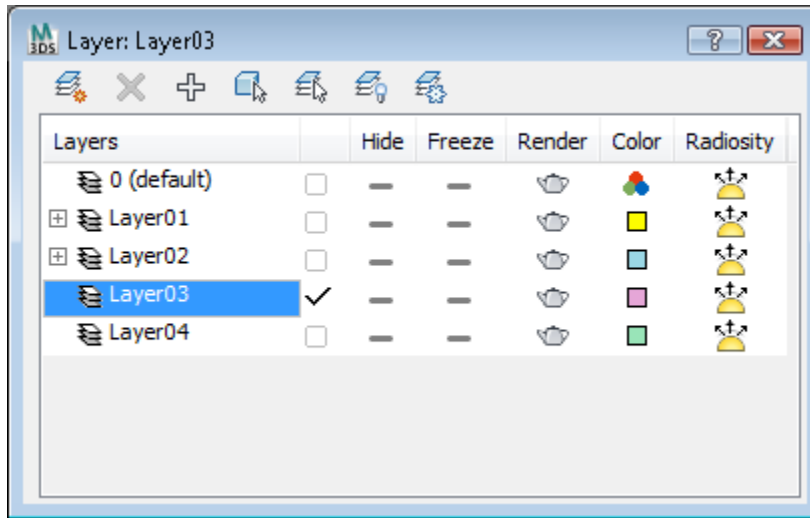




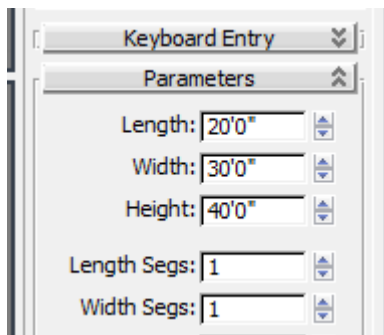
Pick two corners in plan and extend the Z direction vertically. In the control panel, change the length to 25', the Width to 12' and the height to 20'



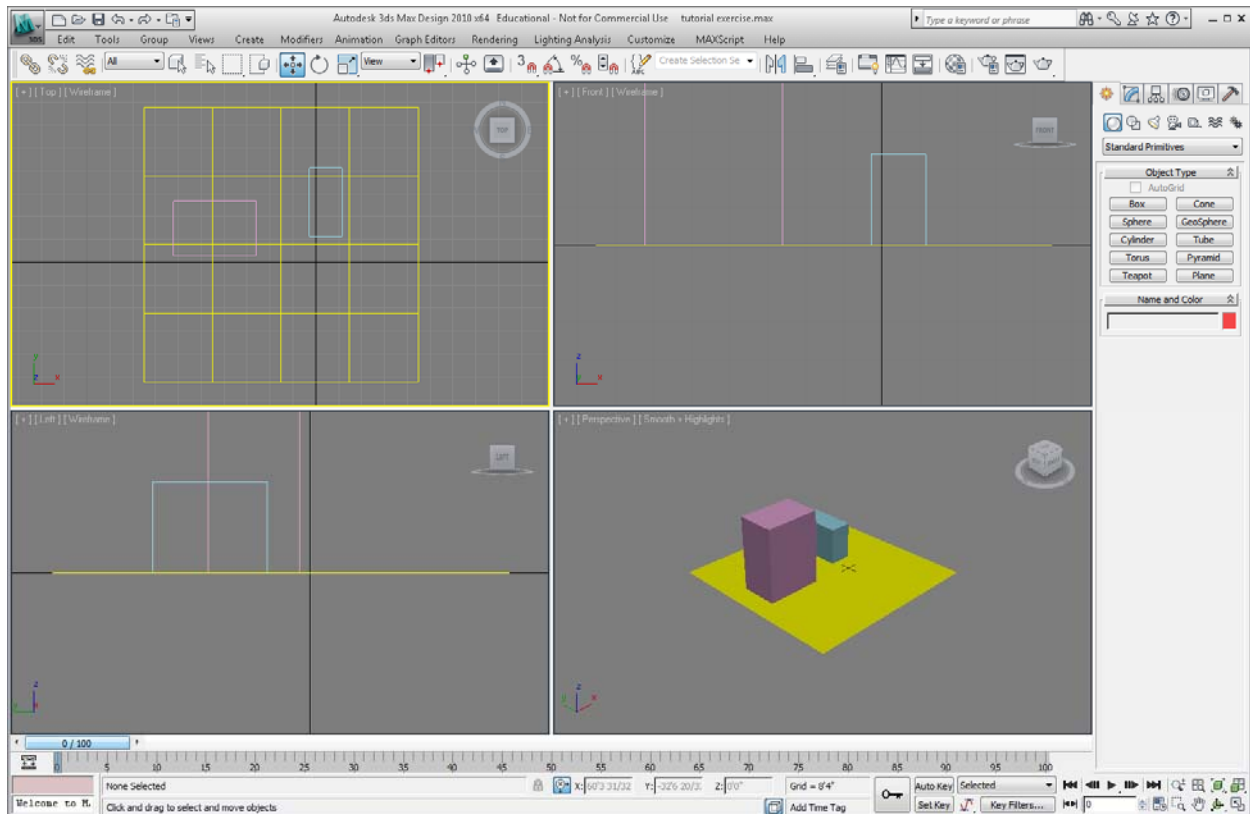
8. Change the current layer to Layer 3



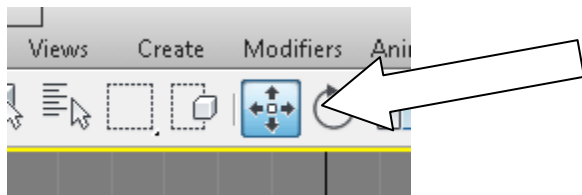
9. Draw another Box and change the Length to 20', Width to 30' and Height to 40'



Your drawing should look something like this:

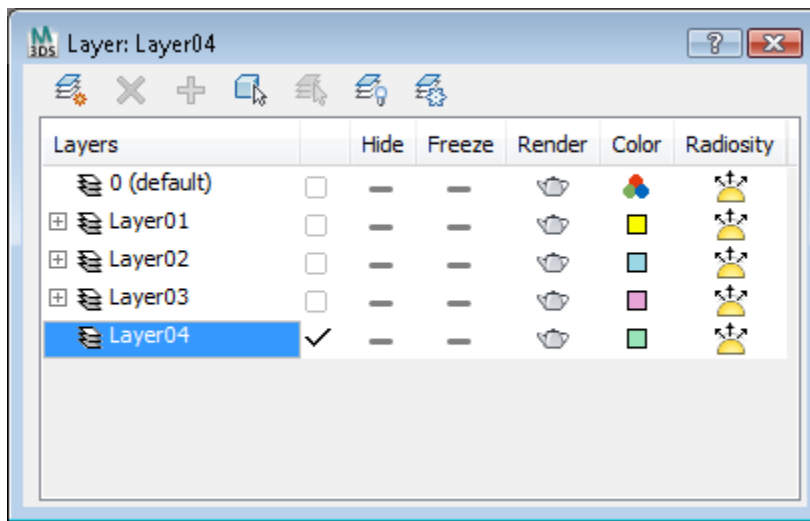


If you do not like where the last Box is located, you can move it by selecting the Move command on the Toolbar:

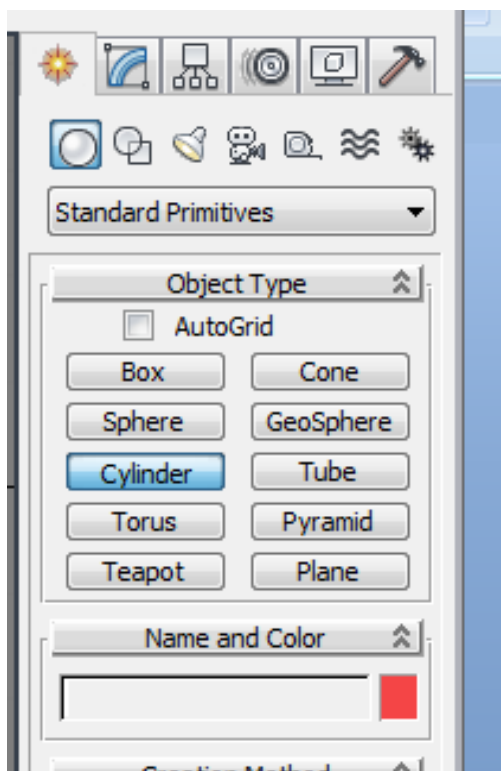




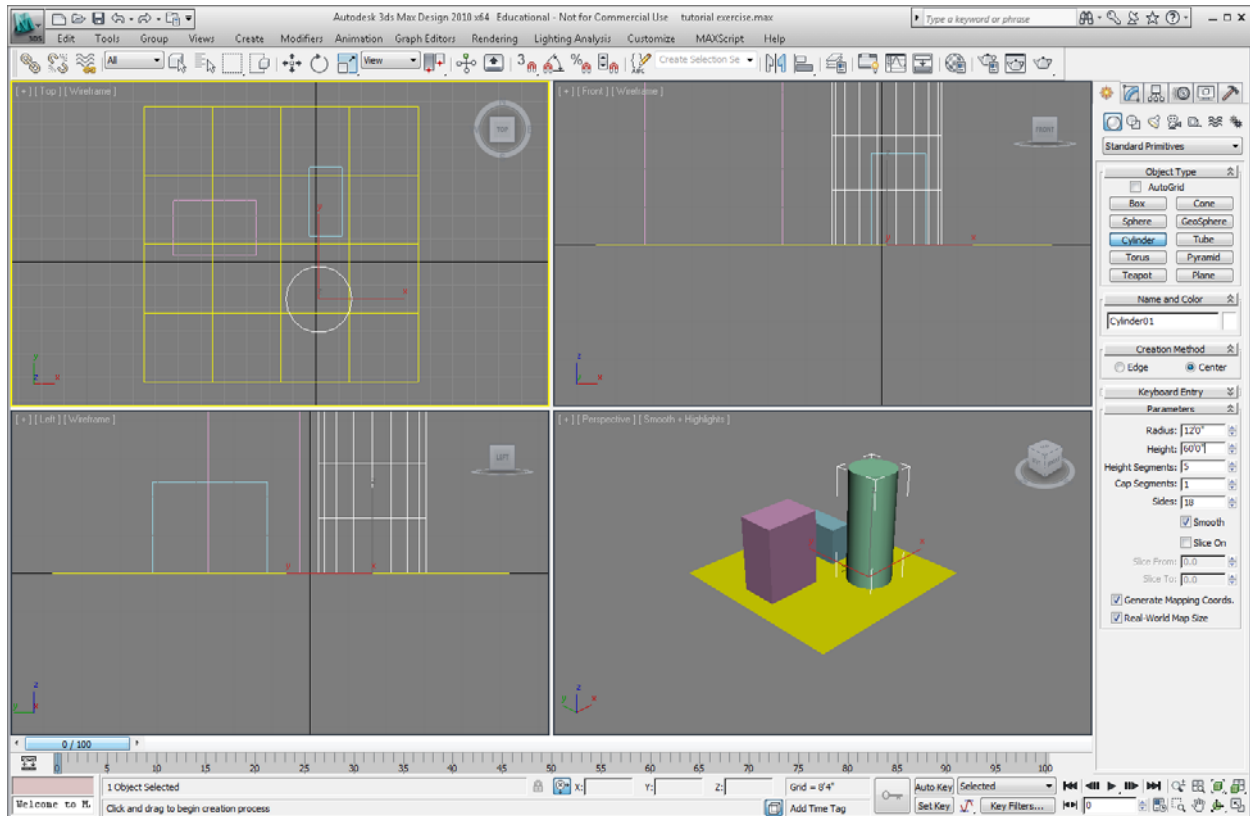
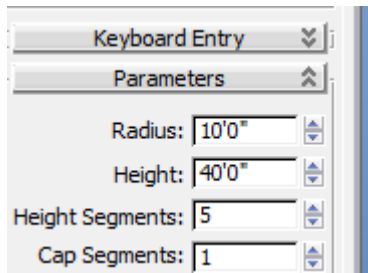
10. Change the current layer to Layer 4



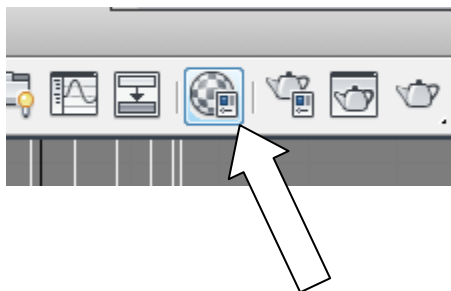
11. Draw a Cylinder



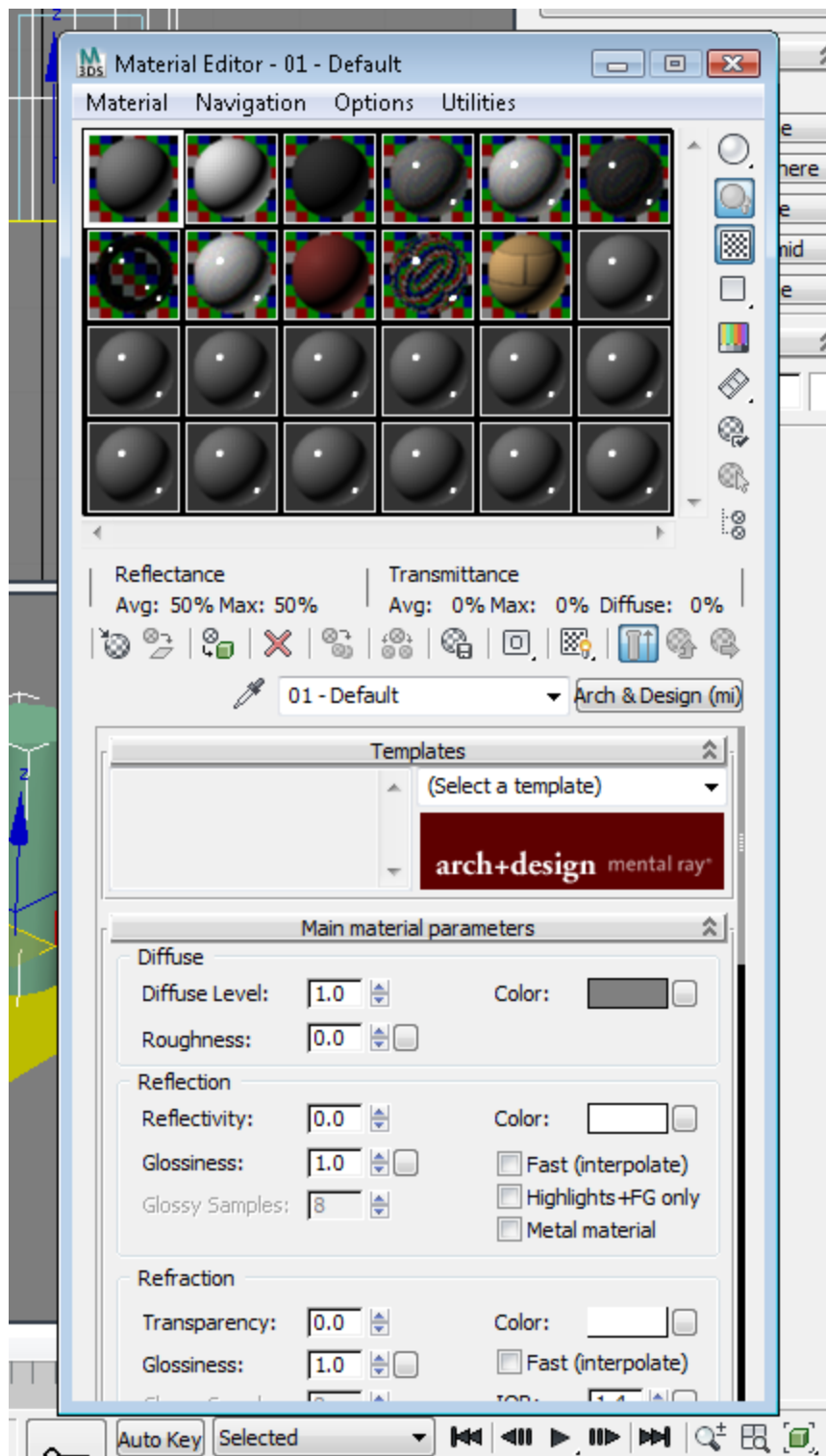
Change its Radius to 12' and Height to 60'



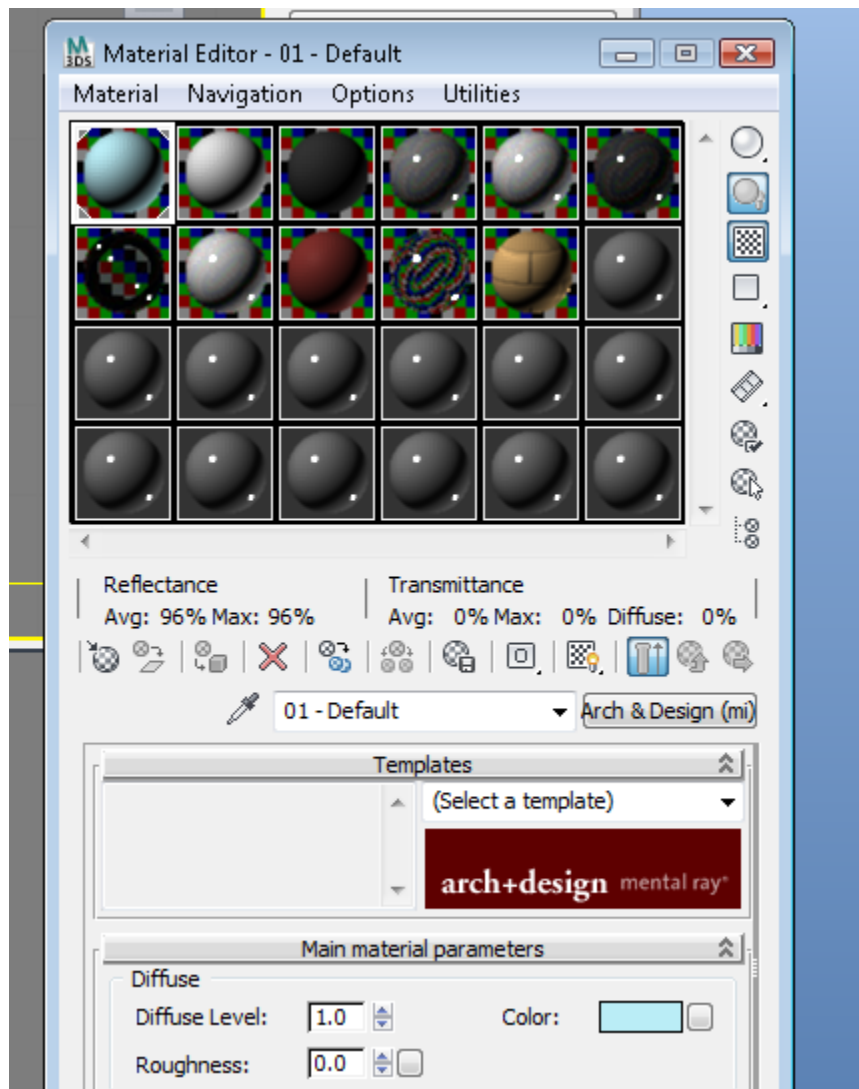
12. Let's assign materials to each of the buildings. Click on the Material Editor icon on the Toolbar:



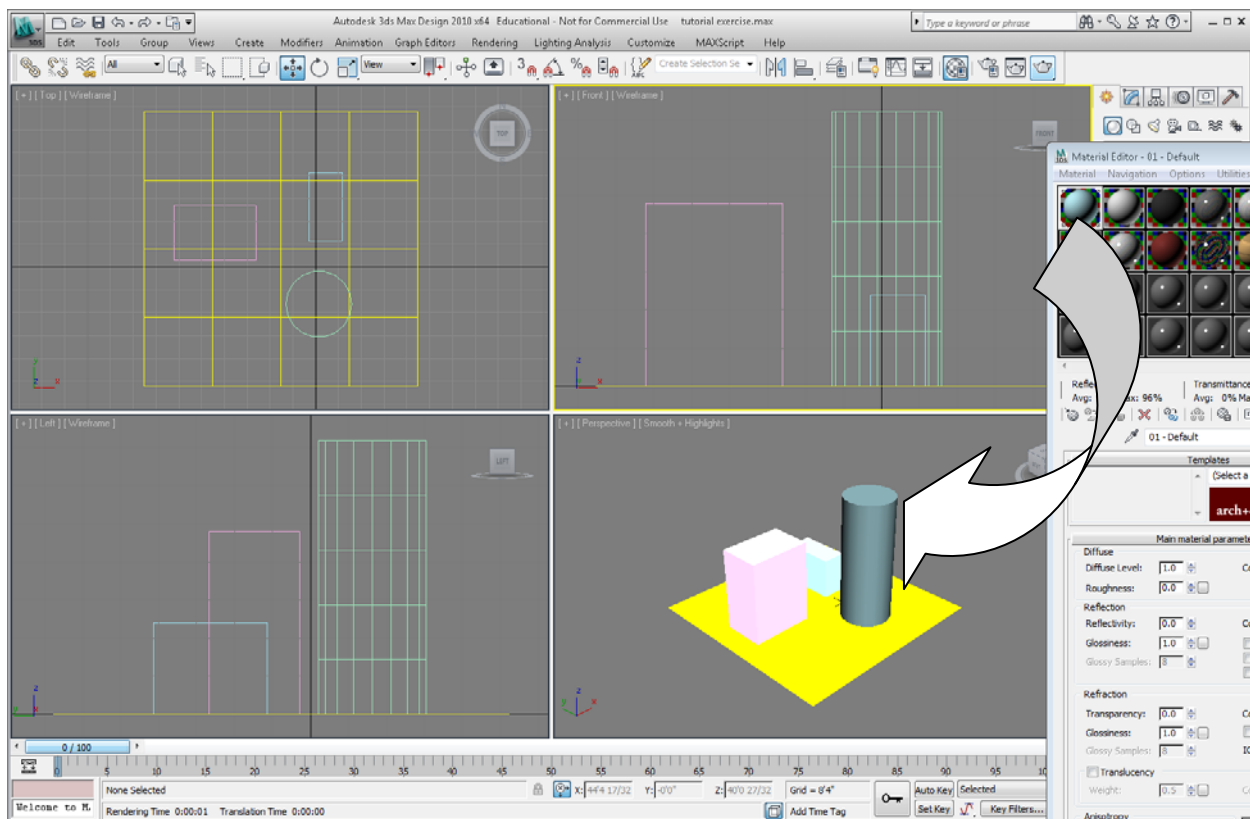
This is how the Material Editor dialogue box looks:



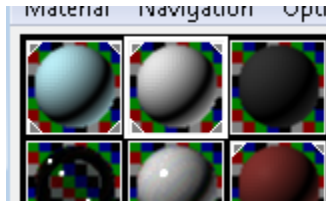
Just like in AutoCAD Architecture, each of the balls represents a material and texture. They can and usually should be changed to match materials that you want to use on your buildings. Set up the material in the material browser and assign it a color.



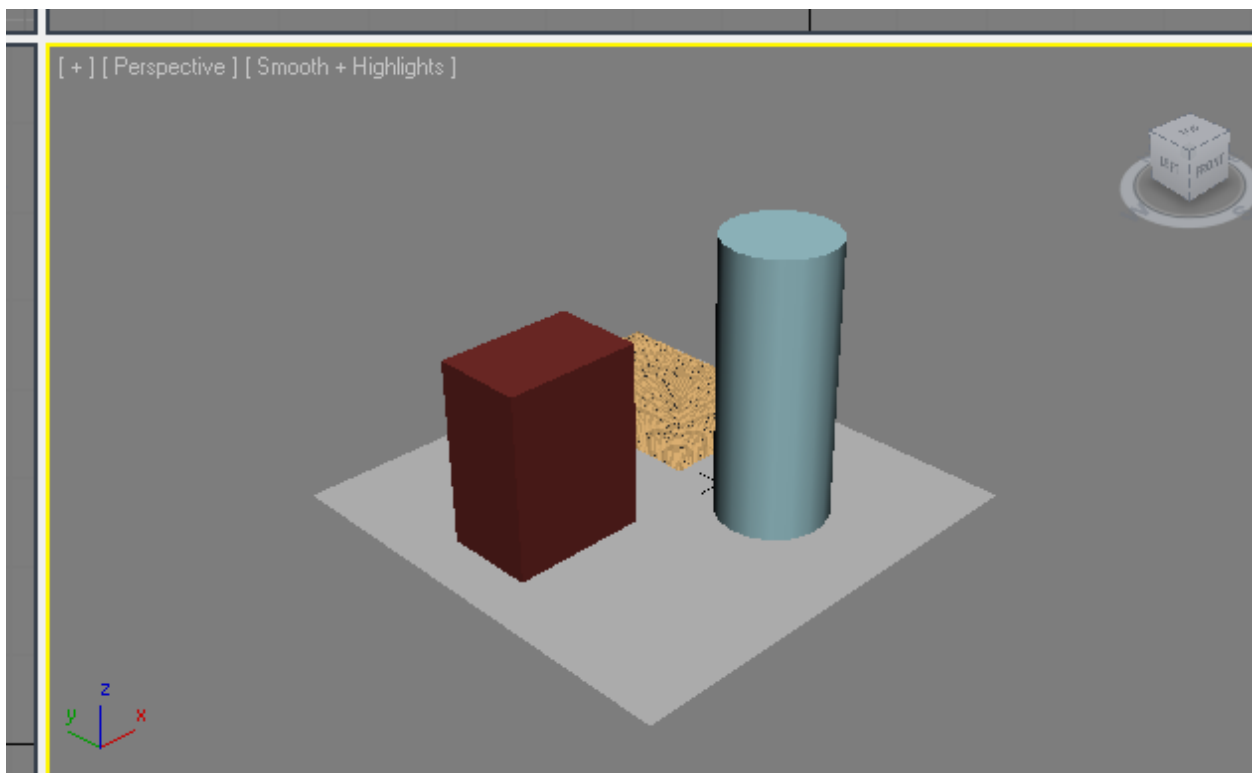
Then drag the material to the object you want to assign it to.



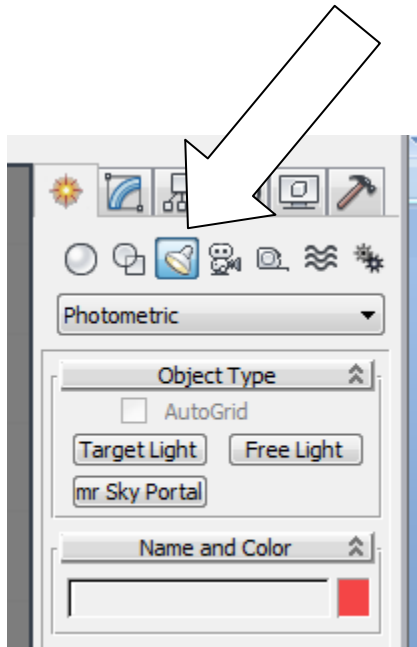
Do the same for the other objects in your drawing, assigning them each a different customized material. Materials that have been assigned to objects have triangles at their corners:



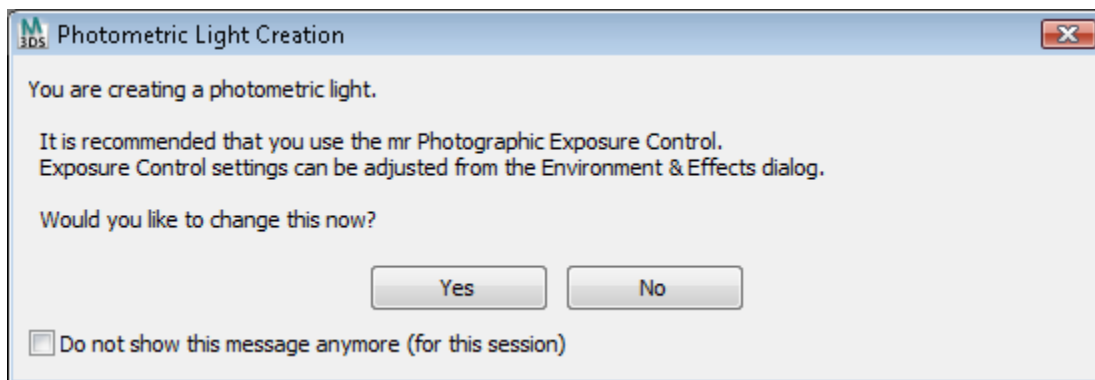
So your drawing now will look something like this:



13. Let's put in some lights. On the Create tab, select the Light icon:

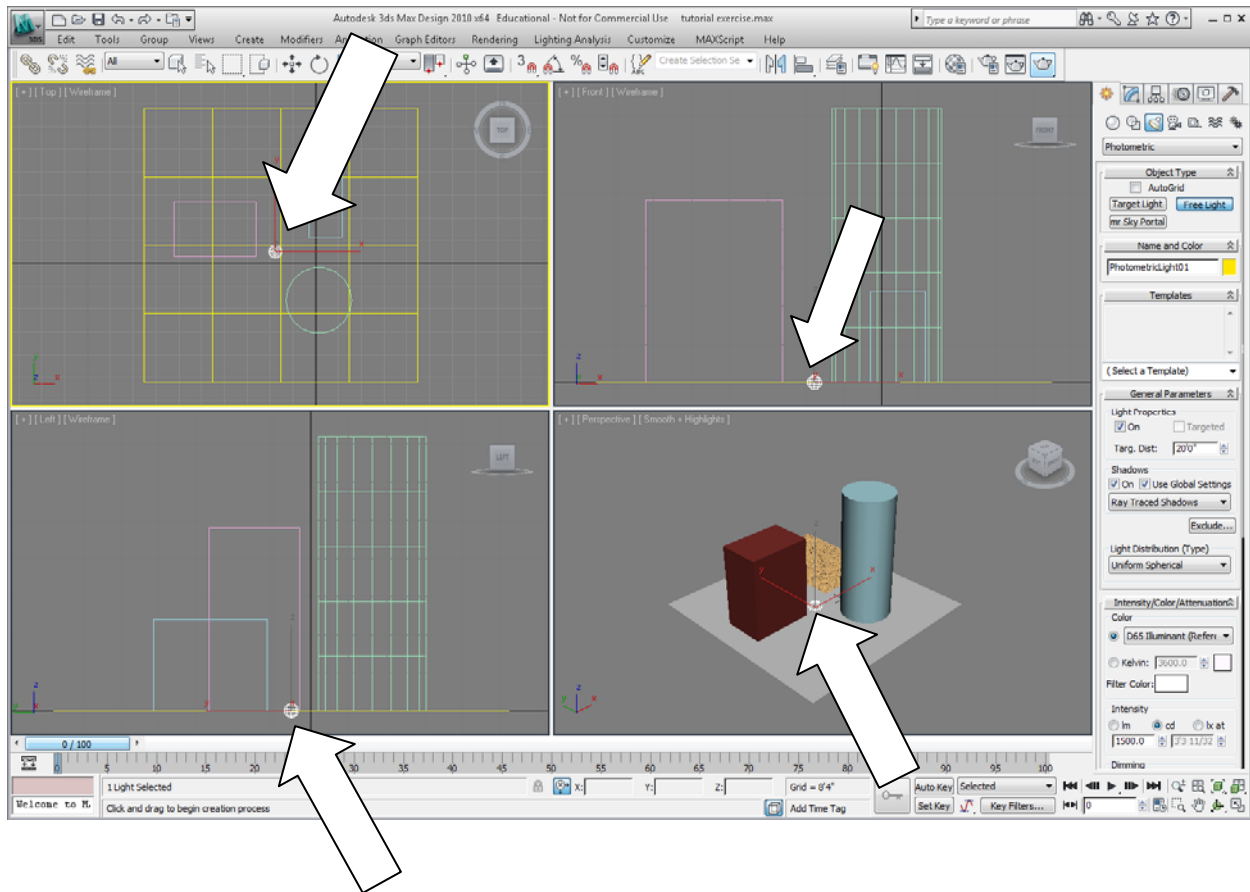


Select Free Light. When you select this for the first time, you will get a message pop-up like this:

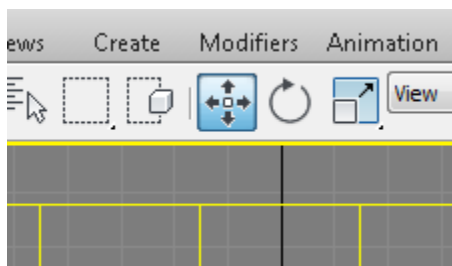


Answer by Yes.

Place the light in plan in the center of all the buildings:

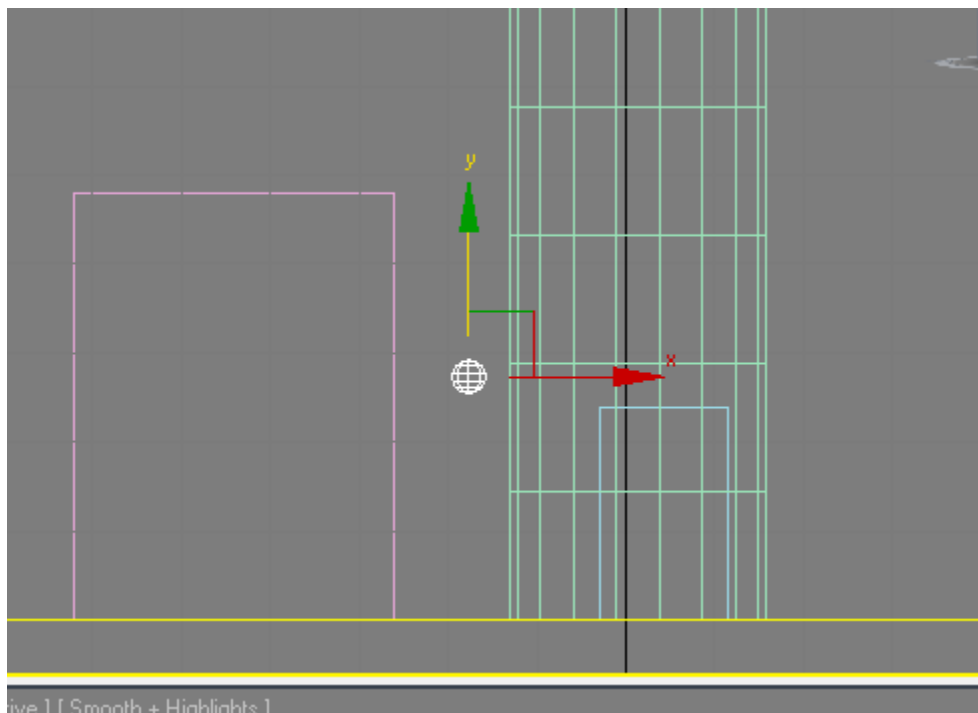
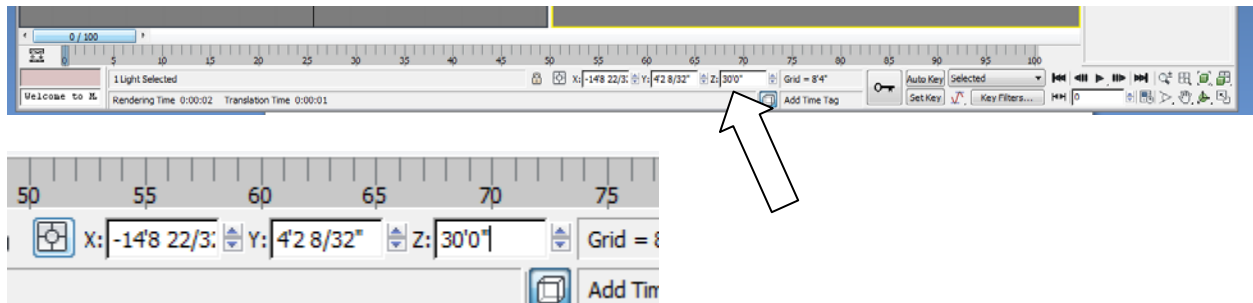


A white globe will appear in each viewport. This is the light symbol. It will be placed at the ground level, so you will need to move it up a bit. To move it, select the Move command on the Toolbar.

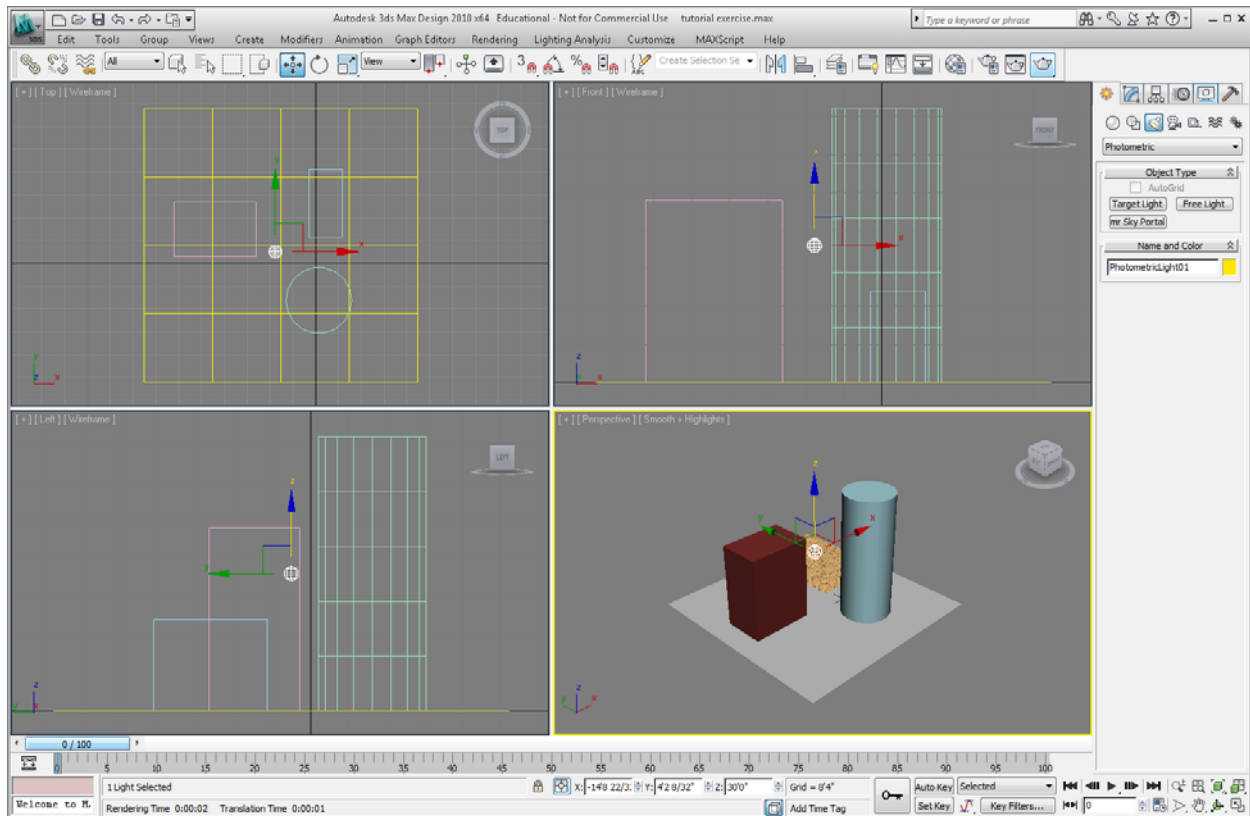




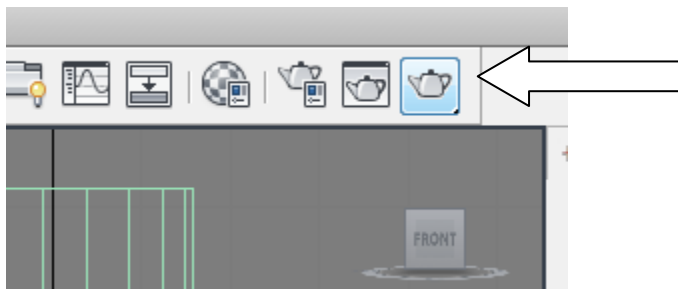
Click on the Z axis icon in the side views or perspective view and move it vertically, or change the Z absolute dimension in the Status Bar at the bottom of the screen to 30' by typing in 30 in the Z slot.



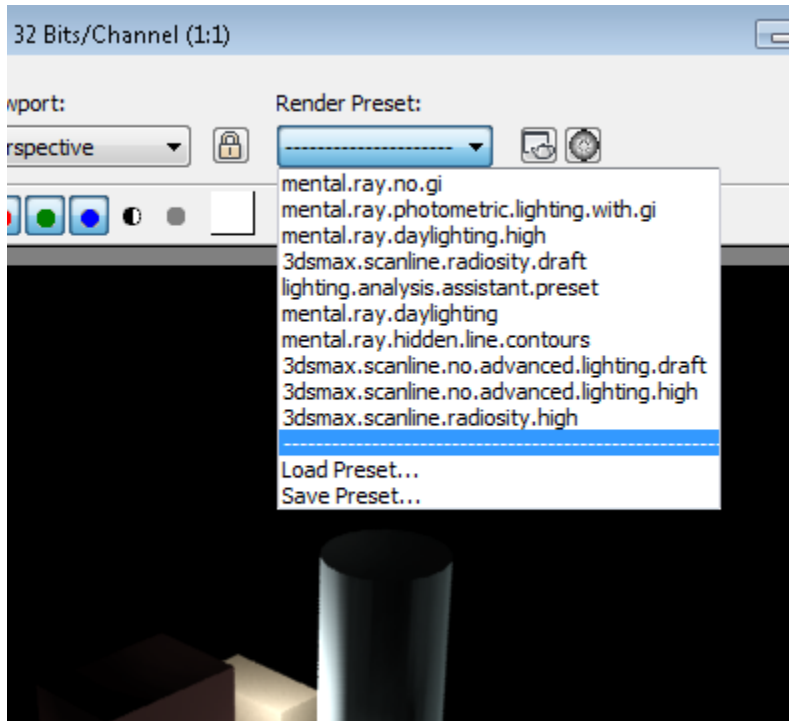
The light will now "float" above the ground plane.



14. Now let's Render this view. Left-click in the lower right viewport to make sure that it is the current viewport. Select the "Render Production" icon on the Toolbar. It looks like this:

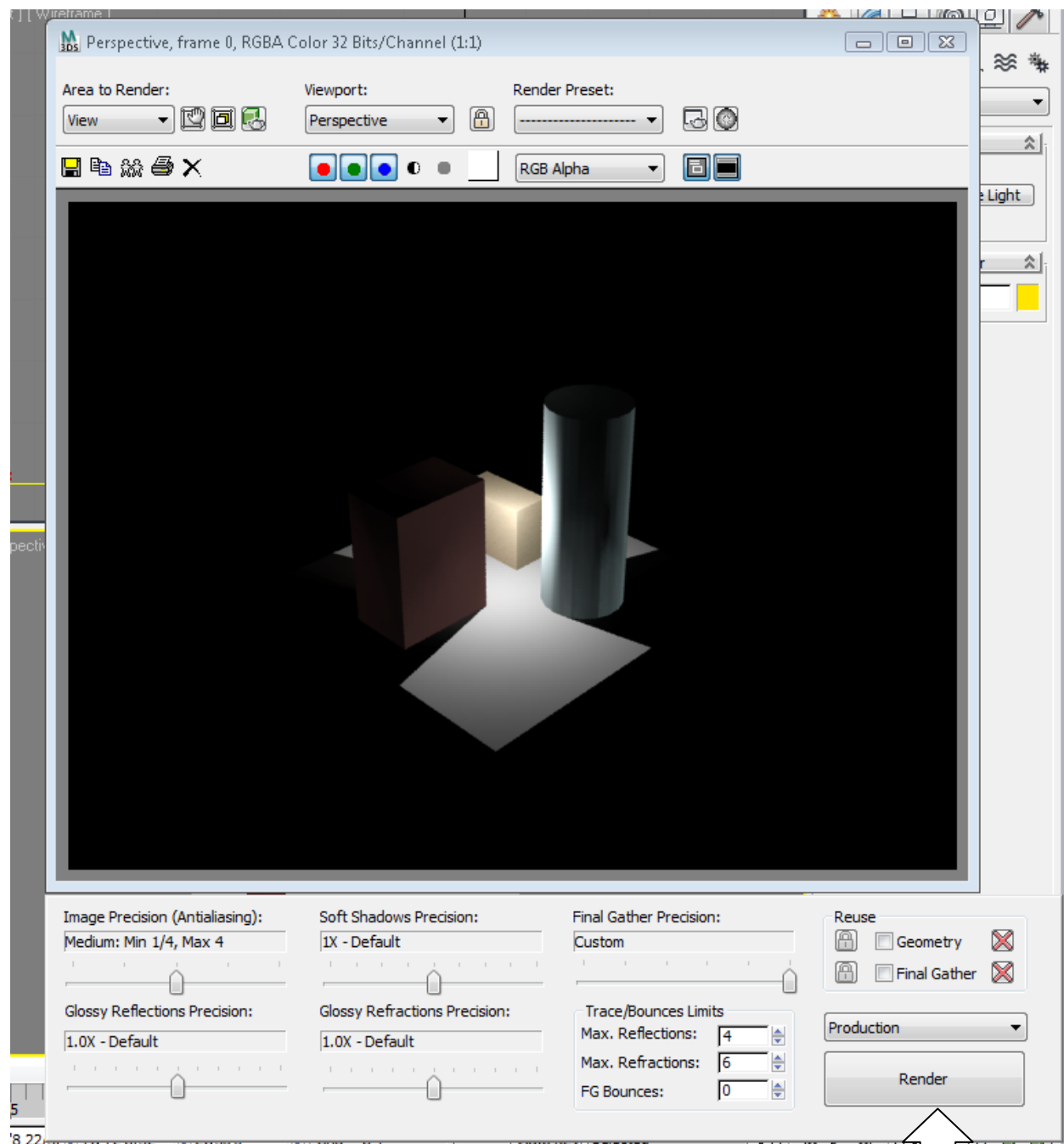


Pull down the Render Preset menu:



and select "mental.ray.no.g" preset.

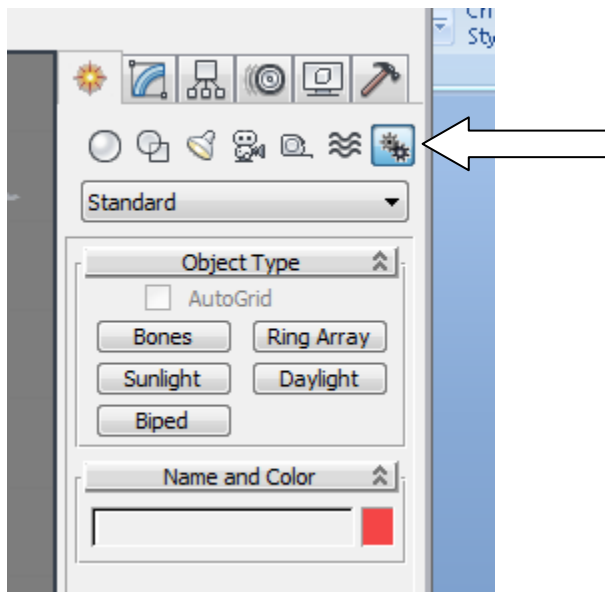
Then select the "Render" button at the bottom of the dialogue box. The results will look like this:



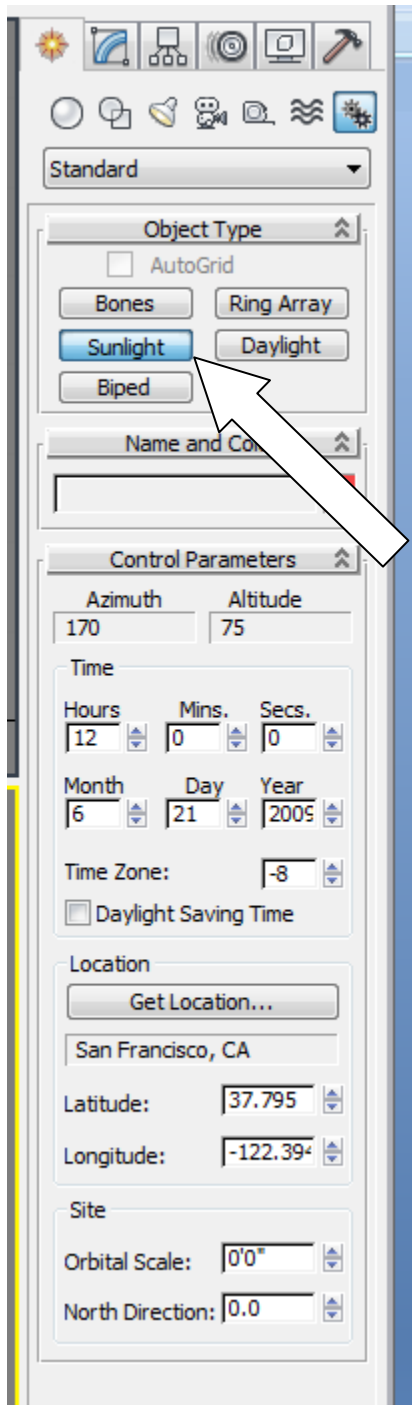
You do not need to set any other parameters. They are all set the way you want them to be.

Looks a little dark, but quite dramatic.

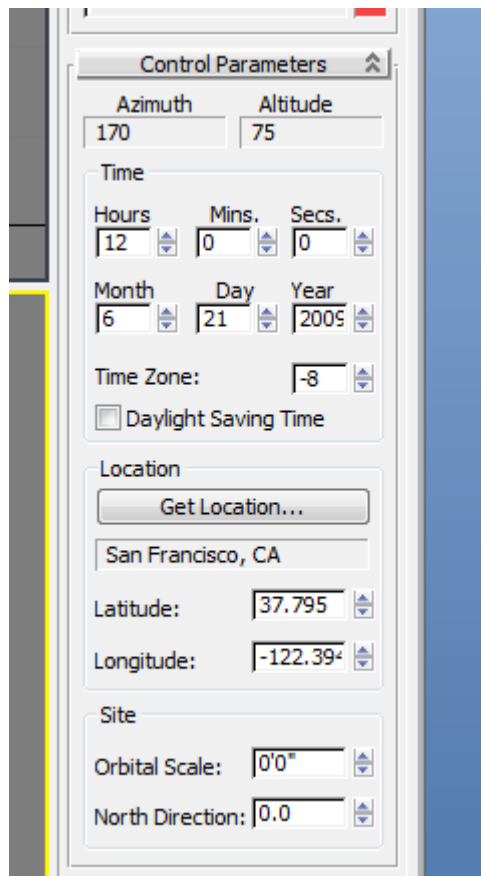
15. Now let's add some ambient sunlight. In the Create tab, select the "Systems" icon.



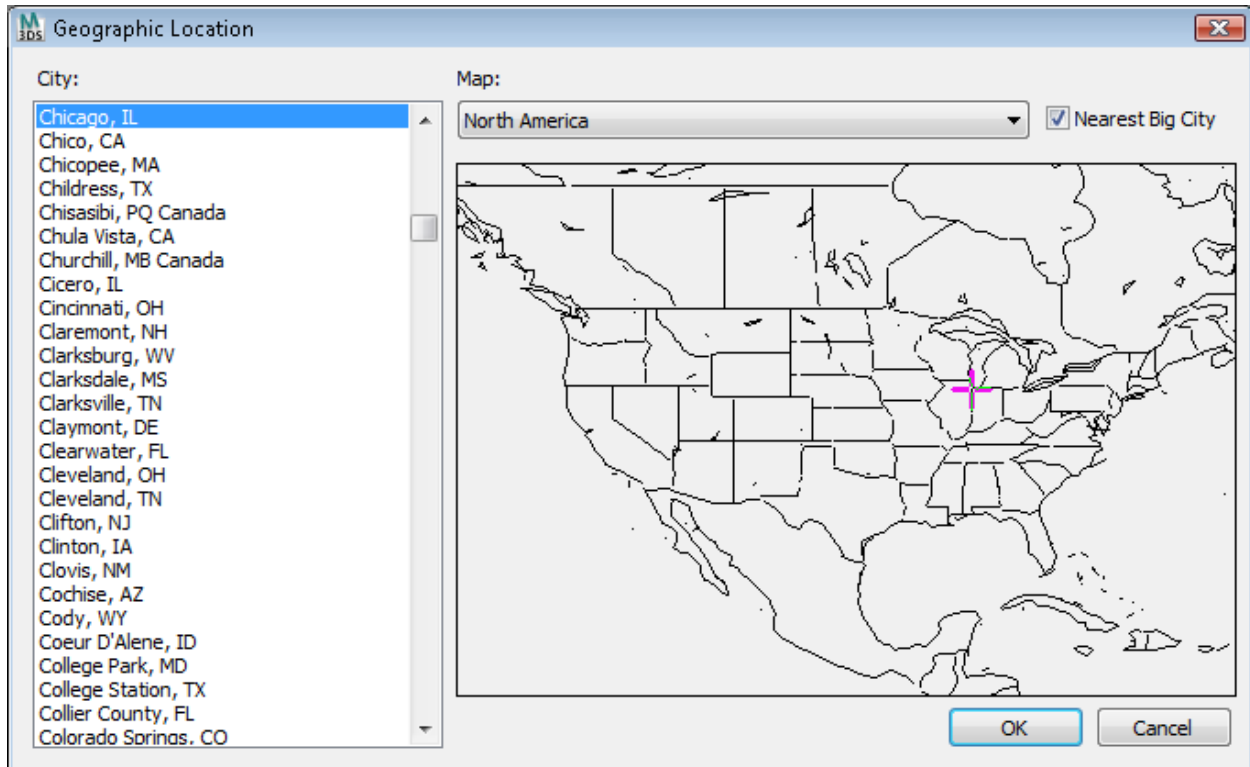
Select the "Sunlight" icon:



Set the time and location:

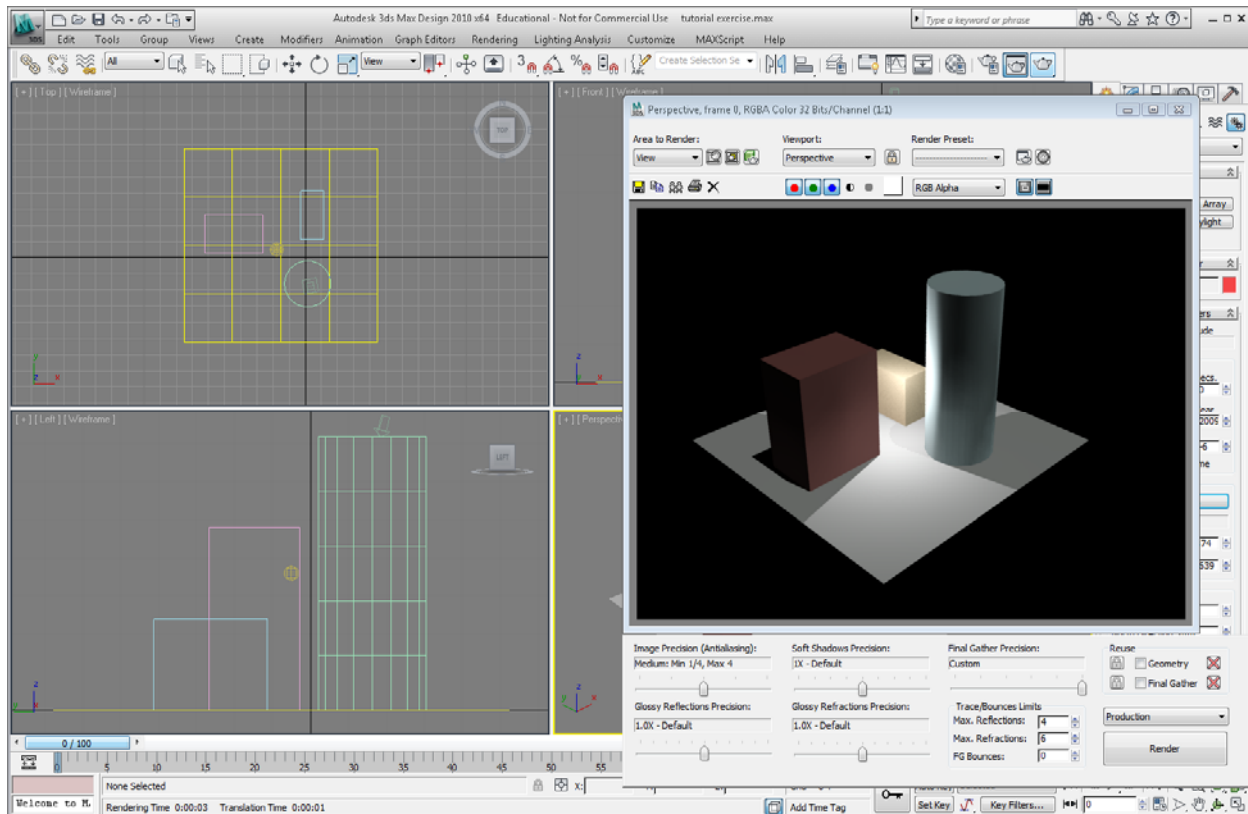


Pick "Get Location..." and select Chicago, Illinois:

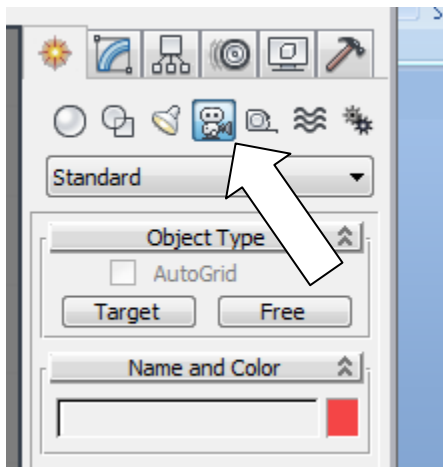




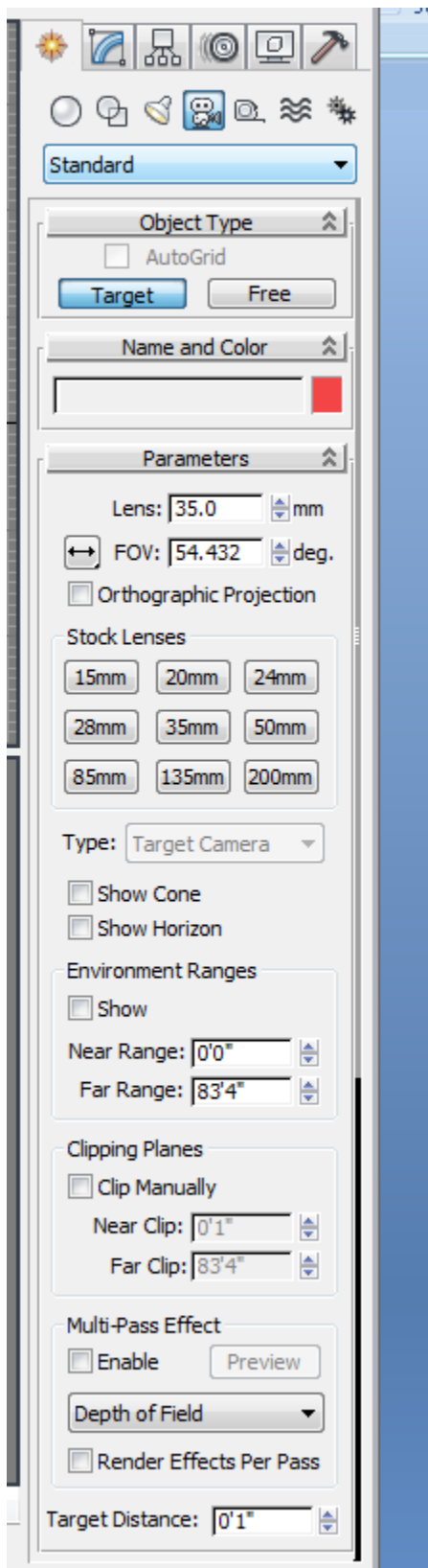
Select the Render icon again. Now the sunlight will fill in the dark areas:



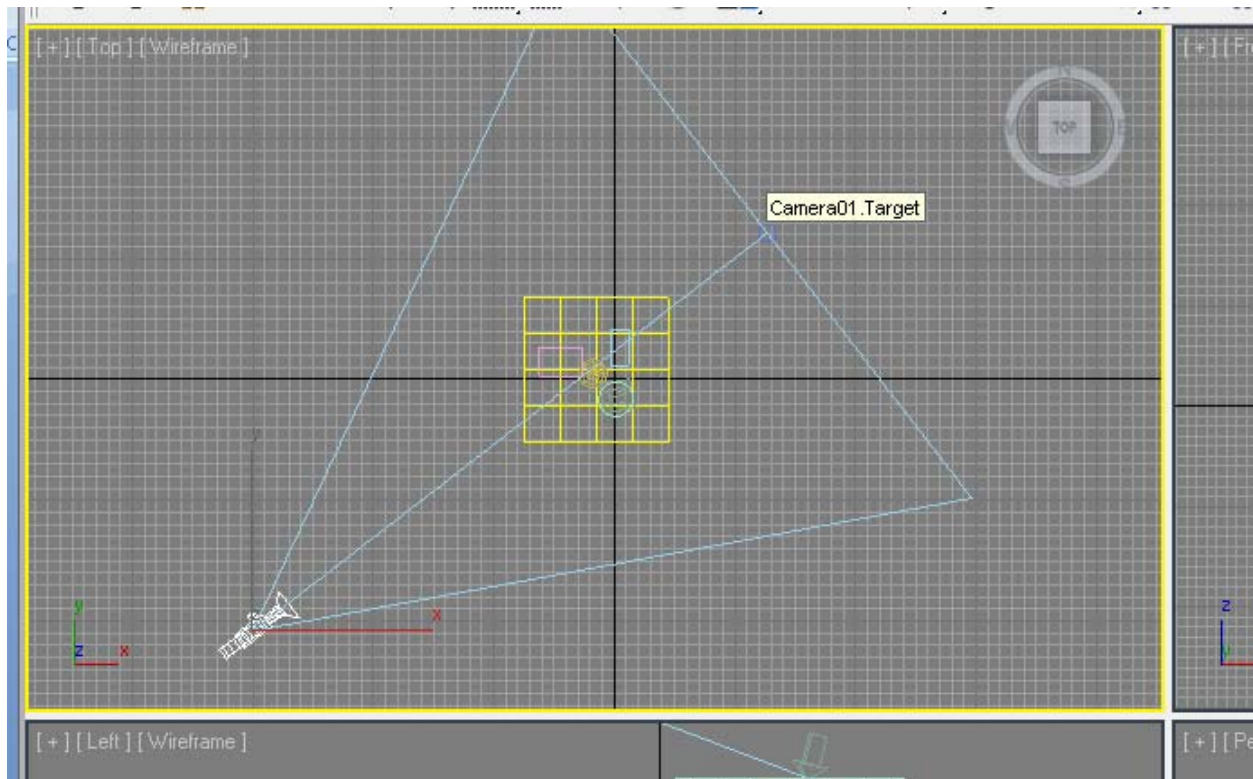
16. Let's locate some cameras. Click on the camera icon in the Control Panel:



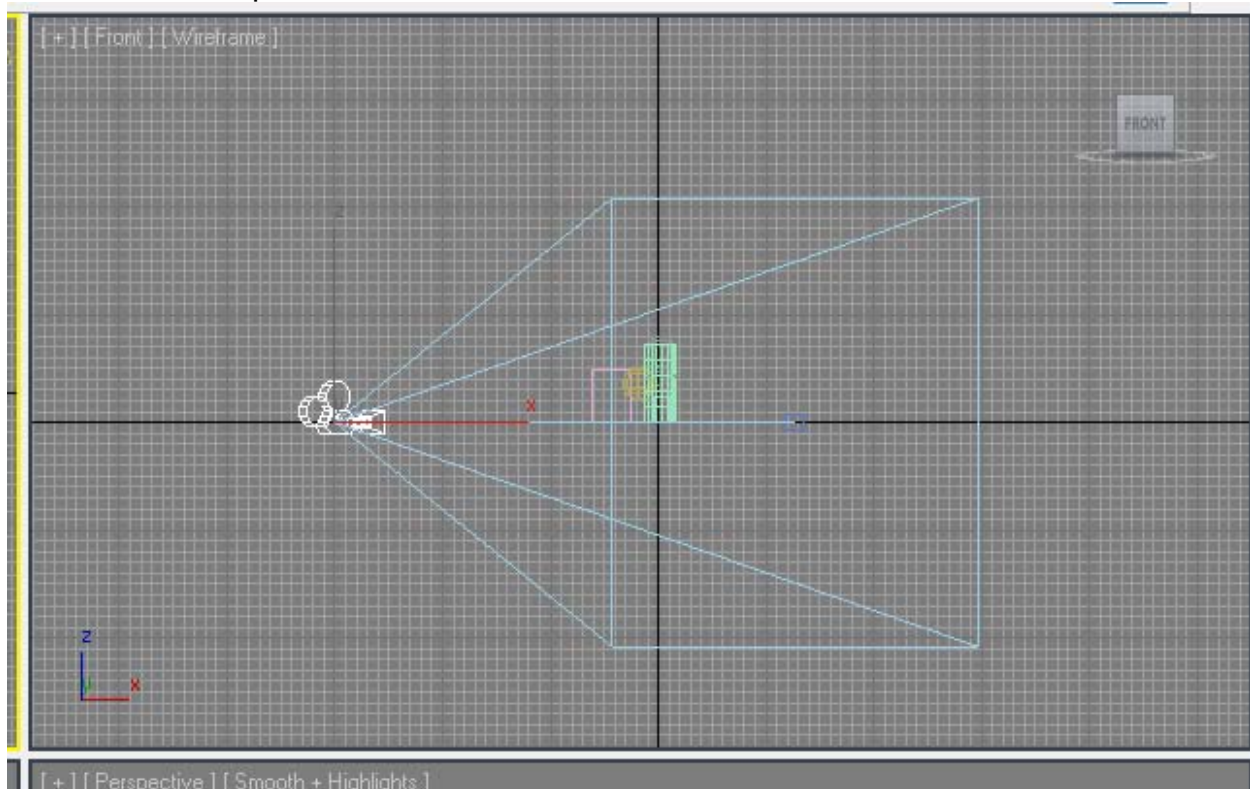
Click on Target button:



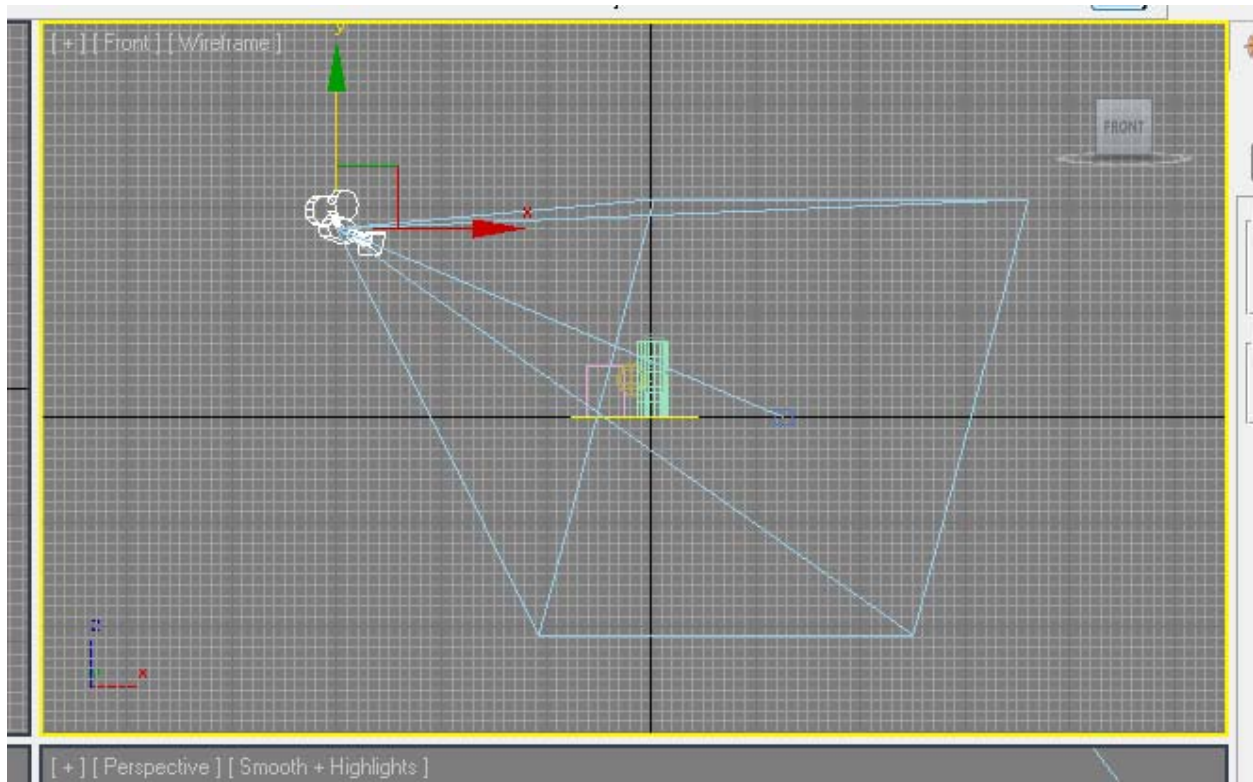
Zoom out in the plan and select a point near the lower-left corner of the plan, then drag the "Target" up and to the right. It will appear like this:



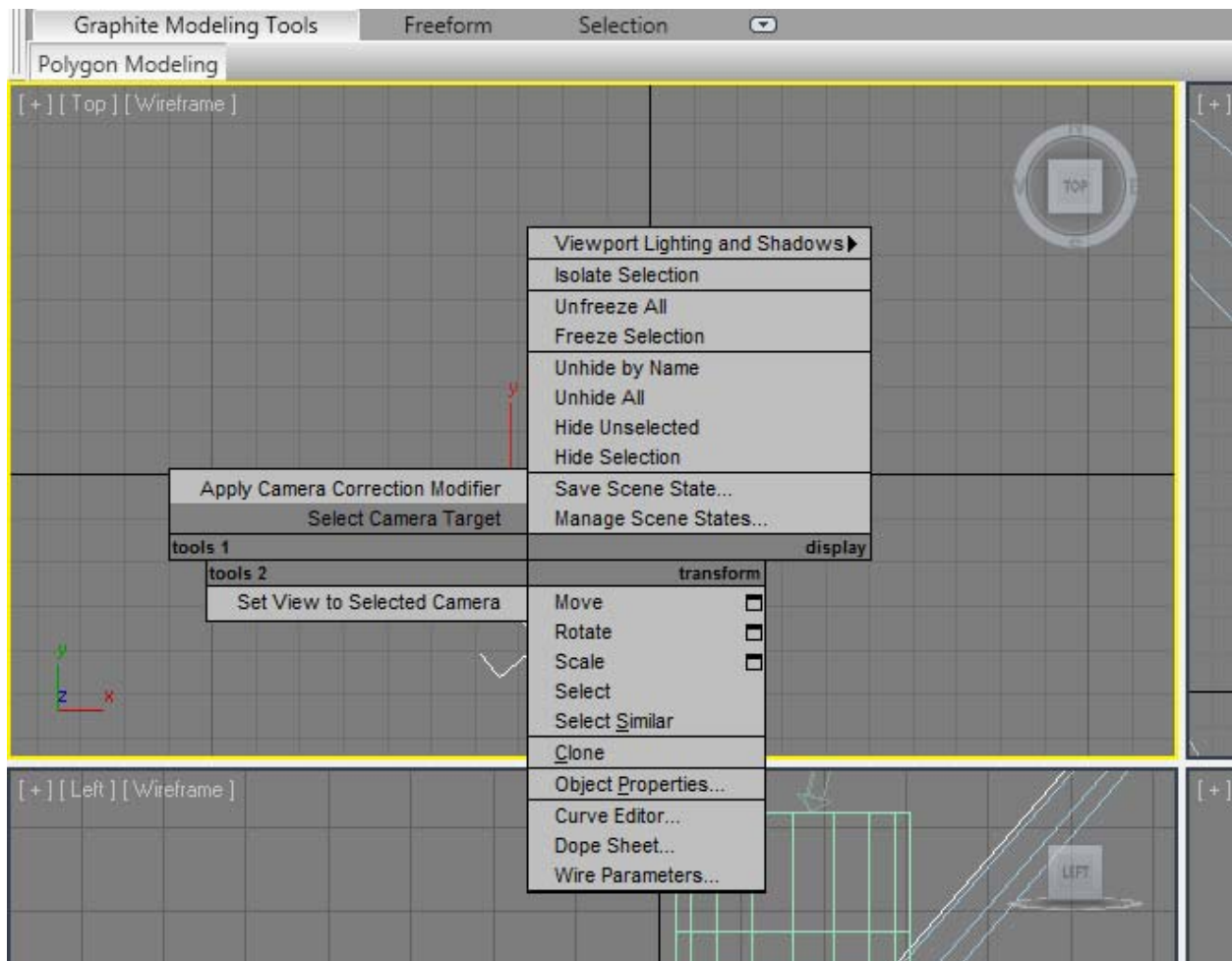
Note that in the side elevation, the camera will be located at the ground level. You will need to move it up.



Pick the "Move" icon in the Toolbar. Drag the Z arrow up using the Z-axis "gizmo".

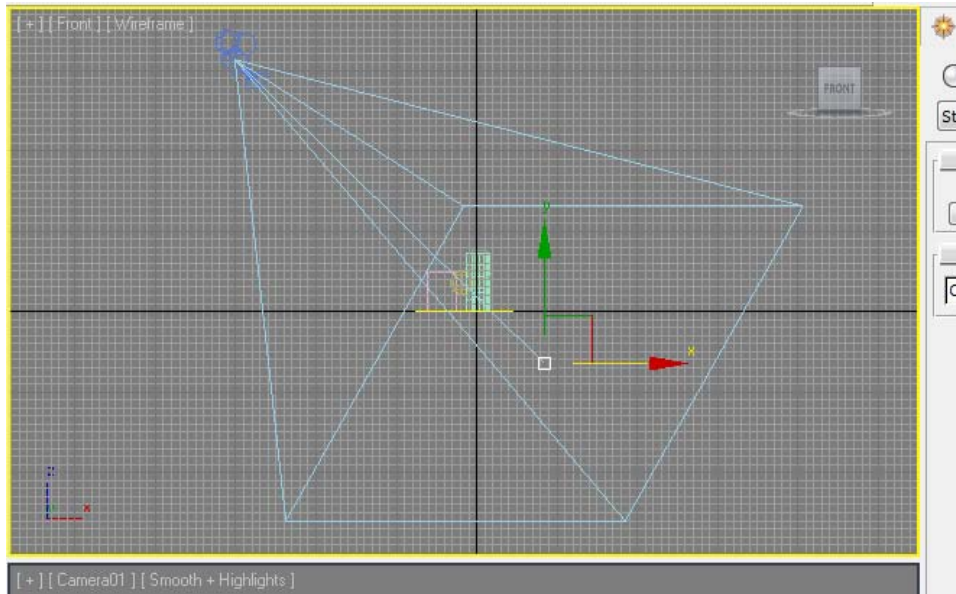


If you need to move the "Target" rather than the Camera, right-click on the camera and select "Select Camera Target."

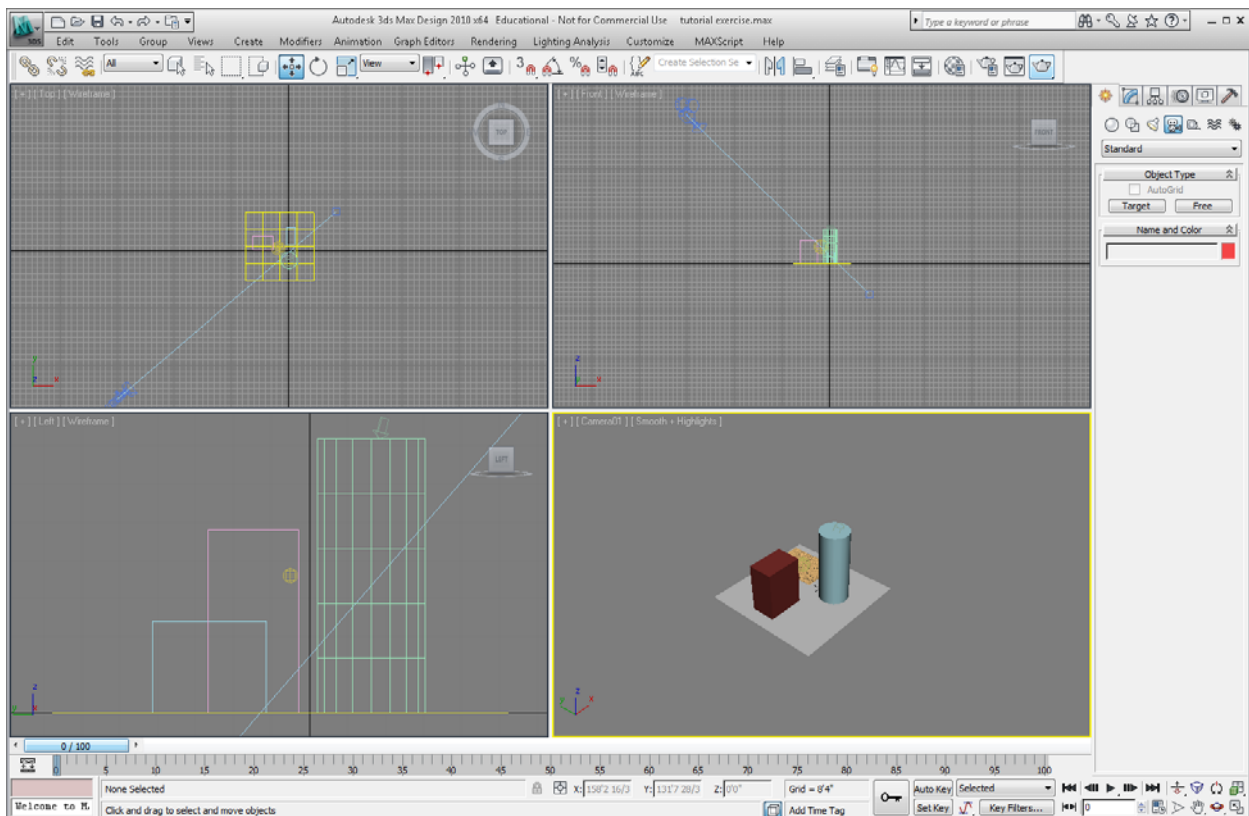


Now you will be able to move the Target either vertically and horizontally.

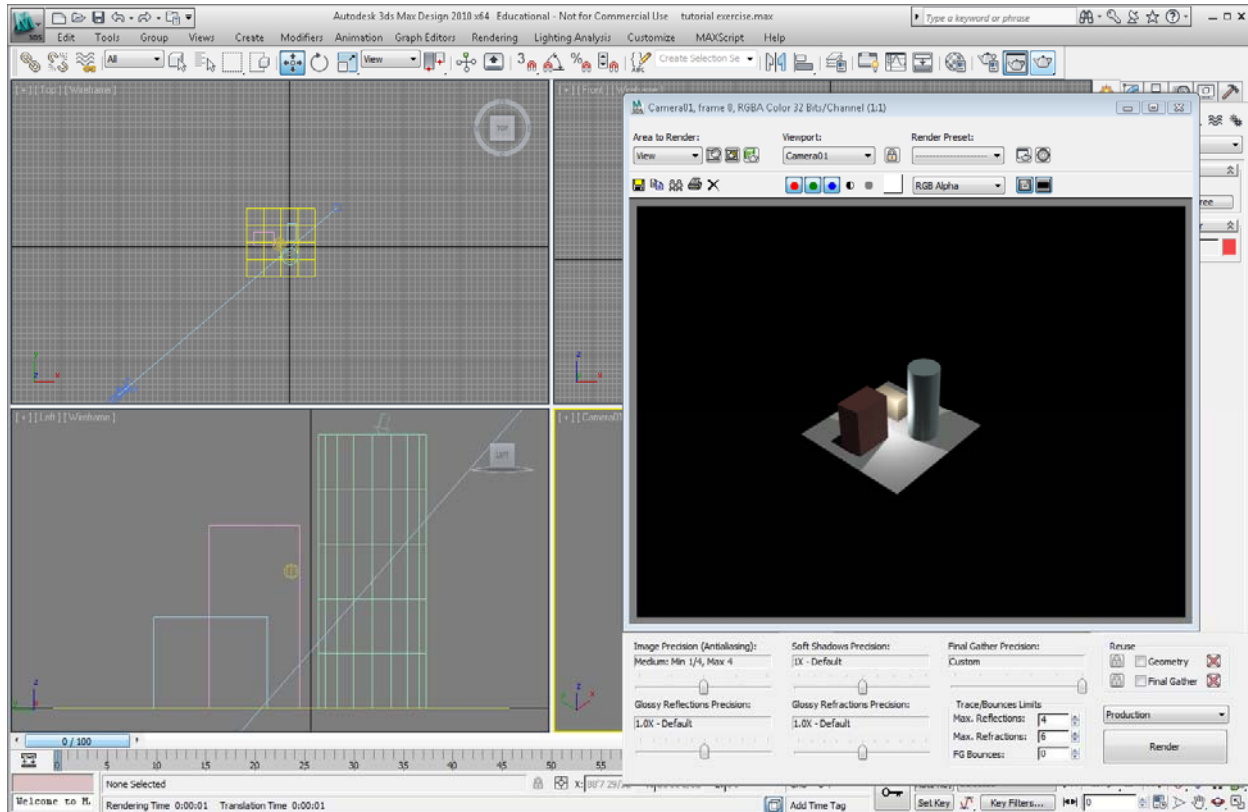




Left click the lower right viewport and type C. This will change the Perspective view to the "Camera" view.

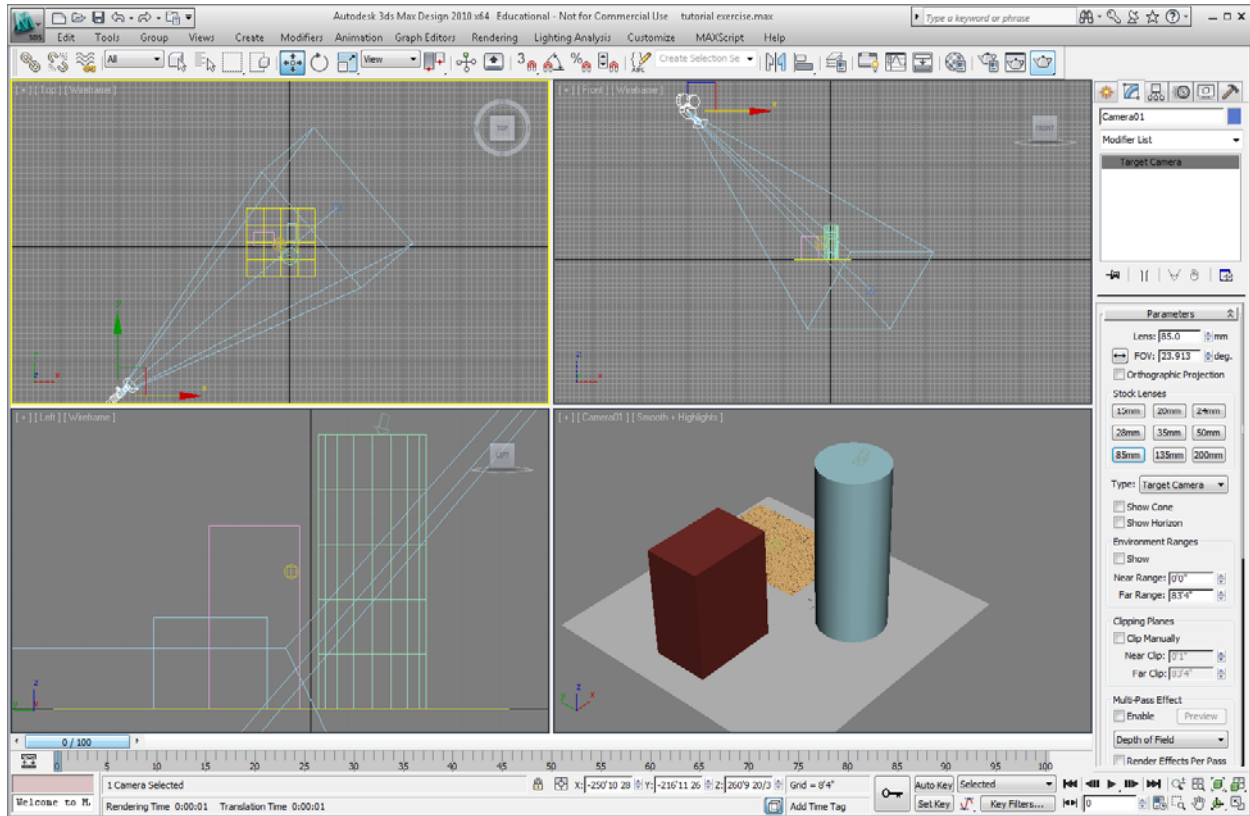


Render that view:

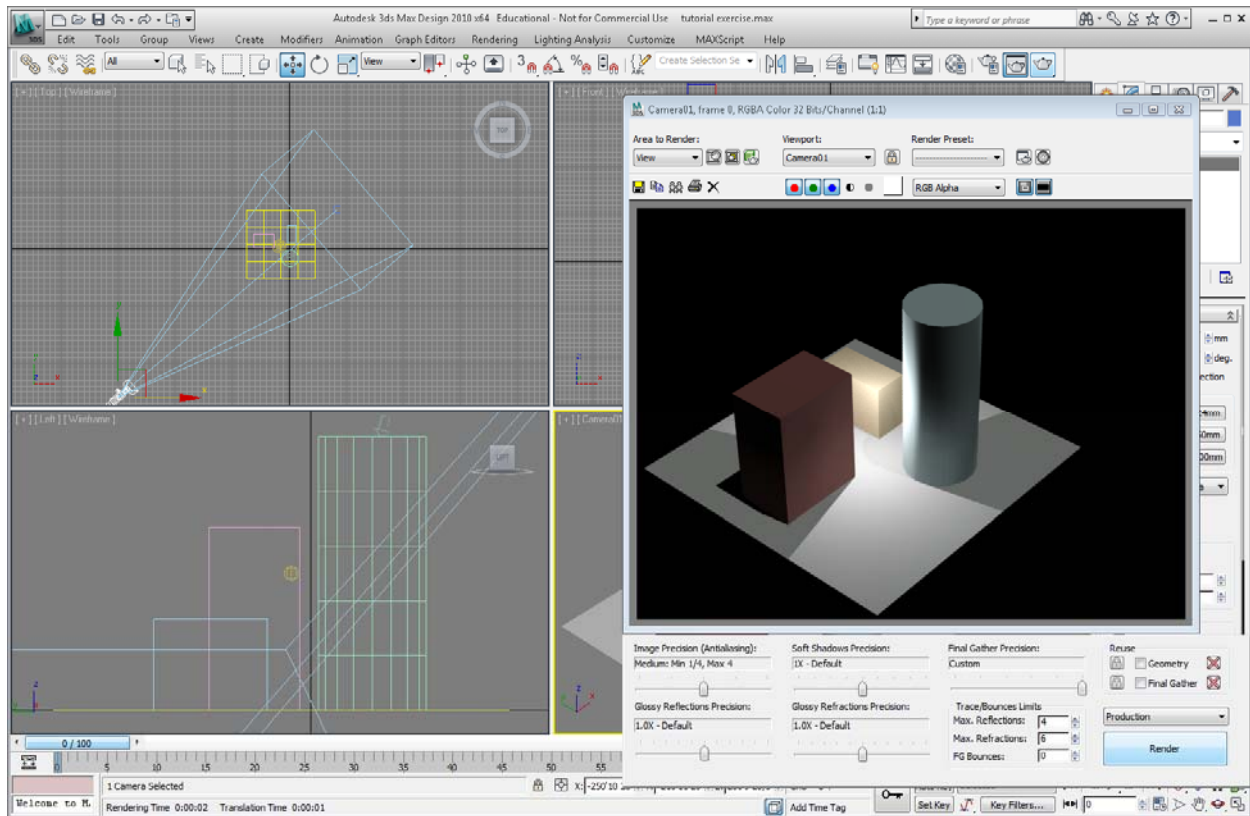


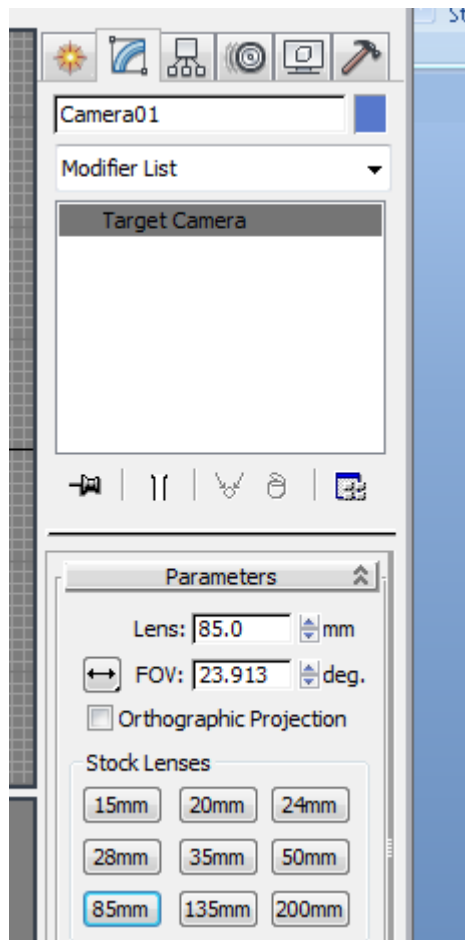
If you want to see the image closer, select the Camera, then pick the Modify tab in the Control panel and adjust the lens length, like this: The longer the lens (larger number) the closer you will seem to get to the object. For instance, this is an 85mm lens:



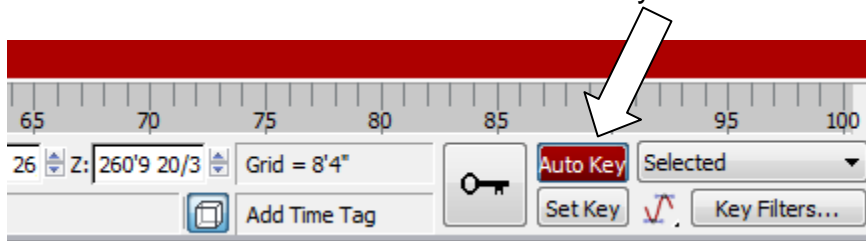


and rendered, it looks like this:

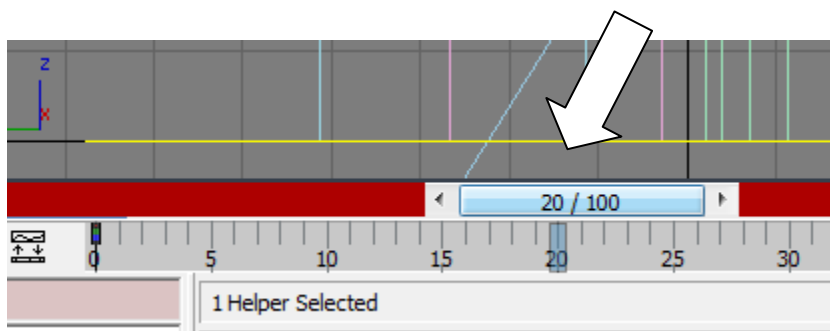




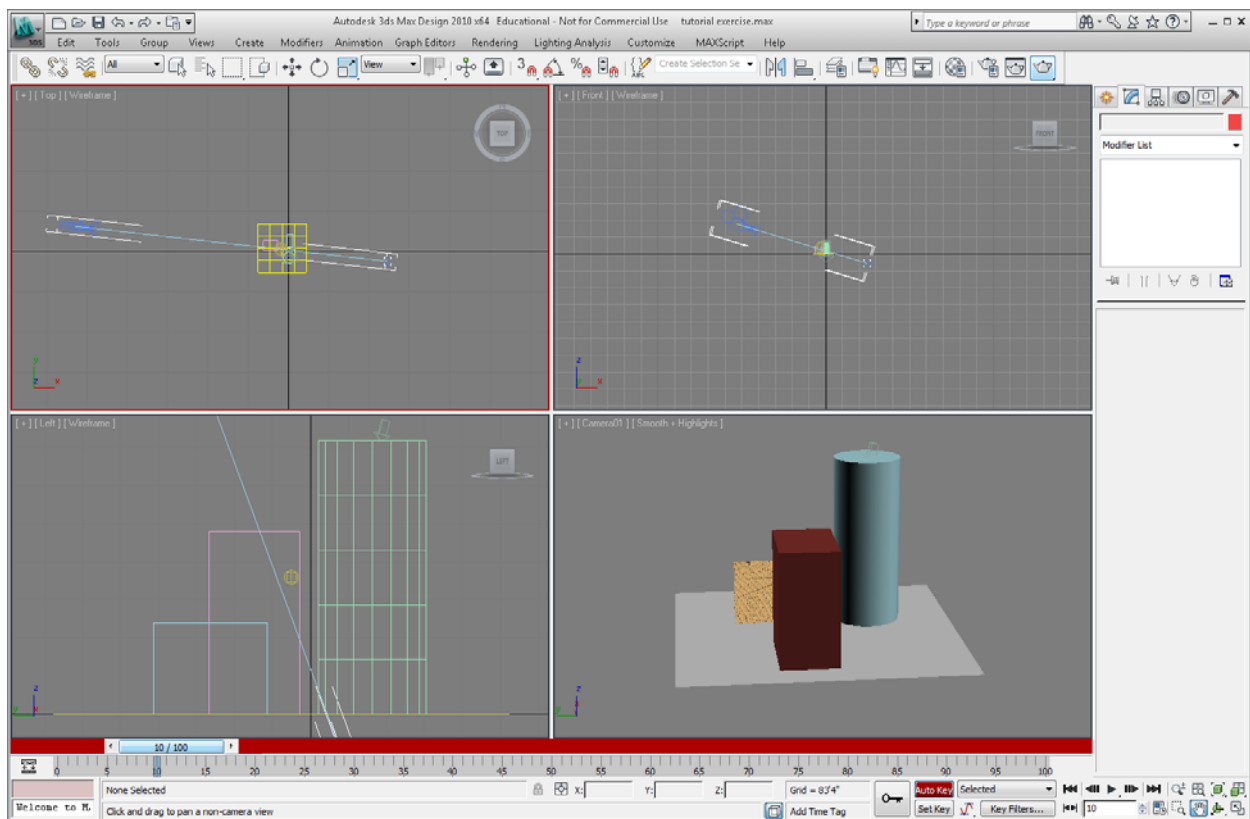
16. Now, to finish, let's do a fly-through with this camera. Select Auto Key on the Status bar. This will turn on the animation keys.



Move the slide bar to the right so it reads 20/100:

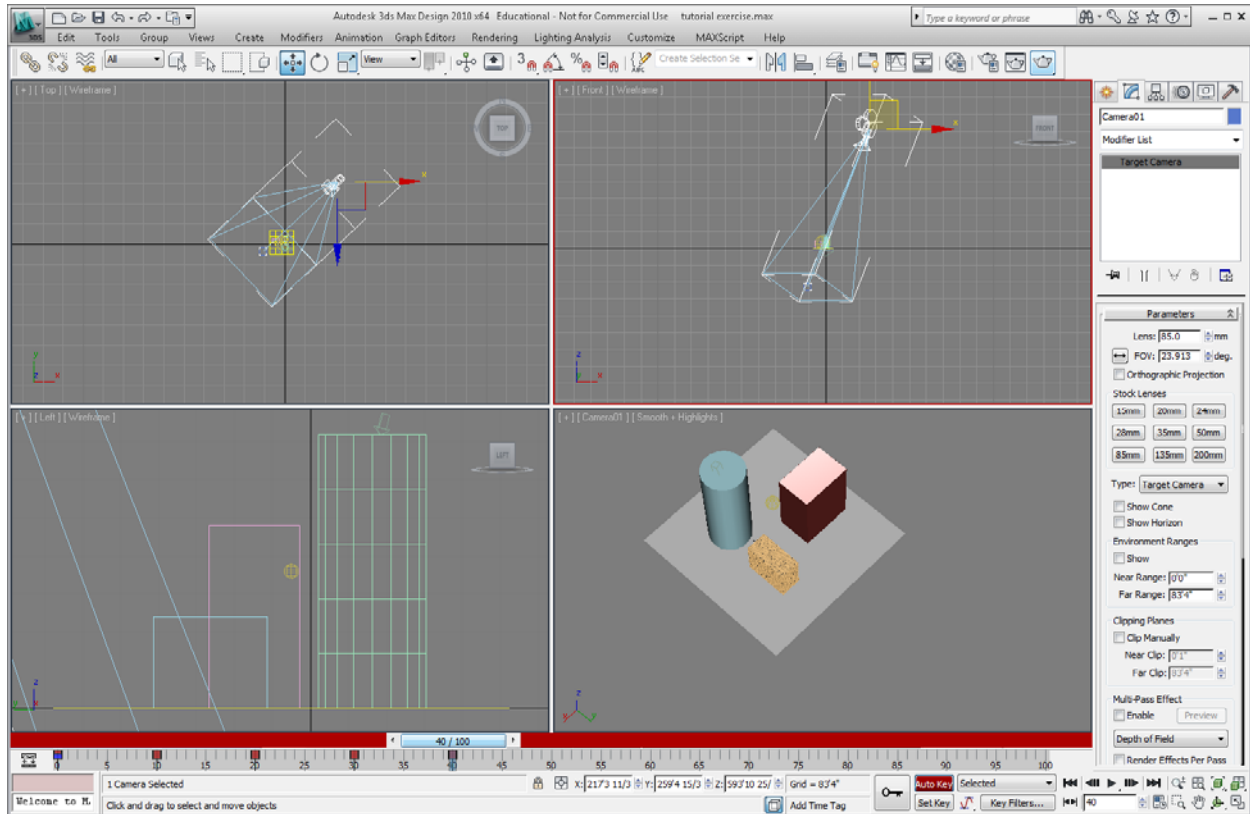


Now move the camera and target to a different position, using the Move command on the Toolbar:



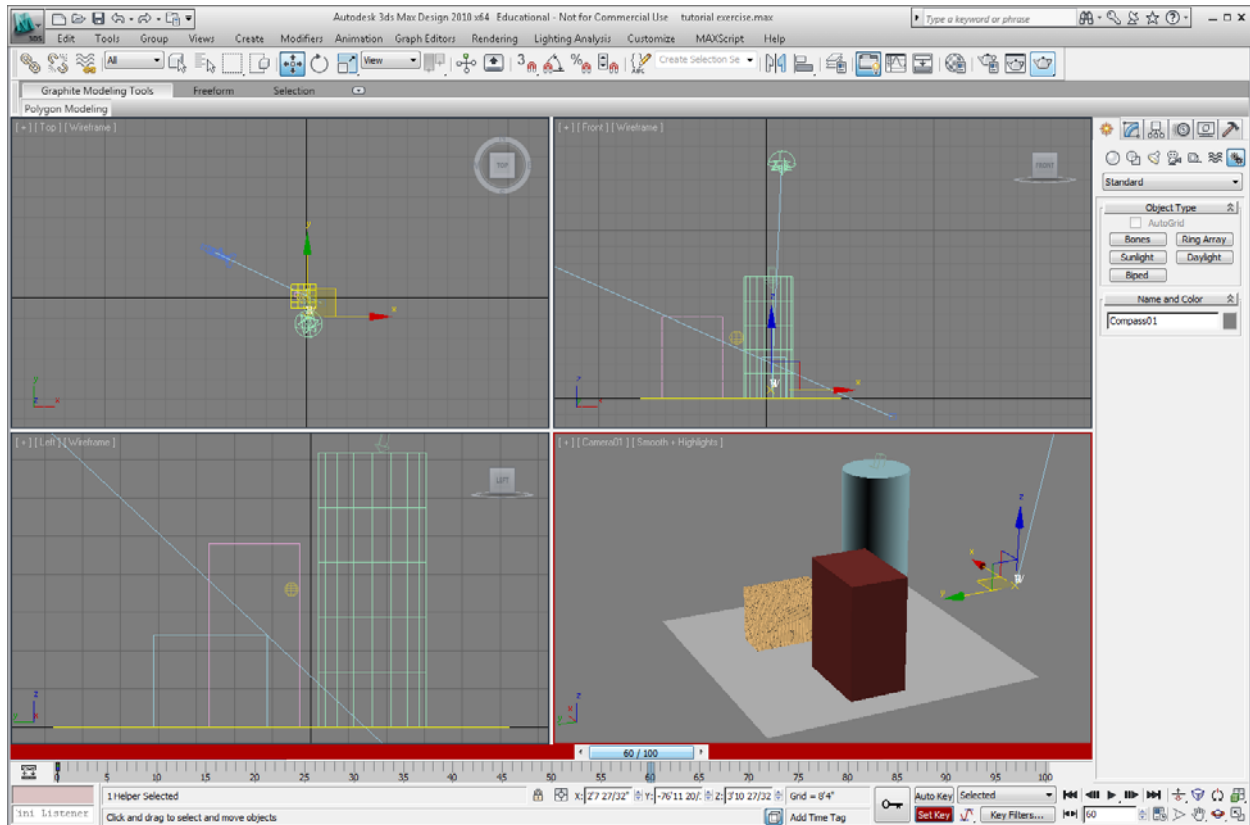
Move slide bar to 40/100

Move camera and target again:



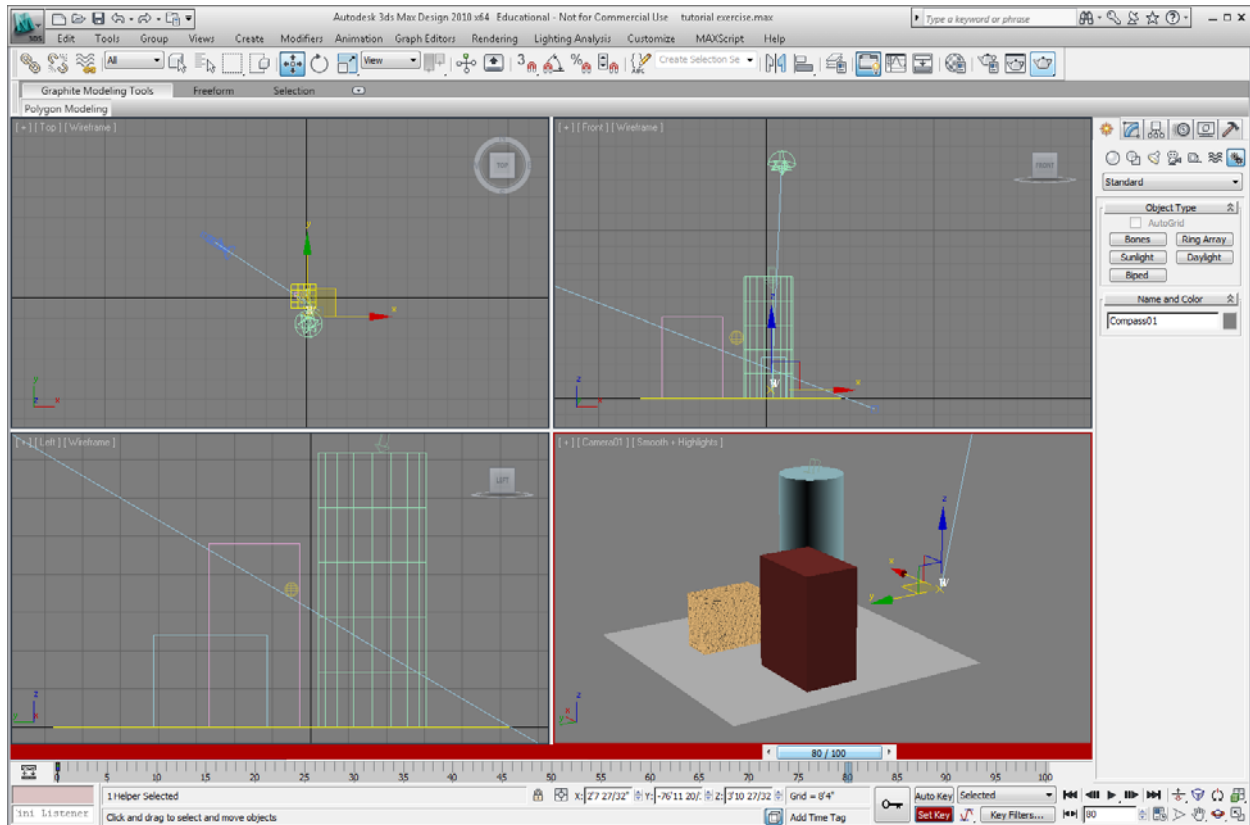
Move sliderbar to 60/100

Move camera and target again and change lens length:



Move the sidebar to 80/100

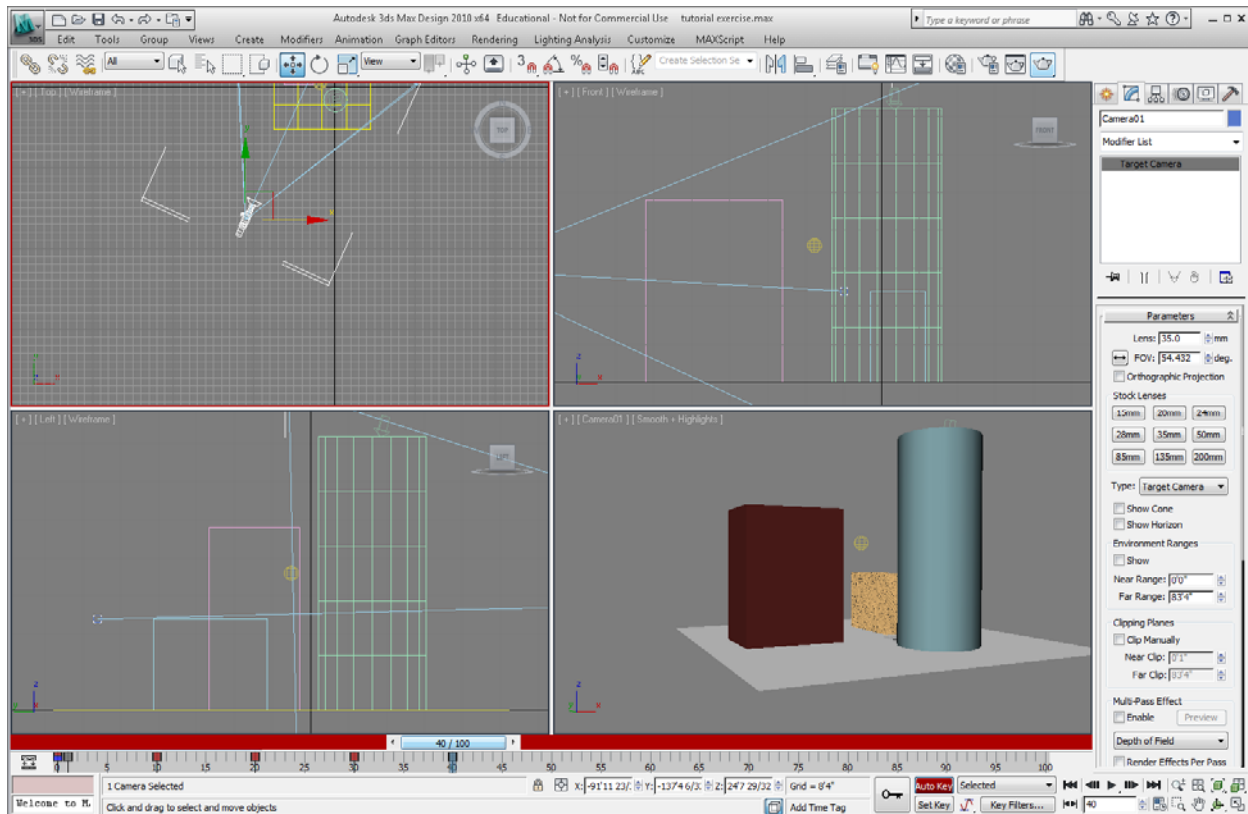
Move camera and target and lens length again:



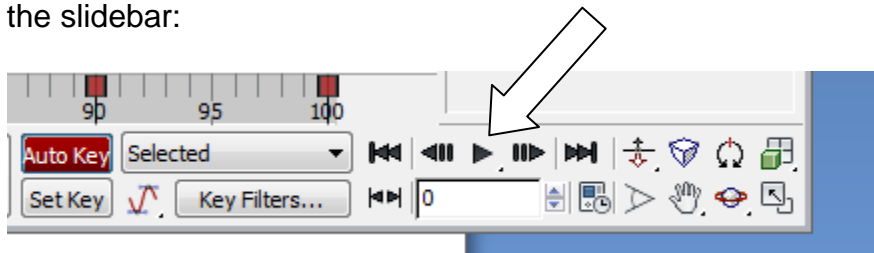
Move sliderbar to 100/100



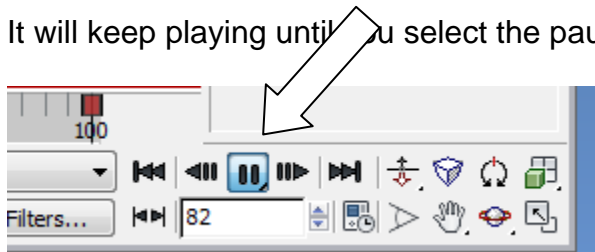
Move camera again:



Done - you now have 5 views that can be animated by selecting the Forward button on the sidebar:

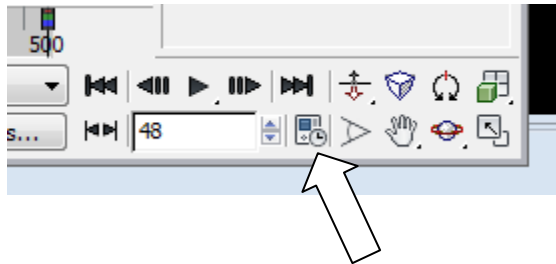


It will keep playing until you select the pause button:

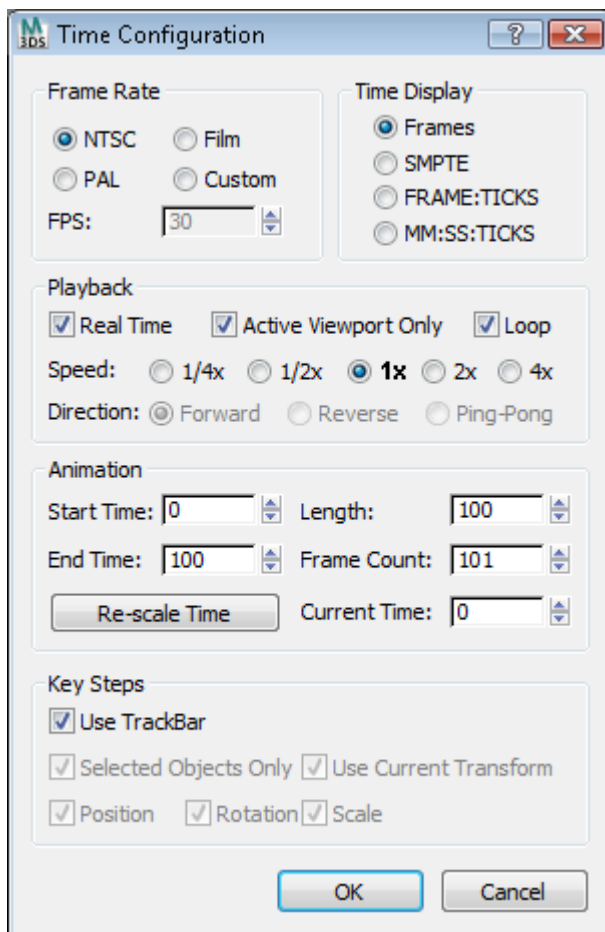


To make it your presentation even more interesting, you could move the buildings, and the camera at every sidebar key. You can adjust the timing between key frames by sliding the key frames right or left on the sidebar.

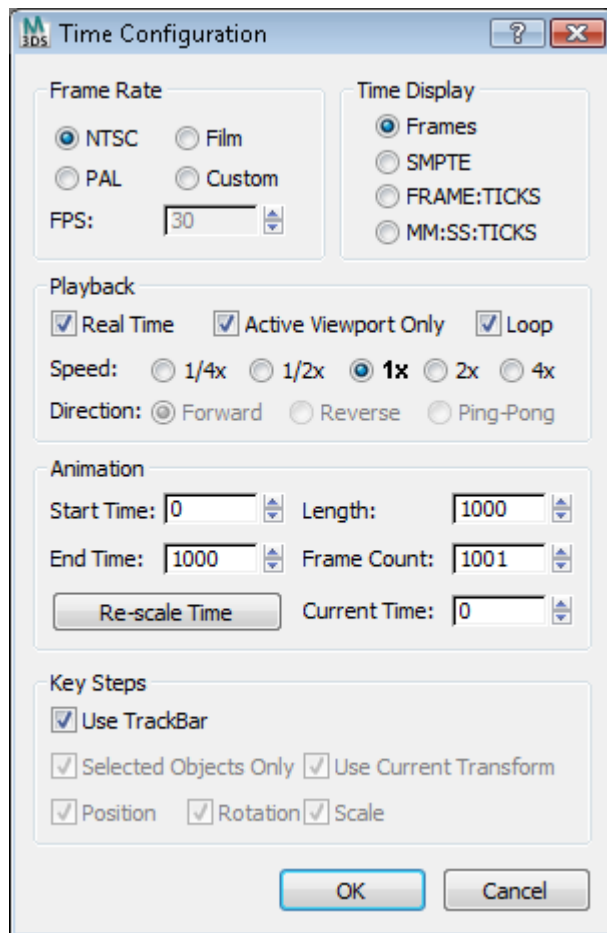
To slow the motion down, change the length of the bar from 100 to, say, 500. To do this, click on the "Time Configuration" icon in the lower right hand corner of the screen:



The dialogue box will appear like so:



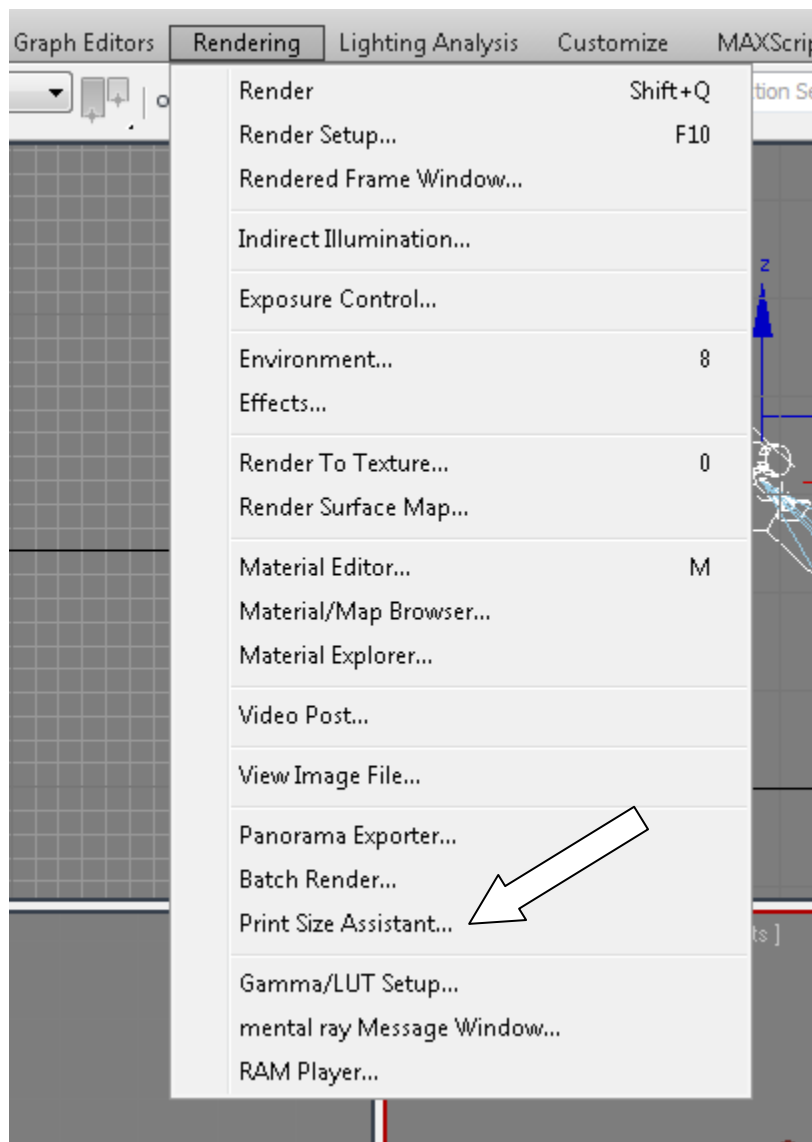
Change "Length" to 1000.



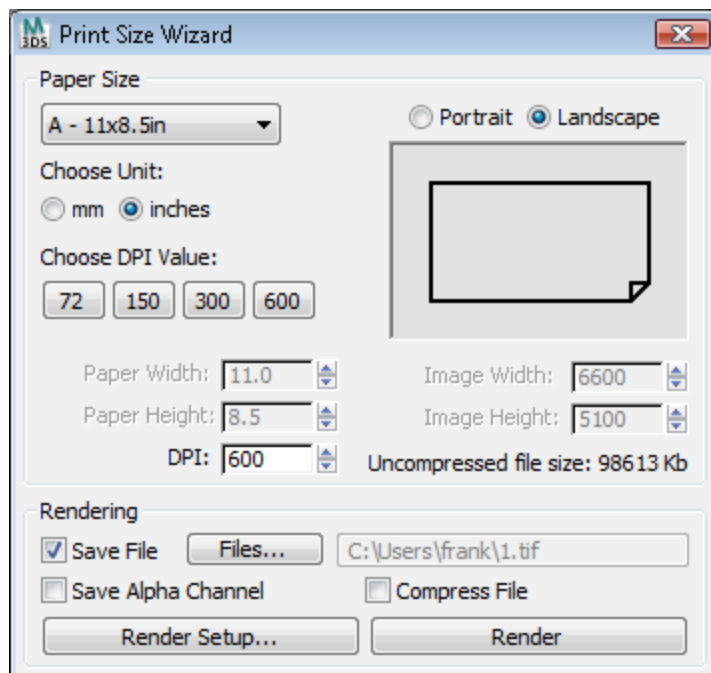
Now play the animation. You will see that it is 10 times slower.

Another way to slow the animation down (or speed it up) is to change the Playback "Speed" to 1/4x, 1/2x, etc.

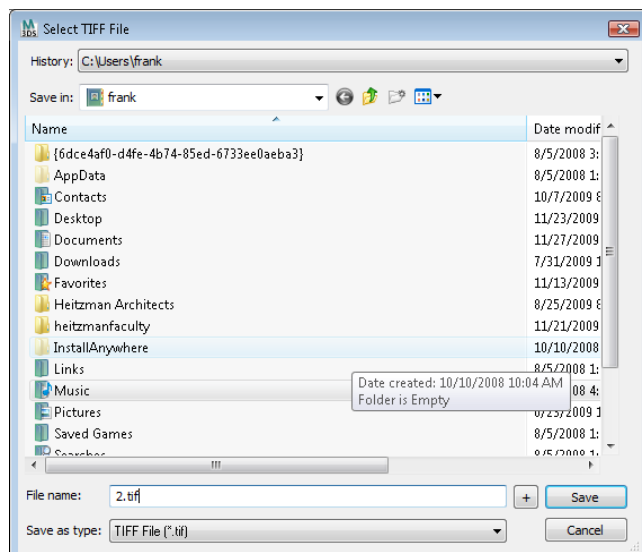
17. Rendered Output. You can output a rendering to a TIF file. Select from the pull-down menu, Rendering>Print Size Assistant



The Print Size Wizard dialogue box then appears:



Select the resolution you want. The higher the resolution, the longer it will take to render and the larger the file size. Select A sized paper, landscape orientation, 72 DPI ("Dots Per Inch"). Then select the "Files" button. This will prompt you for a filename and folder location:



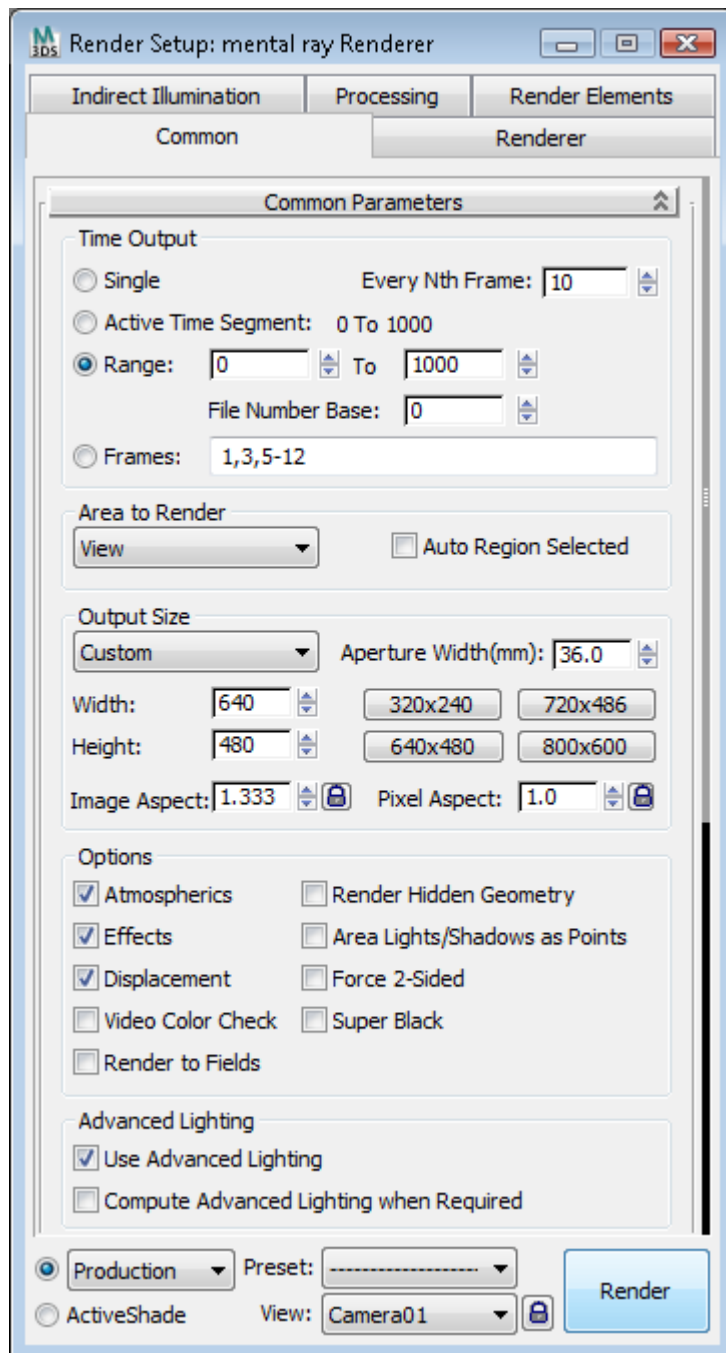
Then select Save. Click the Render button and the rendering will begin creating and saving to the name you gave it. For such a large rendering it will take some time.

18. Now save the animation so it can be played in Windows Media Player by someone who does not have the 3ds Max Design program.

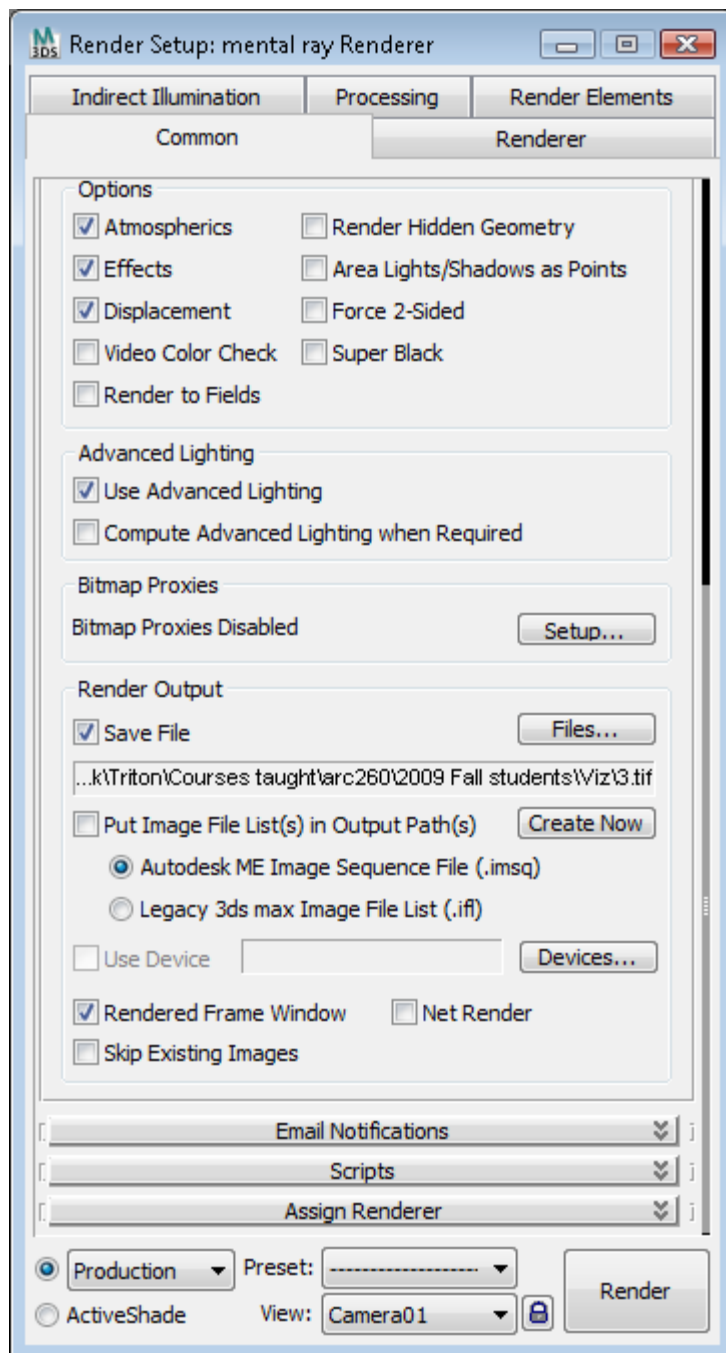
Select the Render Setup icon on the Toolbar:



In the Common tab, select the radio button "Active Time Segment" then change "Every Nth Frame" to 10. This will give you 100 rendered "frames" in the animation file, since you changed the Length of the animation to 1000. You could specify every 1 frame, but the resulting animation file would be very large.

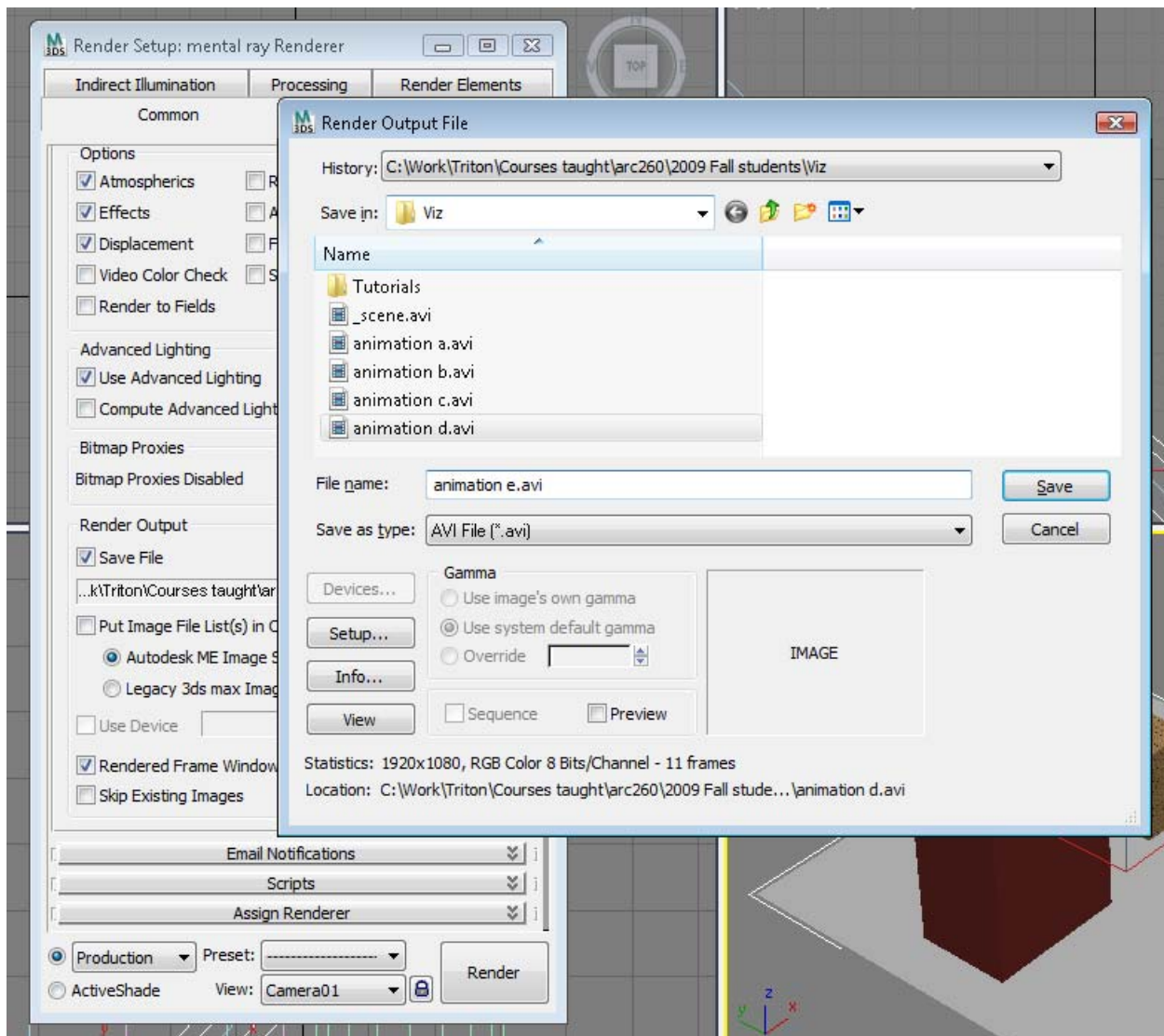


Slide down this same dialogue box and check "Save File."

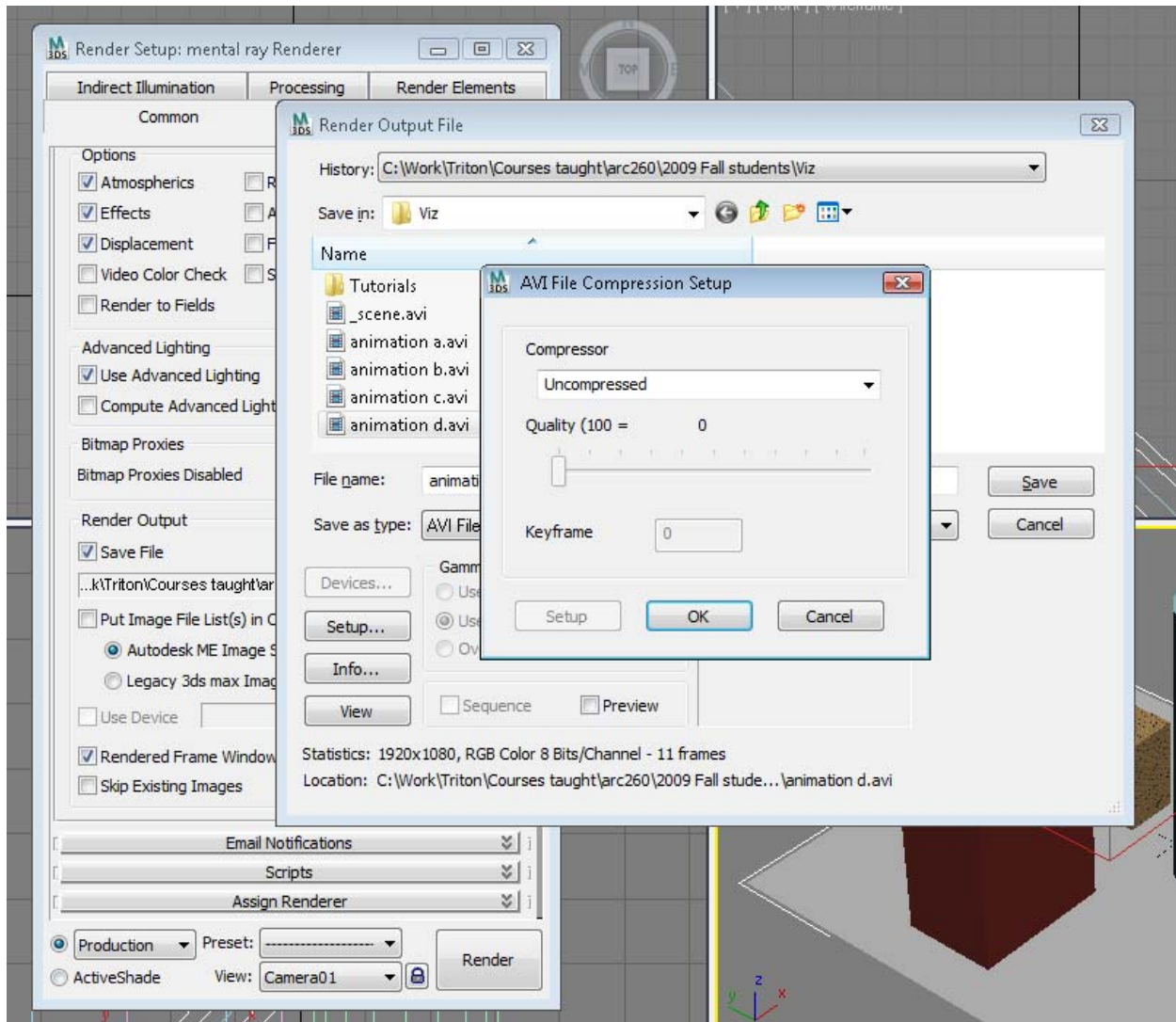




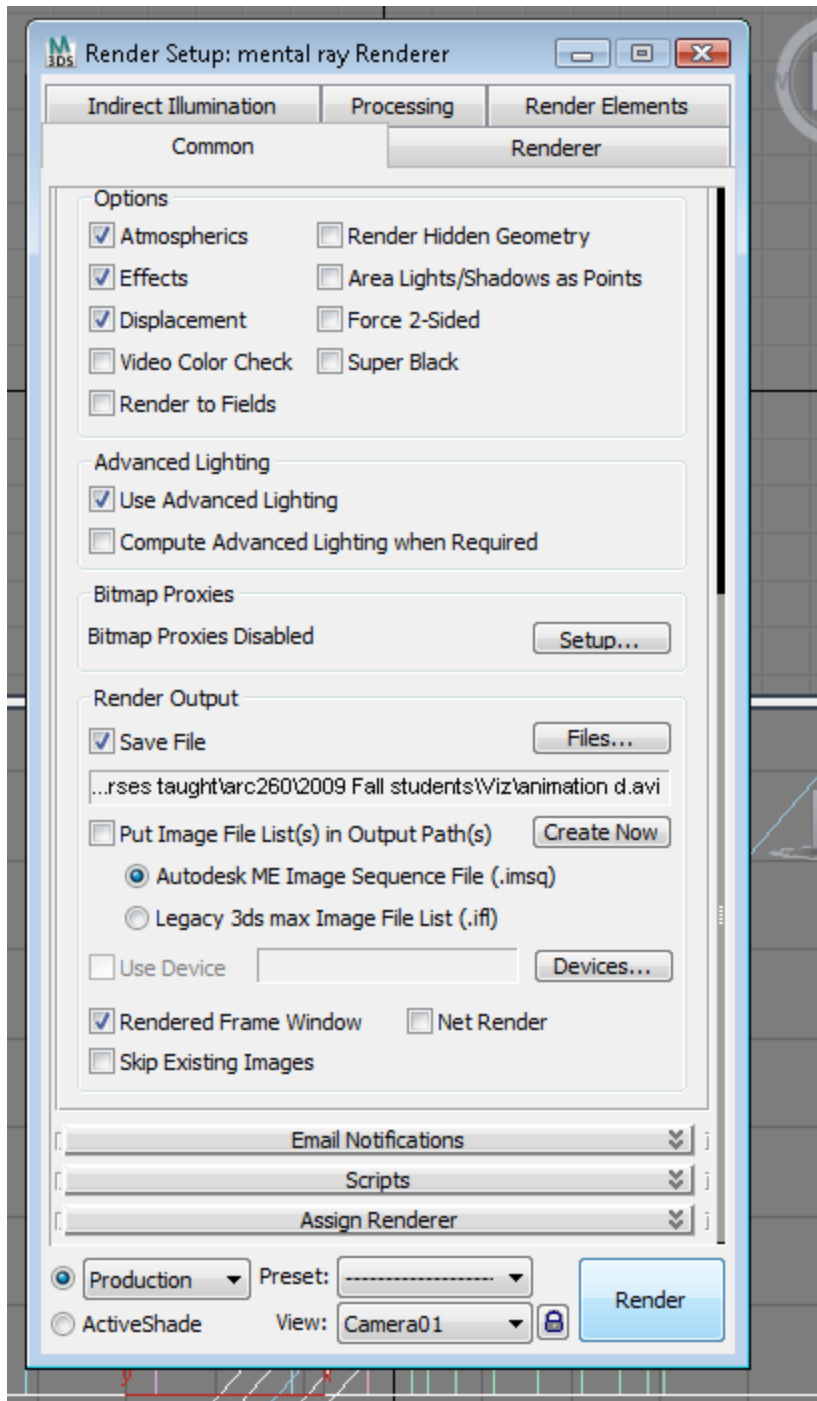
Select the "Files" button, browse to the folder you want to save the file in, select the file type .AVI, and type in the name of the file you want to save. The AVI file type is an animation file that can be played in Windows Media Player.



Click the Save button, then OK:



Then pick the Render button:



Try playing the animation file from your folder by double-clicking on it.

To complete the exercise, save the .MAX file one last time and upload both it, the single frame rendering .TIF file and your .AVI animation file to me in Blackboard.