

# Stack'Em Up

## Next generation instancing

Version 1.1.0

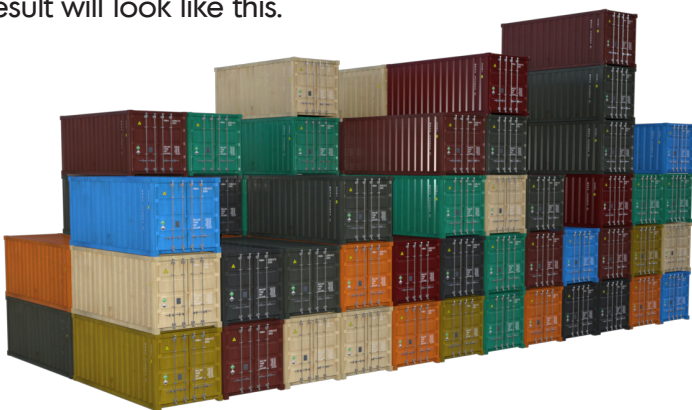
Welcome to Stack'Em Up, the script to build stacks, heaps or walls of your props.

Before we dig into the ins and outs of this script, let's take a look at the reason this script came to be. There are already several great scripts on the market for making instances, so why make another one?

Let's say you want to make a stack of containers using instances? This is how the result would look like in most cases. The same prop, just repeated in X and Z, using the same texture as the original prop, as that is what an instance is, a clone of the original.



Now, we do the same thing using Stack'Em Up, and the result will look like this.

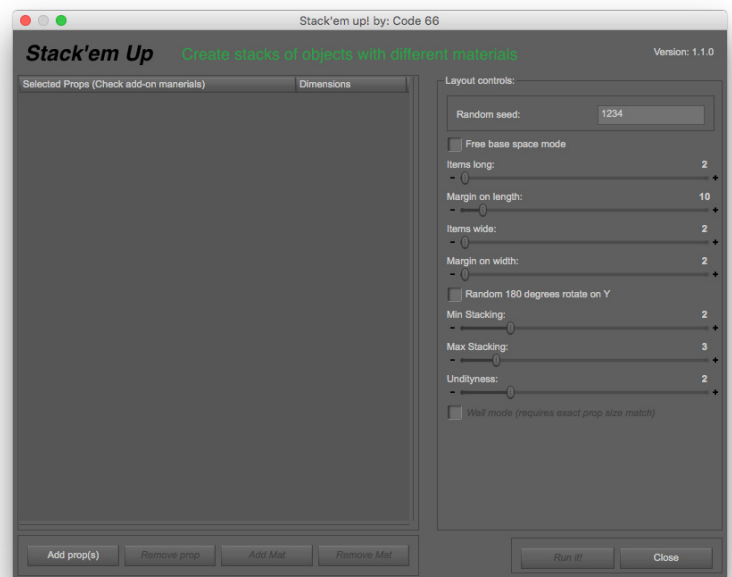


There you see why this script came to life, bringing the power of instances to the next level.

So, how was this done? Well, if you keep reading you will learn how to make stacks, lineups and even build your own walls using Stack'Em Up.

So, we start with the shipping containers when you have the result fresh in memory.

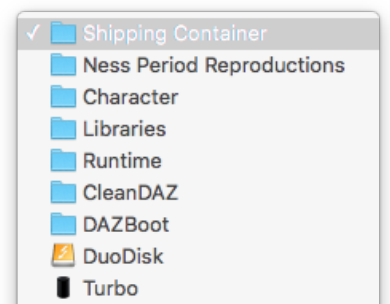
We start the script, and the script dialogue is shown.

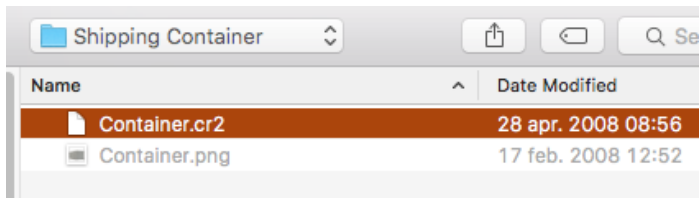


First we need to locate the Prop(s) and Figure(s) we want to stack. In this example we will only use one figure, the Shipping Container. Click the Add prop(s) button to show a standard file open dialogue, and navigate through the content directory, or directories, to locate the item, or items, you want to choose. Any prop that DAZ Studio opens can be used, and in this case we are using a Poser Figure with DAZ Studio Materials.

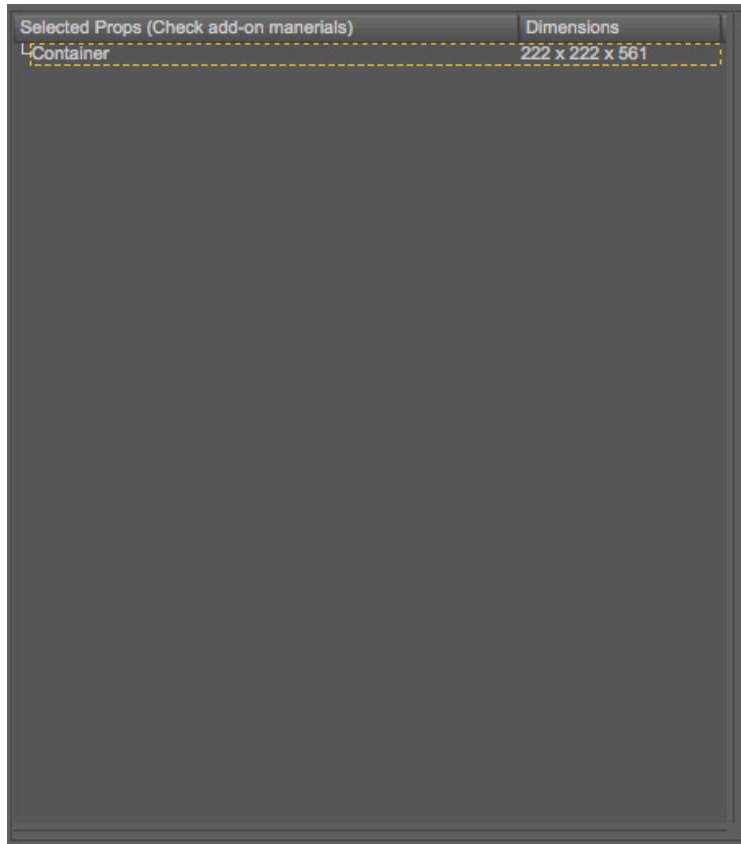


This is the hierarchy on my system to locate it. CleanDAZ is my content library, and Poser figures are located in Runtime/Libraries/Character directory, and then down into the actual product folder.



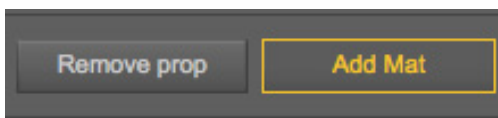


We select the file, container.cr2 and click open. Now, the Prop just loaded is visible in the props list in Stack'Em Up.



You see the dimensions of the prop in DAZ Studio units, which is a good reference when you load several props, if they are too different in size, the result will not be as good as it can be.

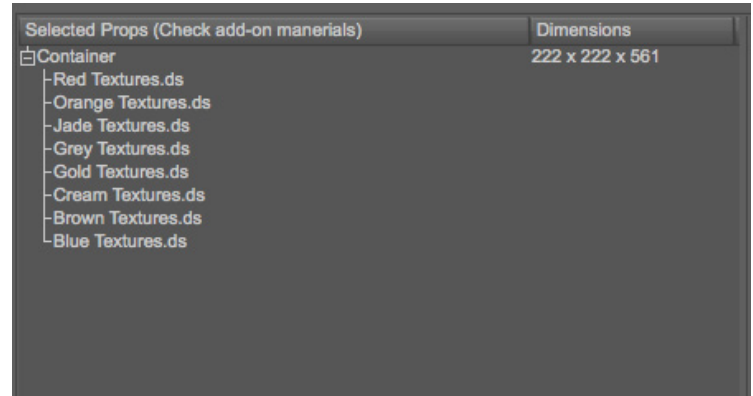
Now, select the prop in the list, Container, and the Add Mat button becomes enabled.



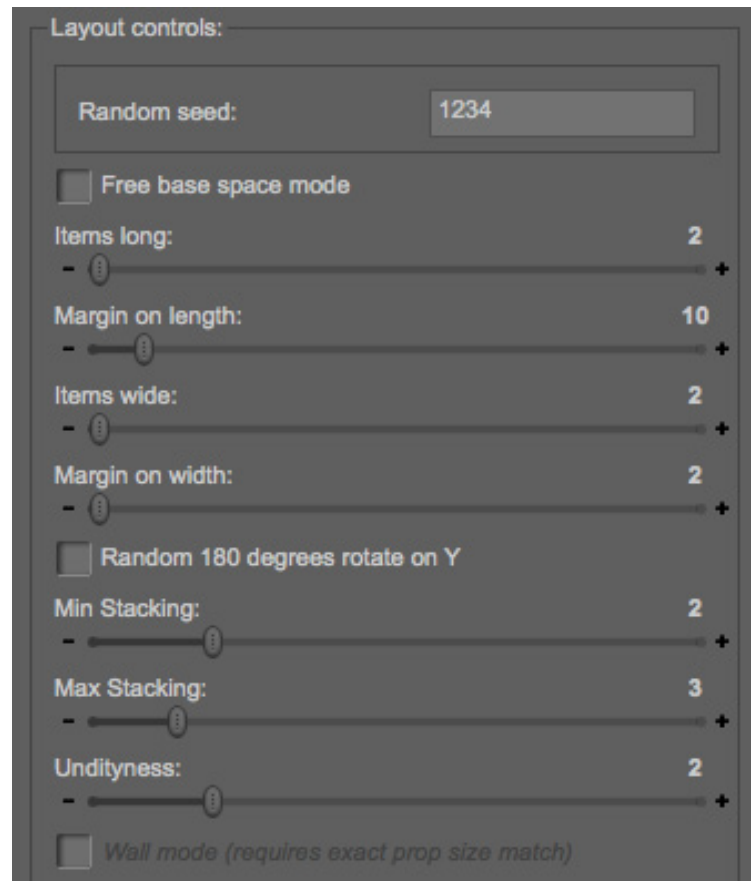
Click on that button to show another file Open dialogue, where you navigate to the Material files. In this case, as it's a Poser item with DAZ Studio materials, there will be both .pz2 and .ds material files, so you can choose either as DAZ Studio will do the right thing.

Remember to only pick materials that do important changes. If you for example would have several material files in this case chaining only the number of the crate, the final result would not be perfect as the crates would all have the same base color as the loaded prop. A good tip is to setup and save your own material setups, and maybe tweak for Iray at the same time, and then pick among those.

Now we can see the different material options that we have available for this prop right in the list. You can remove materials and props using the corresponding buttons.



It's now time to turn our attention to the other half of the Stack'Em Up dialogue, the Layout controls. Below is the settings used for making a great looking container stack that could be on any large Asian port.



The controls are quite self explaining but I will run through them just in case.

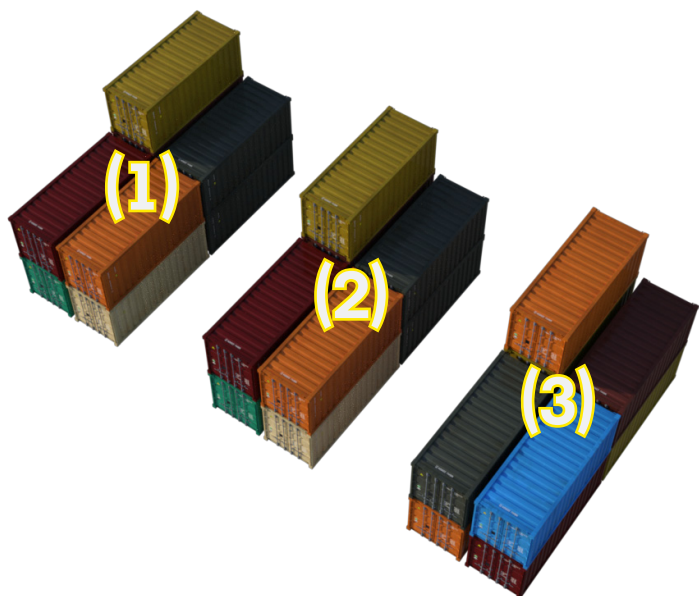
**Random seed:** Sets the seed for the internal random generator. Stacking the same items with the same material options using the same random seed will render the same result.

**Free base space mode:** This option should only be used if you are stacking multiple different props and you want the stacks to contain different objects, not the same object with different materials. This option will void the stack pack algorithm by using the largest ob-

ject as the base space for all other objects. Use this carefully, if it looks ugly because you used this option, it's because you used this option.

### Random seed explained

The three stacks in the image below are all generated using the same prop and the same material options. Stack (1) and (2) were done using the same Random Seed and stack (3) using a different random seed.



**Items long:** How many items should be placed on the X-direction.

**Margin on length:** Controls how much extra space will be between each placed props in the X-direction, and also used in the Untidiness calculations.

**Items wide:** How many items in the Z-direction the stack will have.

**Margin on width:** Controls how much extra space will be between each placed props in the Z-direction, and also used in the Untidiness calculations.

**Random 180 degrees rotate on Y:** If this checkbox is checked, items will randomly be rotated 180 degrees, showing the backside.

**Min Stacking:** The minimum number of props stacked on top of each other, the number can be from 1 to the Mac Stacking, but if they are the same, the stack will have an even height.

**Max Stacking:** The maximum number of of props stacked on top of each other.

**Untidiness:** This controls the imperfection of the stacking. Sometimes very useful as I will show you later.

**Wall mode (requires exact prop size match):** This checkbox sets Stack'Em Up in the wall builder mode and we will come to this one later. As it says, wall builder requires that the Props, if more than one prop is loaded, has an exact match in size. You can override the exact match requirement by checking the **Free base space mode** check box, but the results cannot be guaranteed if you do.

To simply explain the reason for this, just try to make a brick wall with unevenly sized bricks, and no mortar to fill the gaps with.

### Free base space mode explained

The Free base space mode will allow you to do stacks and walls that would normally not be allowed as the dimension difference between the selected props are too big, or you want to randomize the props not on a per stack basis but on a per prop basis. This option, as mentioned before, might create results that are not as good as they would be, but if you use it the right way, you can achieve results not possible otherwise.

The reason for this option was letter props, where users wanted to stack those letter props making secret messages with random letters. The problem was that without this option, the letter would come out on a per stack basis, not looking very random at all. Disclaimer, I don't have any sets with letters with a good thickness, so I used the letter props from Hollywood set.



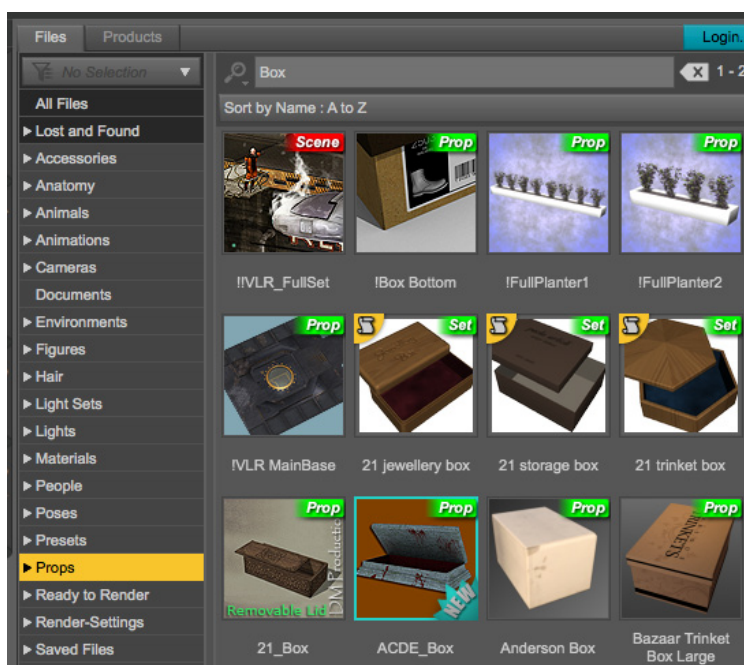


So, now we have set the controls to create a 12 x 2 stack ranging from 3 to 6 units high, we click the Run It! button and sit back and enjoy while DAZ Studio builds your stack.

But not everyone is enjoying large stacks of containers from Asia, but rather what's actually in them. So, the next example will be shoeboxes, or at least boxes.

But first another hint to help you easily navigate the Content library from the file open dialogue, which sometimes can be a pain.

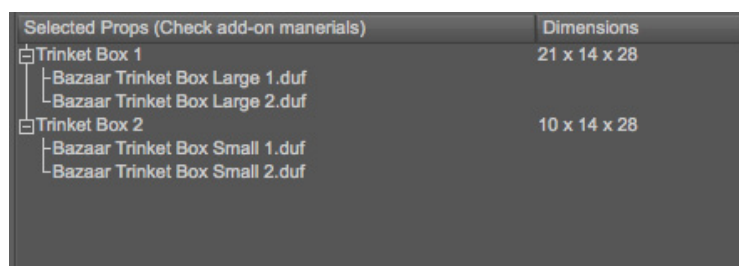
Most of you are used to see content through the Content Browser or the Smart Content browser, but there is no way to really make the file picking as simple as that unless you implement a full browser within the script. But, as always when it comes to DAZ Studio, there are smart shortcuts you can use, to speed things up and make your life a little easier.



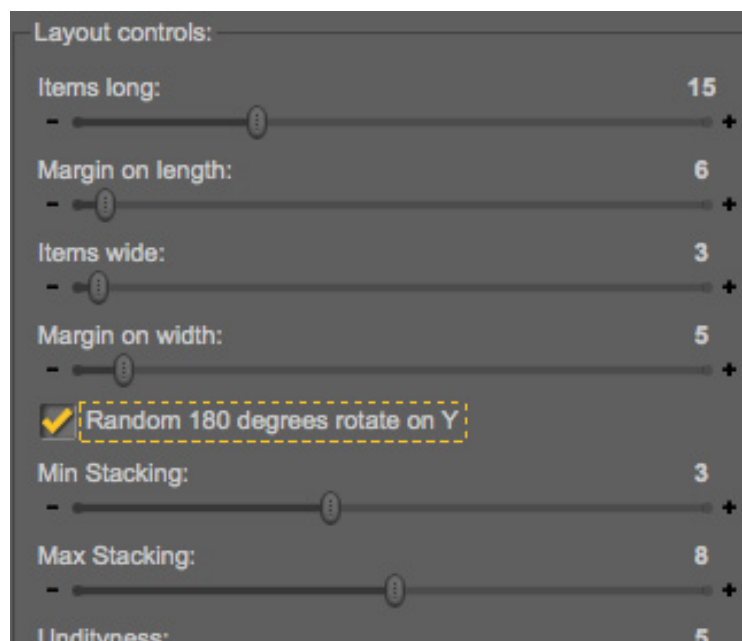
For my next example, the shoe boxes (which came up as a request in the forums), I need to find some boxes, and the best way to search is through the Content Library or the Smart Content. I used Smart Content, searched for Box in Props, and found these nice Trinket boxes from the Bazaar set. Right click the icon and select **Browse to file location...**

Now you can run Stack'Em Up, and when the file open dialogue is shown, depending on if you are on Windows or macOS, one way or another make the file open browser go to the file window that you just opened. In macOS, you just drag the any item from the Finder Window to file open dialogue, how you do on Windows maybe someone can explain.

Now we add the two existing materials for each of the trinket boxes, I bet you now can figure out how, and this is what it looks like.

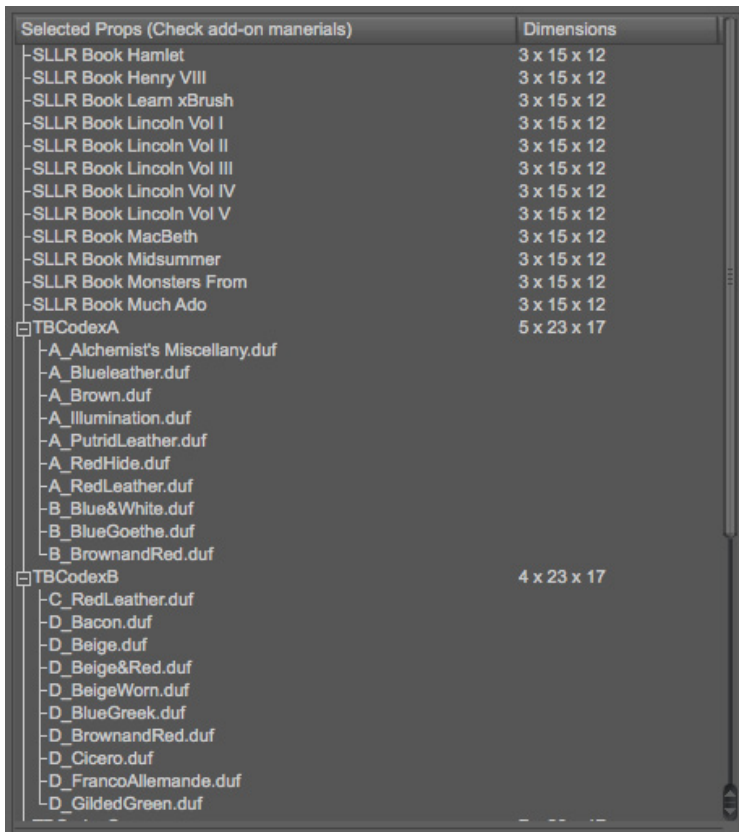


Now we setup the Layout controls for this, we want a 15 x 3 stack with a decent height and height variation, like a pile in a shop behind the Staff Only door.

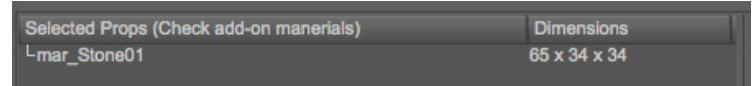


So, we have done containers and shoeboxes, but there are more things that can be stacked or lined up. Let's do something more difficult, let's make is a row of books.

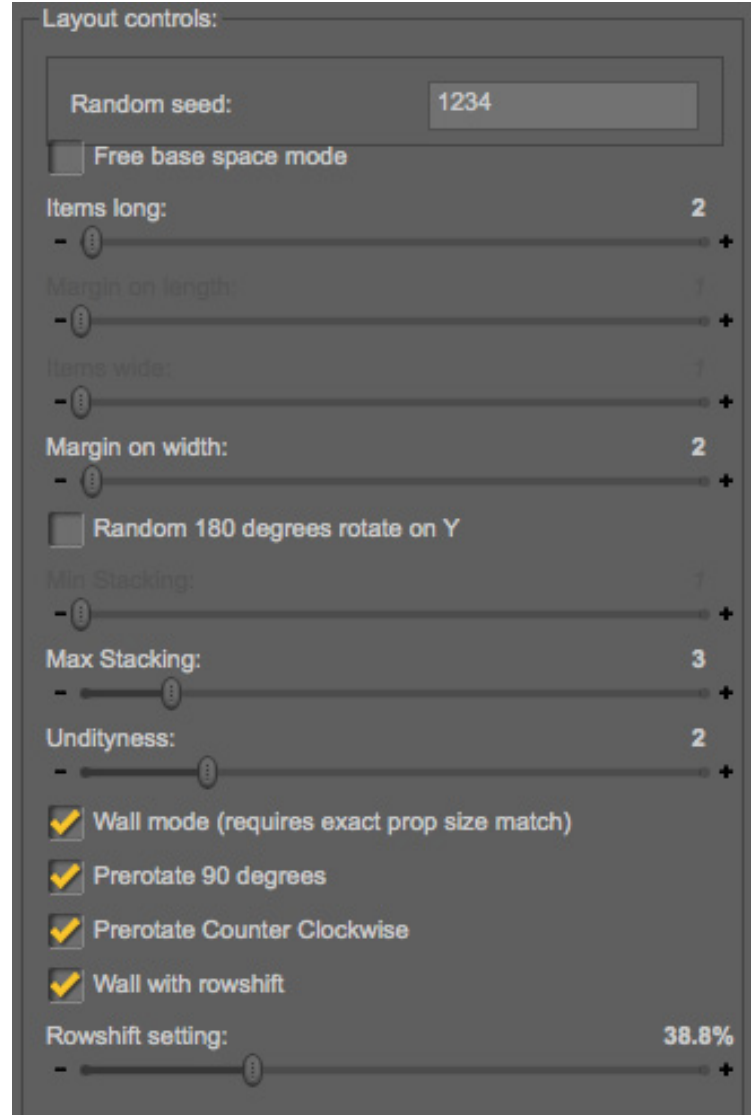
It took some time to find books, but after a while I did, and these are the props and the materials I loaded.



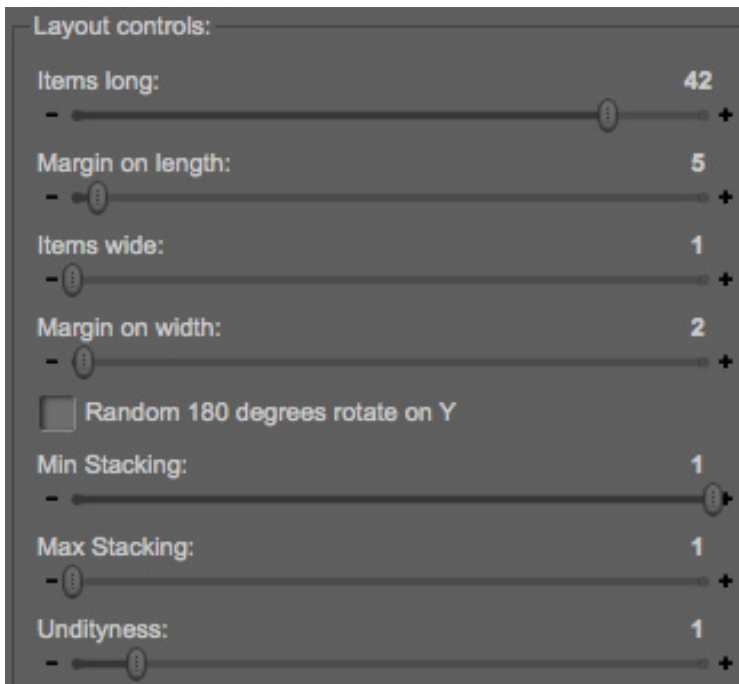
Now, let us go back to the Wall mode, and what you can do with that. For this I will use a stone block prop, only one, as it was difficult to find any blocks that comes with more than one material.



As there are no additional materials available, we can just ignore setting materials, but we will use the rotate 180 on Y setting make it look less repetitive.



And the Layout control looks like this, most important is to set box Min and Max Stacking to 1, and Items wide to 1 also.



As many books only have one material to choose from, adding many props makes the book row look better.



A nice little row of that is.

When you check the Wall mode, a few new parameters are shown.

**Prerotate 90 degrees:** When this check box is set, the props are rotated 90 degrees before they are moved into place. This is good when building a wall with props that have the wrong default position for your wall.

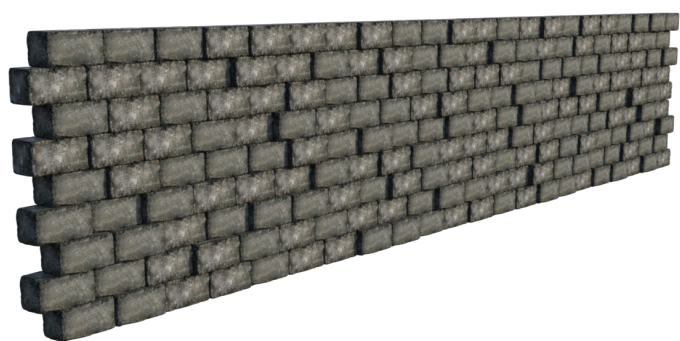
**Prerotate Counter Clockwise:** When **Prerotate 90 degrees** is checked, this option becomes visible. The default rotation directing is clockwise, but sometimes you might want to rotate them counter clockwise instead, then use this setting.

**Wall with rowshift:** This setting is almost a must when making walls as it will make it look so much better, and real, as no one would ever build a wall without rowshift as it would fall down as soon as it was raised.

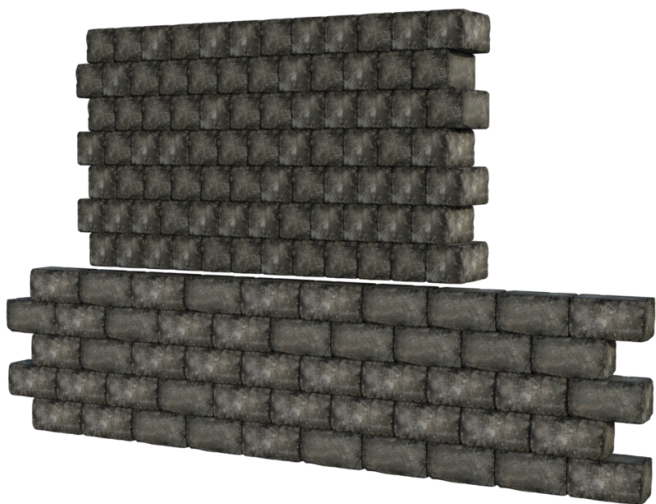
When rowshift is checked, a slider where you can set the rowshift percentage, how much the rowshift is per row.

The Margin on length and the Items width sliders are disabled as they do not do anything with in the Wall mode, so also the Min Stacking.

The Margin on width parameter, in the Wall mode, effects the Z-position Untidyness, so it is used in conjunction with Untidyness. You might need to build a few walls with different blocks before you find something you like.



This is the wall we just built, as you see the untidyness in the Z-direction is quite visible here. Below you can see the difference between Prerotate 90 degrees and not.



So, I hope you now have the basic grasp of what you can do with Stack'Em Up, and keep on stacking!