

Smart Objects

There are many smart things in Photoshop, but Smart Objects were first introduced in Photoshop CS2. We touched on Smart Objects already briefly in February last year when I highlighted the new Smart Filters in CS3. Let's first have a look at vector images before we start with Smart Objects.

About Vectors and Pixels

As photographers we are used to bitmap/raster files, which are made up of pixels. If you find yourself working with icons, logos or text, then you are probably dealing with vector graphics. Programmes like CorelDraw and Adobe Illustrator are generally based on vector graphics.

What is the difference between pixel-based graphics and vector graphics? Pixels come from digital cameras and scanners and the images have a fixed resolution, e.g. 3000 x 4000 pixels from a 12 Mpixel camera. Vector graphics, on the other hand, are made up of geometrical elements, such as points, lines, curves and other shapes, all based on mathematical equations. The files are much smaller and, most importantly, they can be upsized to any size without penalties.

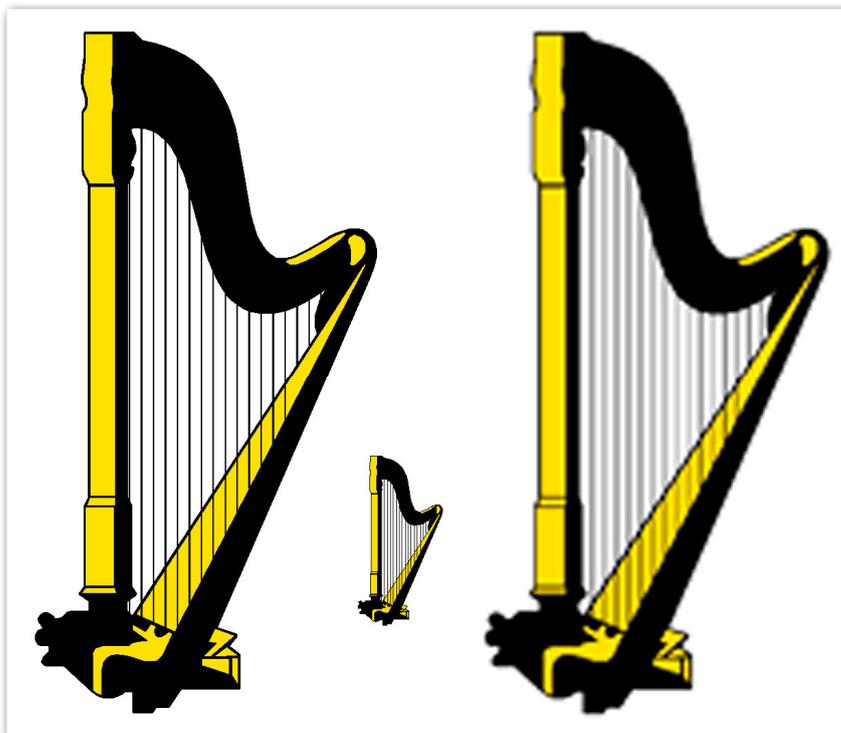


Image 1 – Upsizing Vector and Raster Graphics

Image 1 shows you what happens if we upsize a normal pixel-based image: it gets pixelated and/or blurry. In contrast, the vector image stays sharp and can be rescaled to any size.

Every time you place text in a Photoshop document, you have been working with vector images. Remember, you can resize individual letters or the entire text box without losing sharpness. However, once you rasterise the type layer (Layer > Rasterise ...) the text is seen as normal pixels and the letters get fuzzy when upsized. It is also important to know that vector images can easily be transformed into pixel-based images, but not the other way round.

Smart Objects and Resizing

What have vector images got to do with our digital photos? Not much, but we often resize images and that's where Smart Objects come in handy. There are two types of processes and goodies in Photoshop: on the one hand we have the destructive ones where we alter the image pixels. We make those pixels lighter or darker, change the hue and saturation. All the tools and filters are there to restyle clusters of pixels; they accentuate edge contrast or remove fine detail, blur edges and so on.

The second group of gadgets in Photoshop help us to preserve the original pixels. Here we have Layers, Masks, Adjustment Layers and, since Photoshop CS3, also Smart Filters.

Resizing is certainly a destructive process: by downsizing we throw pixels away and when we try to upsize an image, Photoshop has to interpolate and 'invent' new pixels. Vector images have a huge advantage here and that's where we finally get to our Smart Objects.

Think of an Adjustment Layer – it allows you to go back any time and change your settings without actually affecting the pixels underneath, until you flatten the layers. Smart Objects allow you to scale, warp and rotate objects multiple times, without degrading the original image.

For example, if you drag your images into another document to make a collage, it is a good idea to change them into Smart Objects. There are a number of ways you can change a layer into a Smart Object: from the Layer menu select Smart Objects > group into new Smart Object, or right-click on the layer thumbnail in the Layer Palette and choose convert to Smart Object. You can even open a new file as a Smart Object from the File menu. The layer thumbnail will now have a little square symbol at the bottom right, showing you that it turned into a Smart Object.

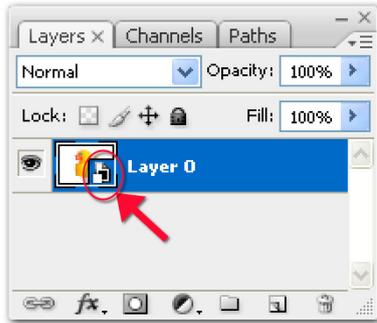


Image 2 – A Smart Object in the Layer Palette

For my example I use Adobe's rubber duck. Start by turning your image layer into a Smart Object and then duplicate the layer. With the Move tool separate the two objects and make one of them very small. No matter how small you made it, at any future time you can bring it back to its original size, without any quality loss. The original pixels are contained within the Smart Object.

Smart Objects for Multiple Edits

I duplicated my duck, resized it and duplicated the smaller version two more times. So I got a mother duck with her three ducklings (Image 3).



Image 3 – A happy duck family with cloned ducklings

In your example double-click on one of the layer thumbnails in the layer palette, or you can go to Layer > Smart Objects > Edit Contents. This brings you to a warning dialog box telling you that you need to save the file after making your changes.

Click OK and you will get your object in its own window. Do some changes to your image. For my example I gave the poor duck a bright green beak.

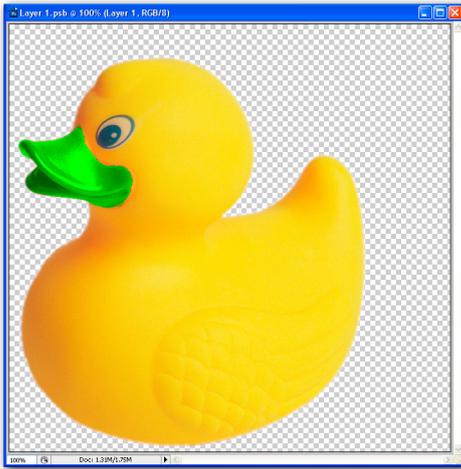


Image 4 – Make your changes in a separate window

Now press Ctrl S to save and click back on your original image. All the ducklings have now changed and look as sick as their mother. This is cool!



Image 5 – The ducklings are the split images of their mother

Think of the possibilities. Say, you are designing a Web page and create a button. Change the button layer into a Smart Object, duplicate to make as many buttons as you need and distribute them with the Move tool. Now you can change your mind at any time about the style and the size of your buttons. Just edit one of them and all the other buttons will follow at once.

All the Smart Object layers are linked. What if we want to exclude some of our ducks from any change? Let's assume that one duckling is taking after his father, who is a normal looking duck. In that case we need to copy our Smart Object layer via Layer > Smart Objects > New Smart Object via Copy. That way we get a unique, separate copy. It is still a Smart Object and an identical twin of its parent layer, but it can be edited independently (Image 6).

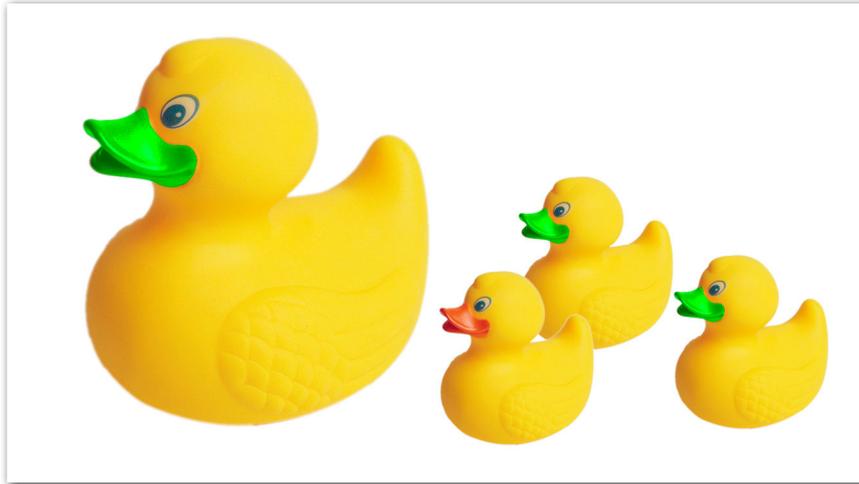


Image 6 – One duckling is taking after his father

If you work with icons or illustrations in Adobe's Illustrator, try and paste them as Smart Objects into Photoshop. This way you keep the flexibility of a vector-based object. You can resize the objects without losing quality. You can also apply changes via Illustrator. After saving and closing, the objects will be updated in Photoshop.

It is possible to add a mask or a Layer Mask to a Smart Object layer. However, you need to be careful. As long as you don't move or scale the object, everything is okay, but as soon as you move or scale it, the mask doesn't move/scale with it. It just acts like an unconnected mask and stays where it was. The way around this problem is to put the Smart Object in a group, and then apply the mask to the group.

Smart Objects and Camera Raw Files

Imagine you can edit an image in Photoshop coming from a camera Raw file, then go back and tweak the Raw source data - and still keep all your Photoshop edits! Well, with a Smart Object the non-destructive dream has come true.

Remember what Smart Objects are doing: they contain references to the original image data, and you can always alter the source data through Camera Raw. All the parameters from your Raw conversion are stored as metadata. At any time you can go back and edit those parameters, thereby re-processing your original file in a different way.

Start by creating a new document of any size, then go to File > Place and select a Raw file. Photoshop then comes up with the standard Camera Raw dialog. You set and tweak your conversion parameters and, after finishing, press OK to continue the Place command. The processed Raw file is now sitting in a Smart Object layer.

The opened Raw file is placed at full width of your document, ready with control handles for resizing. Double-click or hit Enter to accept the size as is. Depending on the aspect ratio you might have some extra space. Use Photoshop's Trim command under the Image menu to cut the canvas size down to match your image.

If you started with a small document size, you might not get the full resolution of your camera file. Use the Image Size command to change the pixel dimension to the original Raw file.

Anytime, after any amount of editing in Photoshop, you can simply double-click on the Smart Object icon and it will open up again in Camera Raw. This is very handy, especially for adjustments like highlight recovery and finetuning the colour temperature, which can only be done in Camera Raw.

Russell Brown has written a set of scrips, called Dr. Brown's Place-A-Matic. It runs from the Bridge and will save you from creating a new document. It opens your image in two non-linked Smart Objects, which can later be blended. Check it out on www.russellbrown.com/tips_tech.html.

Smart Filters

Smart Filters were introduced in Photoshop CS3 and finally bring you the convenience of Adjustment Layers to filters.

You first need to turn your working layer into a smart object, then you apply one or more filters. At any future time you can go back and change the settings, eg. for your sharpening and noise reduction. Just as with Adjustment layers, you will find a layer mask which allows you to apply the filter(s) to only part of the image.

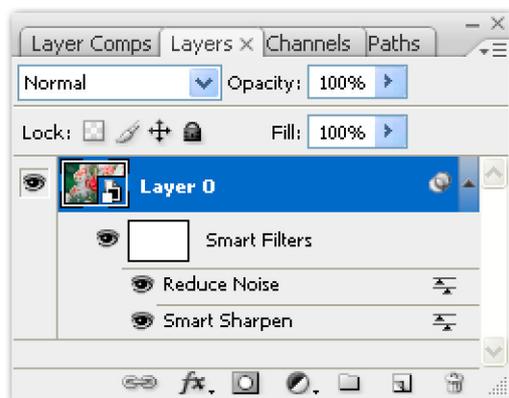


Image 7 – Smart Filters