

PHOTOSHOP ELEMENTS AS A MODELING TOOL

Jack Burgess © 2021 Rev. 4/6/21

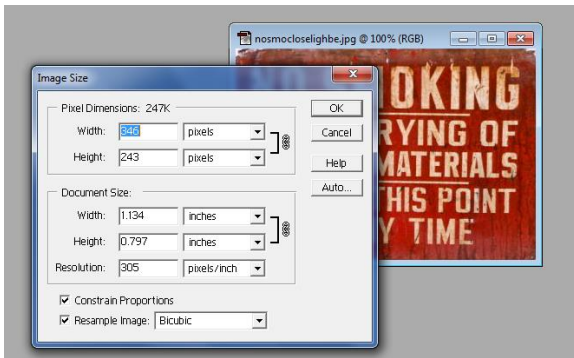
I am currently running Photoshop Elements 2019 on a Windows 10 computer. If you are running an older OS, earlier versions of Photoshop Elements might work. The most current version is Photoshop 2021 which is available on Amazon and other online retailers. (It is listed as "Adobe Photoshop Elements 2021 [PC/Mac Disc]" for \$74 limited offer.) Note that the software does not come with an instruction manual. The "Photoshop Elements 2021 For Dummies" gets good ratings on Amazon).

TOOLS

Note that all comments below and in the clinic relate to the "Expert" choice at top of the screen. Many of the tools have options which show at the bottom of the screen when a tool is selected. Click on Window/Info or Window/Navigator from the menu the top and a dialogue box will appear with various tabs such as History, Navigator, etc. That box can be moved around.

SIMPLE SIGNS

To download a graphic such as a sign from the Internet, right click on the sign image that you want to copy and then select Save Image As. Open the file and Ctrl A then Ctrl T to transform the image. Point the mouse at a corner to get a



two-headed arrow and rotate the corner as needed to straighten the image. Click on the green arrow accept the change. Then use the Crop Tool to eliminate any background by clicking in the upper left corner and dragging the box down to the bottom right corner. Use the handles on the sides to adjust the box as necessary. Depress Enter or click the green checkmark to complete the step.

Use Image/Resize/Image Size to find the actual size of the graphic or sign. The "chain" between Width and Height means that the proportions are constrained...increase one dimension and the other increases proportionally and vice versa. That "chain" is set with the

"Constrain Proportions" check box. If you uncheck the Resample Image checkbox, the Width, Height, AND resolution are linked. A higher resolution provides better detail. With Resample unchecked, increase the size of the graphic and the resolution will decrease. Likewise, decrease the size of the graphic and the resolution will increase. If the size of a graphic is increased too much, the resolution will go down too low and the image will pixilate and be useless.

To determine how big our final sign needs to be, divide the desired size (in inches) by the scale factor. Let's assume that our sign should be a scale 24" wide. In HO the graphic needs to be 24"/87 or 0.27" wide. Type the desired width in the Width dialogue box and click OK. If a sign needs to be adjusted for whiteness, etc., adjust it with the Enhance/Adjust Lighting and then the Brightness and Contrast feature. Print it on gloss photographic paper for the best image.

To print more than a single copy of the sign per sheet, first change the Canvas size (Image/Resize/Canvas Size) to a larger size such as 4x6 or 8x10. Use the Navigator tab and slider to zoom out to see the sign. Use the Marquee Tool to draw a box around the graphic; this box only needs to include all of the sign and some space along the graphic. Use Edit/Copy (or Ctrl C) to copy the graphic. Then Paste (or Ctrl V) to make a second copy. It will be directly over the original so use the Move Tool to move it so that it is visible. Paste as many copies as you need. You can see these Layers by clicking on the Layers Tab. To combine the layers, use Layer/Flatten Image and save as a .jpg file. Then print on photographic paper.

SIGN IMAGE SOURCES

- Google's Image Search (Google/Images) for typical graphics
- eBay for various signs

- www.caltrafficsigns.com for traffic signs (some are for California only)
- Images of license plates for various states and years are available from a number of sites

RESCALING BUILDING PHOTOS

If you have a good view of one side of a building and know the width of the building from a Sanborn map or even Google Earth (which lets you measure the width of the building; see next paragraph), print the photo and measure the width of the building with an HO scale ruler. Divide the known width by the scaled width and multiply by 100. That will give you the percentage that the photo needs to be enlarged. Open the photo and click on (Image/Resize/Image Size). Change the "Width" drop down box from Inches to Percent and type in the percentage that you calculated. The resulting photo will be HO scale. Print it and you can then measure the width and height of the windows, etc.

Keep in mind that if a building still exists, you can measure it using Google Earth or Google Maps. In Google Earth, input the location (such as the city) and zoom in enough to find the building. Click on the "Show Ruler" from the icons at the top of the page. Select "Feet" as the measurement option. Click on one corner of the building and then the next corner. The length will be displayed. Keep in mind that you might be measuring the length of the roof and not the length of the building unless you zoom in to a 3D view. Also, buildings tend to have been built to even measurements such as 10 feet, 25 feet, etc.

Google Maps also has this option but it isn't quite as easy to use. In Google Maps, switch to the Satellite view by clicking the Satellite view icon. Move to the location that you need. Right click on the map and chose Measure Distance. Then click on the other end of the building or object.

SCALING FROM HISTORICAL PHOTOS

In order to scale a historic photo so that you can measure various items in the photo, you need at least one "known" dimension and the photo needs to be a "straight on" view of the building or freight car. If it is a building, you might know the length of the building from Google Earth (see previous topic). If it is a freight car, you might know the axle spacing of the trucks (typically 5'-6" for cars since the 1920s or so). You can also compare the wheel diameter (typically 33") with the axle spacing then then use the axle spacing.

For the example of the freight car with an unknown truck axle spacing, use the Rectangular Marquee and draw a box equal to the wheel diameter which is 33". Assume that the Info box shows the Width as 0.700". Then draw a box to measure the width of the axle spacing which is 1.300"

You now know three things:

Known Actual Length – 33"

Known Measured on Photo – 0.700"

Unknown Length Measured on Photo – 1.300"

To get the axle spacing:

$$\frac{\text{Unknown Length Measured on Photo times Known Actual Length}}{\text{Known Measured on Photo}}$$

Or

1.300" x 33" divided by 0.700" which equals 61.2" or 5 feet. You need to keep in mind general known facts such as axle spacing was typically 5 feet or 5' 6".

PHOTO MEASUREMENT CONVERSIONS			
Known: These are the actual length of an item and how long it measures on a photo			
	Feet	Inches	
Actual Length:	0	33	
Measured on photo:		0.700	
Unknown: This is the length of what you want to know as measured on the photo			
	Feet	Inches	Inches
Measured on photo:		1.430	
Actual Length:	5.618		67.41
Actual Length (rounded)	5	7	
Actual Length (rounded)		67	

If you are comfortable with Excel spreadsheets, I have an Excel spreadsheet on my Clinics handout page which lets you input the length of a known item, its scaled width together with the scaled width of something you don't know. The result is the width of that unknown. The graphic to the left shows the same calculations shown on the previous page.

STATION SIGNS FROM HISTORIC PHOTOS

Open the photo and crop the photo close to the sign. To straighten the image, turn on a grid (View/Grid). Select the entire sign (Ctrl A) and then Ctrl T. Position the mouse just outside of a corner to get a two-headed arrow and rotate the image to align with the grid. Turn off the grid (uncheck it in the drop-down menu). Use the Marquee Tool to draw boxes around the sign and Delete the background. To eliminate keystone, use Ctrl A, then select



Image/Transform/Skew and drag the lower handles inward or outward. Select Enhance/Adjust Lighting and then Brightness/Contrast to fix any contrast problems; increase the contrast to make the blacks blacker and increase Brightness to make

the sign whiter. Clean up the background of the sign if needed using the Eraser. When using the Block eraser, holding Shift will constraint the movement to horizontal or vertical. If you click on the two-headed arrow next to the Foreground Color/Background Color at the bottom of the Tool Box (image at left), and reverse the colors, the Eraser will produce Black instead of erasing things, good for cleaning up B/W sign borders.

MAKING YOUR OWN SIGN GRAPHICS

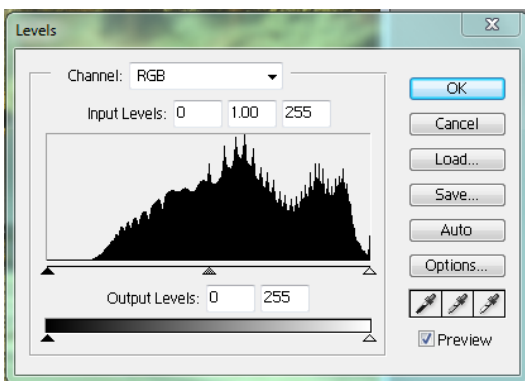
Photograph objects around your home to make your own graphics including flags, station clocks, posters, calendars, etc. Open the photos in Photoshop Elements and follow the techniques under "Simple Signs".

WORKING WITH LAYOUT PHOTOS

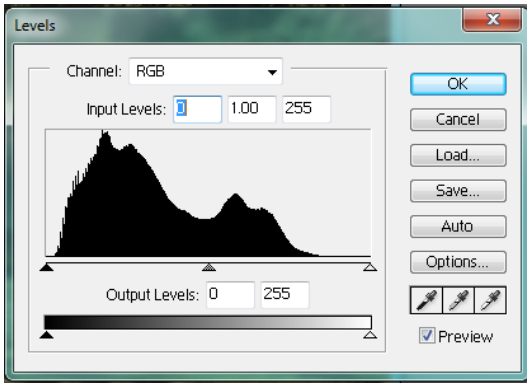
Note that .jpg files are fine for publications, both print and online. The minimum resolution for print magazines is 300 dpi (I submit 10" wide photos). For photos which might be spread over two pages, the photo needs to be 17" wide but staff can work with 14" wide by 300 dpi photos. The online *Model Railroad Hobbyist* magazine also requests photos to be a minimum size of no smaller than 2400 x 1600 pixels which is 8" by 5½" in size. I typically submit 10" by 100 dpi photos for how-to articles. When saving .jpg files, always Save As with a Quality of 12.

Levels - Use Enhance/Adjust Lighting/ Levels to darken or lighten a photo

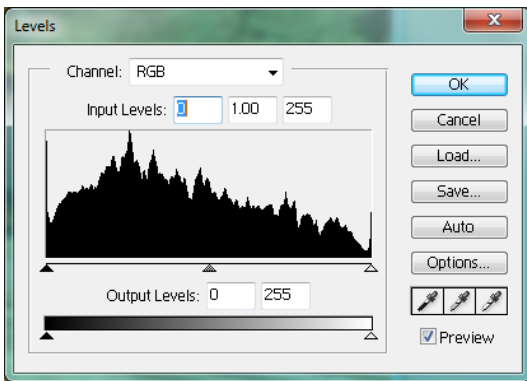
To make a photo darker or lighter, adjust the Levels rather than the Brightness/Contrast. (Brightness/Contrast should be reserved for graphics like signs.) To adjust the Levels, click on Enhance/Adjust Lighting/Levels. The histogram is a graph of the distribution of blacks/darks and whites/lights in the photo. Blacks are on the left and whites on the right end of the graph as shown by the graphic at the bottom of the dialogue box.



The graph to the left is of a photo which is too light as shown by the flat portion of the graph on the left side, i.e., too much light colors in relation to the amount of dark colors. To darken it, slight the Black slider on the left until it aligns with the left edge of the histogram.



This graph on the left is of a photo which is too dark. This graph is flat on the right or "white" end. To lighten it, slight the White slider on the right until it is aligns with the right edge of the histogram.



This graph is of a photo which has a pretty good range of darks and lights.

If both ends of the histogram are flat, drag both sliders toward the middle. Once you have done this, you can further lighten or darken the image if needed by moving the middle slider.

Cloning - Use the Clone Tool to replace small sections of visible fascia with scenery, remove spots, etc.

Select the Clone Tool and click on the Size slider. Pick a soft brush around 100 pixels if the resolution of the photo is around 300 dpi; use a smaller brush with lower resolution photos. You can also select a brush type by clicking on the downward arrow to the right of the curved line to the left of the Size slider. To begin, move the tool circle to the area you want to clone FROM and hold down the Alt key. The circle will turn into the cross-hair icon and then click the mouse key. Move the circle to the area to be cloned over and hold down the mouse button and move the mouse or just click the mouse. Note the "+" which shows where you are cloning from. Occasionally reset the FROM point to avoid a uniform cloning pattern. Unchecking the Aligned box will "freeze" the FROM location.

Sharpening - Use the Sharpen feature to sharpen the image as the last step after resizing if necessary

Enlarge the image on the monitor to about actual size. Select Enhance/Adjust Sharpness. The amount of sharpening will depend on the size of the photo and whether any sharpening was done in the camera itself. Slide the Amount slider until the image is sharp but not overly sharp. Note that cameras and phones will sharpen photos the second you take them unless Sharpening it turned off. If you have used focus stacking software, you will need to sharpen the photo as the last step.

Replacing a Portion of the Background with a photo of sky

First make a copy of the Background layer. To do this, open the Layers Tab and right click the space to the left of the Background thumbnail and choose Duplicate Layer. Click on the Background layer to make it "active". Then delete all of

the Background using Ctrl A and Delete. Your image will disappear from the Background layer but still be visible on the Background Copy.

Click on the Background Copy to make it active. You want to erase all of the sky from this layer. If the sky in your photo is a unique or single color, use the Magic Wand and click on the sky to select it and then Delete it. If the background is similar in color to the adjacent scenery, the Magic Wand won't work. Instead, select the Lasso Tool and use the mouse to direct the Lasso along a line between the layout scenery and the background, staying just inside the sky. Circle back and click near the beginning to form a closed circle. Delete the encircled area. The Eraser with a small brush setting can also erase portions of the sky at the joint. All of the area to be changed to sky must be erased.

The "sky" needs to come from a photo of about the same width and the same resolution as the layout photo. If the resolution is much less than the model photo, it won't fit. Open a photo with a sky to be copied. If needed, change the resolution to match the destination photo. Drag a box to encompass the sky and Copy it.

When something is pasted into a photo, it will create a new layer directly above the active one. When we Paste in the sky, we want it between the Background and the Background Copy so that it will be visible in the blank area we opened up in the Background Copy layer.

Return to the layout photo and if necessary, click on the Background layer and then Paste the sky into it. It will be centered and most likely hidden by the Background Layer. Turn off both the Background and the Background copy layers. Click on the new sky layer to make it active.

Use the Move Tool to move the sky to the top of the picture. If needed, Ctrl A and use the handles to stretch the sky to fill the upper portion of the photo. Turn on the Background Copy. Click the sky layer to make it active. If the sky is too dark for the model photo, adjust it using Levels. We can adjust the Levels of just the sky layer by having the sky layer active. When you are satisfied, use Layer/Flatten Image and Save As a .jpg file.

The transition between the land and sky may be too defined due to the erasing steps. Correct that with the Blur Tool. Set the diameter at around 45 and blur the tops of the landscape portion to soften them. You can also use the Clone Tool to clone bushes onto the sky area.