Interiors – without edges

A Clinic given at KC2018, Kansas City National NMRA Convention
by Jeff Gerow

We're going to add interiors to our models that look good whatever angle you look at them, appropriately changing as your point of view changes. The "secret" is the coved floor which looks realistic when viewed from above, a trick I learned from TV studios and theater.
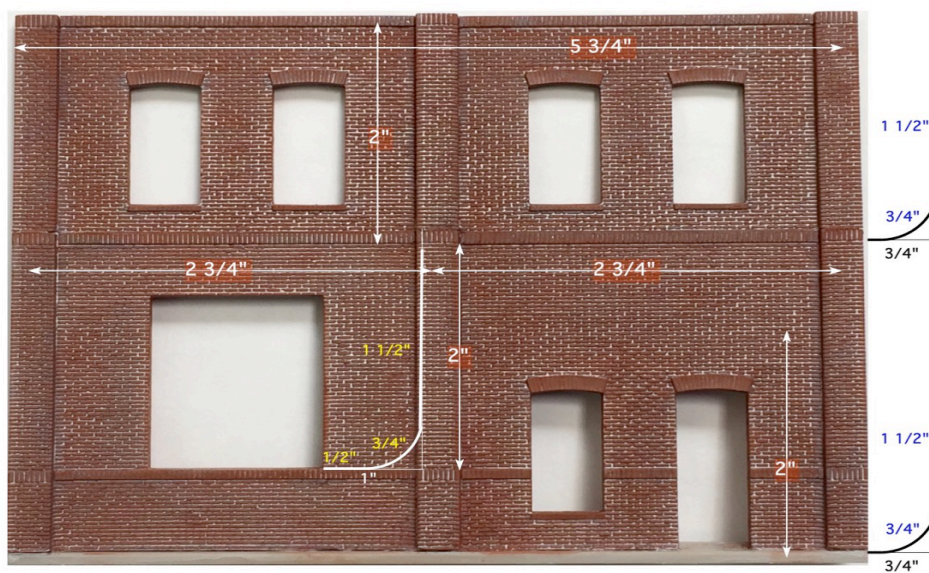

Sizing the Window

Once you've found a window to fill – determine how big the image behind it will need to be. You'll want to determine where the room walls will be for the use you intend. It's generally best to include an opaque divider between window sets, hopefully far enough to be "out of sight" (and painted black to help that). On the demonstration model shown, this worked out to 2 3/4" wide – which becomes the horizontal dimension for each interior image.

I found that 3/4" of an inch is a good set back for the interior image. That corresponds to about 6' in HO scale. Near objects in the image thus seem about 6' back from the window. That not only looks appropriate but is far enough back to be able to light it evenly. An open area like a loading dock can be a little deeper to allow for placing more front "actual" detail; for example, on the demonstration model the loading dock is 1" deep. Going further back than 3/4" doesn't improve the overall effect, it actually can seem a bit too far away.

When considering how high to make the interior image, note how tall the windows are and where the floor hits the exterior wall. On the demo, the windows are tall (7'), and set low on the wall – so the
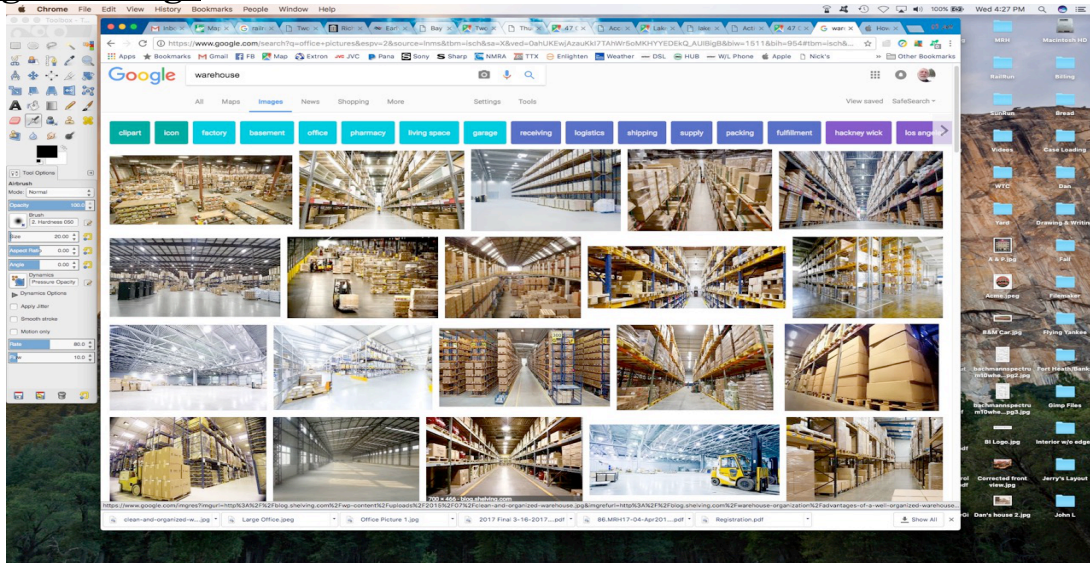
interior images are 2 1/4" of visible image with some fold-over at the bottom, demonstrated graphically below. Keep in mind where scale "eye-level" will be as you choose and trim pictures, more on that later.

Interior Measurements

So, for this demonstration model, images 2 3/4" wide and 2 1/4" high will "fill" the windows and loading dock.

Finding the Image

Search Google Images for images that look like they were shot through a window. Search for "Warehouse", "Loading dock", "Office", "Vintage Office", "Reception", "Waiting Room", or various store interiors... of course depending on the intended business behind your window. You can, of course, also create images (how good an artist are you?); or take photos of actual rooms.

Once you find an image you want to use – download it to your desktop.

Processing the Image

Download and run GIMP [www.gimp.org]

Open your chosen image in GIMP. I'll be demonstrating with the conference room that will end up above the loading dock. It's called "Office Picture 1"

We'll be working in inches, so in the lower left of the GIMP picture window make sure to set inches – it will make it much easier for us Americans. There are a couple of other instances where you will need to set "inches" - make sure the numbers make sense...
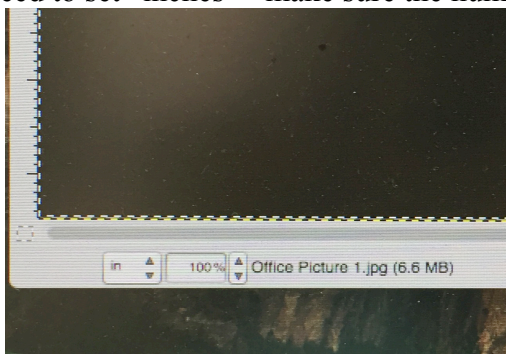

Adjust Resolution

Further, since we're making only a very small picture, we need to make sure the resolution is high enough that we can see some details at that size – I use 300 pixels/inch (standard print resolution). Thus, the first step in GIMP is to adjust the resolution of the image to 300 pixels/inch

Under the "Image" tab, you'll find "Scale Image". Clicking gives the "Scale Image Window" – leave the X & Y resolutions "linked" [the chain icon to the right is connected] and change either resolution to 300 pixels/inch (both will change when you press "Scale").
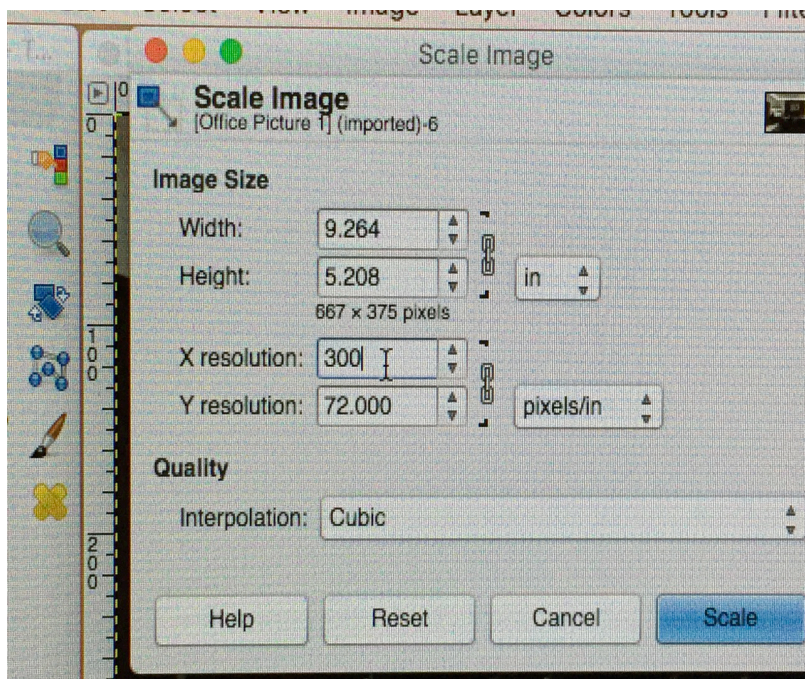
Adjust Width

Return to the "Scale Image Window", now we need to set the width. Leaving the size "Linked", change the "Width" to 2.75 [of course it's in 100th's of inches] and press "Scale".
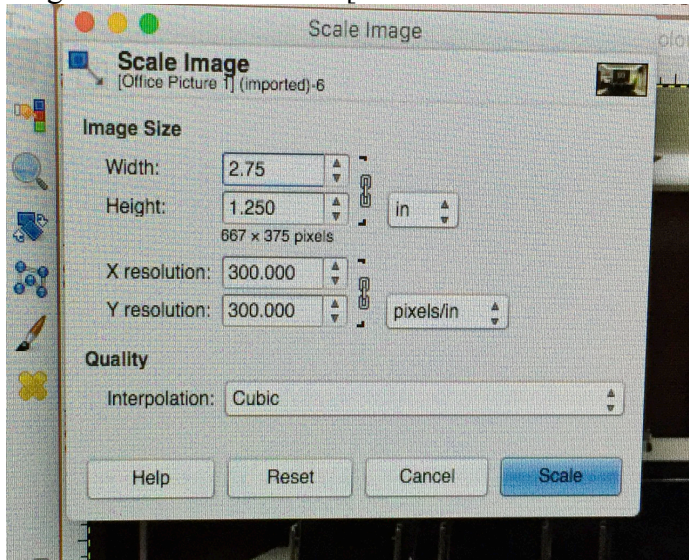

Stretch Height (If necessary)

Now look at the picture and see if the height of the main part of the image is high enough (in scale). It generally is – but if you need to stretch it out – you can further "Scale Image" . Unlink Width and Height and make the height stretch to whatever you need.

Extend Floor

Generally the height is good (in scale) and all you need is a bit more floor – so let's see what's involved in making the floor bigger.

Since we're making it bigger, we'll need to enlarge the "canvas" on which we're creating. We don't need to make it wider, just taller – 2 1/4" is nominal – so let's make the canvas at least 2 1/2" tall. Again in the Image Tab, click "Canvas Size". Make sure Width and Height are not linked, then change the Height to 2.5" and click "Resize". With no "Offset" the canvas will extend at the bottom of the picture, just as we want.
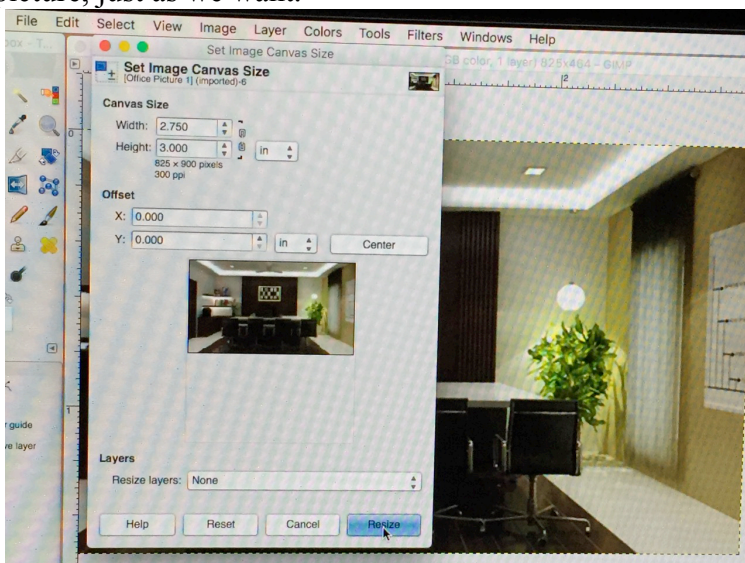
Next – Create a new Layer so you don't affect the base image – Use Layer Tab – "New Layer" command.

Next create a box where the floor will extend with the "Rectangle Select Tool" (Upper left in the Toolbox). Create a box that covers only the extended canvas below the image. You'll need a total height of 2 ¼" so the 2 1/2" height will give some "wiggle room".

Now to fill that box with color! Choose the "Color Picker Tool" (medicine dropper icon) and look down in the Tool Options to make sure that the "Source" is the "Image" and "Sample Merged" is checked – to be able to "see" the picture through the new layer. Pick a spot, in this case under the table, with the dropper tip; and click to load that color into the foreground pallet. Choose the Bucket Fill Tool (a bucket tilting) and click it over the rectangle you made. Magically, the floor is all the same color.
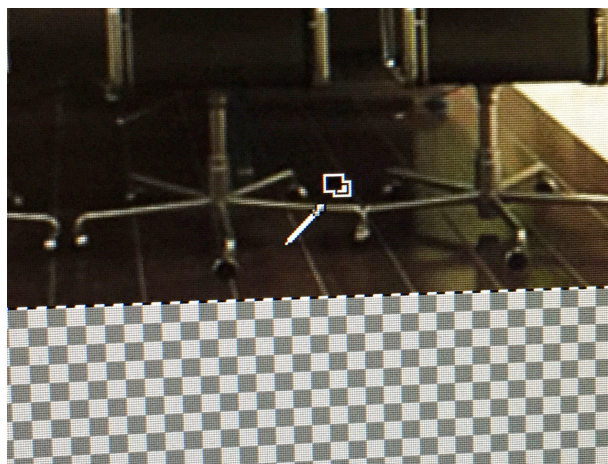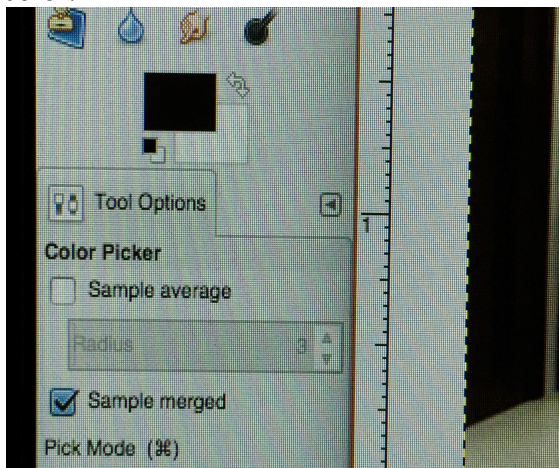

This might be enough – but you can extend some of the floor textures onto this "same color" box you've made -- using the Clone Tool (Date Stamp icon). Choose the Clone tool and make sure the "Source" in Tool Options is the "Image" with "Sample Merged" checked. Choose a spot on the image that you want to clone (on a Mac) by holding down the "cmd" (little 4-leafed clover) key and clicking the mouse. That spot chosen will be cloned wherever you click the mouse and will fill in as you move.
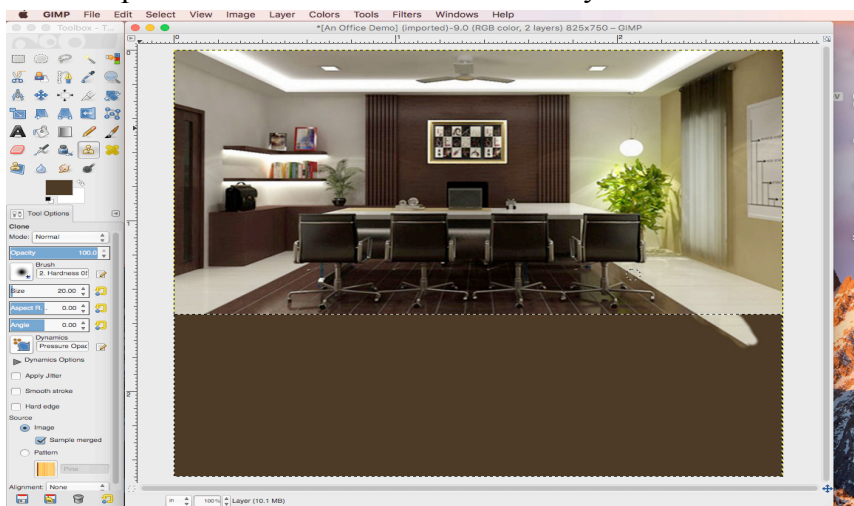
As you do it a bit, you'll get the feel of "staying within the lines" as you fill in the floor. Remember that you have control of the pattern, size, edges, and especially opacity down in the Tool Options. And the most wonderful thing is that each "click and move" until you release the mouse is erase-able.

Print the Interior Image

Once the floor is extended and painted, you need to print it out. I like to "Merge Visible Layers" (under the "Image" Tab) to make sure a layer doesn't get forgotten. Then I "print" to a pdf file on a USB "stick" to "SneakerNet" to my wife's printer – which could be at Staples, if your husband/wife doesn't have a nice printer. Make sure to check the "Image Settings" Tab in the Print dialog box to make sure the size hasn't been changed, especially important if you enlarge the canvas and add several layers of room interiors to print on one sheet (Ask why I found this adjustment...)
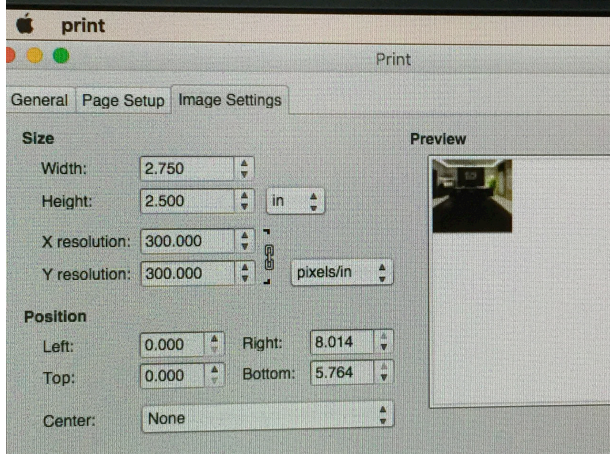
Processing the Print

Dullcoat the Printed Image

Cut out the printed room image(s) and use a small loop of blue tape to hold down for spray painting. I use an airbrush to seal the pictures (both sides) with Testor's Dullcoat. I suspect you could use aerosol cans of dull coat (or other matte covering) – gently, as well – but I am a big fan of airbrushing Dullcoat – it's actually worth the cost of an airbrush – it's that much better.

Prepare the Building for Installation of Interiors

Add Walls

The room(s) will need dividing walls and ceilings to attach the images. Using 3/4" wide strips of stryene (I used .030" thick sheet), create room dividers and ceilings at the more-or-less correct level. These should all be 3/4" deep, unless a room needs a deeper rear wall – for example the loading dock in the demo is 1" deep. Floor structure is unnecessary as the picture forms the floor where it attaches to the wall.

Make Walls Opaque

Spray the rear of the building with black paint to make sure there is no light leakage [Some plastic panels aren't even opaque enough on their own, so paint helps] Once windows and lamps are installed, check for light leaks and use more black paint. Use a really bright light to see if there are light leaks, especially around the windows and other openings – easy to fix now – a painful reminder later... Painting the ceiling(s) white can be useful for spreading the light – but realistically, it's virtually impossible to see ceilings inside mounted buildings on a layout.

Wiring and Lighting

Light Quality - Diffusion

Depending on the sources you use, you may need to give the lamp or LED some help in filling the "room". In theater, lighting designers take advantage of materials developed specifically to alter the quality of the light, we can too! Rosco is one manufacturer making color correction filters as well as materials to alter the qualities of the light. Fortunately for us HO scale modelers, their sample book (Google: Rosco Cinegel) contains virtually a lifetime supply of many wonderful color, diffusion and reflector materials and only costs $3-5 (plus postage)[you may even have a local lighting supply house who could supply a sample book]. I often use diffusion to spread and soften the light – Tough Frost and Light Tough Frost are good general diffusers at this scale. Another favorite is Tough Silk, a diffuser with a horizontal spread – great for spreading those single source LED's to cover 2 3/4".

Final Installation

Install windows and any other finish work before wiring. Check for light leaks as a last step before wiring. This demonstration building has a different light source in each room and uses some diffusion as shown. The lamps/LED's are glued in with Liquid Nails Project glue, generally facing about 45° down. The wiring was attached with Liquid Nails as well, near the front wall (invisible) when possible.

Loading Dock
The lower left loading dock has a 12-14V lamp, a Life-Like left over from when that was still a company. It has a small piece of aluminum foil behind it – both as a reflector and to separate the bulb from the plastic floor (there is an air gap around the reflector). The bulb has a "blotchy" light output – which is improved substantially using a layer of Rosco Light Tough Frost diffusion. 12VDC is applied directly to the bulb.

Reception Desk
Next to the loading dock is the Reception Desk – lit with a single T1¾ LED from LEDtronics.com, with Tough Silk to spread the beam horizontally (the "Frost" above is a general diffuser – silk has a horizontal (or vertical) component). A 1KΩ resistor limits current to the LED.

Warehouse
Above the Reception Desk is a warehouse – lit with a single SMD (surface mount) LED from LEDBaron.de (through eBay, generally) that comes with magnet wire leads attached (a truly wonderful thing). It is very small with high output over a very wide area and needs no diffusion. A 1KΩ resistor limits current to the LED. Sources seem to change almost daily for these on eBay – best option is to search for "SMD LED with leads". It's really OK to order these from China (or at least it has been) – they are also available from US sources (like Richmond Controls) but are 6-10 times more expensive

Conference Room
And above the Loading Dock is a Conference Room, lit by one section of the Warm White LED strip available from MicroMark. One section is 3 LED's (the minimum size that can be cut off), and can be connected directly to 12VDC; but here has an additional 1KΩ resistor to furthervlimit current. This was a last minute replacement for a very yellow "Warm White" LED that I could no longer stand. For a permanent installation, I'd use a bit more resistance to better match the levels in the other rooms. These strips from MicroMark are quite good and consistent in color and output. I'm also using them to light passenger cars.

Install the Images
Align and trim to fit
Now is the time to line up the picture in the window. First, imagine a 6' tall person standing at the rear of the picture and use this eye-line to match where 6' shows on the exterior of the building.
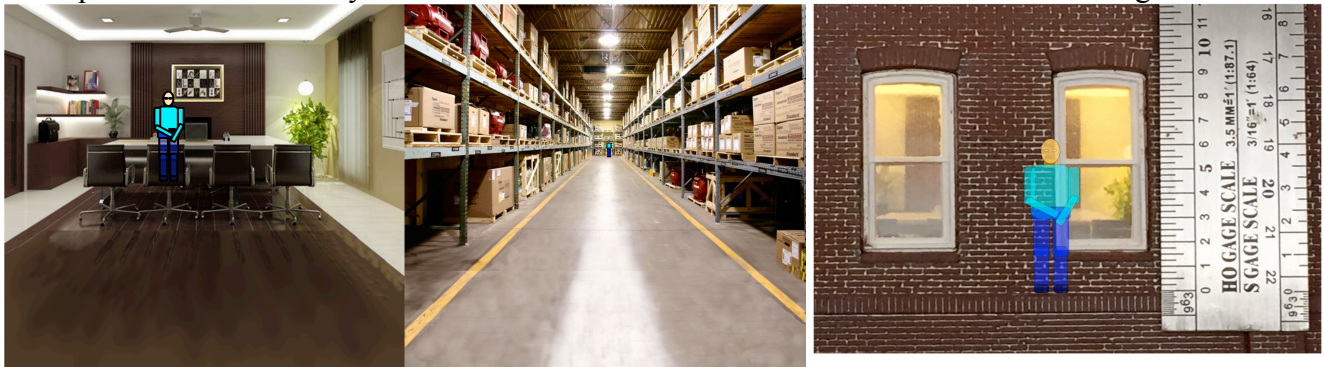

The height of this "6' tall person" will vary greatly depending on the picture you're using The horizon is always at eye level and should be consistent from one window to the next. Trim the prints as needed

and fold the bottom of the floor carefully, where it will be glued to the wall. Take your time and make sure you are happy with the look before committing to glue. It is very useful to wait until the lights are in before this step.

Glue in Place
I use Woodland Scenics "Scenic Accents Glue" for attaching the interiors – it allows a bit of repositioning and seems to hold forever once pushed down. Put a line of glue below the floor level on the rear of the front wall and along the rear of the "ceiling" plastic strip. When the glue is dry/clear, place the interior gently into the floor glue and check through the window to make sure it's level. Gently attach the top and view through the window, step back a little – and make sure it's just right. Small changes in attachment make big changes in leveling the image. When it is wonderful, press down on the glue lines (I used the opposite end of a tweezer on the floor glue line, finger on the ceiling glue line).
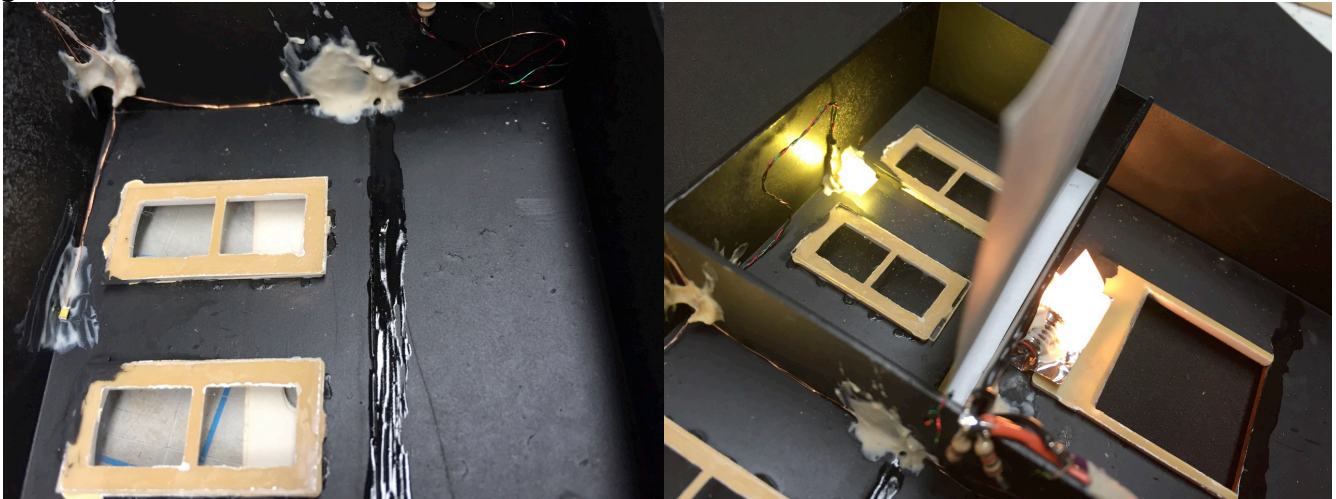
Flatten the Back
Finally, add a flat plastic back to flatten each room's rear "wall" and enjoy your new interiors.