Seeing the big pixel

Difficulty: Intermediate

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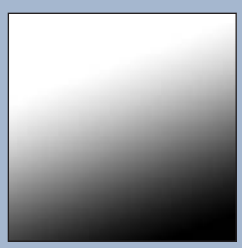
Here we show you how to combine giant pixels in a layer mask with a high resolution image. The trick lies in creating a coarse pattern of pixels at a low resolution and then increasing the resolution of pixels while retaining the same pattern.

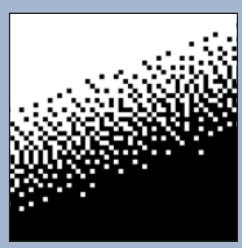
Frog and **Tutenkhamun** images courtesy of **Photo Essentials.**

To understand how this technique works you must first understand the difference between greyscale and bitmap images. All pictures are made up of pixels (picture elements); a series of coloured squares butted against each other.

Greyscale
Greyscale images are made up from 256 shades of grey (including black and white). In a blend there is a smooth transition between shades.

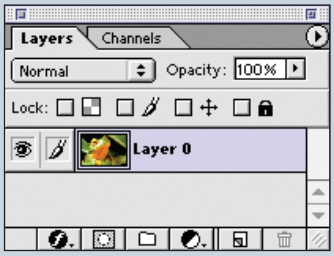


Bitmap
Bitmap images have pixels that are either black or white. There are no shades of grey in a bitmap image.



Greyscale images
Photoshop uses 8-bit channels to create greyscale (monochrome) images.

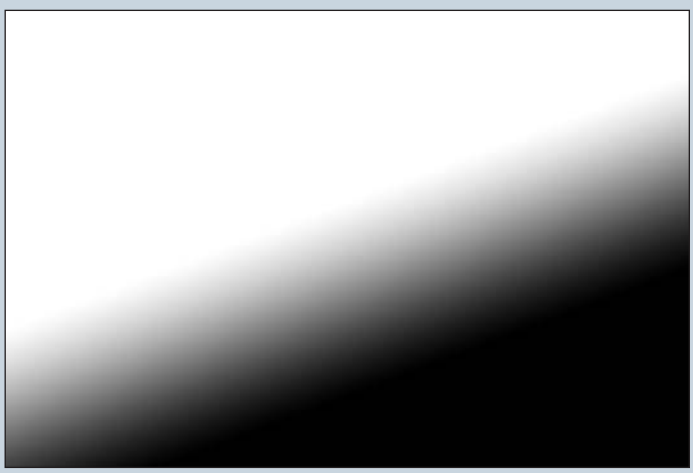
RGB colour images
Colour images are made up from three 8-bit channels, one each for red, green and blue. There are approximately 16,700,000 (256 x 256 x 256) possible colours.



Our sample is 300dpi
Here is our candidate for a large pixel blend.
The image is shown here at actual size with a resolution of 300dpi to allow for high quality printing.
For images intended for the web the process would be the same, as would relative size percentages, but the pixel count would be lower.
The size of our image is 1,075 x 717 pixels.

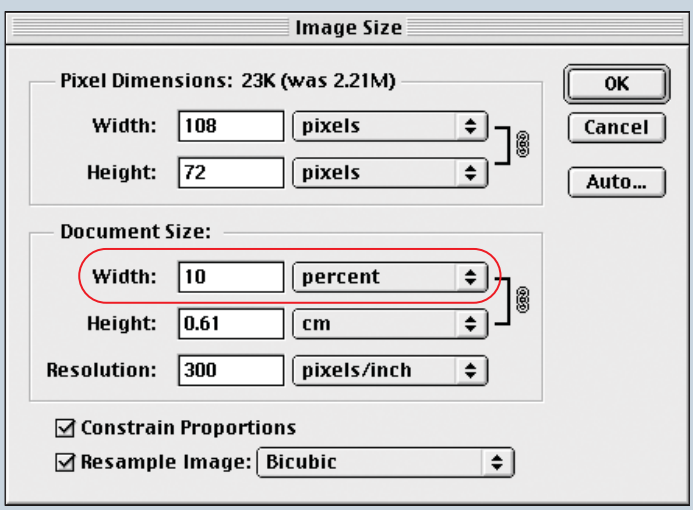
Copy a channel
We wish to position a blend so that it will not interfere with our frog's face, so we copy one of the channels (in this case we chose green, of course) to act as a guide.

Automatic size and mode
When you have copied the (greyscale) channel to the clipboard, Photoshop will automatically select the same pixel dimensions and mode (greyscale) for the new file..



Create a blend in the channel
Select the Gradient tool, set the default colours by hitting the D key, then select Linear Gradient from the Options Bar.
Make a gradient directly inside the copy of the green channel, positioning your mouse in the middle of the page and dragging from left to right diagonally.

Smaller file size
When you decrease the size of your file to 10% of the original, it will look quite small on your monitor at first.
Double-click the Zoom tool to bring it back to a usable size and you will see that the gradation is now very coarse.

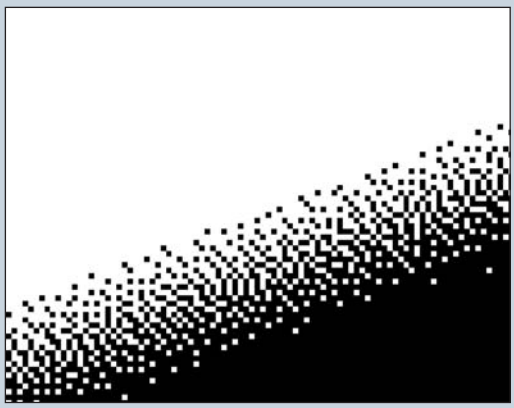


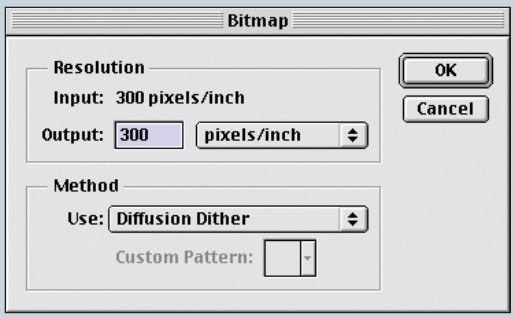
New file
We must now work on the channel in a separate greyscale file so that our next few steps do not affect our image.
Copy the blend channel to the clipboard, create a new file (which will be greyscale by default) and paste the channel into it (as a layer). Our aim is to reduce the image size so that we can achieve a coarse pixel pattern and have less pixels.
In this case, we must reduce the file to one tenth of its size in both width and height. (File will be one hundredth of the original size.) At this stage we still have a smooth blend, albeit at a low resolution.

This effect is possible because of Photoshop's ability to resample using Nearest Neighbor, thus retaining the coarse pixel pattern.

Convert from greyscale to bitmap

Use Image > Mode > Bitmap to convert the image to the bitmap mode in which there are no shades of grey, only black or white pixels. Use the same input and output resolutions. Notice how coarse they look at this resolution.



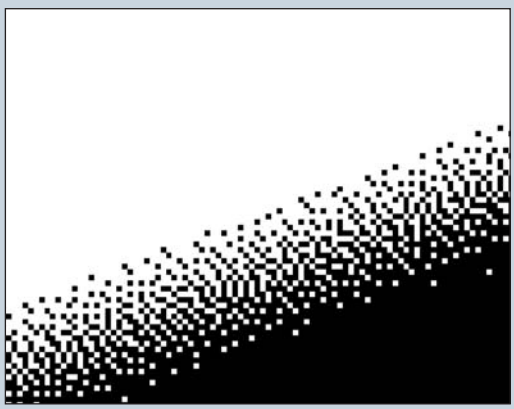


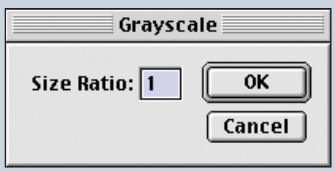
And then back to greyscale

Use Image > Mode > Grayscale to convert the image back to greyscale using the default size ratio (one).

So here's the first trick

The shades of grey do not return. You now have a greyscale version of the bitmap pattern.
It's just very small, that's all.



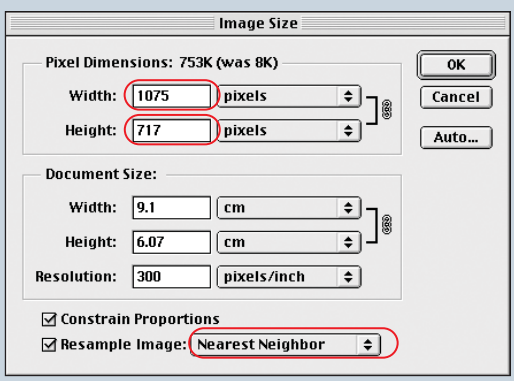


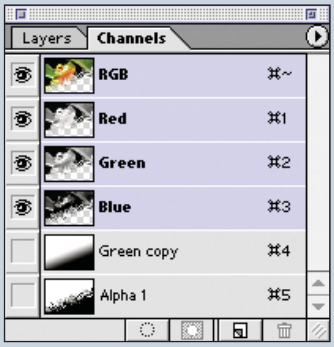
Increase the resolution

Now we must return the file to the original pixel count so that it can be used as an alpha channel in the original file.
Use Image > Image size to return the image to the original resolution.
You can key in the original pixel dimensions to ensure an exact fit.

Here's the second trick

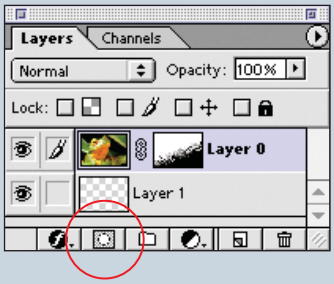
It is essential that you resample the image using 'Nearest Neighbor' to ensure that your image looks exactly the same as it did at the smaller file size.



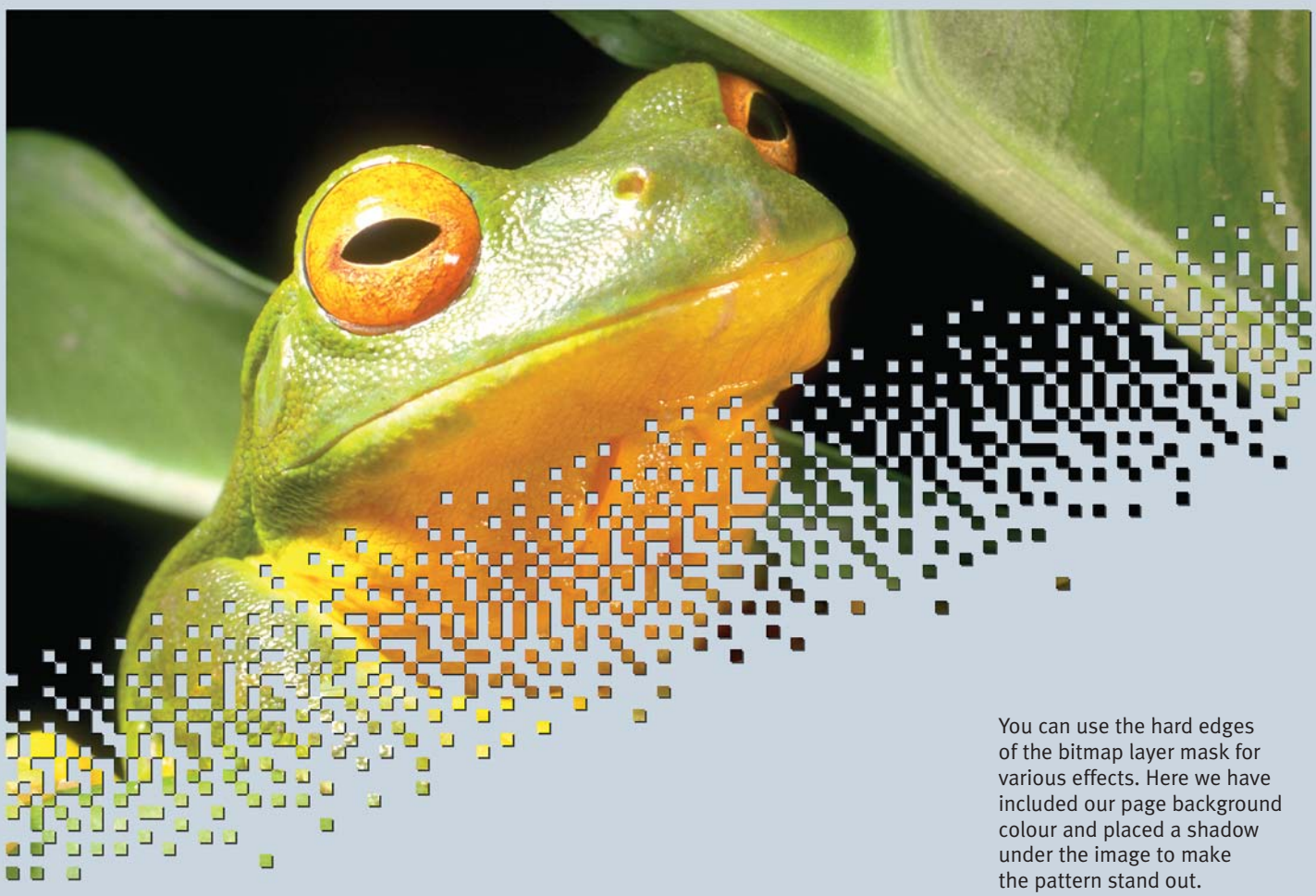


Paste image as an alpha channel
Paste the greyscale image back into your original file as an alpha channel. Double-click on the background layer to turn it into a layer and use Command/Ctrl-Click on the new alpha channel to load it as a selection.

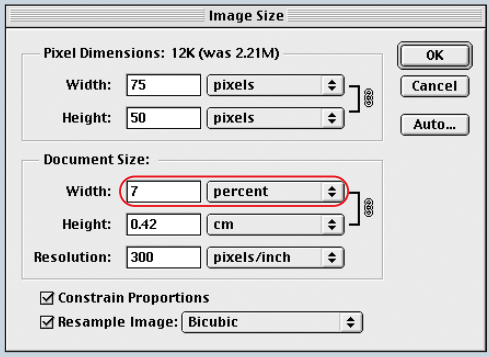
Note: If your gradient is not created from the middle of the image, the desired effect will not be achieved.



Make a layer mask
Click on the layer mask icon to create a layer mask. Now you have a combination of a high resolution image and a low resolution layer mask.



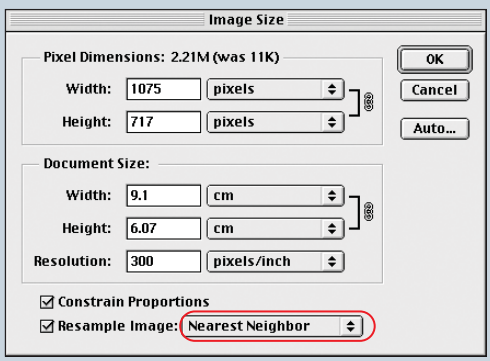
You can use the hard edges of the bitmap layer mask for various effects. Here we have included our page background colour and placed a shadow under the image to make the pattern stand out.



Include optical conundrums in your work by combining different resolutions in the same image

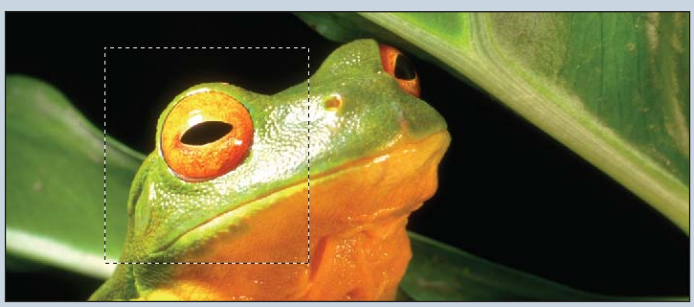
Small frog, big pixels
There are other ways to combine mixed pixel sizes for creative effect.
Here we have taken our original frog image and reduced the pixel count to 7 percent.
As you can see, the image is very coarse.

Upsample with Nearest Neighbor
As before, increase the pixel count to the same as the original image, using Nearest Neighbor to preserve the large pixels.

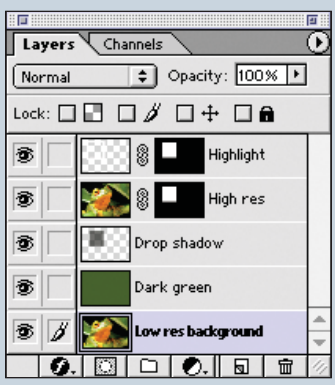


Layer swap
Now we need to place both images in the same file with the low res layer beneath the high res layer.

Make a selection
Select an area of the image to return to high resolution and save the selection as a channel.

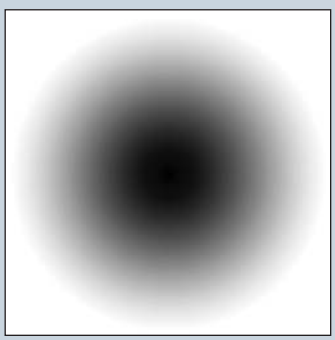


Add a layer mask
With the original high resolution image on a layer above the low res version, add a layer mask to allow the lower layer to show through.
Here we have added a drop shadow and a highlight edge to make the high res section stand out. To increase the difference between the two parts of the image, we have placed a dark green layer above the background

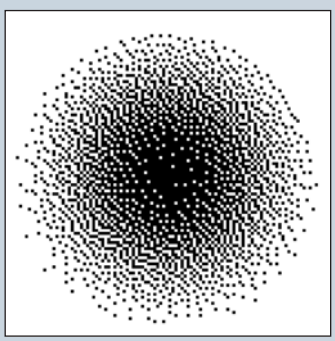


The large pixel technique works with all types of blends. Try it with radial blends to create pixel dust. The size of the particles can be controlled through the pixel count. Experiment to get the effects you want.

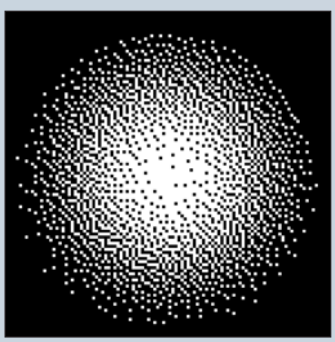
Create a radial blur in an alpha channel.



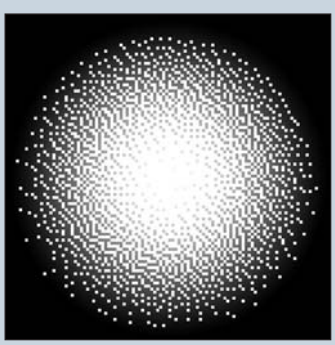
Copy the channel into a new greyscale file. Reduce the file size to (say) 10% of the original and convert it to bitmap mode. Then return it to greyscale mode using Nearest Neighbor.



Copy the new file back into the original file as an alpha channel and invert it.



Use Image > Calculations to combine the original soft radial blur channel (or a slightly smaller version) with the enlarged bitmap channel.



Radial variation and combination

Our picture of Tutenkhamun was created using a 'large pixel' layer mask.

The layer mask is a combination of a smooth radial blur and a coarse, enlarged bitmap pixel version of a radial blur.