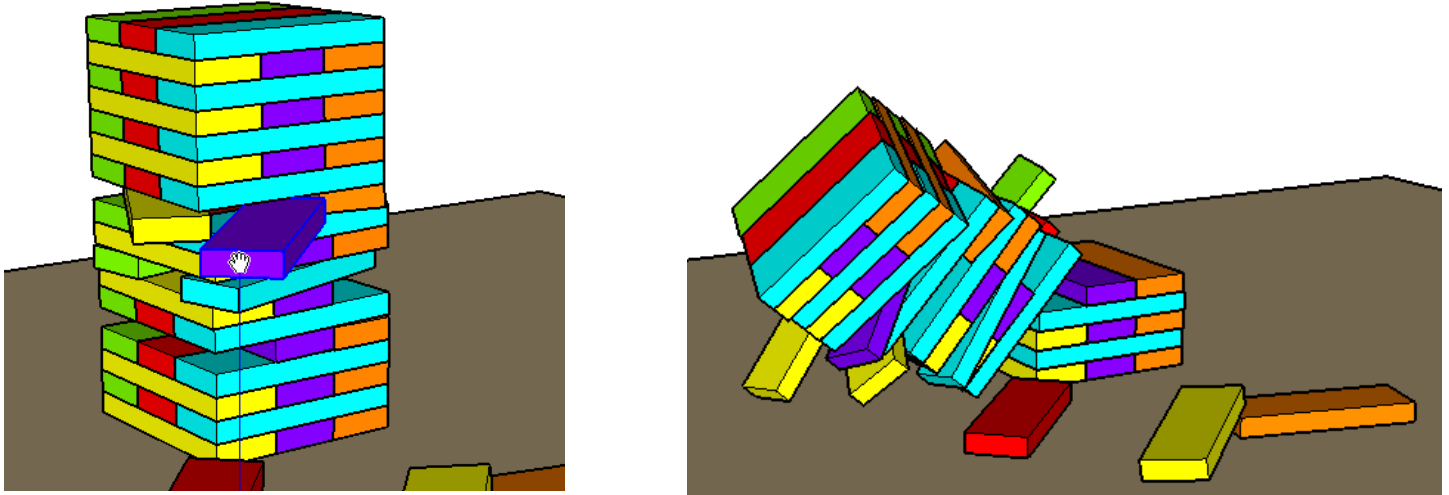


Jenga, in Sketchy Physics

As most of you know, I've been working on a new book, showing how to use Sketchy Physics to create all sorts of cool models. This project comes from that book - it's a relatively simple model consisting of Jenga blocks. To play the game, you pull out blocks, one by one, hopefully without causing your tower to collapse.

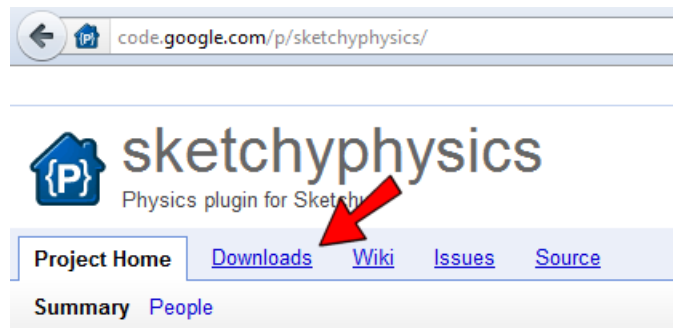


For this project, it helps to have some basic knowledge of Google SketchUp (though detailed instructions are provided). In particular, it's important to know how to zoom, rotate, and pan the view. If you need more information on how to get started, and a description of some basic tools, please read *3DVinci's Getting Started Guide (PDF)*.

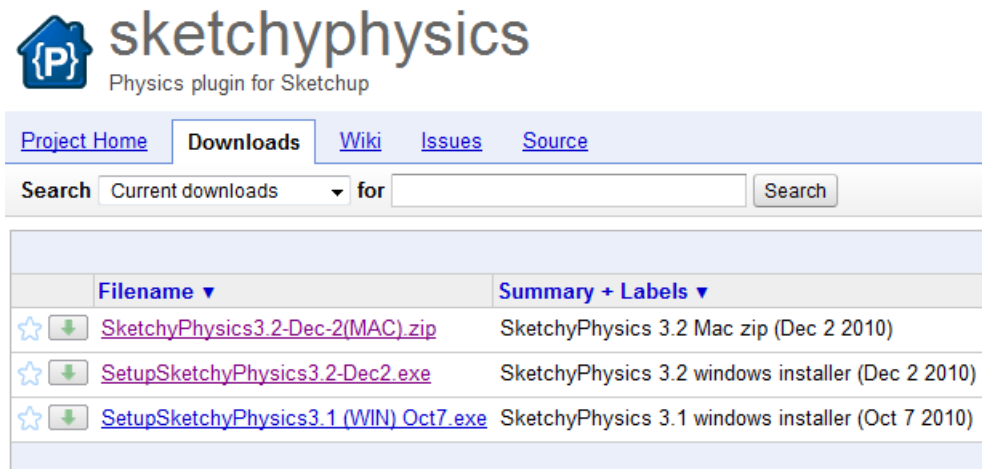
PC users: go to http://www.3dvinci.net/SketchUp_Intro_PC.pdf.

Mac users: go to http://www.3dvinci.net/SketchUp_Intro_MAC.pdf.

If you don't already have the Sketchy Physics plug-in, you can get it (for free!) at code.google.com/p/sketchyphysics. Click the "Downloads" link.



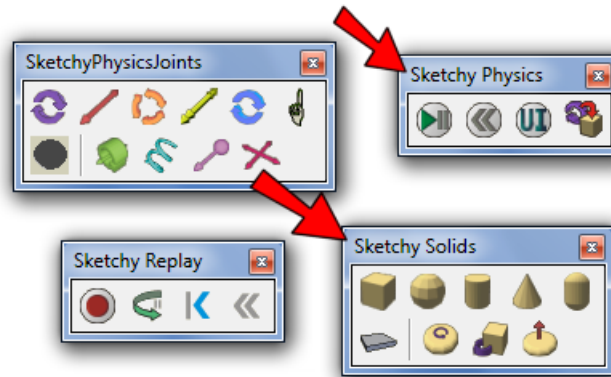
Choose the most recent version for either PC or Mac - at this time the most recent version is from December 2010, but a new version will be coming soon, I'm told!



The screenshot shows the website for sketchyphysics, a physics plugin for Sketchup. The navigation menu includes Project Home, Downloads, Wiki, Issues, and Source. Below the menu is a search bar with a dropdown menu set to 'Current downloads' and a search button. The main content area displays a table of download links:

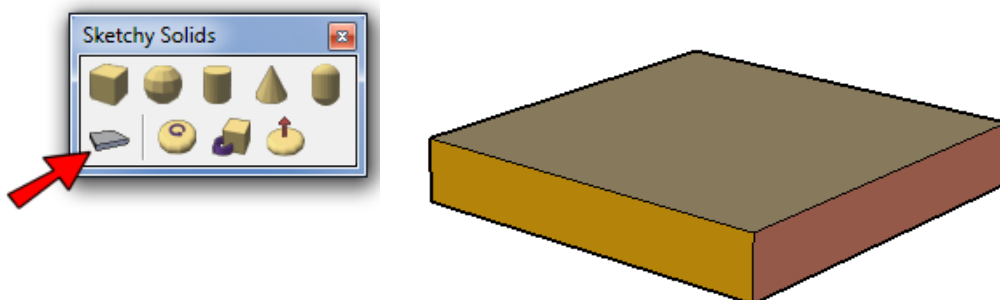
	Filename ▾	Summary + Labels ▾
☆ ↓	SketchyPhysics3.2-Dec-2(MAC).zip	SketchyPhysics 3.2 Mac zip (Dec 2 2010)
☆ ↓	SetupSketchyPhysics3.2-Dec2.exe	SketchyPhysics 3.2 windows installer (Dec 2 2010)
☆ ↓	SetupSketchyPhysics3.1 (WIN) Oct7.exe	SketchyPhysics 3.1 windows installer (Oct 7 2010)

When you next open SketchUp, you will see four new toolbars. We'll need two of these toolbars for this project: the one labeled **Sketchy Physics** and the one called **Sketchy Solids**. (You can close the others if you want - they can always be reopened via the **View / Toolbars** menu.)

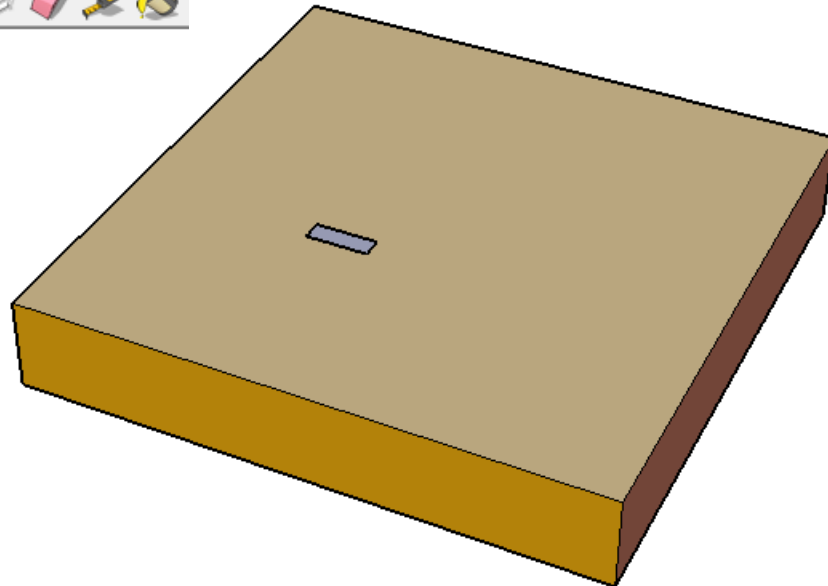


Step 1: Build the Blocks

1. Click the icon shown below, which creates a solid floor. This floor, basically a large, stationary box, is defined by default as an object that won't move when you run the Sketchy Physics plugin, so it makes a good base. (Without it, your Jenga blocks will fall through space!)



2. For the first Jenga block, activate **Rectangle** and draw a rectangle near the middle of the floor. The long side should be three times longer than the short side, so enter something like 9',3' and press Enter. (Any values will do, as long as one is three times the other.)

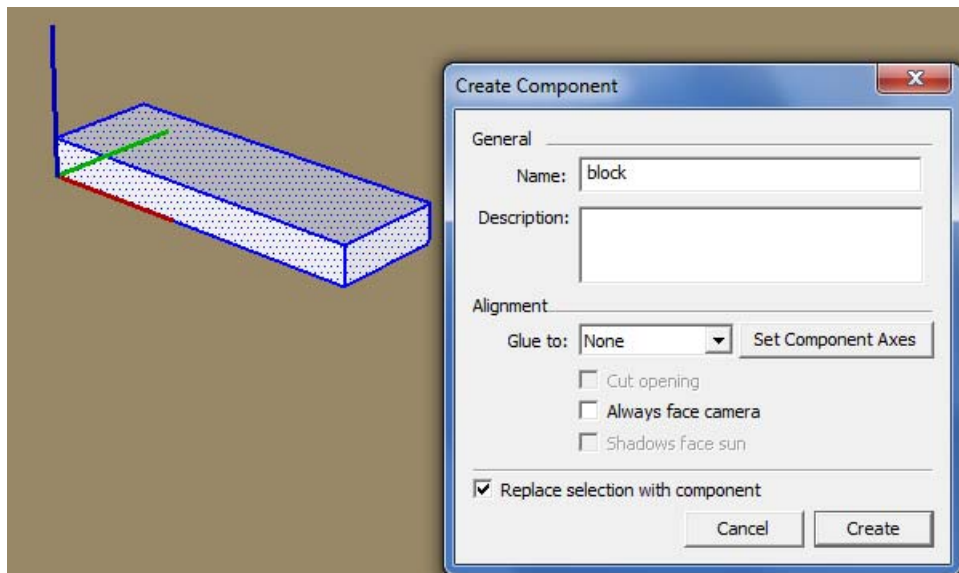


Dimensions 9',3'

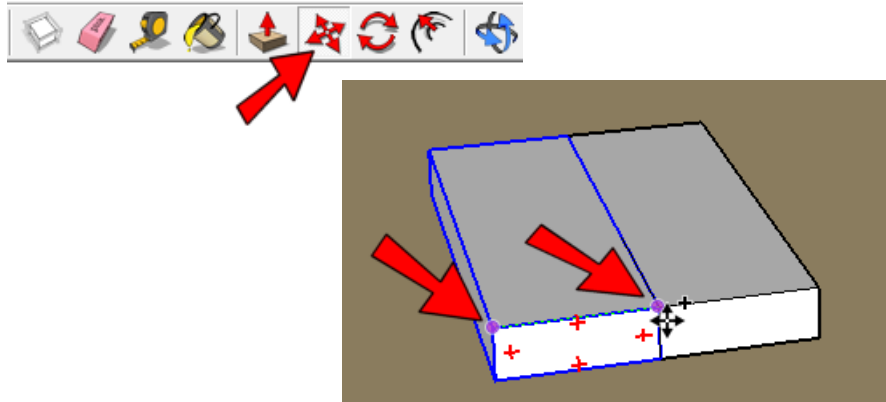
3. Activate **Push/Pull** and pull up the rectangle to make a small block.



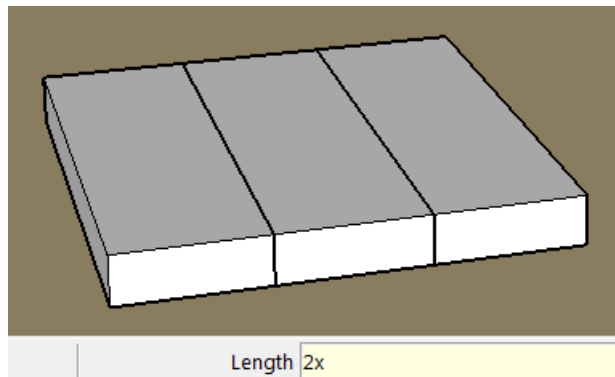
4. Sketchy Physics only works on objects that are groups or components. And since this block will be copied multiple times, it should be component. Activate **Select** (press the Spacebar) and drag a window around the entire block to select it. Then right-click on any selected face and choose **Make Component**. Give the block any name and click **Create**.



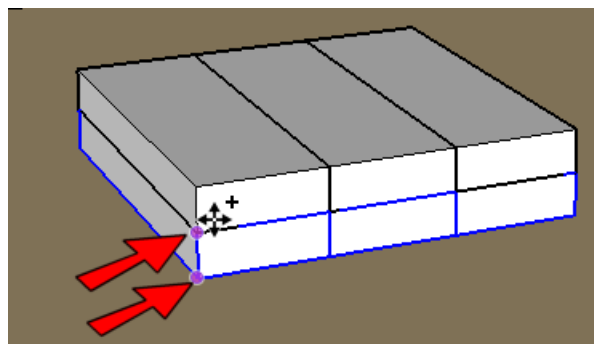
5. When the component is created, it is highlighted in blue which means it's selected. Leave it selected and activate the **Move** tool to make a copy. Press the Ctrl key (PC) or the Option key (Mac) to add the "plus" sign to your cursor. (You don't have to keep this key pressed, just tap it.) For the copy points, click the two corner points shown below, to place the copy right next to the original.



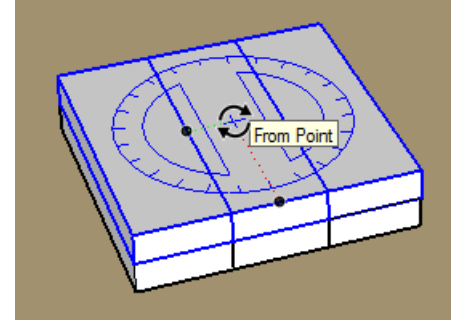
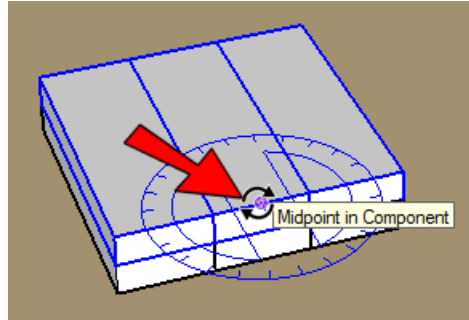
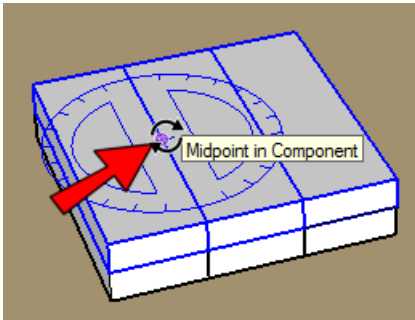
6. Just after the copy is placed, type 2x, which appears in the **Length** field, and press Enter. This creates two copies, for a total of three blocks.



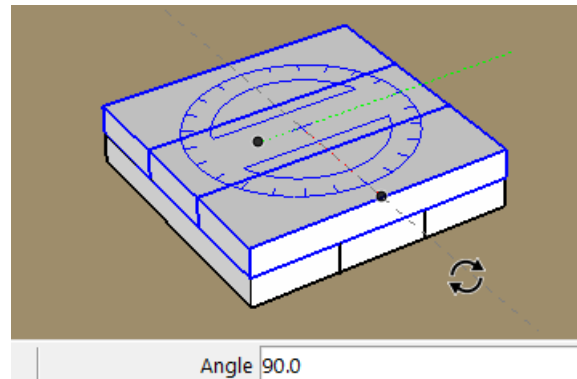
7. Now select all three blocks, activate **Move** again and press Ctrl / Option, and click the two points shown below to copy all three blocks straight up, on top of the original set. When the copy is created, leave the three new blocks selected.



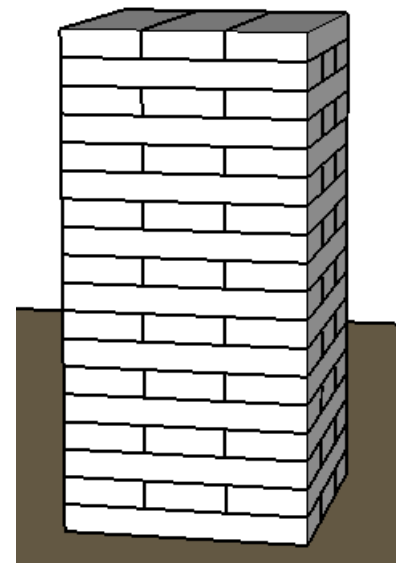
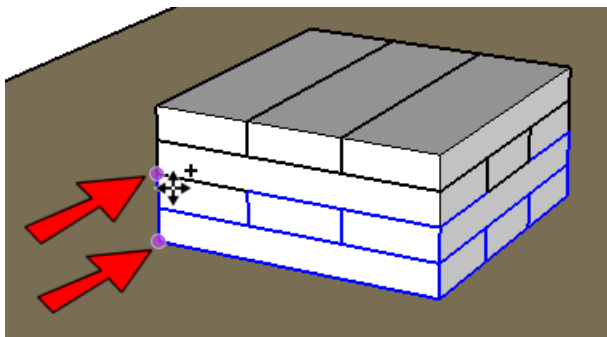
8. Activate **Rotate**. The protractor needs to go in the exact center of these three blocks. So in order to help SketchUp find this point, first hover (don't click) over a midpoint like the one shown below on the left, then hover over another midpoint like the one shown below in the center. Then move your cursor near the center, and click when you see the red and green dotted lines meet, as in the picture on the right.



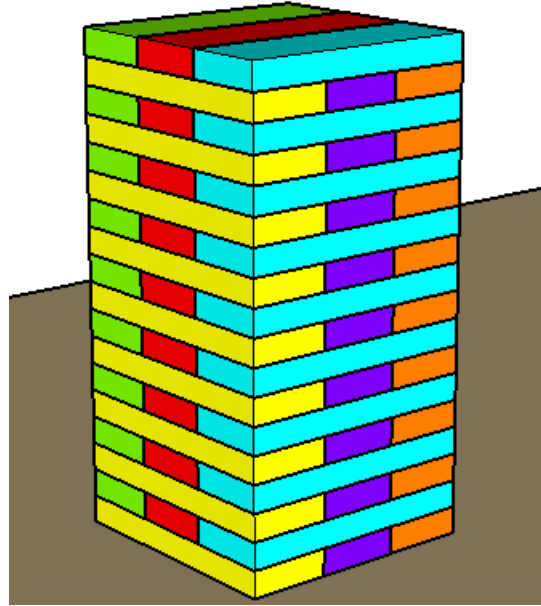
9. Click anywhere to start the rotation, and click again when you see 90 degrees in the **Angle** field.



10. To complete the tower, select all six blocks and use **Move** with Ctrl / Option to create one copy straight up. Then enter 8x to make eight copied sets.



11. Paint the blocks with different colors if you like. (When painting components, you don't have to open them for editing, just choose a color and click the component.)

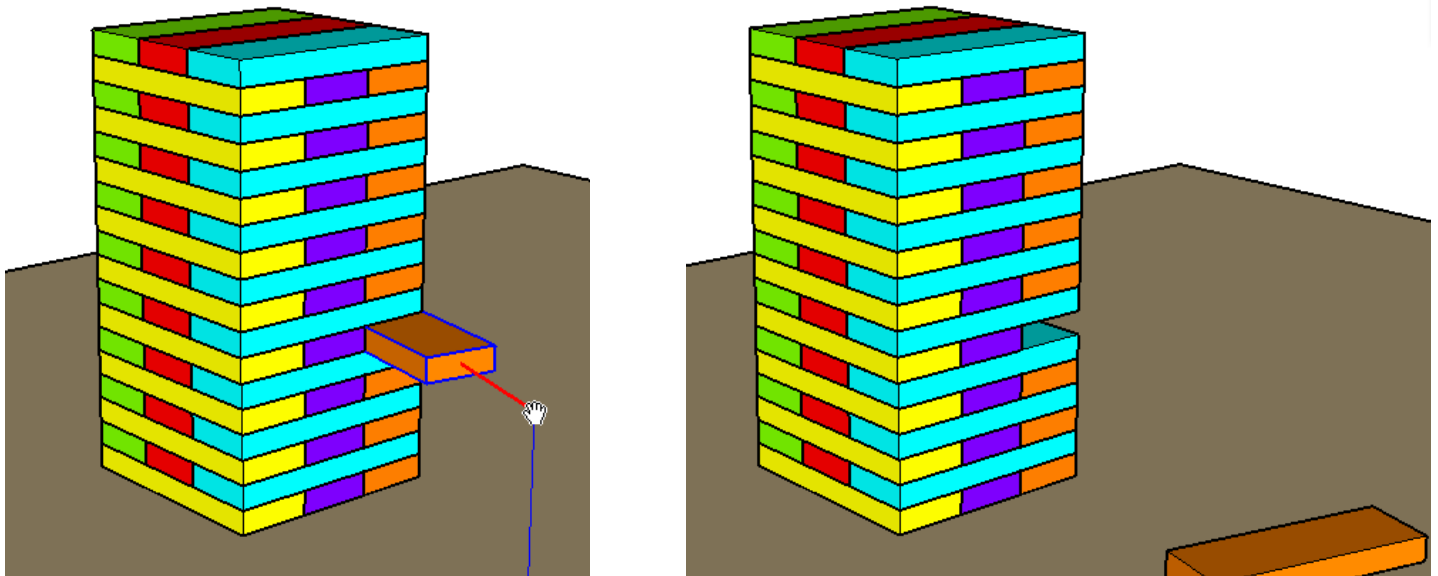


Step 2: Play Jenga!

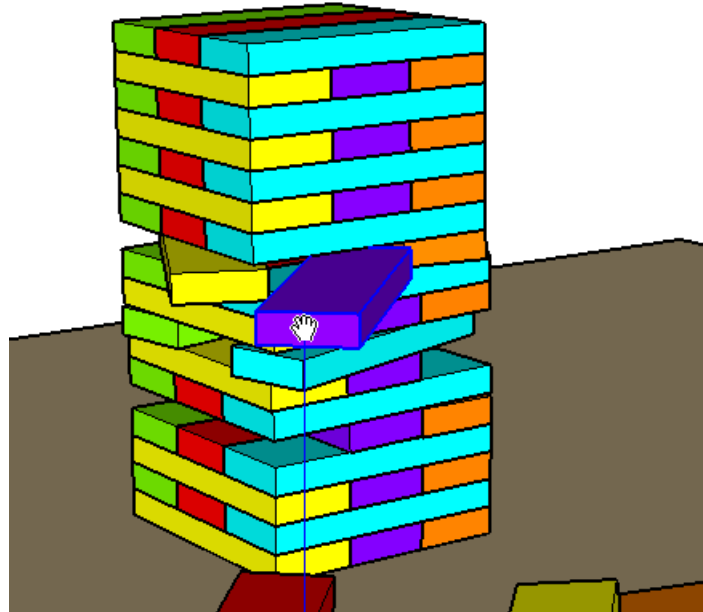
1. To run Sketchy Physics, click the **Play** button on the **Sketchy Physics** toolbar. Nothing should happen yet - the blocks are sitting on the floor just like real blocks would, until you start messing with them.



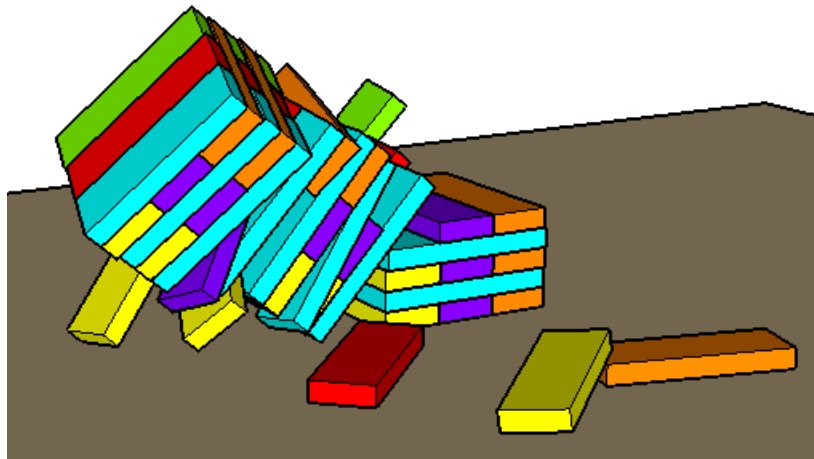
2. The cursor turns into a hand symbol, which means it's ready to move objects around and set things in motion. Click and drag one of the blocks, pulling it out from the tower. If your block doesn't move, try dragging the mouse a bit faster. The block should land on the floor. (Or if the block slides off the floor, it will fall forever into space, but we'll get it back later.)



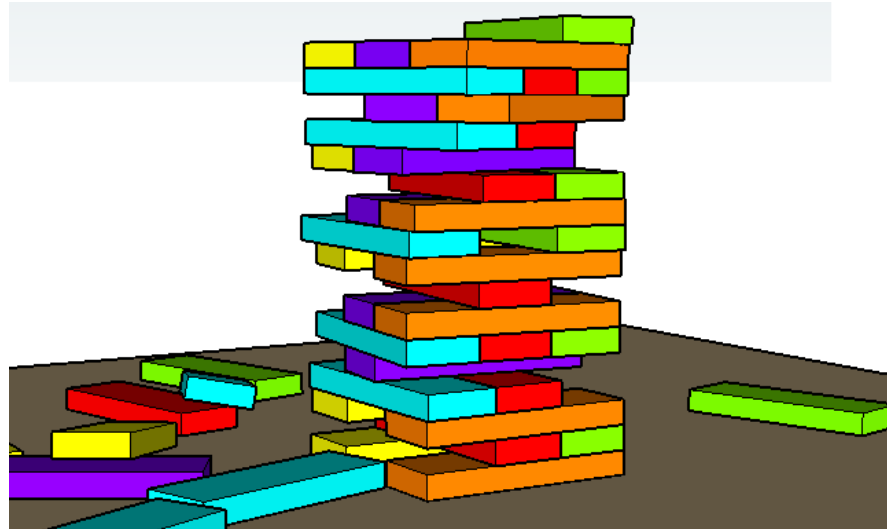
- Keep pulling out blocks, with the goal being to keep the tower from collapsing. Just like in real Jenga, if you pull a block to the side, rather than straight out from the tower, it will cause adjacent blocks to move. You'll also notice that lower blocks are harder to pull than higher ones - this makes sense because the lower blocks have more weight above them.



- Keep going until your tower falls. Here's my first attempt: not so good . . .



. . . But later attempts were much better!



5. When you're ready to play again, just click the **Reset** button to get all your blocks back in their tower. Then click **Play** again and start pulling.

