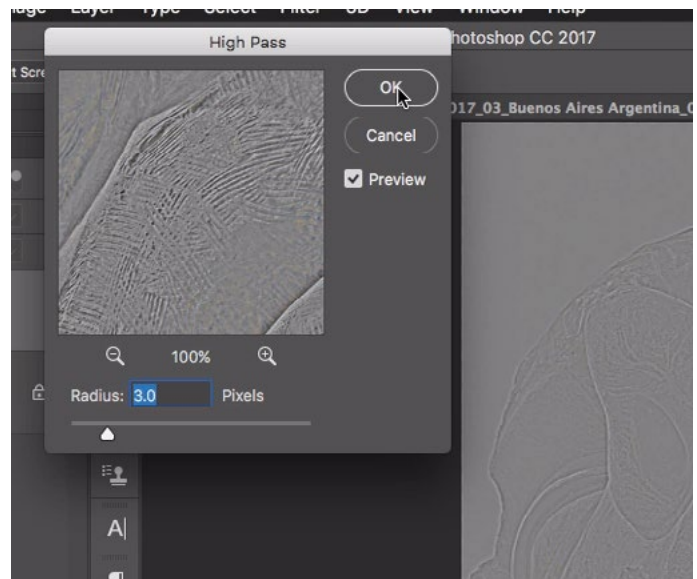High Pass Sharpening

High Pass Sharpening

In this lesson, we're going to learn how to sharpen our images using a technique called high pass sharpening. We'll also look at how this technique relates to the Unsharp Mask filter.

The High Pass filter can be accessed by going to the main menu at the top of the interface and choosing Filter > Other > High Pass. When the High Pass dialog pops up, you'll find a Radius slider at the bottom. If you drag the slider all the way to the left, you will get solid, 50% gray. As you increase the radius, you'll start to see more and more detail in the preview window.

The High Pass filter is actually directly related to the Gaussian Blur filter. When we apply the Gaussian Blur filter, we increase the radius slider to remove more and more detail from the image. The detail that is being removed when using the Gaussian Blur Radius slider is the same detail that is being added when using the High Pass Radius slider.

To sharpen an image using the High Pass filter, we'll first need to duplicate the image layer. To do this, I like to use the keyboard shortcut Command+J (Ctrl+J on Win). Then, with the top layer active, we'll go to the Filter menu and choose Other > High Pass. In the High Pass dialog, we'll drag the Radius slider up until we can see the fine details starting to appear and then we'll click OK. Then, we need to change the blending mode of this layer to Overlay. (The Blending Mode menu is located at the top of the Layers panel.)
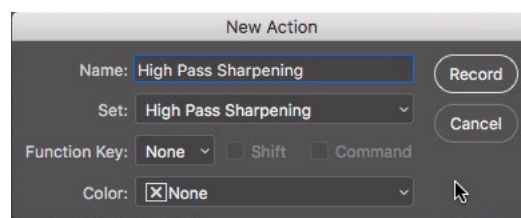

The High Pass filter is being used to sharpen an image. The Radius slider determines how much sharpening will be applied.

Above are two detail shots of an image. The version on the left is before using the High Pass filter and the version on the right is after using the filter.
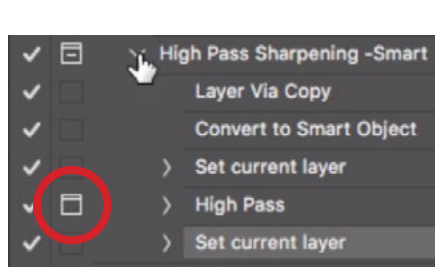
Creating an Action for applying high pass: Version 1

Since the process for high pass sharpening is always the same, we can create a couple of actions that will accomplish the task faster. To do this, we'll open an image in Photoshop and make sure the Actions panel is visible. If it's not, you can access it by going to the Window menu and choosing Actions. I'm going to create a folder within the Actions panel in which to place the new actions, so I'll click on the New Folder icon at the bottom of the Actions panel and name the folder "High Pass Sharpening." With this new folder active, we'll click on the New Action icon at the bottom of the Actions panel. In the New Action dialog, we'll name the action "High Pass Sharpening" and then click the Record button. You can see the little record icon turn red at the bottom of the Actions panel, indicating that everything we do will be recorded. Now, we'll follow the steps we covered earlier. We'll start by duplicating the image layer. We'll then change the blending mode of the image duplicate to Overlay. Doing this step before the high pass step will allow us to see a realistic preview when we work with the High

After we click the New Action icon, the above dialog will appear. Here, we can enter a name for the action and specify which folder it should be placed in.

Pass filter. We'll then go to the Filter menu and choose Other > High Pass. I'll set the Radius slider to the setting I think I would use the most and then we'll click OK. Lastly, I'll rename this layer by going to the Layer menu and choosing Rename Layer. I'll name the layer "High Pass S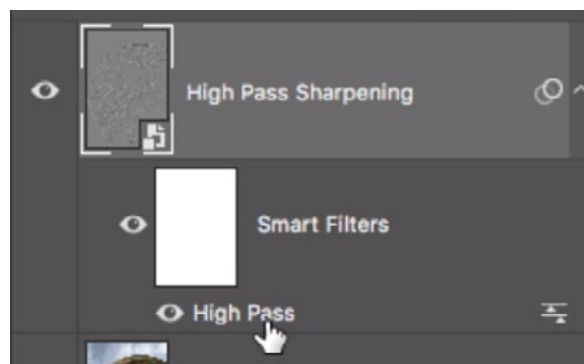harpening." We can now click the Stop button at the bottom of the Actions panel in order to stop the recording process. Because the high pass setting will be different for every image, we need to tell the action to pause and ask us for settings at that step. If we click on the little gray square to the left of the High Pass step in the Actions panel, the action will pause at this step and allow us to adjust the Radius slider. When we click OK, the action will continue to play. To run the action, we can click on the name of the action and then hit the Play button at the bottom of the Actions panel.

Here, we clicked on the little gray square to the left of the High Pass step within the Actions panel. This tells the action to pause at this stage to ask for settings.

Creating an Action for applying high pass: Version 2

We'll now create a second action for high pass sharpening that will work in a smarter way than the previous action. We'll start by clicking the New Action icon at the bottom of the Actions panel, naming the action "High Pass Sharpening - Smart" and then clicking the Record button. We'll duplicate the image layer and then go to the Filter menu and choose to "Convert for Smart Filters." This will turn the image duplicate into a smart object. I'll change the blending mode to Overlay and then go back to the Filter menu and choose Other > High Pass. I'll set to Radius slider to a setting that's either low or 0 and I'll click OK. Then I'll rename the layer by going to the Layer menu, choosing Rename Layer and then typing in "High Pass Sharpening." I'll hit the Stop button at the bottom of the Actions panel. Finally, I will click on the little gray square to the left of the High Pass step so that the action pauses and asks for settings at this stage.

The advantage of this version of the action is that we can go back and change the high pass settings at a later time, and that's because we converted the high pass
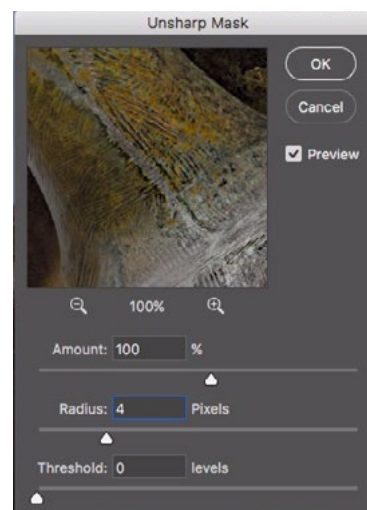
layer into a smart object. If we closed the document and opened it later, we could double-click on the name "High Pass" beneath the High Pass Sharpening layer thumbnail and the High Pass dialog will appear so that we can adjust the settings. Had we used a layer that was not a smart object, the setting would be locked in.

Because we converted the high pass layer for smart filters, we can double-click on the filter name at any time to adjust the settings.

High Pass vs. other filters

The sharpening result we achieve with the High Pass filter can be achieved using other methods as well. For example, the Unsharp Mask filter is related to the High Pass filter. We can access it by going to the main menu and choosing Filter > Sharpen > Unsharp Mask. A dialog will appear and there will be three sliders at the bottom. We will set the Amount slider to 100 and the Threshold slider to 0. Now, the Radius slider will work in the same way that the Radius slider within the High Pass dialog works. This is the case when you use a low radius setting, of around 6 or under. Once you go over a slider setting of about 6, you will need to gradually lower the Amount slider in order to achieve the same result as you would with the High Pass filter.
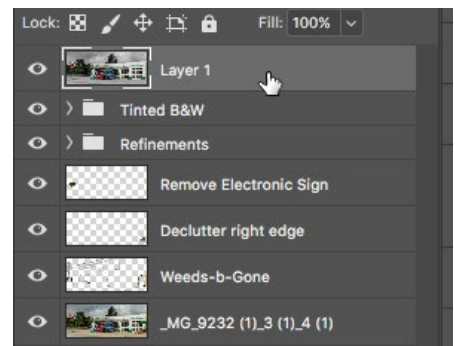

Here, we are sharpening the image using the Unsharp Mask filter.

Why use High Pass?

If we can get the same results using the Unsharp Mask filter that we can using the High Pass filter, when would we choose to use High Pass over Unsharp Mask? The answer is when we have a multi-layered document and want to be able to later make changes to the underlying layers.

I we wanted to apply the Unsharp Mask filter on a multi-layered document, we'd have to either merge all of the layers (flattening the document) or create a merged version of the entire document on a layer at the top of the layer stack. We can do this by selecting the top layer and using the keyboard shortcut Shift+Command+Option+E (Shift+Ctrl+Alt+E on Win). Then, we would apply the Unsharp Mask filter on that layer. The problem is that if we want to make any changes to the underlying layers, they won't be visible because that merged layer at the top of the layer stack is hiding them.

The top layer is a merged copy of the document with the Unsharp Mask filter applied. Any changes made to the underlying layers will be hidden by this top layer.

We'll now follow the same technique as above, but we will use the High Pass filter instead of the Unsharp Mask filter. With the same multi-layered document open, we'll activate the top layer and create a merged copy of the document by using the keyboard shortcut Shift+Command+Option+E (Shift+Ctrl+Alt+E on Win). We'll then convert this new layer into a smart object so that we have the ability to change the settings later, so we'll go to the main menu and choose Filter > Convert for Smart Filters. We'll next change the blending mode of the layer to Overlay. We can now go to the Filter menu and choose Other > High Pass, decide how much sharpening we want by using the Radius slider and then click OK. Even

After applying the High Pass filter at the top of a multi-layered document, you can see the odd effect that can occur when making changes to an underlying retouching layer.

though the high pass layer is sitting at the top of the Layers panel, it is not obscuring the layers beneath it. We can make changes to those underlying layers and see those changes reflected in the image. The exception to this would be changes to any retouching layers. If we change objects in the image, as we would when retouching, the result will look odd because those objects looked different at the time we applied the high pass sharpening.
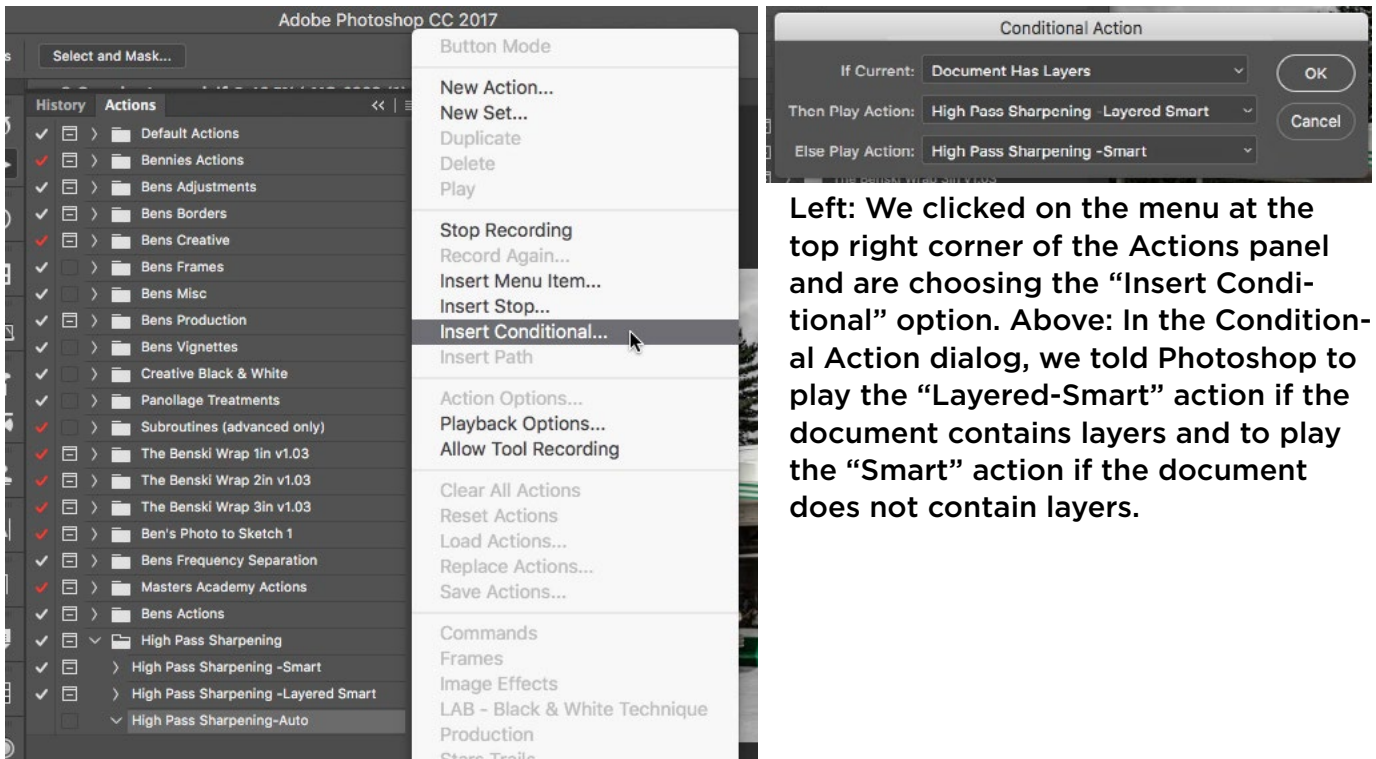
Creating an action for a multi-layered file

The actions we created earlier in the lesson are designed for a document with a single, background layer. If we try to use them on a more complex, multi-layered document, they won't work properly. We'll need to create a different action designed for this kind of document. We'll start by clicking the New Action icon at the bottom of the Actions panel, naming the action "High Pass Sharpening - Layered Smart" and clicking the Record button. Now we need to start with either the top layer active or all layers active, but when recording an action, we can't just click to activate a layer. That's because an action will record the step based on the layer name and the layer name will be different for every document. Instead, we'll go to the Select menu, choose All Layers and then go to the Layer menu, hold down the Option key (Alt on Win) and choose Merge Visible. This will give us a merged version of the document at the top of the Layers panel. Next, we'll convert the new layer into a smart object by going to the Filter menu and choosing Convert for Smart Filters. We'll change the blending mode of the layer to Overlay and then we'll apply the High Pass filter, using a relatively low setting (the exact setting won't matter because it will be different for every document) and then click OK. Now we will rename the layer by going to the Layer menu, choosing Rename Layer and then typing in "High Pass Sharpening" as the new name. We'll now hit the Stop button at the bottom of the Actions panel. Finally, we need to click on the little square to the left of the high pass step so the action knows to stop and ask us for settings at this stage.

Let Photoshop decide which action to use

The action we just created was designed for a multi-layered document. If we try to use it on a single-layered document, it won't work. That's because some of the steps (Select All Layers, Merge Visible) use commands that will not be available in a single-layered document.

To ensure that we use the action designed for our document (single layer or multi-layered), we're going to create another action that will first look at the document and determine whether it contains layers. It will then run the appropriate action depending on whether the layer has one or more layers. Note that we need to have already created the two actions we covered earlier. We'll click on the New Action icon at the bottom of the Actions panel, name the action "High Pass Sharpening - Auto" and then click the Record button. I'll then click on the little side menu located in the top right corner of the Actions panel and choose Insert Conditional. This will let us ask a question within the action and proceed based on the answer. In the Conditional Action dialog, we'll set the If Current menu to "Document has Layers" and set the Then Play Action menu to "High Pass Sharpening - Layered Smart." We'll set the Else Play Action menu to "High Pass Sharpening - Smart" and then click OK. Now, regardless of what type of document we have, we can run this action and Photoshop will intelligently choose between the two high pass actions and play the appropriate one.

Left: We clicked on the menu at the top right corner of the Actions panel and are choosing the "Insert Conditional" option. Above: In the Conditional Action dialog, we told Photoshop to play the "Layered-Smart" action if the document contains layers and to play the "Smart" action if the document does not contain layers.