Web Standards & Best Practices
:: LOOK & FEEL / GUIs :: Using Adobe Photoshop

1. Table of Contents

IMAGE FOR WEB

Image Formats ::

We're going to look at the three common image formats used on the web: **GIF**, **JPEG** and **PNG**. You'll learn how these image formats work, and where to use each type of image in your web pages.

> The GIF Image Format

GIF stands for **Graphics Interchange Format**. It is probably the most common image format used on the Web. GIF's have the advantage of usually being very small in size, which makes them fast-loading. Unlike JPEG's, GIF's use *lossless* compression, which means they make the file size small without losing or blurring any of the image itself.
GIF's also support *transparency*, which means that they can sit on top of a background image on your web page without having ugly rectangles around them.
Another cool thing that GIF's can do is animation. You can make an animated GIF by drawing each frame of the animation in a graphics package that supports the animated GIF format, then export the animation to a single GIF file. When you include this file in your web page (with the **IMG** tag), your animation will be displayed on the page!
The major disadvantage of GIF's is that they only support up to 256 colours (this is known as *8-bit colour* and is a type of *indexed colour* image). This means they're not good for photographs, or any other image that contains lots of different colours.

>> Making Fast-Loading GIF's

It's worthwhile making your GIF file sizes as small as possible, so that your web pages load quickly. People will get very bored otherwise, and probably go to another web site!
Most graphics programs let you control various settings when making a GIF image, such as palette size (number of colours in the image) and dithering. Generally, speaking, use the smallest palette size you can. Usually 32 colour palette produce acceptable results, although for low-colour images you can often get away with 16. Images with lots of colours will of course need a bigger palette - say, 128, or even 256 colours.

8-colour GIF
(1292 bytes)

64-colour GIF
(2940 bytes)

> The JPEG Image Format

JPEG stands for **Joint Photographic Experts Group**, a bunch of boffins who invented this format to display full-colour photographic images in a portable format with a small file size. Like GIF images, they are also very common on the Web. Their main advantage over GIF's is that they can display true-colour images (up to 16 million colours), which makes them much better for images such as photographs and illustrations with large numbers of colours.

The main disadvantage of the JPEG format is that it is *lossy*. This means that you lose some of the detail of your image when you convert it to JPEG format. Boundaries between blocks of colour may appear more blurry, and areas with lots of detail will lose their sharpness. On the other hand, JPEG's do preserve all of the colour information in the image, which of course is great for high-colour images such as photographs.

JPEG's also can't do transparency or animation - in these cases, you'll have to use the GIF format (or PNG format for transparency).

>> Making Fast-Loading JPEG's

As with GIF's, it pays to make your JPEGs as small as possible (in terms of bytes), so that your web sites load quickly. The main control over file size with JPEG's is called *quality*, and usually varies from 0 to 100%, where 0% is low quality (but smallest file size), and 100 is highest quality (but largest file size). 0% quality JPEG's usually look noticeably blurred when compared to the original. 100% quality JPEG's are often indistinguishable from the original:

Low-quality JPEG (4089 bytes)   High-quality JPEG (17465 bytes)
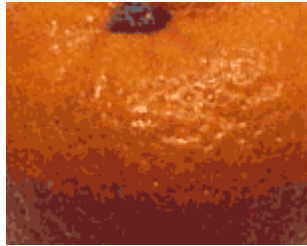
> The PNG Image Format

PNG is a relatively new invention. It stands for **Portable Network Graphics**. It was designed to be an alternative to the GIF file format, but without the licensing issues that are involved in the GIF compression method.

There are two types of PNG: PNG-8 format, which holds 8 bits of colour information (comparable to GIF), and PNG-24 format, which holds 24 bits of colour (comparable to JPEG). PNG-8 often compresses images even better than GIF, resulting in smaller file sizes. On the other hand, PNG-24 is often less effective than JPEG's at compressing true-colour images such as photos, resulting in larger file sizes than the equivalent quality JPEG's. However, unlike JPEG, PNG-24 is lossless, meaning that all of the original image's information is preserved.

PNG also supports transparency like GIF, but can have varying degrees of transparency for each pixel, whereas GIF's can only have transparency turned on or off for each pixel. This means that whereas transparent GIF's often have jagged edges when placed on complex or ill-matching backgrounds, transparent PNG's will have nice smooth edges.

Note that unlike GIF, PNG-8 does not support animation.

One important point about PNG: Earlier browsers don't recognise them. If you want to ensure your website is viewable by everybody, use GIF's or JPEG's instead.

16-colour PNG-8
(6481 bytes)

Full-colour PNG-24
(34377 bytes)

Summary of Image Formats::

This table summarises the key differences between the GIF, JPEG and PNG image formats.

GIF	JPEG	PNG-8	PNG-24
Better for clipart and drawn graphics with few colours, or large blocks of colour	Better for photographs with lots of colours or fine colour detail	Better for clipart and drawn graphics with few colours, or large blocks of colour	Better for photographs with lots of colours or fine colour detail
Can only have up to 256 colours	Can have up to 16 million colours	Can only have up to 256 colours	Can have up to 16 million colours
Images are "lossless" - they contain the same amount of information as the original (but with only 256 colours)	Images are "lossy" - they contain less information than the original	Images are "lossless" - they contain the same amount of information as the original (but with only 256 colours)	Images are "lossless" - they contain the same amount of information as the original
Can be animated	Cannot be animated	Cannot be animated	Cannot be animated
Can have transparent areas	Cannot have transparent areas	Can have transparent areas	Can have transparent areas

On the whole, GIFs are better for the Web, as Web graphics tend to be small, have a small amount of colours, and sometimes need fancy stuff like animation or transparency. However, JPEGs are really handy when you have a very complex or large image (such as a photo), and/or you want a full colour image. PNG-8 can often produce smaller file sizes than GIF, and both types of PNG are lossless.

USING IMAGE EDITORS FOR WEB

USING PHOTOSHOP :: PHOTOSHOP'S LOGIC/STRUCTURE :: PRINCIPLES

Adobe Photoshop is the basic, the primary and the most important tool in Digital Image Editing.
You can't imagine, as a Digital Image Designer, a life without Photoshop; Photoshop is, actually, a Digital Fine Art Studio: you have there an easel, pens, pencils, brushes, airbrushes, erasers, you can choose between watercolours and oilcolours, between pencil and charcoal and, on top of all, you have Sp Fx, - Special Effects.

One of the most important Photoshop's functional principles is constituted by the fact that Photoshop thinks an image and edit it in/on LAYERS.
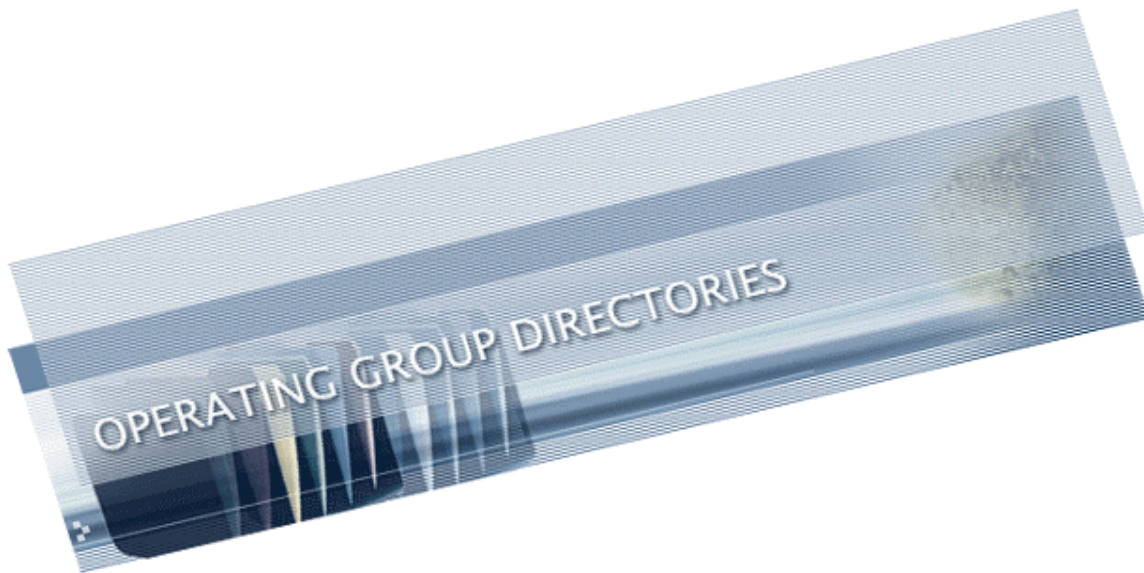
LAYERS

> What layers are:

The easiest way to explain layers is with an example. The following image shows a Photoshop document containing two layers, a background layer and a text layer:

Each layer can be manipulated, drawn on, and moved around independently of any other layer. Imagine that each layer is actually a physical sheet of clear plastic, with the graphic imprinted on the plastic:
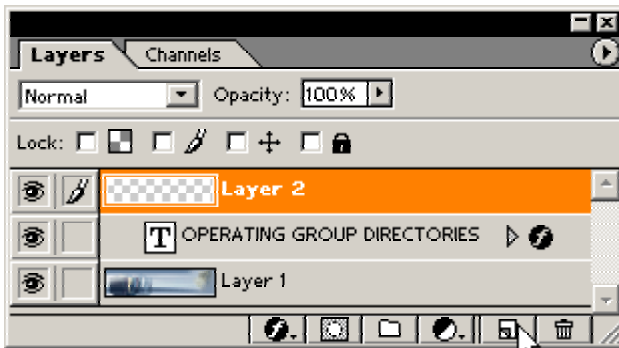
> Creating a Layered Document

Layers are controlled through the Layers palette in Photoshop. In this palette, you can see each layer along with a thumbnail showing the contents of the layer.

At the bottom of the palette you'll see a little New icon. Click on this icon to add a layer to your document:

You can now draw on your new layer, and it will not affect the layers below it, just as if it was a separate sheet of plastic on top of the image. Cool, eh? :)
Before working on a layer, make sure you click on the layer you want to work with in the Layers palette first, so that it becomes active. The currently active layer is shown highlighted in blue above (Layer 1).

> Naming Layers

Layer 1 isn't a very memorable name, but luckily you can change the name of your new layer easily! Double-click on the **Layer 1** layer in the Layers palette and you will see the **Layer Options** dialog appear. You can then enter a new name for your layer in the **Name:** box, and click OK to rename the layer.

> Moving Layers Around

Just like a real sheet of plastic, you can "slide" your layer around on the page. To do this, select the **Move** tool (the arrow with the crosshair next to it, at the top of the Tools palette),

or press the **V** key. Select the layer you want to work with in the Layers, then you can move the layer around by clicking with the mouse in the document window and dragging:

A nice shortcut is to just hold down the **Control** key and drag to move your layer around. This has the advantage that you don't have to switch to the **Move** tool and back again - the current tool remains active while you move the layer.
You can also move layers above or below other layers in the document. To do this, click on the layer in the **Layers palette** and drag it so that it's where you want it to be:
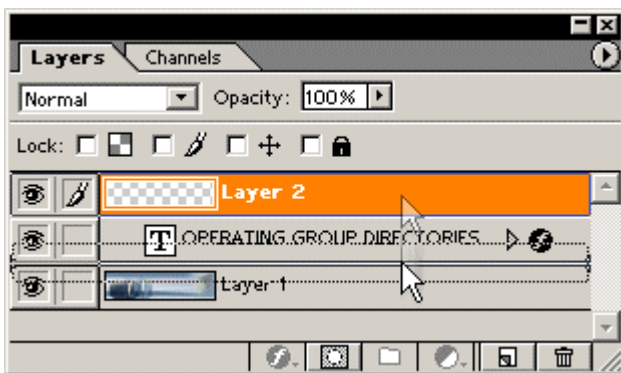
Another quick shortcut here is to use the **Control + [** key and **Control +]** key to move the current layer down and up respectively.

> **Showing and Hiding Layers**

Often it's useful to be able to hide a layer so you can work on the layers underneath it, or hide all other layers so you can concentrate on the current layer. You can do all this using the little eye icons next to each layer in the **Layers palette**:
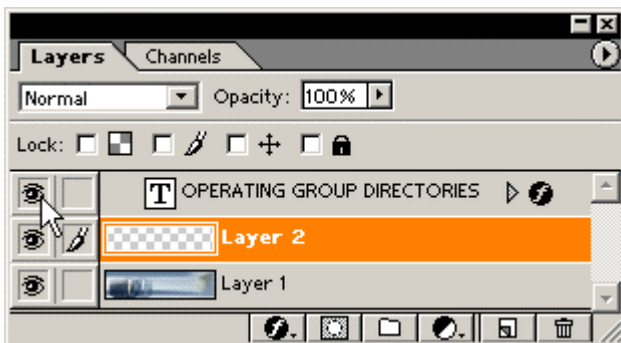
To hide a layer, click once on the eye icon. The eye will disappear and the layer will become invisible.
To show the layer again, click again on the eye icon. The layer will reappear.

To hide all layers except one, **Alt+click** on the eye icon for the layer you want to keep. **Alt+click** on the eye again to reveal all the layers.

> Copying Layers

You'll often want to duplicate an existing layer so that you can work on a copy of it. To make a copy of a layer, either drag the layer in the Layers palette to the New icon at the bottom of the palette, or select the layer and then select Layer > Duplicate Layer... (this method allows you to name the new layer too!).

> Deleting Layers

If you get carried away with your layers(!) and you want to delete one, find the layer in the **Layers palette** and drag it down to the little **trash can icon**. Or select **Delete Layer** from the **Layer** menu.

> Preserving Layer Transparency

Often, not every part of a layer will be covered with graphics. For example, with our example, the text layer only has pixels for the word "Stonehenge" at the bottom; the rest of the layer is empty. These empty pixels are **transparent**.
If you check the **Lock transparent pixels** (**Preserve Transparency** for Photoshop 5) box in the **Layers palette**, all the transparent pixels in the currently selected layer will remain transparent, even if you try to paint over them or fill them.
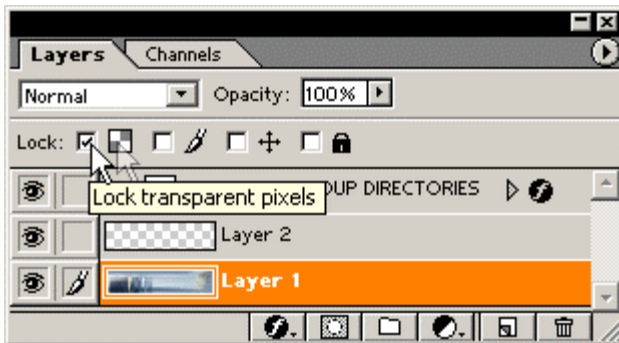
This is often very useful, as it allows you to work with just the stuff in the layer, rather than the whole layer. For example, here we've drawn a green like with the **Paintbrush** tool right through the words "Operating Group Directories", both with and without **Preserve Transparency** checked:

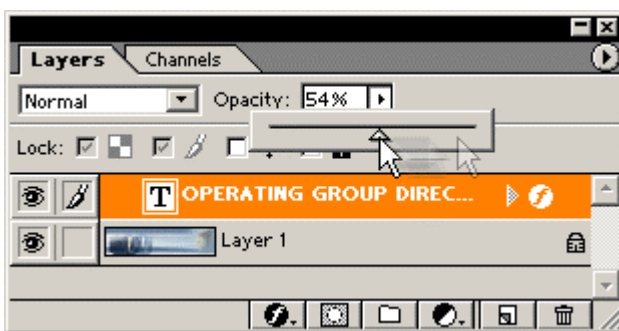Without **Preserve Transparency** Checked

With **Preserve Transparency** Checked

> Changing the Opacity of Layers

You can change how opaque a layer is, in other words, how much of the underlying image shows through the layer, with the Opacity option in the Layers palette:

You can enter a value by clicking on the number in the box and entering a new number, or by clicking on the arrow next to the number and then dragging the slider that pops up. You can also use the keyboard number keys 1, 2, 3, etc to quickly enter values of 10%, 20%, 30% etc, but this only works if you're using a tool that doesn't have an Opacity option (for example the **Marquee tool**). This option allows you to blend layers together subtly, with the topmost layers being slightly transparent, allowing the bottom layers to show through. For example:
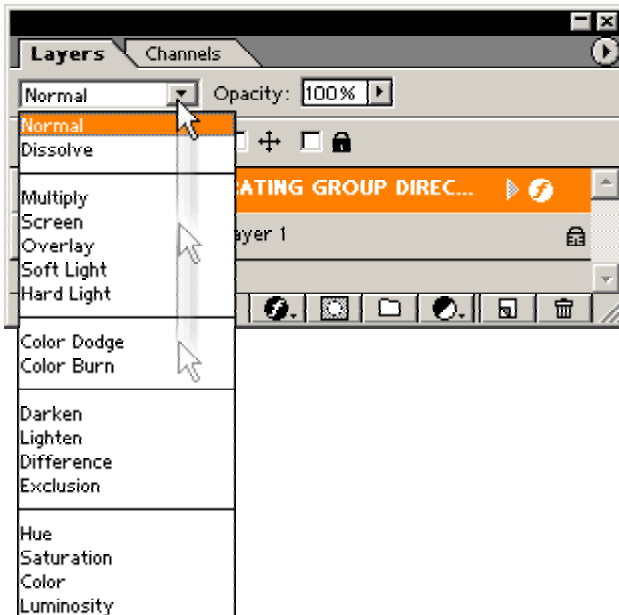

"Operating Group Directories" layer with **54% opacity**

> Blending Options

If you click the "Normal" drop-down box in the Layers palette, you will see a long list of blending modes that you can choose for the current layer:

The best way to understand these modes is just to play around with them and see what they do! Some of them, such as **Overlay** and **Soft Light**, are good for creating realistic light effects, while others such as **Difference** and **Exclusion** produce some quite wacky effects!

SELECTION :: SELECTING

We'll present you some ways to select areas of your images using the variety of selection tools available in Photoshop. First we'll talk about why selecting part of an image is so useful, and then we'll examine the various selection methods in Photoshop: the Marquee tools; the Lasso tools; the Magic Wand tool; the Color Range tool; and the Quick Mask mode. Finally, we'll look at ways to modify and fine-tune your selections.

> Why use selections?

Selections are a great way to work on parts of your image independently, rather than manipulating the image as a whole.
Once you've selected a part of an image (e.g. a person's head or other object), you can then manipulate this object separately from the rest of the image. This means you can cut the object out; add drop shadows; adjust the brightness/contrast; warp it; apply effects and filters easily - in fact, anything you like!
Now let's look at the different selection tools in Photoshop, starting with the Marquee tools.

> The Marquee tools :

The simplest selection tools to use are the marquee tools. These include the **Rectangular**, **Elliptical**, **Single Row** and **Single Column** marquee tools. Activate the tools by clicking and holding the mouse button on the top-left tool in the **Tools Palette**:
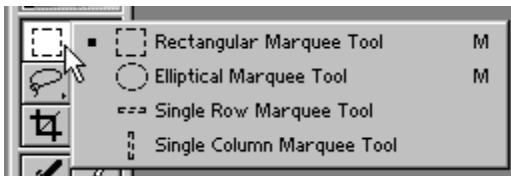
Click on the tool you would like to use. The **Rectangular Marquee** tool lets you select a square or rectangular area; the **Elliptical Marquee** tool selects a circular or elliptical area; and the **Single Row** and **Single Column** tools select a single line of pixels either horizontally or vertically.
To use one of the Marquee tools, click and drag out the selection with the mouse in your image:

> Creating a selection with the Rectangular Marquee Tool

By holding down the **Shift** key while dragging, you can constrain the selection to a square (for the Rectangular Marquee tool) or a circle (for the Elliptical Marquee tool):

> Creating a circular selection with the Elliptical Marquee Tool


Also, by holding down the **Alt** key while dragging, you can drag from the centre of the selection rather than from the edge - this is great for positioning circular selections precisely! Try it out to see what we mean.

> The Lasso tools

The lasso tools are great for seleting well-defined, irregularly-shaped areas. For example, they work well on strong foreground features of an image, such as a person's head.
To use the Lasso selection tools, click and hold the mouse on the Lasso tool icon in the **Tools Palette**:
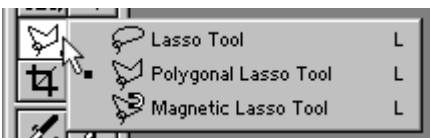
Click on the tool you'd like to use. The best way to learn about these tools is to try them out, but here are some pointers for you:

> Lasso tool

The regular **Lasso Tool** lets you select freehand areas by clicking and dragging with the mouse - when you release the mouse the "loop" is closed, completing the selection. This tool is great for quickly selecting a rough area.

> Polygonal lasso tool

The **Polygonal Lasso Tool** lets you create selections based on straight lines (or **segments**). This allows you more precise control when selecting using the mouse. Click with the mouse in your image to add the first **fastening point**, then move the mouse and click again to create a new fastening point with a segment in between. Continue in this way until you're done, then close the selection border by moving the mouse over the first point and clicking (double-clicking with the mouse will also close the selection automatically).


> Magnetic lasso tool

The **Magnetic Lasso Tool** is similar to the Polygonal tool, but it tries to add fastening points automatically based on the edge of the area you're selecting. For this reason, the magnetic lasso tool works best when selecting areas that contrast well with their surroundings. As with the Polygonal tool, you click to start it off. You can also add your own points by clicking. Finish the selection by moving the mouse over the first point and clicking, or just double-clicking.

OPERATING GROUP DIRECTORIES

The magnetic lasso tool's Options let you control the tool's sensitivity:
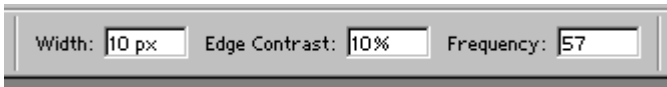
Width controls the range of pixels around the mouse pointer within which the tool looks for the edge of the object you're tracing. If your object has well-defined edges you can set a high **width** value and trace the object quickly and roughly. For more blurred edges, reduce the **width** and trace more precisely.

Edge Contrast specifies the tool's sensitivity to the edge of the object you're selecting. A high **Edge Contrast** will only detect edges that contrast strongly with the rest of the image, whereas a low **Edge Contrast** will detect softer edges.

The **Frequency** option controls how often the magnetic lasso tool will automatically place fastening points. A higher **Frequency** value will place more fastening points as you trace round the object.

> Lasso Tips

If you place a fastening point incorrectly with the polygonal or magnetic lasso tools, press the **Delete** key on the keyboard to "undo" the point. You can keep pressing **Delete** all the way back to the first fastening point if necessary.

As well as the automatic points added by the magnetic lasso, you can add your own manual fastening points by clicking with the mouse.

You can temporarily turn the regular lasso tool into the polygonal lasso tool by holding down **Alt** (Windows) or **Option** (Mac), then releasing the mouse button, then clicking where you want the end of the straight line segment to be. To revert to the regular lasso, release the **Alt/Option** key while the mouse button is held down.

Likewise, you can turn the polygonal and magnetic lasso tools into the regular lasso tool by holding down **Alt/Option** and dragging with the mouse.

The magnetic lasso tool can be turned into the polygonal lasso tool by holding down **Alt/Option** and clicking with the mouse where you want the straight line segments to end.

As well as double-clicking to close polygonal and magnetic selections, you can also hold down the **Control** key and click.

> The Magic Wand tool

The Magic Wand tool is a great way to select irregular-shaped objects that are just one colour (for example, a red rose, or a person's hand). To activate the tool, click on the **Magic Wand** icon in the **Tools palette**:

To use the tool, click inside the object you would like to select. You'll see that the tool selects all the pixels that are similar in colour to the pixel you clicked on:

Often, your object will contain a couple of colours; in the above example, the flower has a green centre as well as the red petals. To select the centre as well, we simply hold down the **Shift** key and click in the centre to add to our selection (see **Adding and Subtracting** further down the page):

> Tolerance option

The **Tolerance** setting lets you to control the sensitivity of the Magic Wand tool:
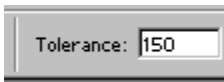
If the **Tolerance** value is high, a wider range of colours will be selected. For example, if you click on a red pixel when the **Tolerance** is set very high, the Magic Wand tool might also select pixels that are pink and orange. If you set the **Tolerance** to a lower value, then only pixels that are very similar to the shade of red you clicked on will be selected. Experiment with different **Tolerance** values so that most or all of your object gets selected, without selecting the background as well.
Contiguous option
If you check the **Contiguous** box next to **Tolerance**, then only adjacent areas of the same colour will be selected. If you deselect **Contiguous**, all pixels of the same colour will be selected.

> The Color Range tool

The Color Range tool is great for selecting particular colours in your image - for example, all the reds, or all the greens. You can then work on these specific colours - turning them from green to red, for example, or removing particular colours from the image.
This tool doesn't work well for selecting particular areas of your image (such as a foreground object), as it has a tendency to only partially select pixels, and often selects unwanted parts of your image that are a similar colour. But it's great for selecting colours to work on!

To use the tool, choose the **Select > Color Range** menu option. You'll see the **Color Range** dialog appear:
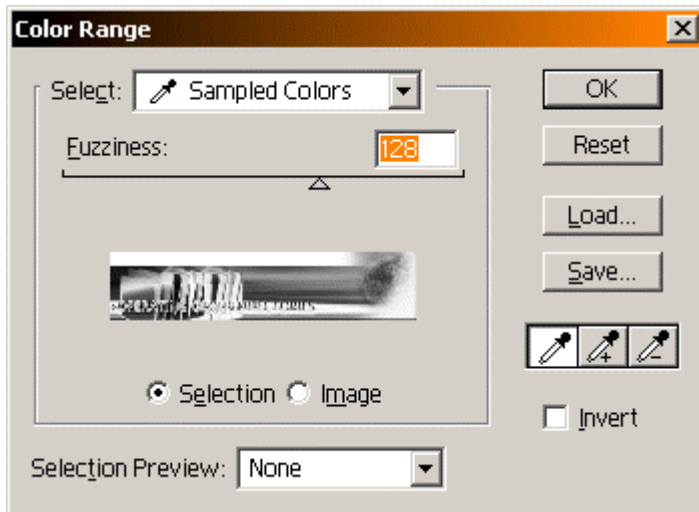
The most flexible way to use the tool is in the **Sampled Colors** mode (choose **Sampled Colors** from the **Select:** drop-down box). Click with the mouse in the document window on an area of your image that contains the colour you want to select. You'll then see this colour range turn white in the preview inside the **Color Range** dialog. This means that this range has been selected.
(**Tip:** You can also click in the preview window to choose the colour to use.)

> Changing the selection

To increase the degree to which colours in the colour range are selected, increase the Fuzziness slider. You'll see increasing areas of the preview image turning white as the degree to which each pixel is selected increases. Slide the slider to the left to decrease the intensity of the selection.
You can add to the range of selected colours by holding down the Shift key and clicking on new areas of colour in your image. Alternatively, you can click on the eyedropper icon with the little plus sign in the Color Range dialog.
Likewise, you can subtract colours by holding down the Alt/Option key and clicking in the image, or selecting the eyedropper icon with the minus sign then clicking in the image.

> Preview options

You can click on the **Image** radio button to preview the entire image in the dialog (useful if you can't see all of the image in the main window). Click the **Selection** radio button to revert to the normal preview mode.
You can also preview the selected areas in the main document window using the **Selection Preview** drop-down box. You can choose from the following options:
Grayscale shows how the selection will appear if converted to a channel.
Black Matte will show the selected areas in colour over a black matte background.
White Matte will show the selected areas in colour over a white matte background.
Quick Mask shows how the selection would look in **Quick Mask** mode, using the current Quick Mask settings (see below for info on the Quick Mask mode).

> Color Range presets

The **Select:** drop-down box allows you to choose various preset colour ranges, such as all **Reds**, **Blues** or **Greens** in the image. You can also select just the **Highlights**, **Midtones** or **Shadows**.
Out of Gamut will select all the colours in the image that are out-of-gamut (i.e. cannot be printed).

> An example

In this example, we want to select all the green leaves in the image so that we can change their colour. To do this, we use the **Color Range** tool in **Sampled Colors** mode, then **Shift**+click on a couple of leaf areas to select a broad range of greens:

We then click **OK** to create the selection, and use **Image > Adjust > Hue/Saturation** to change the leaves from green to brown, without affecting the rest of the image:

> The Quick Mask mode

Photoshop's Quick Mask mode is a really versatile way of selecting stuff. Instead of creating marquees as you do with the other tools, you can actually "paint" the selection using any of Photoshop's painting tools. You can even use the other selection tools on the Quick Mask, as if it was a regular image! This makes the Quick Mask mode a very powerful feature of Photoshop.

To activate Quick Mask mode, click on the **Edit in Quick Mask mode** button in the **Tools palette**, or press the **Q** key:

You may like to select something with a regular selection tool (e.g. the Marquee tool) before entering Quick Mask mode, so that you can clearly see what's selected and what isn't:

You can see that the un-selected areas of the image are covered with the red mask when in **Quick Mask** mode.
You can now "paint" on the mask using any of the painting tools (Pencil, Paintbrush, Airbrush, etc), and use the Eraser tool to erase areas of the mask (in other words, to select more pixels). You can even use other tools such as the Fill and Smudge tools.

When you're ready, you can click the **Edit in Standard Mode** button to switch back to the regular marquee selection (or press the **Q** key again):
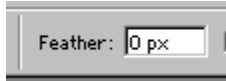

> Modifying Selections

Once you've made your basic selection using the above tools, there are a lot of things you can do to play around with it. In this section we'll look at **Feathering**, **Anti-aliasing**, **Adding and Subtracting**, **Bordering**, **Smoothing**, and **Expanding and Contracting**.

> Feathering

Many of the selection tools include a **Feather** option:

Feathering blurs the edges of the selection so that the selection partially blends with the non-selected area. Note that feathering causes some loss of detail in your selection!
Feathering is useful for "softly" selecting an area of an image. Then, when you manipulate the selection, the boundary between the affected areas and the non-effected areas will not be a harsh line, but the effect will gradually fade towards the edge of the selection.

Original selection	Selection copied and pasted with 0% feathering	Selection copied and pasted with 10% feathering

To feather the selection, enter a value greater than zero in the **Feather** option shown above *before* you create your selection. Alternatively, to feather a selection after it's been created, use the **Select > Feather...** menu option.

> Anti-aliasing

Anti-aliasing is the process of reducing the jagged "staircase effect" caused when a line or curve of pixels of one colour meets a line of pixels of another, contrasting colour. Anti-aliasing is achieved by averaging the colours of the edge pixels of a selection between the selected area's colour and the background's colour.
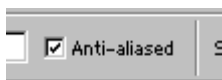

Circular selection with no anti-aliasing   Circular selection with anti-aliasing

Note that, unlike feathering, only the edge pixels are changed. Anti-aliasing does not blur outwards from the edge like feathering does.
To use anti-aliasing when making a selection, check the **Anti-aliased** option *before* creating your selection:

Note that you must enable anti-aliasing *before* you draw your selection, as there is no way to add anti-aliasing afterwards!

> Adding and Subtracting

You can modify the shape of your selection by:
 > Adding new areas to the selection
 > Removing (subtracting) areas from the selection
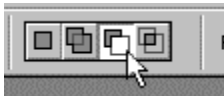 > Creating intersections with the selection and a new area

> Adding

To add to an existing selection, hold down the **Shift** key while creating your new selection, or click on the **Add to selection** button:
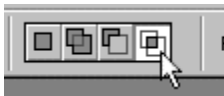
> Subtracting

To subtract from an existing selection, hold down the **Alt/Option** key while creating your new selection, or click on the **Subtract from selection** button:

> Intersecting

To intersect with an existing selection, hold down the **Shift** and **Alt/Option** keys while creating your new selection, or click on the **Intersect with selection** button:
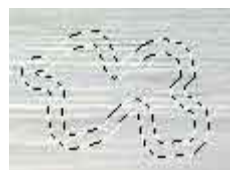

> Border

You can turn an existing selection into a border selection. A border selection selects just the edge of the original selection. To turn a selection into a border, pick the menu option **Select > Modify > Border**. In the **Width** box, enter how wide you would like the border to be (in pixels).

Original selection   Bordered selection

> Smoothing

Smoothing rounds off the sharp edges of a selection by averaging the selected and non-selected pixels over a specified sample radius. This is great for creating smooth curvy selections, or for filling in bits that were missed out when using the **Color Range** tool.
To use smoothing, choose **Select > Modify > Smooth**. Enter a value for **Sample Radius** - the higher the value, the more pronounced will be the smoothing effect.

Original selection   Smoothed selection

> Expanding and Contracting

You can change the size of your selection after you've created it. To make the selection bigger, choose **Select > Modify > Expand** and enter the number of pixels you'd like to expand the selection by.

Similarly, to make the selection smaller, choose **Select > Modify > Contract** and enter the number of pixels to contract the selection by.