Google SketchUp® 7 Hands-On

Advanced Exercises

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Exercises, tips, and tricks that will help take your designs, models, and presentations to a whole new level.

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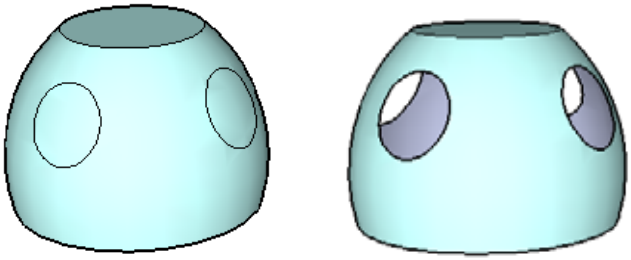
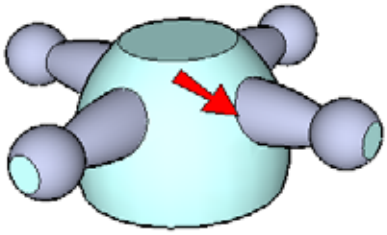
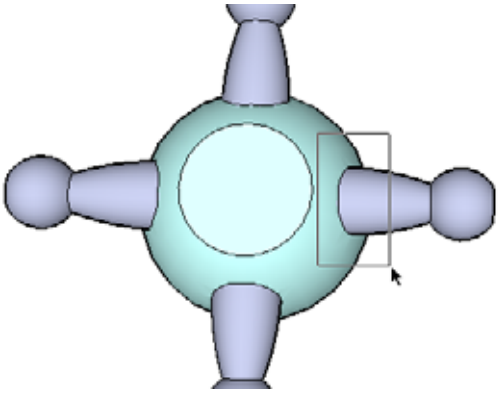
21. The last step is to cut holes in the base to accommodate the handles. Hide all of the handles, then remove the faces covering the holes.



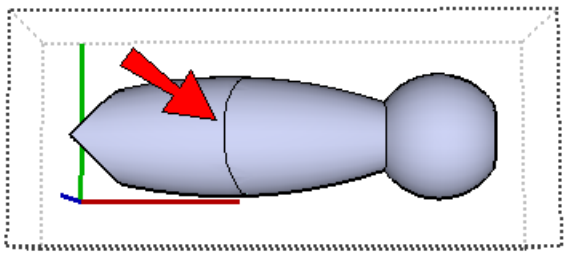
22. Here's another way to get the same results. Use **Undo** to return to this: the base and untrimmed handles, with intersection edges.



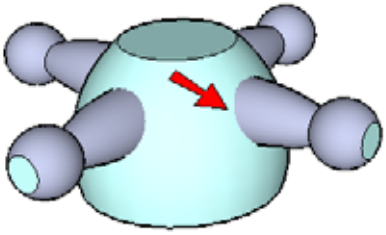
23. Select all intersection edges at one handle (you may end up selecting other edges as well, which is OK. **Copy** the edges (**Edit / Copy**).



24. Edit the handle where you selected the edges, and paste in the copied edges using **Edit / Paste in Place**.

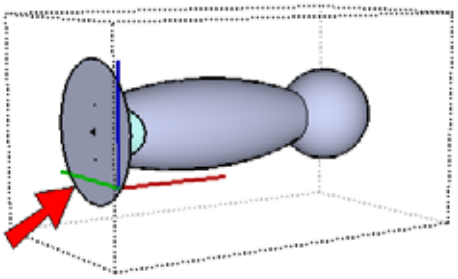


25. Now you can trim the handles as you did before, and remove the intersection circles from the base.
26. **Undo** again to the untrimmed handles and base, with *no* intersection edges.

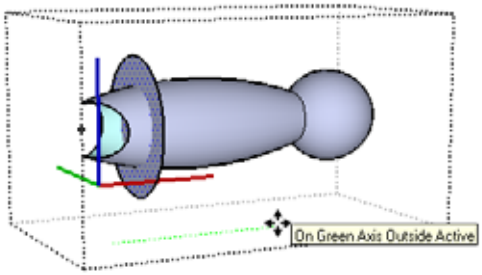


This method will create a more realistic faucet, with separate solid pieces rather than hollow shells.

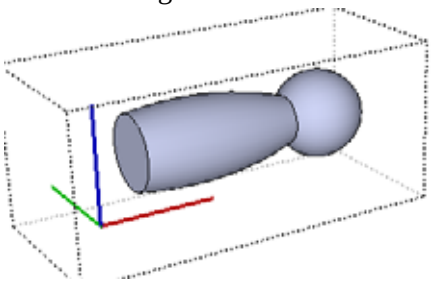
27. We will now shorten the handle so that it just barely protrudes into the base. Edit a handle, and use the guide point to draw a vertical circle. (Remember, you can Shift-lock a circle's orientation before you click its center point.)



28. Move this circle slightly toward the end of the handle.



29. This time use **Intersect / Intersect Selected** (not **Intersect with Model**), so that you get intersection edges with the circle, but not with the faucet base. Then trim extra edges.

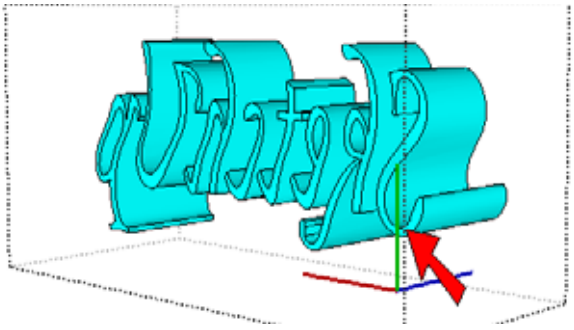


10. Choose **Edit / Paste in Place** to place the text edges on the box.

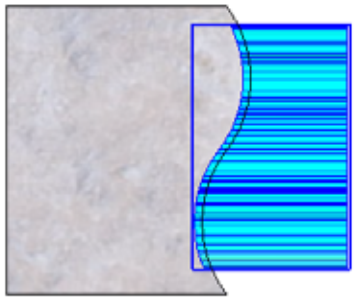
11. Paint each letter face new color. Then, to select them all, right-click on any letter and choose **Select / All with same material**.

12. Cut these faces (**Edit / Cut**).

13. Unhide the text, and open it for editing again. Then choose **Edit / Paste in Place** to place these faces on the backs of each letter.

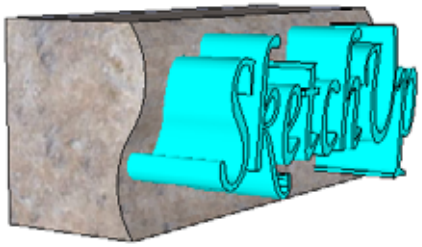


14. Close the text component again. Switch to **X-Ray** view again and move the text staight back so that it protrudes very slightly into the box.

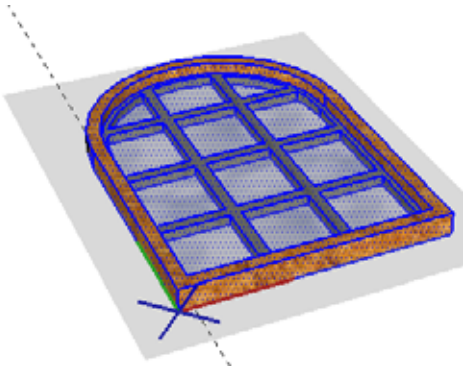


15. **Explode** the component and trim away the fronts of the letters. You're left with an engraving of the text within the box face. The sides of the letters have the color you used for the 3D text component, and the letter faces have the color you used for the faces along the front of the box.

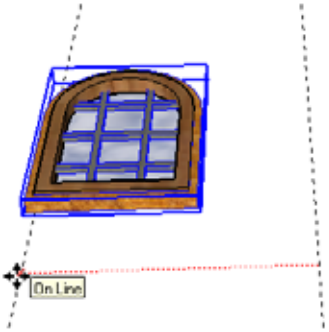
16. Now that you've engraved this box the hard way, let's see an easier way to do it. Use **Undo** to return to the original 3D text component, protruding into the box, with no intersection edges.



18. Make a component for the window front, again gluing it to **Any** face and checking **Cut opening**. The component's cutting plane should be along the back of the frame.

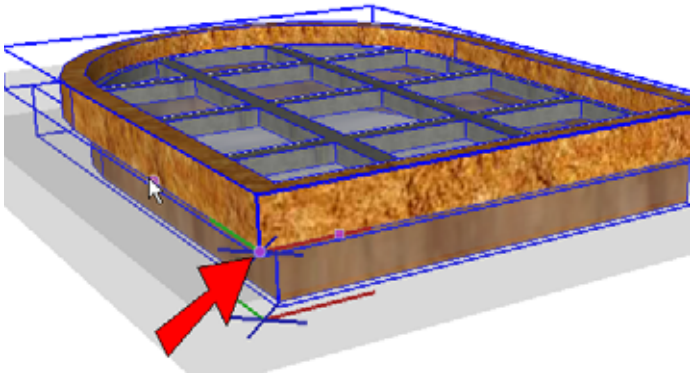


19. Use the guide lines as a reference to move the front component atop the back component.



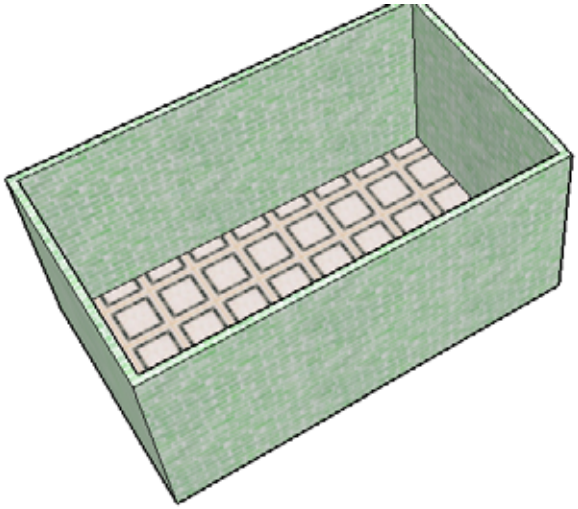
20. Erase the guides. Then move the front component up, using the same distance as the thickness of the back frame (6 inches, in my case).

21. Make a component of these two components, gluing it to **Any** face. Do not check **Cut opening**, and set the component axes and cutting plane along the back of the front frame.

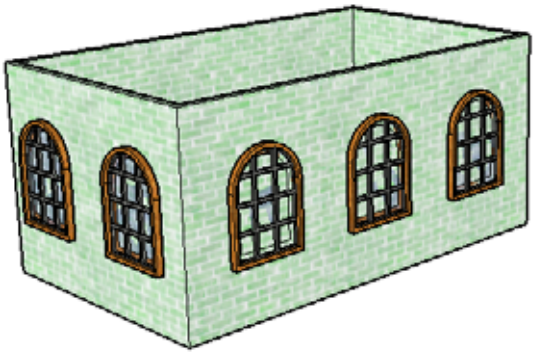


22. Erase the window.
23. To make the walls that will house this window, make a rectangle in **Top** view and offset it by the thickness of the back frame (6 inches again, in my case).

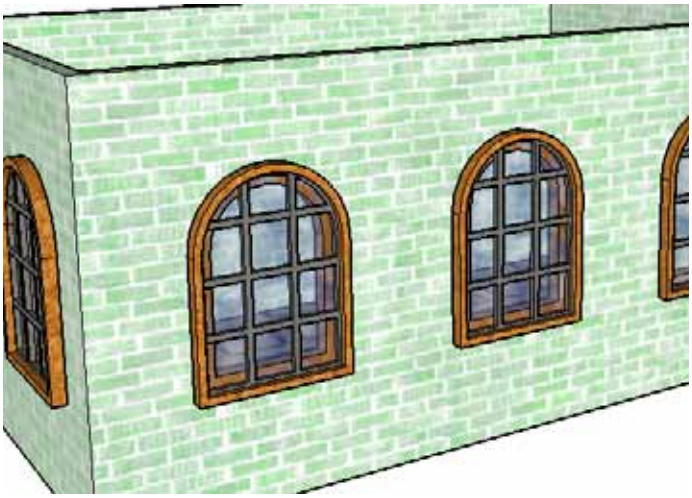
24. Pull up the walls.



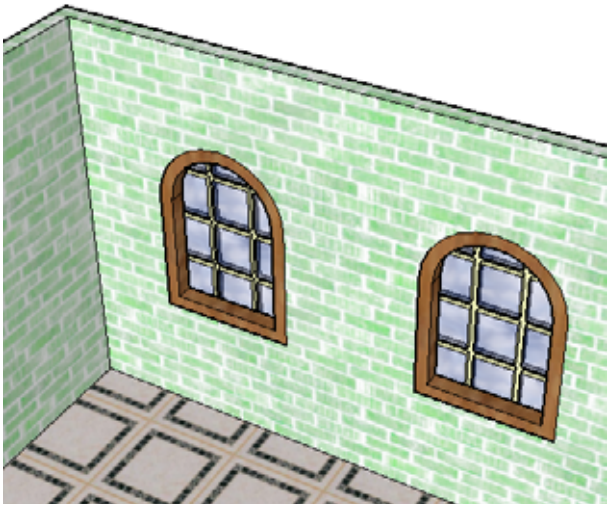
25. Insert a few windows. No faces of the walls are cut.



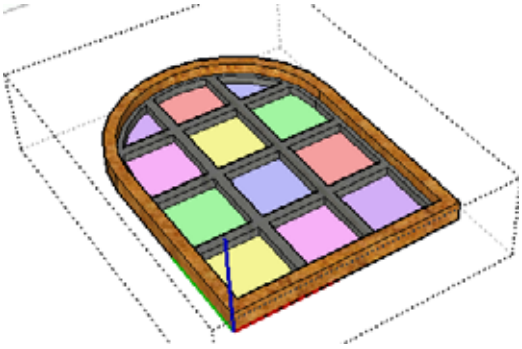
26. Select and explode all of the windows. This releases the front and back components, which are each set to cut their respective faces, and you can see through the windows.



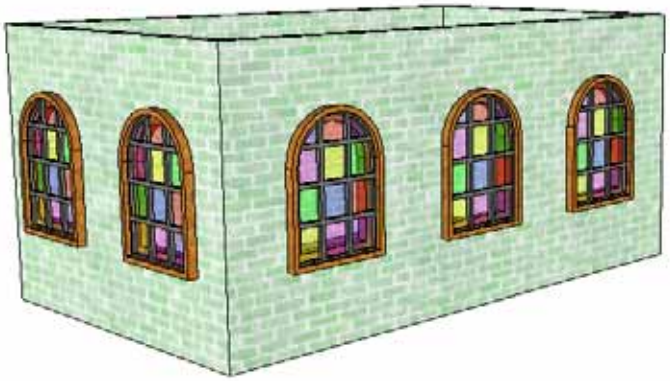
27. From the back of the windows, you can see that the frame fits perfectly within the wall.



28. This step is totally unnecessary, but it's neat. To make the windows look like stained glass, bring one of the front components into some blank space, or edit one that's already there. Paint each pane a solid color, and edit each color to be translucent.



This is how the windows look with the new colors.



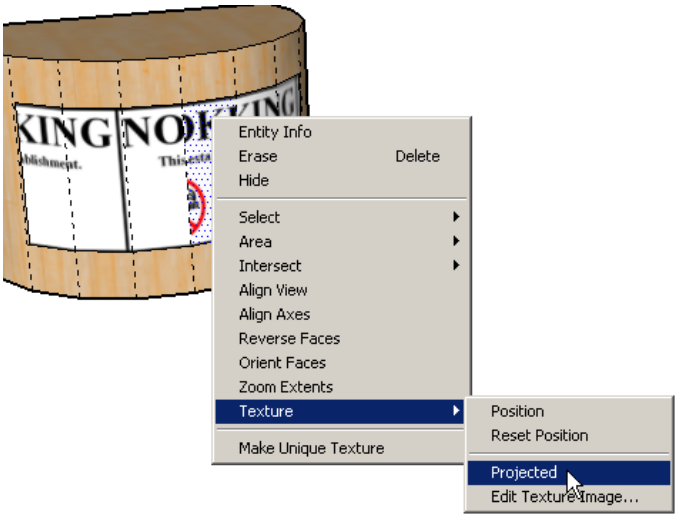
6. Pull the back face of the box so that it intersects the curved face. Then run **Intersect with Model** to create the intersection edges.

7. Erase the sides faces of the box, so that you are left with this:

8. Sample the material on the flat face.

9. And click the inner curved face to project the material onto it. The image size is correct, but the positioning is a bit of a mess. The flat sign face is no longer needed, so erase it.

10. To fix the positioning, let's try to project the texture. Display the hidden edges, and right-click on one of the middle segments. Choose **Texture**, and **Projected** is not checked. Choose **Projected** to make the material here, well, projected.

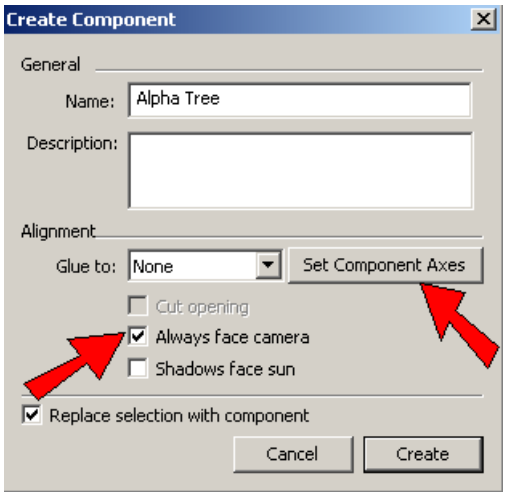


11. Turn off the hidden edges, sample the projected texture, and click anywhere on the curved face. The sign now fills the face with projected image.

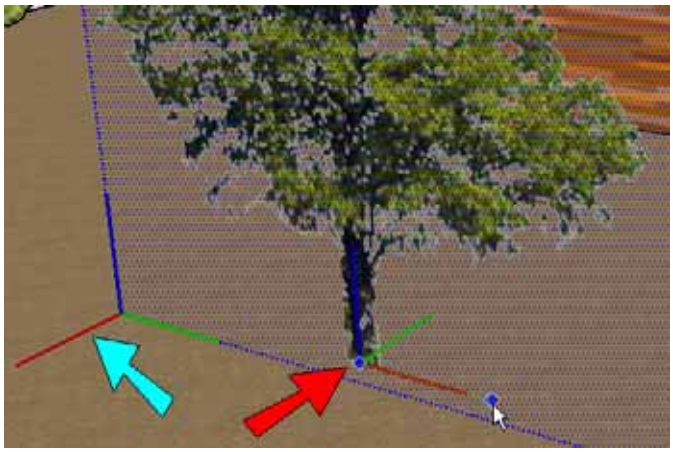
12. There's a problem, however. Look closely at the first or last letter of the sign. The "G" below is stretched because it is on a diagonal face that has a projected image from a flat face. So to get a true wrapping of this sign, we can't use projected textures.

18. You can select each edge, or double-click the face and Shift-click the face again to unselect it. With the edges selected, right-click on one of them and choose **Hide**. Now we have a natural-looking tree.

19. Make a component from this tree, and this time check **Always face camera**. Also check **Set Component Axes**.



20. As before, place the origin at the bottom of the trunk, and set the red direction to the right. This is important: for the green direction, maintain the existing relationship between the current red and green axes. In my example, look at the existing axes indicated by the blue arrow below: the green axis is 90 degrees counter-clockwise from the red. So for the new axes (see the red arrow below), the green axis also has to be 90-degrees counter-clockwise from the red.

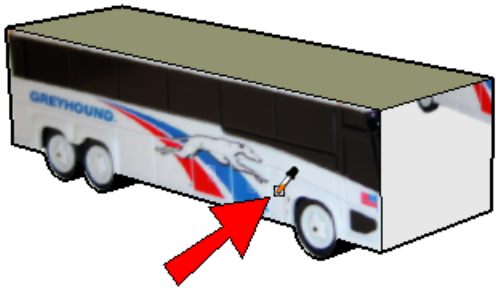


If you don't maintain the red-green relationship, future components won't be inserted the way you want (they'll either be facing the wrong way or upside-down).

21. Create the component, move it down to the ground if necessary, and insert a few more.

17. Now for the front of the bus. Click the bus thumbnail in the **Materials** window and apply it to the front face. The position of the texture on this face is random, though you know how to fix it. But there is a better way.

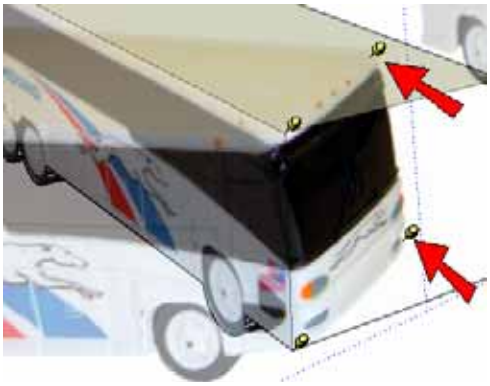
18. Use **Paint** + Alt/*Cmd* to sample the correctly positioned texture on the side.



19. Now click the front face. The photo still needs to be adjusted, but its placement is correct along the edge shared with the side face.

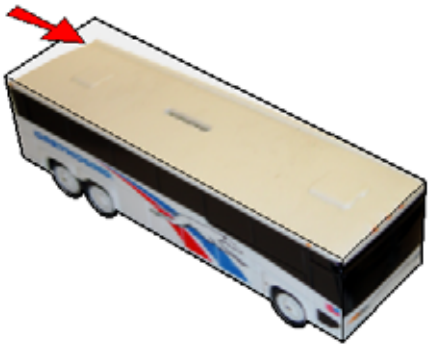
(If your photo isn't facing the right way, or is upside down, start positioning it, right-click, and try **Flip / Left/Right** or **Up/Down**.)

20. Position the texture on this face. The pins along the common edge are already located correctly. But the two pins indicated below need to be moved to the correct corners.



21. Drag these pins into place.

22. The top face can be done the same way. Sample either the side or front face material, and apply the material to the top. The image is already aligned along the two edges common to the side and front faces, but needs adjustment in this corner:



8. To complete the main par of the table, we need to remove what's not included. To make tracing easier, change the edge color (**Styles** window, **Edit** tab, **Edge** settings), and trace the rectangle below the table top and between the vertical supports.

9. Pull this rectangle through.

10. The faces that were not painted, or are painted incorrectly, will be painted a solid color. This color should be red, but I'm using white so that other objects will be easier to see. To paint the outer faces on the other side and back, sample the correctly painted faces first.

11. Make this part of the table into a group. This will prevent other objects from sticking to it, and will make it easier to select later.

12. Now we will create one table leg. Draw a rectangle to create this vertical face.

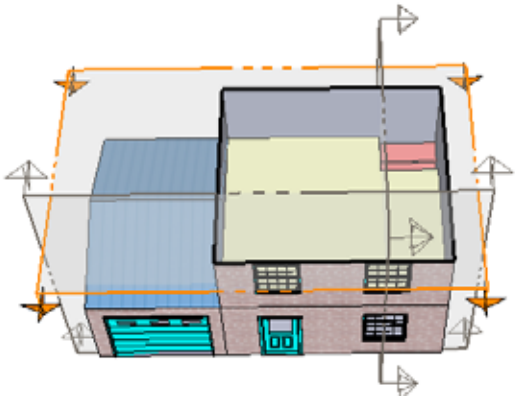
13. Go back to the photo's scene tab, right-click on the new face, and choose **Project Photo**. This applies the photo only to the new face.

14. Trace around the front face of this leg:

17. Close the group and toggle off section cuts.

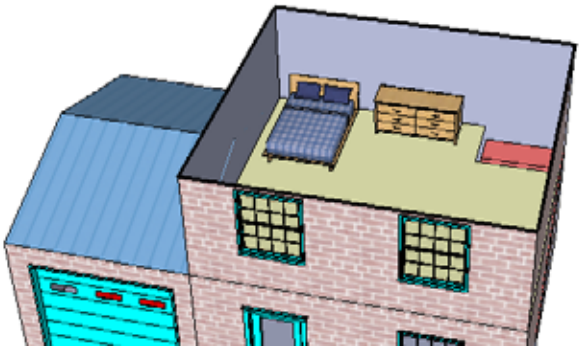
18. The last two section planes will be used for getting the necessary views for placing furniture. Activate **Section Plane** again, and orient it to the ground plane. Hold Shift, and place the plane just below the roof.

Now you can see into the room on the second floor, and all of the other planes have returned to the display.

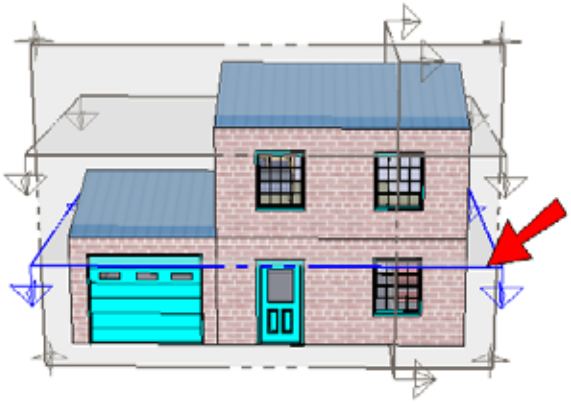


TIP: *If you want to keep certain section planes from being displayed, you can hide them like any other SketchUp object. Hidden section planes will not return to the display when you toggle section plane display; you will need to manually unhide them.*

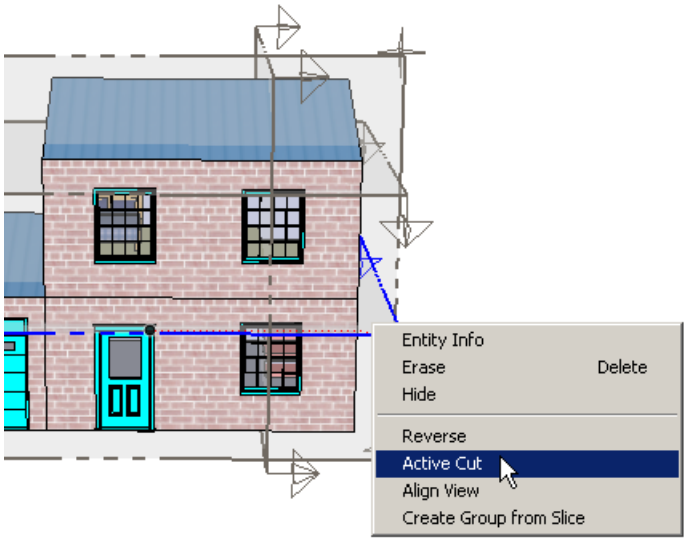
19. Toggle off the section plane display, and add some furniture. (The easiest way to find furniture is to do a quick search in the **Components** window for the piece you want, such as "queen bed author:google.")



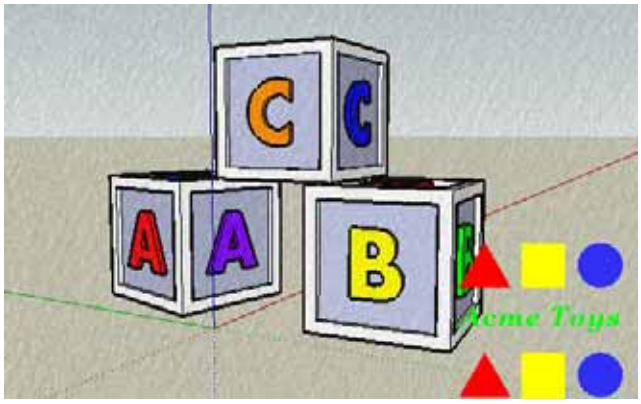
20. Toggle section planes back on. Then make a copy of the horizontal plane you just made, placing it just below the second floor.



21. This section plane is not automatically active, so right-click on it and choose **Active Cut**. (You can also activate a section plane by activating **Select** and double-clicking the plane.)



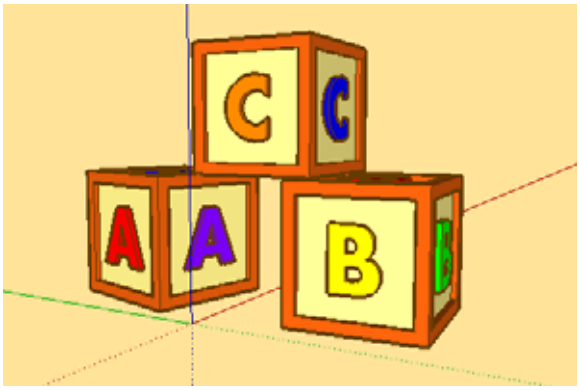
5. To see what these styles look like, activate them one by one. “Company Watermark” has a logo overlay in the lower right corner, and a grainy overlay throughout.



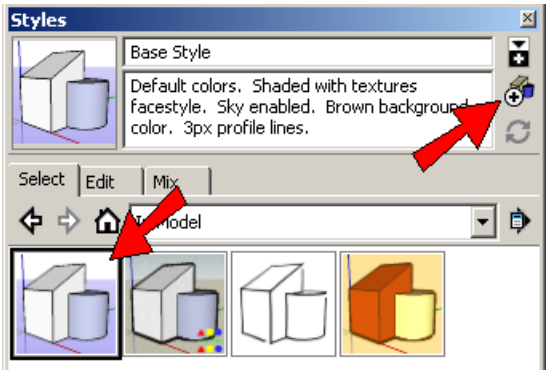
NOTE: *Watermark styles are covered in “Watermarks and Backgrounds” on page 168.*

6. “Marker with Depth Cue” has marker-like sketchy edges that become less thick the farther they are from the camera. No axes are displayed, there is no sky or ground, and the view is **Hidden Line**.

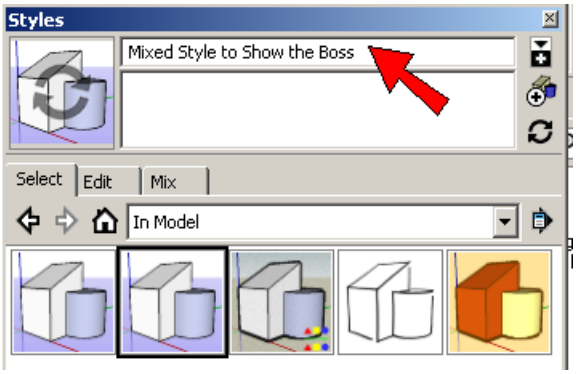
7. “Reddish Brown” has an orange background, and its face colors are orange for the front, pale yellow for the back.



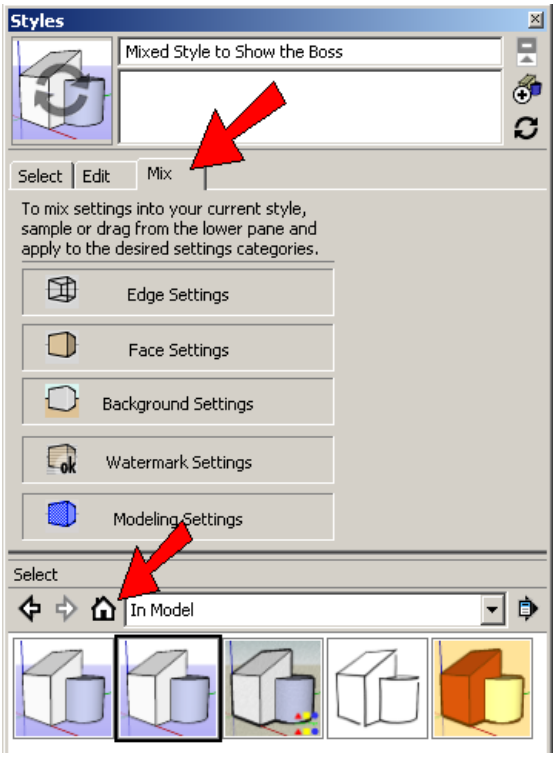
8. Activate “Base Style” again, and click **Create new style** to create a new style based on “Base Style.”



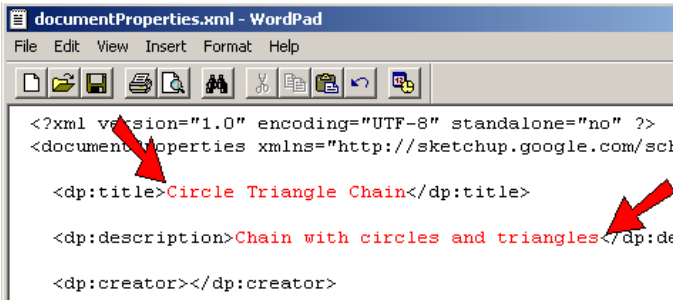
9. Assign this new style a name.



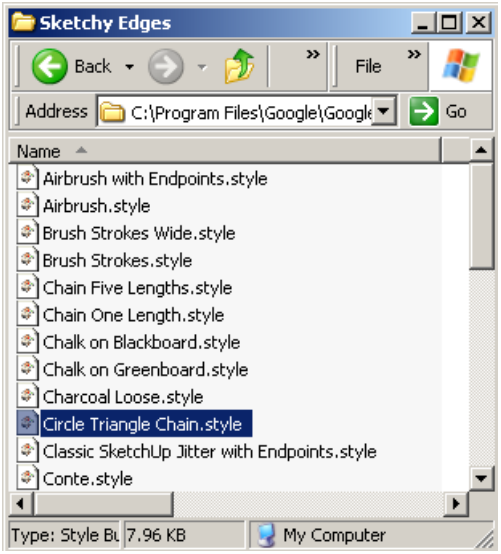
10. With the new style active, click the **Mix** tab. This opens the lower pane of the **Styles** window, which should be set to **In Model**.



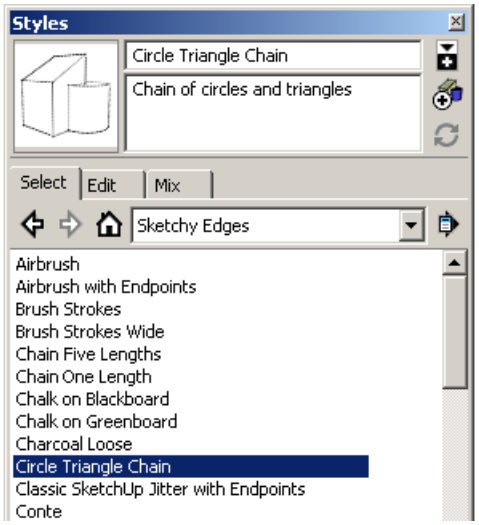
6. Save and close the file. Then make similar changes in the “documentProperties.xml” file.



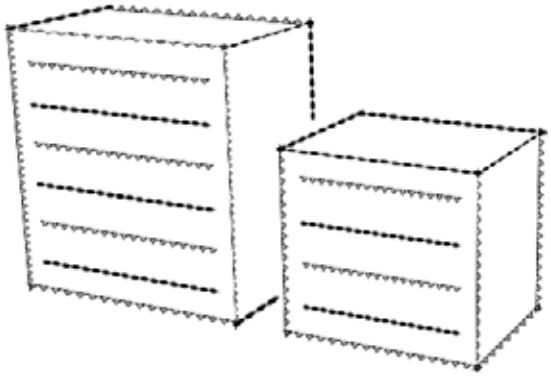
7. Save and close the file, and make a new .zip of the contents inside “temp.” Rename this .zip file “Circle Triangle Chain.style.” and move it into the “Sketchy Edges” folder. Delete the “temp” items.



8. Return to SketchUp and activate this new style.



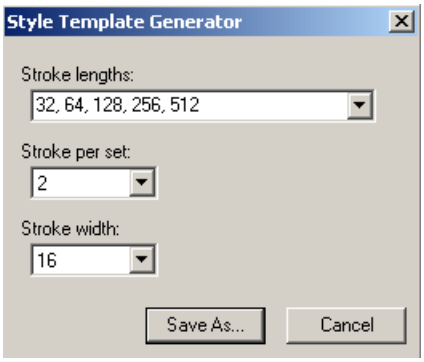
The edges are now evenly split between circle and triangle chains.



Sketchy Edge with Two Graphics for Each Length (Style Builder)

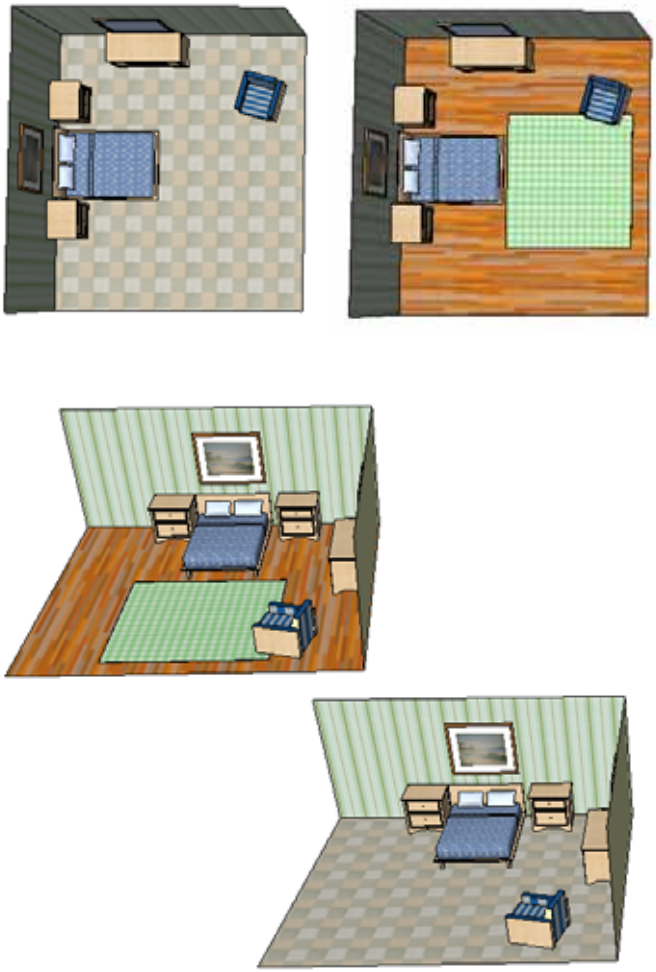
For this style, we’ll fill in a template generated by the **Style Builder**.

1. Open **Style Builder**, and choose **File / Generate Template**.
2. Make sure all five lengths are used, and set 2 **Strokes per set**. The **Stroke width**, as we’ve seen, is 16.



3. Click **Save As**, and save the template as a graphic file.

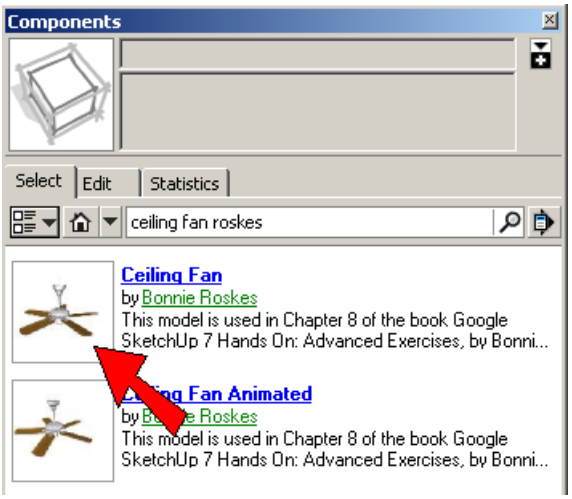
15. Because the scene was not saved with a specific view, you can orbit to any view and click the scene tabs to try out the two floors.



Using Layers to Simulate Animation

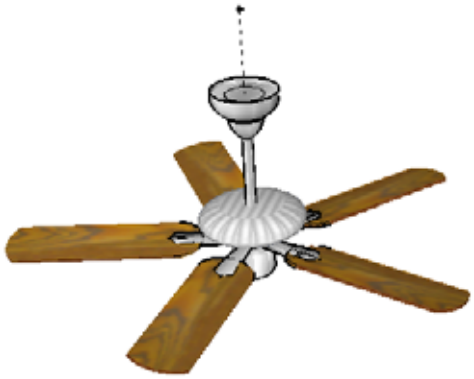
SketchUp does not have the capability to actually move objects in an animation (well, not without a plug-in or dynamic component), but you can use layers and scenes to simulate objects moving.

1. In the **Components** window, search for "ceiling fan roskes." For the model shown below, click the thumbnail to insert it directly into the current file.

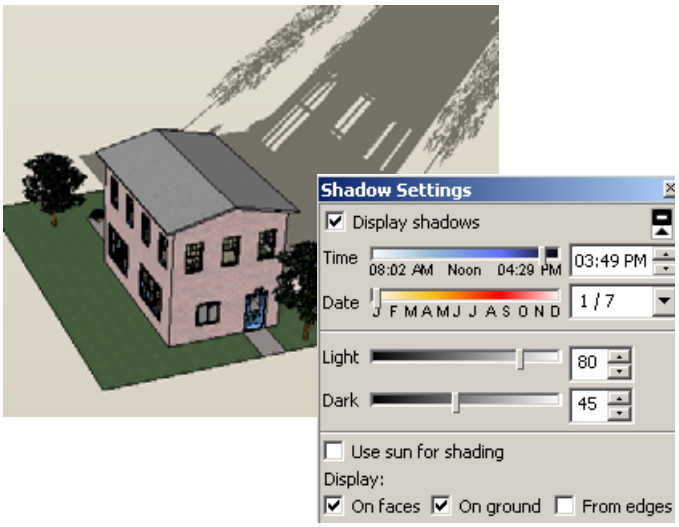


NOTE: *The "Ceiling Fan Animated" model contains the completed version with the scenes we're about to create. Because this model has scenes, it should not be inserted directly into an open file, it should be opened in another instance of SketchUp.*

2. **Explode** the model.

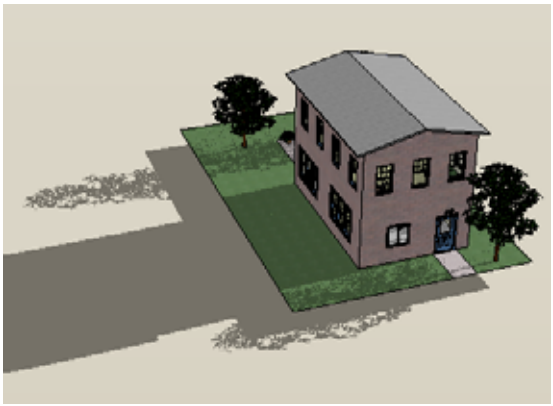


8. Change the time to an evening hour, and the shadows pass to the other side of the house.

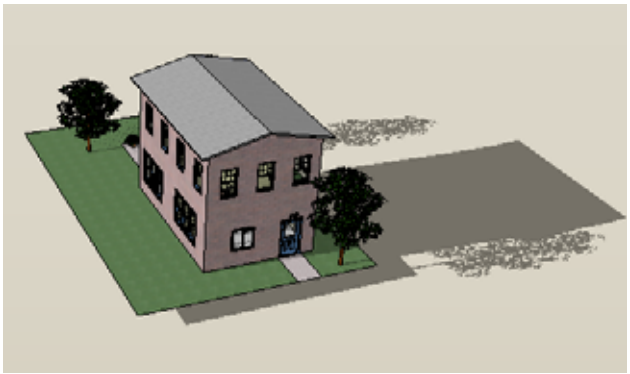


9. Create the “Winter PM” scene.

10. Now switch to a summer month and morning hour, and create a new scene.



11. Switch to an evening hour and create another scene.



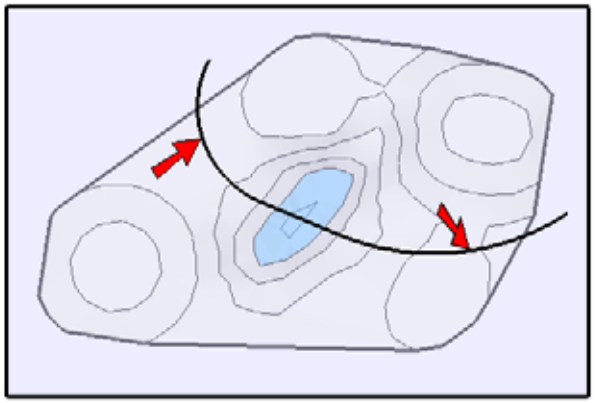
12. Because the view was not saved in any scene, you can view any part of the house, such as the patio, and check out the shadows that appear at various times of day and year.

13. Shadows also appear inside the house.Use the walk-through tools to make your way inside, and click the scene tabs to see how the shadows pass through the rooms.

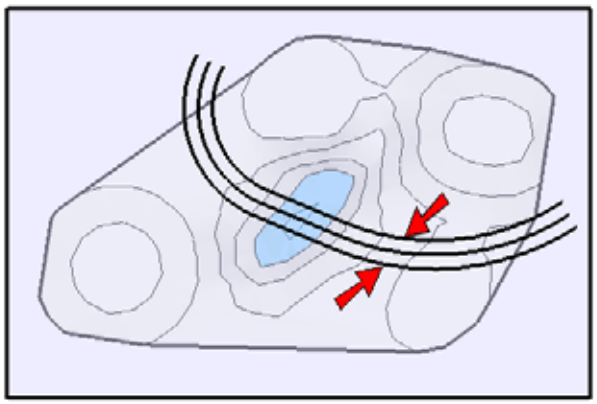
NOTE: *You may have already noticed, but shadows can cause your model to move slowly. This is because SketchUp needs to recalculate shadows every time you orbit or zoom or walk. If shadows are slowing you down, turn them off, then turn them back on when you have the view you want.*

9. Do the same for a point with the same elevation on the other side of the lake.

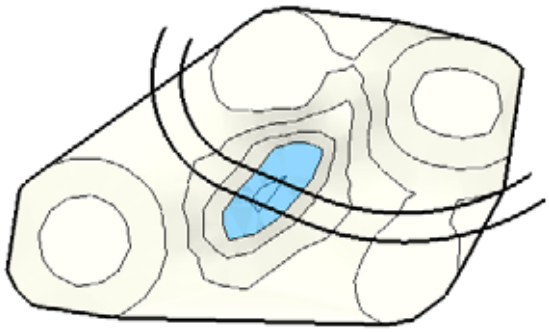
10. Now complete the road line with a tangent arc on either side of the line.



11. Select the three roadway curves and use **Offset** to make roadway boundary curves 3 meters on either side. (If your units are not meters, enter 3m.)



12. Erase the rectangle and roadway center lines, so that only the boundary lines remain.

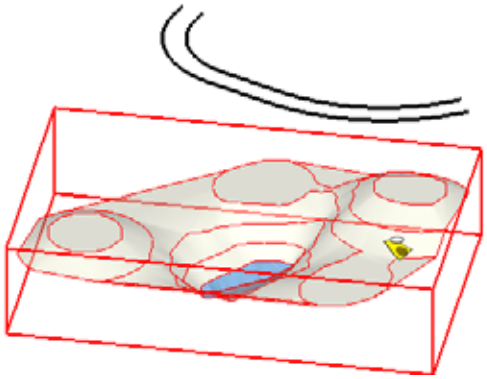


13. Turn off **X-Ray** view, and choose **Camera / Perspective**.
14. To compare **Drape** and **Stamp**, make a copy of the entire model. **Drape** will be used on TIN, **Stamp** on the other.

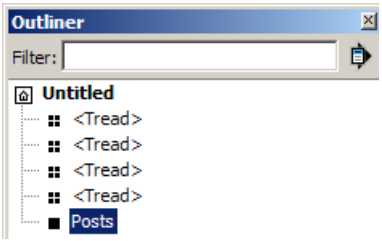
Drape

1. For one of the TIN models, select its roadway boundary curves - there should be six total.
2. Click **Drape** (**Tools / Sandbox / Drape**).

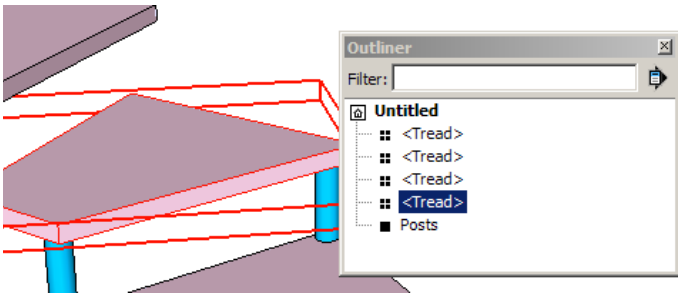
3. Click the TIN. Even though it is grouped, you can still select it as a whole (you could select it ungrouped as well).



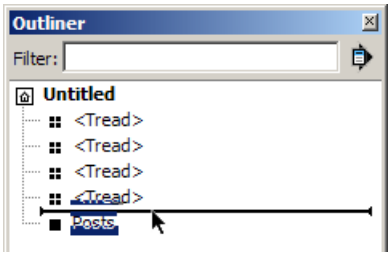
The **Outliner** should look like this: four tread components and one group of posts (the group was renamed as “Posts” in this example).



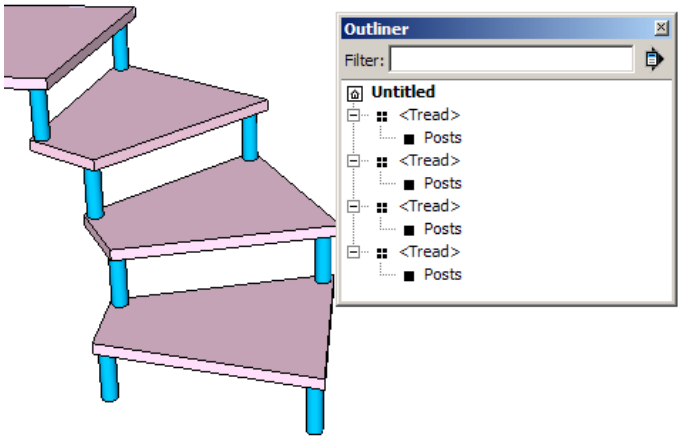
16. Select the tread above the posts to see which one it is in the **Outliner**.



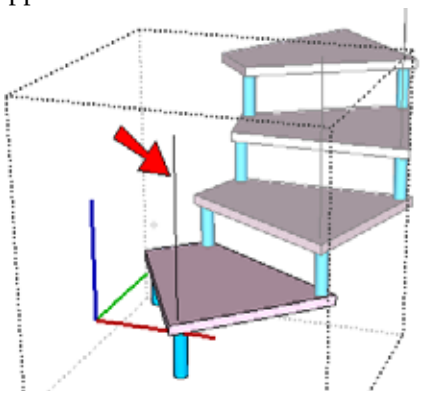
17. In the **Outliner**, drag the post group below the tread that was highlighted.



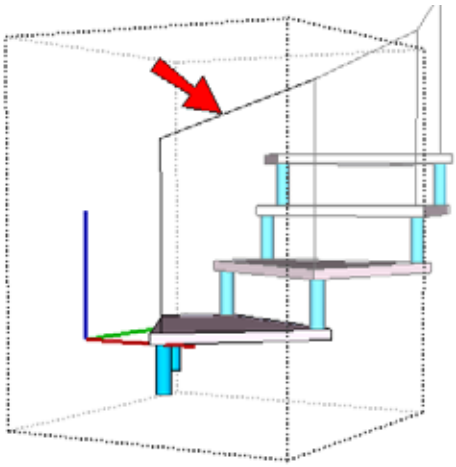
This makes the posts a sub-component of the tread. And because all treads are identical, they each get their own group of posts.



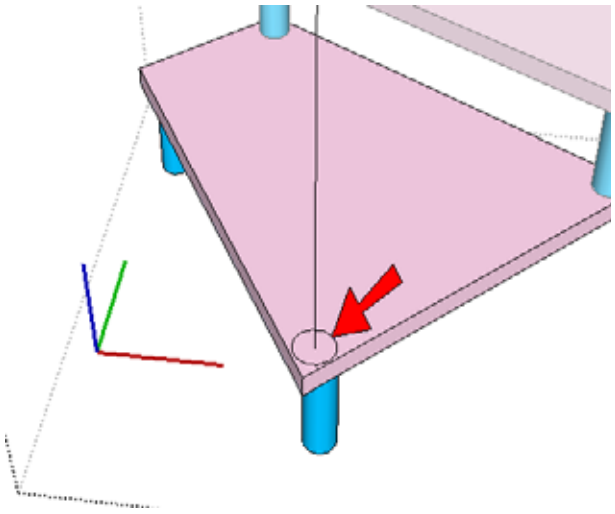
18. To create a railing, start by opening a tread component (not the top one) and adding a vertical line from the outer bottom corner, approximately aligned to the center of the post below. (It might be easier to visualize this in **X-Ray** view.) The vertical line appears on all treads.



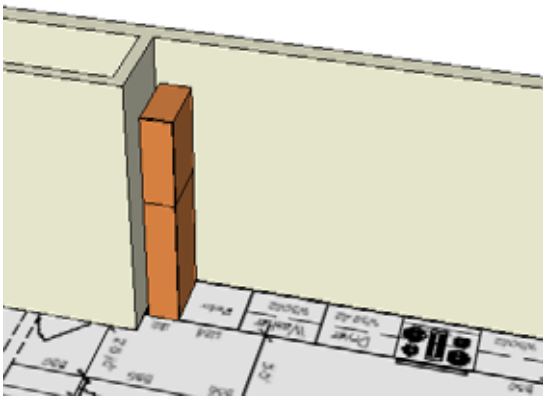
19. Draw another line connecting the vertical line to the end of the line above it.



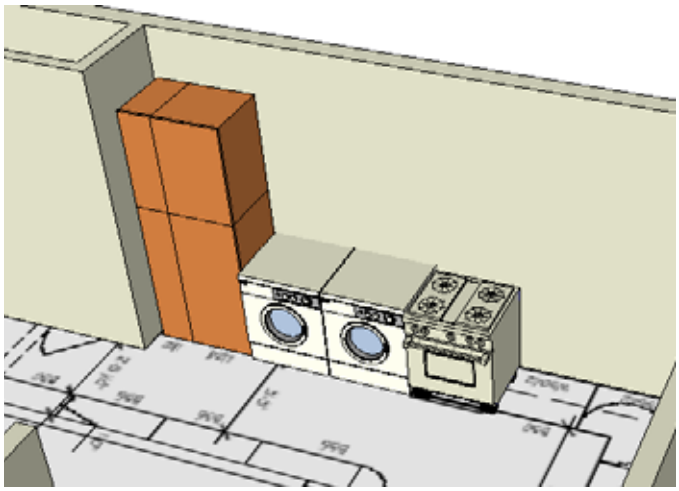
20. For the railing section, draw another circle, centered at the bottom of the vertical line.



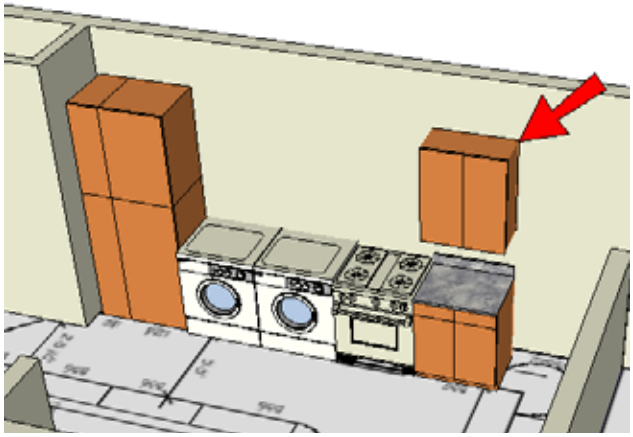
15. **Rotate** and **Move** it into the corner, and apply some color if you want.



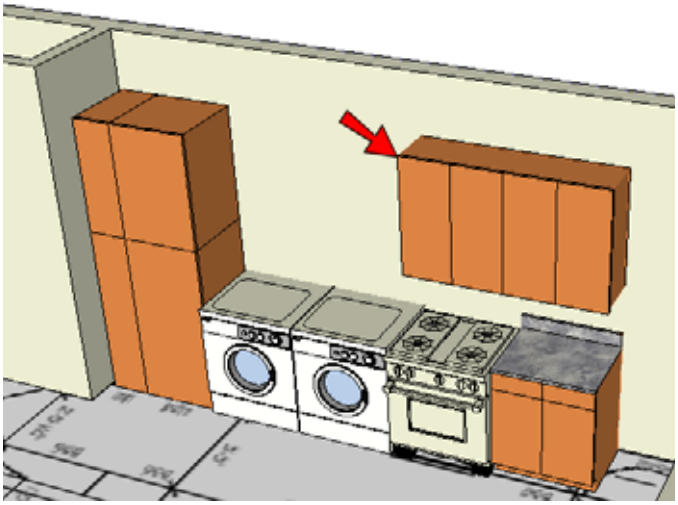
16. The next cabinet is supposed to be 2’ wide so copy the 1’ cabinet, make it unique, edit it, and move its entire right side one foot to the right. Next to that, insert two copies of the washer, and one range.



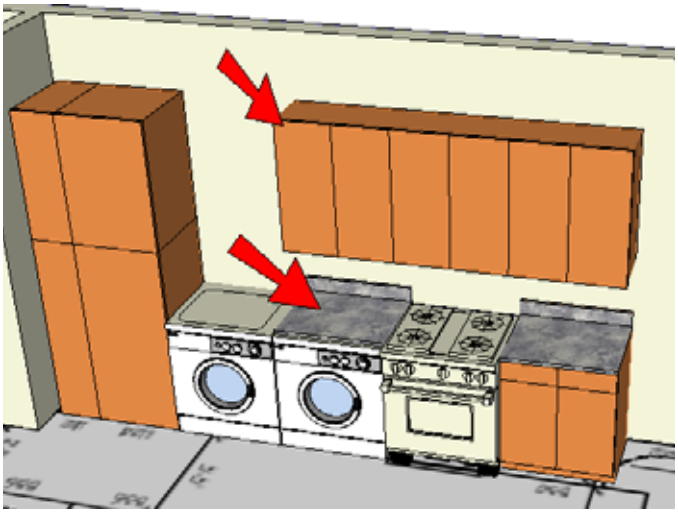
17. Next, insert a 2’6” cabinet.



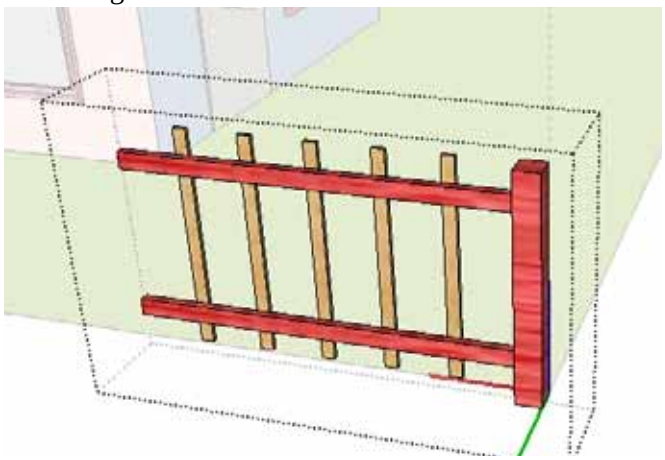
18. Wall cabinets should proceed along the wall above the appliances. So make a copy of the 2’-6” cabinet, and make the copy unique. Edit the copy to remove the wall cabinet and counter.



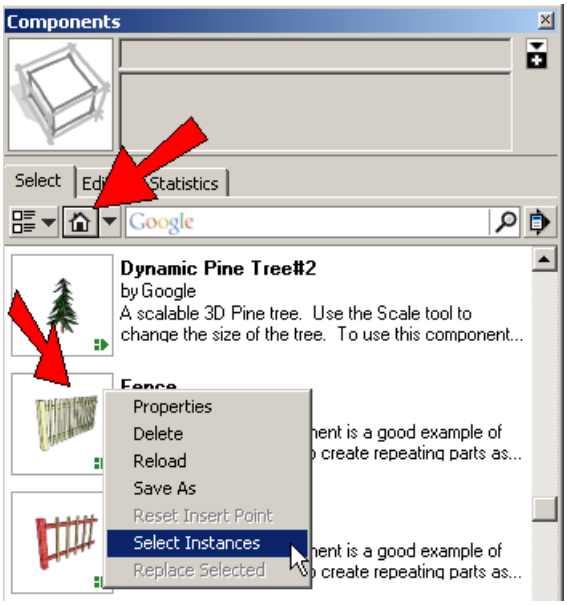
19. The next wall cabinets should have the counter included, to go over the washer and dryer. So copy the original 2’-6” cabinet once again, and make it unique. Edit it to remove only the wall cabinet, leaving the counter.



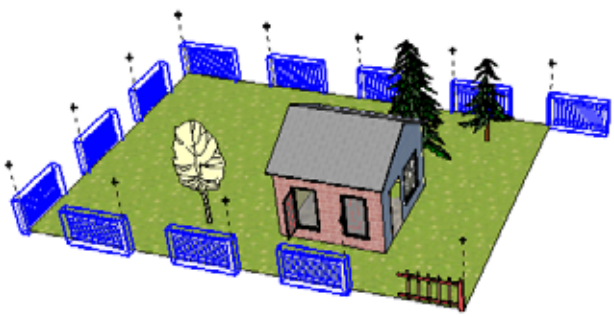
7. Fence materials are not available on the **Component Options** window, so open the changed fence and change its materials.



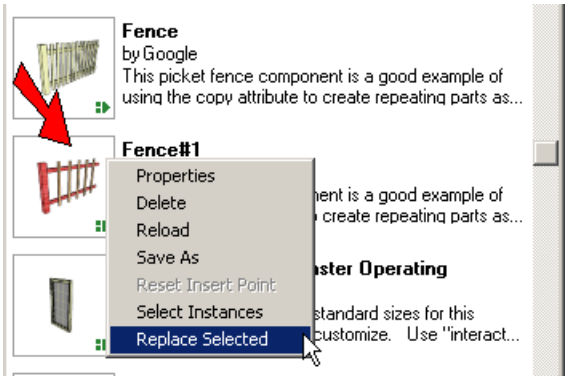
8. Now open the **In Model** folder of the **Components** window, and find both fences - the original and the new one. Right-click on the original fence thumbnail and choose **Select Instances**.



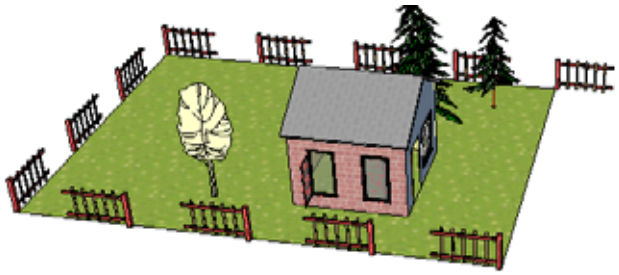
Now all original fences are selected.



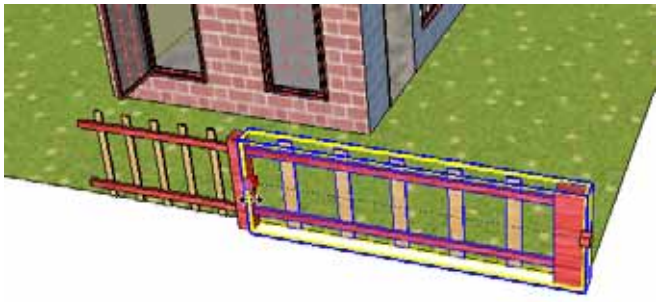
9. Now right-click the thumbnail for the new fence and choose **Replace Selected**.



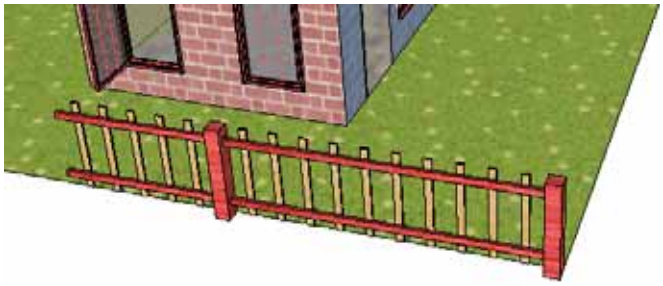
Now all fences have the new spacing and materials. (This picture shows the "Posts" layer hidden.)



10. To extend one fences to the correct length, activate **Scale** and drag the handle for the unfinished end to meet the post of the neighboring fence.



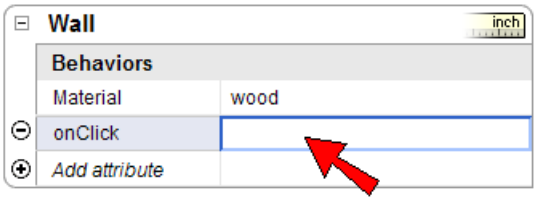
Once scaled, the posts self-copy to maintain the set spacing.



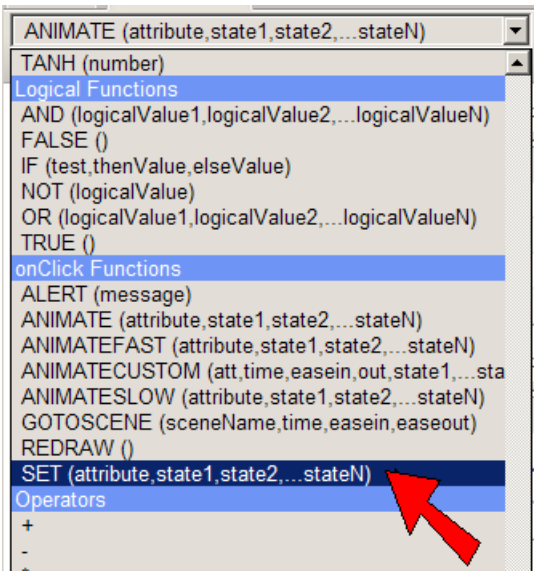
Creating Material Behavior

When the user uses **Interact** on the ball it moves, and when the user click on the wall or stand, we want its material to change. So we need a different type of "onClick" behavior for these objects.

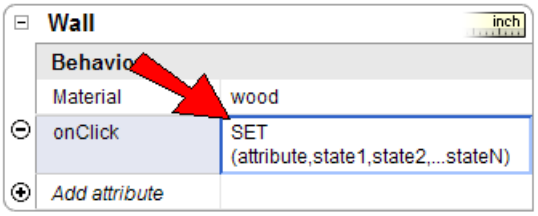
1. Start with the wall: add an "onClick" attribute. Then place your cursor inside its definition field.



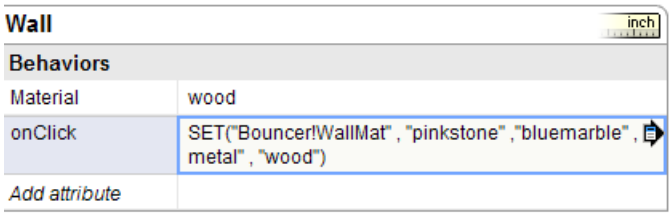
2. For the definition syntax, find the SET function, listed under "onClick."



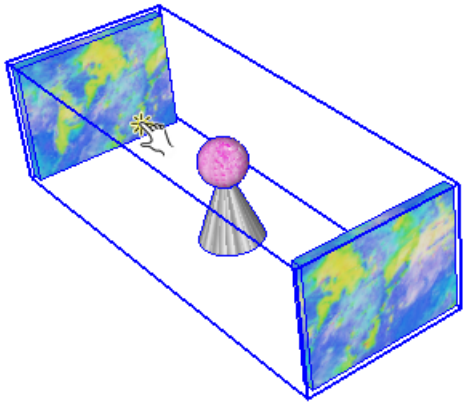
3. Insert this syntax into the definition field.



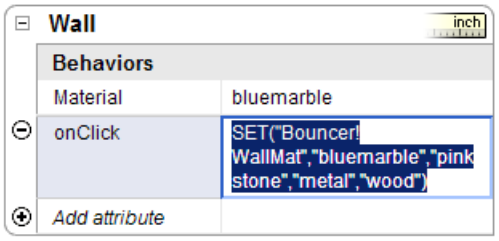
4. The attribute is the wall material, entered below as "Bouncer!WallMat." Then each material name comes next, each within quotes and separate by commas. Type this carefully!



5. After pressing Enter, test out the walls by using Interact to click on them. Both walls should scroll through all four materials.



6. We want the same behavior applied to the stand. But we don't need to type this syntax out again; we can copy the one we already entered for the wall. Select the wall's material behavior syntax and copy it (Ctrl+C, *Cmd+C*).



7. Add an "onClick" attribute to the stand, and paste in the syntax (Ctrl+V, *Cmd+V*).