

Designing USPSA stages with SketchUp

Installing and configuring SketchUp:

- SketchUp Make is a free program that can be downloaded at <http://www.sketchup.com/>
- There are great tutorials for designing stages on YouTube and general tutorials on how to use SketchUp at <http://help.sketchup.com>. I highly recommend printing the Quick Reference Card also found at the SketchUp Help Center which provides a brief overview of the tools
- You will also need a mouse. A mouse is much better for SketchUp than a touch pad.
- Once you have SketchUp installed, use these steps below to configure the program:

1.) “Welcome to SketchUp” window:

This window is displayed when you start the program and can be turned off. If you need to get to it, it is under Help → Welcome to SketchUp... in the program’s toolbar

From this window, you can:

- Choose which template to use as a default (feet and inches)
- Access tutorials
- Start using SketchUp by clicking on “Start using SketchUp”

2.) Main Program Interface:

- Get the toolbars you need: View → Tools → and click on “Large tool set”; “Views”; “Styles”. You can choose to deselect “Getting Started” to remove duplicate tool buttons
- Configure the “Default tray” that shows up on the right hand side of screen. Window → Default Tray → Deselect “styles” and “shadows” and **select** “layers” and “instructor.”
- The “Instructor” is handy for those learning SketchUp
- To open a bay template or other file, File → Open → Find file you want to open. Or open the file by finding it on your computer and double clicking....just like other files for other programs.
- Import props (a.k.a. components)
 - From the 3D Warehouse: File → 3D Warehouse → Get models
 - Select the model and save the file, don’t import directly into current file unless you want the whole thing in your stage
 - You can also search the 3D warehouse in the “components” section of the default tray
 - From the USPSA prop library you have saved on your computer: File → Import → Find folder on your computer and select component (make sure the *.skp file type is selected, and you can activate the “preview” window in the upper right corner of the toolbar in the Import window in Windows)

- Remember that there are 3 axes in SketchUp. Blue is up and down (use up arrow to lock). Red is left and right (use right arrow to lock). Green is forward and reverse (use left arrow to lock). The axes are indicated on the screen and can be disabled under View → Axes.

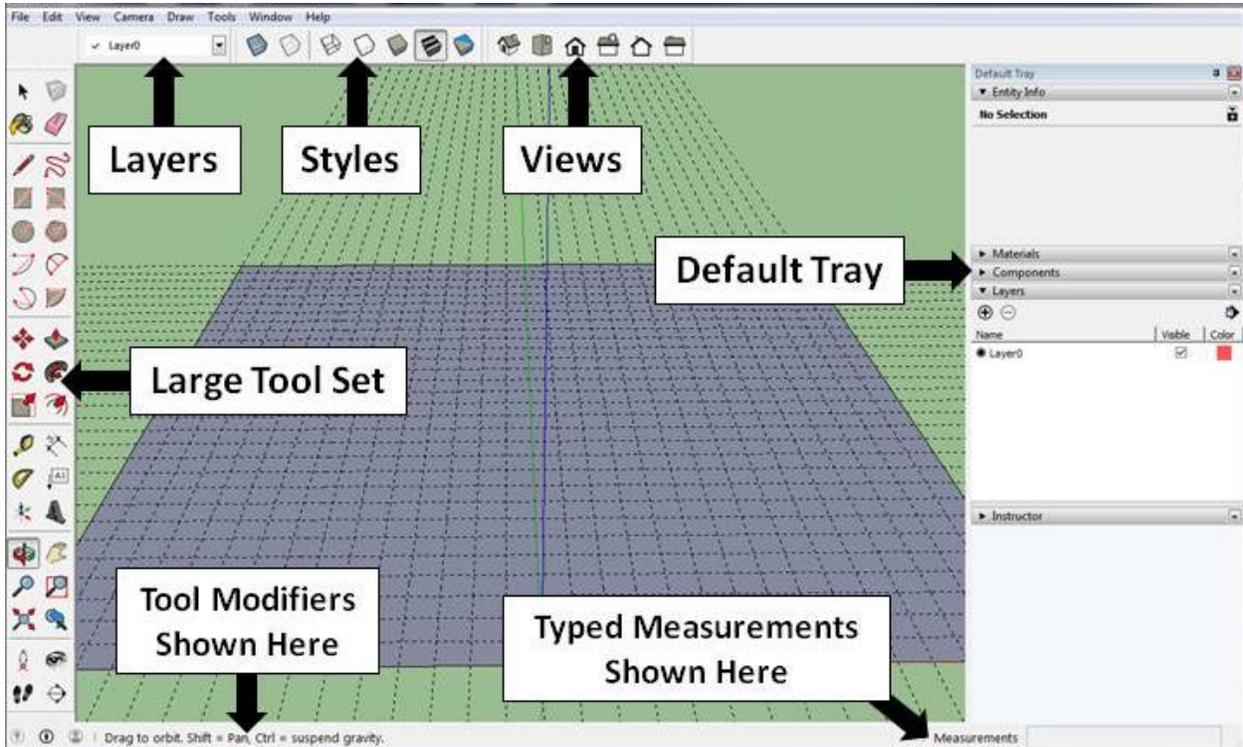


Figure 1: What your SketchUp window should now look like.

SketchUp Tools for Stage Design:

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Orbit: This tool does just what the name says, it orbits (rotates) the view of the screen
- 
Pan: This tool is a “hand” that lets you slide the viewing window left, right, up, or down on a flat plane
- 
Position Camera: This is a great way to check out the view from shooting positions within the stage
- 
Select: This is what you use to select components within the model to manipulate them
- 
Move: Use this tool to reposition props around the bay

-  **Rotate:** Use this tool to angle walls, fault lines, and targets. The tool will be the color of the direction the rotation is happening.
-  **Dimensions:** This is used to mark distances in the model.
-  **Text:** This is used to make text bubble labels. I use this to label targets and activator cables for moving targets.
-  **3D Text:** Some people use this to label targets, but I prefer to use this text to make the starting “X” marks and marks on tables for handgun starting positions.
-  **Paint Bucket:** Use this to change color of components. Choose the color in the Materials section of the Default Tray.
-  **Tape Measure:** Use this to draw guides (you can type in the distance between guides. Ctrl key toggles guide creation on/off. When guide creation is off, you can use it to just get a measurement on things....like a real tape measure.
-  **Push/Pull:** This is a great tool for extending or shortening fault lines and target sticks. Just remember to make you component unique! (see Advanced Options)

The SketchUp Demo Bay Exercise:

- Open the “SketchUp_Demo_Bay.skp” file. You will notice a .skb file with the same name appear where you have the .skp file saved. This is a “backup” file that is created by the program as you work with the file. There is no need to send this file when you share your stage with others. The **.skp** files are the real SketchUp files.
- This is a very broken stage (hopefully you recognize that). During the process of fixing the stage to make it legal for a USPSA match, you will learn how to use the above tools (or at least most of them). Experiment with the tools! You will only learn SketchUp by using it!
- A few things I want to point out in the Default Tray on the right:
 - **Layers:** I like to use layers to organize items in my stage model. In this demo stage, Layer 0 is the bay floor. I have 4 additional layers that contain parts of the stage. You can use this panel to add more layers, delete layers, and make layers invisible.
 - **Entity Info:** When you have selected a component of the model, the entity info section shows the details. You can use this section to move the component into a different layer and if the item contains text, this is where the font can be changed.

- **Materials:** You can use this section to select colors and textures to add to components with the Paint Bucket tool. Select the color/texture you want and then click what you want colored with the paint bucket.
- **Components:** Shows a list of all components in the model. Will create a duplicate that you can add to the stage if you select an item from this list. Search box searches the 3D Warehouse.
- **Instructor:** Explains how to use the tool you currently have selected.
- **Floating or buried targets and walls:** This is the most frustrating thing in SketchUp. Sometimes when a component gets moved, it ends up being buried in the ground or floating in the air. The way to get your item back above or touching the bay floor, first click and hold on it with the Move tool and then press the up arrow key while keeping the mouse button depressed. This will lock movement of the item in only the up and down directions. Then simply drag up or down until it is back on solid ground.
- **“Undo” is your friend!** If you do something and it totally messes things up, remember to use the “undo” option. Edit → Undo
- **Editing targets and walls:** All of these things can be edited. Want to edit or create a new target array? Want to make a wall shorter? Want to rotate a target on the stand? This can be done!
 - First make whatever you want to edit “unique.” If you don’t make the item unique, all copies of that item will be changed. To make an item unique, use the Select tool and right click on what you want to edit. A pop-up menu appears. Click on “Make Unique.” If there is only one copy in the model, the option is grayed out.
 - Then with the select tool, double click on the item. Everything else in the stage will be covered in a green tint except for the item you are editing. You can then select parts of the item and move them, rotate them, recolor them, etc. Sometimes the components will have sub parts that can be opened further by double clicking on them.
 - Once you are done editing, just click outside the item and the screen returns to normal.
- **Make props into components:** Save all the edited or new props and targets you create to import into other stages later!
 - Make sure the prop is one group and select it. To make groups, select all the pieces and then right click and choose “make group.”
 - Right click on prop → Make component
 - Right click on prop → Save as
 - Name and save in location you choose
- **Export pictures of your stage**
 - Rotate the camera to the view you want, or use the Views tool bar to quickly get an overhead view.
 - Once you are happy with what you see on screen, File → Export → 2D graphic
 - Save the image and then insert it into your stage diagram sheet