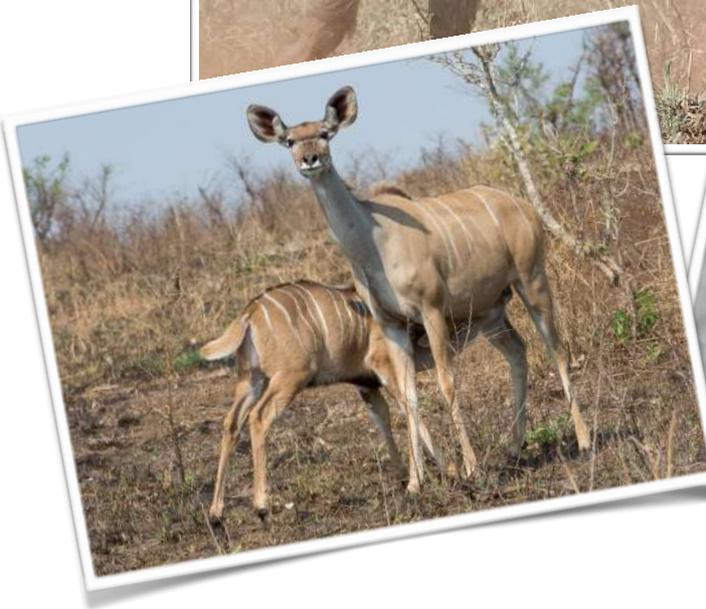
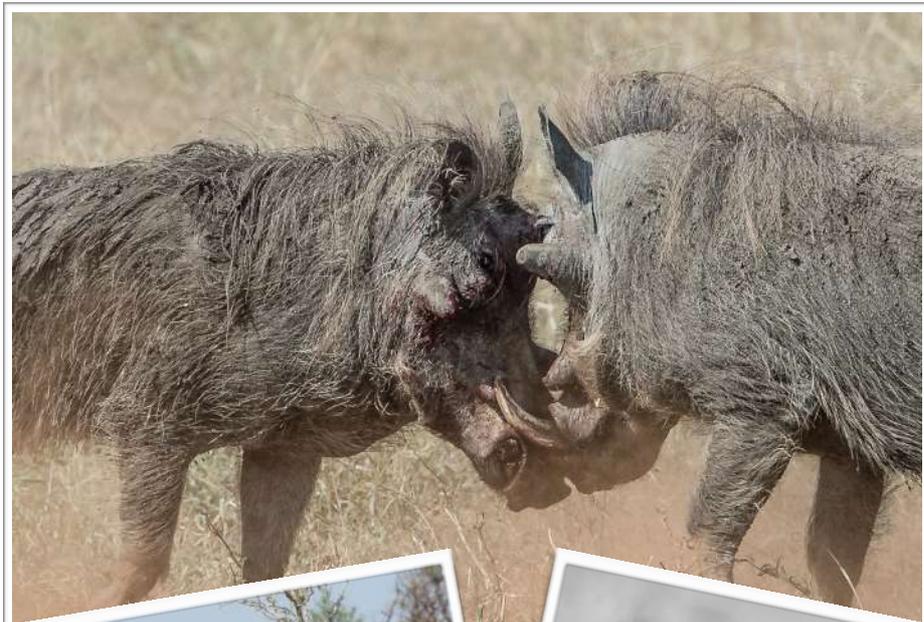


An Introduction to Layers, Masks and Channels in Photoshop



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Two approaches to image editing

When images are edited in Photoshop or any other editing program there are two general approaches:

Direct or Destructive editing: In simple photo-editing programs, all changes are made [directly to the image and those changes will become permanent when you save the image](#). The changes are permanent because editing (eg contrast adjustment) changes at least some of the pixels in the image. These changes cannot be reversed except in the special ways described in the next sub-section. Destructive editing is a bit like applying a tattoo to skin - once the tattoo is applied it is hard to change or remove and you can never get back to the original skin.

Destructive editing is OK if you can be certain that each change you make produces exactly the result you want and if you can be sure that any later changes you make will not alter the effect of earlier changes. It is not often that you can have this level of certainty when editing - so destructive editing is not recommended.

Undoing direct edits.

If there is some reason why you have to use destructive editing, there are several ways that you can “undo” edits in Photoshop:

- a. You can *undo the last change* you made by pressing Control+Z (Windows) or Command+Z (Mac).
- b. You can step backwards through several edits by pressing Control+Alt+Z (windows) or Command+Option+Z (Mac).
- c. You can remove all edits and get the image back to what it was when you opening it by selecting File>Revert from the menu.
- d. If you have made several edits you can go back to any one of them by selecting the relevant step of the editing process in the History panel.
- e. In the History panel you can take a “Snapshot” of the image after several edits, make more edits, take another Snapshot, and so on.

Then, if necessary you can come back to any one of those Snapshots by selecting it in the History panel.

You cannot do any of the above after you have saved and closed the image file - when you re-open the file the "history" will have been lost.

Non-destructive editing: A much better approach is to use non-destructive editing that allows you to modified or reverse any of the editing, even if you save the file and then re-opened it. This approach to editing changes the appearance of the image without changing any of the pixels in the original image.

Because there are many occasions when you will want to edit an image in stages or change your mind about an edit or produce several different versions of an image, non-destructive editing is recommended.

There are various approaches to non-destructive editing, depending on what software you are using. It can be done in RAW converters such as Lighthouse or Adobe Camera Raw, or it can be done in programs such as Photoshop that support the use of layers.

Layers

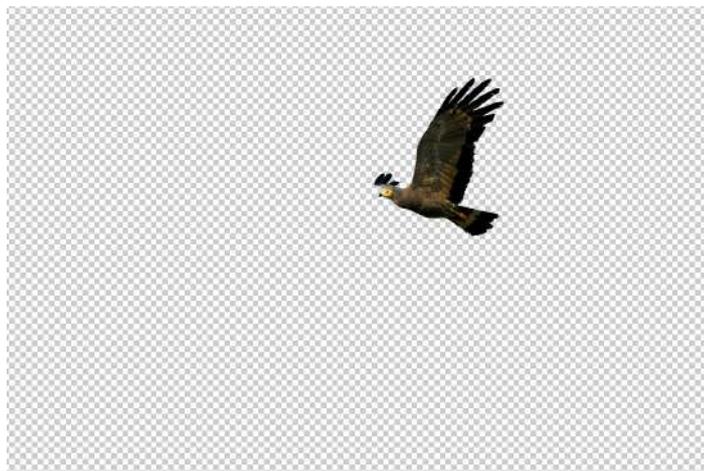
Layers are one of the most powerful features of Photoshop (or any other program that supports layers) because they provide ways of editing images that are simply not possible without layers. Using layers to edit an image is a bit like adding make-up to a face. No matter how much make-up you apply or what the face looks like with the make-up applied, the underlying face has not changed and you can always wash off the makeup and see the original face again.

When you open an image in Photoshop it becomes the **background layer**. Other layers can be placed on top of this background to change the appearance of the image without altering anything in the background layer. You can think of these additional layers as being like sheets of acetate in a stack - the appearance of the overall image depends on what

you see when looking down through this stack. For example, if I open this image as the background layer:



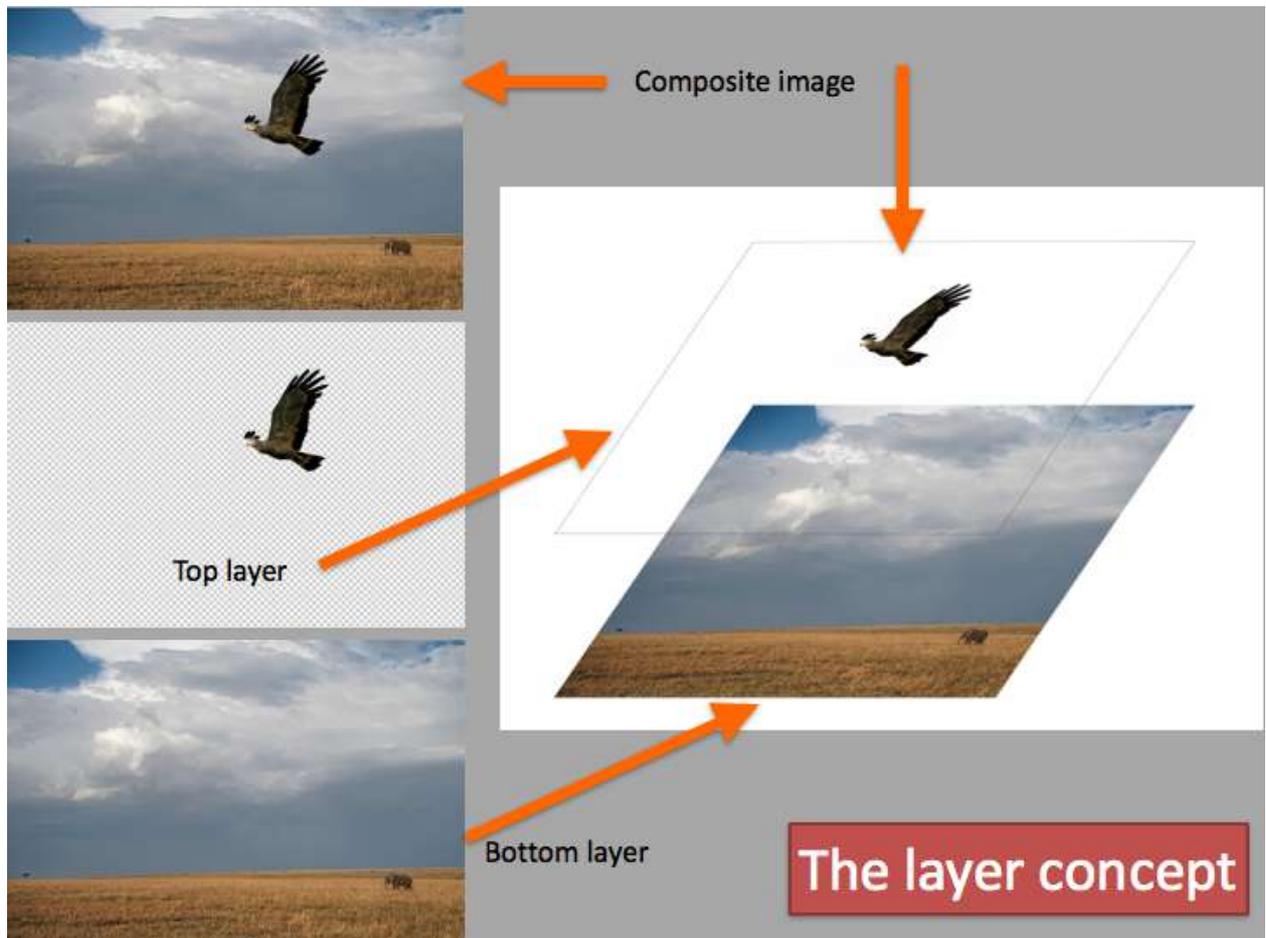
And place this image (transparent except for the bird) in a layer above it:



The composite image ('seen from above') would be this:



The overall process can be represented as follows:



Some of the advantages of creating the composite image in this way, rather than placing the bird directly into the original image are:

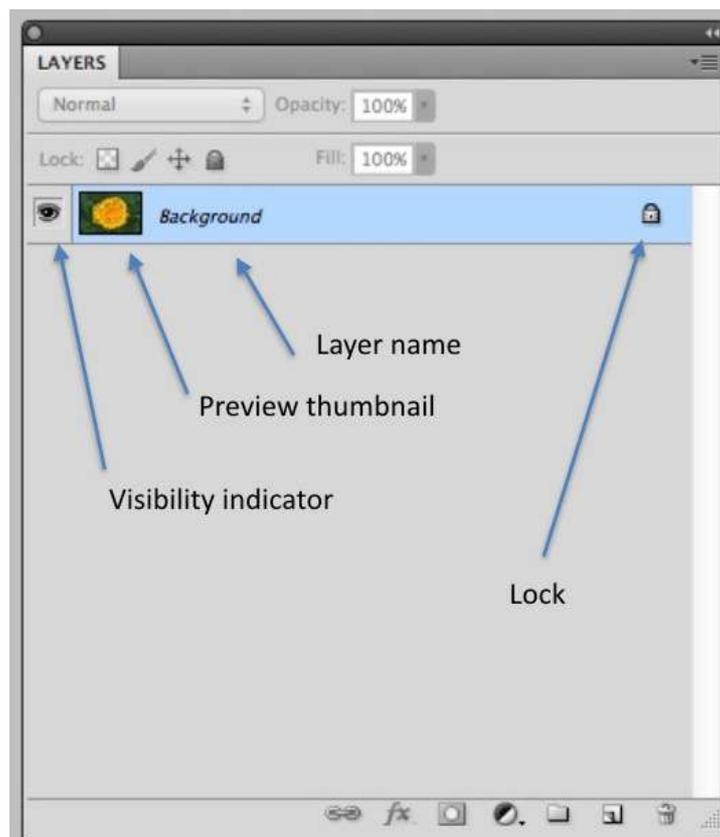
- The bird can be removed simply by deleting the top layer.
- The bird can be moved around or rotated in the top layer without altering anything in the bottom layer.
- The size of the bird can be changed without altering anything in the bottom layer.
- Enhancements such as sharpening or colour changes can be made to the bird without altering anything in the bottom layer.

The process of combining images in this way is just one of the many applications of layers and utilises just one of many types of layers (image layers).

The layers panel

The layers panel is the 'control centre' for layers in Photoshop. If it is not visible you can open it by selecting **Windows>Layers** from the menu or by pressing **F7**.

When an image is opened in Photoshop the layers panel will initially look like this:



By default, the layer name will be "Background" and it will be 'locked' (which restricts what can be done to this layer).

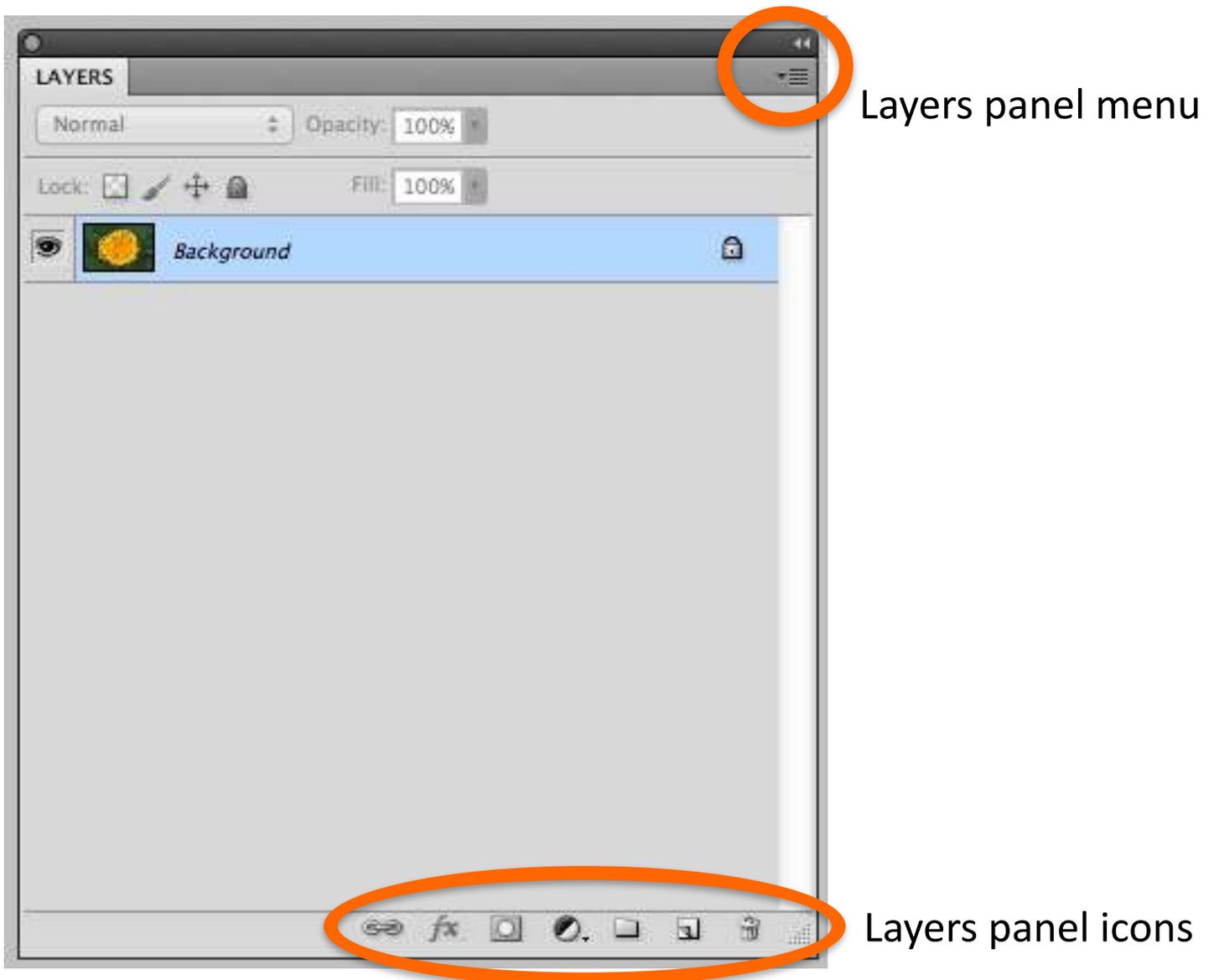
The preview thumbnail will be a miniature version of the image.

The 'eye' icon allows you to turn the visibility of the layer on and off. If you turn off the visibility of this background layer the screen will be blank.

Later, when you add additional layers, the visibility of each layer can be independently turned off to temporarily remove whatever effect was created by that layer.

You can make adjustments (via the menu) that will alter this background layer - but this is NOT a good idea as it would be destructive editing and the whole idea of layers is to enable you to do non-destructive editing.

Most of the things you will want to do with layers can be achieved from the layers palette, many of them with the layers panel icons or from the layers panel menu.

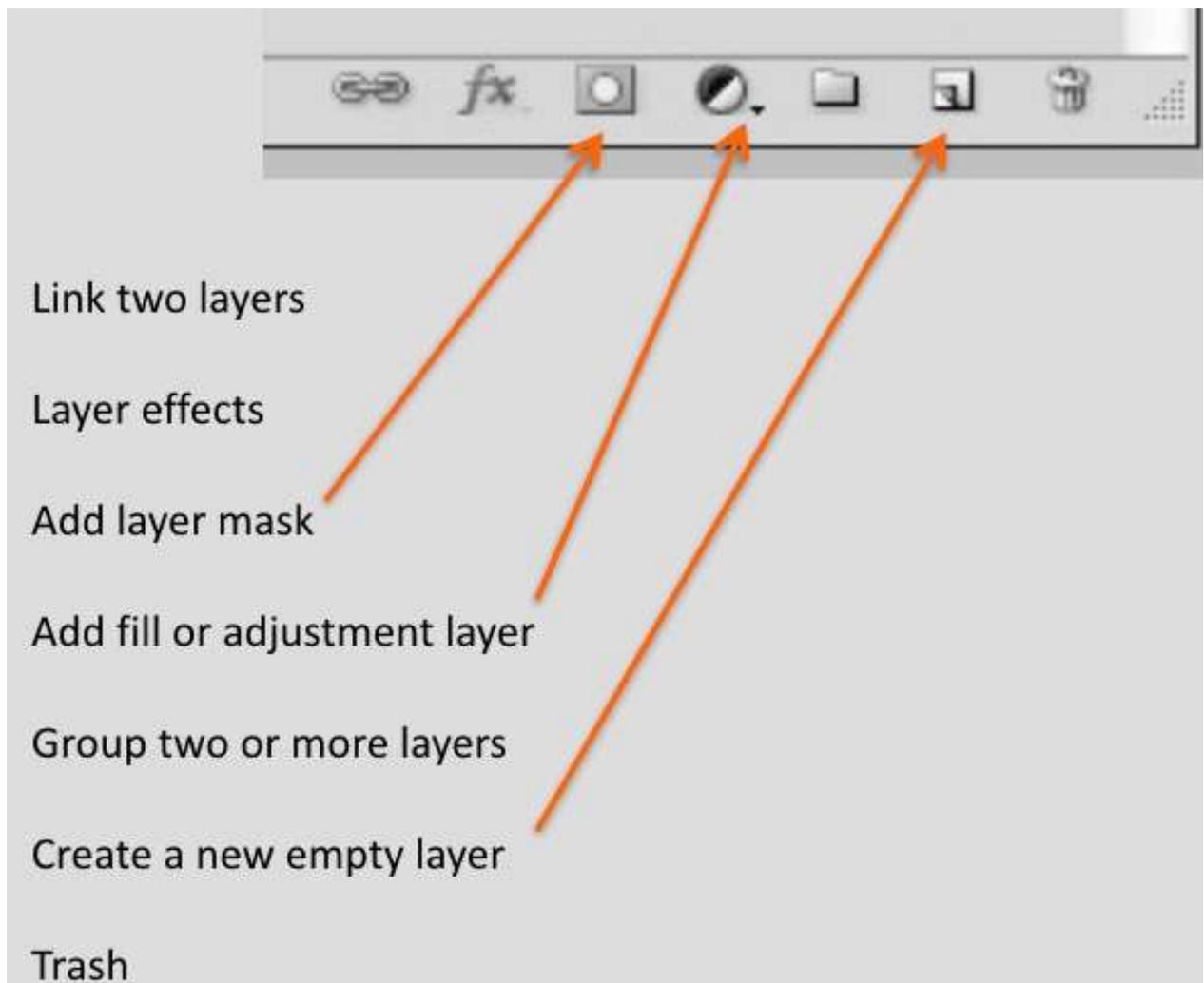


Before starting to use the layers panel icons or menu items you need to know what type of layers can be created and what their general purposes are. The basic layer types are:

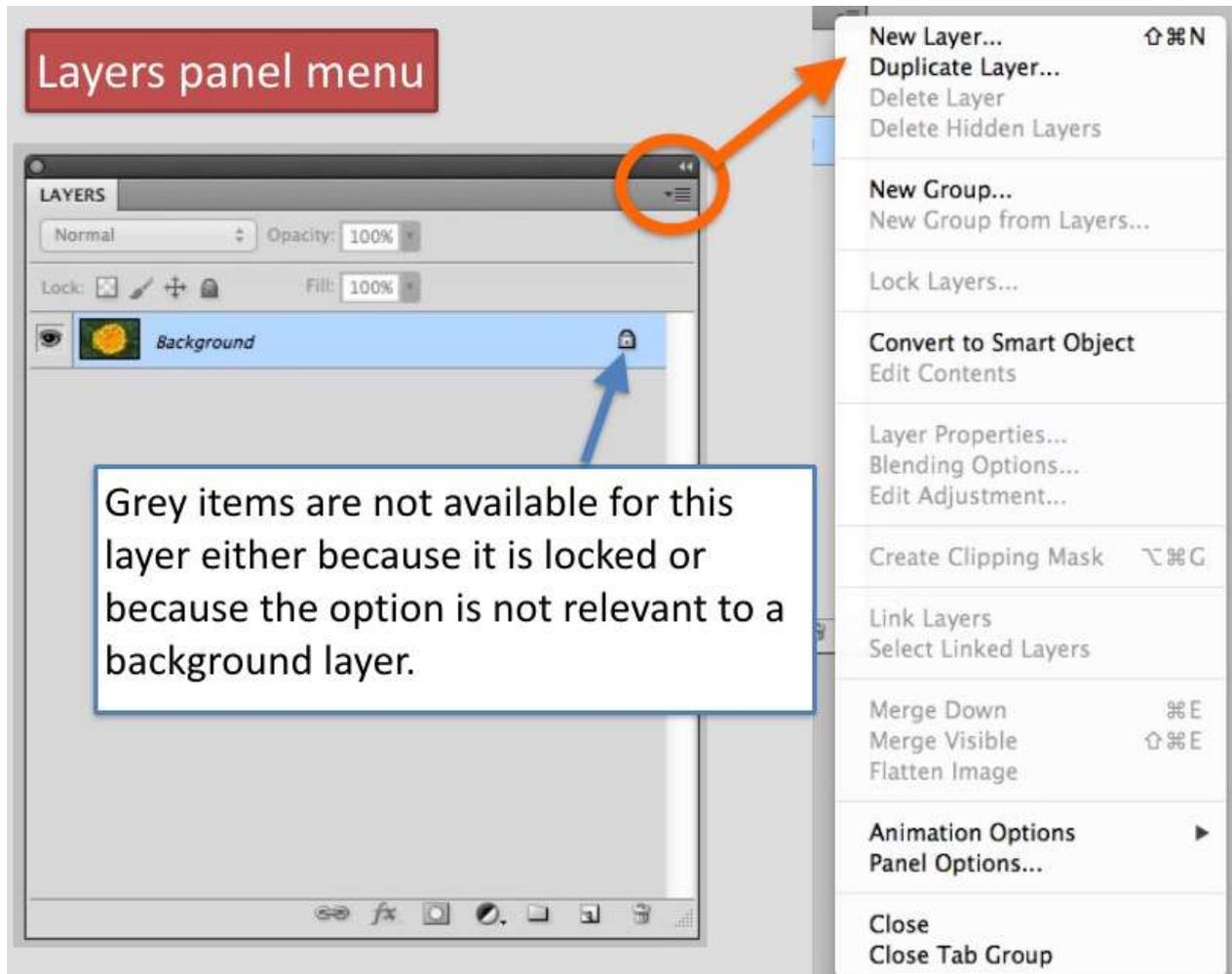
- a) Image layers (that contain at least some image pixels).

- b) Fill layers that contain solid colours or patterns and which are initially opaque.
- c) Fill layers that contain gradients which may or may not be semi-transparent.
- d) Empty layers that are used to hold image information later (such as when cloning).
- e) Text layers.
- f) Adjustment layers that contain 'instructions' for altering the image (such as brightness/contrast adjustments).

Of the seven layer panel icons, two allow you to create new layers. One is for creating a new 'empty' layer and one is for creating fill layers (solid colours, gradients or patterns) or adjustment layers. These, plus the icon for creating layer masks are the three that you will use most frequently.



You can also create two types of new layer from the layer panel menu - either a new empty layer or a duplicate of the layer that is currently selected.



New layers can also be created from the main Photoshop menu and again there are three options:

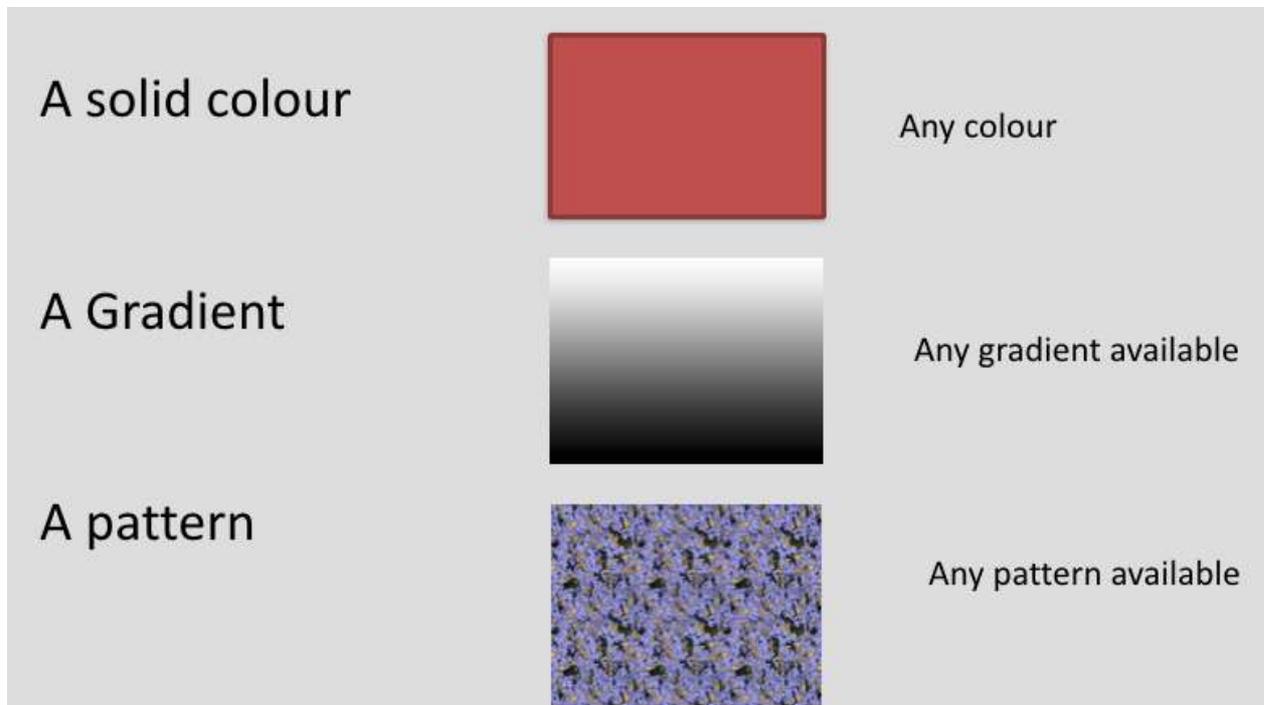
Layer>New>Layer will create a new empty layer.

Layer>New Fill Layer will allow you to create a layer with a solid colour, a gradient or a pattern.

Layer>New Adjustment Layer will allow you to create one of 16 different types of adjustment layer in Photoshop CC (earlier versions of Photoshop had fewer types of adjustment layer).

Fill layers

The options for fill layers are:



There are various uses for fill layers and these will be explored in another tutorial. The content of fill layers cannot be edited directly (as it can be for image layers), it is done through a dialogue.

Adjustment layers

Adjustment layers are the 'heart' of non-destructive editing in Photoshop. Adjustment layers do not ever contain image pixels, they just contain 'instructions' that Photoshop uses to change the appearance of images. For example, a Brightness/Contrast adjustment layer would contain information about the brightness and contrast adjustments you have made using that layer.

Adjustments that are made with adjustment layers are non-destructive because:

- (a) The adjustment layers do not change any of the pixel information in your image.

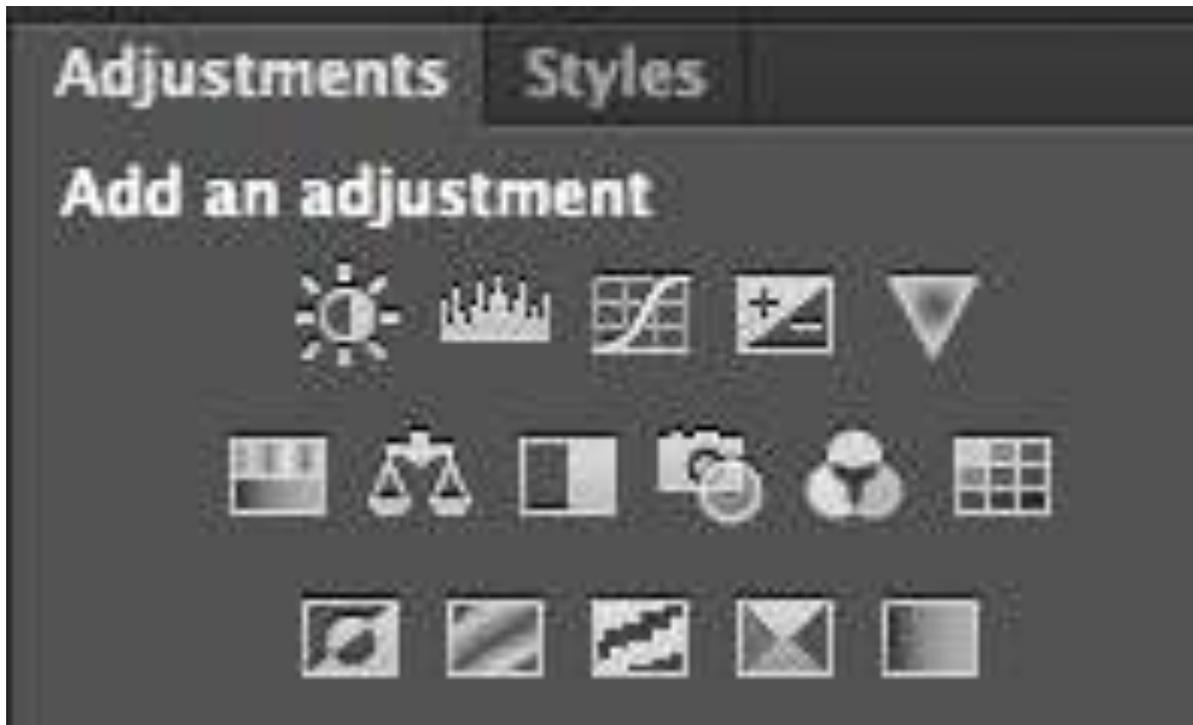
- (b) You can remove the layer simply by dragging it to the trash can at the bottom of the layers panel.
- (c) You can change the adjustment by double clicking on the adjustment icon on the layer - the adjustment dialogue will re-open and you can make the change.
- (d) If you save the image as a PSD (Photoshop) or TIFF file the layers are preserved. Next time you open the image the layers are still there and you can make further adjustments to any layer if you want to. (Note: You cannot save layers in a JPEG file.)

When you create an adjustment layer, it will effect all the layers below it (but none above it). You can restrict it to effecting just the layer immediately below it by creating a *clipping mask*. To do this, hold down the Alt key and click on the boundary between the two layers.

The types of adjustment layer available in Photoshop CC are:

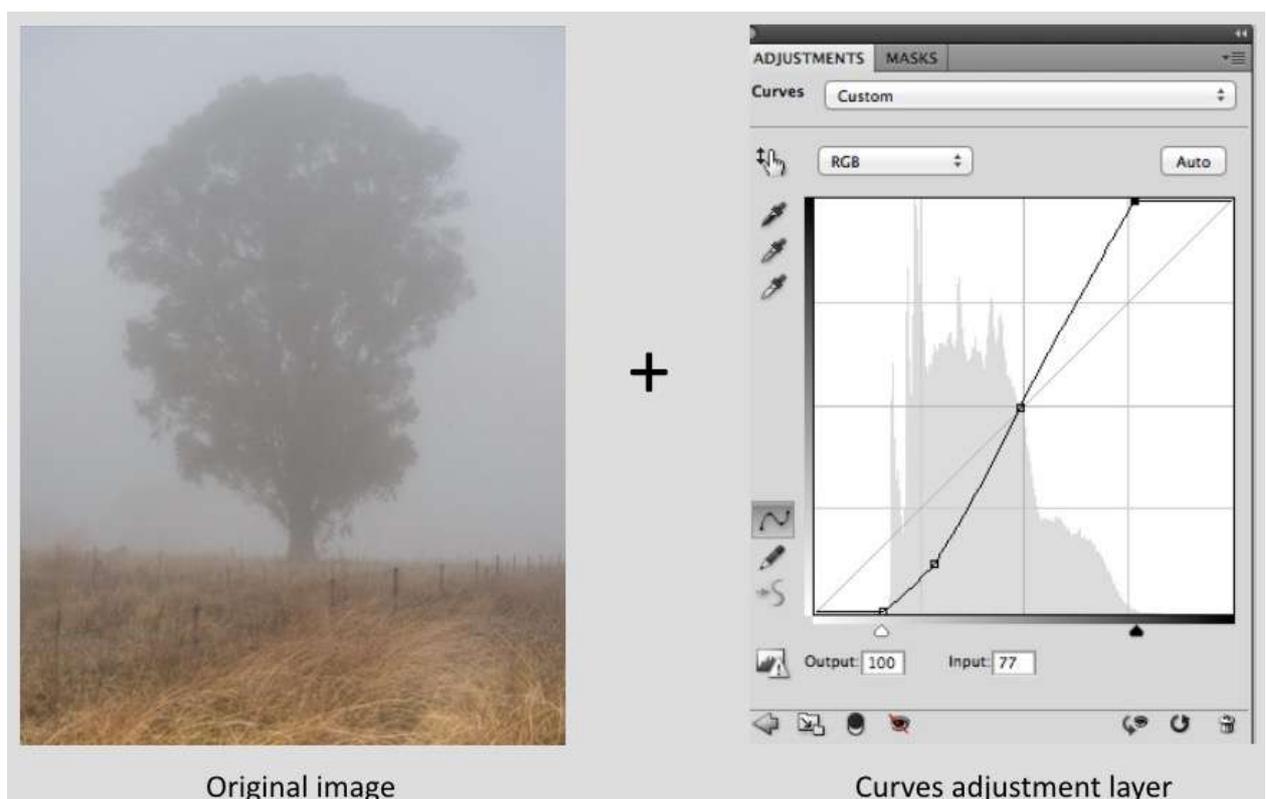
- Brightness/Contrast
- Levels
- Curves
- Exposure
- Vibrance
- Hue/Saturation
- Colour Balance
- Black and White
- Photo Filter
- Colour Mixer
- Colour Lookup
- Invert
- Posterise
- Threshold
- Gradient Map
- Selective Colour

The quickest way to create an adjustment layer is to select its icon from the Adjustments Panel:



If this panel is not visible, open it from the menu: Windows>Adjustments.

Example:





When you create an adjustment layer, a window opens to give you the controls that are specific to that type of adjustment.

Copying layers

Sometimes you will want to create duplicates of layers. There are four ways to copy a layer:

1. From the *main menu* select Layer>Duplicate Layer.
2. From the *layers panel menu* select Duplicate Layer.
3. In the layers panel click on the layer and drag it to the New Layer icon at the bottom of the panel.
4. Select the layer and press Ctrl-J (Windows) or Cmd-J (Mac). (Note: If you make a selection on an image and press Cmd-J it will create a new layer that contains just that selection. This only works on image and fill layers.)

Layer opacity

There are two other important layer options that can be selected in the layers panel - blend mode and **opacity**.



The **opacity** slider changes the transparency of the layer if it is an image - so reducing the opacity allows you to 'see through' an image, as in the following example:

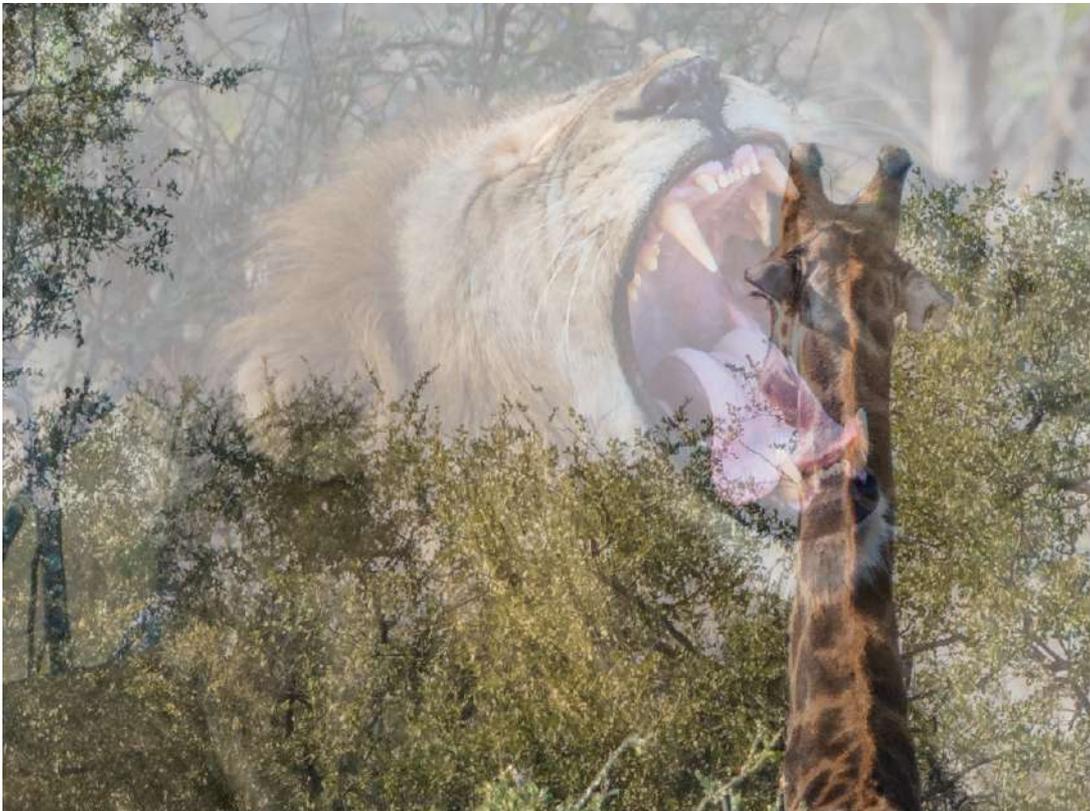


Top layer



Bottom layer

When the opacity of the top layer is reduced to 50% we get this:



If the opacity of an adjustment layer is reduced, the amount of influence the adjustment layer has on the layers below it is reduced as in this example:



The original image could benefit from a boost in contrast, so a curves adjustment layer is added:



The effect of the curves adjustment layer is too strong, so the opacity of that layer is reduced to 50%.



Some useful techniques with layers

1. To **delete** a layer - select the layer and press 'delete' or select the layer and drag it into the trash can at the bottom of the layers panel.
2. To **move** a layer up or down in the stack of layers just select it and drag it to the desired opposition.
3. To **flatten** all the layers in an image (and keep the overall appearance of the image) select "Flatten image" from the menu in the layers panel. Generally, flattening layers is not a good idea because you cannot undo it later.
4. To **merge** all the layers in an image without flattening it (so that you still have all the separate layers) - select the top layer in the stack and press Ctrl+Shift+Alt+E (Windows) or Cmd+Option+Shift+E (Mac). The

new merged layer will appear above the previously selected top layer. This process is called "Stamp Visible" because if some of the layers are turned off (not visible) when you do it, the merged layer will not contain any information from those turned off layers.

5. To **copy** a layer from one image to another - drag the layer from the layers panel in one document and drop it on to the other document. If you hold down the shift key while you drag, the layer will be centred on the second document. You will normally only do this if the two images have the same pixel dimensions.
6. To **fill** a layer with the foreground colour press Alt+Backspace (Windows) or Option+Delete (Mac).
7. To **fill** a layer with the background colour press Control+Backspace (Windows) or Command+Backspace (Mac). These last two processes work for selections as well as for layers but only on image or fill layers. If you do it on an adjustment layer it fills the layer mask with black or white.
8. When you **save** a file in the PSD (Photoshop) format or the TIFF format the layers are preserved (they will be there when you open the file next time). If you save the file as a JPEG, Photoshop will flatten the file (merge the layers) before saving it. When you open it next time the layers will not be there. If you need to save a JPG version of a file it is usually best to first save the PSD file with layers, then save the JPG file.
9. To select a layer (rather than selecting all layers in the image), hold down the Ctrl key (Windows) or Cmd Key (Mac) and click on the layer thumbnail in the layers panel.
10. To rotate a layer, select it (using the technique above) and then choose Edit>Transform or Edit>Free Transform from the main menu. When the rotation is made, press Enter (Return on Mac) to confirm it and then Ctrl-D (Cmd-D) to deselect the layer.

Blend modes

The **blend mode** of each layer controls the way that layer interacts with the layers below. Unless you change it, the layer blend mode will be 'normal'. This simply means that the layer will effect the layers below in the way that you would expect.

The other blend modes use various mathematical functions to determine how the layer being blended interacts with the layers below it. They are grouped into the following categories:

Blend Modes that darken some/all pixels:

Darken

Multiply

Colour burn

Linear burn

Darker colour

Blend Modes that lighten some/all pixels:

Lighten

Screen

Colour dodge

Linear dodge

Lighter colour

Blend Modes that alter the contrast in the image:

Overlay

Soft light

Hard light

Vivid light

Linear light

Pin light

Hard mix

Blend Modes based on colour information:

Hue

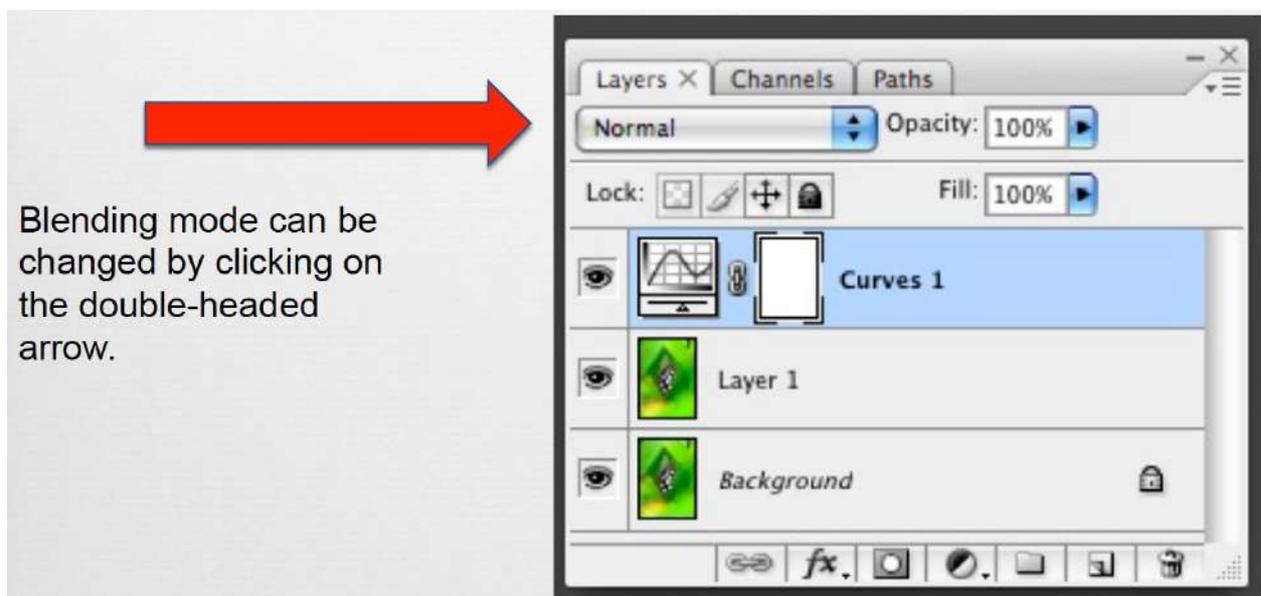
Saturation

Colour

Luminosity

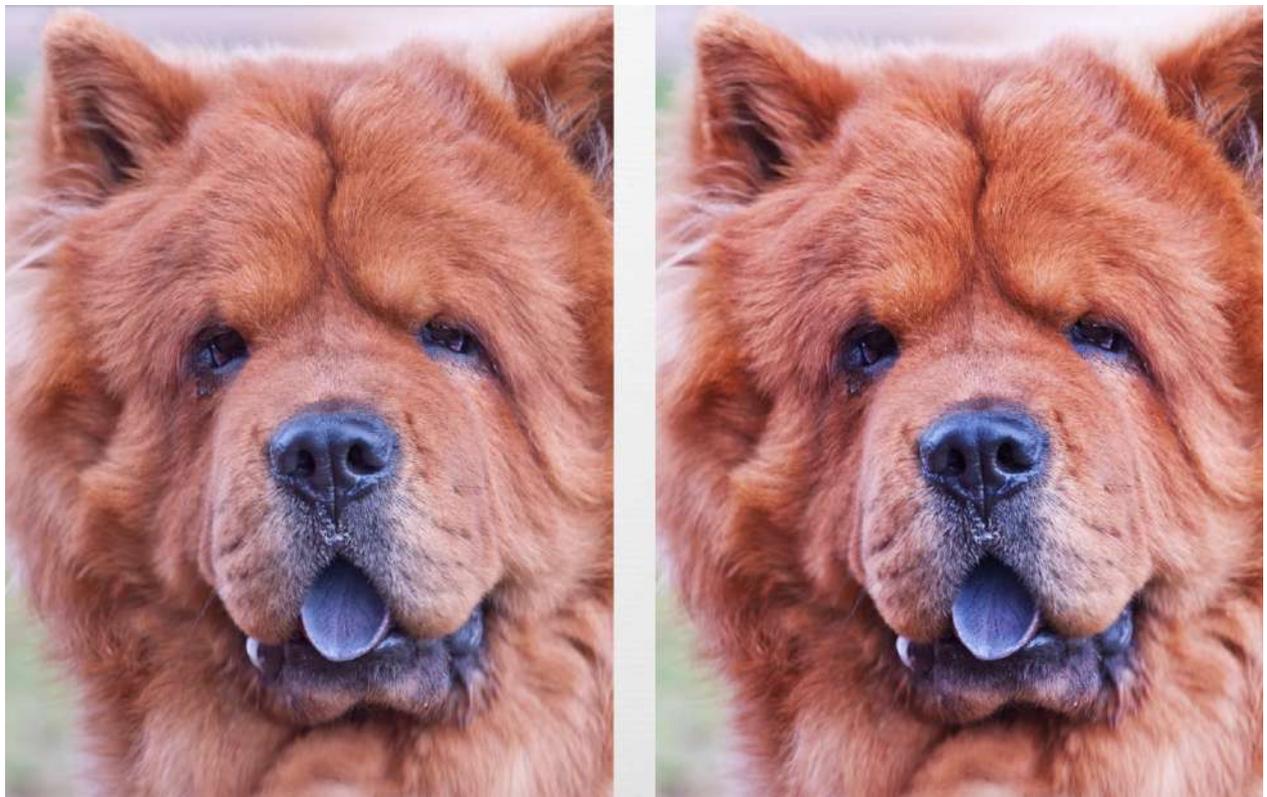
In each group, the blend mode shown in blue is the one you will probably find most useful. These and other modes are described in detail in another tutorial. For now, here are just a few points about blend modes:

1. The blending mode of the background layer cannot be changed.
2. The blending mode of all other image, fill or adjustment layers can be changed.
3. The result of changing the blending mode of a layer will depend on:
 - (a) The blend mode selected.
 - (b) The type/content of the layers being blended.
 - (c) The opacity of the blending layer.



Following are just a couple of simple examples of what can be achieved with blending modes:

Blending an image with itself to give more structure and depth of colour:

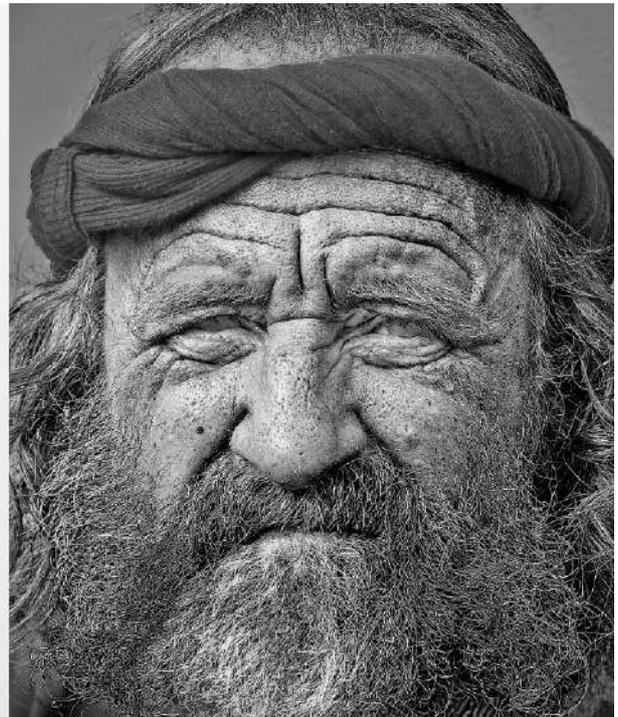


Duplicate image and blend with "overlay" mode at 40% opacity.

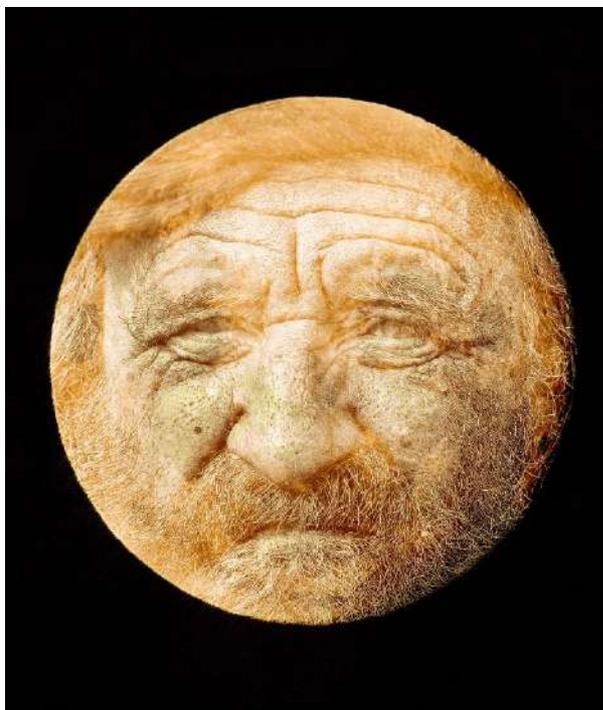
Blending two different images:



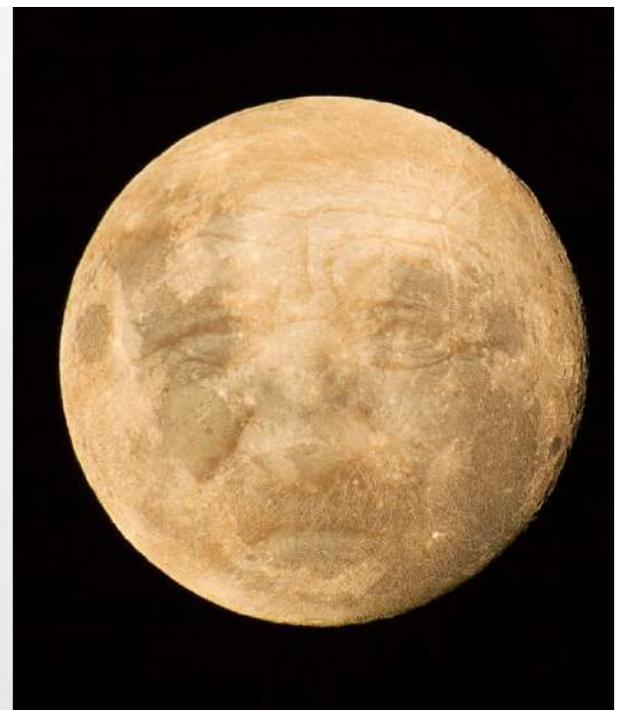
Bottom layer



Top layer



Overlay blend with 100% opacity



Overlay blend with 50% opacity

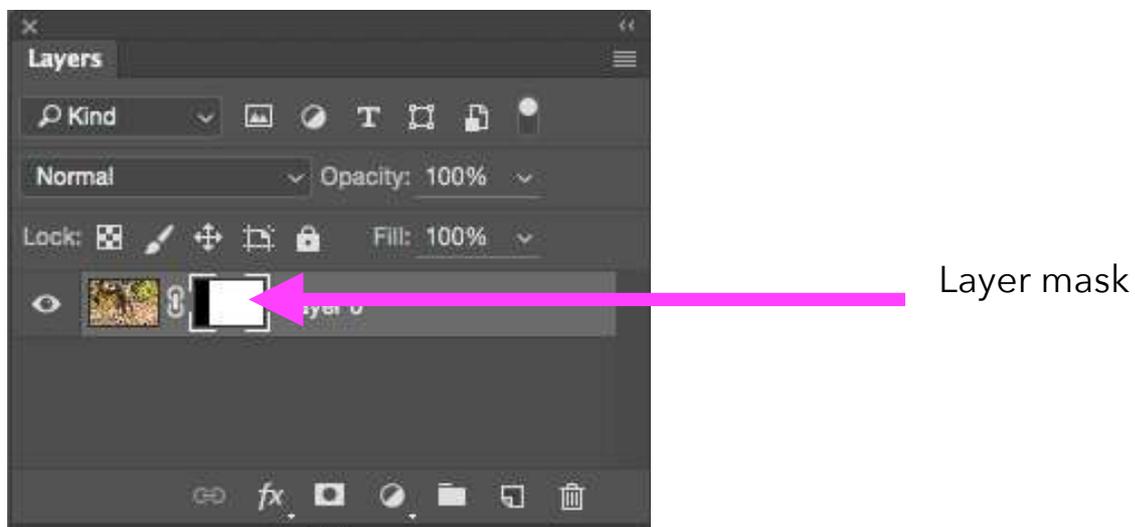
LAYER MASKS

To “mask” something means to cover it. So **layer masks** are used to cover part or all of the content of image layers or the effect of adjustment layers.

Layer masks have to be greyscale (they cannot contain any colour information) so they can contain white, black and any shades of grey. The effect is this:

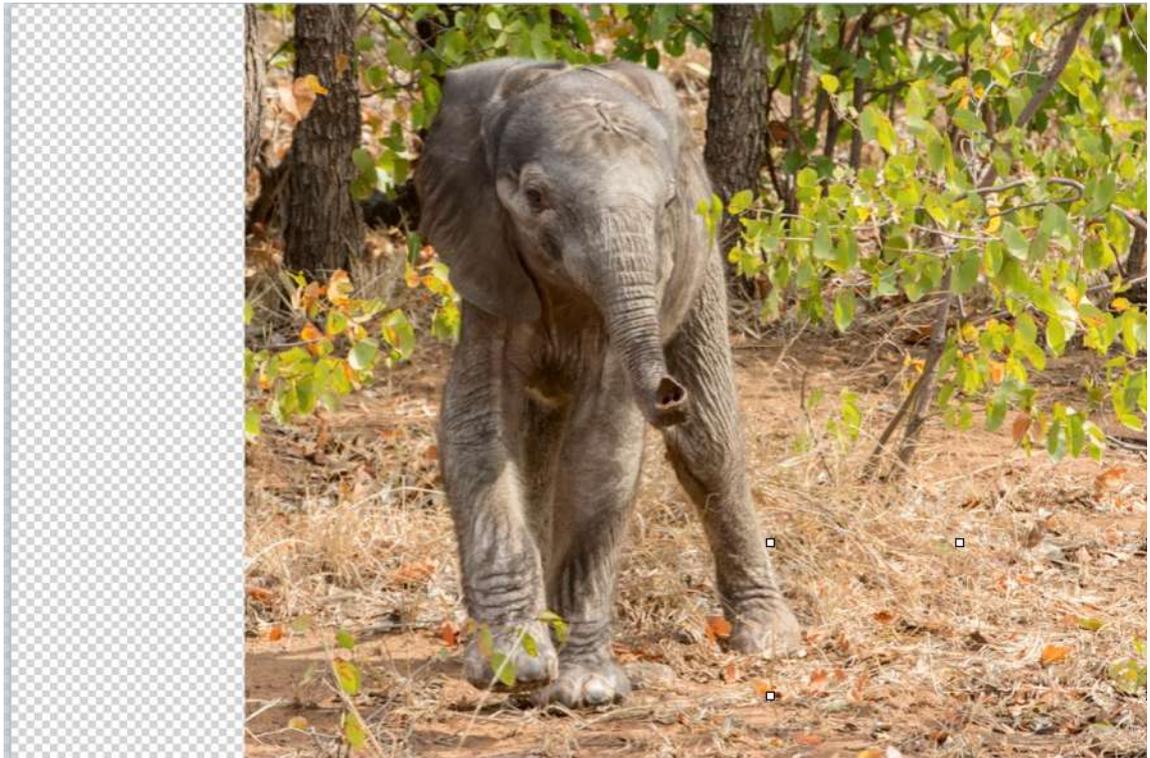
- WHITE - on an image layer, this part of the mask allows the corresponding part of the image to be visible. On an adjustment layer it allows the adjustment to be applied to the corresponding part of the image.
- BLACK - on an image layer, this part of the mask will hide the corresponding part of the image (making it transparent). On an adjustment layer it prevents the adjustment being applied to the corresponding part of the image.
- Shades of GREY - on an image layer, this part of the image will become partially transparent. On an adjustment layer, the effect of the adjustment will be reduced on the corresponding part of the image (depending on the density of the shade of grey).

When a layer mask is applied, it shows as a small icon on the appropriate layer in the layers panel:



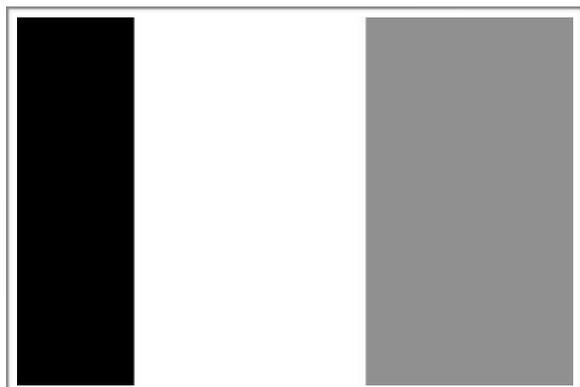
If you hold down the Alt key and click on the layer mask icon the mask will appear full size in place of the image, and you can then edit it just as you would an image. To close the layer mask, Alt-click on its icon again.

In the above example, the mask was applied to the background layer so the effect on the image would be this:

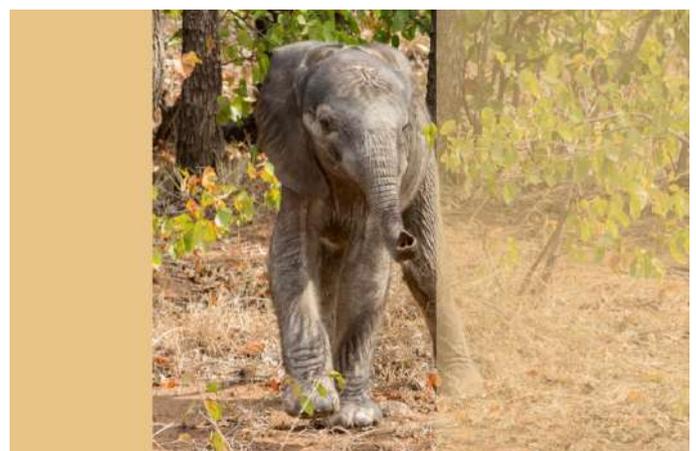


The strip down the left hand side of the image has been covered by the black area of the layer mask.

If a colour fill layer was placed below the background layer and this layer mask applied the result would be:

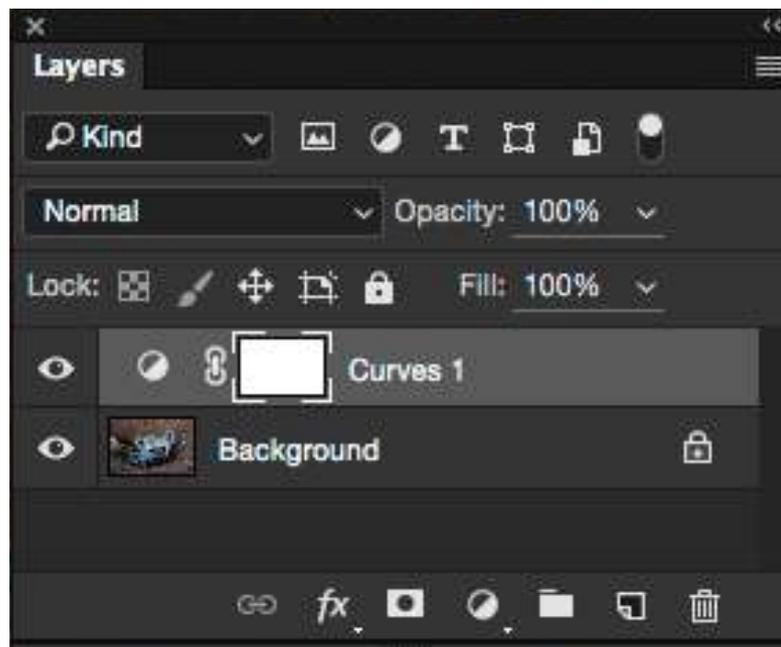


(c) 2017 Roy Killen

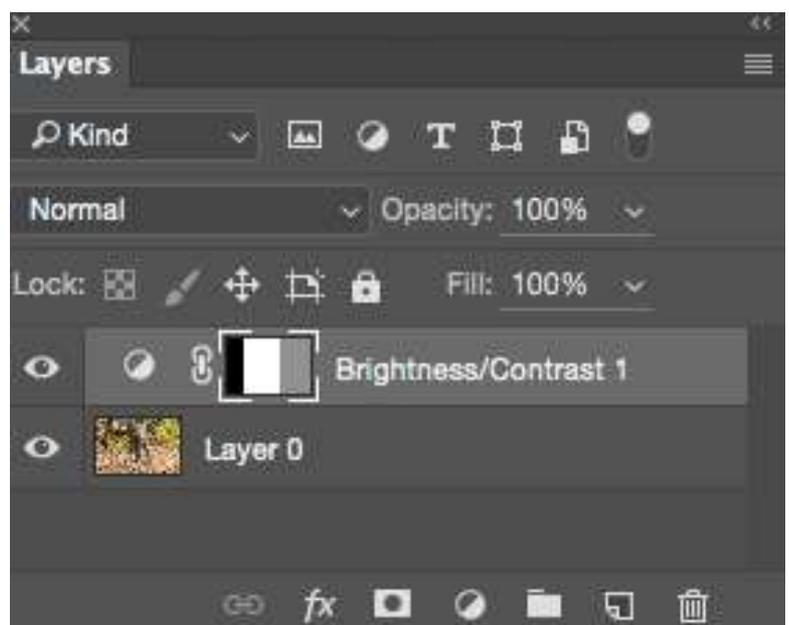


The left hand side of the image is fully masked (covered) to reveal the coloured layer beneath and the right hand side is made partially transparent by the mid-grey strip on the mask.

When you create an ADJUSTMENT layer, a white layer mask is created automatically. For example:



If nothing is done to this mask (no black or grey added to it) the adjustment will have full effect. If black or grey is added to the mask then the effect of the adjustment will be reduced in those areas according to the density of the grey toning. For example, if the previous black/white/grey mask was applied to a brightness/contrast layer adjusted to reduce the brightness of the previous elephant image the result would be this:

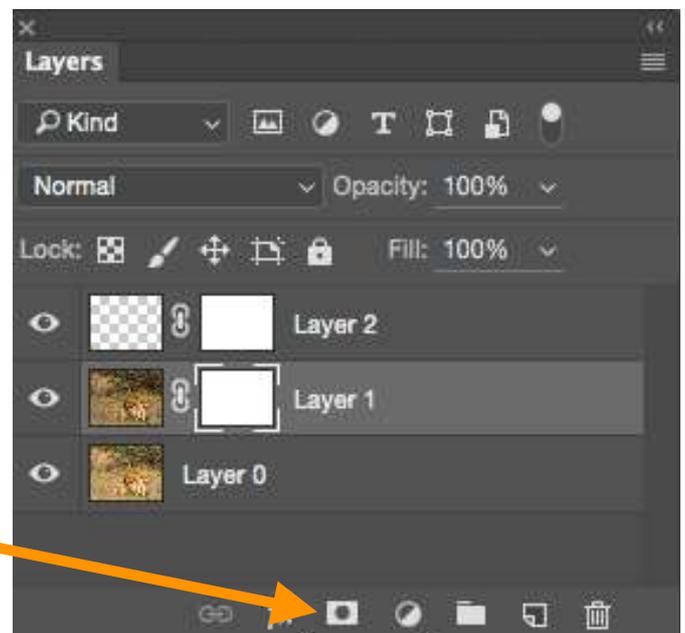




You can see that no change has occurred on the left of the image where the mask is black. The full effect of the brightness reduction has occurred where the mask was white (in the centre part of the image), and there has been a partial reduction in brightness where the mask was grey.

If you create a fill layer (solid colour, gradient or pattern) Photoshop will automatically create a white layer mask.

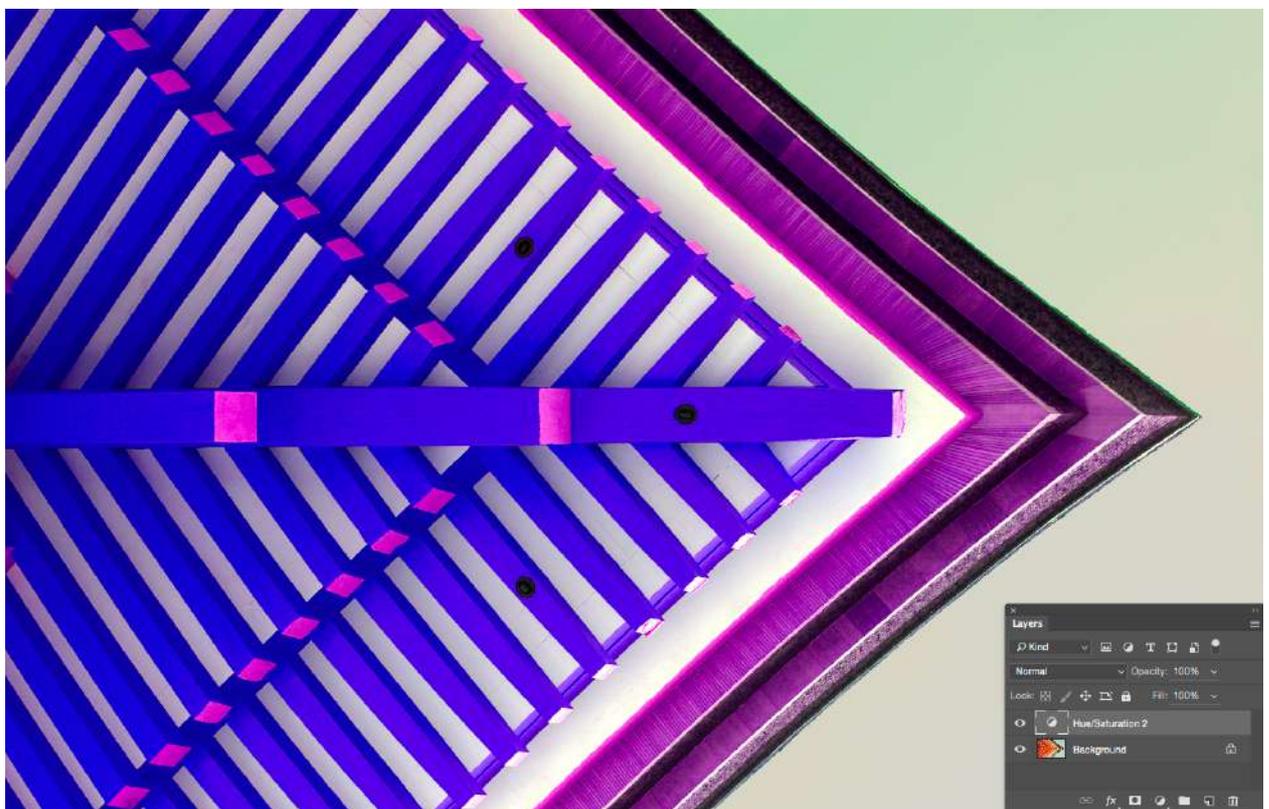
If you add an empty layer or an image layer, no mask will be created. You can manually add a mask to any layer by clicking on the layer mask icon at the bottom of the layers panel:



Complex layer masks can be used to restrict adjustments to specific parts of an image, as in the following example.

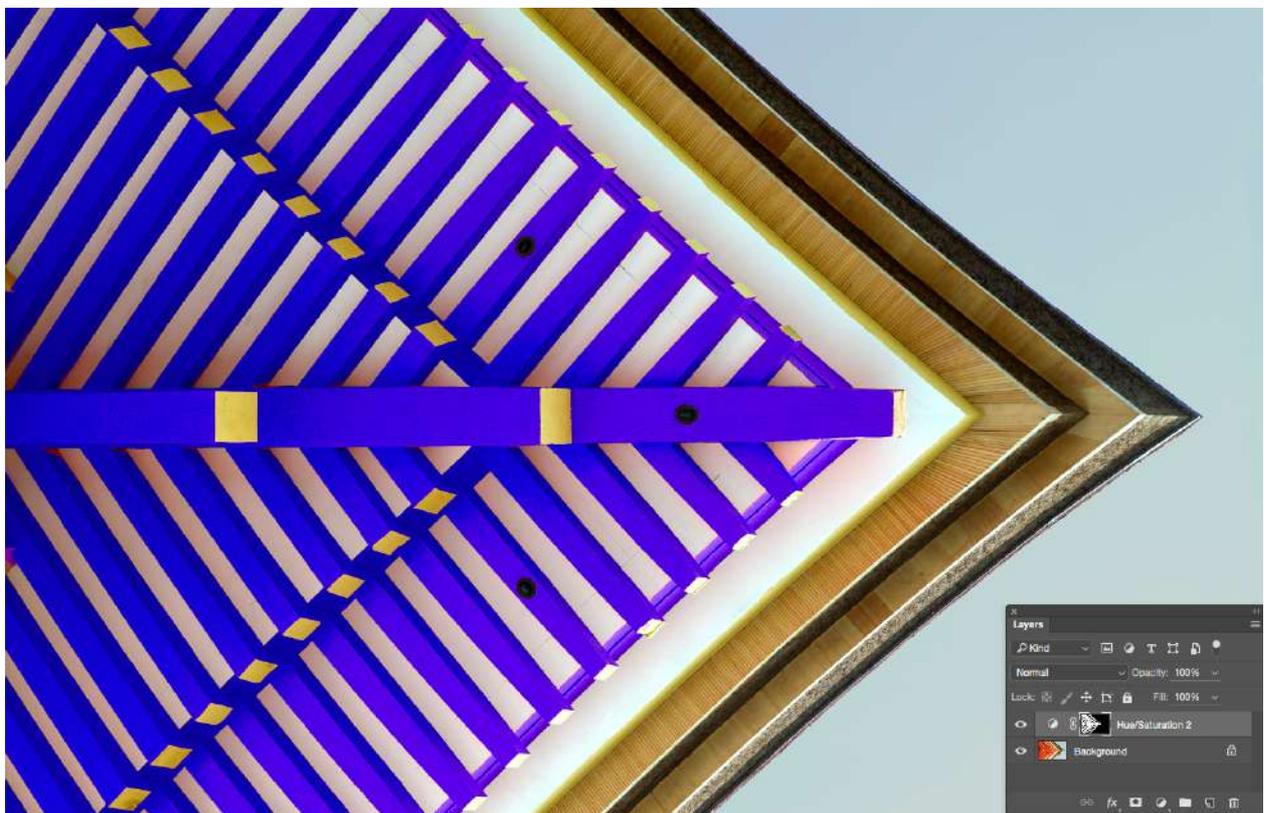
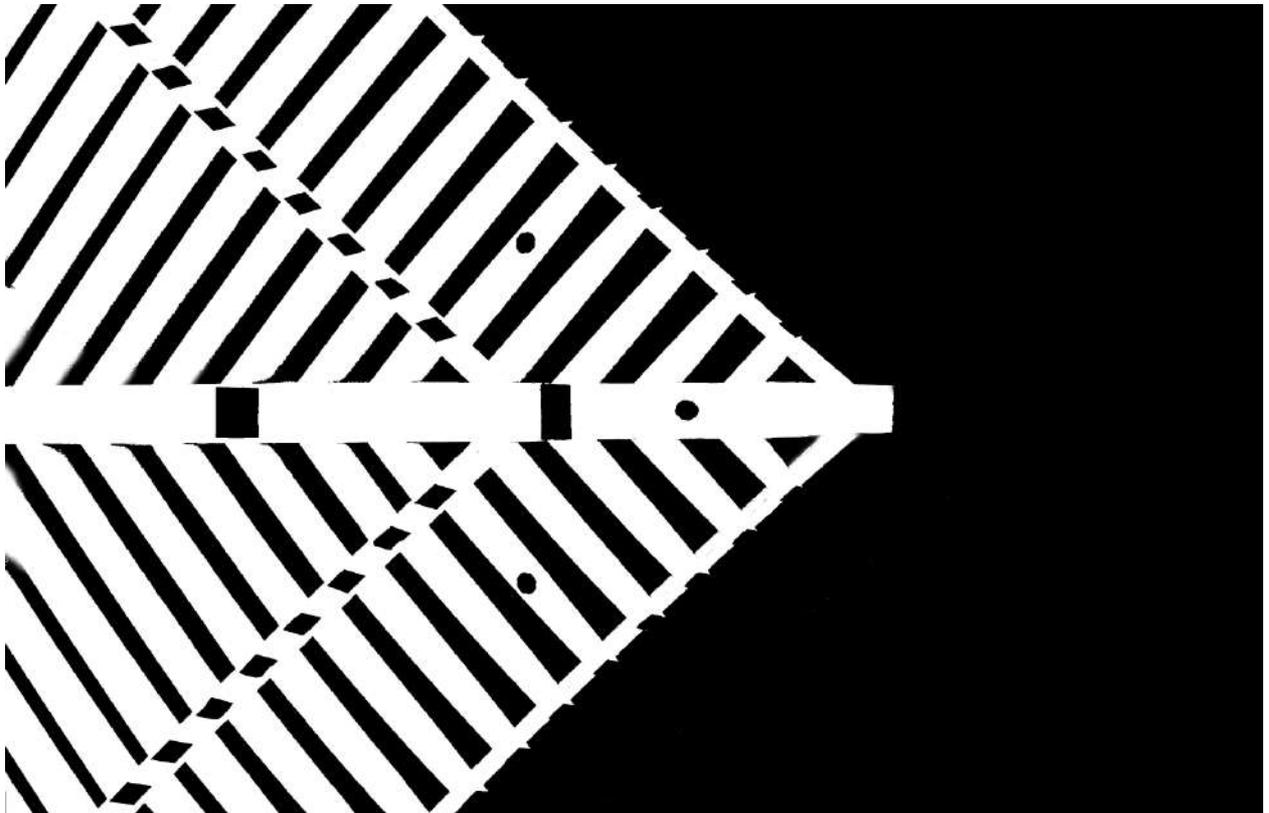


Original image



Hue/Saturation layer applied - no mask so adjustment changes the whole image.

By creating a layer mask based on the orange tones in the original image the hue/saturation adjustments can be restricted to the 'orange' areas:



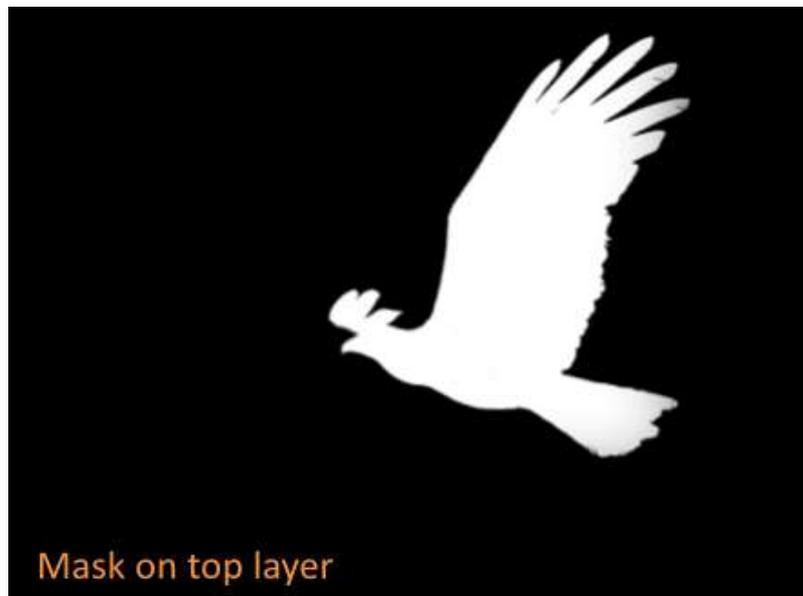
Layer masks can be used to combine two images, as in the following example.



Bottom layer



Top layer



How to place two images into layers in a single file

If you want to combine images in the way I have show above you need to place the two original images (the beach scene and the bird) as layers in the same image file. The procedure is as follows:

1. Open the first image - the one that will be the background image (the beach scene in this example).
2. Open the second image (the bird in this example).
3. Select all or part of the second image - the part that you want to copy. This does not have to be a precise selection as you can apply layer masks later to refine it.
4. Copy this section (or the whole image).
5. Switch to the first image.
6. Paste the copied image - it will become a new layer on top of the first image.
7. If necessary, use the Move tool to reposition the second image. You might find it useful to reduce the opacity of this second image layer to help you re-position it.
8. When you are satisfied with the position of the second image you might need to create a mask on that layer to remove any unwanted elements.

Some tips for working with layer masks

Layer masks can be **moved** from one layer to another by simply clicking on the layer mask icon and dragging it to the required layer.

Layer masks can be **copied** from one layer to another by Alt-clicking on the layer mask icon and dragging it to the required layer.

Layer masks can be **inverted** (whites changed to black and blacks changed to white) by selecting the layer mask (just click on its icon) then pressing Ctrl-I (for windows) or Cmd-I (for Mac).

Note: When a layer mask is created, it also appears as an alpha channel (more about channels later). If this alpha channel is duplicated, it will be **saved** with the image even if the image layers are flattened before saving.

If you make a selection and then add an adjustment layer (perhaps by clicking on the relevant icon on the adjustments panel) the adjustment layer created will automatically have a layer mask with a white area that corresponds to the selection.

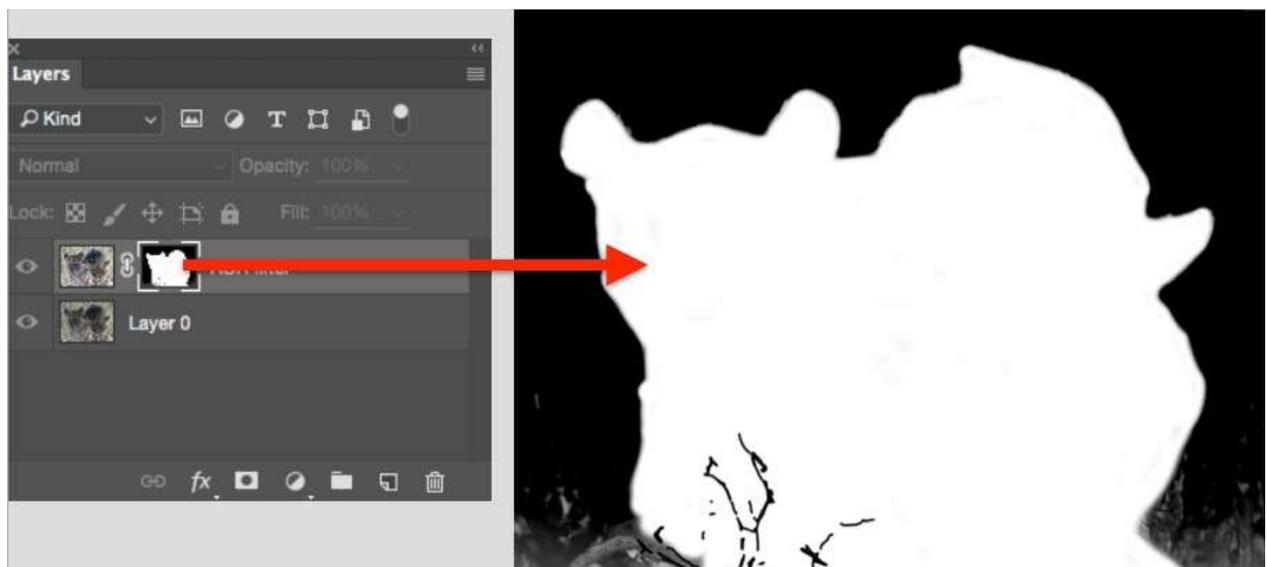
The following example shows how a layer mask can be copied and inverted to allow for different types of adjustments on two areas of an image.



In the original image the lions are obviously in shade and the background is in bright sunlight. To improve the image it is necessary to lighten the

main subject and darken the background. The process used was as follows:

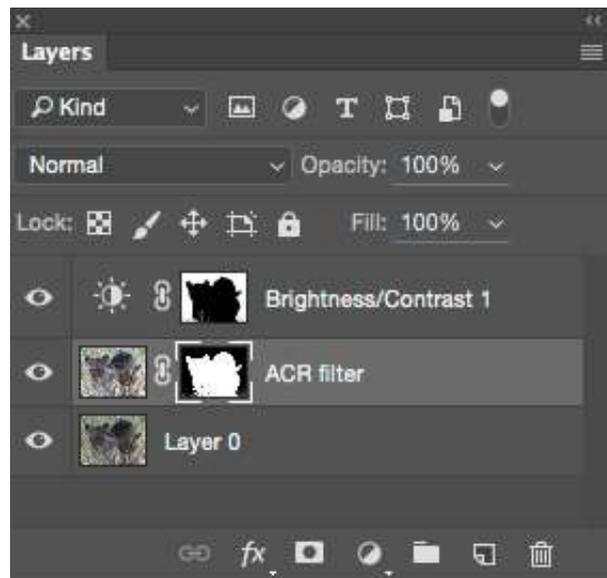
1. Duplicate the background layer.
2. Open the duplicated layer in Adobe Camera Raw by using the Camera Raw filter in Photoshop. Make adjustments to improve the appearance of the lions without being concerned about the background. Return the image to Photoshop.
3. Create a layer mask based on the lions.



The result was:



The next step was to add a brightness/contrast layer and adjust it to give the desired effect on the background. So that these adjustments did not effect the lions, the previously created layer mask was copied to the brightness/contrast layer and inverted to give the final result.



CHANNELS

Channels are “storage baskets” that hold information that Photoshop uses to construct images.

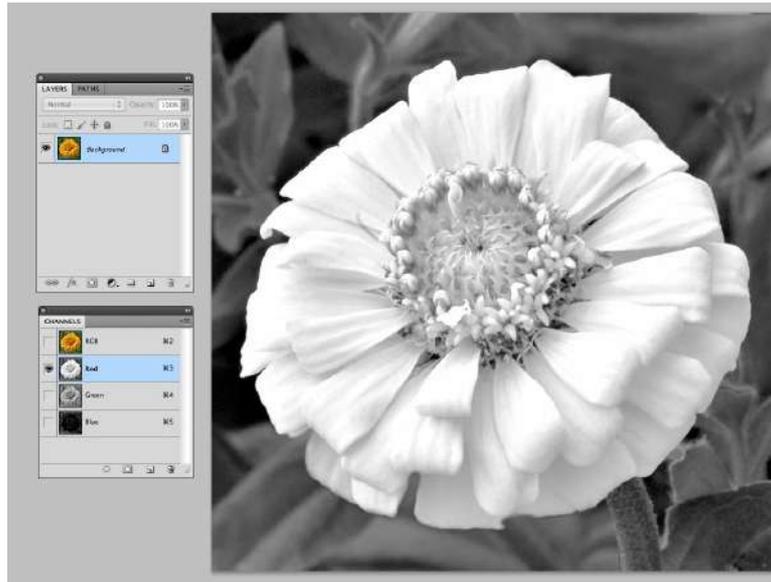
RGB images (the colour mode in which we normally work in Photoshop) consist initially of three channels: red, green and blue. Each channel contains information about the variations in intensity of the relevant colour across the image. Each channel is a grayscale image in which light areas represent intense colour and dark areas represent lack of colour.

Consider this example:

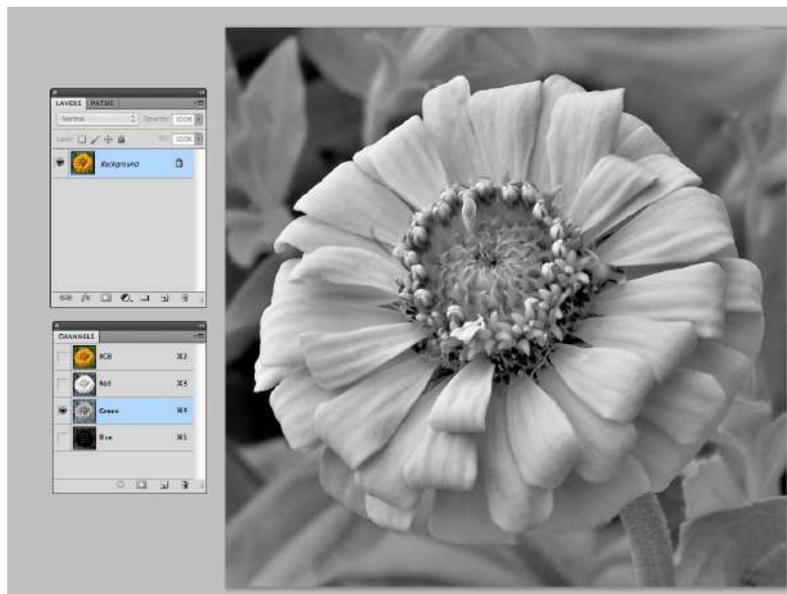


In Photoshop, the image is constructed from information about the red, green and blue components of the colour in each pixel. To see how much of each of these colours is used to create the image we can look in the Channels Panel where we would see this:

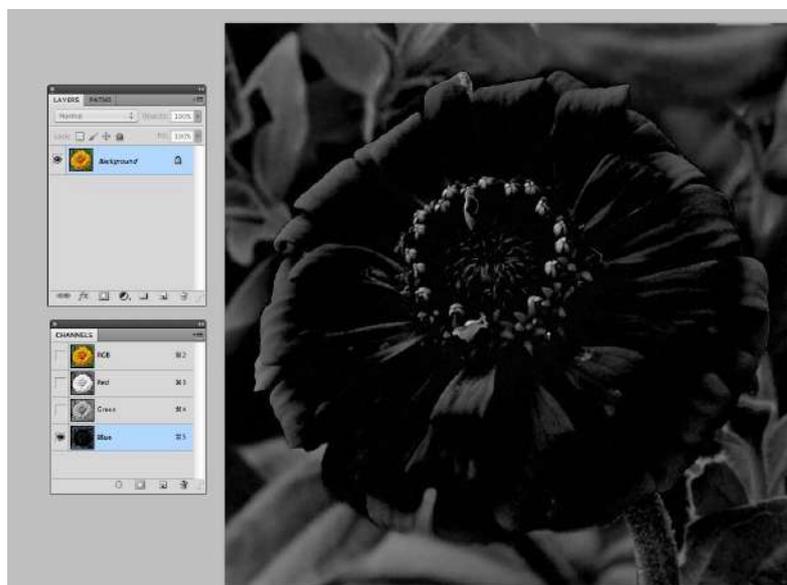




RED channel



GREEN channel



BLUE channel

Layer mask created from RED channel

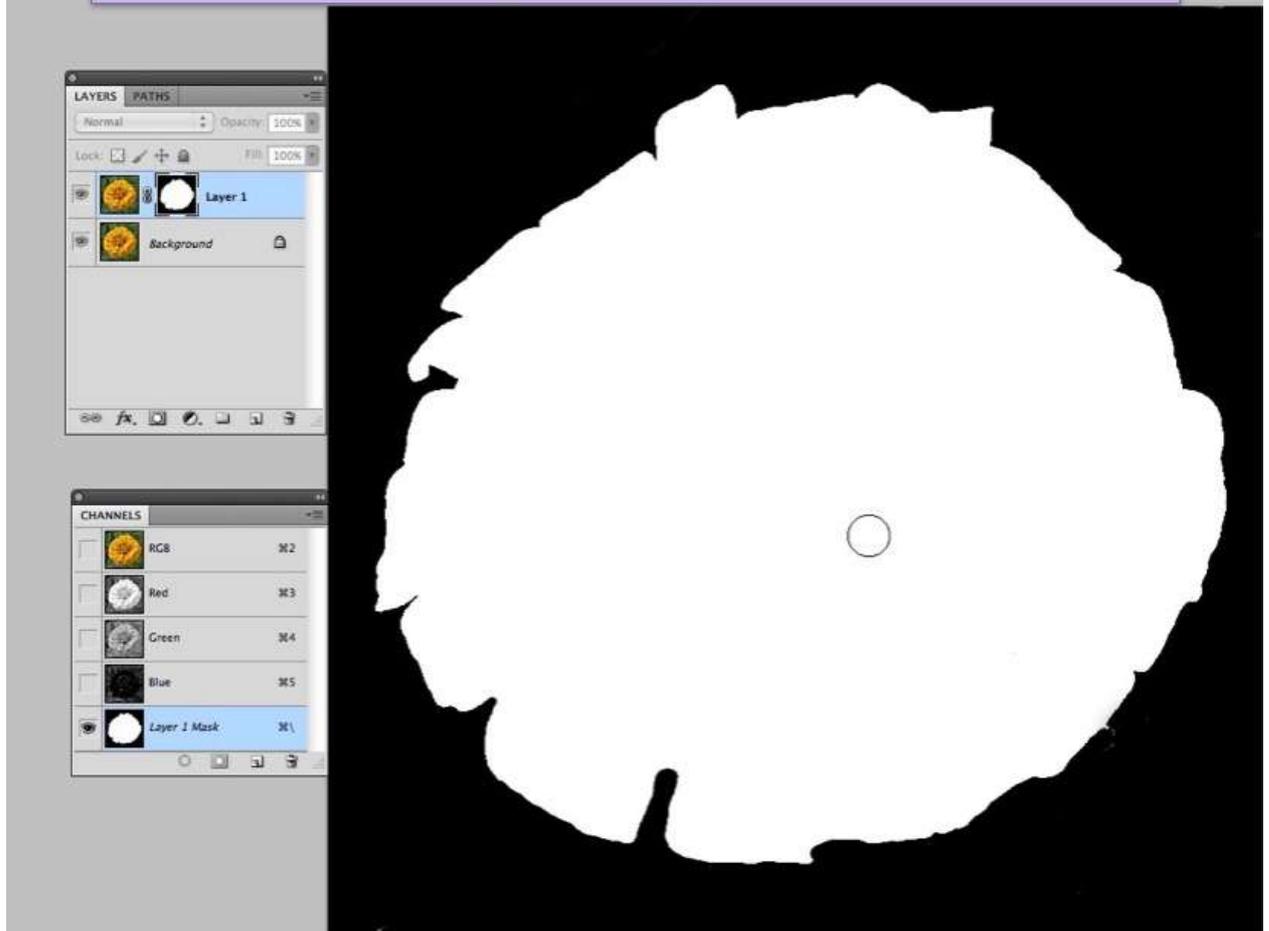


Refining the layer mask



Select mask and make levels adjustment

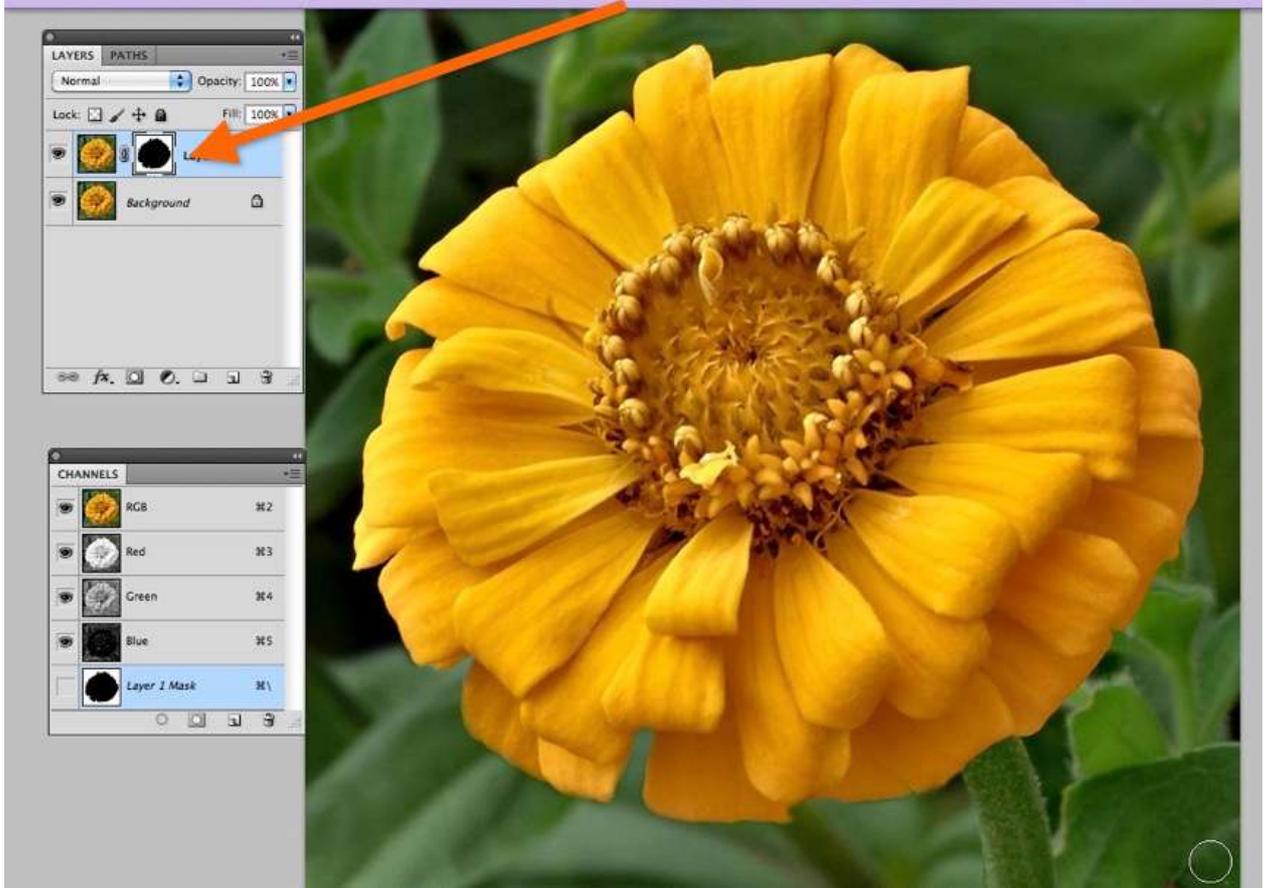
Clean up the mask with brush



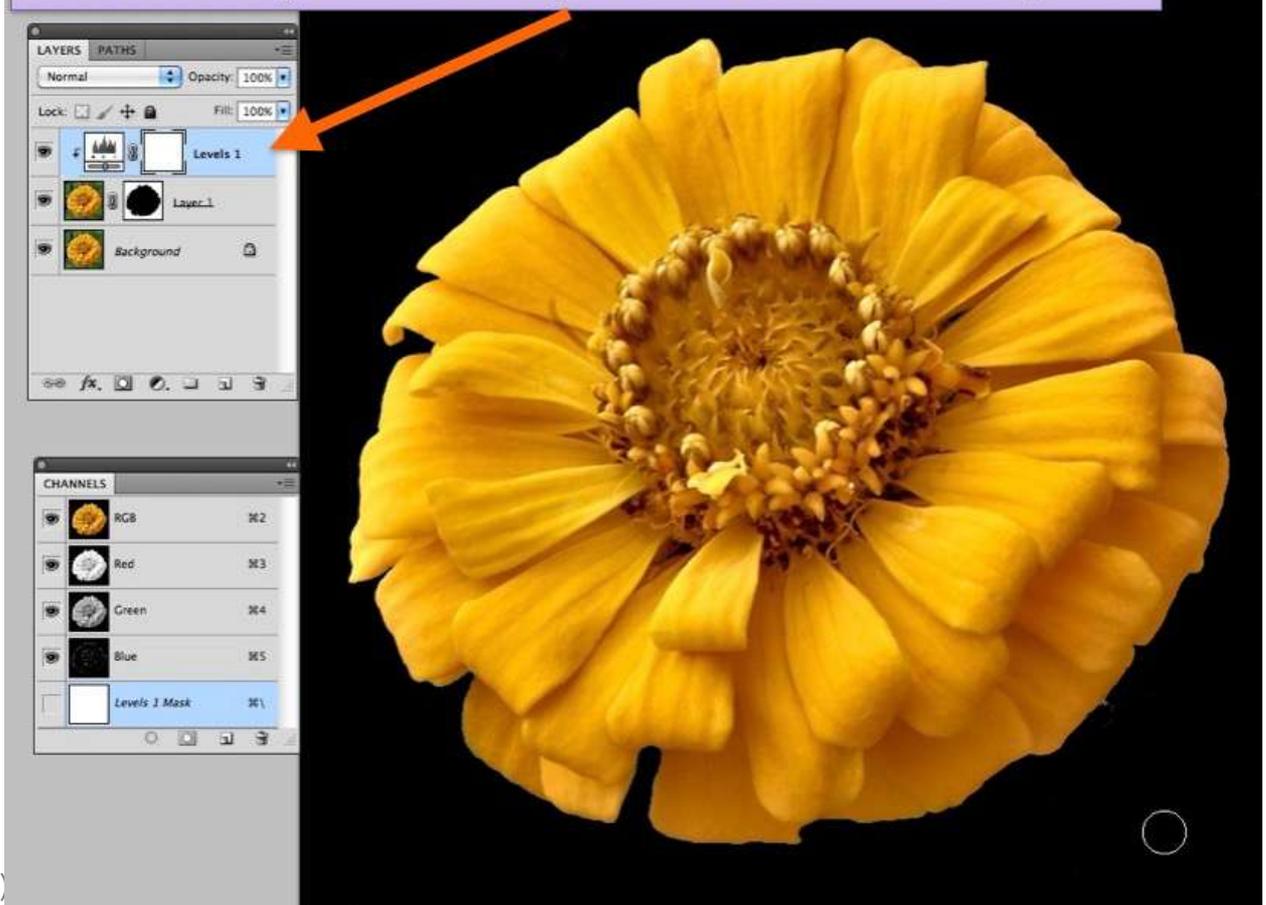
Refined mask is ready for use.



Layer mask has been inverted so that image background can be adjusted



Add LEVELS layer linked to layer below to darken background



(c)

Saving channels as layer masks

There are many ways in which you can use the information in the RGB channels, and one of the most useful is to use it to generate layer masks. The process is simple:

- Open the Channels panel and decide which channel you want to use.
- Ctrl-click (Windows) or Cmd-click (Mac) on the required channel. This generates a selection based on the grayscale information in the selected channel. It may not look like a very clear or neat selection but don't be concerned about that.
- Select the layer to which you want to apply the mask and click on the "Add layer mask" icon. This applies the mask to the layer. (Note: If the layer already has a mask, perhaps created automatically on an adjustment layer, you will have to delete this mask before applying the mask that is generated from the channel.)

Once you have generated a layer mask in this way, you can use it or modify it in the same way that you would any other mask. For example, you could open the mask (Alt-Click on the mask icon) and apply a Levels adjustment to it to increase the contrast between the light and dark areas of the mask. You might also want to paint on the mask (with black, white or grey) to make it more useful.

The general principle is this: If you want to use the mask to provide very subtle changes to your image you will probably want to keep the grayscale information that came from the channel. The shades of grey in the mask will provide gradual changes between the light and dark areas and thus blend the changes provided by the light and dark areas of the mask. . If you want to use the mask to make very definite differences between parts of an image you will probably want to modify the original mask with adjustments or painting.

The following example shows how channel-generated masks can be produced, modified and used on the flower image shown earlier.

In order to achieve this result it was necessary to use a clipping mask. This simply means that the adjustment layer was “clipped” to the layer below if so that the adjustment affected that layer but not all layers.

As is usually the case in Photoshop, this result could have been achieved with a different approach. The mask could have been applied directly to the levels adjustment layer.

Saving selections

When you create a selection (no matter how you do it) you can save that selection as an alpha channel by simply selecting Select>Save Selection from the main menu.

Saving layer masks

Sometimes it is useful to be able to save layer masks so that you can use them multiple times. The simplest way to do this is to save the masks as alpha channels. The process is simple because each time you create a layer mask it automatically appears as an alpha channel in the Channels panel. To save it, all you have to do is right click on the channel containing the mask and select “Duplicate Channel”.

Turning a Channel into a Layer

Sometimes it is useful to be able to turn a channel into a layer rather than into a layer mask. The process is as follows:

- Open the Channels panel and click on the icon of the channel you want to use. The “eye” symbol should stay on for this channel and go off for all the other channels. You should then see a greyscale image of the selected channel.

- Press Ctrl-A (Windows) or Cmd-A (Mac) to select all this image.
- Press Ctrl-C or Cmd-C to copy the image.
- Select the RGB channel in the channels panel (click on its icon) and you should see the full colour image back again.
- In the Layers panel select the layer above which you want the new layer to appear.
- Press Ctrl-V (or Cmd-V) to paste the new layer. It should appear in the layers panel and be visible as the top layer of your image.

SUMMARY

Using the information in these notes, it is possible to do the following:

Convert a selection to a layer mask.

Convert a selection to a channel.

Convert a layer mask to a channel.

Convert a channel to a selection.

Convert a channel to a layer.

If you master each of these techniques it will open a new world of image editing possibilities.

If you have any suggestions for improving these notes please email me at roykillen@mac.com