Simple Methods for Point/Poly Count Reduction & Co-planar Polygons

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This tutorial attempts to cover:

• A simple method to reduce polygon counts in models.

• Simple tool to fix overlapping points, which are usually hard to find.

• Explaining co-planar polygons and why they are bad.
Poly Counts
A simple method for eliminating needless polygons is to consider what really needs to be visible. For instance, the bottom of the smaller box will never be seen, so it can be safely eliminated from the object without compromising anything.

Also consider: will the bottom of the larger box ever be visible, or will it be always be on the floor or ground in your scene?
Other considerations for visible polys:

• Is the object attached to a surface? If so, the polys facing that surface aren’t necessary.

• Will you only be rendering your scene from one camera angle? If you never see the back of a desk, for example, why take the time to model drawers?
Unmerged Points
Say I’m working on a snowman for a scene.
I want to connect my two large snowballs using a Boolean Union.
Voila! One problem, though. Even when points that are generated by Boolean operations are overlapping, Lightwave doesn’t weld them.

Not only does this add extraneous points, but it can create problems during rendering.
A handy way to deal with hard-to-spot overlapping points is the use the Merge Points tool under the Construct tab.
Lightwave has now automatically merged all points that it detects in the same space as each other.
Other considerations for unmerged points:

• The Merge Points tool is handy until you have points that you want to overlap and it welds them for you. Just like any tool that performs global operations, use caution.

• Many problems can result from unmerged points. Fix them early before they become a major issue!
Co-planar Polygons
Co-planar polygons:
When polys are “co-planar,” that means they exist on the same plane (axis). When co-planar polygons overlap with one another, Lightwave doesn’t know how to process light reflections since both surfaces are reflecting simultaneously. In the real world this is physically impossible, and therefore not really an issue. But in the virtual world, this can cause some serious problems.

For example…
Here I have a red box...
And a blue box. They both occupy the same space.
As you can see, coplanar polygons don’t play nice in render. Be careful of this trap, since coplanar polys look normal in both Modeler and Layout.
Other considerations for co-planar polygons:

- Whenever a surface looks like two textures crashed into it, there are probably two co-planar polygons there.

- Lightwave won’t tell you if you have co-planar polys, so keep an eye out for them. If you think you might have some, do a draft render at the lowest settings to check. That way you won’t be taken by surprise at final render time.
In summary:
• A good way to reduce your poly count is to eliminate polys that will never be seen by the camera.

• Be careful of unmerged points, which can cause problems. The Merge Points tool can help.

• Co-planar polygons can also cause problems. The texture incongruities they cause will not show up until render, so watch out!