Adobe®

Photoshop CS5

Quick Reference Tutorial

What is a Layer?

The best way to think of a layer is to look at it like a sheet of clear plastic. If you lay this plastic on top of an image, you can paint on it, place text on it, or put another image on it, without affecting the image underneath. Moreover, you can put additional sheets of clear plastic (layers) that contain graphics or parts of an image on top of other sheets to compose a complete image out of many components.

The beauty of layers is the ability to perform actions on a layer by layer basis. If you need to edit one part of your image but not another, simply create a layer including the piece that needs editing, and edit it on that layer. You can also create a layer over your image to allow you to perform edits without affecting the original. You can even compare multiple effects or retouches by using a different layer for each one, and then toggling them on and off against the background image. Layers are endlessly useful in Photoshop.

The image below is made of three layers: one has the writing, one has the background, and one has the sunflowers. You can see the layers in the Layers palette to the right of the image. The picture on the right is the three layers that compose the picture on the left.
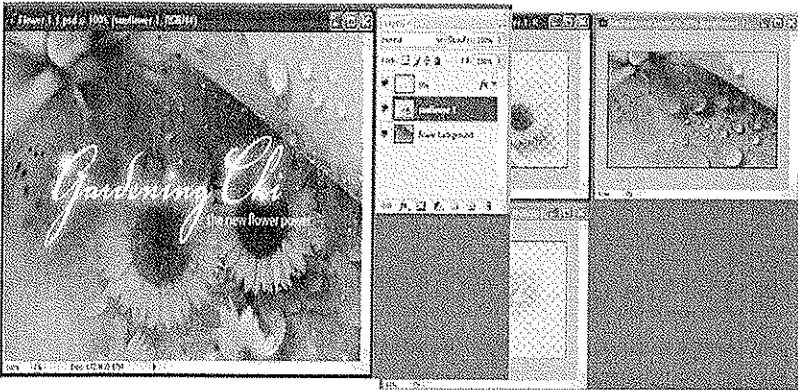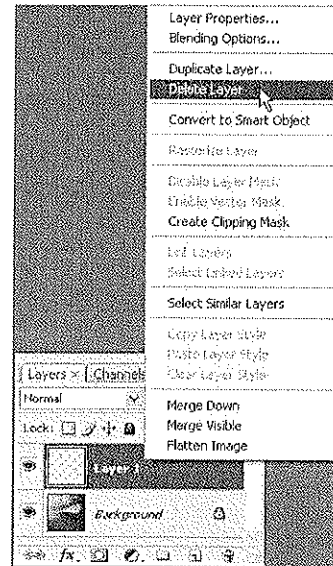

Deleting Layers

If you decide you no longer want a layer, it is easy to remove it. At the bottom of the Layers palette, there is a garbage can icon. Simply drag the layer you no longer need over the garbage can.
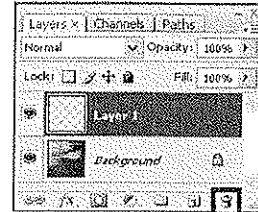
Another way to delete the layer is to right click the layer, and from the shortcut menu, choose Delete Layer, as shown below. You can also choose Layer – Delete – Layer.

Linking Layers
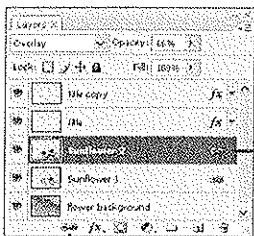
Link tool

Link indicator

To link layers, select the layers you want to link (using Ctrl + click), and then either click the link tool at the bottom of the Layers palette, or choose Link Layers from the Layer or palette options menu. When you click a layer that has links, a link icon appears beside it and any layers it is linked to.

If you want to temporarily disable a link, you can Shift + click the link icon for the layer. When you want to re-activate the link, Shift + click it again.

Creating Layers

There are three easy ways to create layers:
- Use Layer – New – Layer
- Press Shift + Ctrl + N
- On the Layers palette, click the New button
- Layer – New – Layer via Copy
- Layer – New – Layer via Cut

## What are Hue, Saturation and Brightness?

Hue refers to how we perceive the dominant wavelengths of a color source. It is the characteristic we are describing when we refer to a color as green, or purple, or red. You could think of hue in the same way that you think of shades or tones of color. Some people use the word hue in the same way they would use the word color.

Saturation refers to how we perceive the ratio of the dominant wavelengths to all the other wavelengths of a color source. In other words, saturation can be described as the strength or intensity of a shade or tone of color. A color that is very saturated will appear strong and vivid to our eyes, while a color that is much less saturated can appear to be washed-out or weak. A color that is completely desaturated will appear as a shade of gray.

Brightness refers to how we perceive the amount of light energy given off by a color source. People often think of brightness on a scale from dark to light, with black having very little brightness (light energy), and white having maximum brightness. As it turns out, any of the colors that can be described in terms of red, green, and blue values can also be described in terms of hue, saturation, and brightness values. Some people find that the hue, saturation, and brightness scheme is a more intuitive and natural way to view color than the RGB scheme.

Using the Paint Bucket

The Paint Bucket, also known as the Fill tool, is used to fill a canvas, a layer, or a selected area with color by clicking in it. It will replace all pixels that are the same or close to the pixels that you click on, based on a tolerance that you can specify.

■ Gradient Tool	G
■ ⟁ Paint Bucket Tool	G
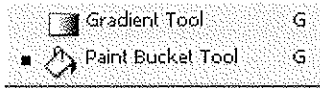
Here is a before and after look at the sunflower image with the background darkened to a navy blue:

The Blur, Sharpen, and Smudge Tools

The Blur tool is used to soften edges and other areas of high contrast in an image. Some users might use the Blur tool to create an out-of-focus effect, while others might use it to deemphasize unwanted harshness or contrast. You can also use the Blur tool to soften and blend artifacts left by other image edits, like removing or adding objects or using the Stamp tools.

The Sharpen tool is the opposite of the Blur tool. It increases the contrast where you paint, giving a sharper look to your image. The Sharpen tool is a variant of the Blur tool.

⬤ ■ ◊ Blur Tool	R
⬤ △ Sharpen Tool	R
⬤ ◡ Smudge Tool	R

The final variant of the Sharpen tool is the Smudge tool. It sounds a lot like the Blur tool, but it is quite different. It's like someone actually smudged your image while it still had wet paint on it. You can smudge the image using the colors that exist in your image, or you can select the Finger Paint option on the Options bar to smudge your image with the foreground color.

Using Pens

The Pen tool is another useful vector graphic tool provided in Photoshop. The main purpose of the Pen tool is to allow you to create vector paths.

A path can be used to get very fine control for filling a specified area, applying a paint stroke along a predefined course, creating your own custom vector shapes, or for making selections. The different Photoshop Pen tools provide different approaches and options for creating paths. Creating paths with the Pen tools is a complex subject, and takes a lot of practice.

■ ◊ Pen Tool	P
◊ Freeform Pen Tool	P
◊⁺ Add Anchor Point Tool	
◊⁻ Delete Anchor Point Tool	
� Convert Point Tool	

The Pen tools (described in the order they appear in the box above) have the following functions.

Pen Tool	The standard Pen tool is used to create anchor points to join straight lines.
Freeform Pen Tool	This tool lets you draw with the pen in pretty much any way you like (similar to the brush or pencil in this respect).
Add Anchor Point Pen Tool	Use this tool to add an anchor point to a path that has already been drawn. Anchor points give you control over your path; however, too many anchor points can give you unexpected results and can make your image harder to edit, display, and print.
Delete Anchor Point Tool	This tool can be used to remove unwanted anchor points from a path.
Convert Point Tool	This tool allows you to add handles to a point, letting you drag your path into a curve.

Drawing Straight Lines

To use the standard Pen tool to draw a straight line or a shape made of straight lines, click on the image canvas where you want the line to begin, and then click again to complete the line. After making the second click, you now have two anchor points. The first anchor point becomes hollow, and the last anchor point is filled.

Second anchor point

Initial anchor point

If you continue clicking, the lines will form a shape, and only the last anchor point is filled. You can either leave the path open or close it. To leave it open, Ctrl + click somewhere away from your path. To close the path, position your pen over the initial anchor point so that an empty circle appears beside the pen. Click and your shape will close.

The Dodge, Burn, and Sponge Tools

The Burn tool will darken the regions you drag your mouse over, whereas the Dodge tool lightens them. The Sponge tool is used to increase or decrease color saturation.
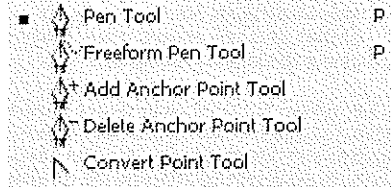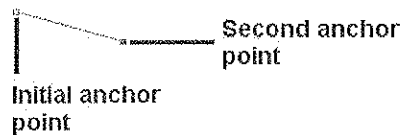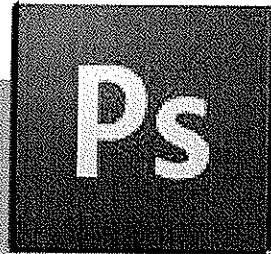
Use small brush sizes for detailed work, and larger brush sizes for large, evenly blended areas. If you click the airbrush button at the right of the Options bar for the Dodge tool, you can hold your left mouse button down and the spot beneath your mouse pointer will continue to lighten. If this button is not on, you must click your left mouse button to lighten the spot your pointer is over incrementally.

◉ Dodge Tool	O
■ ◉ Burn Tool	O
◉ Sponge Tool	O

Ps

Intermediate

Training Manual

Photoshop CS5

Computrain

Adobe Photoshop CS5 Intermediate Courseware
Published by Computrain Technical Institute

Courseware Release Version 3.0
© 2010 by Computrain Technical Institute

Table of Contents

Section 1: Using Layers

In this section you will learn how to:

- Use the Layers palette
- Hide and display layers
- Change layer transparency
- Arrange layers
- Create basic layers
- Delete layers
- Rename a layer
- Create a layer via cut or copy
- Use adjustment layers
- Use fill layers
- Apply effects and styles to layers
- Group layers
- Use Auto-Align
- Use Auto-Blend
- Duplicate layers
- Link layers
- Merge layers
- Export layers

Lesson 1.1: Using Layers

In Photoshop, the ability to work with layers is a useful critical skill. Once you get comfortable using layers, a world of image editing options will open up. You will be able break down your image into several component parts, giving you the ability to single out and modify one part without affecting any of the others. You will also be able to make parts of the image visible or invisible with a click of your mouse. Because you can work with each layer independently, you will be able to create and combine many different effects for different parts of your image.
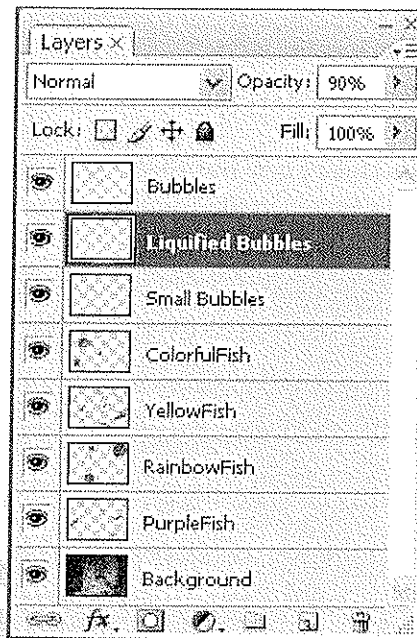
In this lesson you will learn what a layer is and how to create one. In addition, you will how to delete a layer, how to recover a deleted layer, and how to rename a new layer.

What Is A Layer?

The best way to think of a layer is to look at it like a sheet of clear plastic. If you lay this plastic on top of an image, you can paint on it, place text on it, or put another image on it, without affecting the image underneath. Moreover, you can put additional sheets of clear plastic (layers) that contain graphics or parts of an image on top of other sheets to compose a complete image out of many components.

If a layer contains no image information it will be totally clear and the underlying layers or image will be visible. Each layer has an opacity setting that controls how much shows through that layer – if the opacity for a layer is set at 100%, you will not see the underlying layers. If a

layer contains only part of an image, the part of the layer with no image data will be transparent.

The beauty of layers is the ability to perform actions on a layer by layer basis. If you need to edit one part of your image but not another, simply create a layer including the piece that needs editing, and edit it on that layer. You can also create a layer over your image to allow you to perform edits without affecting the original. You can even compare multiple effects or retouches by using a different layer for each one, and then toggling them on and off against the background image. Layers are endlessly useful in Photoshop.

As mentioned above, you can adjust the opacity of each layer individually. You can also set each individual layer to be visible or invisible. Perhaps more importantly, there are a number of stylistic effects, image edits, and retouches that you can perform on individual layers.

The image below is made of three layers: one has the writing, one has the background, and one has the sunflowers. You can see the layers in the Layers palette to the right of the image.
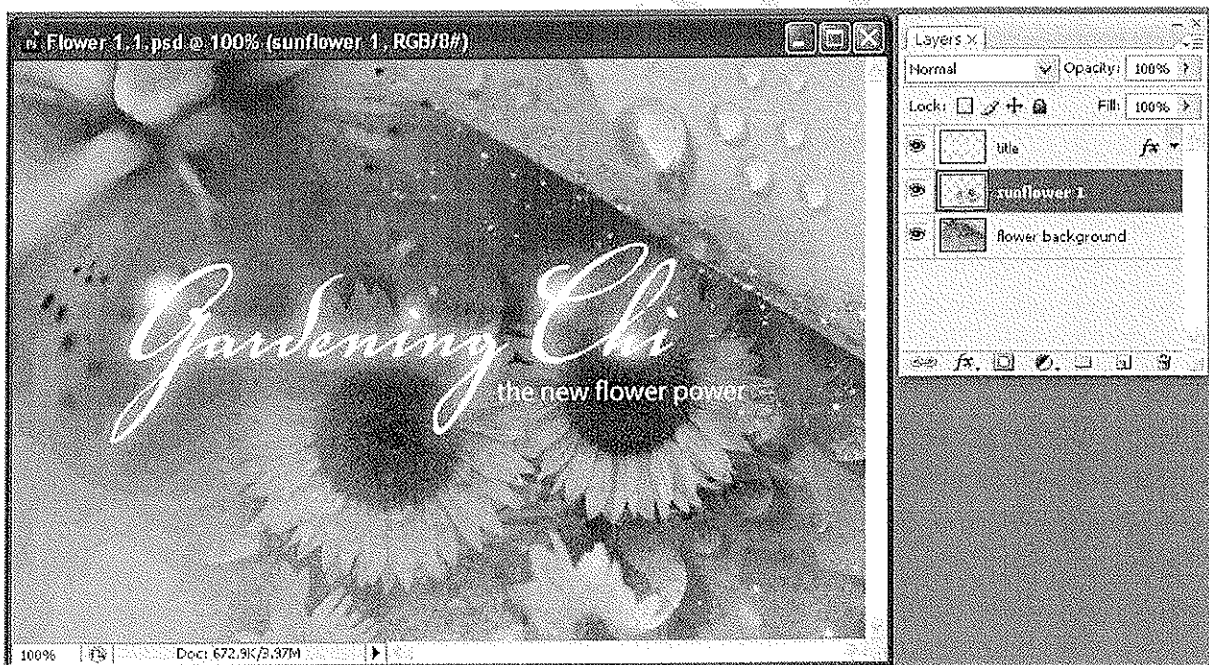
Here are the three layers that compose the above image:
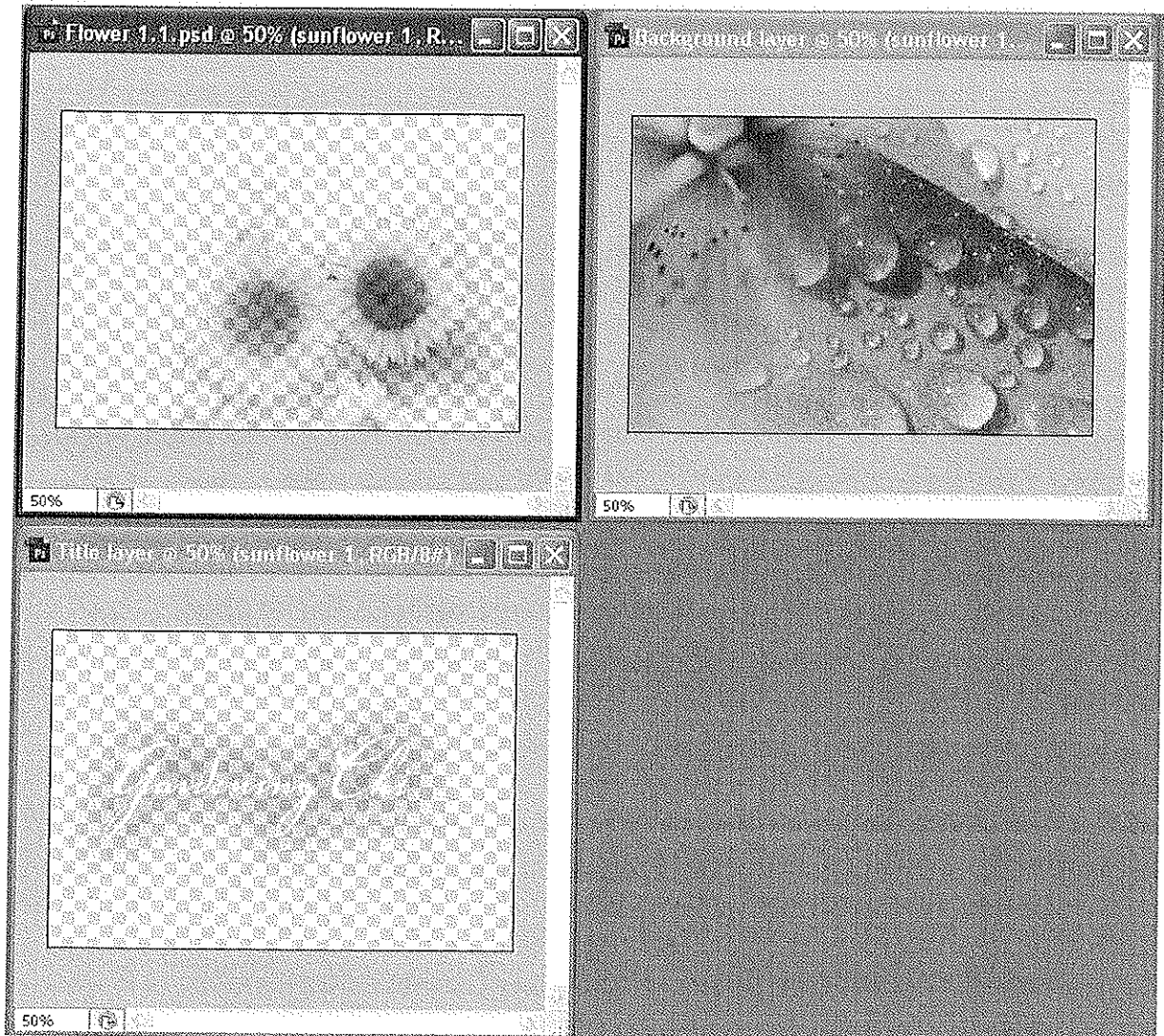
When you add layers to an image, and you want to keep the layer information separate and intact, save the file in PSD or PSB format. This Photoshop Document format will preserve all of the individual layers and related information so you can retrieve the document at a later date and continue to work with the original layers. If you save your layered image as another format type, like GIF or JPEG, the layers will not be preserved as separate editable components. The layers will be amalgamated to form one image and will not be retrievable as separate entities later.

There is a special layer in many images called the Background layer. You will notice it is italicized and locked. This layer has limited functionality – you can't change its order, opacity, or blending mode. If you want to work on this layer in one of these ways, you have two choices. You can duplicate the layer by right-clicking it in the Layers palette and choosing Duplicate

Layer. Give the new layer a name, and then you can do anything you like to it. If you want to simply remove the attributes of a background layer and convert it to a regular layer, simply right-click the layer and choose Layer from Background. Again, name the layer. This method doesn't add another layer to your file.

Using the Layers Palette

You use the Layers palette to work with layers. In the default workspace, the Layers palette is the bottom palette, in the same zone as the Channels and Paths palettes. Make sure the Layers palette is displayed by clicking its tab. If the palette is docked, click the icon to display it. If you can't see it at all, choose Window – Layers.

The Layers palette shows you all the layers that are in the active image, which layer you are currently working on, and the settings for each layer.
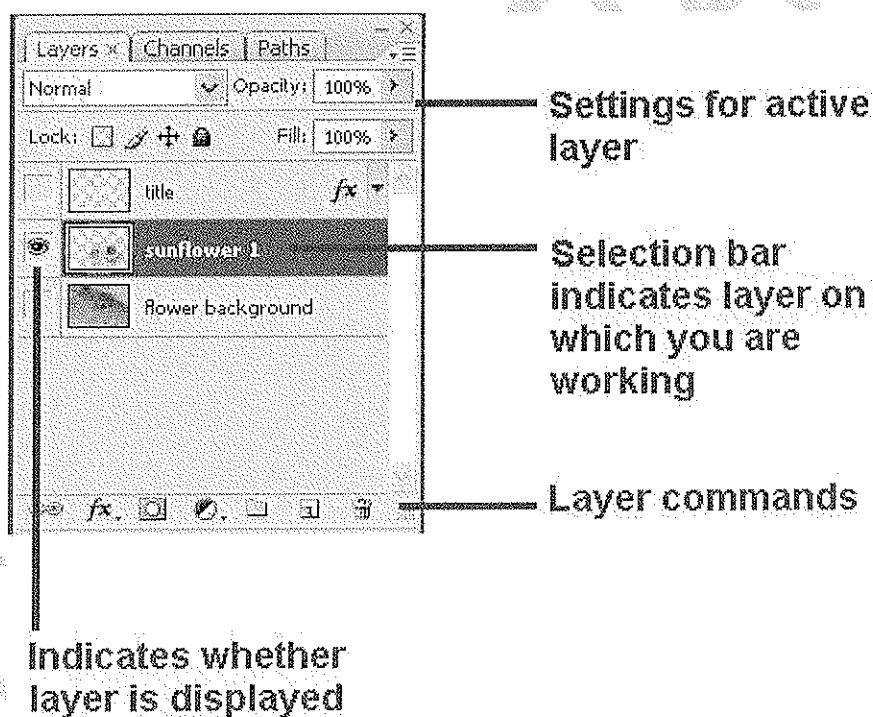
You choose which layer to work on by clicking it. The active layer has a blue bar over it. You can view all the layers together, but your changes are applied to the currently active layer. When you click on a layer in the Layers palette to make it active, the settings reflect this layer.

If a layer has effects added to it, the *fx* icon appears at the right of the layer name. This toggles the layer effects - if you click this, the layer expands to show what effects have been applied.

Click it again, and the effects collapse. We haven't learned about effects yet – we'll cover them in Lesson 1.3. Here is a layer expanded to show the effects:
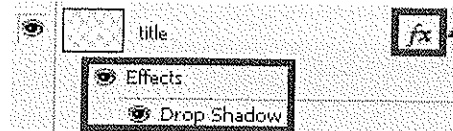
Hiding and Displaying Layers

You can selectively show and hide layers. This can result in variations on the same image, or can be used to test the effect of a layer. The eye icon to the left of the layer in the Layers palette indicates the layer is currently being shown. To toggle the layer on and off, click the eye icon to hide it, and the blank space to show it.

Here is the flower image without the writing showing. Note that the eye icon is present beside the Sunflower 1 layer and the Flower background layer, and not present beside the Title layer.
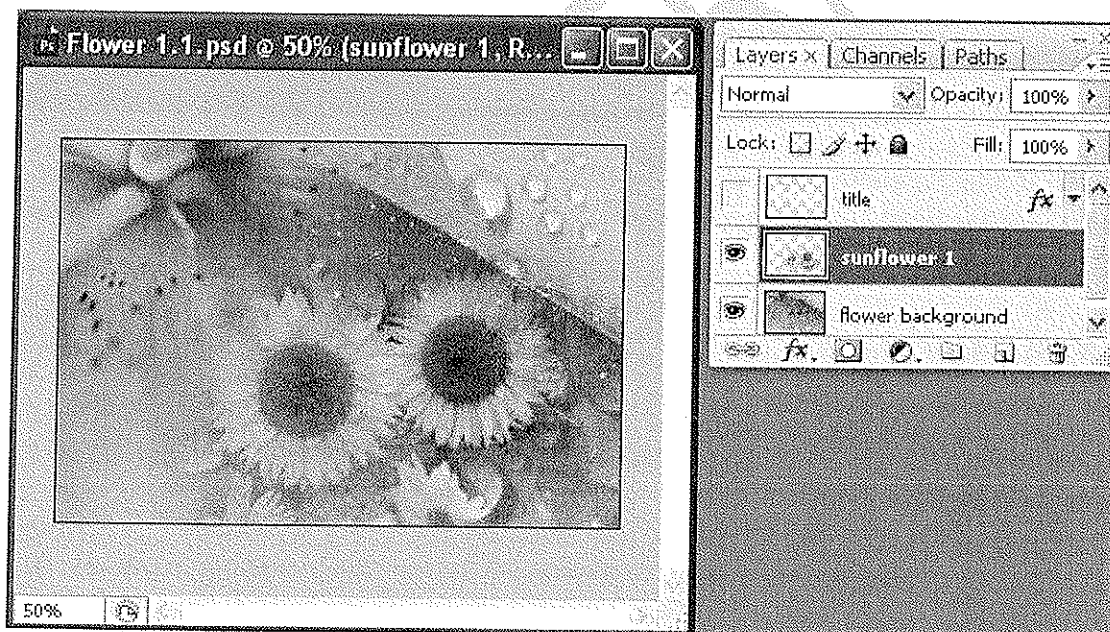
Changing Layer Opacity

As you add layers to an image, you control how see-through that layer is. The opacity control has a range of 0% to 100% - the higher the percentage, the less you can see the next layer. If a layer takes up the entire canvas, and the opacity is set to 100%, none of the layers below that layer can be seen. The flower image has three layers, all set to 100% opacity (remember that the Title and Sunflower 1 layers only have images on part of the background). If the opacity of the sunflower level is reduced (so the layer becomes more transparent), you begin to see the

background layer showing on top of the sunflowers. In the image below, the opacity has been set to 50%, so you can see the bubbles and leaves of the background layer showing on top of the sunflowers.
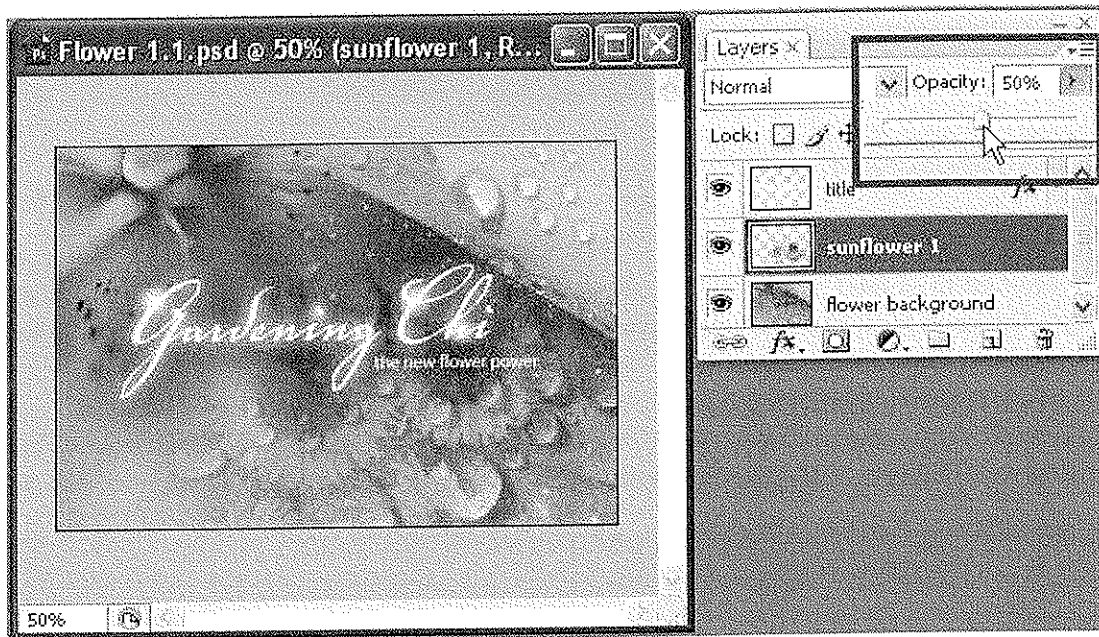
A second setting for controlling opacity is called Fill. Fill lets you change the opacity of the effects that have been applied to a layer without affecting the rest of the layer. We will discuss using fill in Lesson 1.3.

Arranging Layers

The order of your layers is integral to the appearance of your image. Because each individual layer can contain different information and effects, the question of which layer goes on top of another is an important one.

The layers in an image are seen relative to their position from top to bottom in the Layers palette, meaning the top layer in the Layers palette will be the top layer in the image. For instance, if the top layer is completely filled with image data and is 100 percent opaque, you will not see any of the other layers underneath. The same can be said for each layer in succession down to the bottom of the list.

Index

Tools

To demonstrate this, the order of the layers in the flower image has been changed: the Background is now the first layer. You now can't see anything but this layer because it fills the entire canvas and is 100% opaque. You can see that all three layers are still visible; the change is due to the order of the layers.
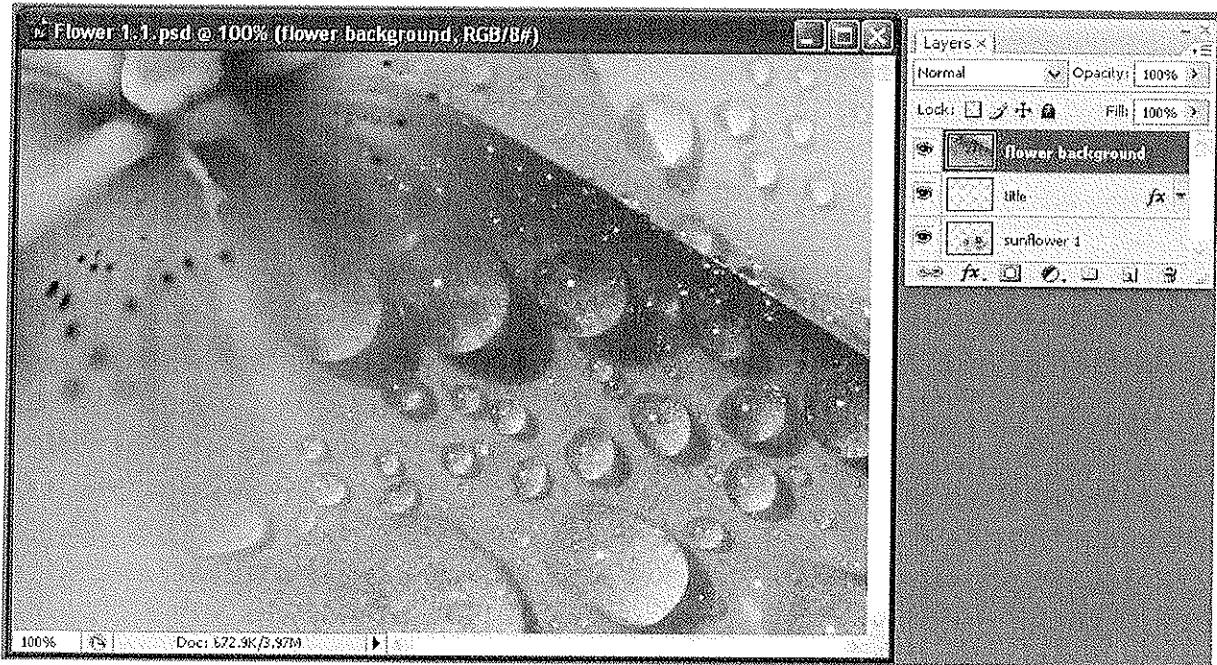
To change the order of the layers, drag and drop them in the Layers palette. As you drag, a black line appears, indicating the new position of the layer.
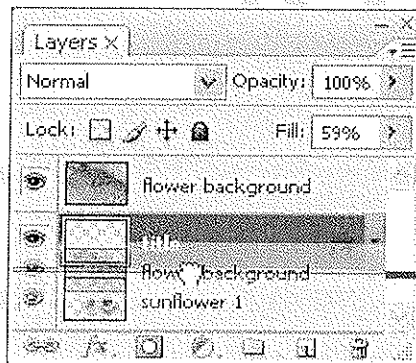
Line indicating new position

Lesson 1.2: Working with Layers

In order to use layers in your image, you need to be able to create them. Sometimes you are creating a layer for its content, as we saw in the fish and flower images in Lesson 1.1. Sometimes you are creating a layer to adjust another layer in the image – for example to add texture or color, or to adjust the contrast. We will cover adjustment layers in the next lesson. In this lesson, you will learn how to create and delete a basic layer.

Creating Basic Layers

A blank layer is just that: blank. There is nothing on it all, and you can use it for whatever purpose you wish.

There are a number of different ways to create a new blank layer:
- Use Layer – New – Layer
- Press Shift + Ctrl + N
- On the Layers palette, click the New button

When you create a blank layer, the New Layer dialogue box appears. Give the layer an appropriate name, and if you wish, choose a color for the layer. A layer color is used for color coding related layers, and does not affect your image at all. It's a tool to help you manage layers when you have a lot of them to keep track of. For example, you might assign the color green to all layers of the dealing with a specific part of the image, or you could code content layers with one color and adjustment layers with another. (The Mode and Clipping Mask features will be covered in future lessons.) Click OK to create the layer.
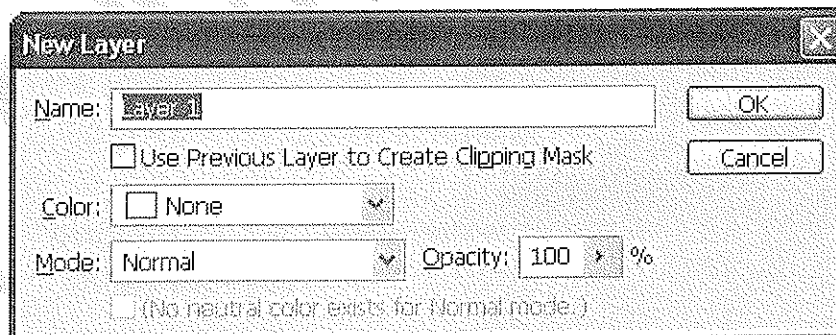
New layers appear above the selected layer, so to save yourself some time, decide where your layer belongs, and click the layer above which you want your new layer to appear before using the New Layer command.

Deleting Layers

If you decide you no longer want a layer, it is easy to remove it. At the bottom of the Layers palette, there is a garbage can icon. Simply drag the layer you no longer need over the garbage can.
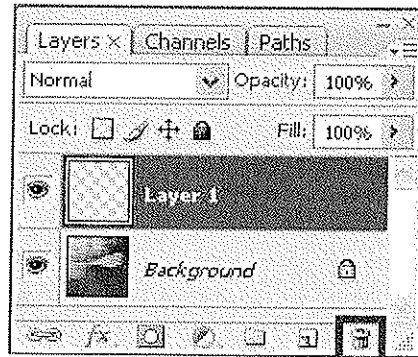
Another way to delete the layer is to right click the layer, and from the shortcut menu, choose Delete Layer, as shown below. You can also choose Layer – Delete – Layer.
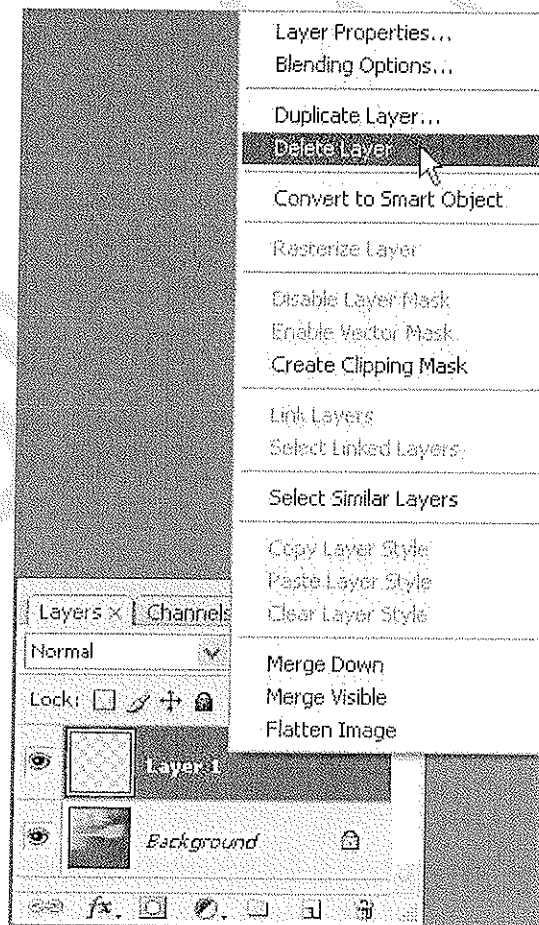
If you use one of the menu methods, a dialogue box appears asking you to confirm your choice. If you don't want to confirm future deletions, select the Don't Show Again check box.
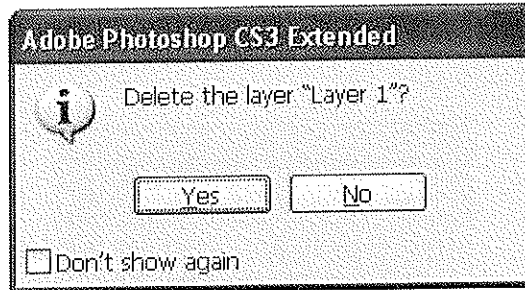
Renaming a Layer

Your layer name should reflect the content or purpose of the layers. In the Flowers image, the layer names clearly told you what was on the layer: the title, the sunflowers, and the background. If you aren't happy with the name you have give a layer, or if you discover a spelling error in it, you can rename the layer. The layer name is located in the Layers Properties dialogue box, which you can see by right-clicking the layer and choose Layer Properties, or by choosing Layer – Properties. Replace the current name with the desired name, and then click OK.
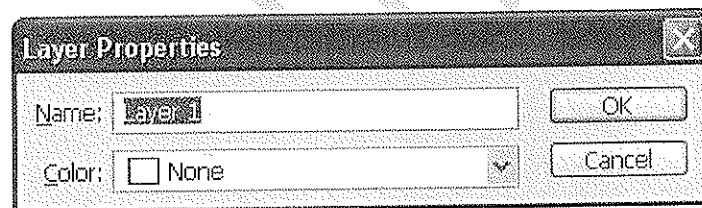
A quick way to rename a layer is to double-click the layer name and type a new name.
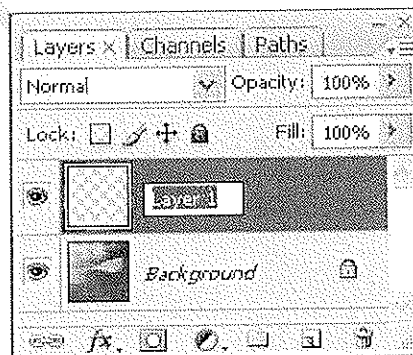
Creating a Layer via Cut

You can cut a piece out of one layer and place it on its own layer. This allows you to work on one part of the image selectively, without affecting the other parts. By using Layer via Cut, instead of cutting something and pasting it onto a new layer, you ensure that the pasted image lines up exactly with the image it was cut from. Layers created this way are given the default name of Layer[n], where [n] is the one number higher than the last numbered layer. You should rename the layer to a name reflecting its purpose.

To create a layer via cut, select the part of the image that you want as a new layer. Then, click the Layer menu, choose New, and choose Layer via Cut.
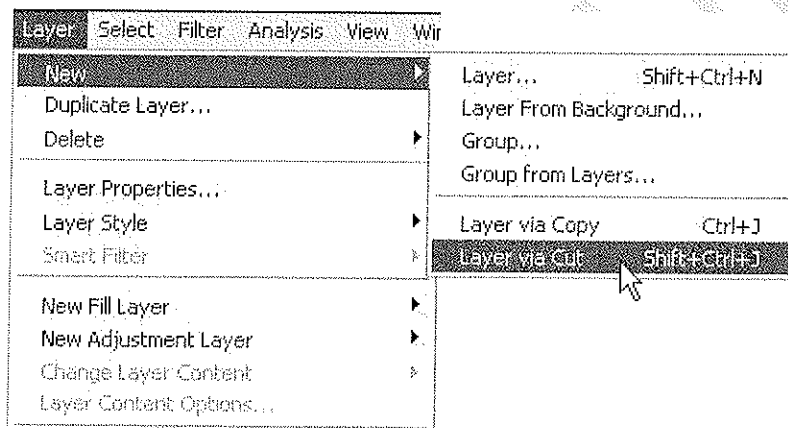
Creating a Layer via Copy

Layer via Copy is just like Layer via Cut, except that you are leaving the source image in its place. Like Layer via Cut, you should rename the layer after you create it.

Layer via Copy does not require a selection; if no selection is made the entire layer will be copied. If a selection is made using one of the selection tools, only the selection will be copied to the new layer. Once you have decided what you want the new layer to contain, click the Layer menu, choose New, and choose Layer via Copy.

Lesson 1.3: More on Layers

Adjustment and fill layers are special types of layers used in Photoshop. An adjustment layer does not contain any pixels; instead, it contains instructions on how the pixels in the underlying layers will be affected. In this way, adjustment layers give you the ability to apply an effect to a group of layers, and then at any time in the editing process, alter that effect while preserving the integrity of original image.

If you apply effects directly to your image, it is likely you will degrade the original image. If you change the color or shade in an image, or apply an effect to your image, you are changing the pixel information in that image or layer. If you don't like how your edits turned out, you may have to make further changes to clear up the unwanted effects. All of these operations on the pixel values can degrade the image from its original state. For example, if you adjust the light and shade in an image, it is very difficult to adjust it back to its exact original state at a later time. Adjustment layers allow you to try effects and edits without affecting the integrity of the underlying image.

Making Adjustments with Layers

Examine this image:
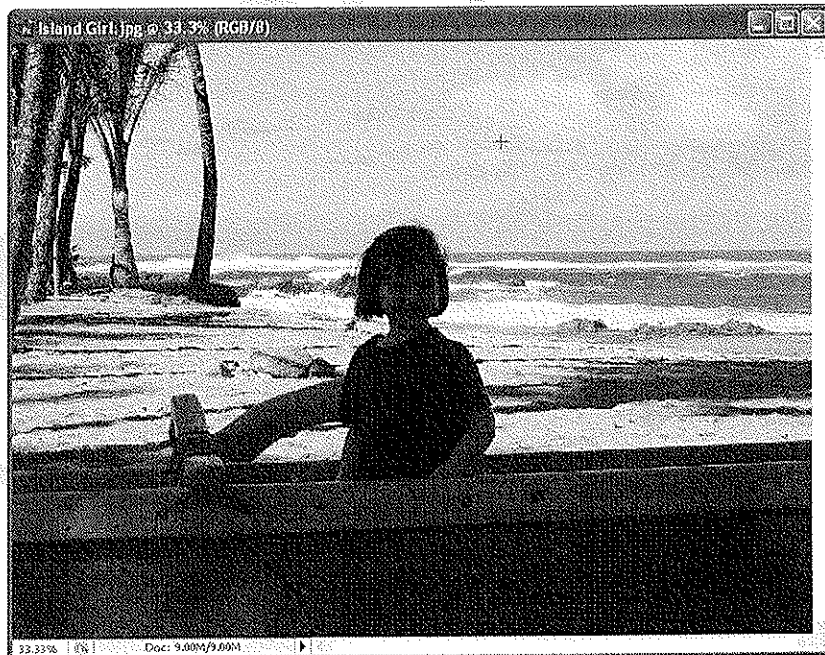
The girl's face is in shadow and needs to be brightened. By using a Levels adjustment layer, we can brighten her without touching the underlying image.

Here she is after applying the adjustment layer:
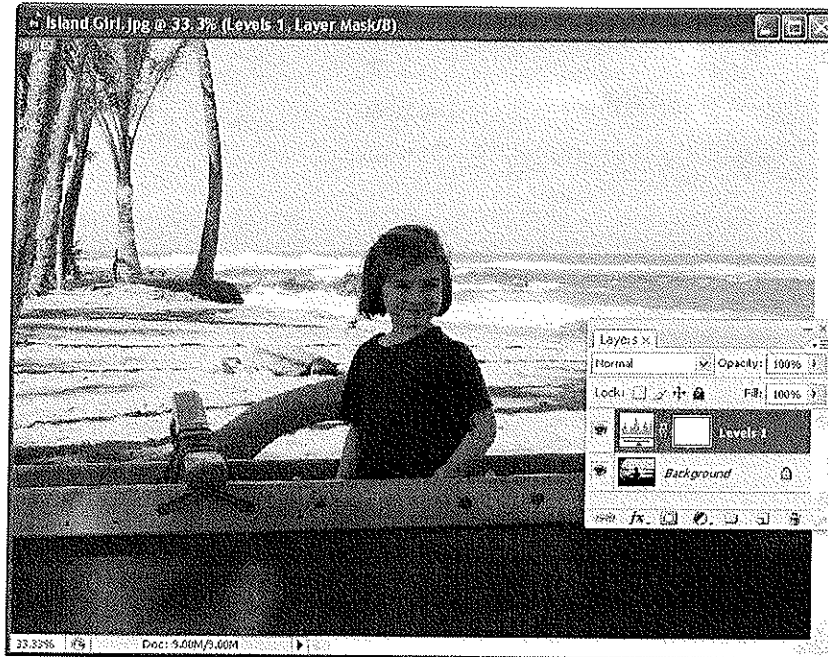
By adjusting the image's midtones, we are able to more detail in the girl's face.

With adjustment layers, you are able to edit non-destructively: in other words, you can change the way your image appears without touching the underlying image. You can create an adjustment layer by clicking the Create New Adjustment or Fill Layer button on the Layers palette, or by selecting New Adjustment Layer from the Layer menu.
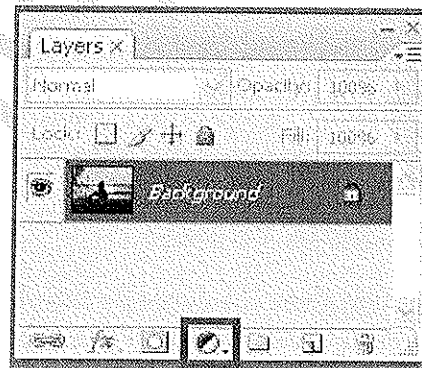
There are many different types of adjustment layers, as you can see from the menu:
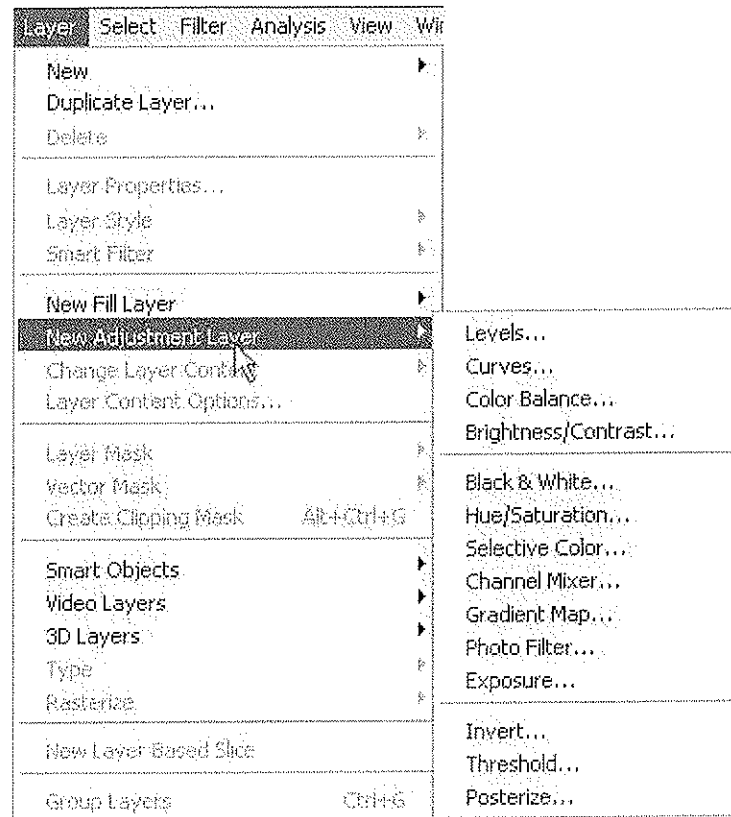
Here is a list of the options available in the adjustment layer menu.

Levels   Allows you to create an adjustment layer for controlling light and shade via the three main tonalities: shadows, mid tones, and highlights.

Curves   This option gives you much finer control over the light and shade tonality of your image by letting you adjust a curve representing the tonal output for the image.

Color Balance   This option gives you general control over the color balance of your image. You could also adjust color balance using the Levels option by working with separate red, green, and blue channels.

Brightness/Contrast   Used to create brightness/contrast adjustment layers.

Hue/Saturation   Create a hue/saturation adjustment layer.

Selective Color   Allows you to create an adjustment layer for altering an individual

color group (such as reds, greens, or purples) very specifically.

Channel Mixer   This adjustment layer provides excellent control for the process of turning color images into grayscale (commonly known as black and white).

Gradient Map   This adjustment layer will allow you to create a color gradient for your image based on specific colors of your choice.

Photo Filter   You can use this option to simulate the effects of photographic filters (such as sepia tone).

Invert   This adjustment layer creates a negative of your underlying image.

Threshold   This will turn your image into high contrast black and white (no gray). With a slider switch, you can adjust the point (threshold) at which pixels become white or black.

Posterize   This adjustment layer allows you to add a posterize effect, essentially displaying your image with fewer colors (you can specify the amount).

Don't worry if you do not understand these effects completely. The only real way to understand them is to get a feel for the results. Experiment with the adjustment layers options and observe the results. The beauty of adjustment layers comes from the fact that you can create and delete them as many times as you want without affecting your original image.

After choosing the desired type of adjustment layer, the relevant dialogue box appears. Simply choose the settings you want, and the adjustment layer is created. The adjustment layer adjusts all layers below it, so placement of an adjustment layer is important. At any time, you can double click the adjustment layer in the Layers palette, and the dialogue box or control for the effect will appear again. In this way, adjustment layers allow you to readjust the effect as much as you like without degrading the underlying image information.

As with regular layers, you can configure the opacity and fill of an adjustment layer in the usual way using the sliders available in the Layers palette.

You can delete an adjustment layer in the same way that you would delete a regular layer. Just right click on the layer and choose the Delete Layer option.

Using Fill Layers

Fill layers differ from adjustment layers in that they don't affect the layers underneath them. Fill layers let you fill a layer with a solid color, a gradient, or a pattern. There are three types of fill layers, as you can see from the Layer – New Fill Layer menu command:

```
Layer  Select   Filter   Analysis   View   Wir
   New                                        ▶
   Duplicate Layer...
   Delete                                     ▶
   Layer Properties...
   Layer Style                                ▶
   Smart Filter                               ▶
   New Fill Layer                             ▶    Solid Color...
   New Adjustment Layer                       ▶    Gradient...
   Change Layer Content                       ▶    Pattern...
   Layer Content Options...
```
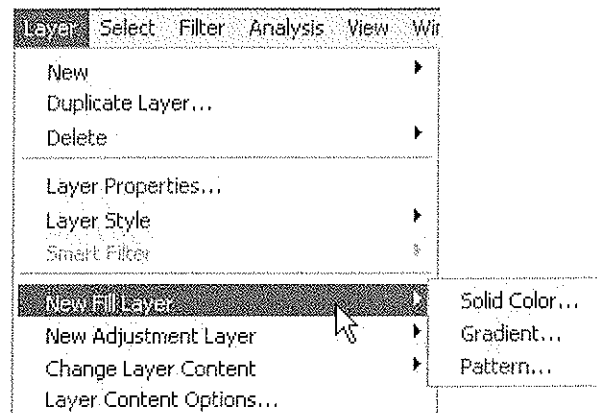
Here is an overview of the options available:

Solid color   Will fill the adjustment layer with the current foreground color (like the Paint Bucket tool).

Gradient   Will allow you to create a color or grayscale gradient for the adjustment layer (similar to the gradient tool).

Pattern   Will allow you to select and apply a pattern to the adjustment layer (like the Pattern Stamp, but applied to the entire layer).

Using Layer Styles and Effects

Photoshop comes with a variety of special effects you can apply to any of your layers. You can add drop shadows, bevel the edges of your layer, or overlay a pattern or gradient. When you apply these effects you create a Layer Style. You can use the preset styles from the Styles palette, or you can use the Layer Styles dialogue box to create your own style.

Here is an image with no styles applied to it:
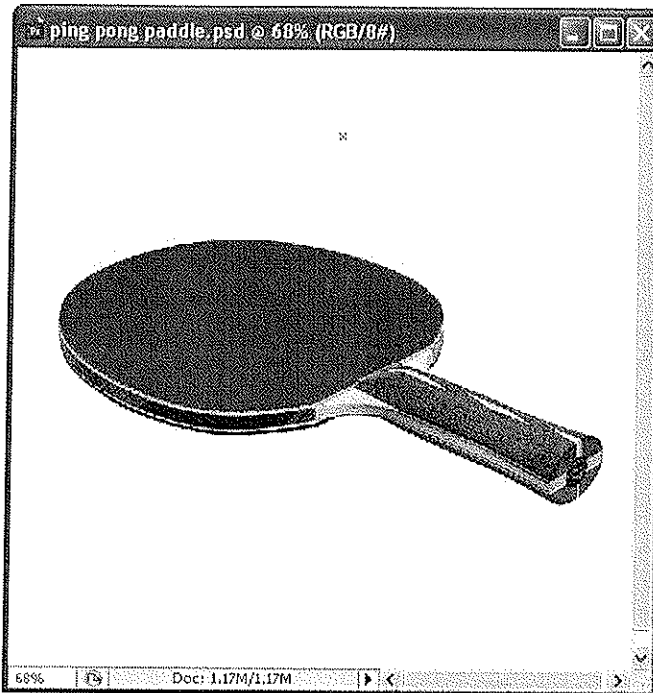
To apply a preset style, select the layer to which you want the style applied, and then choose the style from the Styles palette, shown here:
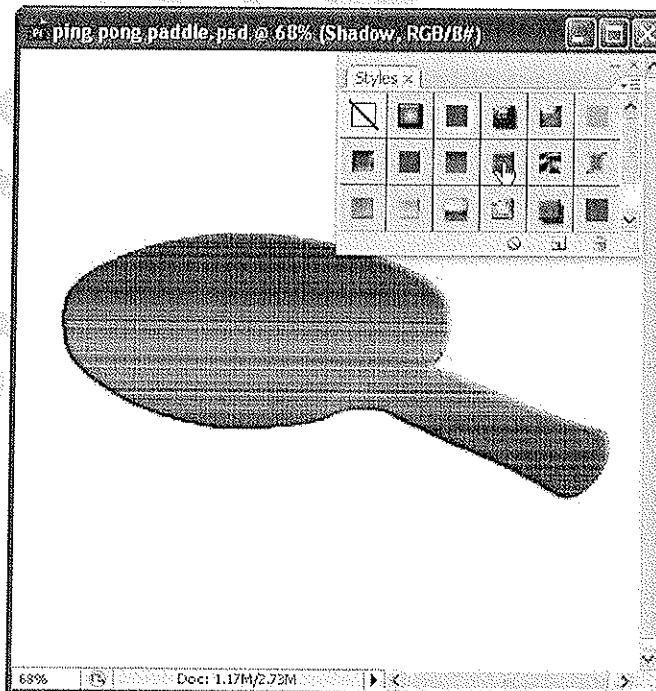
If you want to customize a style, choose Layer – Layer Style – Blending Options.
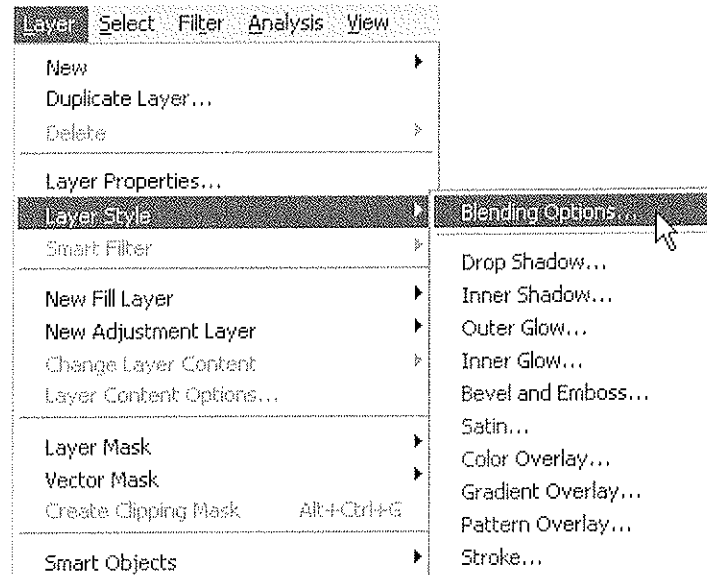
Now you can customize a style or create a new style using the Layer Style dialogue box:
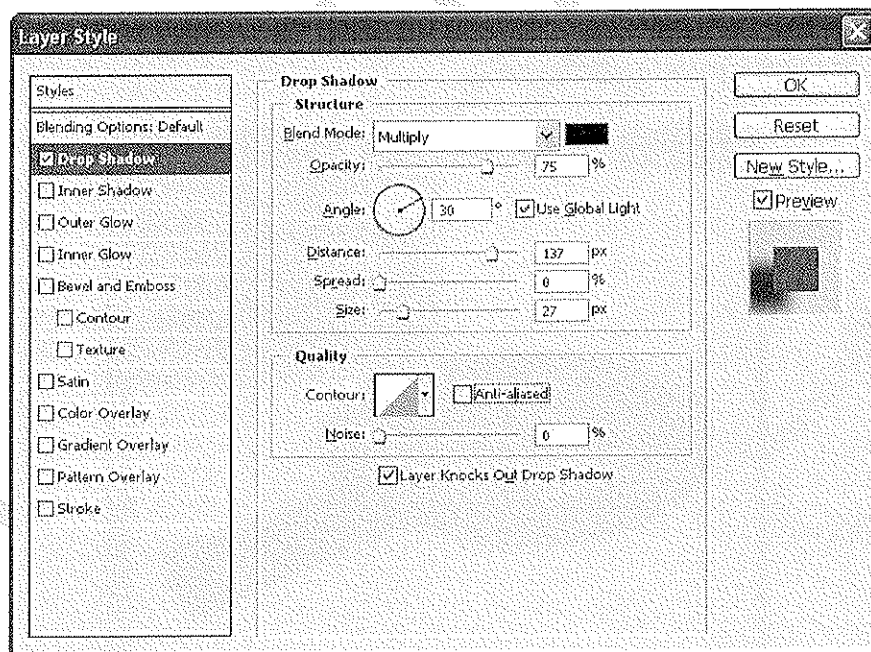
Here is an overview of the options on the left hand side:

Drop Shadow	Use this if you want a shadow to fall behind the layer.
Inner Shadow	This gives the layer a recessed look. The shadow appears on the inside edge of the layer.
Outer Glow/Inner Glow	Adds a glow effect to the layer, either on the inside or outside edge.
Bevel and Emboss	Adds a beveled edge to the layer, or adds texture.
Satin	Adds a satiny look to your layer.
Color, Gradient, and Pattern Overlay	Overlays your layer with the gradient, color, or pattern of your choice.
Stroke	Outlines the layer with the gradient, color, or pattern of your choice.

Here is the image with the drop shadow as set up in the dialogue box on the previous page:
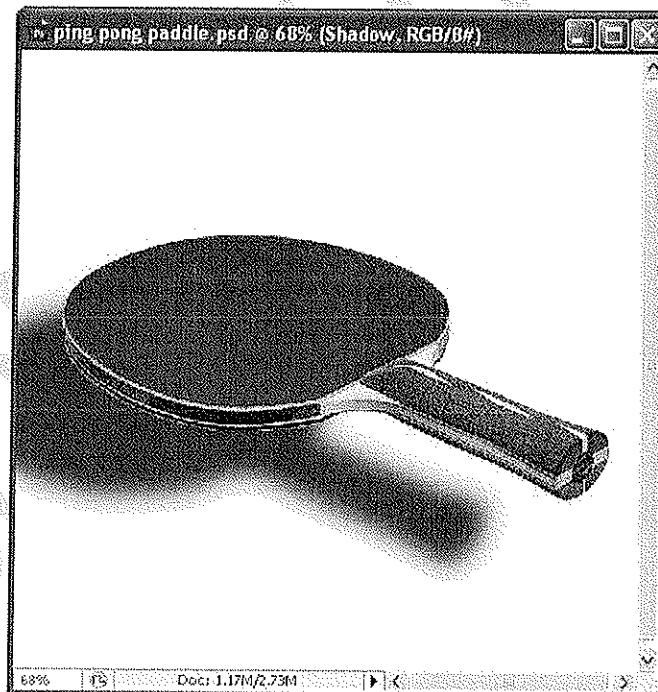
Adding a Color Stroke to a Layer

If you don't want to use the Color Stroke effect provided in the Styles palette, you can stroke directly onto the pixels of your image. Select the layer you want to add the effect to, and then from the Edit menu, choose Color Stroke. Color stroke applies a border on a layer that is completely filled in, or surrounds the contents of a layer that is only partially filled.

In the Stroke dialogue box, you can set the width and color of the stroke, as well as the position of the stroke. This dialogue box is being used to create a thick lime green border around an image.
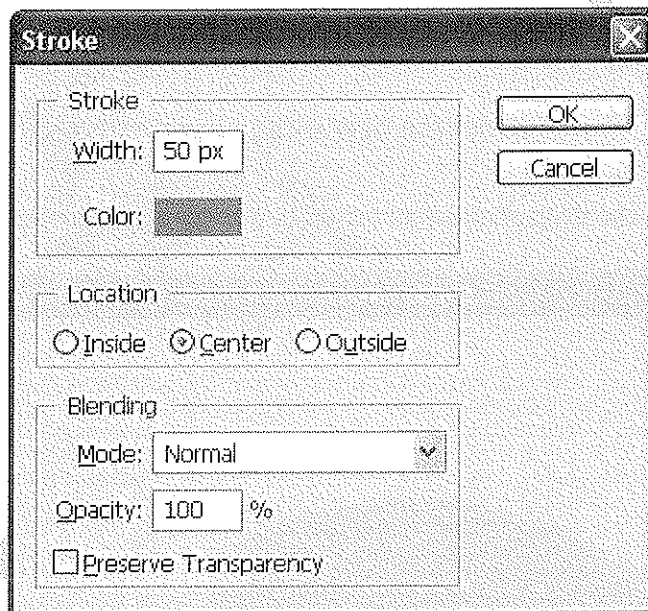
Here is the image after these settings have been applied:
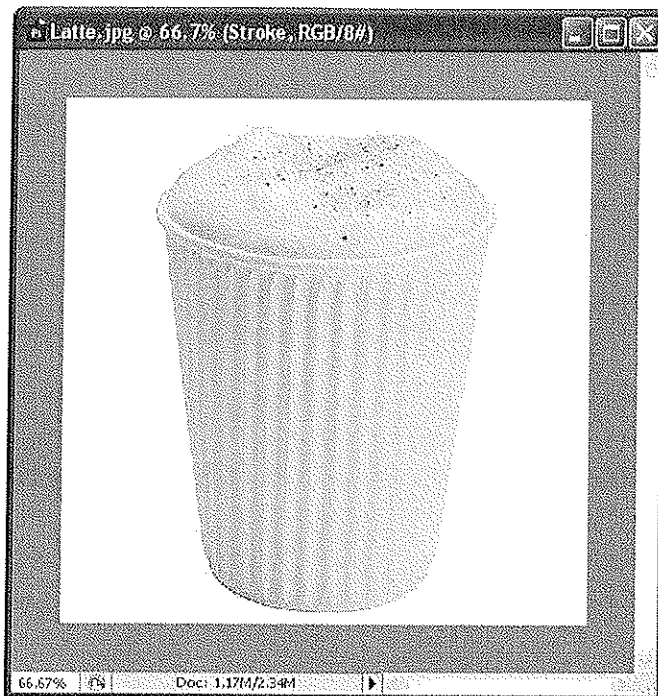
Grouping Layers

If you find that you have a lot of layers, and are having a hard time keeping track of them, it's time to start grouping them. You can think of grouping as storing your layers in folders to keep track of them.

For example, in our Fish image, we have more layers than can be seen in the default palette. If we enlarge the palette we can them all, but if we start adding adjustment layers, we are soon going to have enough layers that the Layers palette will become difficult to work with.
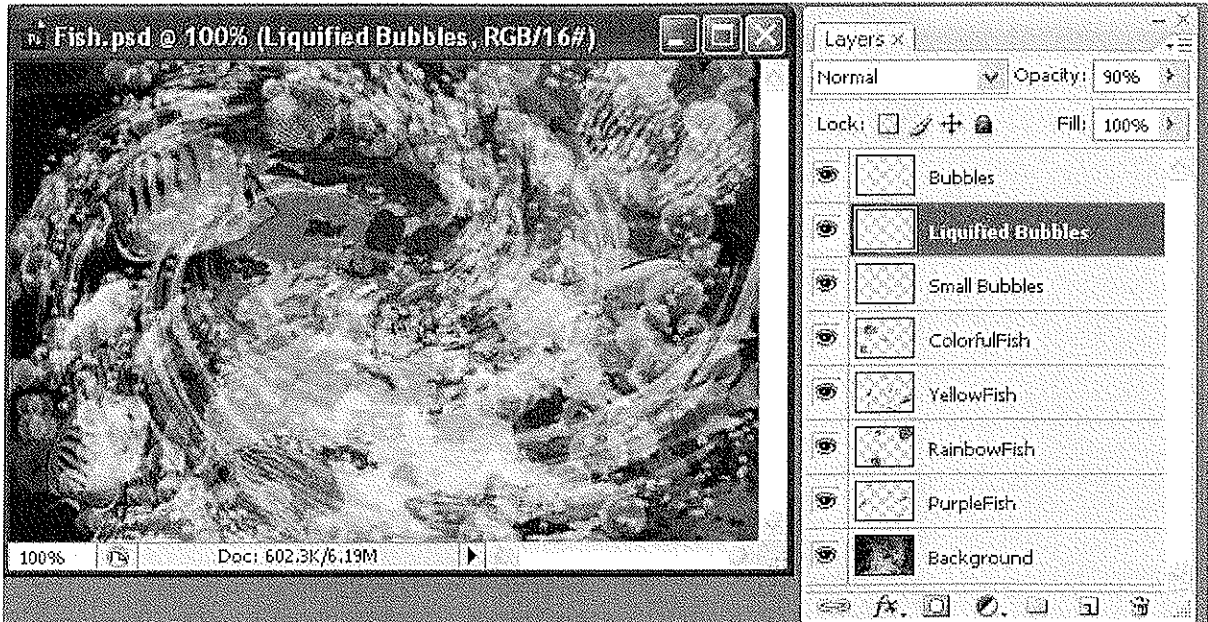
To group layers, select the layers in the Layers palette by holding the Ctrl key and clicking on each layer. Then, either choose Layer – Group Layers, or drag the layers over the Group button at the bottom of the palette.

The group will need to renamed, as it is created with the default name of Group1. You can rename a group in the same manner as a layer: either double-click the group name and replace it, or right-click the group, choose Group Properties, and rename it.
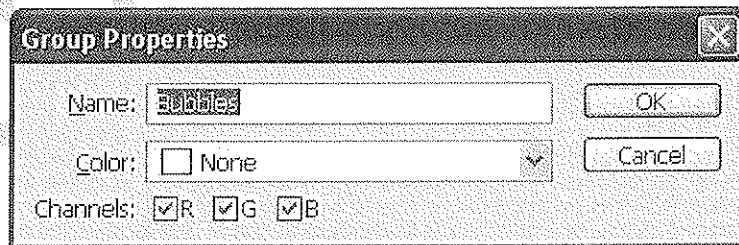
You can also create a group and then add the layers to it after. To do this, click the Group button on the palette, and then click and drag the desired layers into the group.

Here is our Layers palette after reorganizing the layers:
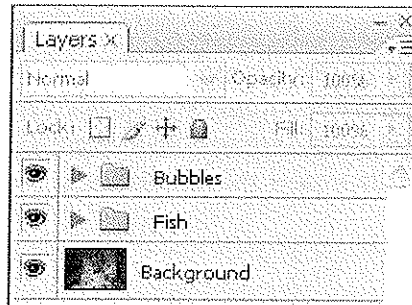
To view the layers in a group, click the arrow beside the group folder to expand it. You are only deciding whether layers are visible on the palette; you still need to toggle the eye icon to control whether the layer is part of the image.

To ungroup the layers, do one of the following:
- Click the group, and then from the Layer menu, choose Ungroup Layers. The folder will disappear, and the layers will once again be listed individually.
- Right-click the group and choose Delete Group. A warning dialogue box appears, and you can choose what you wish to delete: just the group or the group and its contents.
- Drag the group over the garbage can. This will delete the group and all layers in the group with no warning, so be careful.
- Click the group and press Delete. Again, this deletes the layers in the group with no warning.

Lesson 1.4: Advanced Layers

There are many useful things you can do with layers. You can take an image that is in pieces and use Photoshop to create a completely seamless image. You can link layers together so that they move as a unit, or you can merge them so they become one layer. If you want a layer to be stored in its own file, you can easily export the layers in your image to their own file.

Using Auto-Align

Auto-Align is an excellent tool for lining up the layers in an image. If you have a couple of different pictures of roughly the same subject, and you like part of one picture, and part of another, Photoshop can blend the two layers together into a seamless image. Or, if you want to make an image out of several smaller images (for example, a panoramic view that wouldn't fit in one camera shot, but is broken up into a couple of shots), Auto-Align helps you create the blended image. Often, aligning your layers is the first step in the editing you are planning, and by using Auto-Align, you can ensure that you are off to the best start.

Photoshop auto-aligns images by looking for identical elements between the layers and using that to calculate the relative positions of the layers. You can choose which layer you want Photoshop to match, or you can let Photoshop automatically decide what works best for the layers in your image.

The Auto-Align Layers command is found on the Edit menu, and will only be available to you if you have selected more than one layer. (To select multiple layers, click one of the layers in the Layers palette, hold Ctrl, and click the additional layer(s). Make sure you only select layers that need to be aligned.)

After choosing Auto-Align, you need to select the method Photoshop should use to calculate the alignment, as shown in the Auto-Align Layers dialogue box. There are four different ways that Photoshop can do this:
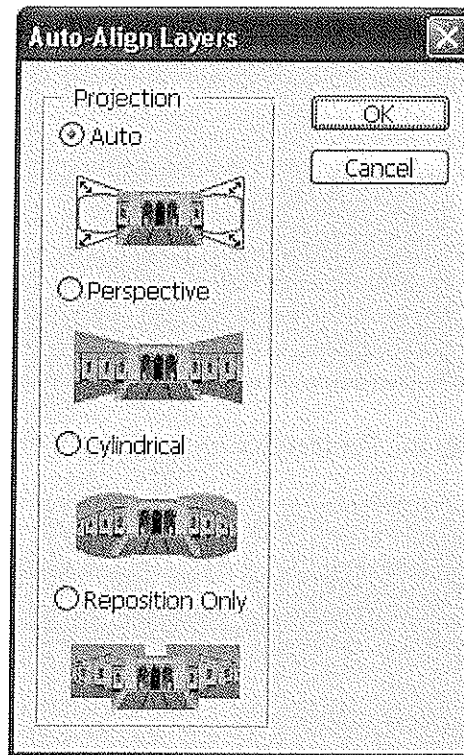
Auto   Photoshop decides whether Perspective or Cylindrical is a better choice.

Perspective   By using one of the images as the base image, Photoshop transforms the other images so that the common content matches. Photoshop may transform the image in any way it needs, including skewing, stretching, and repositioning.

Cylindrical   Photoshop displays each image as an unfolded cylinder, and then matches the content shared between the layers. It is particularly useful for panoramas, as it reduces some of the distortion that perspective can cause.

Reposition only   Matches the overlapping content, but does not transform any of the images. This is useful for matching images with the same content, but where one image is slightly offset from the other.

For example, we have the following three images, which are three shots of the same view that the lens angle wasn't wide enough to capture in one shot.
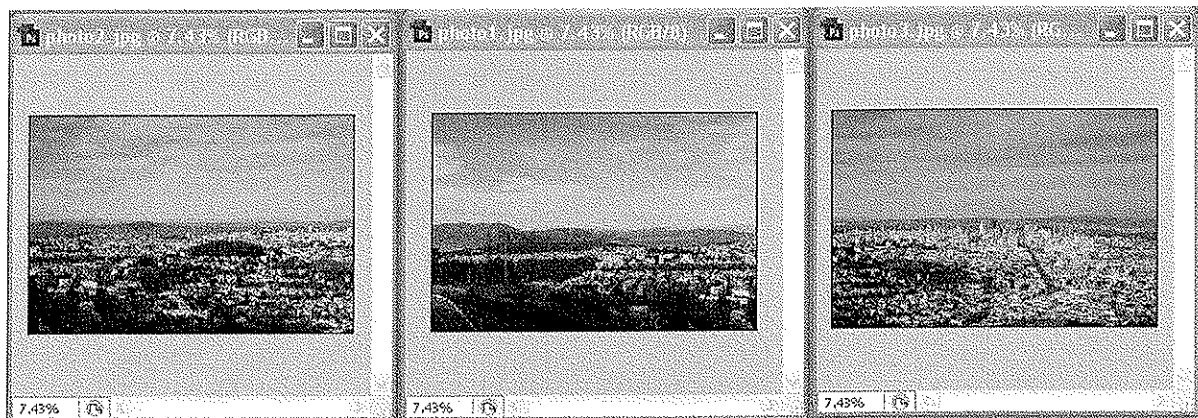
Here is the image blended using the Perspective method. Note the skewing of the images.
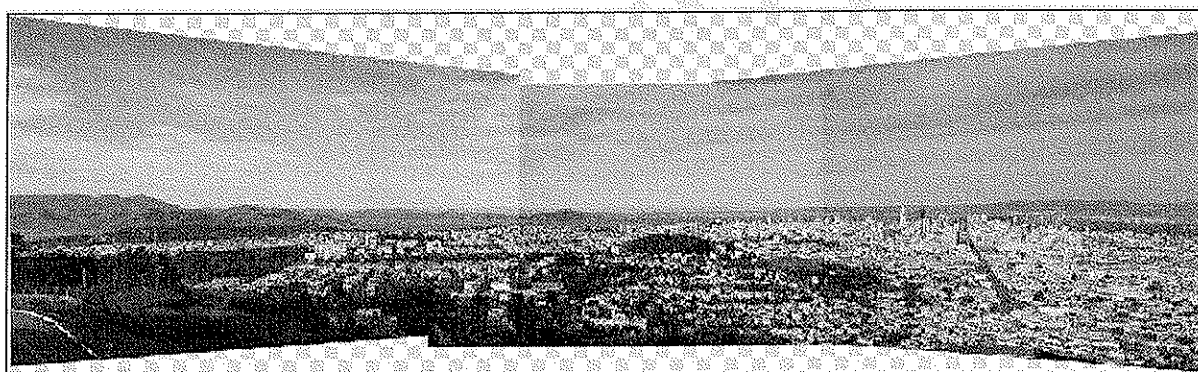
Here is the image aligned using the cylindrical method. Note how it is flatter and more even looking.
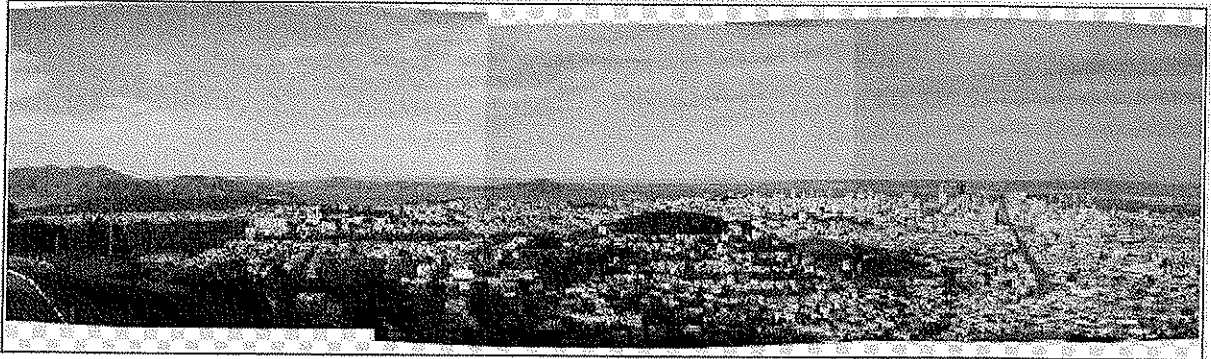
Using Auto-Blend

When you take different images, layer them, and then align them, you will probably end up with slight differences in exposure. This will look chunky, and you will be able to tell that the image came from more than one source. To fix this, we can use Auto-Blend. Auto-Blend smoothes out the differences between the layers, thus creating a seamless image. In the image above, you can see the lines between the three images and the differences in exposure.

To Auto-Blend your layers, from the Edit menu, select Auto-Blend Layers, and then wait for Photoshop to do its magic. Auto-Blend can take a bit of time, depending on your system and the size of the layers.

Here is the landscape shown above after Auto-Blending. You can see that the lines between the original images have disappeared, and the exposure looks consistent across the image.
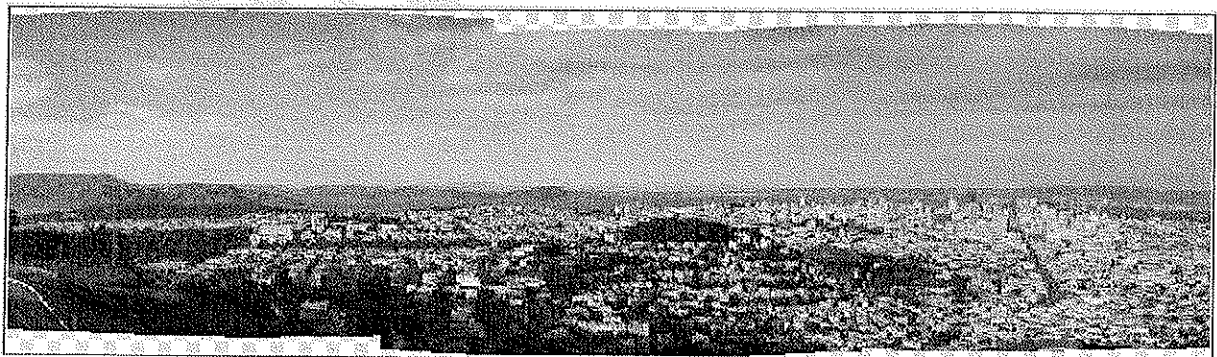
Linking Layers

There may be times when you want to link two or more layers in such a way that they can be moved around the image together without losing their individual layer qualities.

To link layers, select the layers you want to link (using Ctrl + click), and then either click the link tool at the bottom of the Layers palette, or choose Link Layers from the Layer or palette options menu. When you click a layer that has links, a link icon appears beside it and any layers it is linked to.

Link indicator

Link tool
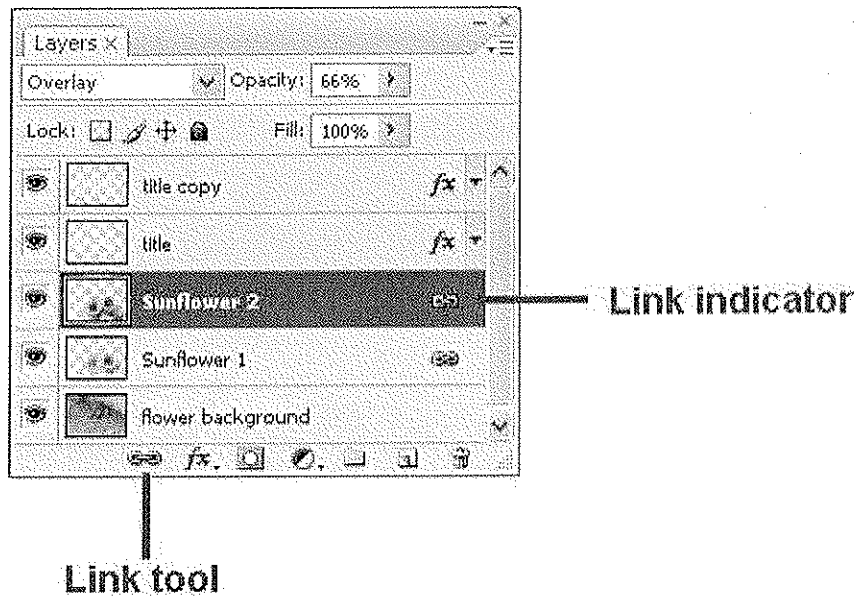
In this example, the layers named Sunflower 1 and Sunflower 2 have been linked together. If the Move tool is used when either of the linked layers is selected, the layers can be dragged around the image window together. You can also apply transformations to linked layers.
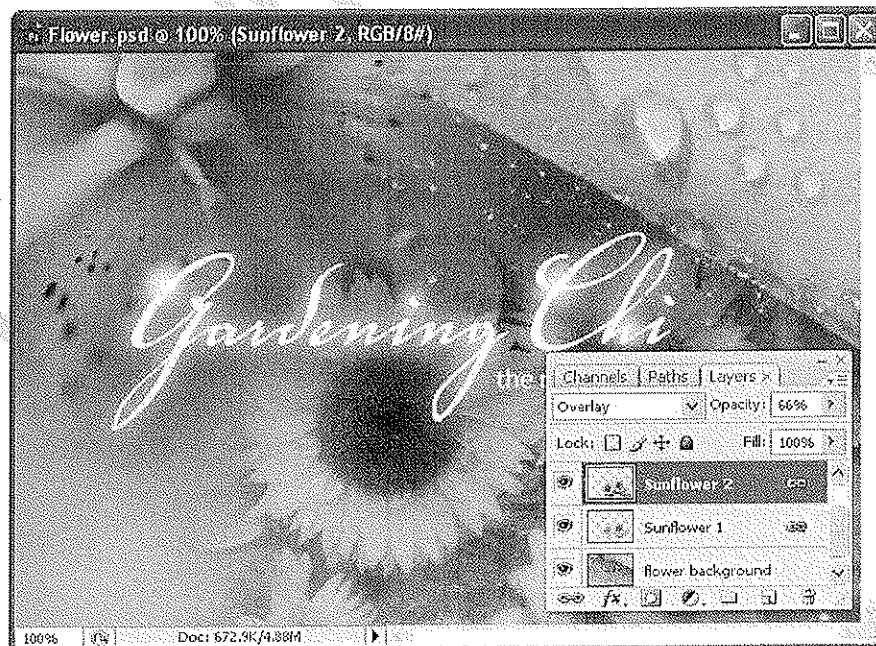
Duplicating Layers

When you consider that part of the reason we work with layers is because we do not want to risk spoiling the underlying image, the following question arises: what do we do if we have invested a lot of work into a layer and we do not want to risk spoiling it?

The answer is to make a duplicate of the layer you want to keep safe. This will let you try out additional edits to the layer without altering the original.

The Duplicate Layer command is available on both the Layer menu and the options menu on the Layers palette, as shown below.
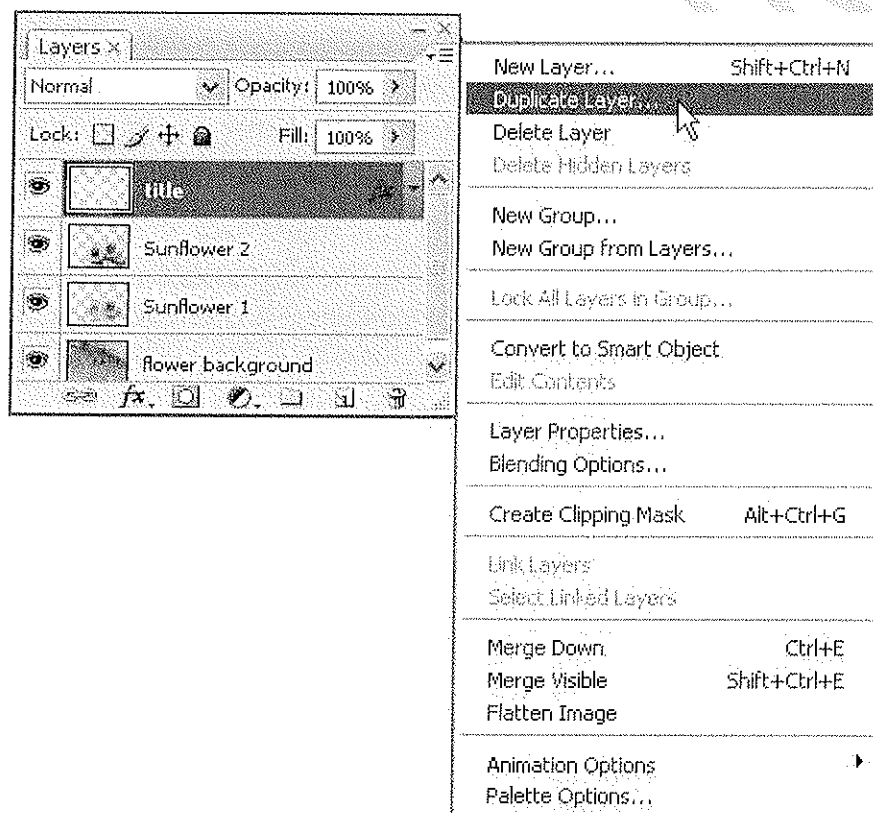
Click the Duplicate Layer item in the menu to open the following dialogue box.
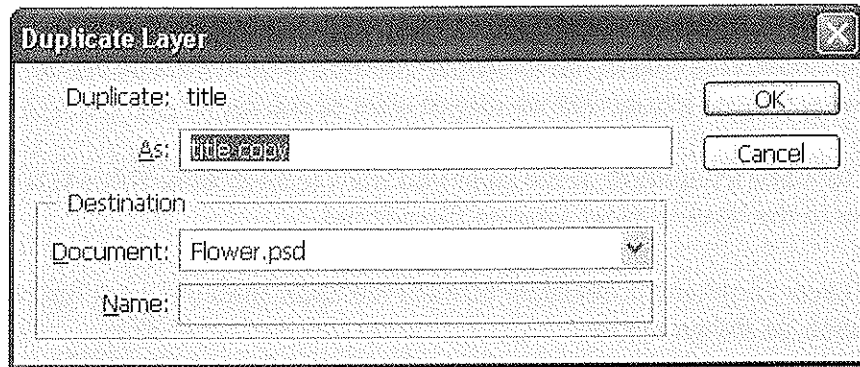
The default name is the original layer name followed by the word "copy." Simply enter a name for the duplicate layer and click the OK button to create it. If you want the layer to become part of another image file, make sure the file is open, and then choose the file from the Document list. (By default, the destination that is specified will be the image that contains the layer you are duplicating.)

When you click OK, the duplicate layer appears above the source layer in the Layers palette. You may wish to avoid confusion and make the original layer (the source of the duplication) invisible by clicking the eye icon. Now you can edit the copy without affecting the original layer.

You can also create a duplicate layer by dragging and dropping the layer you want to copy down to the new layer icon (just to the left of the trash can in the Layers palette). When you do this, a copy of the layer will appear in the Layers palette list.
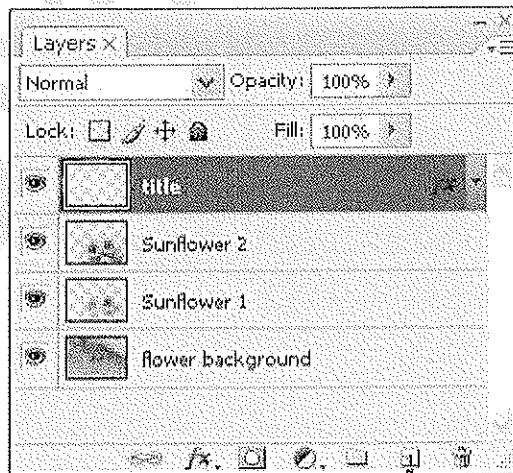
Drag layer over New Layer tool to create a copy

Merging Layers

After you have worked with your layers, used adjustment and fill layers, and produced an image to your liking, you may wish to merge some layers together. The more layers you have in your image, the bigger the file size, and the slower the image is to work with. Merging layers allows you to preserve your edits while reducing file size. When you merge layers, the image data in the top layer takes precedence over any data in the underlying layers.

There are three ways to merge layers:

Merge Layers   When you have more than one layer selected, you can choose Layer – Merge Layers to merge the selected layers.

Merge Visible Layers   Display only the layers you want to merge, and then from the Layer or palette options menu choose Merge Visible. This is a good way to see the resultant layer, as it will be the only visible layer.

Merge Down   To merge down, you only need to select one layer, and then from the Layer or Palette Options menu choose Merge Down. The layer will merge with the layer immediately below it.

As well, you can flatten your image by choosing Flatten Image from the Layer menu. Flattening converts the image to a single layer, meaning all of the layers are merged onto the background. Flattening is a permanent change to your image and will be discussed more in Lesson 3.4.

In our flower image, we have two linked layers – Sunflower 1 and Sunflower 2. By making them the only visible layers, and then choosing Merge Visible from the palette options menu, we can merge the layers.
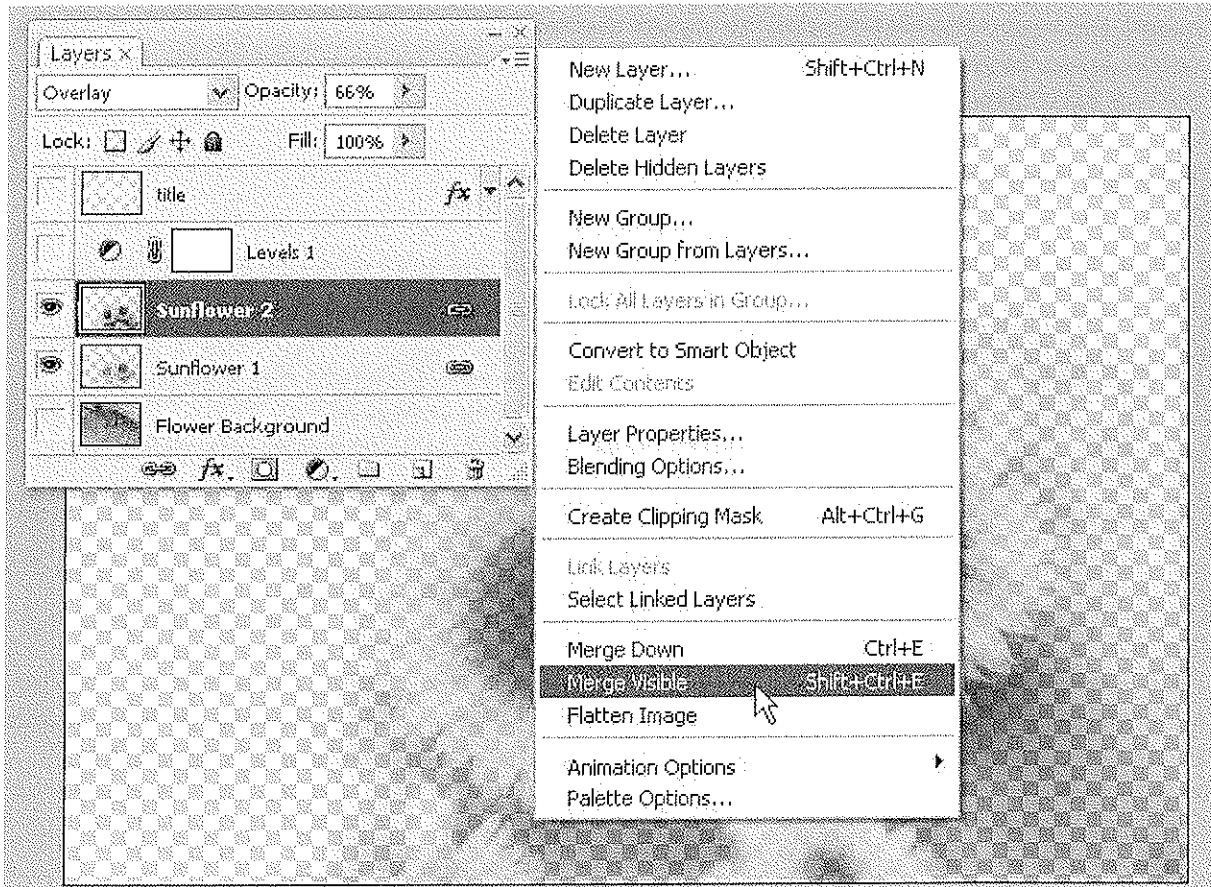
After merging the layers, we have one less layer in our image. The top layer no longer exists; the new layer retains the name of the bottom layer.
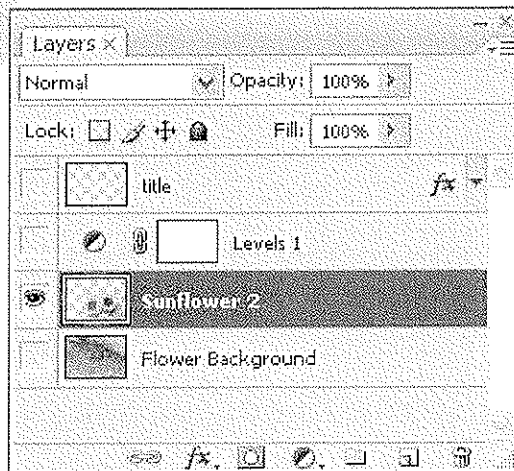
Exporting Layers

You can create a file out of a layer in an image by exporting it. When you do this, each layer of the image becomes its own file. To export your layers, run the Export Layers to Files script from the File menu.
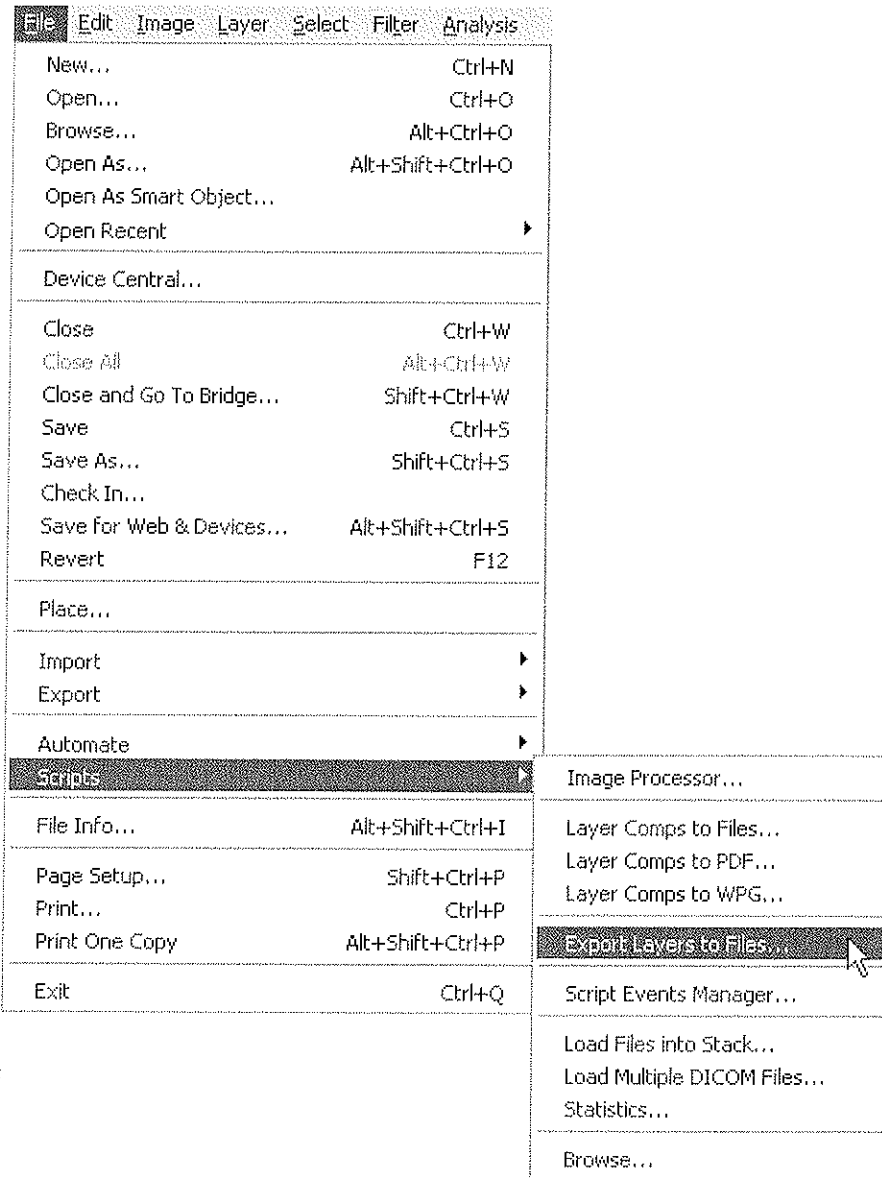
Then, using the dialogue box shown below, choose a file name prefix for the layers, the folder in which you want to store the files, and the file format.

Export Layers To Files

Destination:

C:\Documents and Setting: Browse...   Run

File Name Prefix: Cancel

Flower

☐ Visible Layers Only

File Type:

PSD   ▾

☑ Include ICC Profile

PSD Options:

☑ Maximize Compatibility

Please specify the format and location for saving each layer as a file.
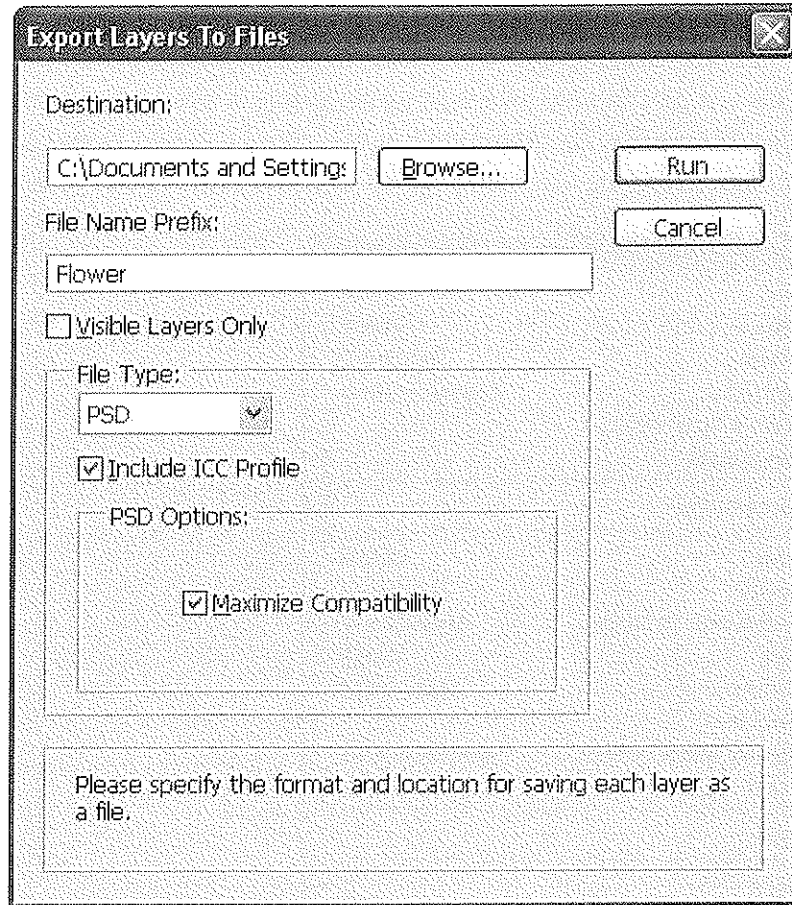
The resultant file names will be the prefix followed by a four digit number based on the layer order, and then the layer name. The result of exporting the four layers in the Flower image is this list of files:

Flower_0000_title.psd
Flower_0001_Levels 1.psd
Flower_0002_Sunflower 2.psd
Flower_0003_Flower Background.psd

Section 1: Review Questions

1. **What is a layer?**
   A. A duplicate of an image
   B. A type of channel
   C. A virtual plastic sheet that can hold a selection, an image, or an effect, and that can be stacked one on top of another
   D. Any of the above

2. **Which of the following is true?**
   A. There are at least three ways to create a layer.
   B. There is only one way to create a layer.
   C. You cannot create a layer. You must use pre-existing layers only.
   D. None of the above.

3. **How do you hide a layer from view?**
   A. Double click on the layer
   B. Click the layer's eye icon to make it disappear
   C. Drag the layer to the hide button at the bottom of the palette
   D. Choose Hide Layer from the Edit menu

4. **What does "adjusting a layer's opacity" mean?**
   A. Adjusting the level of black in the layer
   B. Adjusting the level of saturation in the layer
   C. Hiding a layer
   D. Altering the transparency of the layer
   E. Any of the above

5. **Why is the order of your layers in the Layers palette important?**
   A. With layers, order is not important
   B. The lowest layers in the palette will be seen on top of the highest layers in the palette
   C. No layers beneath the top layer will ever be seen
   D. The top layer will be seen, and if it is only partially covered, or if it is transparent, the visible parts of underlying layers can be seen as well

6. **What is the effect of layers on file size?**
   A. Keeping the separate layer information intact makes your files larger
   B. Preserving your layers does not affect file size
   C. Preserving your layers decreases file size
   D. You cannot preserve separate layer information

7.   **What do you call the process of creating an image out of two or more slightly misaligned images?**
   A.   Auto-Align
   B.   Auto-Blend
   C.   Create panorama
   D.   Stack

8.   **Auto-Blend adjusts for differences in:**
   A.   Hue
   B.   Saturation
   C.   Exposure
   D.   Position

9.   **What is an adjustment layer?**
   A.   An adjustment layer is a layer that has had an editing effect applied to it
   B.   An adjustment layer is a layer that contains a mask associated with a particular kind of image adjustment
   C.   There is no such thing as an adjustment layer in Photoshop CS5
   D.   None of the above

10.   **How do you put a selection on a layer?**
   A.   Layer – New – Layer via Copy
   B.   Layer – New – Layer via Cut
   C.   Image – Add Selection to Layer
   D.   A and B

Section 2: Retouching Images

In this section you will learn about:
- Retouching
- Hue and saturation

In this section you will also learn how to:
- Use the Blur tool
- Use the Sharpen tool
- Use the Smudge tool
- Use the Dodge tool
- Use the Burn tool
- Use the Sponge tool
- Work with hue and saturation
- Work with brightness and contrast
- Work with shadows and highlights
- Use the Healing Brush
- Use the Pattern Stamp
- Use the Clone Stamp
- Use the Patch tool

Lesson 2.1: Working with Retouch Tools

One of the most common uses for photo editing software is retouching images. The broad selection of powerful retouching tools that Photoshop provides makes it one of the best choices for this kind of work. Photoshop has the tools you need for removing blemishes, enhancing color, and almost everything else in between. With Photoshop, your digital images can be artistically enhanced, altered, revitalized, and repaired to a state that is arguably better than the original.

In this lesson, you will learn about retouching images. You will also learn how to use three Photoshop tools intended for retouching and enhancing images: the Blur tool, the Sharpen tool, and the Smudge tool. Keep in mind that retouching images is as much an art as it is a science. Use this lesson to learn about these tools, and then refine their use with experimentation and practice.

What is Retouching?

Retouching is the process of emphasizing, removing, adding, or enhancing elements in an image. These elements can include people, shadows, color, structures, or blemishes. Images can be retouched to improve their general appearance, to create emphasis, to focus on a particular region of the image, or for reasons of artistic expression.

With Photoshop CS5, there are many ways you can retouch any given image. What tools you use and what approach you take will vary from image to image, depending on the end result you have in mind. Photoshop has a number of stamps, brushes, brightness, color controls, and other tools that give you a lot of flexibility when it comes to retouching. If you have a pretty good idea of what you want your want your digital photo to look like, more often than not Photoshop can help you achieve the desired results.

The Blur Tool

The Blur tool is used to soften edges and other areas of high contrast in an image. Some users might use the Blur tool to create an out-of-focus effect, while others might use it to deemphasize unwanted harshness or contrast. You can also use the Blur tool to soften and blend artifacts left by other image edits, like removing or adding objects or using the Stamp tools.

To use the Blur tool, first select it from the toolbox.

When you click the Blur tool, the Options bar changes to reflect the relevant options:
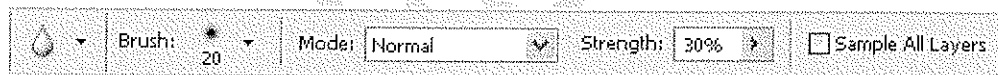
Here are the settings for the Blur tool:

Brush   Determines the size and shape of the brush used to apply the blurring.

Mode   Controls exactly how the pixels are affected by the blurring:
- Normal produces a consistent result, changing each pixel in the same way
- Darken paints with the darkest appropriate pixel in the area; has a greater effect on lighter pixels
- Lighten paints with the lightest appropriate pixel in the area; has a greater effect on darker pixels
- Hue results in the same luminance and saturation with which you started, but adjusts the hue (shade of color)
- Saturation results in the same luminance and hue with which you started, but adjusts the saturation (vividness of color)

- Color results in the same luminance with which you started, but adjusts the hue and saturation
- Luminosity results in the same hue and saturation with which you started, but adjusts the luminance (level of light)

Strength   The degree to which your pixels will be affected.

Sample All Layers   If checked, the colors of all layers will be taken into account as Photoshop calculates the changes it makes to each pixel.

Finger Painting   If checked, blurs with the foreground color.

In this image, the stems stood out very sharply. Using the Blur tool, we can soften it. The left image is before using the Blur tool; if you look closely at the stems in the right image, you can see that they have been softened.
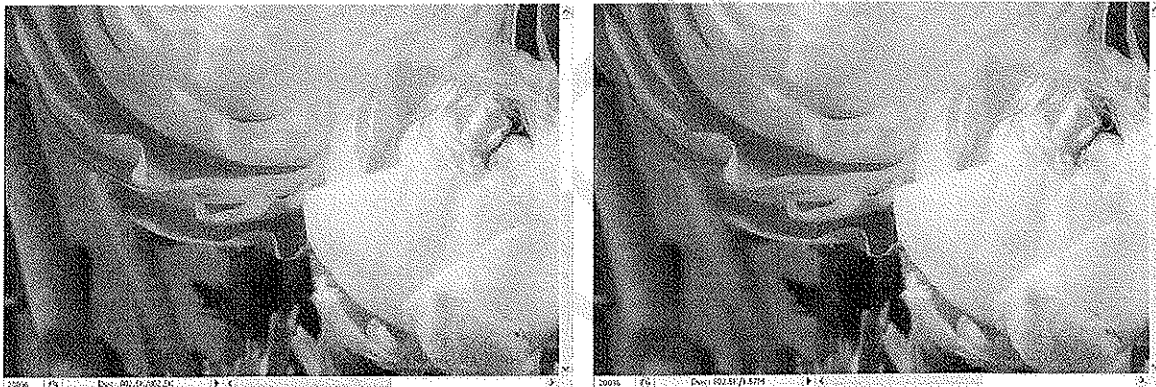
The Sharpen Tool

The Sharpen tool is the opposite of the Blur tool. It increases the contrast where you paint, giving a sharper look to your image. The Sharpen tool is a variant of the Blur tool.

The options for the Sharpen tool are the same as those for the Blur tool, so you can refer to the table above for a full explanation.

In this image, some of the petals' edges have been sharpened:

The Smudge Tool

The final variant of the Sharpen tool is the Smudge tool. It sounds a lot like the Blur tool, but it is quite different. It's like someone actually smudged your image while it still had wet paint on it. You can smudge the image using the colors that exist in your image, or you can select the Finger Paint option on the Options bar to smudge your image with the foreground color.

Here is the same flower image smudged at 10% strength with a large brush in a clockwise circle:

Lesson 2.2: More Retouching Tools

In the last lesson you were introduced to some of Photoshop's retouch tools: the Blur tool, the Smudge tool, and the Sharpen tool. In this lesson, we will continue to explore retouching tools with discussions of the Dodge tool, the Burn tool, and the Sponge tool.

The Dodge, Burn, and Sponge tools differ from the tools in the first lesson in that they produce direct effects on the color tones of your image. These tools lighten (dodge), darken (burn), or intensify (sponge) the color values for the areas that you drag your mouse pointer over.

The Dodge Tool

Using the Dodge tool is similar to using the tools we've already covered. Click the tool on the Toolbox, set the options in the Options bar, and apply the dodging to the image.

With the Dodge tool, however, there is an option called Range that the previous tools did not have. You can use the range drop list to select what kind of color tones will be altered: shadows, midtones, or highlights. Instead of setting the Strength, as we did for the Blur tool and its variants, we set the Exposure which adjusts the intensity of the adjustment.

Shadows are the darkest parts of your image, while highlights are the lightest parts of your image. Midtones comprise the large range of colors in your image that are lighter than the shadows, and darker than the highlights. With the Dodge tool, you cannot lighten all tonal ranges with a single stroke of your mouse pointer. Instead, you must select the particular range you want to modify and then drag your mouse over the area you want to lighten.

With the Exposure slider switch, you can adjust the intensity or power of the lightening effect of the Dodge tool. Basically, if the exposure value is higher, the lightening effect will be stronger. Use caution when using the Dodge tool with a high exposure value. If the exposure is set to a high value, a single stroke with the mouse pointer can make a drastic difference in the image. It is normally best to work with low exposures (5% -15%) and small to moderate brush sizes, but this will depend on the effect that you are trying to achieve. If you want to create the effect evenly over a larger area, use a large brush size (60 pixels) with low brush hardness.

In this example, the shadow under the saucer has been lightened slightly using the Dodge tool.
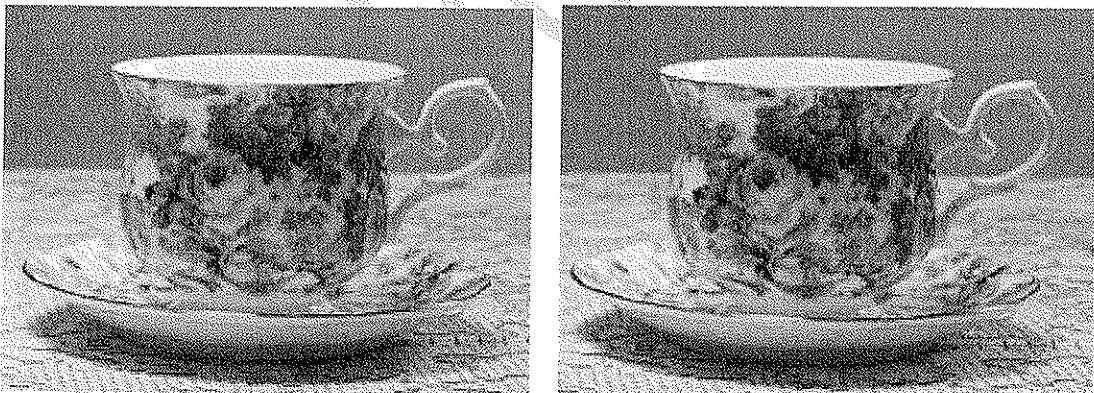
If you click the airbrush button (the button with the pen symbol on it) at the right of the Options bar, you can hold your left mouse button down and the spot beneath your mouse pointer will continue to lighten. If this button is not on, you must click your left mouse button to lighten the spot your pointer is over incrementally.

The Burn Tool

The Burn tool is the opposite of the Dodge tool. The Burn tool will darken the regions you drag your mouse over, whereas the Dodge tool lightens them.

To use the Burn tool, first select it from the toolbox.

After you select the Burn tool, set your brush qualities, your tonal range, and your exposure strength in the Options bar.

To create a burn effect, drag your mouse pointer (brush tip) over the region of the image that you want to darken. Be careful when using the Burn tool as its effects can be quite pronounced when you use a high exposure setting. To start, choose a small to moderate brush size and a low (5% to 15%) exposure setting. To distribute the effect evenly over a larger area, use a larger brush size with a low hardness setting. As you are working, you can use the [key to decrease the size of your brush, and the] key to increase it.

In this example, the teacup on the right has had its pattern enhanced by darkening the purple flowers.
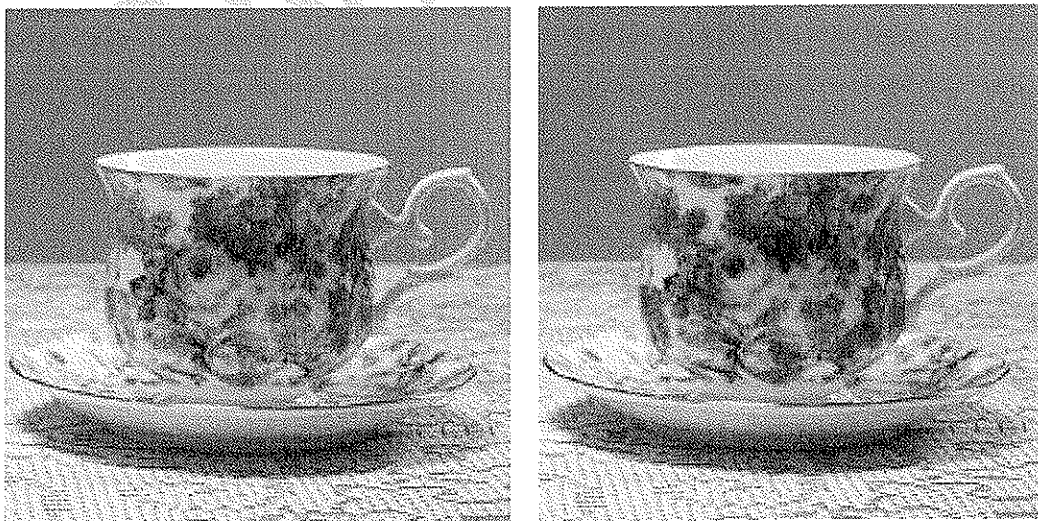
The Sponge Tool

The Sponge tool, which is located in the group with the Burn tool and the Dodge tool, is used to increase or decrease color saturation.
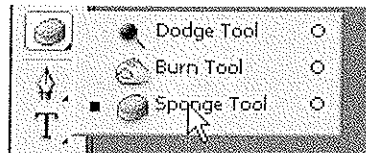
The Options bar is slightly different for the Sponge tool. You first set the mode to either Saturate or Desaturate. When you increase color saturation, you are increasing the brightness and strength (intensity) of a color to make it more vivid. Desaturating is the process of making a color less vivid (duller or less intense).
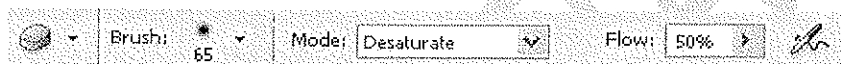
You can use the Flow slider switch to control the strength of the Sponge tool's effect. Higher values strengthen the effect, and lower values weaken it. To begin, use a lower flow setting. Remember, you can always repeat your strokes to make a stronger effect as an alternative to increasing the flow value.

As with the Burn and Dodge tools, use small brush sizes for detailed work, and larger brush sizes for large, evenly blended areas.

Do not confuse the results from the Desaturate setting for the Sponge tool with the results produced by the Dodge tool. The Sponge tool desaturates color, that is, it makes the color less pure or intense. The Dodge tool affects the lightness of the color.

After you select the Sponge tool and set up its options, you can create your desired effect by dragging your mouse pointer over the specific region of the image that you want to saturate or desaturate. It is probably best to start with a lower flow value until you become accustomed to using the Sponge tool. Again, you can use [to decrease the size of the brush, and] to increase it.

In this example, the lighter purples have been brought out more by saturating them with the Sponge tool.
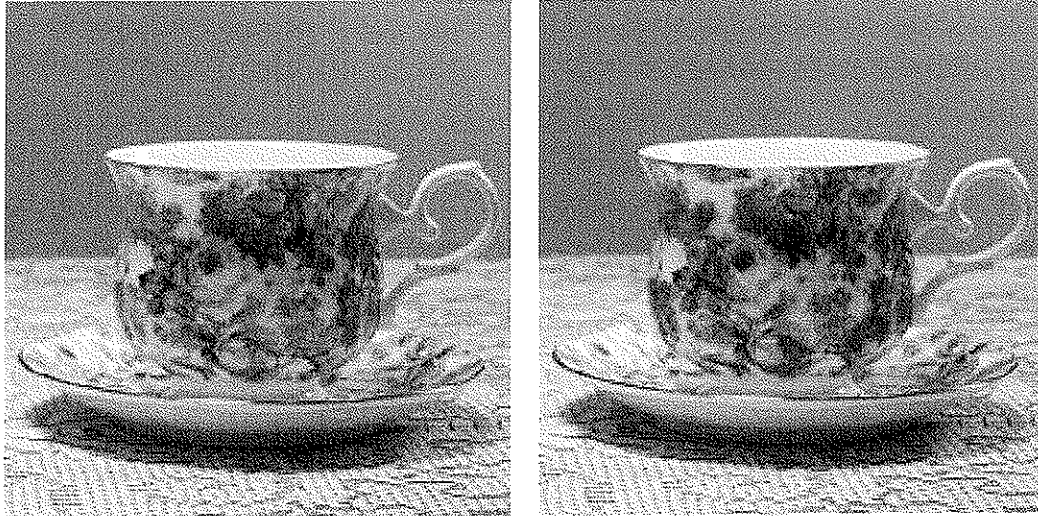
Lesson 2.3: Working with Color, Brightness, and Contrast

In the preceding lessons, you learned how to apply retouch tools to specific image areas. You used the retouch tools to enhance tonal ranges by darkening or lightening them, and you learned how to use the Sponge tool to saturate or desaturate the color in a specific area. These are not the only ways to work with light and color, however. Photoshop also provides tools for working with color and brightness that are more global in nature. In this case, the changes are applied across the entire image, not just localized areas that you drag or click over.

In this lesson you will learn about hue, saturation, and brightness. You will learn how to use the Hue/Saturation dialogue box, as well as the Brightness/Contrast dialogue box. You will also learn how to manipulate shadows and highlights using the Shadow/Highlight dialogue.

What are Hue, Saturation, and Brightness?

As you probably already know, colors on your computer screen can be described in terms of their red, green, and blue components. By mixing these levels of these color components you can generate millions of different colors. Another way to look at color is in terms of hue, saturation, and brightness.

Hue refers to how we perceive the dominant wavelengths of a color source. It is the characteristic we are describing when we refer to a color as green, or purple, or red. You could think of hue in the same way that you think of shades or tones of color. Some people use the word hue in the same way they would use the word color.

Saturation refers to how we perceive the ratio of the dominant wavelengths to all the other wavelengths of a color source. In other words, saturation can be described as the strength or intensity of a shade or tone of color. A color that is very saturated will appear strong and vivid to our eyes, while a color that is much less saturated can appear to be washed-out or weak. A color that is completely desaturated will appear as a shade of gray.

Brightness refers to how we perceive the amount of light energy given off by a color source. People often think of brightness on a scale from dark to light, with black having very little brightness (light energy), and white having maximum brightness.

As it turns out, any of the colors that can be described in terms of red, green, and blue values can also be described in terms of hue, saturation, and brightness values. Some people find that the hue, saturation, and brightness scheme is a more intuitive and natural way to view color than the RGB scheme.

Working with Hue

If you choose Image – Adjustments – Hue/Saturation from the menu bar, you will see the following dialogue box.
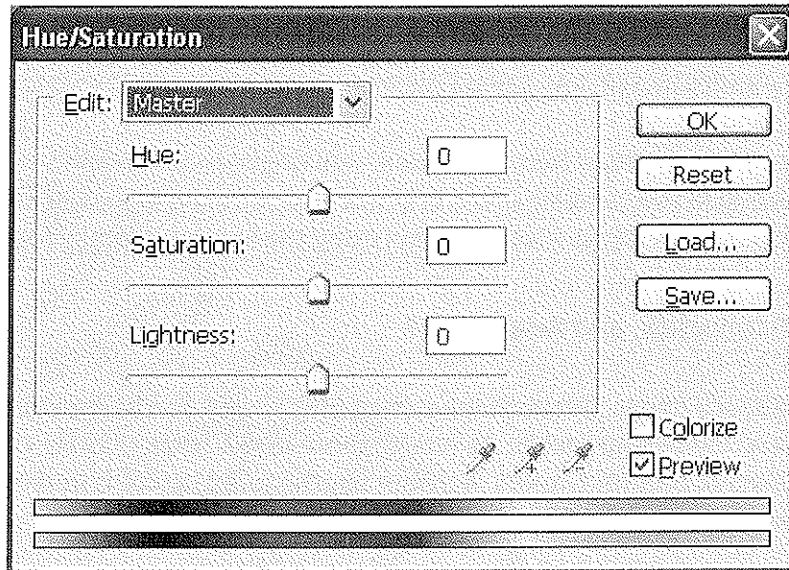
When you are working with hue and saturation, you can control the master setting for all colors, or you can work on an individual channel – Red, Green, or Blue, or Cyan, Magenta, or Yellow. This selection is made from the Edit list.

When you are working on the master, all colors in your image are affected by your adjustment. Moving the hue slider changes the hues (shades of color) in the active image. (Notice that by default, the sliders are at a level of zero.) If the checkbox labeled Preview is cleared, you will not see the adjustments you make reflected on the image. If you put a check in the Colorize checkbox, you can create a colorized version of the image similar to grayscale (like sepia tone).

Here is an image that has had the hue adjusted. The image on the left is the original:
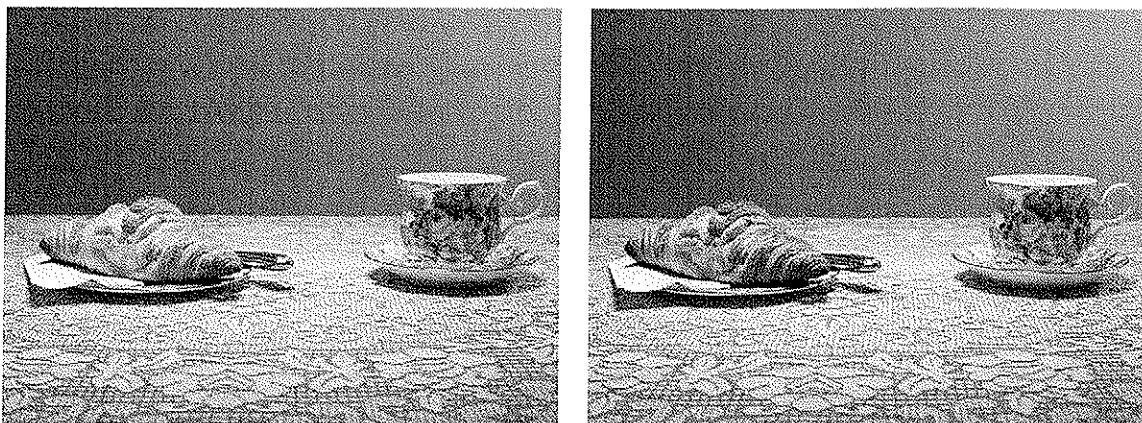
If you are working on a particular color, bars appear along the sliders at the bottom. These bars actually represent four different color wheels, and you can adjust the hue for each.
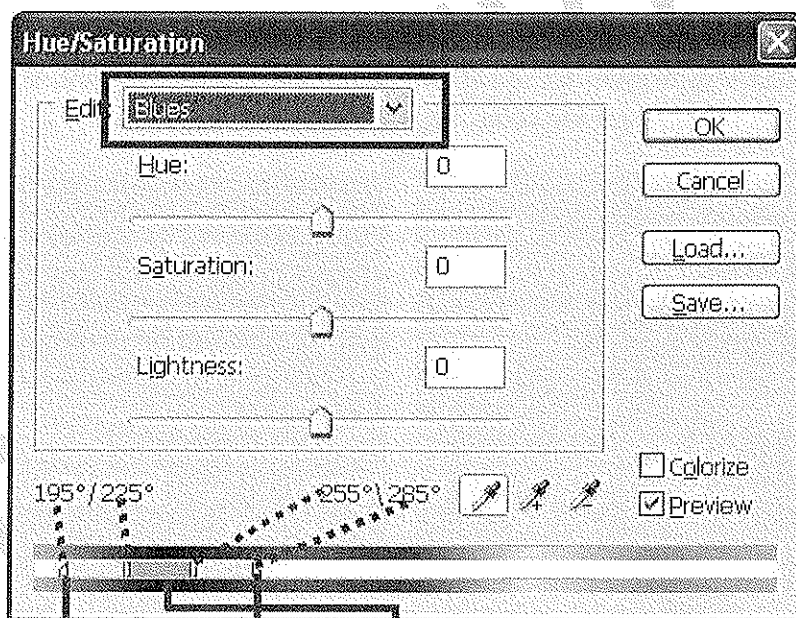
Fall off limits   Color range

The color range sets the colors to be affected by the adjustment. The bar at each end of the range can be adjusted, or you can slide the whole range by clicking on the gray between the bars. If you slide the bar so far that you are into another color range, the Edit list changes to reflect this. The fall-off limits set the color at which the adjustment feathers instead of being a sharp change. As you move the sliders, the percentage values for each color wheel display the current setting.

Once you have made all of your setting, click OK to accept them. These new settings now become the basis for further changes: the values in the Hue/Saturation dialogue box are reset to zero, and changes are relative to your current settings.

Working with Saturation

Saturation is changed using the same dialogue box as hue. Adjusting the saturation controls how vivid the color is. Technically, saturation measures the amount of gray in proportion to the hue. Increasing the saturation results in a positive percentage. Conversely, to decrease the saturation, or make the color more dull, move the slider to the left of 0. Here is the teacup image with the Master saturation set to +60 on the left and -40 on the right. You can really see the difference in the vividness of the color.
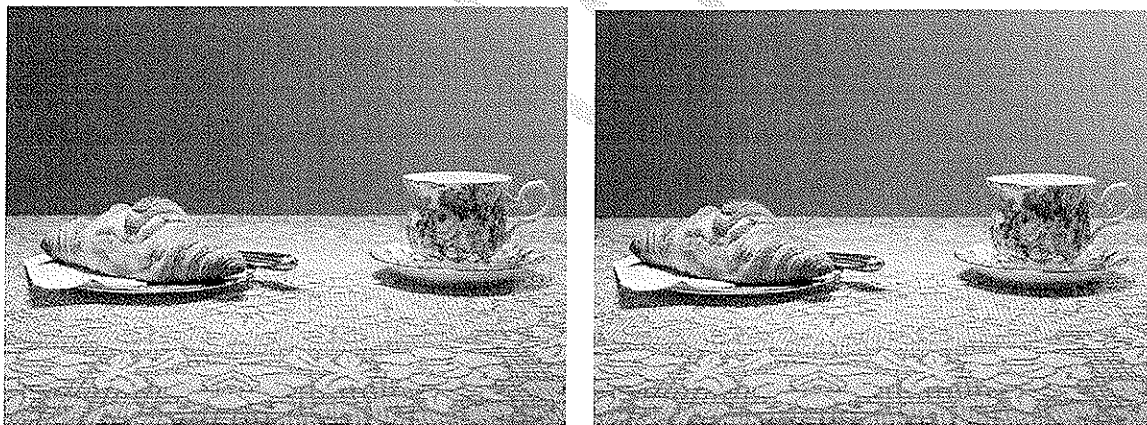
If you want to just adjust the saturation of one color channel, choose the color from the Edit list, the same as working with Hue.

In this image, only the blues are adjusted to +60. You can see that the croissant and teacup aren't as vivid; it's mostly the background that has been changed.

If you would like to keep a given set of adjustments, you can save the configuration by clicking the Save button in the dialogue box. If you would like to load a saved configuration, click the Load button.
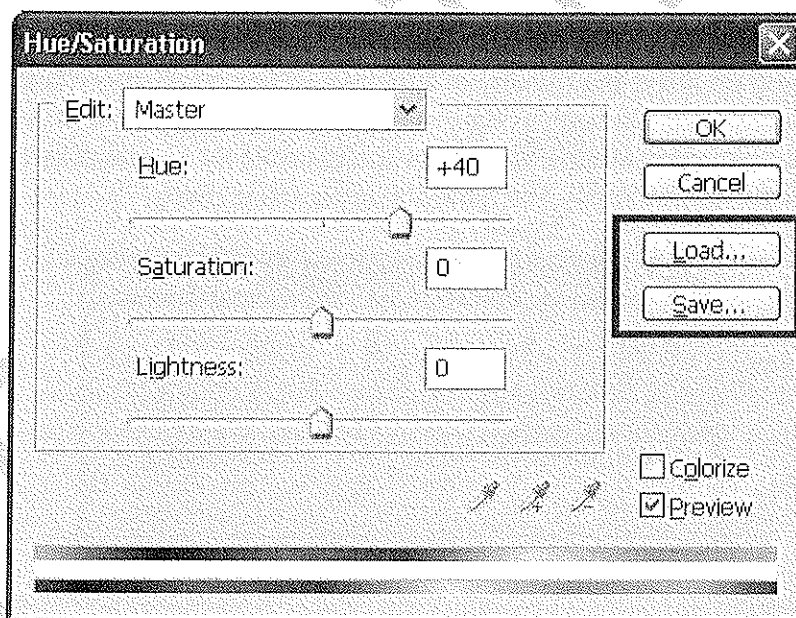
To desaturate your entire image so that all color is removed, and your image appears in shades of gray, select Image – Adjustments – Desaturate.

Working with Lightness

The final setting in the Hue/Saturation dialogue box is the lightness setting. Lightness refers to how much white is in the color – 100% is pure white, and 0% is pure black.

This image had a nice amount of light to start with, so you can see that when we increase the light in it to +40, it starts to get a washed out look. Again, once you are satisfied with your settings, click OK to accept the changes.
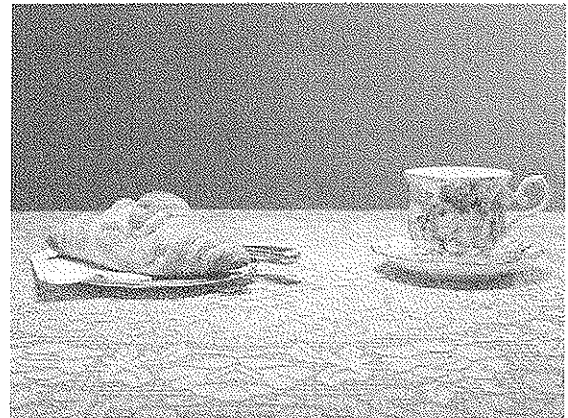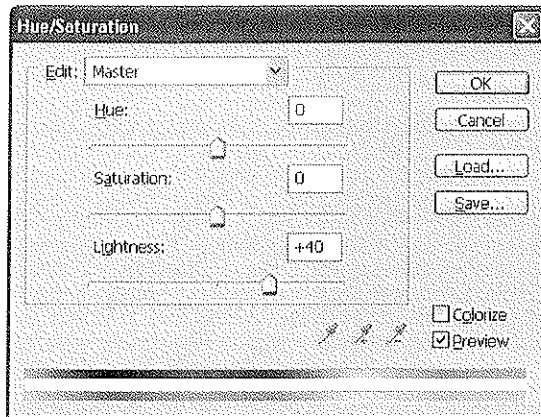
Working with Brightness and Contrast

Brightness and contrast affect the tonality of your image. These adjustments should be made on a layer, not on the original image, as they result in the permanent loss of some image information. You can manipulate the brightness and contrast for an image by choosing Image – Adjustments – Brightness/Contrast. The dialogue box is shown here:
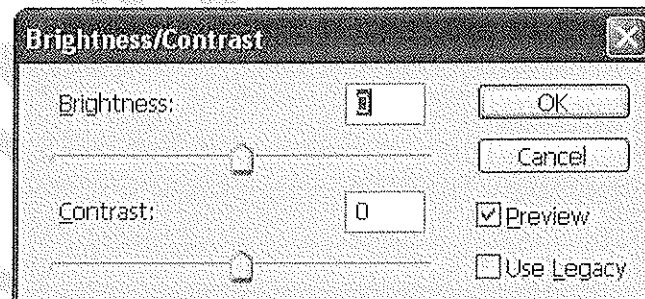
Here you can use the slider switches to adjust the level of brightness (light or dark) and the level of contrast in the image. Contrast can be described as the differences in color and light in an image that helps to distinguish the image's various elements. You can enter values directly in the value fields provided if you wish.

In this example, the image on the left has been brightened and had the contrast increased:
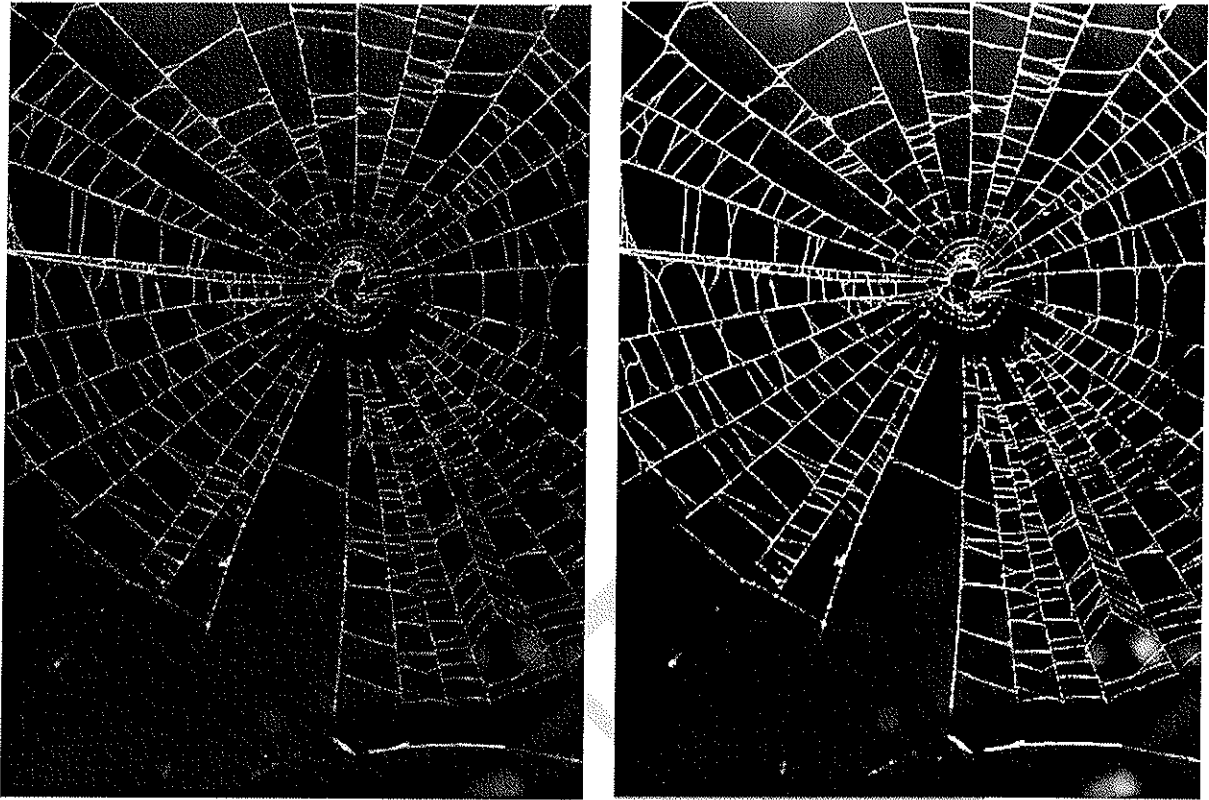
Once again, a check in the Preview checkbox allows you to see your adjustments on the image as you make them. This way, you can see what the changes look like before you commit to them.
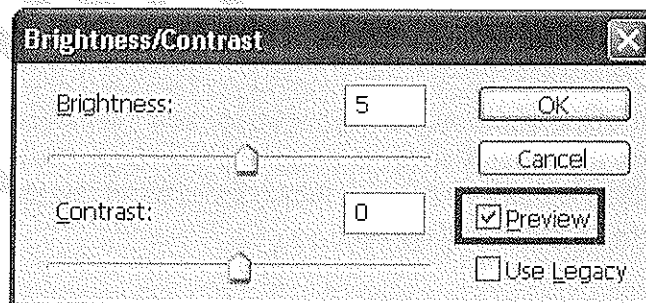
As with the Hue/Saturation dialogue box, pressing the Alt key lets you toggle between Reset and Cancel. If you click the Reset button, the sliders will be set to the default positions at a level of zero.

When you are satisfied with your brightness and contrast adjustments, click the OK button to implement the changes. Keep in mind that this method of configuring brightness and contrast

applies to the entire image, so you have no control over how isolated these effects will be using this method.

Working with Shadows and Highlights

You have already seen two retouch tools that can be used with shadows and highlights: the Dodge tool and the Burn tool. Although these tools can be applied to specific areas of an image, Photoshop CS5 provides a Shadow/Highlight dialogue box that can be used to modify shadows and highlights for the entire image at once.

To adjust the shadows and highlights for your image, choose Image – Adjustments – Shadow/Highlight from the menu bar. You may notice that the image you are modifying changes slightly. This is because the Shadow/Highlight command adjusts the image to a default shadow/highlight setting. Unlike the preceding hue/saturation sliders, and the brightness/contrast sliders, the Shadows Amount slider's default value is 50% rather than zero. Usually, just by invoking the dialogue box you will see a change in your image.
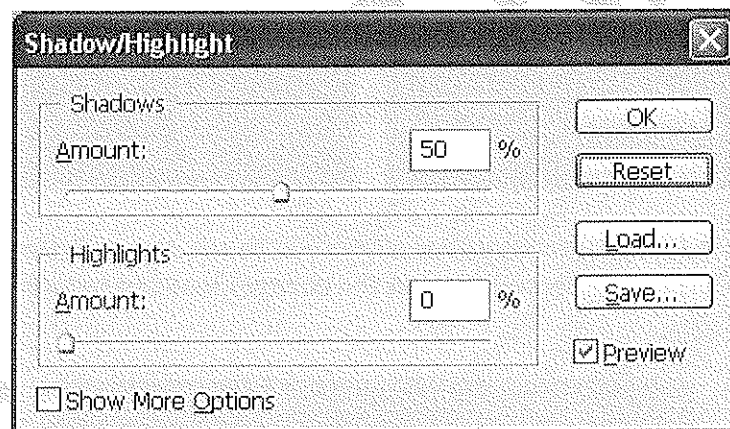
There is a slider for controlling the shadows in your image and a separate slider for the highlights. If you increase the shadow slider to a higher percentage, the shadows in the image will lighten, possibly revealing more underlying detail. If you move the slider the other way, to decrease the amount, the shadows will darken.

If you increase the Highlight amount to a higher percentage, the highlights throughout the image will darken. If you decrease the Highlight amounts, the highlights will lighten.

If you wish, you can enter values for Shadows and Highlights directly in the fields provided.

As before, you can use the Alt key to make a Reset option available (meaning the Cancel button will display the word Reset when the Alt key is pressed). Clicking Reset will restore the image's original values.

The shadow and highlight controls are great for correcting over or under exposed images. You can also use these controls effectively to balance or tweak light and shadow in practically any image.

Adding some shadows to the spider web really makes the web stand out nicely:
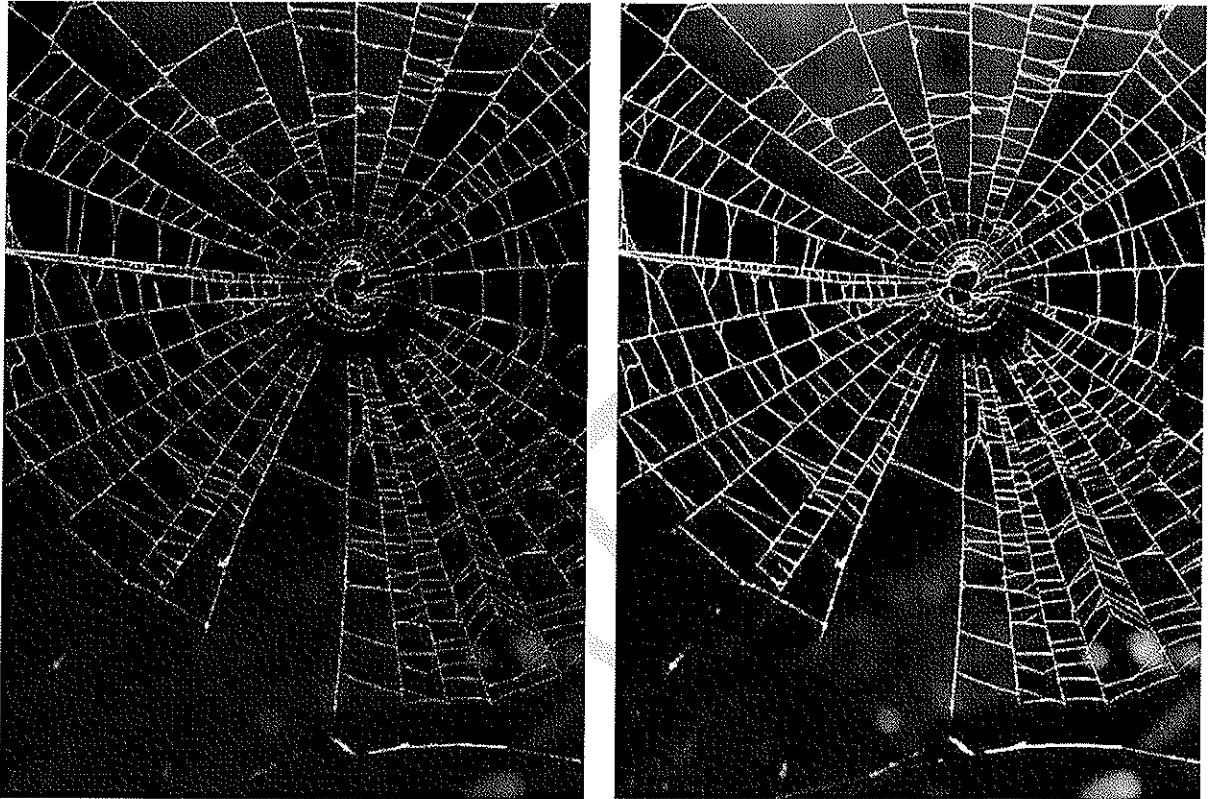
You can get finer control over highlights and shadows by clicking the Show More Options checkbox. When you do this, the dialogue box will appear as follows:
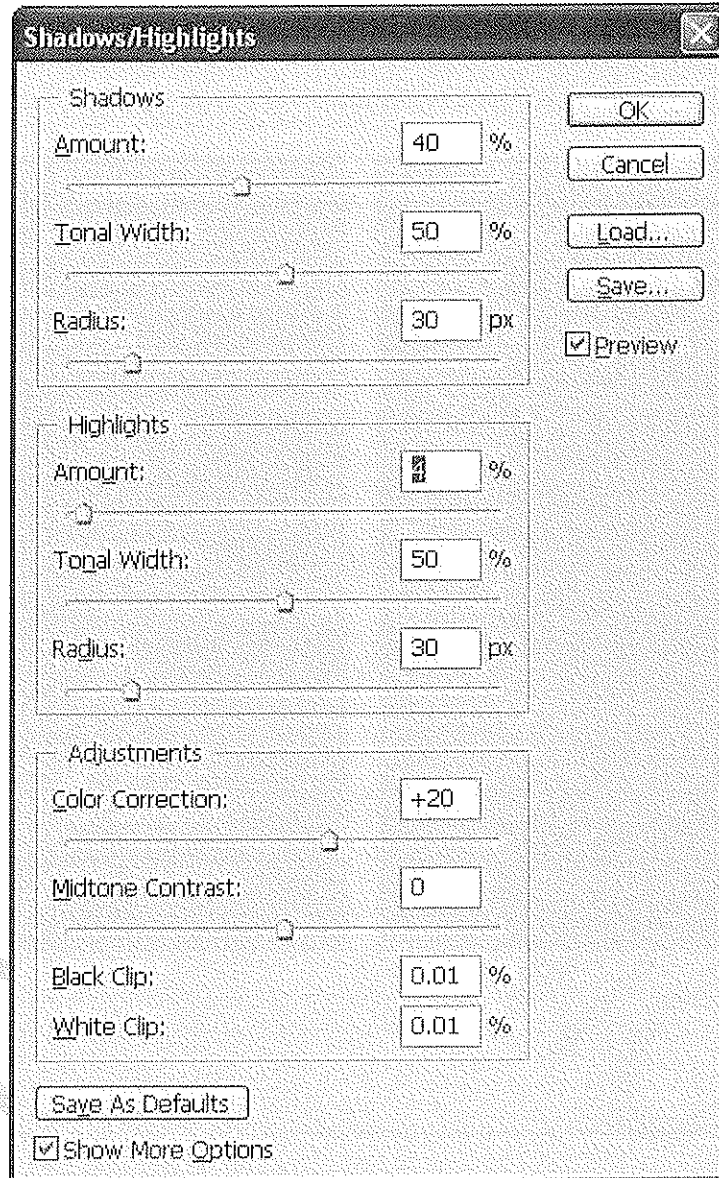
Now with the expanded options, you can see two additional sliders: Tonal Width and Radius.

The tonal width is the range of values that will be adjusted with the sliders. For example, a small tonal width setting for shadows would mean that only very dark regions will be affected by the sliders. Basically, if you move the tonal width slider to the right (for either the shadows or highlights) more regions of the image will be affected with changes to the shadow or highlight amount values. If you move the tonal width sliders to the left, fewer regions will be affected.

The radius sliders control the physical area of the pixels that are affected, based on location (as measured in pixels) rather than relative lightness or darkness.

How you adjust the Radius sliders and the Tonal Width sliders will depend on the image you are working with and the end results that you are after. In general, you will probably want your radius values to be between 30 and 60 pixels to start, but feel free to experiment.

As for the tonal width values, first set your shadow and highlight amount sliders until you are satisfied with the results. Then adjust your tonal width sliders, watching carefully to see how they change the appearance of detail and light in your image. When you are happy with these adjustments, you may want to go back and tweak your Radius values to see if you can uncover any additional detail.

You can use the Color Correction slider to compensate for loss of color due to the shadow and highlight adjustments. Areas of the image that were not adjusted should not be affected by the Color Correction values. You can also add contrast to the midtones of an image with the Midtones Contrast slider if you wish.

As always, you can enter values directly in the fields provided if you prefer not to use the sliders. If you wish to save a particular group of settings, use the Save button. To load a saved configuration, use the Load button. If you click the OK button the adjustments you made will be implemented in the image.

If you wish to revert to the condensed version of the dialogue, clear the Show More Options checkbox.

Lesson 2.4: Retouching With Stamps and Brushes

Even though we have learned a lot about adjusting an image, there is still another group of tools that play an important part when it comes to retouching images: the Stamp tools and Healing Brush tools.

In this lesson, you will learn about the Healing Brush and the Patch tool. You will also learn about the Clone Stamp and the Pattern Stamp tool. These tools can be extremely helpful when retouching images and they are easy to use.

Unlike the retouch tools in the previous lessons, the stamp and brush tools that follow are used primarily for removing, blending, or covering up blemishes or other unwanted elements. These tools are fun to use, and they can produce amazing results.

The Healing Brush

The Healing Brush works by borrowing or sampling image information from one spot, and then using that information to neatly cover or repair an unwanted blemish or region in another area. The Healing Brush gets its name from its ability to blend (heal) the texture, shading, and color of the borrowed data into its new destination.

The Healing Brush is the tool that looks like a bandage:

When you select the tool, the Options bar reflects the settings you can make for the healing brush. You can choose the size and hardness of your brush and the mode in the same way you have for other tools.

However, there are three additional settings for your brush: the spacing, the angle, and the roundness.
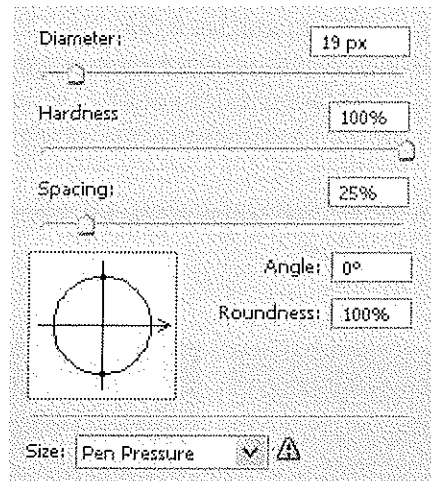
Spacing	Sets the distance between brush marks in a stroke. The percentage is based on the brush size.
Angle	If you change the angle, your sample will be rotated by the degree that you set.
Roundness	If you set roundness to 100%, you will have a perfectly round brush. At 0%, you have a linear brush. Everything in between is an oval brush. As you change the percentage, the sample brush shows you what your brush will look like.

Here is a specialized brush setting:
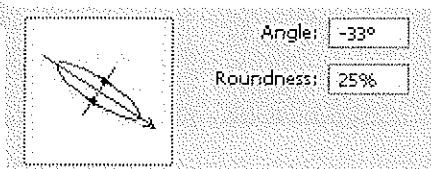
The options for the Healing Brush include a couple that we haven't yet seen.
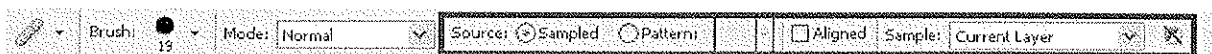
Before using the brush, set your source: you can take a sample of the image that you want to transfer to the damaged or blemished area, or you can select a pattern to place over an area. You will also notice a checkbox labeled Aligned. If this is checked, the sample area that is used as your source will move uniformly with your mouse pointer when you drag it around the

image. If Aligned is deselected, the sample cross hairs will return to the original spot you sampled whenever you release the left mouse button.

To use this tool, select it, set your options, and then take the sample that you are referencing by pressing Alt and clicking. Then begin clicking where you want to repair or change your image. Readjust the brush and options as needed until you are happy with your results. Remember, you can use the square brackets on your keyboard to adjust the size of the brush as you work.

In this image, you can see a blemish on the grape in the left image. Using the healing brush, we can improve the appearance of the grape.
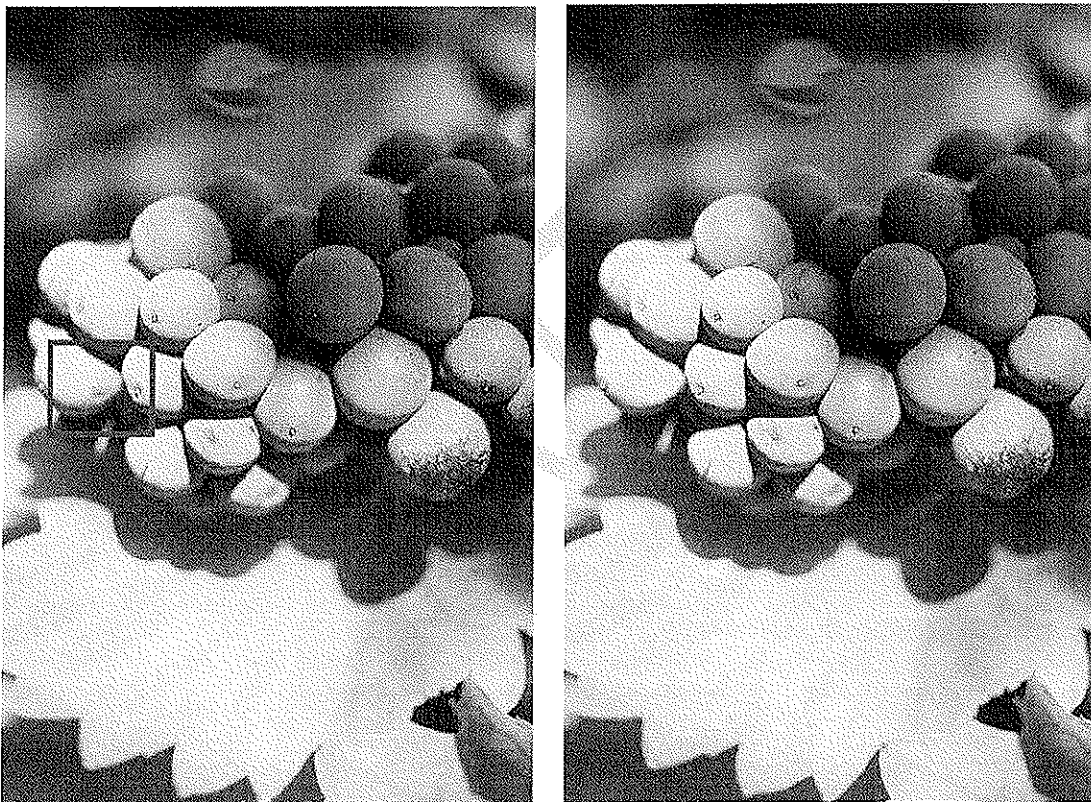
Sometimes the edges of your repairs are difficult to control properly. You can solve this problem by making a careful selection around the area you are healing. When you use the Healing Brush close to the edge of the selection, the selection will keep the brush strokes inside the border.

The Patch Tool

The Patch tool is a variant of the Healing Brush.

There are two approaches to using this tool: selecting the Source or selecting the Destination. You can decide which approach to use on the Options bar.

If you start by selecting the Destination button on the Options bar, you will use the Patch tool as you would the Lasso tool, and select the area of the image you are going to use as a patch. You can add to or subtract from the selection by using the buttons on the Options bar as you would for any selection. Once you are satisfied with your selection, simply drag the patch over the area you want to repair.

In this image, the mud flap was removed using this method – an area of the asphalt was selected as the destination, and then it was dragged over the mud flap. You can see that a bit of editing work would still need to be done, but the bulk of the task is completed with this tool.
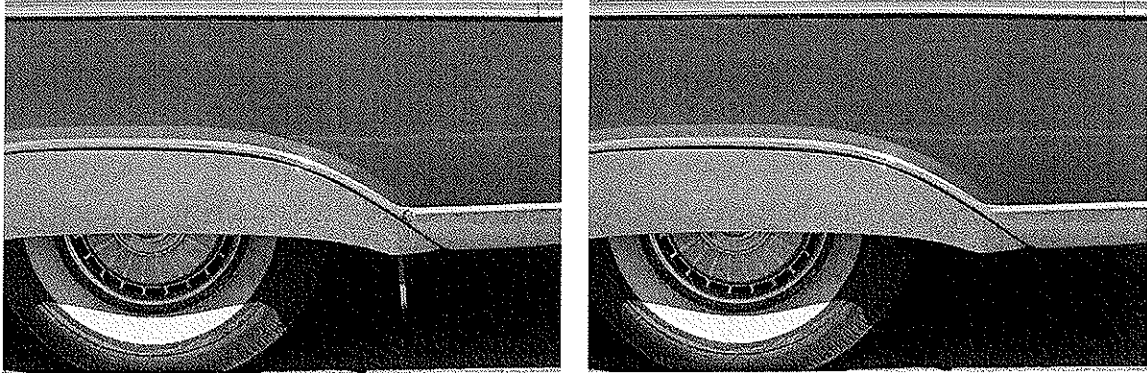
Alternatively, you can use the Patch tool's Source option. When you choose this option, the area you select will be covered with image data from the area that you drag the selection border over. When you drag the dashed selection border into position, and release the left mouse button, the area where you originally made the selection will be filled in and blended with the region that the selection border has been moved to.

If you are using the Source option, your mouse pointer will look like a small patch with a curved arrow pointing into it. If you use the Destination option, your mouse pointer will look like a small patch with an arrow pointing out of it.

A final option is to patch using a pattern. Select the area you want to patch, click the Patch tool, select the pattern from the Options bar, click Use Pattern, and then drag over the area to patch.
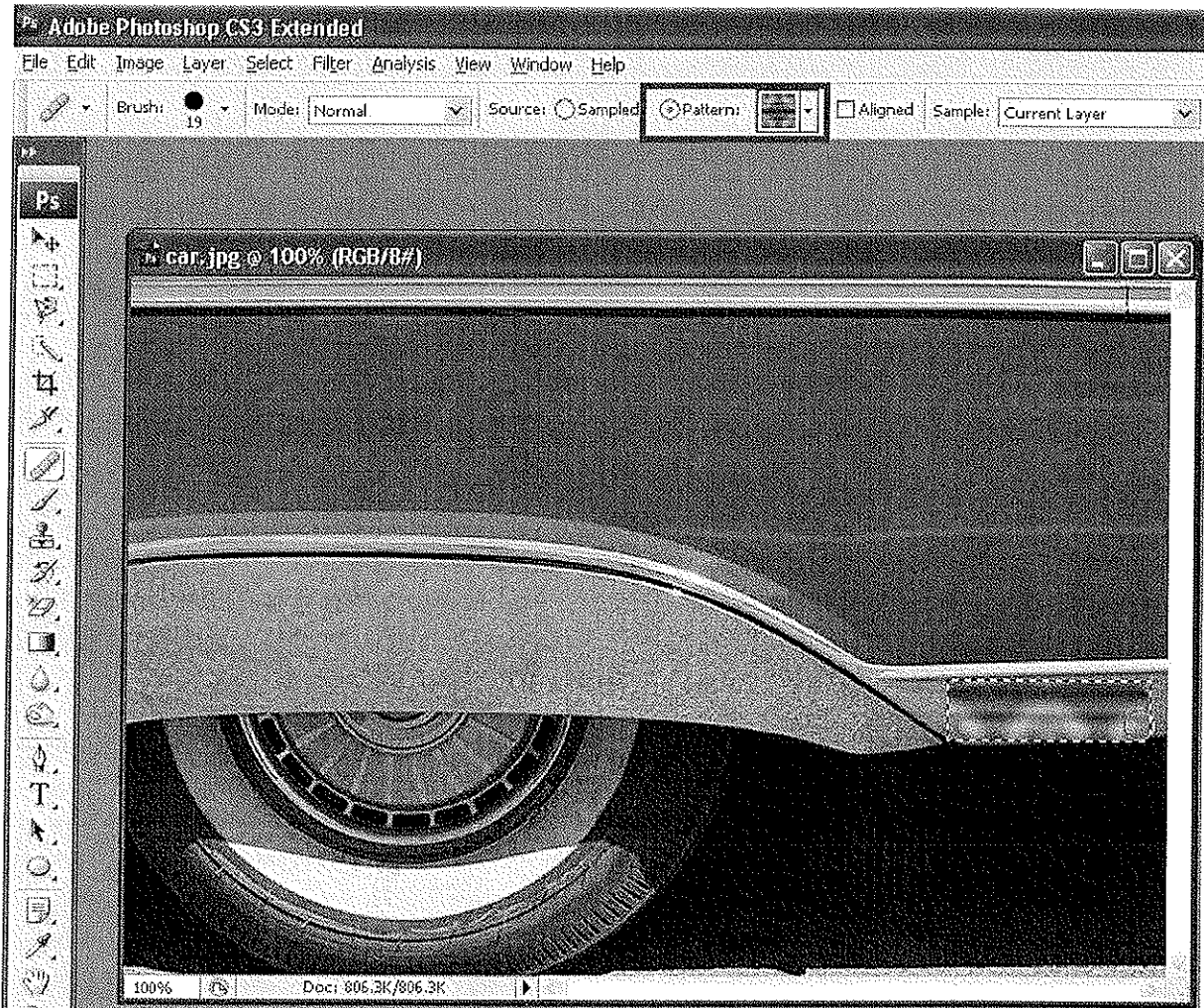
Here we have chosen a pattern that does not match the car for illustration purposes.

The Clone Stamp

The Clone Stamp tool is a lot like the Healing Brush tool, except that the Clone Stamp does not automatically try to heal or blend the sampled image data into its new surroundings. The clone stamp is great for removing small blemishes or unwanted objects from your image. The quality of your cloning is dependent on your sample, so select it carefully.
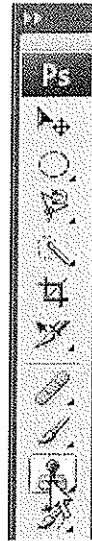
As with the Healing Brush, you can press the Alt key and click on an area of your image to sample it. A set of cross hairs will appear over the spot that you sample. The pixels from the spot you sample will be painted (cloned) on to the image as you drag your mouse pointer over it. Each time you click your mouse, the cross hairs indicate the source of the cloned pixels. You can also simply click your mouse on the image to deposit the image data onto a single spot the size of your brush.

In this image, the Clone Stamp has been used to remove the letters from the pink heart (beside the yellow one).
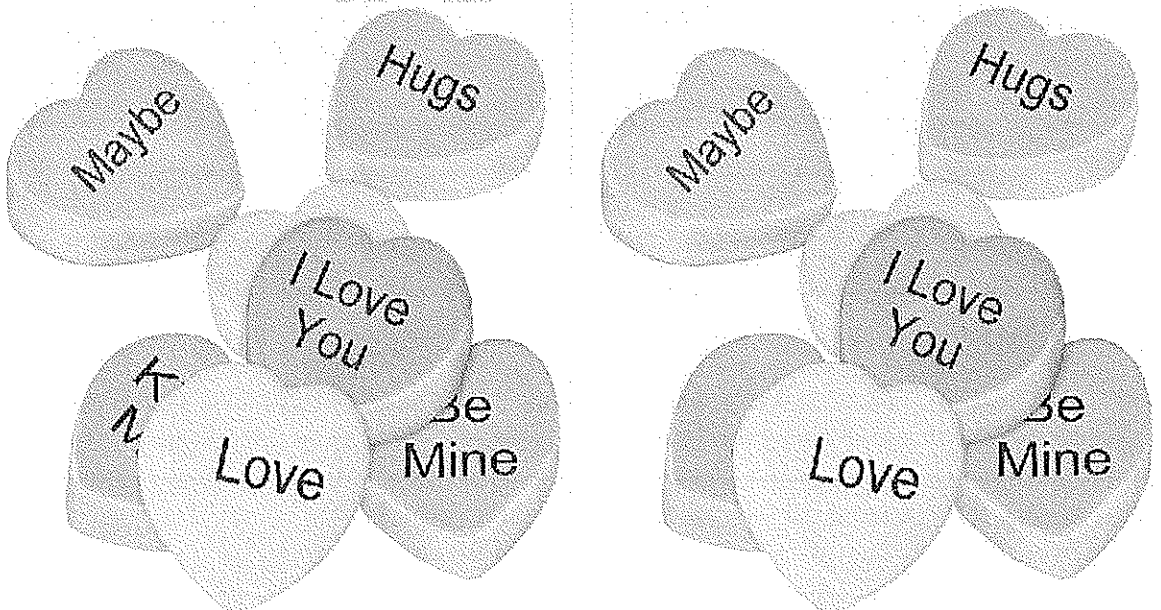
When you select the Clone Stamp tool, its configuration options will be available in the Options bar as shown.

You can change the brush qualities (such as size and hardness) with the Brush options and you can specify how the color is blended with the options available in the Mode drop list. You can use the Opacity slider to adjust the transparency of the data you are cloning. If the setting is close to 100, the data will be opaque. If the setting is close to 0, the data will be almost transparent.

You will also notice an Aligned checkbox at the left of the Options bar. This checkbox is critical to how the Clone Stamp tool works because it determines the source pixels. If you don't select Aligned, the source sample is always the one you originally Alt-clicked on. No matter where else you click in the image, it always stamps it with the same pixels.

If you select Aligned, the source pixels change as you move your mouse. When you first select your sample by Alt-clicking, and then use the clone stamp, you determine the relative distance between the sample and destination. From that point on, every time you move your mouse and click or drag to use the Clone Stamp, the source changes. It moves along with you and you can tell where the source is by the cross-hairs. Since your source is always changing, this is a good way to actually clone an element of your image.

In this example, the Clone Stamp has been used to create a second planet – you can see the source and destination. By Alt-clicking anywhere in the planet to start your source, and having the Aligned check box selected, you can simply drag to add another planet.

You can use the Options bar to choose whether your sample should include only the current layer, the current layer and all layers below, or all layers. If you want to ignore the adjustment layers when sampling, click the button to the right of the Sample list.

As with the Healing Brush, you can use the selection tools to create a border to confine your paint strokes. If you need to clone from more than one sample, you can use the Clone Source palette. This palette adds functionality to Clone Stamping, notably the ability to store up to five different sources for stamping. You can set up your sources, and then keep the palette close by and select whichever sample you need. To display the Clone Source palette, select Window – Clone Source. When you click one of the five source icons across the top, it either displays the source information, or is empty and therefore available to store the next sample.

Store up to five sources for easy access
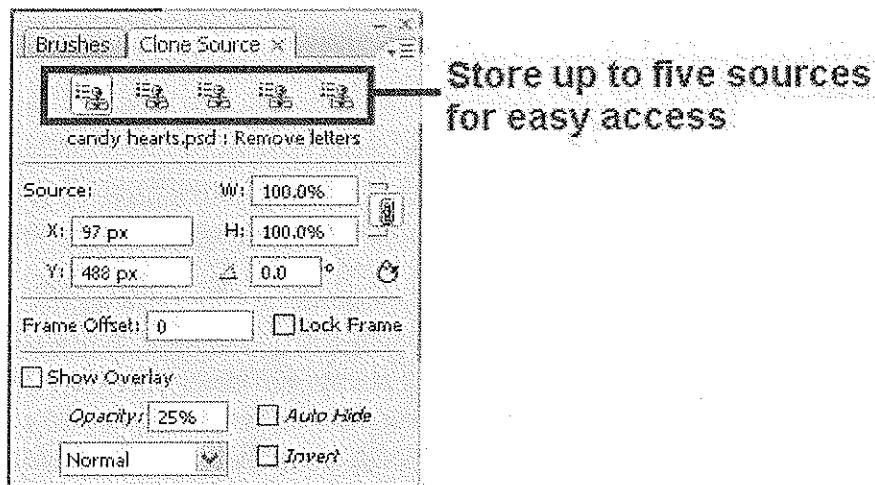
The Pattern Stamp Tool

The Pattern Stamp is not really a retouch tool in a strict sense, as it is used to apply graphic patterns to an image with painting strokes (not usually appropriate for retouching digital photos). It can be extremely useful for certain special effects, however, and because of its grouping with the Clone Stamp tool, it will be covered here.
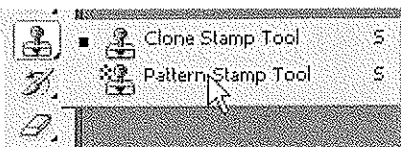
To use the Pattern Stamp, first select it from the Photoshop toolbox. When you select it, its options will be displayed the in the Options bar.
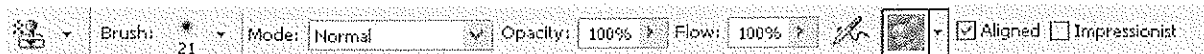
You have already seen most of these options in the tools we have looked at. You choose your sample from the pattern list, shown below. Also, the Impressionist checkbox gives the pattern an impressionist look by painting smudged dabs rather than a solid pattern.
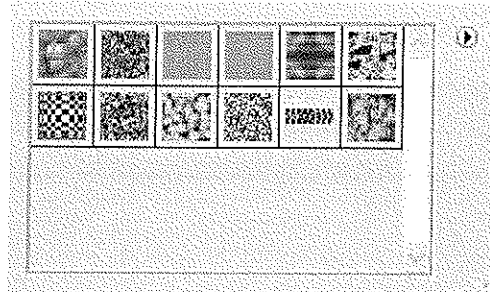
You can choose a pattern from this palette by clicking on it, and it will then be displayed in the Pattern preview box in the Options bar. If you drag your mouse pointer over an image, the selected pattern will be painted along with your stroke.

If you want to paint with a pattern from an image, you can create a custom pattern. First, select the pattern using any selection tool, and then from the Edit menu, choose Define Pattern, and in the Pattern Name dialogue box, enter a name. This pattern will be appended to the pattern list on the Options bar.
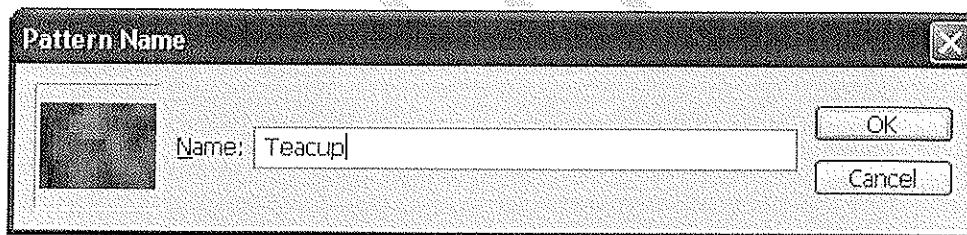
As with most painting or stamp tools, you can make a selection or inverse selection with one of the selection tools, and then paint inside the selection. Your paint strokes will be confined to the selected area.

In the image below, several things have been done. First, a custom pattern was created from a different image (the teacup we have seen previously). Then, a selection was made by using the Quick Selection tool to select the cup, and then inverting the selection. This ensures the cup and foam are not accidentally covered with the stamp. Finally, the Clone Stamp tool was applied with a large brush to produce the final result.
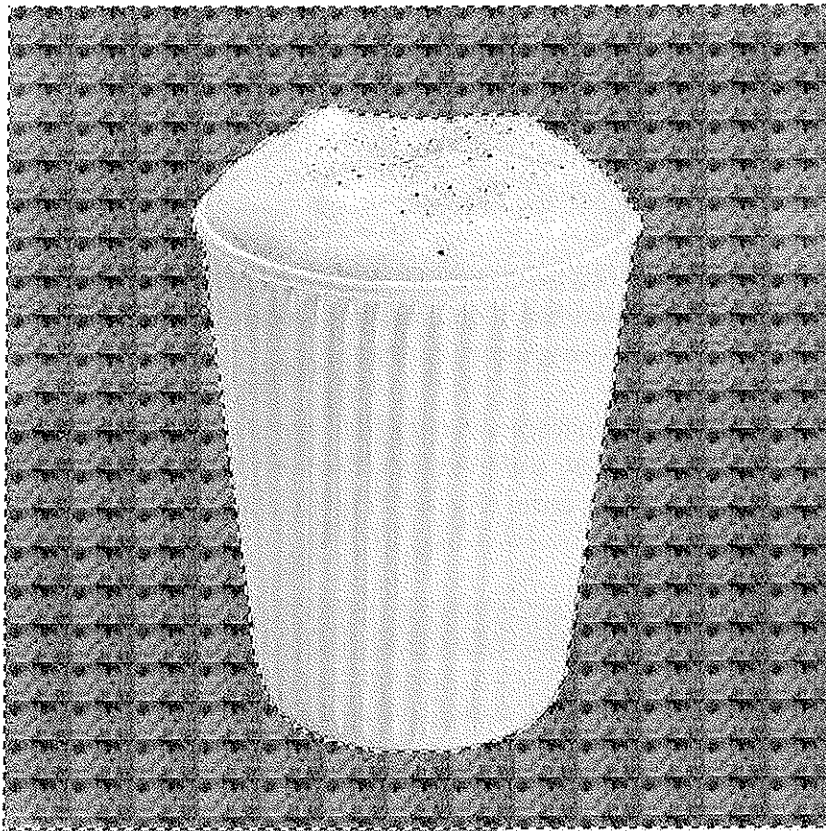
Section 2: Review Questions

1.   **The purpose of the Blur tool is...**
   A.   To soften edges in an image
   B.   To harden edges in an image
   C.   To smudge selected regions
   D.   Any of the above

2.   **In Photoshop, the Sharpen tool is grouped with...**
   A.   The Dodge and Sponge tool
   B.   The Burn tool and Gradient tool
   C.   The Blur tool and Smudge tool
   D.   The Pattern Stamp tool and Clone Stamp tool

3.   **What is the purpose of the Sponge tool?**
   A.   To saturate color
   B.   To fade color
   C.   To decrease contrast
   D.   A and B

4.   **Saturation is a word that describes the...**
   A.   Wetness of a color
   B.   Darkness of a color
   C.   Vividness of a color
   D.   None of the above

5.   **You can adjust the shadows and highlights in an image by using which menu command?**
   A.   Image – Adjustments – Shadow/Highlight
   B.   Edit – Shadows/Highlights
   C.   Image – Mode – Darken/Lighten
   D.   None of the above

6.   **Which of the following is not a retouch tool?**
   A.   The Dodge tool
   B.   The Move tool
   C.   The Clone Stamp
   D.   The Patch tool

7. The Healing Brush is very similar to the ...
  A. Clone Stamp tool
  B. Sponge tool
  C. Zoom tool
  D. There is no such thing as the Healing Brush tool

8. The Pattern Stamp tool is grouped with...
  A. The Patch tool
  B. The Blur tool and Sponge tool
  C. The Clone Stamp tool
  D. None of the above
  E. All of the above

9. Brightness and contrast affect the...
  A. Tonality of your image
  B. Hue of your image
  C. Saturation of your image
  D. None of the above

10. What is retouching?
  A. Correcting light and shade in an image
  B. Adjusting color saturation in an image
  C. Removing imperfections and blemishes from an image
  D. All of the above

Section 3: Getting Creative

In this section you will learn how to:
- Use the Paint Bucket
- Use the Paint Brush
- Work with custom brushes
- Use the Airbrush
- Use the Pencil tool
- Work with horizontal and vertical type
- Perform a spell check
- Use the Character palette
- Work with lines and shapes
- Use pens
- Create and manipulate paths
- Use and undo rasterization
- Flatten the image

Lesson 3.1: Working with Brushes

You already know that several Photoshop tools can be applied with brush strokes. Tools like the Healing Brush and the Clone Stamp, and the Dodge, Burn, and Sponge tools, are all applied with the tip of a digital brush. What you may not have seen is the variety of options Photoshop provides when it comes to brushes and painting.

In this lesson, you will become familiar with the Paint Bucket (fill tool), the standard Brush tool, and the Pencil tool. You will also learn how to use the Airbrush feature and how to work with custom brushes.

As you have seen, there are a multitude of Photoshop effects and features that can be applied with brushes. If you learn how to get more control over your brushes, you will also be learning how to get more control over these effects and features.

Using the Paint Bucket

The Paint Bucket, also known as the Fill tool, is used to fill a canvas, a layer, or a selected area with color by clicking in it. It will replace all pixels that are the same or close to the pixels that you click on, based on a tolerance that you can specify.
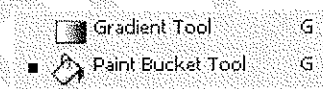
The Paint Bucket is grouped with the Gradient tool, but it is used to apply an even coat of color, where the Gradient tool is used to apply a geometrically changing color effect (a gradient). When you select the Paint Bucket, the Options bar changes to reflect the relevant options:
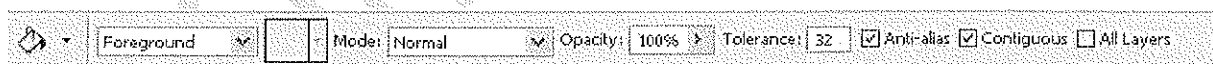
Before you can paint, you need to decide what you will be painting with. If you are painting with a color, make sure Foreground is chosen on the Options bar, and set the foreground color to the color you want. To paint with a pattern, choose Pattern instead of Foreground. Set your Mode and Opacity, and then click the color you want to replace with the new color. If you want all of the color in the whole image to be replaced, make sure that you have Contiguous deselected on the Options bar. If you want to color all layers, select the All Layers check box. Set the tolerance to determine how wide a range of color will be replaced (the higher the tolerance setting, the more pixels will be recolored).

Once you have the Paint Bucket set up, click in the image to paint it. One click might not be enough to recolor everything you need; sometimes you will need to click in several locations.

Remember that you can use the History palette or Undo to step back, tweak your settings, and try again until you get it right.

Here is a before and after look at the sunflower image with the background darkened to a navy blue:

Using the Brush

Using the Brush tool is an important part of working with Photoshop. First of all, a variety of Photoshop tools are applied with brush strokes, and learning to manipulate your brushes will help you to manipulate these other tools. Secondly, learning how to manipulate your brushes will give you more power and flexibility when it comes to actual painting or adding color to your Photoshop images and creations.

First, select the Brush tool from the toolbox.

You will then see its configuration options appear in the Options bar.

Choose a brush preset, or manually set the options for your brush, and then click and drag over your image. The brush preset picker contains the settings for the size and hardness of your brush – the softer the brush (the lower the percentage), the more diffuse the edge of your stroke will be.
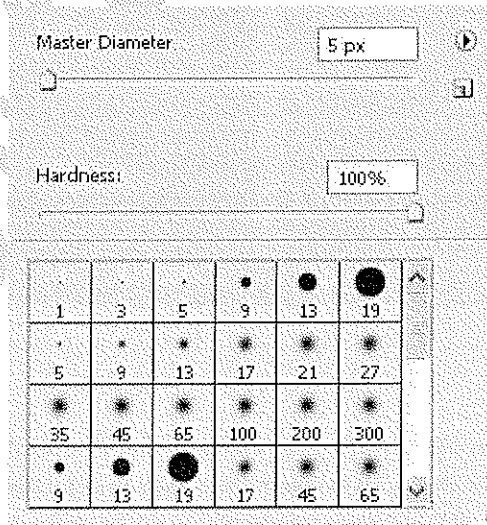
The brush paints with the current foreground color, so make sure you have set it to your desired color. To get a perfectly straight line with your brush, click on your image canvas at the start point of your stroke, and then Shift + click at the point where you want your stroke to end. The stroke will be painted in a straight line from point to point.

As an example, take a look at the following Photoshop canvas with varying brush strokes:
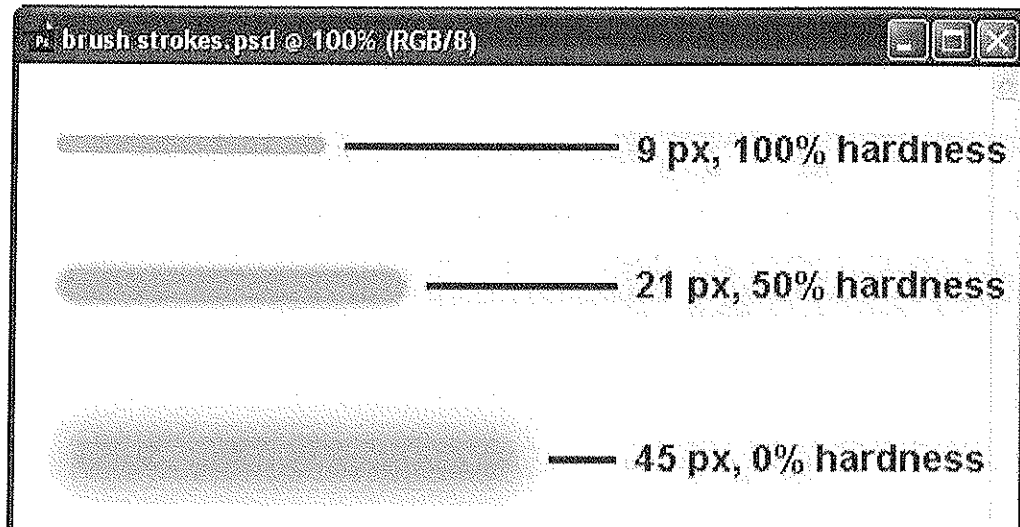
Brushes can be further varied by changing the painting mode. For example, here is a brush stroke painted with the Dissolve mode:
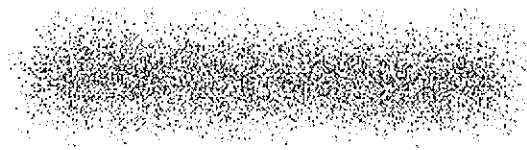
Experimentation is the best way to see the range of brush choices you have, and to determine what will best meet the needs of a given situation.

Working with Custom Brushes

If you can't get the brush you want by working with the presets and options, you can use part of an image to create a brush from scratch. This means you have an endless variety to the brushes you can create.

For example, we can create a brush based on the bubbles in the fish picture, and by working with the Brushes palette, can create a brush that paints bubbles onto the image.

Selection used to create bubble brush tip
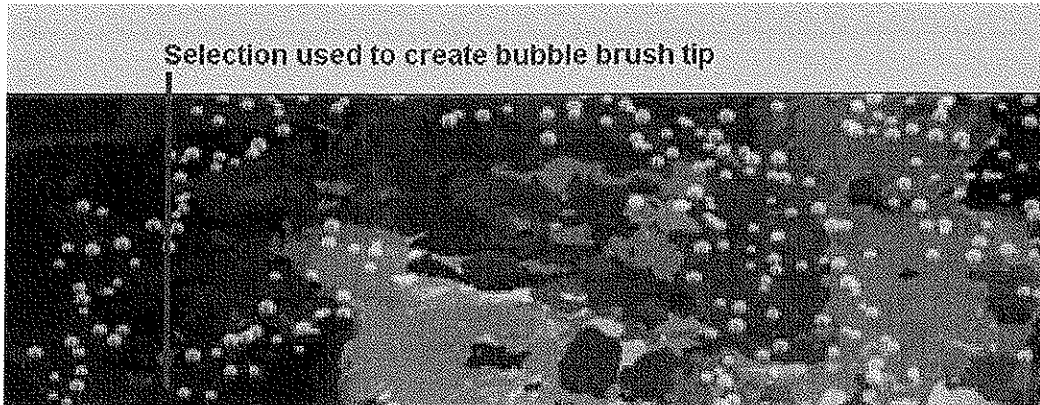
To accomplish this, simply select the part of the image that you want as your brush, and then from the Edit menu, select Define Brush Preset. In the Brush Name dialogue box (shown below) name the brush and click OK.
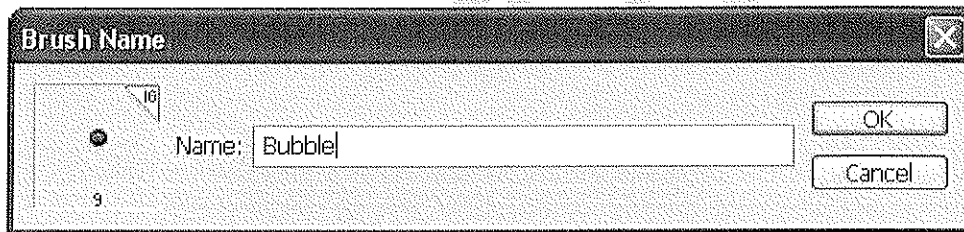
Then, use the Brushes palette to modify the brush as you wish. (You can turn the Brushes palette on by clicking the icon at the right side of the Options bar, or by selecting Brushes from the Window menu.)
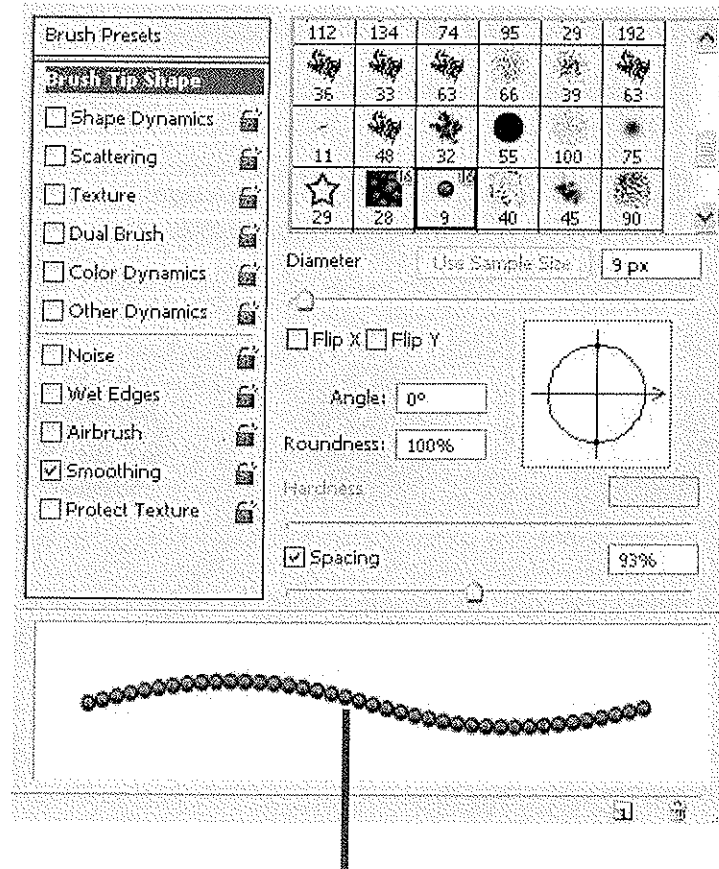
**Based on a bubble
from the fish image**

The brush will be available to all images, not just the source image.

Using the Airbrush

The Airbrush will apply gradual tones, appearing as a softer stroke that can appear faded or dark depending on how long you hold your mouse button down over the canvas. A quick stroke can have a different effect than a slow steady stroke. This color intensity of the stroke can be controlled with the Flow slider.

To start using the Airbrush, click the Brush icon in the toolbox. Then, click the icon next to the Flow slider on the Brushes Options bar.

Toggles Airbrush

A single click with the flow set low will apply a faded dot. A single click with the flow set high will apply a strongly colored dot. As you hold your mouse button down, the color will gradually intensify depending on the flow setting.
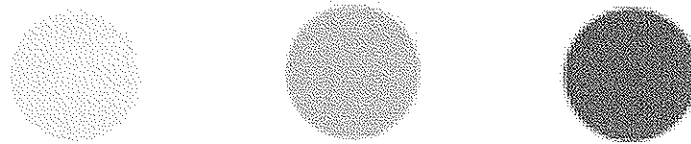
Above are three dots, each created from a single click with a brush set at 30 pixels wide and 100% hardness. For the first dot, the flow was set at 10%, for the second the flow was set at 50%, and for the third and final dot, the flow was set at 100%.

Airbrushes can be used effectively to apply light and shadow to an image, often through a mask, as discussed in Lesson 4.1.

Using the Pencil Tool

The Pencil tool is grouped with the Brush tool in the Photoshop toolbox.
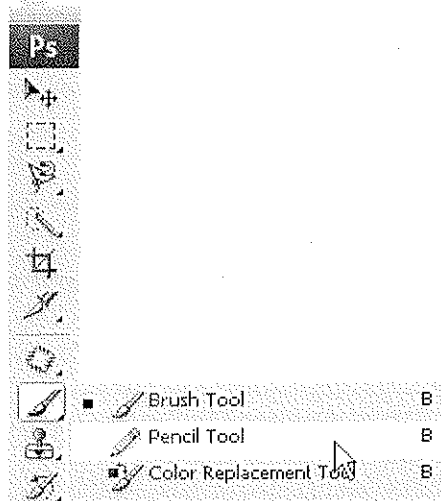
The Options bar for the Pencil tool is very similar to that of the brush:
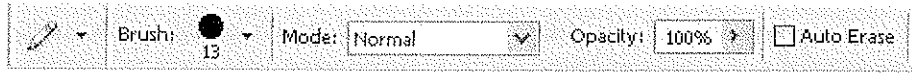
Note that there is no airbrush option for the pencil, as the pencil is intended to produce hard lines. There is, however, an Auto Erase option. If this is selected, you can paint with either the foreground or the background color. If the cursor is over an area containing the foreground color when you begin dragging, the pencil paints with the background color. If the cursor is over any other color, the pencil behaves normally, and paints with the foreground color.

The Pencil tool operates in a way that is almost identical to the Brush tool, except that the Pencil tool gives you harder and crisper edges. To use the Pencil tool you normally select the foreground color that you want to draw with, and then specify your pencil diameter and hardness in the exact same way as would with the Brush tool.

As with the Brush tool, there are settings for blend mode and opacity available in the Options bar.

Lesson 3.2: Using Type Tools

Although Photoshop is designed primarily for bitmap image processing, it contains a very comprehensive and functional set of type tools. You can use these tools to add titles or headings to your images, or to create your own text-based graphics from scratch.

In this lesson you will learn how to work with horizontal type and vertical type. You will learn how to modify your typed characters, and you will learn how to work with the Character palette.

Working with Horizontal Type

Horizontal type runs from left to right across your image. The Horizontal Type tool is grouped with the other type tools.
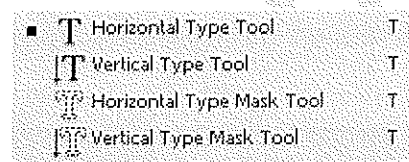
As always, once you choose the Horizontal Type tool, the Options bar displays the relevant choices.
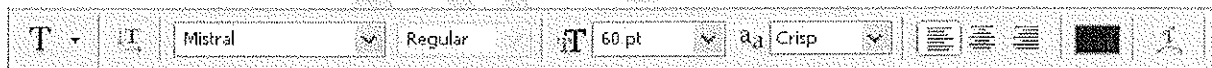
The Options bar for text is different from the tools we have seen thus far, and includes:

The Tool preset picker gives you access to customized type tools that you have created.

Changes the orientation of your type from horizontal to vertical or vice versa.

Choose the font family from a long list of fonts included in Photoshop.

Some fonts have styles associated with them, such as a bold version. If this is the case, they are available on this list.

Changes the type size. Use the list to select the size, type the size directly in the box, or click and drag over the two Ts at the left. (Dragging to the right increases the size; dragging to the left decreases it.)

[icon]	Sets the anti-aliasing for the text. Options range from None to Smooth. If you apply anti-aliasing, Photoshop smoothes the edges of the text out.
[icon]	Choose from Left, Center, or Right alignment for your text.
[icon]	Set the color of the text. The text color is independent of your foreground color.
[icon]	Warps your text according to a number of set warp styles.

At the end of the Options bar are three more buttons:

As you are adding text, you need to commit to it (by clicking the check mark) to finish the entry, or cancel it (by clicking the circle with a line through it) if you don't want to keep it. The last button opens the Character and Paragraph palettes.

When you add type to an image, a new layer is created for the type. The exception to this is if you are working in a file format that doesn't support layers, such as Multichannel, Bitmap, or Indexed Color mode. In this case, the type appears on the background and is rasterized. (Rasterization is covered later in this section, in Lesson 3.4.)

You can enter type using two different techniques. Each has ramifications for appearance and editing. If you are just adding a few words, all on one or two lines, use point text. To add point text, select the Horizontal Type tool, set your options, and then click where you want to start typing. The text appears in one long row: if you want to start a new line, you must press Enter.

The text in this image was entered as point text:

If you plan on typing a paragraph, use paragraph text. Select the Horizontal Type tool, set your options, and then drag your mouse pointer to create a rectangle on the image. When you type, the text will be confined inside this rectangle. If you type past the boundary of the rectangle, the type will wrap to the next line within the rectangle.

You can modify the justification, alignment, and indentation of your paragraph with the Paragraph palette. (When you select a type tool, a button will appear in the far right of the Options bar that will allow you to toggle the Character and Paragraph palettes on and off the screen.) The empty text box looks like this:
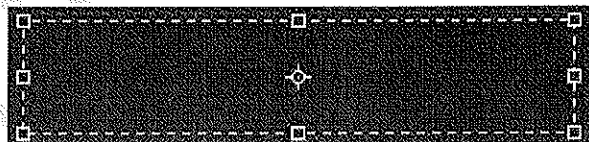
If all of the text doesn't fit in the text box, the bottom right handle changes to have a t in it. This lets you know that you need to resize the text or the bounding box. To resize the bounding box, click and drag one of the handles. Hold the Shift key down while you drag if you want to maintain the proportions of the box.

Here is a bounding box that cannot display all of the text:
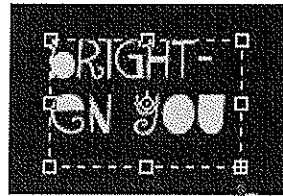
Text overflow indicator

A second type of Horizontal Type tool is the Horizontal Type Mask tool. You use this in much the same way as the regular Horizontal Type tool. The difference is that the letters that you type will create a selection. (The outline of the letters will be the dashed selection border). You can use this selection just like any other type of selection: apply transformations, copy the selection, make an inverse selection, etc. Masks are covered more thoroughly in Lesson 4.1.

It is also important to note that the type mask will not be created on its own layer as with the regular type tools. It is best to avoid using the type mask on a layer created for regular type. This is because the regular type on the layer will have to be rasterized (converted from a vector graphic to a bitmap image) before you can perform certain actions with the selection you create with the type mask. When the regular type is rasterized, you cannot go back and edit it as type (i.e. change the font, change the size, delete letters) because it has been converted to a bitmap image.

Working with Vertical Type

The rules for the Vertical Type tool are pretty much the same as for the Horizontal Type tool, with the important difference that the type will be added to the image canvas vertically (up and down) rather than across (left to right).

You can still create paragraphs by selecting the Vertical Type tool and dragging out a paragraph boundary before you type. When you click inside the boundary and begin to type, the vertical text will be confined within the specific rectangle you made. You can also add vertical text to an image without using a paragraph box.

Just as before, the regular vertical type will be placed on its own layer above the image background. If you use the Vertical Type Mask, a selection will be created from the outline of the letters you type. As before, this selection will not be on its own layer.

When you select the Vertical Type tool, you can use any of the options in the Options bar or character palette to format or adjust the vertical type, the same way that you would adjust the horizontal type. There is also the Vertical Type Mask tool.

Here is an example of some vertical type.

Whether you confine your vertical type to a paragraph box, or type it freely, the text will wrap left to create a new vertical line. When adding text without a paragraph box, you must press the Enter key to create a new line. Remember, you can toggle your type between vertical and horizontal by clicking the Text Orientation button in the Options bar.

Modifying Type

When you add type to an image, there are a lot of modifications that you can make to it. You can perform all of the standard changes, like setting a new font size or changing the font itself, in pretty much the same way as you would with a word processor. The Options bar and the Character palette are both instruments of change for your type. You can apply the changes globally, by selecting the layer, or selectively, by selecting only the text that you want to modify.

United

Once you have made the changes to your type, you can accept them by clicking the Commit button on the Options bar, or reject them by clicking the Cancel button.

In addition to the basic formatting, you can warp your text and use layer styles and options to enhance your text. You can also perform any transformation on text as well – rotating, skewing and so forth.

When you click the Warp tool on the Options bar, the Warp dialogue box appears. First, choose a style from the drop down menu, and then fine tune the settings.

Warp Text

Style: Arc Lower

OK
Reset

○ Horizontal ⊙ Vertical

Bend: +50 %

Horizontal Distortion: 0 %

Vertical Distortion: 0 %
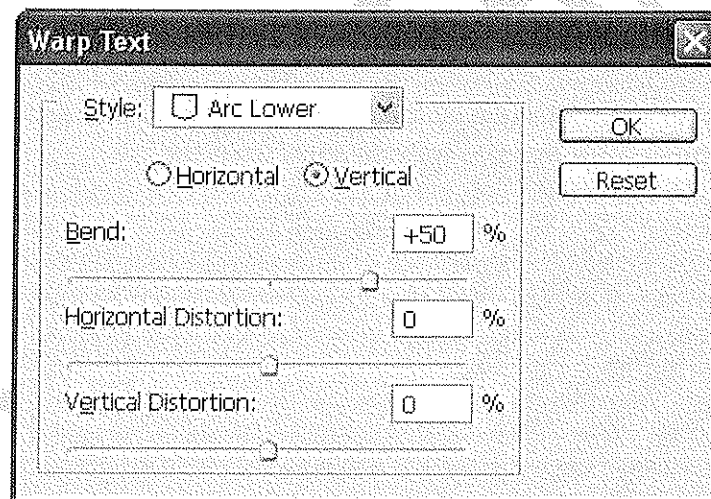
There are a number of styles that you can use to warp your text, as shown here:
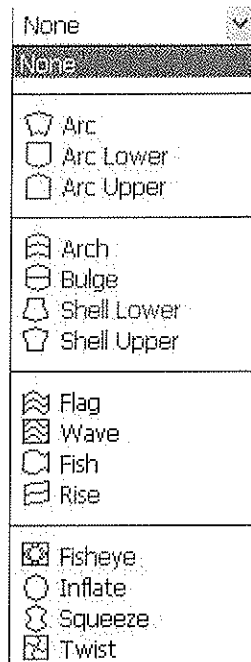
You can warp vertical or horizontal text by selecting the text layer that you want to modify, and then selecting the type of warp that you want to apply from the list.

The following illustration shows a few examples of the Warp effect on some simple text.

Hello

Hello

Hello

Hello

H
e
l
l
o

When you apply a warp effect, it is applied to the text layer that is currently active (remember, a text layer is created when you use the Horizontal or Vertical Type tool). This means that your entire sentence or paragraph (or whatever text is on the layer) will be warped. If you want to warp only select words, or use different warping styles for different words, you can do this by carefully creating individual layers for the different text and warping combinations.

Type that is warped can be edited in the usual way, and the warp effect will be automatically applied to the editing changes.

Layer styles can also be used to enhance text; you can use them to add shadows, bevels, and other special effects. To use a layer style, select the text layer, and then from the Layer menu choose Layer Style, or click the Add a Layer Style tool at the bottom of the Layers palette. (Layer Styles were covered more thoroughly in Lesson 1.4.)
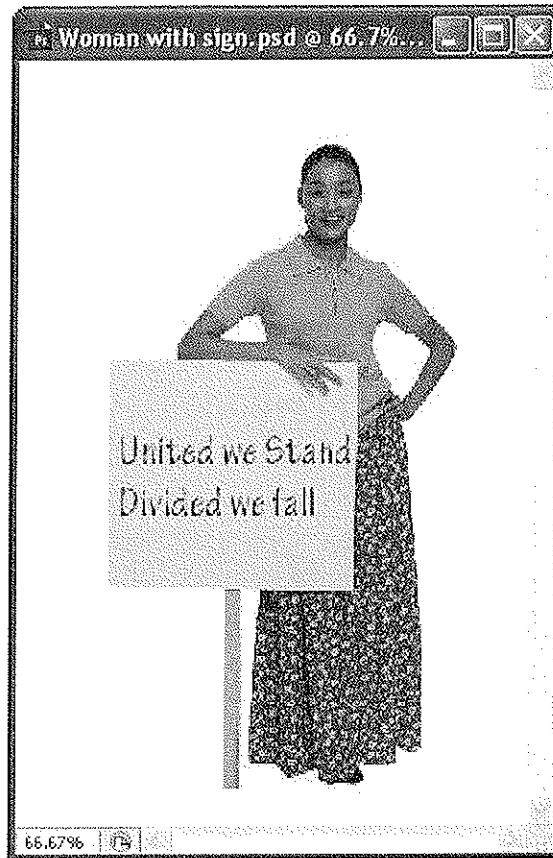
The type on the above image has the layer styles shown in the dialogue box below:
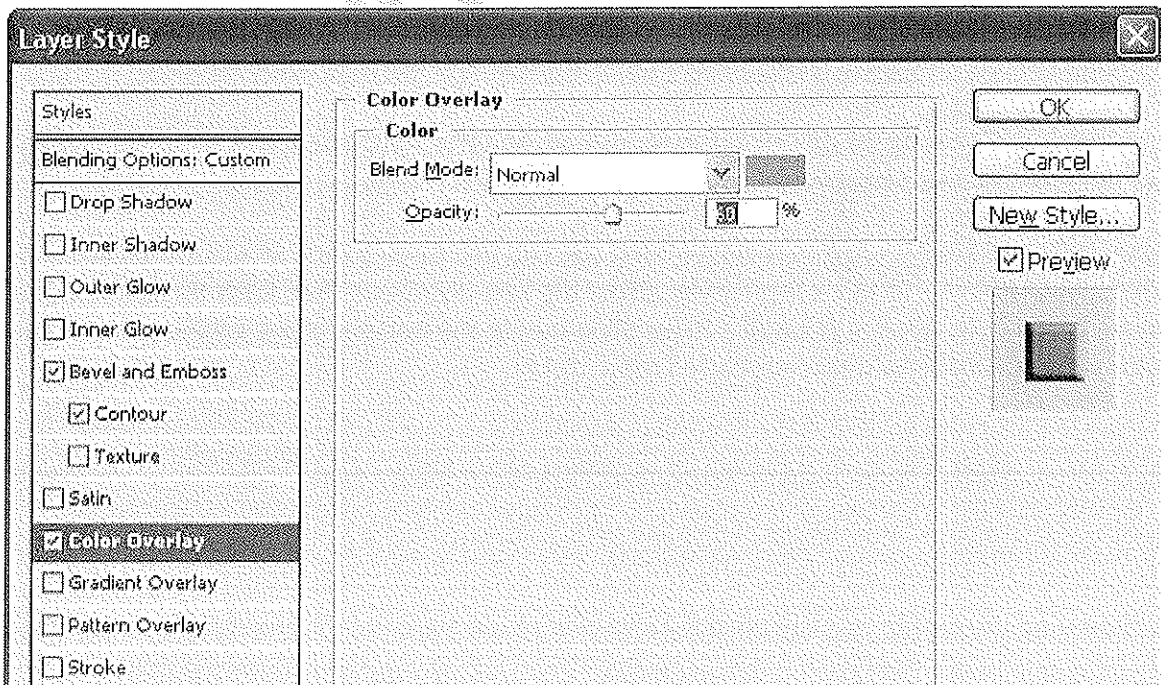
Performing a Spell Check

Whenever you are using more than a few words of text, it is always a good idea to spell check your work. Photoshop checks all layers that aren't locked or hidden. If you just want to check a particular word, click in the word before starting the spell checker.

To check the spelling in your image, choose Check Spelling from the Edit menu. The spell checker uses the language set on the Character palette. For each error, Photoshop offers replacement suggestions. Click the correct spelling, and then click Change. If you want to change all instances of the incorrect spelling, click Change All. To ignore the error, just click Ignore (or Ignore All for multiple instances).
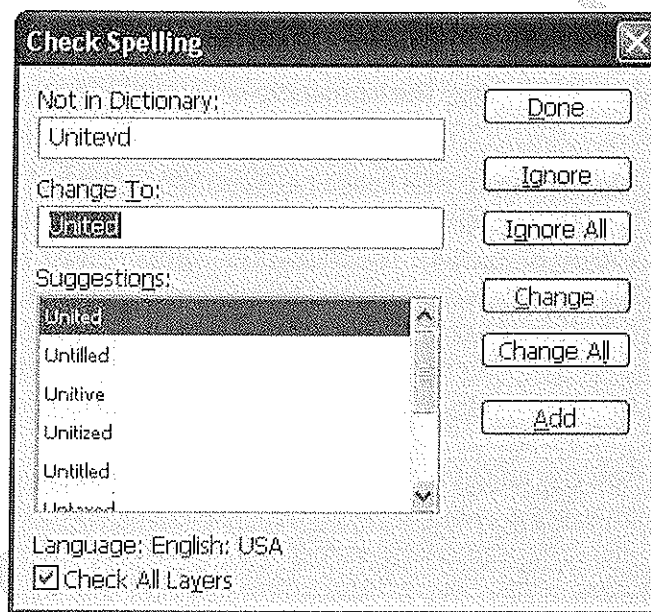
Working with the Character Palette

Photoshop is not a word processor: it's an image editing application. In order to maximize the control you have over your text, you can use the Character palette. Using the palette, you can decide exactly how you want your type to appear with far more control than a word processor gives you.
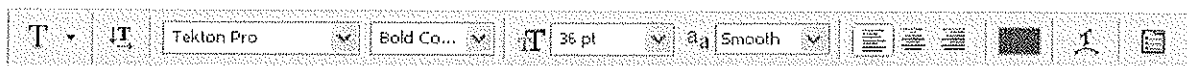
Toggle Character and Paragraph palettes

To view the Character palette, click the Toggle Character and Paragraph palettes button on the Type tool Options bar, or choose Character from the Window menu.
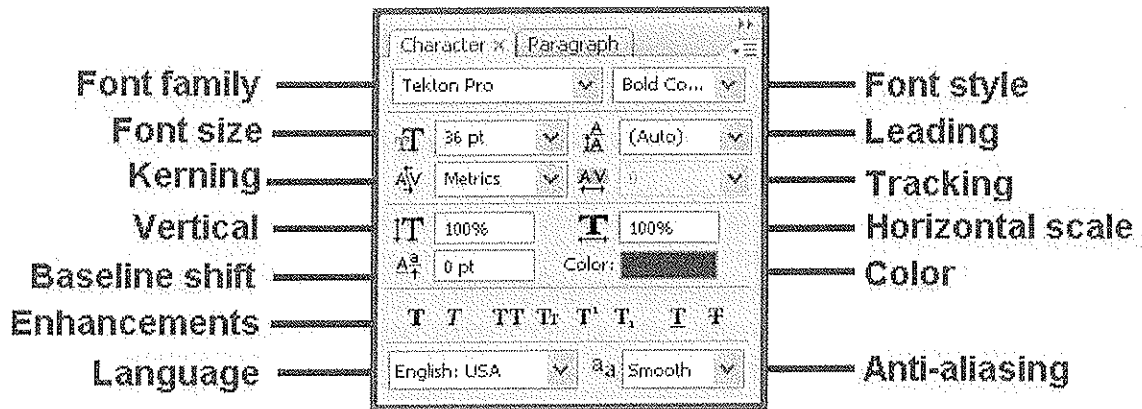
Several of the settings on the palette are also available on the Options bar: the font family, font style, font size, color, and anti-aliasing. The remaining settings are discussed in the table below.

Kerning	Sets the horizontal space between the individual letters or characters. Usually this will be set to Metrics or Optics, the two choices at the top of the list of options. The Metrics or Optics setting will use the default kerning that was designed for the particular font. If you want to change the default kerning, you can do so by clicking in between the letters of your text, and then entering a value into the field, or by selecting a value from the list.
Vertical scaling	You can adjust the vertical scaling of the text by selecting it and then entering a value in the vertical scale field. The size of the text will increase or decrease vertically only, not horizontally.
Baseline shift	Moves the letters up or down relative to the rest of the type. A negative number moves the selected text below the baseline; a positive number moves it above.
Enhancements	Includes buttons for creating subscripts, superscripts, underlines, strikethroughs, faux bold, faux italics, and to make your text small capitals or all capitals. (Faux bold and faux italics can be used to apply bold or italics styles to type fonts that do not support bold or italic characters.) If you let your mouse pointer hover over each T icon, a brief description of its function will appear in a comment box.
Language	Sets the dictionary for the type. Used for checking the spelling and hyphenation.

Leading   Sets the space between your lines of text. You can set this manually by choosing from the list, or you can choose Auto. If it is set to Auto, the space between lines of text will be adjusted for you every time you start a new line.

Tracking   Tracking is also used to set the space between letters, but not on an individual letter by letter basis like kerning. To adjust the tracking, select the text you want to alter, and choose an option from the drop list, or enter a value directly.

Horizontal scale   You can adjust the horizontal scaling of the text by selecting it, and then entering a value in the horizontal scale field. The size of the text will increase or decrease horizontally only, not vertically.

In addition to the Options bar and Character palette, you can also right click type to access a shortcut menu with the some of the type options.
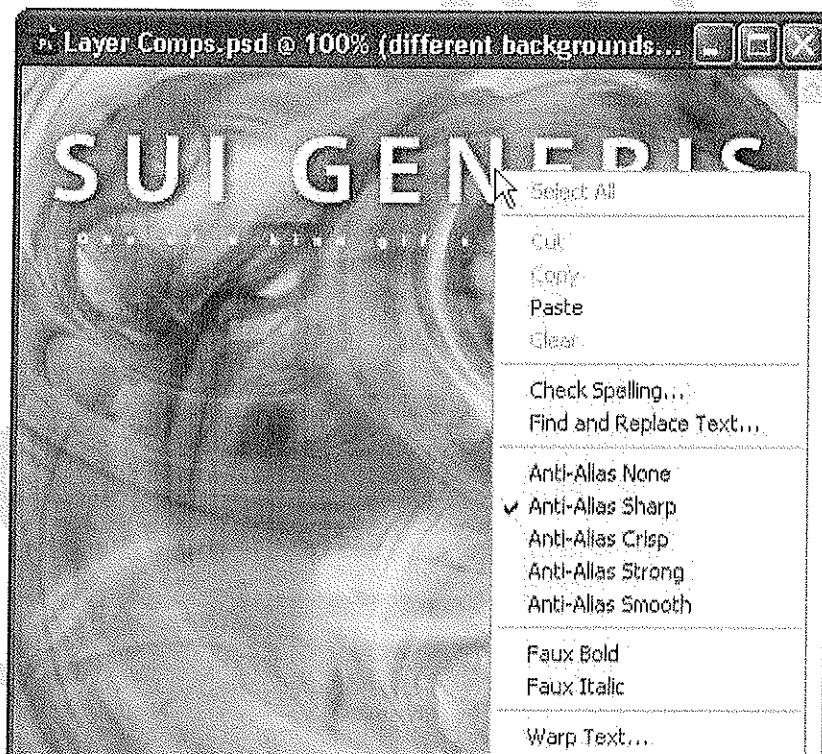
Lesson 3.3: More Photoshop Drawing Tools

Photoshop is very well known for its powerful bitmap image editing capabilities. Although not as well known, Photoshop's drawing and vector graphics tools are also excellent.

Just to review, a bitmap image is composed of an array of pixel values that are mapped to an x, y coordinate system. Vector graphics, on the other hand, are lines, curves, and shapes that are described mathematically. They can be manipulated and scaled easily without a loss in quality because re-sampling is not involved. When a vector graphic is manipulated, the underlying mathematical vectors are adjusted appropriately (so there is no guessing at pixel values when the size is changed).

When it is time for a vector graphic to become a bitmap image, it must be rasterized. This is the process of converting the mathematically described image into an array of mapped pixel values. A vector graphic must be rasterized before you can apply many of Photoshop's editing features to it.

In this lesson you will learn more about the vector graphics tools. You will learn how to use the Shape tools, how to work with custom shapes, how to use the Pen tools, and how to manipulate paths.

Working with Lines and Shapes

To create a simple vector graphic, you can choose from among the Shape tools in the Photoshop toolbox. Here are the Shape tool variants available from the toolbox.

▪ ☐ Rectangle Tool	U
☐ Rounded Rectangle Tool	U
○ Ellipse Tool	U
○ Polygon Tool	U
＼ Line Tool	U
⌐ Custom Shape Tool	U

If you choose any of the Shape tools, the Options bar will provide a panel of buttons to access the other Shape tools.

The options vary slightly depending on the tool you've chosen, but remain essentially the same.

At the far left of the Options bar, the current tool is shown, and you can choose presets for the tool.

Next to this, you can choose what you want to do with your shape. You can do one of three things:
- Create a vector shape layer (a different layer is created for each shape)
- Create a path (paths are discussed later in this lesson)
- Fill in the area with the foreground color (this does not create a vector drawing, but rather colors the actual pixels in)

You can change which drawing tool you are using by clicking it on this section of the bar. This is the same as clicking a tool on the Toolbox.

These options look slightly different depending on whether you are drawing a path or a shape, but they determine what happens when you add another shape to the drawing. You can add to an existing shape, subtract from an existing shape, or even intersect the shapes.

The remaining options vary depending on the shape. You can set colors, styles, end points for lines, number of sides for polygons, and so forth.

To use a Shape tool, choose it from the toolbox, and then drag your mouse pointer over your image or blank canvas to create a shape.

100%   Doc: 531.6K/0 bytes
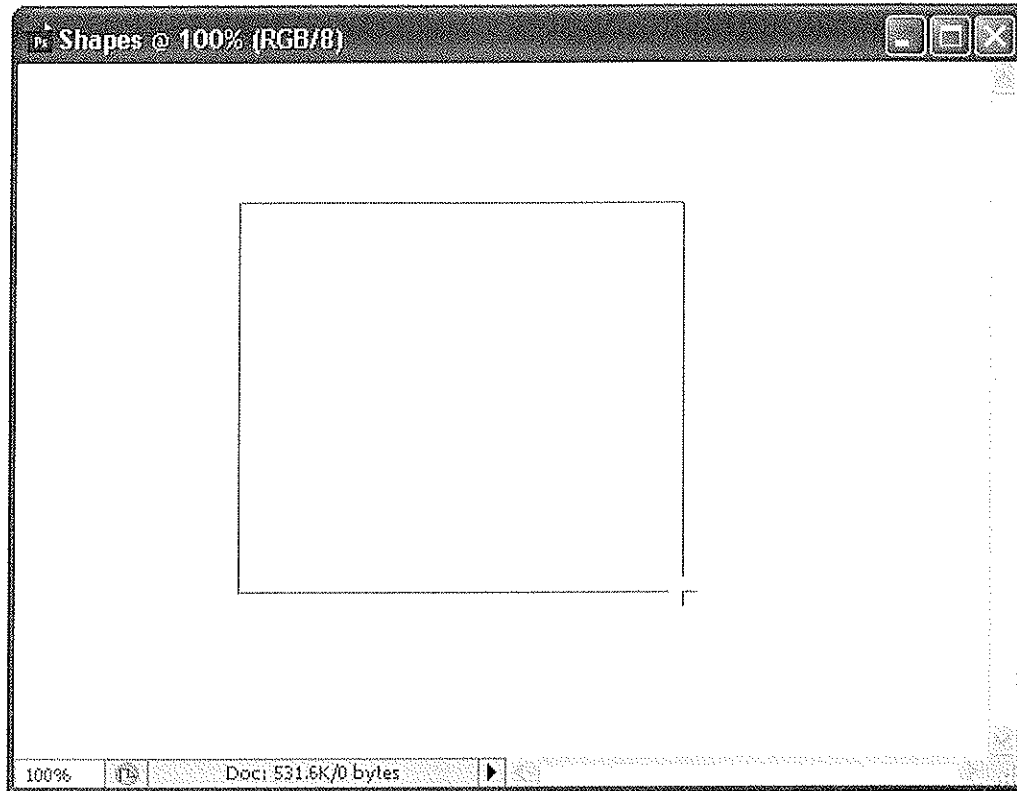
If you have chosen Shape Layer, then a new layer is created when you draw the shape.
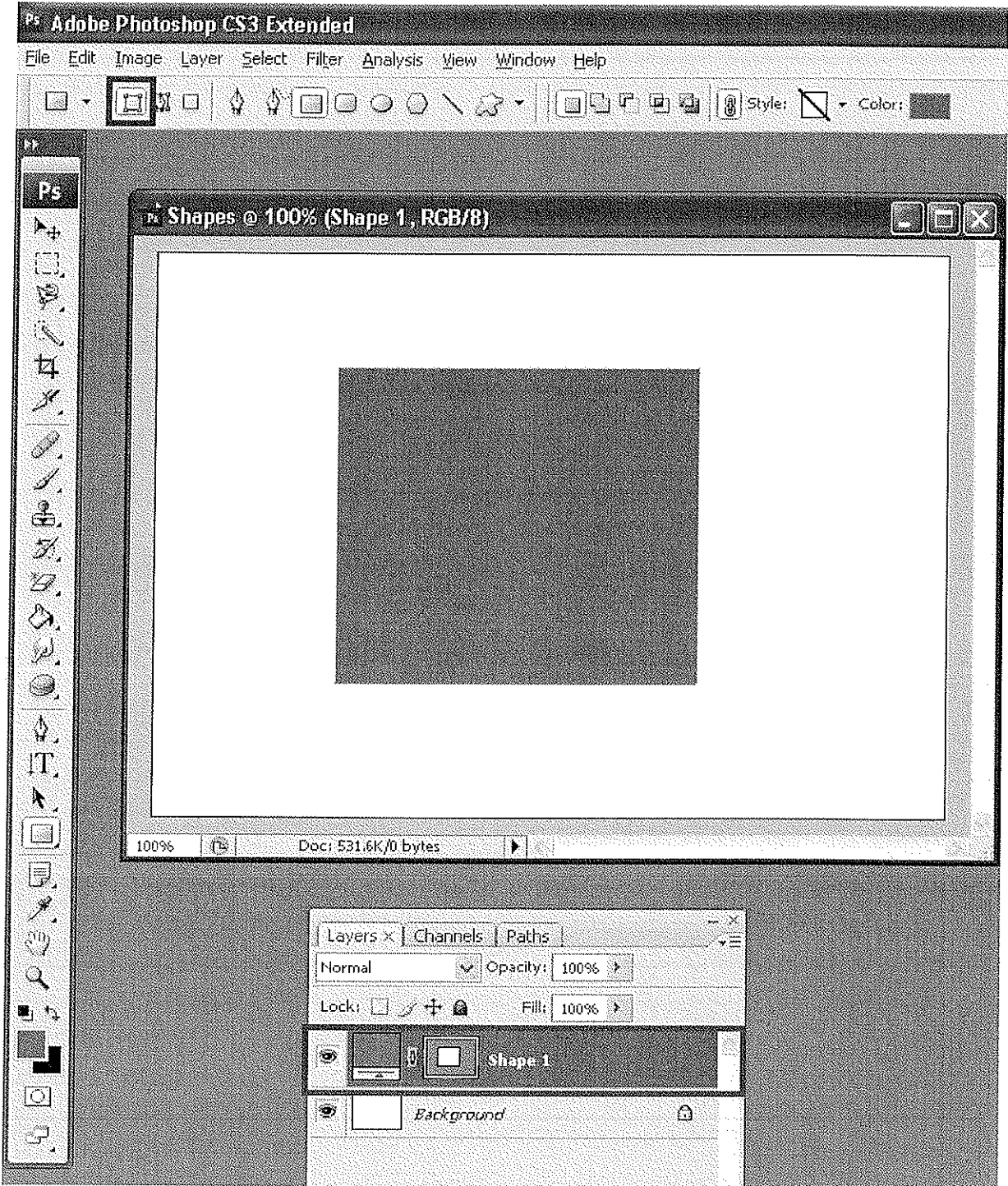
If you have chosen Path, then the shape appears as an outline.
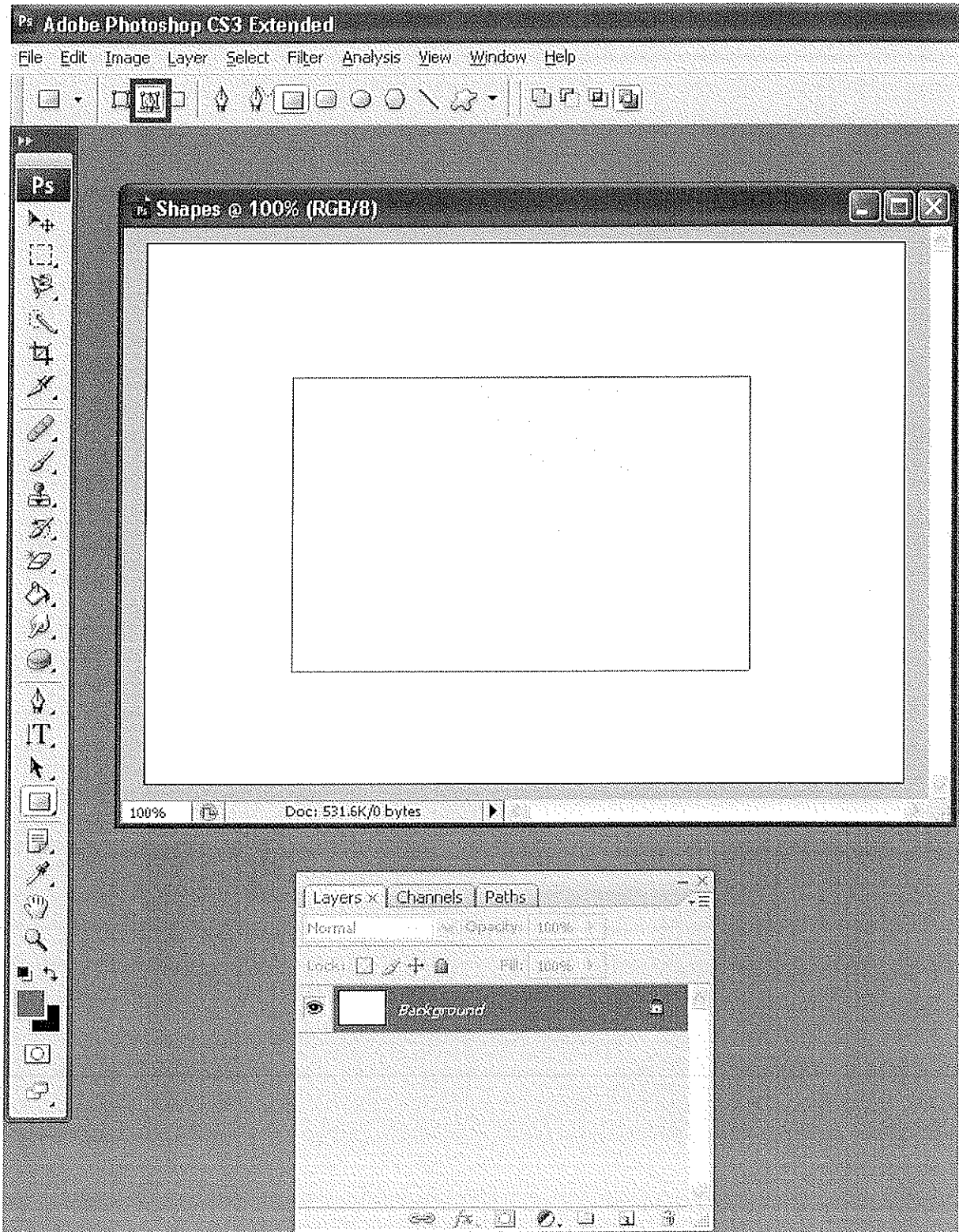
Just like the selection tools, if you press the Shift key while you drag with the Rectangle tool, you will create a perfect square. If you press the Shift key while you drag with the Ellipse tool, you will create a perfect circle. To draw a straight line, select the line tool and drag your mouse pointer over the image canvas.

Working with Custom Shapes

Custom shapes take you beyond polygons to creating many different vector images. The default shapes are shown here, but many more are included with Photoshop, and you can create your own. To draw with a custom shape, you do the same thing as you would to draw with any other shape. First, select the Custom Shape tool.
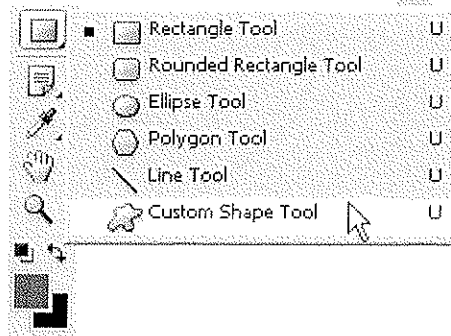
Next, select the shape you want from the shape list in the Options bar.
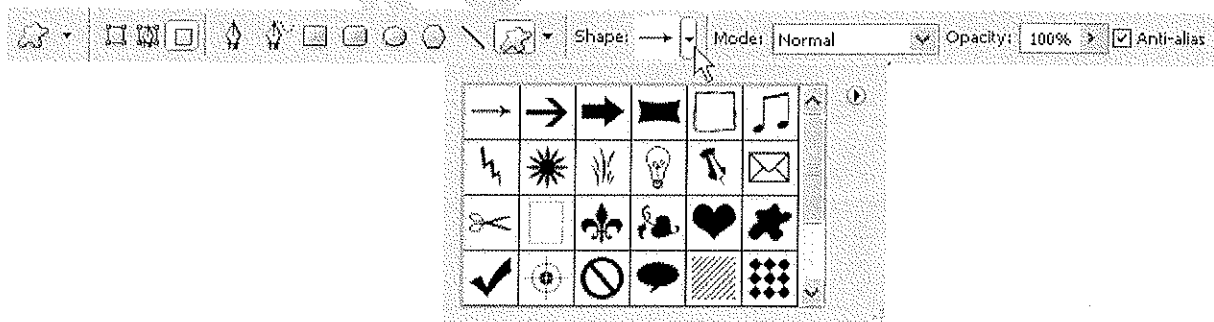
Next, set the options, and then click and drag to create your image.

You can also access the shape list by right-clicking in your image after selecting the Custom Shape tool.

If you create any shape (custom or other), and then choose Edit – Free Transform Path, a box with move handles will appear around the shape. For example, we could add the leaf shape to the bottom left corner of this image. Then, after choosing Edit – Free Transform, you can right-click the drawing and choose your transformation from the shortcut menu. Remember that after you choose your transformation, you must choose Commit (press Return) or Cancel (press Escape) from the Options bar.

There are many more shapes than those shown on the default list. To see other shapes, click the arrow on the shapes list. Then, choose a collection.
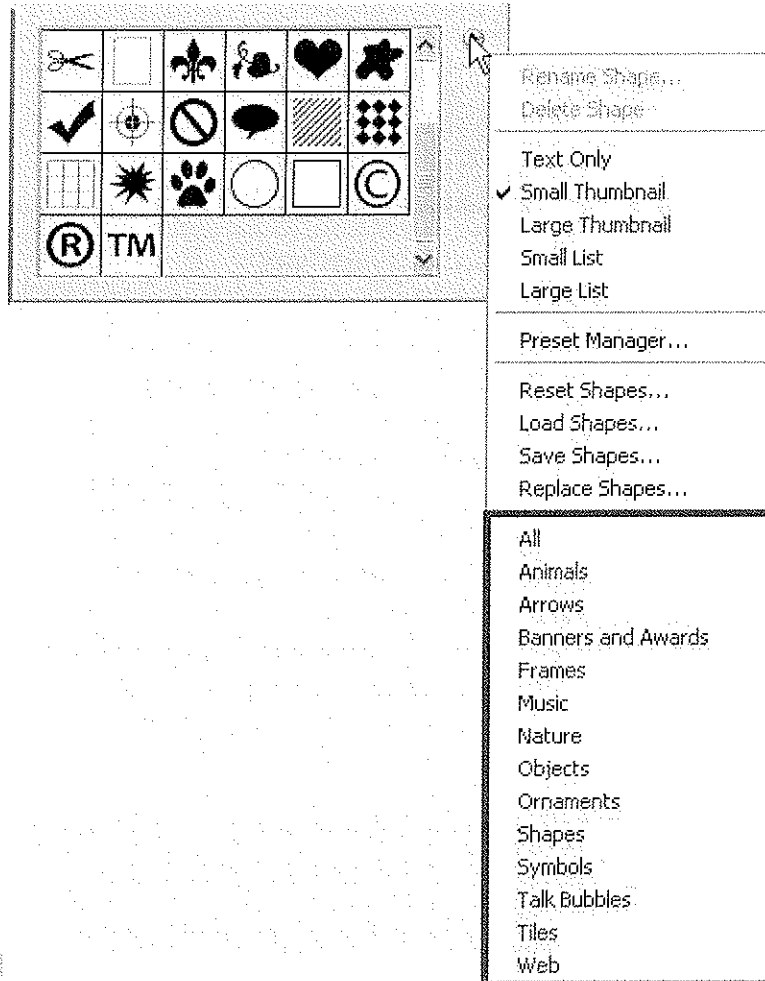
Once you click a collection, you will be prompted if you want to load it. Once you click OK, the Shapes gallery will contain only the shapes from that collection.
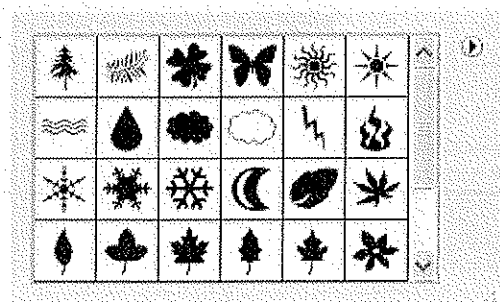
To add a custom shape collection, click Load Shapes, and select the file you want to add. (It must be in CSH format.)
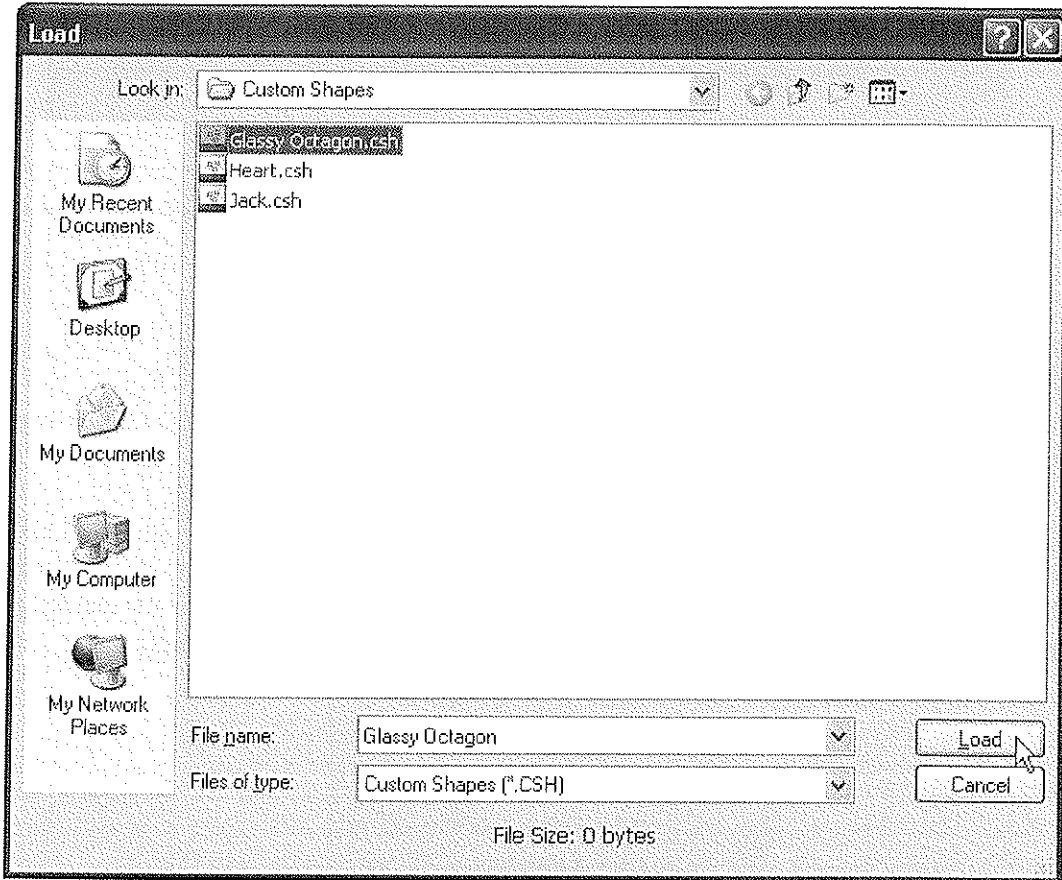
At any time, to return to the default list, choose Reset Shapes from the menu.
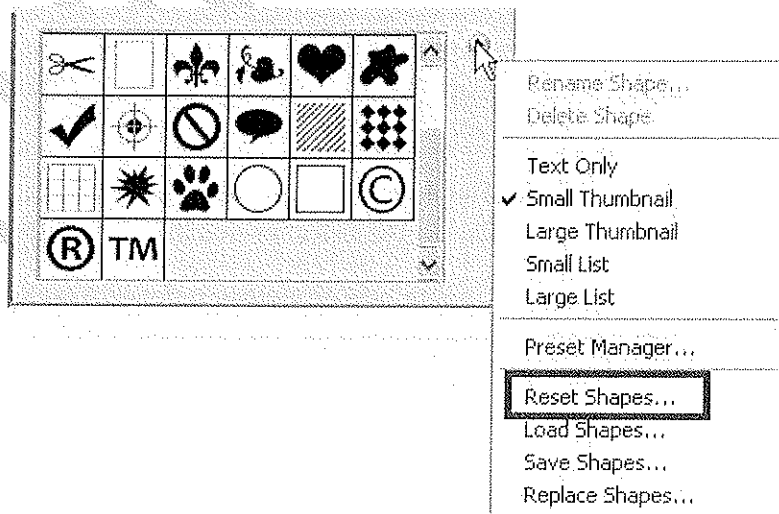
You can also add your own custom shape. First, create the shape using the Pen tool (covered shortly), and then right click your drawing. Click Define Custom Shape, and then, in the Shape Name dialogue box, type a name. Click OK and your shape will be appended to the shape list.
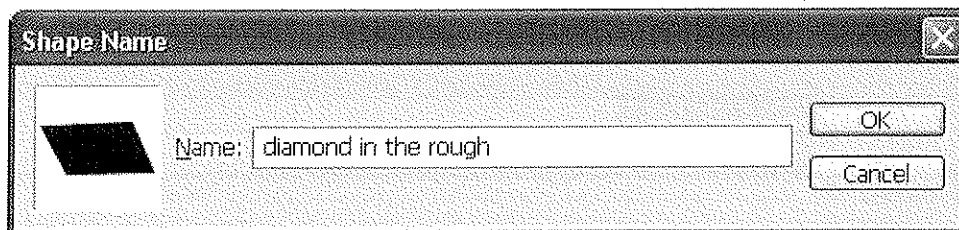
Using Pens

The Pen tool is another useful vector graphic tool provided in Photoshop. The main purpose of the Pen tool is to allow you to create vector paths.

A path can be used to get very fine control for filling a specified area, applying a paint stroke along a predefined course, creating your own custom vector shapes, or for making selections. The different Photoshop Pen tools provide different approaches and options for creating paths. Creating paths with the Pen tools is a complex subject, and takes a lot of practice.

The Pen tools (described in the order they appear in the box above) have the following functions.

Pen Tool	The standard Pen tool is used to create anchor points to join straight lines.
Freeform Pen Tool	This tool lets you draw with the pen in pretty much any way you like (similar to the brush or pencil in this respect).
Add Anchor Point Pen Tool	Use this tool to add an anchor point to a path that has already been drawn. Anchor points give you control over your path; however, too many anchor points can give you unexpected results and can make your image harder to edit, display, and print.
Delete Anchor Point Tool	This tool can be used to remove unwanted anchor points from a path.

Convert Point Tool   This tool allows you to add handles to a point, letting you drag
                                          your path into a curve.

Drawing Straight Lines

To use the standard Pen tool to draw a straight line or a shape made of straight lines, click on
the image canvas where you want the line to begin, and then click again to complete the line.
After making the second click, you now have two anchor points. The first anchor point becomes
hollow, and the last anchor point is filled.

If you continue clicking, the lines will form a shape, and only the last anchor point is filled. You
can either leave the path open or close it. To leave it open, Ctrl + click somewhere away from
your path. To close the path, position your pen over the initial anchor point so that an empty
circle appears beside the pen. Click and your shape will close.

Drawing Curved Lines

If you drag with the pen instead of clicking in different locations, you can create a curved line.
When you drag, a straight line appears, called a direction line. The length and angle of the
direction line determine the curve that you can make with the line. Draw your line about a third
of the distance to the next anchor point you plan to use.

Your next actions are dependent on the type of curve you want to draw. After drawing your
first direction line, position your cursor where you want your next anchor point to be. Then:

- To create a single humped curve, drag in the opposite direction of the direction line you
  dragged to create.
- To create an S curve, drag in the same direction as the direction line you dragged to
  create.

Don't get mixed up between the direction lines, which are not part of your path, and the actual
curves, which are.

Using the Freeform Pen

You can use the Freeform Pen tool to draw as creatively as you like. You can draw as you would with a paintbrush or pencil to create a shape or sketch a picture.

The Pen tool options are mostly the same as the other vector tools, with the exception of the Magnetic option for the Freeform Pen. If you select the Magnetic checkbox, the lines you draw with the Pen tool will snap to edges or borders between strongly contrasting regions in the image canvas you are drawing on.
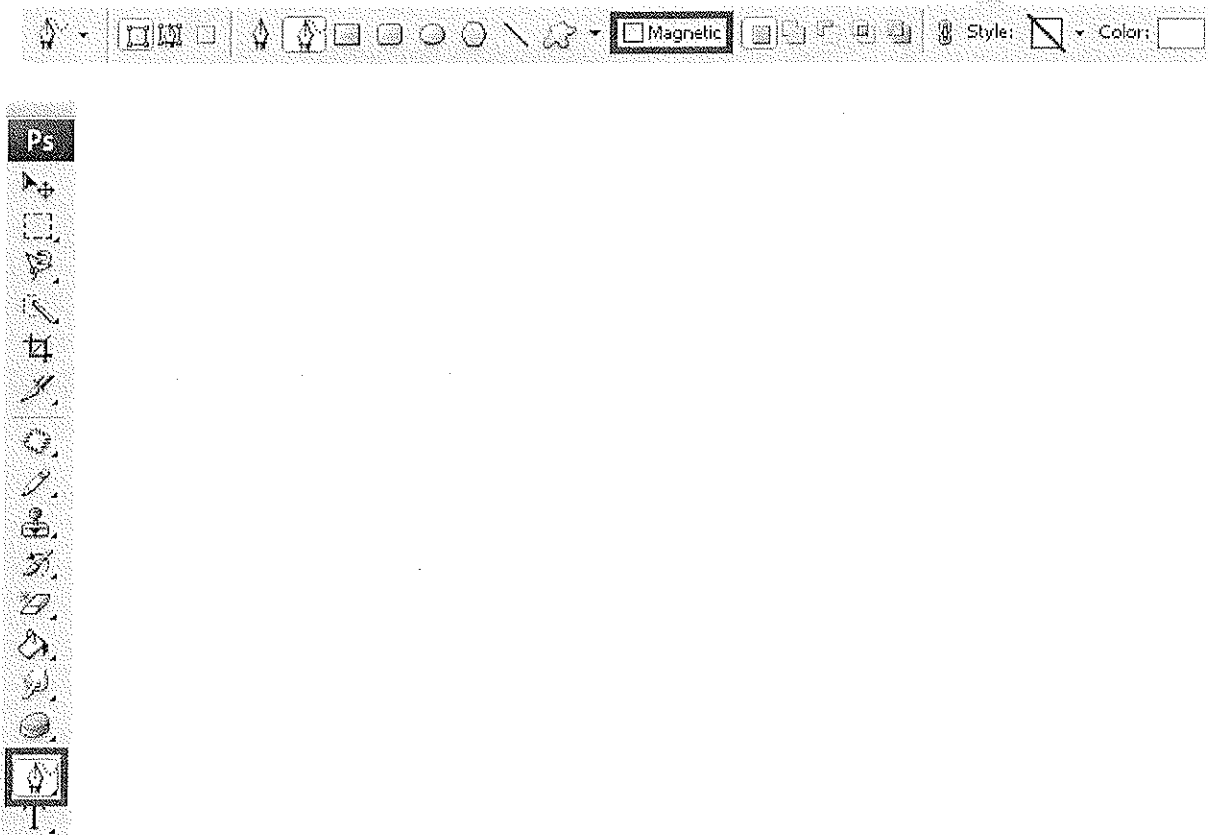
Adding or Deleting Anchor Points

You can use the Anchor Point Pen tool to add anchor points to an existing path or outline. You simply select the Anchor Point Pen tool from the toolbox, and then click on the path where you want to add an anchor point. You can then drag the anchor point to create and shape different types of curves.

By selecting Auto Add or Delete on the Options bar, the Pen tool switches automatically to the Add Anchor Point tool when you position it over a path, and to the Delete Anchor point tool when you position it over an anchor point.
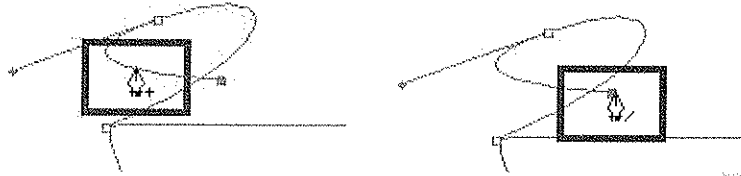
You can also use the anchor point pen to add anchor points to a path drawn with a standard Shape tool, like the Ellipse tool, the Rectangle tool, or even the Custom Shape tool. You can then move and manipulate the anchor points to change the shape.

You can remove unwanted anchor points by using the Delete Anchor Point tool. You simply select the tool and then click on the anchor point that you want to remove. Be cautious though, as the results of your deletion may not be what you expected. It is a good idea to experiment with this tool by drawing some shapes with anchor points, and then selecting the Delete Anchor Point tool to remove the points.

If you click on a path that has no visible anchor points, the Delete Anchor Point pen will place anchor points on the path, allowing you to delete them to alter the shape.

Adding Curves to Your Path

Finally, to use the Convert Point tool (which is the last tool in the pen group), select it from the toolbox, and then click on an anchor point on your path. This will add handlebars to the anchor point that you can then manipulate to create curves.
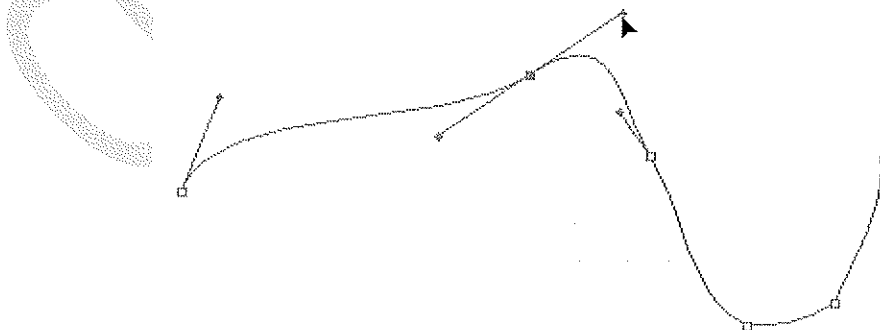
Note: If you select the Shape Layers button on the Options bar, a new layer will be created for your path, and any bounded area you draw with the Pen tools will be filled according to the fill style or foreground color that is currently selected.

Using the Pen tools can be tricky. Knowing how to manipulate the handlebars and placing anchor points to get the smooth curves you want will come only with practice. Try creating a new blank canvas in Photoshop and then using the all of the Pen tools to practice a variety of shapes and drawing methods.

Converting a Path to a Selection

If you are drawing paths on top of an underlying image, you can turn the image region bounded by your path or shape into a selection. This selection can then be applied to a new layer, or otherwise manipulated in the same way as a selection made with the selection tools.

To turn a path or shape into a selection, right click inside the path or shape and choose Make Selection from the popup menu. You will then see the traditional marching ants selection outline where your path or shape used to be. At this point, you can manipulate the selection as you would any other standard selection.

Create vector mask
Delete vector mask
Define Custom Shape...
Make Selection...
Fill Path...
Stroke Path...
Clipping Path...
Free Transform Points
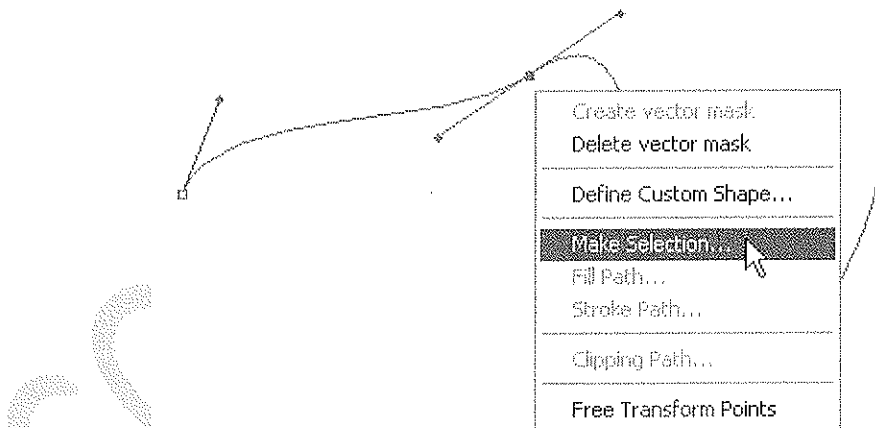
Working with Paths

If you want to move your path, align multiple paths, or move only part of your path, you can use the Path Selection tools.

■ ▶	Path Selection Tool	A
▶	Direct Selection Tool	A
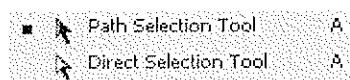
When you select the Path Selection tool, the Options bar changes. There are some new options associated with this tool.
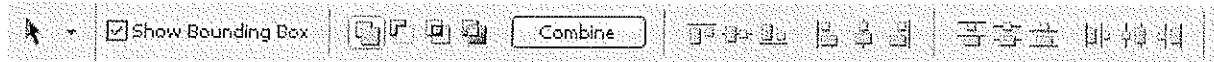
Selecting Show Bounding Box displays a bounding box around the path you select. In this image, there are two paths – one is selected, the other isn't. The bounding box makes it easy to see what has been selected. If you don't show the bounding box, the anchor points are your guideline to what has been selected.
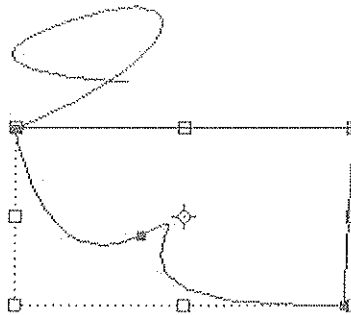
You can select more than one path by dragging a box around the all the paths you want to include. You can then act on all the paths at once – for example, moving them together around your image – or combine them into one path by clicking the Combine button on the Options bar. Combining paths may result in an additional anchor point being added.

The remaining options are alignment buttons, which control one path's relationship to another path. Select the paths you want to align, and then use the appropriate button. For example, you can align the tops of the path, or the middle of the paths.
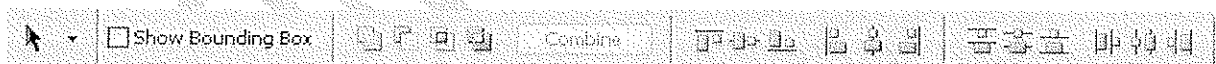
Combine Options   Align Options

The other path selection tool available in this tool group is the Direct Selection tool.
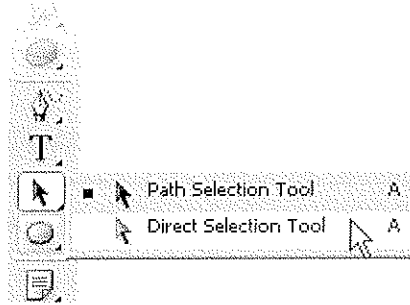
When you choose this tool from the toolbox, you can click on a segment or a part of a path or shape, and then move the segment or reshape the path by dragging the segment. Clicking on a path or shape with this tool will also reveal anchor points that you can drag to modify the given path or shape.

You can also use the Paths palette to manage your paths: to save them, make selections from them, delete them, and more.
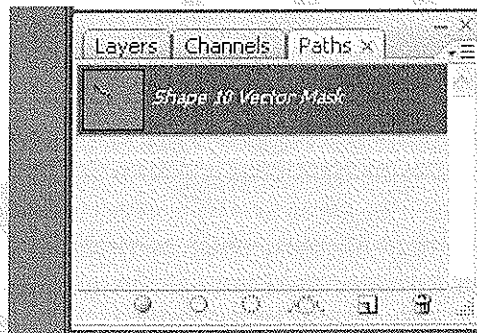
Lesson 3.4: Rasterization

Vector images have their uses, but often we use vector tools to create the shape we want, and then we need to edit it. To use bitmap tools (such as retouching tools) on a vector image, we have to rasterize the image.

In this lesson, you will learn about what rasterizing is and how to do it.

Understanding Rasterize

Unlike a bitmap image, a vector image is not described as pixels. Instead, a mathematical algorithm describes the image. Because of this, a vector image can be easily resized and transformed, as it simply involves a recalculation of the variables. However, because the image is described as a whole, instead of many small parts, the editing you can do to a vector image is limited to transformations, colors, and patterns. To do any detailed editing, you have to work on the image as a bitmap. Rasterizing is the process of converting the mathematically described image into an array of mapped pixel values.

Using Rasterize

Here is the flower image we added a custom shape to earlier. We wanted that shape in our image; however, the sharp edges and color aren't a good fit for this image. Take a look at the shape after it is rasterized (in the right hand image):

It looks much smoother and natural after it is rasterized. There are two easy ways to rasterize a vector image.

If you try to apply a tool designed for bitmap images to a vector shape (the Paint Bucket or the Eraser for example), you will see the following alert.

Adobe Photoshop

This shape layer must be rasterized before proceeding. It will no longer have a vector mask. Rasterize the shape?

OK   Cancel
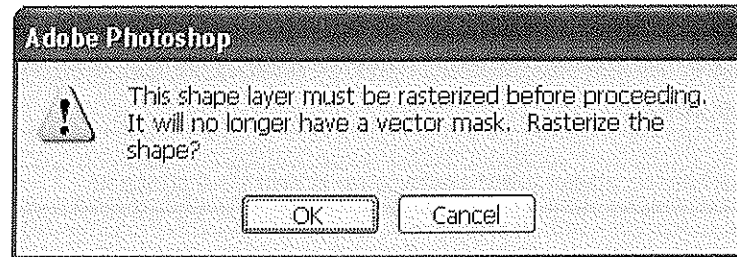
If you click OK, the shape will be rasterized. When this is done, it can be treated as a bitmap image; however, you can no longer edit, scale, or transform the image as a vector graphic.

You can also rasterize a vector graphic by right clicking on its layer in the Layers palette, and choosing Rasterize Layer from the popup menu.
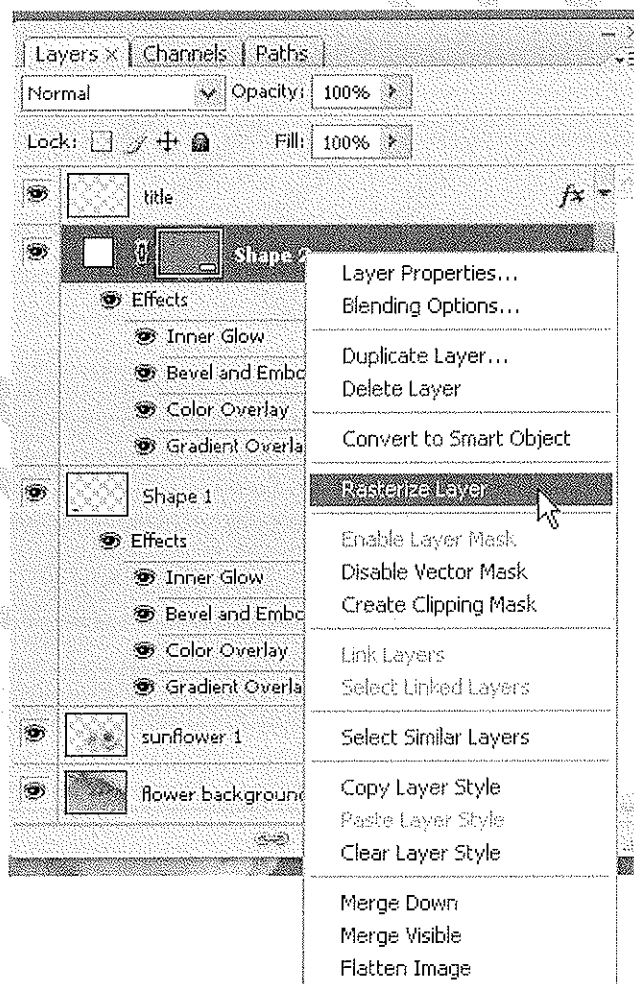
Undoing Rasterize

Because you lose the ability to scale and otherwise transform a vector image after it has been rasterized, you may decide that you want that ability back. Your ability to regain it depends on your actions since rasterizing. The only way to undo a rasterizaton is by using the Undo feature (only available if you haven't done anything else) or the History palette. The History palette stores thirty states by default, so unless you've adjusted that setting, you have a fairly limited time before you are no longer able to return to the vector state. It is a good idea to duplicate your image if you think you might want to revert the graphic to a vector drawing.

Flattening the Image

When you are working with many layers to create the look you want, you are usually saving your file in Photoshop's native .psd or .psb format, or possibly another format that at least partially supports layers. If you want to save your file in a format that doesn't support layers, all the layers are flattened into one layer. This bears touching on at this point because in some ways flattening and rasterizing are similar.

Both involve the conversion of information into one bitmap: rasterizaton mixes information that is already bitmapped with its vector description, while flattening mixes several different sets of information for the same pixel. That information can start off as vector or as bitmapped: if you flatten an image that has both vector layers and bitmap layers, the end result is the same as if you had rasterized and then flattened it.

To flatten an image, simply save it as a file format that doesn't support layers, such as GIF or JPEG.

Or, to manually flatten an image, select Layer – Flatten Image. Photoshop doesn't warn you that you are going to lose your layers, so be sure that this is the action you want to take.

Layer	Select	Filter	Analysis	View	Wir

New   ▶
Duplicate Layer...
Delete   ▶

Layer Properties...
Layer Style   ▶
Smart Filter   ▶

New Fill Layer   ▶
New Adjustment Layer   ▶
Change Layer Content   ▶
Layer Content Options...

Layer Mask   ▶
Vector Mask   ▶
Create Clipping Mask   Alt+Ctrl+G

Smart Objects   ▶
Video Layers   ▶
3D Layers   ▶
Type   ▶
Rasterize   ▶

New Layer Based Slice

Group Layers   Ctrl+G
Ungroup Layers   Shift+Ctrl+G
Hide Layers

Arrange   ▶

Align Layers To Selection   ▶
Distribute   ▶

Lock All Layers in Group...

Link Layers
Select Linked Layers

Merge Down   Ctrl+E
Merge Visible   Shift+Ctrl+E
Flatten Image

Matting   ▶

Section 3: Review Questions

1.   **Which of the following is a fill tool?**
    A.   Paint brush
    B.   Pencil
    C.   Gradient
    D.   Airbrush

2.   **You can create a custom brush by...**
    A.   Modifying an existing preset brush and then saving the modified version as a new brush
    B.   Creating a brush from scratch, based on a particular selection
    C.   Photoshop does not permit the creation of custom brushes
    D.   A and B

3.   **Which of the following is not a Photoshop type tool?**
    A.   Horizontal Type
    B.   Vertical Type Mask
    C.   Vertical Type
    D.   Diagonal Type Mask
    E.   All of the above

4.   **When you add type to an image...**
    A.   A layer for the type is created automatically
    B.   You must create a layer for the type
    C.   The underlying image must be converted to a vector graphic
    D.   You cannot edit type once it is on its own layer

5.   **What is a vector graphic?**
    A.   A bitmap image
    B.   A pixel map image
    C.   A graphic that is described with mathematical vectors and formulas
    D.   A graphic that has been rasterized

6.   **In Photoshop, the Pen tools are used to...**
    A.   Create paths
    B.   Color images
    C.   Write text
    D.   None of the above

7.   **Pressing Shift when drawing with the Ellipse tool will...**
   A.   Draw a straight line
   B.   Fill the ellipse
   C.   Create a selection
   D.   Draw a perfect circle

8.   **When you flatten an image, you end up with...**
   A.   Fewer layers than you started with
   B.   One layer
   C.   More layers than you started with
   D.   A vector image

9.   **The higher you set the tolerance for the Paint Bucket tool:**
   A.   The fewer pixels will be colored
   B.   The more pixels will be colored
   C.   The more the color will be saturated
   D.   None of the above

10.   **A brush paints with:**
   A.   The background color
   B.   The brush color
   C.   The foreground color
   D.   The fill color

Section 4: Working with Masks, Channels, and Filters

In this section you will learn about:
- Masks
- Channels
- RGB and CMYK channels
- Selections and channels
- Filters
- Smart filters

In this section you will also learn how to:
- Use layer masks
- Use vector masks
- Use clipping masks
- Move a mask
- Create a channel mask
- Use the Filter Gallery
- Work with the Sharpen filter
- Work with the Sharpen Edges filter
- Work with Blur filters
- Use the Artistic filters
- Use the Distort filters
- Use the Pixelate filters
- Use the Noise filters
- Use other filters
- Freeze and thaw images
- Liquify an image
- Use the Pattern Maker
- Embed a watermark in an image

Lesson 4.1: Using Masks

If you know how to use masks in Photoshop, you can make a lot of tasks easier to perform and at the same time produce better results. If you need to make a tricky selection from an image, masks can help. If you want to protect one part of your image, and allow an effect to be applied to another (something like a stencil), a mask is the right tool for the job.

If you want to save a selection, you can save it with a mask, and moreover, you can convert a mask to a selection and vice versa. Learning how to use masks in combination with layers and selections will help you reach a new level in digital image processing.

In this lesson you will learn what a mask is and how to create one. You will also learn about Quick Masks, selections, and layer masks. Finally, you will learn how to move a mask to from one layer to another.

What is a Mask?

You can think of a mask as a kind of covering that goes over an image. This description may sound a little bit like a layer, but the reality is that masks are quite a bit different. You vary the covering to choose what shows through the mask. The default mask is a red overlay at 50% opacity.

Here is an image that has been masked. The red parts of the image won't be affected by any adjustments, filters or other edits. The white part is what we want to work on. You can see that the mask is imperfect; it was made from a selection using the Quick Selection tool. We can paint on the mask to select the cup more exactly.
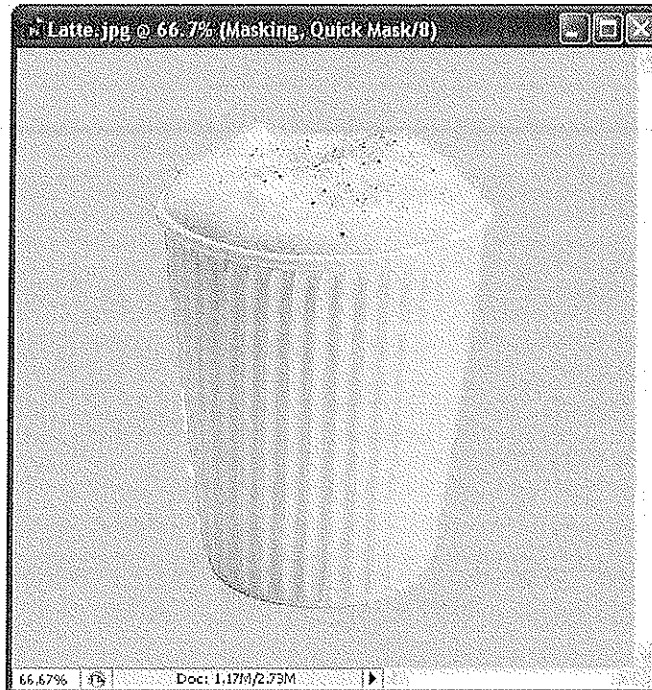
You can only paint on masks with white, black, or gray. When you apply the color white to part of a mask, you will remove that part of the mask, and the underlying layer or image will be exposed in these areas. If you apply black to a mask, you extend the mask, and the underlying image will not be exposed wherever the color black is applied. You can apply this black or white color with the brush, a Gradient tool, or even a Pencil tool. This means that you can literally paint on and off the parts of your image that you want exposed. So now, instead of just working with selection tools to make your selection, you can add the power of masks and brushes to make exact selections.

Using Quick Mask

A Quick Mask uses a selection as its base and masks everything but your selection. This enables you to make a rough selection, apply the mask, and then refine your selection using your brushes.

In this image, we want to change the color of the flowers on the teacup. Start by making a rough selection of the teacup.


Now we'll refine the selection using a Quick Mask. First, click the Quick Mask tool on the Toolbox (it's below the foreground color), or press Q on your keyboard.


A red overlay appears, with everything in red except your selection. This is the Quick Mask. Using your brushes, you can begin to refine your selection. When you applied the Quick Mask, the foreground color automatically changed to black, which extends the mask. Keep painting and adjusting your brushes to get the mask over everything you don't want selected. If you accidentally paint the mask over an area you that you want exposed, just switch to a foreground color of white and paint the mask off.

Here we can see a close-up of the mask being refined:
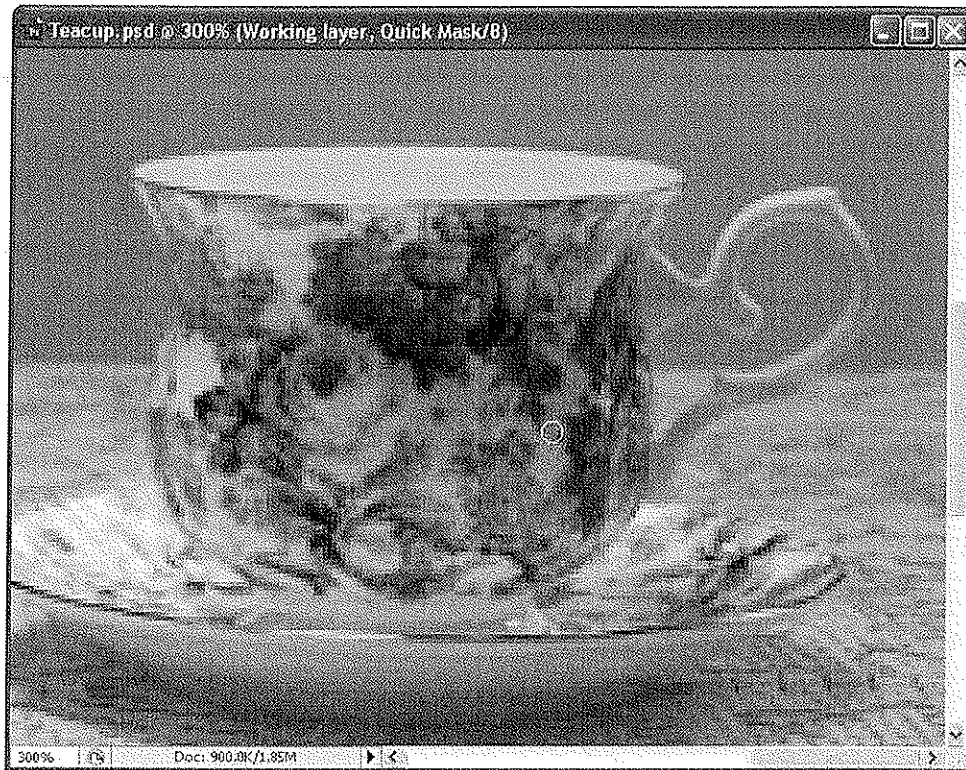
When your mask is complete, you can now selectively change the unmasked portion of your image. For example, you might want to create an adjustment layer. When you add the layer, there is a mask thumbnail beside the new layer, indicating that the adjustment was only made to part of your image.

Here is the Layers palette for this image after an adjustment was made to the hue of the cup to make it more purple like the background:
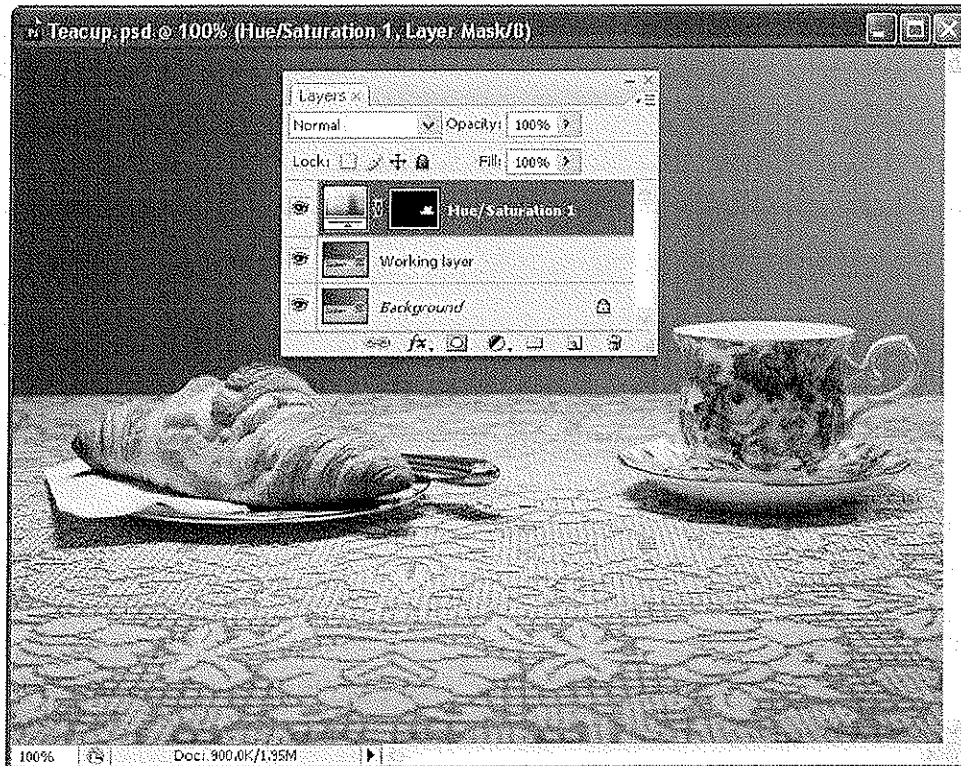
Another way to approach the Quick Mask is to open your image and then click the Quick Mask button. Next, make black your foreground color, and paint the mask onto your image around the area you want to select.

Using Layer Masks

You have just seen how you can use Quick Masks to paint on selection regions and apply effects and adjustments to very specific image areas. It is now time to learn about another important mask type: the layer mask.

With a layer mask, you can basically paint a layer on or off an underlying image. This is a great way to make composite photos with elements from multiple images. To apply a layer mask, select the layer you want to paint onto the layer below, and from the Layer menu, select Layer Mask.

There are two types of layer masks: Reveal All and Hide All. This sets up the initial arrangement. If you reveal all, you will be using your brushes to uncover the layer below. If you hide all, the layer below appears over your masked layer, and you will be using your brushes to uncover the masked layer.

In this example, we are going to blend in another type of flower using a layer mask. Another layer has been added to the image, as you can see here in the upper left corner:

To add the layer mask, select Layer Mask from the Layer menu, and in this case, we are going to Reveal All, and then use a black brush to cover it up with the background layer.

The layer mask appears on the Layers palette beside the selected layer. There are now two thumbnails for the layer: the layer thumbnail and the mask thumbnail. You must select which thumbnail you want to work on.
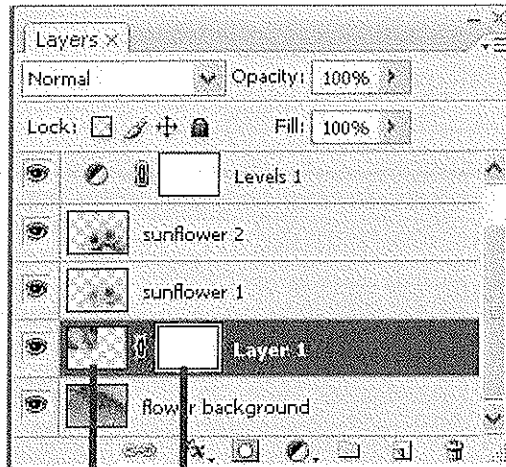

Mask thumbnail

Layer thumbnail

After you select the layer mask thumbnail, select the painting tool of your choice: paint in black to cover your mask, and in white to uncover it. After painting, you can see the mask has helped us blend the images together.
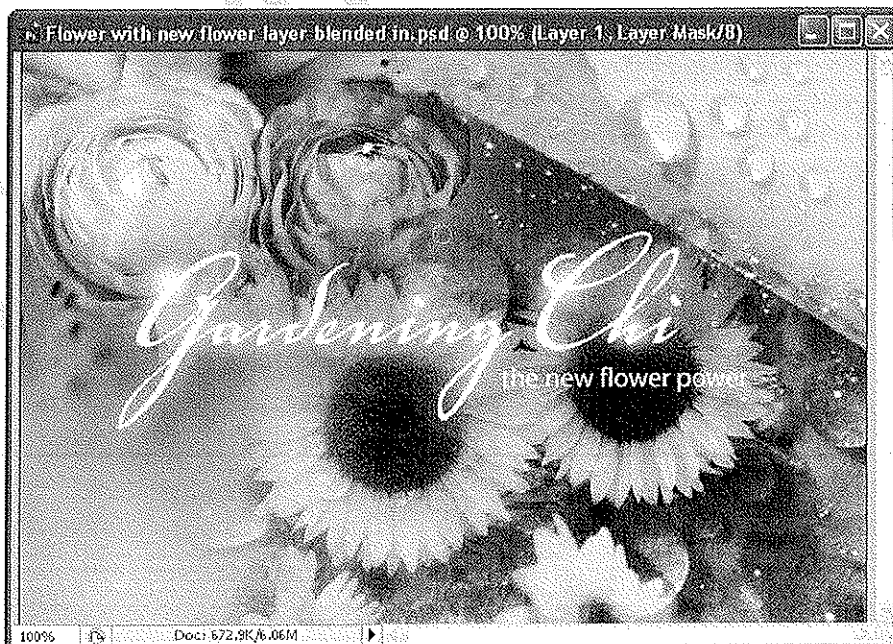
To reduce your file size, once you are sure you want to keep the layer mask, you can apply it, and the layer will permanently reflect your edits. To apply a layer mask, choose Layer – Layer Mask – Apply.

Using Vector Masks

A vector mask is a mask drawn using one of the drawing tools. It creates a nice sharp edge, and is resolution independent. Every time you draw with one of the Shape tools, you are creating a vector mask. You can use the vector mask to selectively apply a layer style to your image. In this example, the second rectangle is a vector mask.
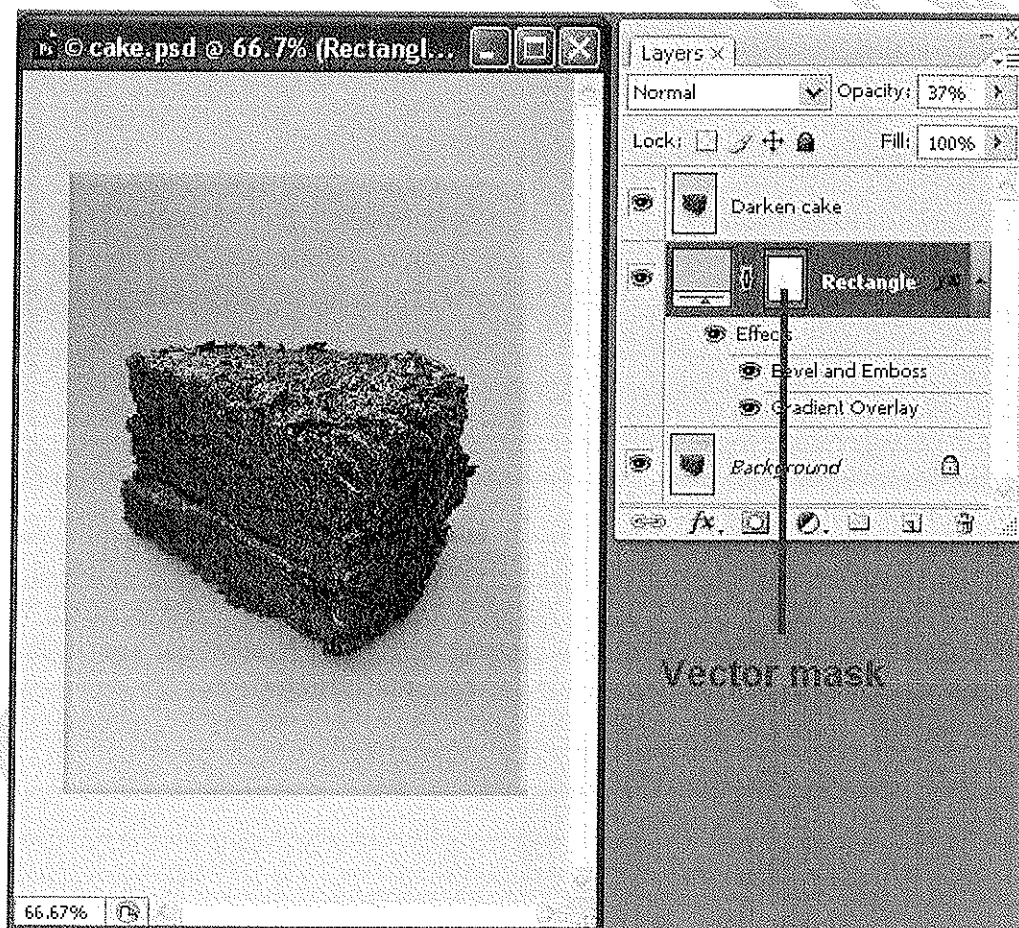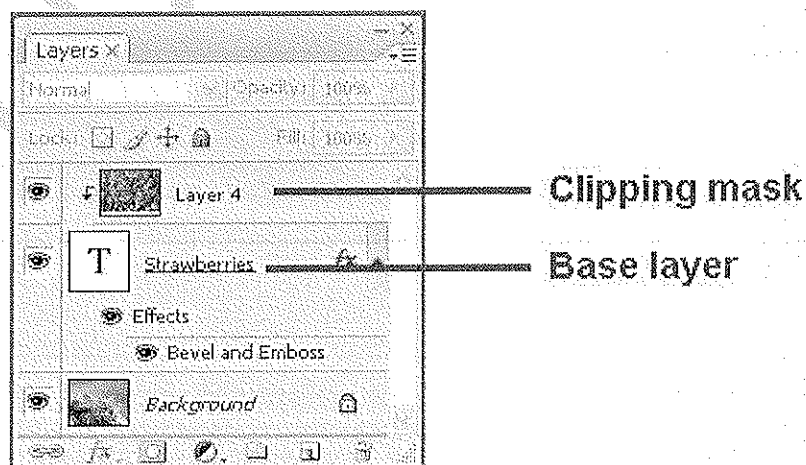

Using Clipping Masks

A clipping mask lets you fill one part of an image with the content of another layer. Many interesting effects can be created this way. A clipping mask involves at least two layers: the base layer and the clipping layer. In this example, the word "Strawberries" has been created

using a clipping mask. The base layer is the layer with the text on it, and the clipping layer has the image that contains the strawberries filling the text. This image has a third layer, the background layer with the large berries on it.
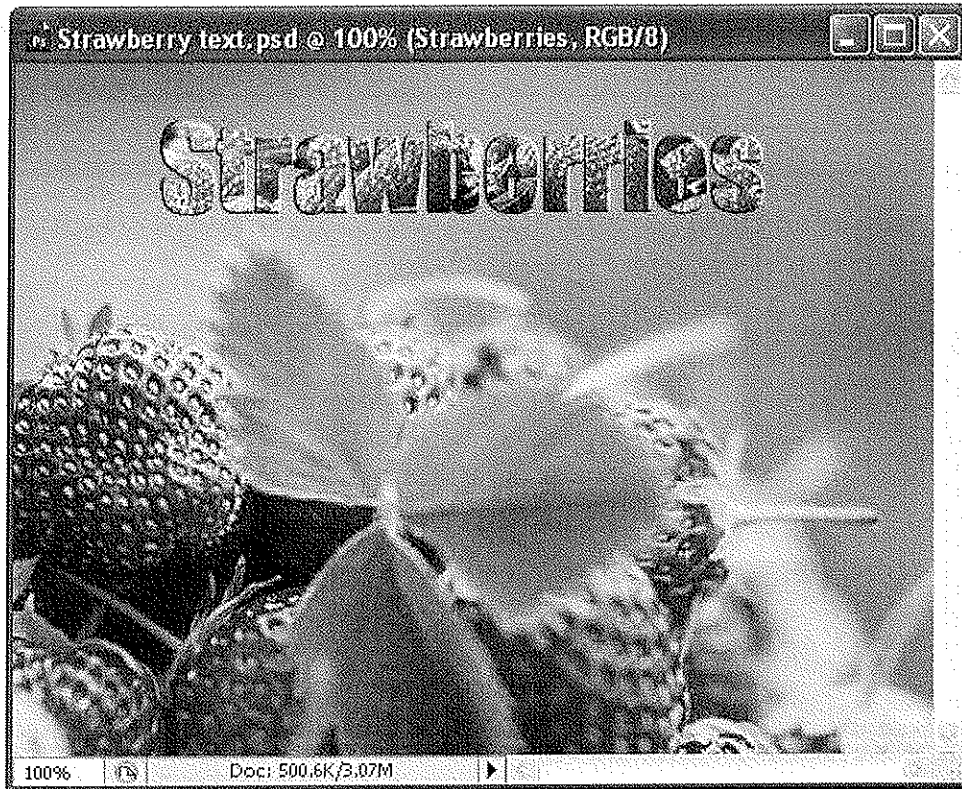
Take a look at the Layers palette for the image. You can see that the clipping layer is indented above the base layer. You can have more than one clipping layer as long as they are on top of each other. The clipping mask has an arrow beside it, identifying it as a clipping layer. You can think of the base layer as a container for the clipping mask; the arrow shows you what is being "poured into" the container.

To create a clipping mask, make sure the clipping mask is above the base layer. Then, select it and choose Layer – Create Clipping Mask. You can also press Alt + Ctrl + G. To create a clipping mask with your mouse in the Layers palette, hold your Alt key and click the line dividing the base layer from the clipping mask.

Press Alt and click on the dividing line
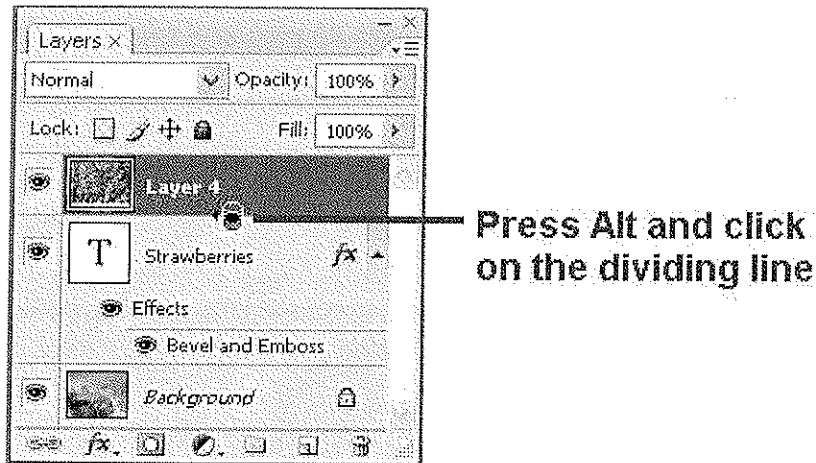
If you don't want the layer to be a clipping mask any longer, do one of the following: Alt + click the dividing line in the Layers palette, press Alt + Ctrl + G, or from the Layer menu choose Release Clipping Mask.

Lesson 4.2: Working with Channels

Channels, masks, and selections are all closely related. When you mask an image, you are protecting part of an image from being modified. A Quick Mask is useful for this, but goes away when you are finished with it. Same with a selection – you can temporarily protect part of your image, but you'll need to remove the selection to move on with your editing. Sometimes you know you are going to work on a selection a number of different times or ways. In this case, you can create a channel mask, which permanently saves a selection with your image that you can apply at any time.

What are Channels?

Channels store both color information and selections (or masks). Channels are simply gray scale images. The type of channel determines the information they store.

Types of Channels

There can be up to three types of channels in a Photoshop image. Each stores a different type of information.

|	
Color	There is a color channel for each color in your image. In RGB images, there are three color channels (one for red, one for green, and one for blue); in CMYK there are four channels (one each for cyan, magenta, yellow, and black). Additionally, there is a composite channel that shows the image in full color. Each color channel contains information about a given pixel; between them all they fully describe the pixel.
Spot Color	Spot color channels can be used in images that are being printed. Spot color refers to ink colors that are exactly the color you want to produce, rather than being a combination of RGB or CMYK colors. You use a channel for each spot color you want to add.
Alpha	An alpha channel is a user created channel that allows you to save a selection. It appears in grayscale, where white is your selected region, and black is protected, just like a mask.

Using the Channels Palette

The Channels palette, in a default workspace, is the tab next to the Layers tab. The top channel shows a full color image, and then each individual channel is shown. Any spot color channels

would be shown next and finally any alpha channels. An image can have up to 56 channels. Like layers, you can selectively choose which channels to display.
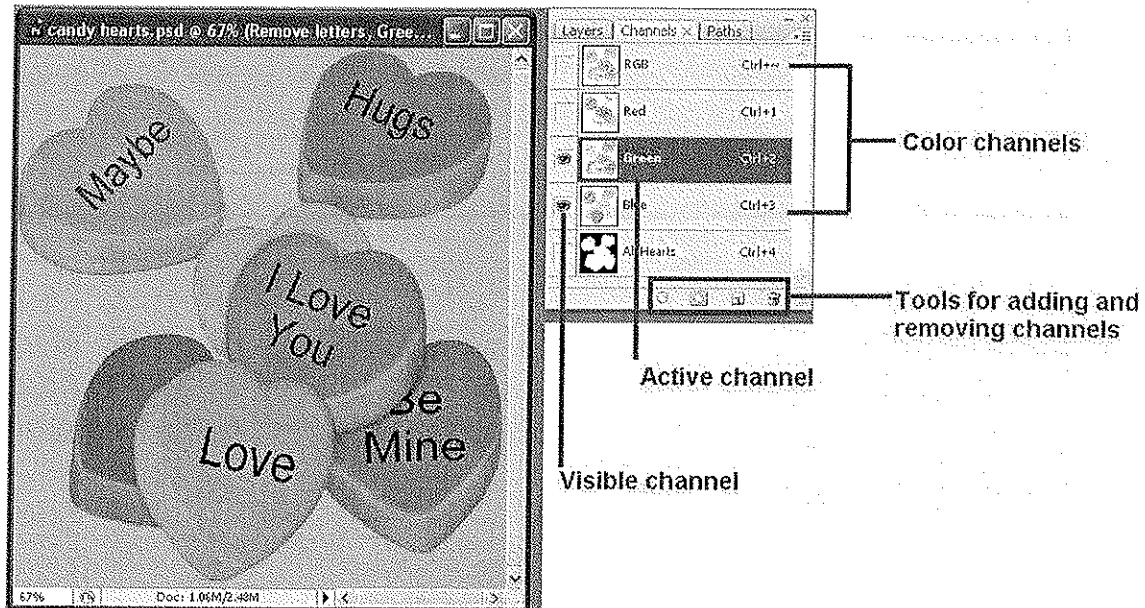

When you view only one color channel, it displays in grayscale. When you display two color channels, the image is no longer grayscale, but shows both colors you have selected. If you would prefer to always view the color of a channel, not the grayscale, choose Edit – Preferences – Interface, and select the Show Channels in Color checkbox.
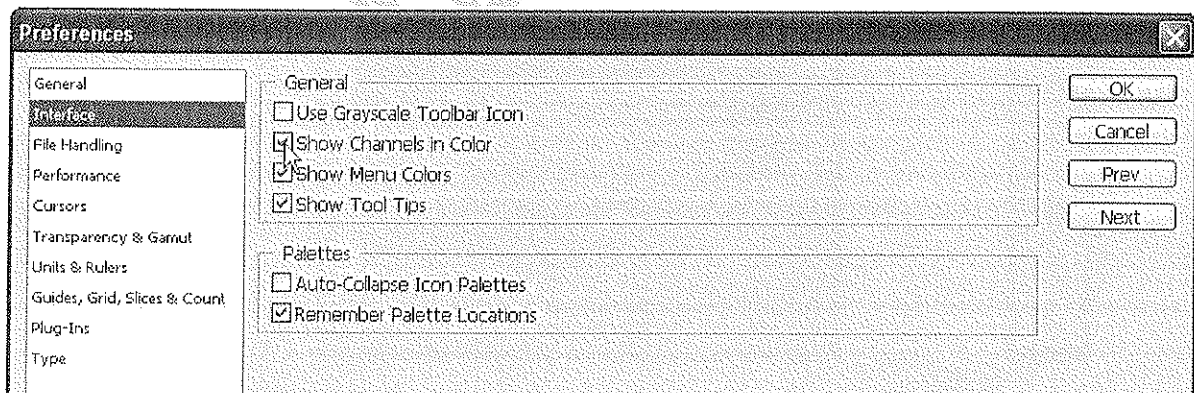

You also can choose which channel to work in, like in the Layers palette. The active channel(s) has a blue bar across it. You can only work on one channel at a time, and you can edit the picture by painting in the image. Painting with white is the same as painting with 100% intensity, while painting with black removes the selected color from the pixels you are painting. If you paint with gray, you are reducing the selected color's intensity.

Here, we are working in the red channel and painting one strawberry black.
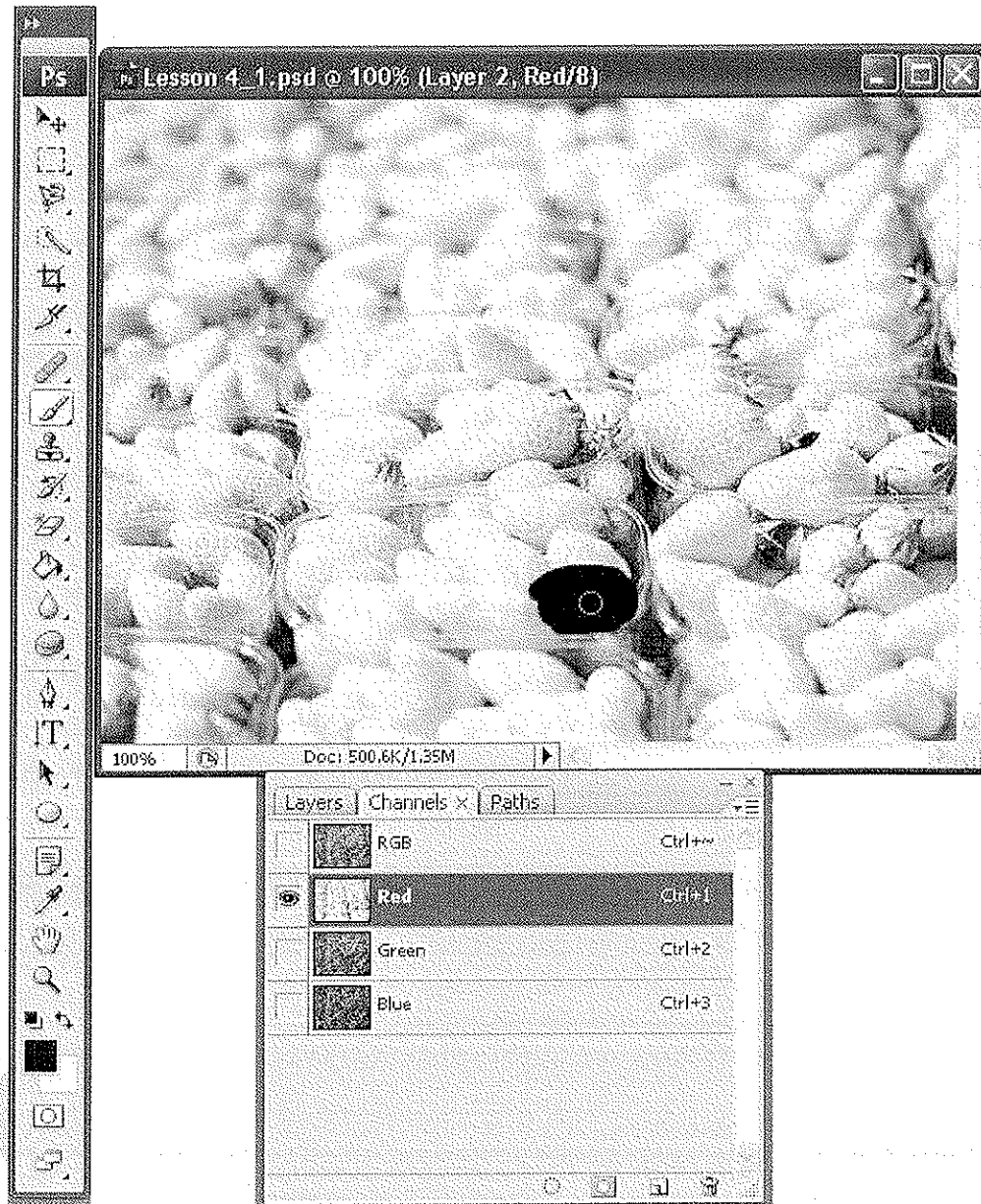
If we switch back to RBG mode, we can see that this strawberry only has the blue and green components left; painting with the black removed the red tones.
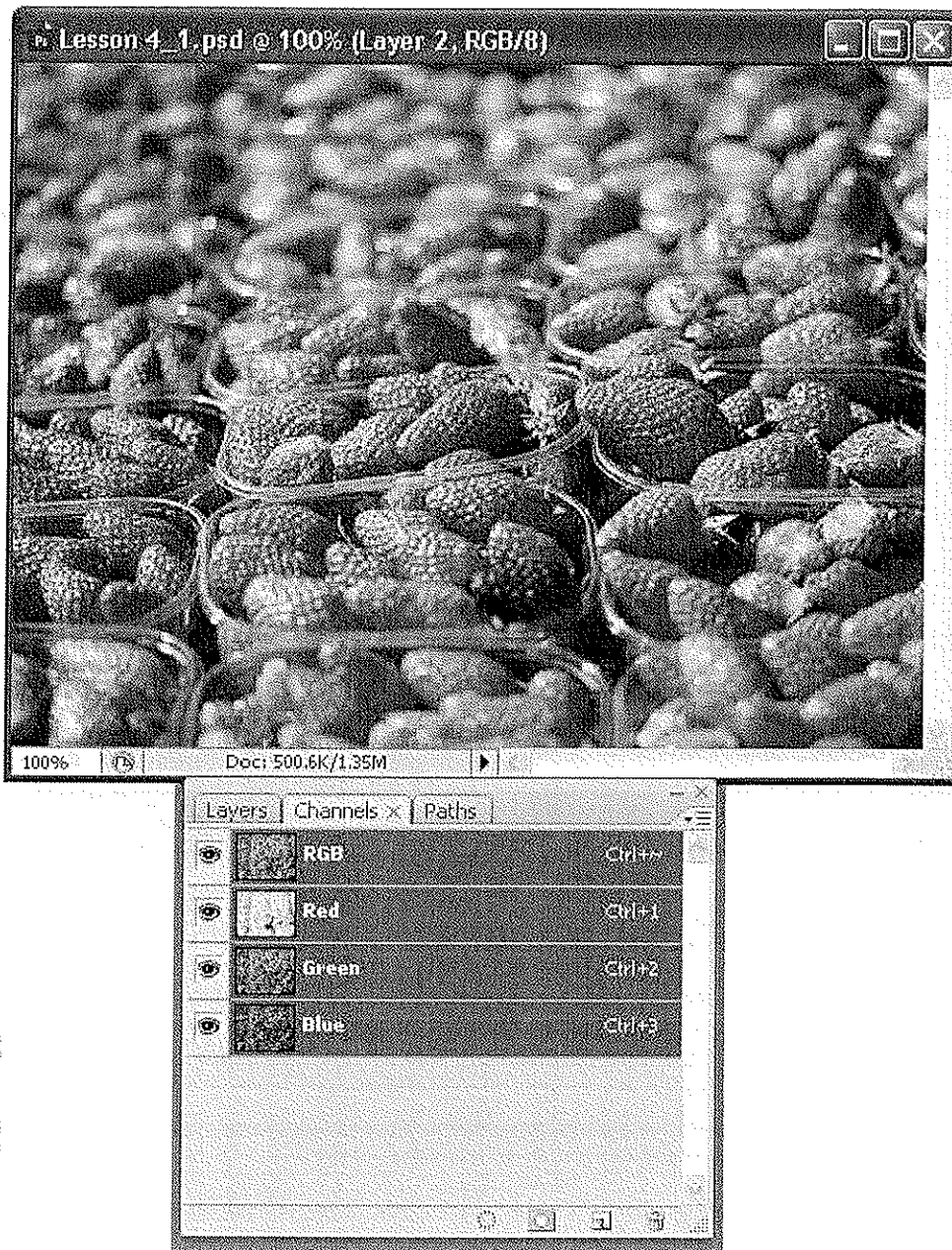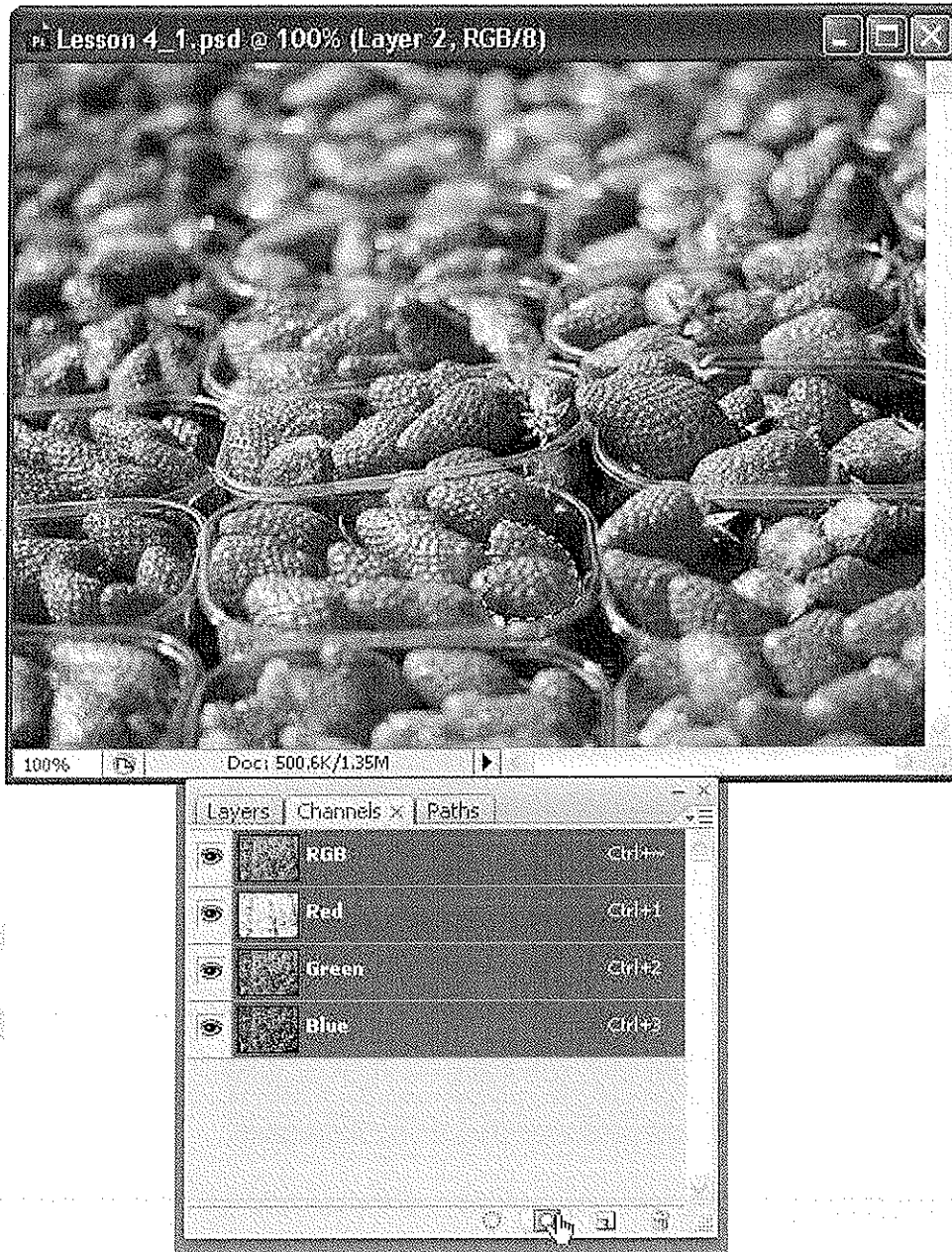

Creating an Alpha Channel

An alpha channel, also known as a channel mask, is a mask that you can invoke whenever you need it. You can also load a channel as a selection, saving you a lot of time. Alpha channels do not take up a lot of space in your file, so it is worth saving any selection that takes you more

The new palette appears with the default name of Alpha [n], where [n] is the next available number – Alpha 1 if this is your first channel. You can double-click the channel name and type a new one.
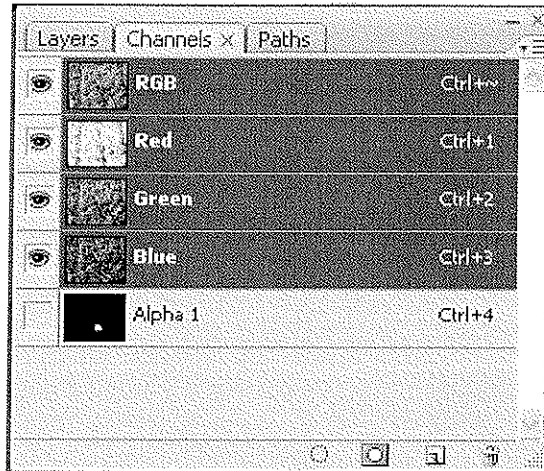
To see the Channel Options dialogue box, first select the channel, and then click the Options menu button on the palette.
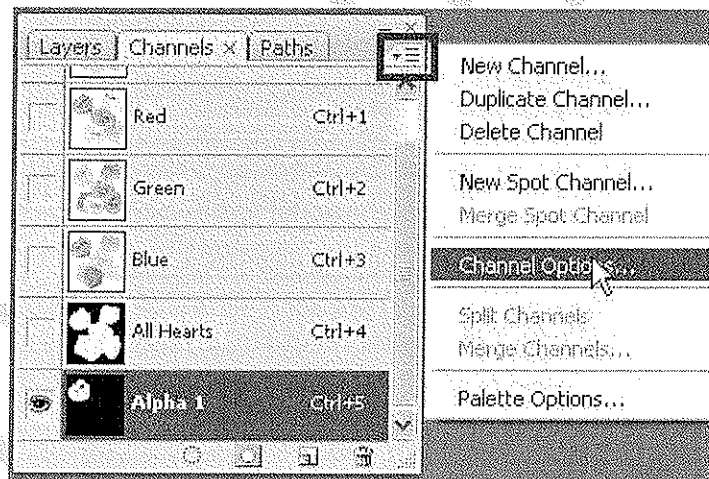
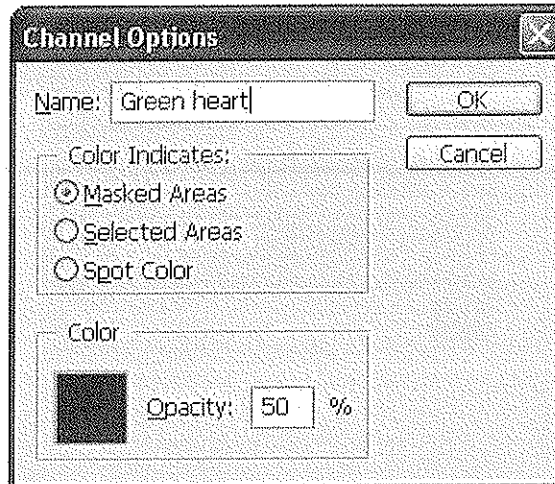The Channel Options dialogue box allows you to name the channel and choose what you want the channel to store. If you choose Masked Areas, you will save a channel mask, whereas if you choose Selected Areas you will save a selection.

Any channel can be loaded as a selection by clicking the Load Channel as Selection button on the Channels palette.

To delete a channel, you can right-click it and choose Delete Channel, or you can drag the channel to the garbage can button at the bottom of the Channels palette.
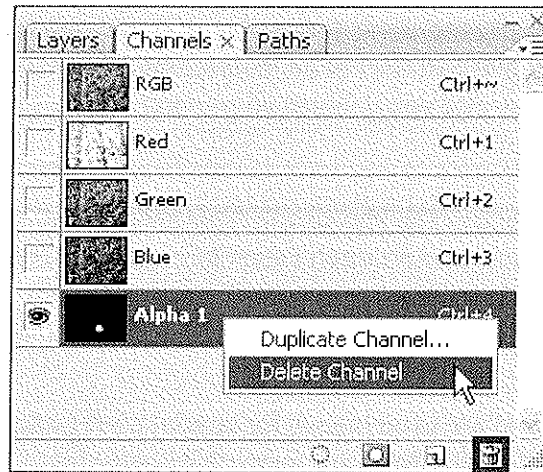
Lesson 4.3: Modifying Images with Filters

Photoshop filters mimic the photographic technique of placing a filter over the lens. They can be applied to an entire image or just part of an image, and can be used to retouch your image or to add special effects. Filters let you unleash your creativity, and you can add some really interesting effects using them.

In this lesson, you will learn about the Photoshop filter gallery, and several types of filters including Smart Filters, Sharpen and Sharpen Edges filters, and Blur filters.

What Are Filters?

Filters overlay your image and are used mainly for special effects. Photoshop comes with an extensive range of filters, although there are many third party filters available. You can modify the settings and opacity for many filters, and by combining filter effects and the order they are applied, you have nearly endless choices for your image.

Most of the filters in Photoshop are organized by category. Categories include special effects like Artistic filters and Emboss filters, and retouch filters like the Sharpen filters.

Here is the same image with two different filters applied to it. The image on top has the Crystallize filter; the bottom image has the Film Grain filter.
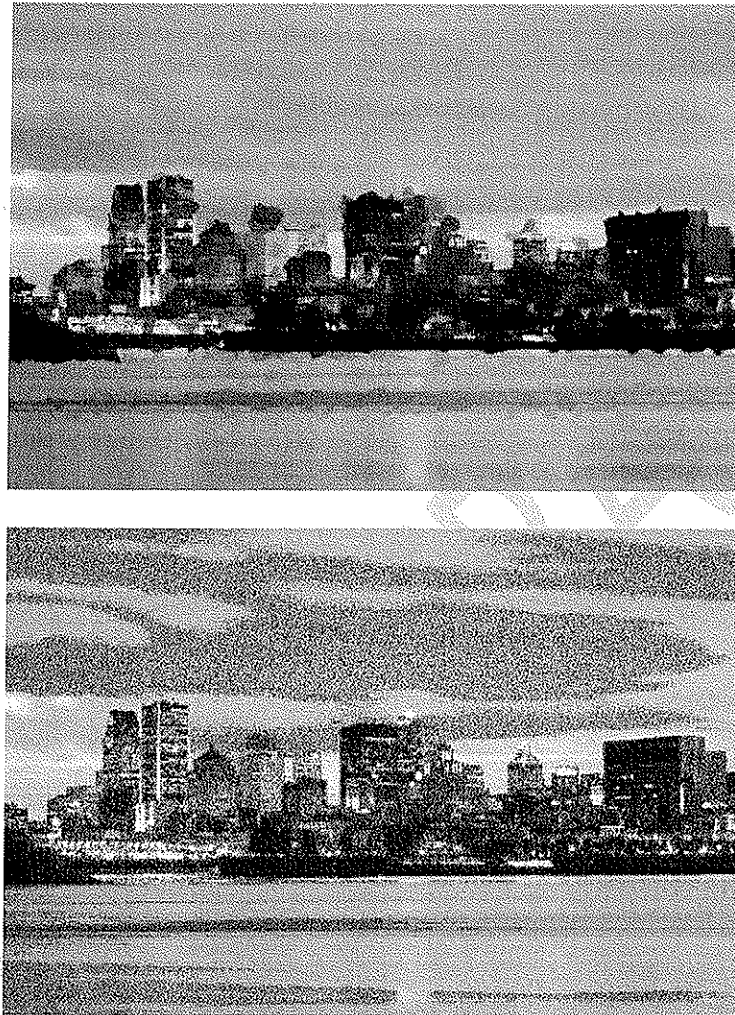

Using the Photoshop Filter Gallery

You can access many of the commonly used filters in the Filter Gallery. Filters are applied to the active layer, so start by selecting the layer to which you want to apply the filter. Then, to view the Filter Gallery, select Filter Gallery from the Filter menu.

The Filter Gallery, shown below, is organized into several panes.

Filter parameters

Delete filter

Image   Filter list   Hide filter   Add another filter
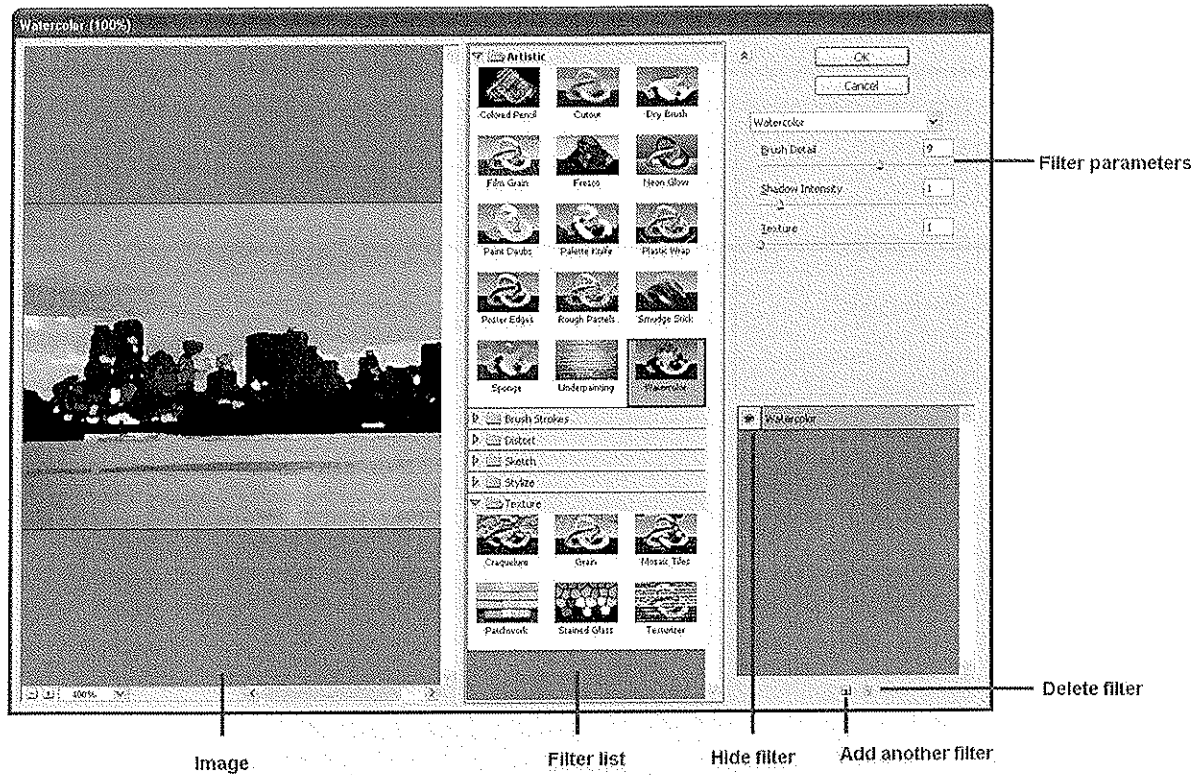
The first pane shows your image, the second is where you choose the filter, and the third is where you set the parameters for the chosen filter and work with the order of the filters. The nice thing about the Filter Gallery is the ability to try out different filters without having to continually return to the menu – it's like one stop shopping for filters. However, the Filter Gallery doesn't contain all filters, so you can't always count on it.

Once you have the Filter Gallery on your screen, you can collapse and expand the categories by clicking the arrow beside them.
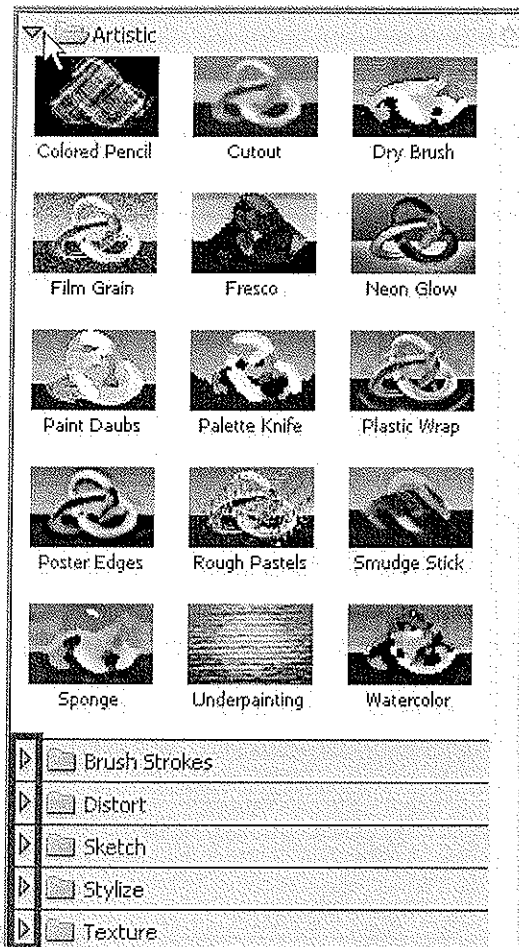
In the above example, the Artistic category is expanded, and all other categories are collapsed.

Once the category is expanded, you can click a filter to see a sample of what the filter looks like applied to the sample image. As well, the parameters on the right of the gallery change to reflect the chosen filter. The parameters vary depending on the filter, but in all cases you can adjust the settings and immediately see the effect the filter will have in the image on the left. If you only want one filter, click OK once you are satisfied.
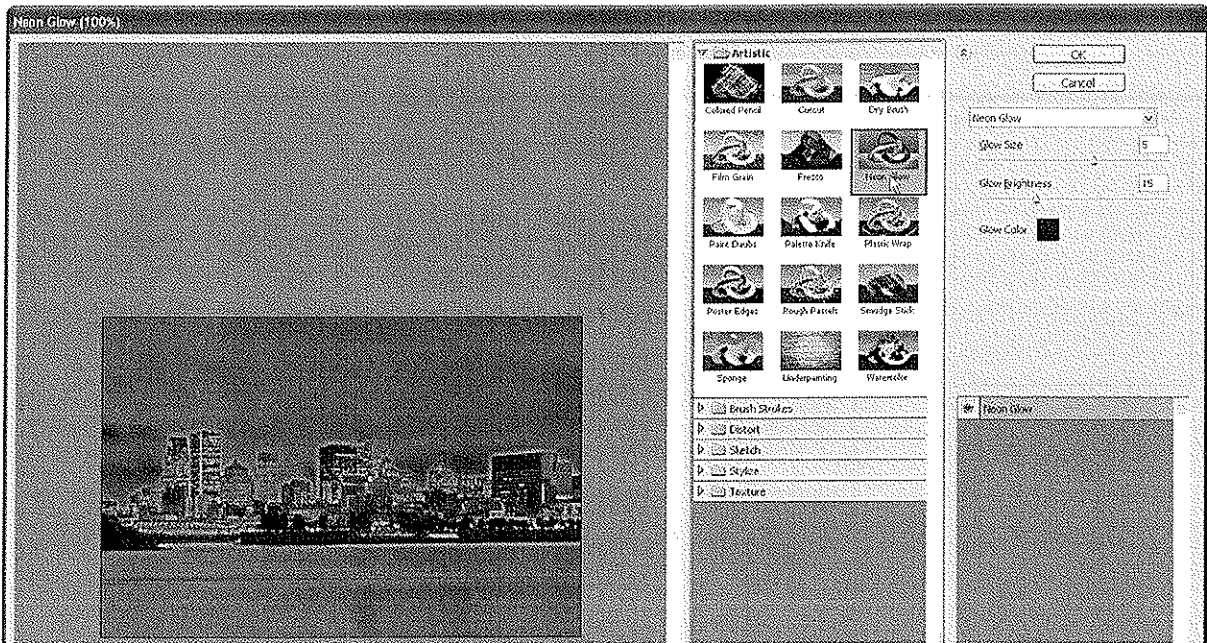
If you want to add another filter, click the New Effect Layer button at the bottom of the gallery.
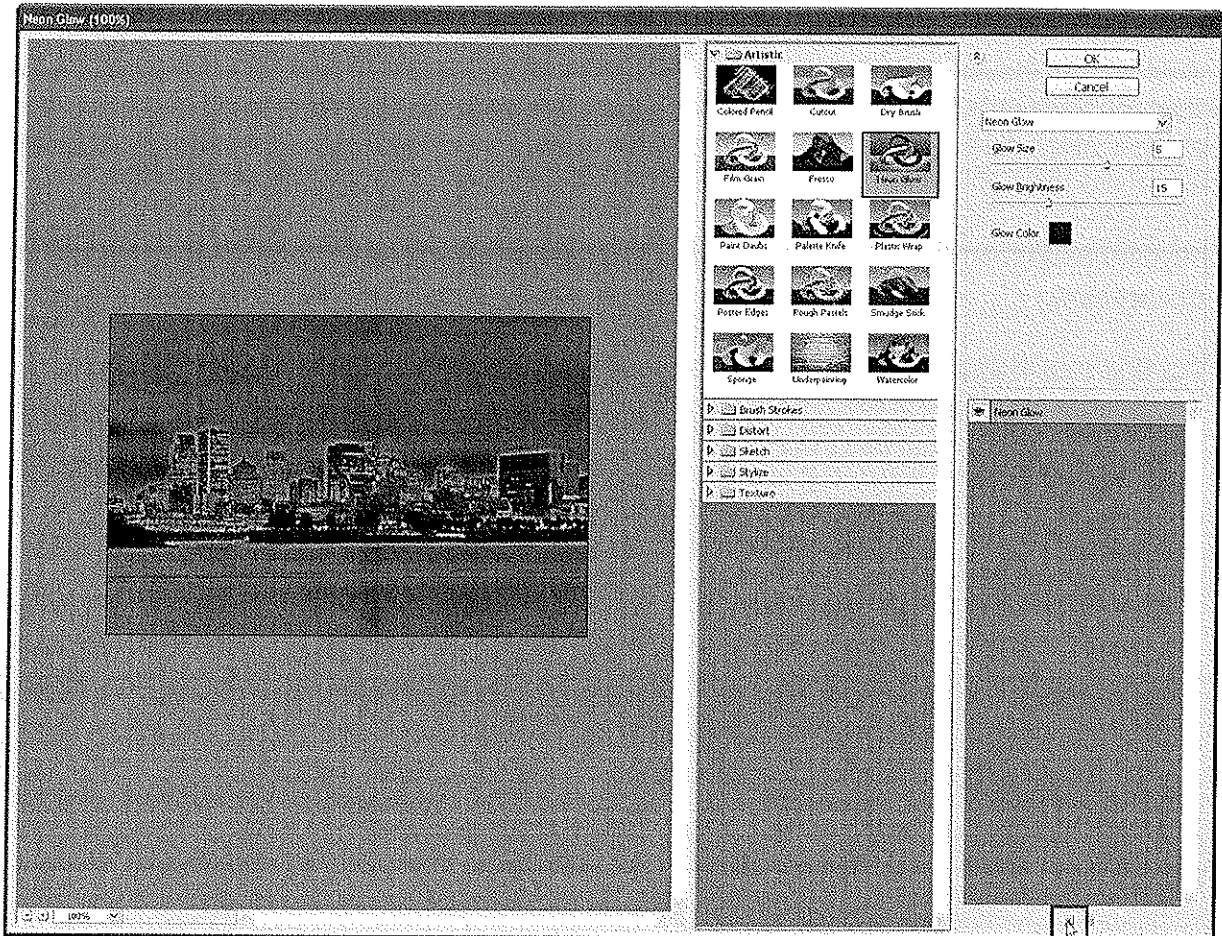
Once you are working with multiple filters, the order the filters appear in makes a big difference. Each filter is listed in the bottom of the filter, and you can click the eye icon beside the filter to display or hide it. You can also click and drag to change the order of the filters, or click the filter and then click the Delete Effect Layer button to get rid of a filter. When you are finished applying filters, click OK.
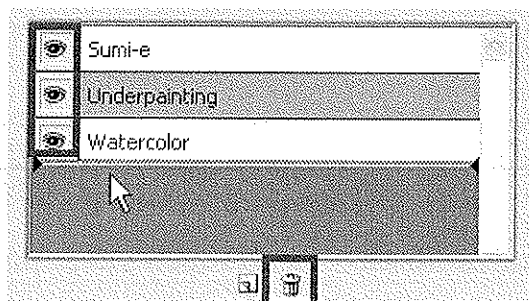
About Smart Filters

If you apply a filter using the Filter Gallery, you have actually changed the contents of the layer to which you applied the filter. If you created a new layer first, you haven't permanently changed the image, but if you applied the filter to the background, you have lost some of your original image data. In previous versions of Photoshop, the only way to non-destructively apply filters was through the use of duplicate layers. In this version of Photoshop, you can non-destructively apply filters using the Smart Filters feature. You may still wish to make a duplicate of your background layer, but you don't need to duplicate every layer you want to apply a filter to anymore.

The first step in applying Smart Filters is to convert the layer to a Smart Object (Smart Objects are covered more fully in the Advanced course). To do this, select Convert for Smart Filters from the Filter menu. You will see a warning dialogue box like this one:
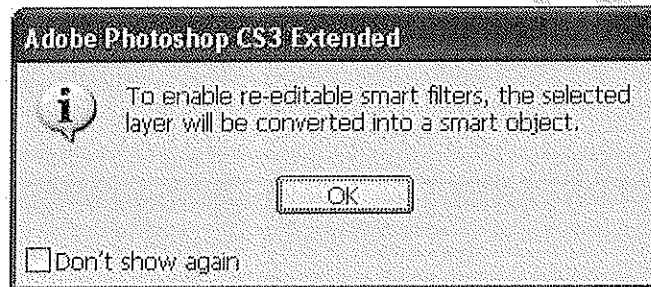
Click OK to convert the layer. The thumbnail for the layer on the Layers palette indicates the change.
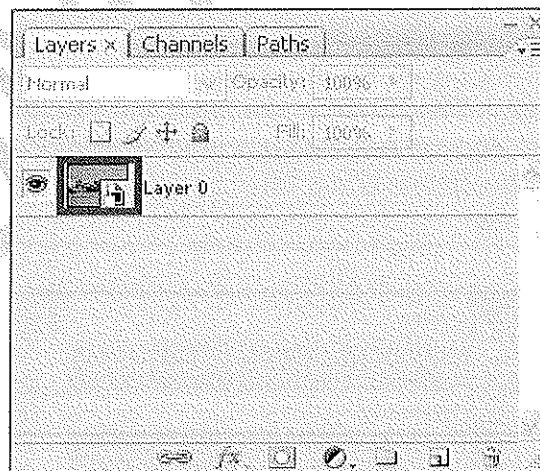
Now you can use the Filter Gallery or Filter menu to apply a filter. After you apply the filter, the Layers palette displays the filter in the same way it displays layer effects: as indented layers below the active layer.
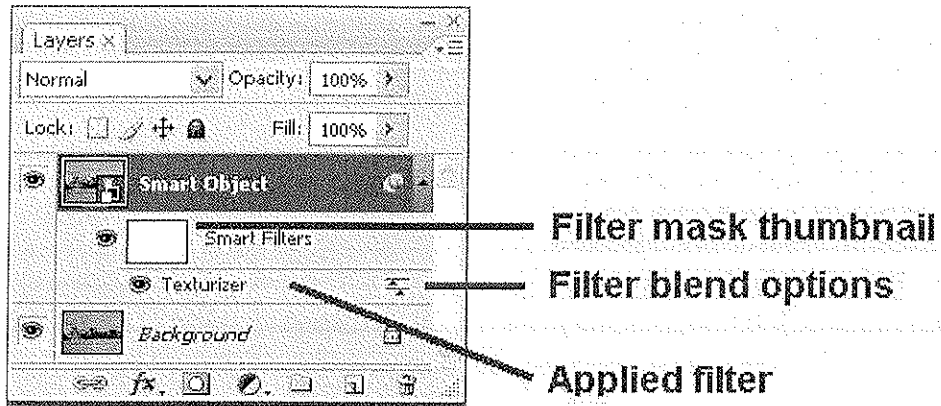
Each filter you apply to the layer appears on its own line. You can control the blending options for each layer by double clicking the button at the right of the filter name. Using the blending options, you can set the opacity and the blend mode for the layer.

Because the filter has an associated mask thumbnail, you can select the mask thumbnail, mask parts of the image, and selectively apply the filter as you wish. In this example, the filter is not applied to the buildings, but only to the sky and water.
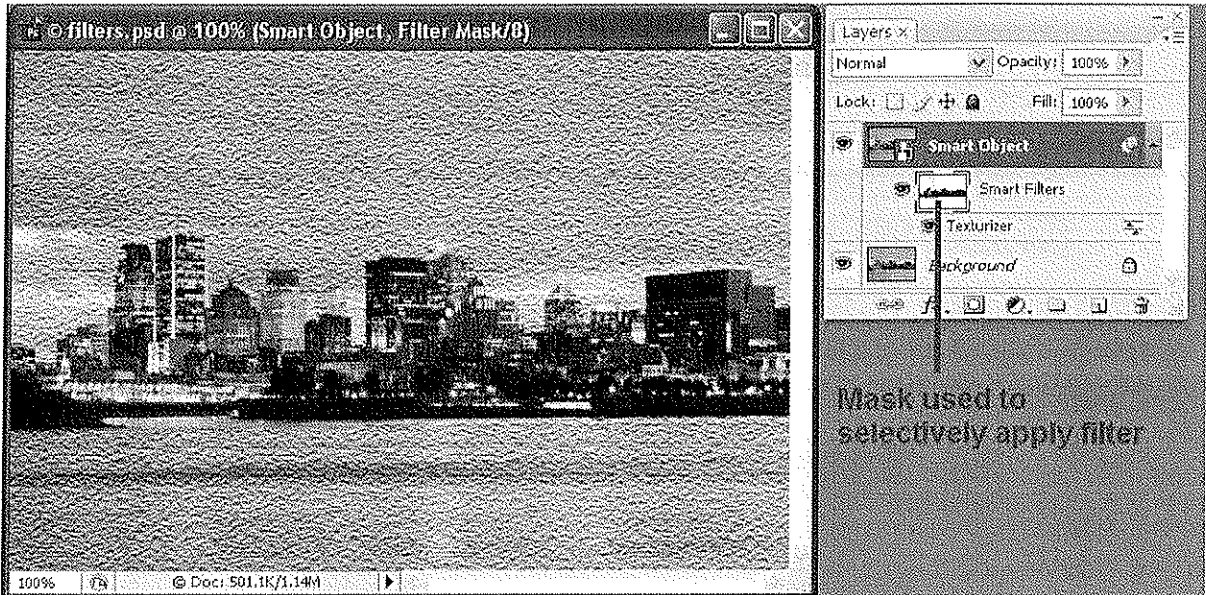
Working with the Sharpen Filter and Sharpen Edges Filter

Sharpening an image increases the contrast in all or part of the image. There are several sharpening filters in Photoshop, all accessible under the Sharpen section of the Filters menu.

```
Filter   Analysis   View   Window   Help
  Filter Gallery                    Ctrl+F
  Convert for Smart Filters
  Extract...                   Alt+Ctrl+X
  Filter Gallery...
  Liquify...                 Shift+Ctrl+X
  Pattern Maker...        Alt+Shift+Ctrl+X
  Vanishing Point...          Alt+Ctrl+V
  Artistic          ▶
  Blur              ▶
  Brush Strokes     ▶
  Distort           ▶
  Noise             ▶
  Pixelate          ▶
  Render            ▶
  Sharpen           ▶      Sharpen
  Sketch            ▶      Sharpen Edges
  Stylize           ▶      Sharpen More
  Texture           ▶      Smart Sharpen...
  Video             ▶      Unsharp Mask...
  Other             ▶
```
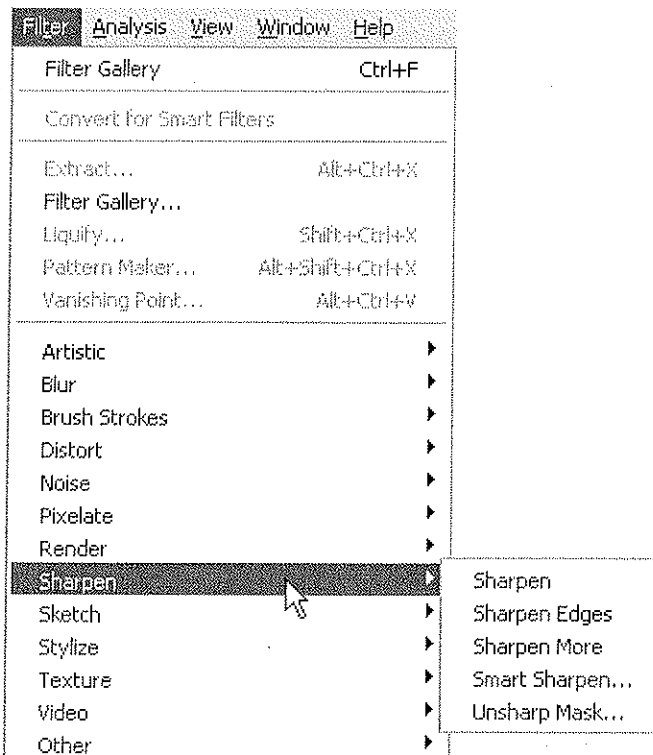
Probably the most commonly used Sharpen filter is the Unsharp Mask, which sharpens the edges in your image. Edges are defined by you: you set the threshold at which the difference is pronounced enough for sharpening to occur. When there is a large enough difference, the pixels on the darker side are darkened, and those on the lighter side are lightened. You also control the amount the pixels are adjusted by setting the amount, expressed as a percentage of the original. The radius determines how far out Photoshop performs the adjustment.
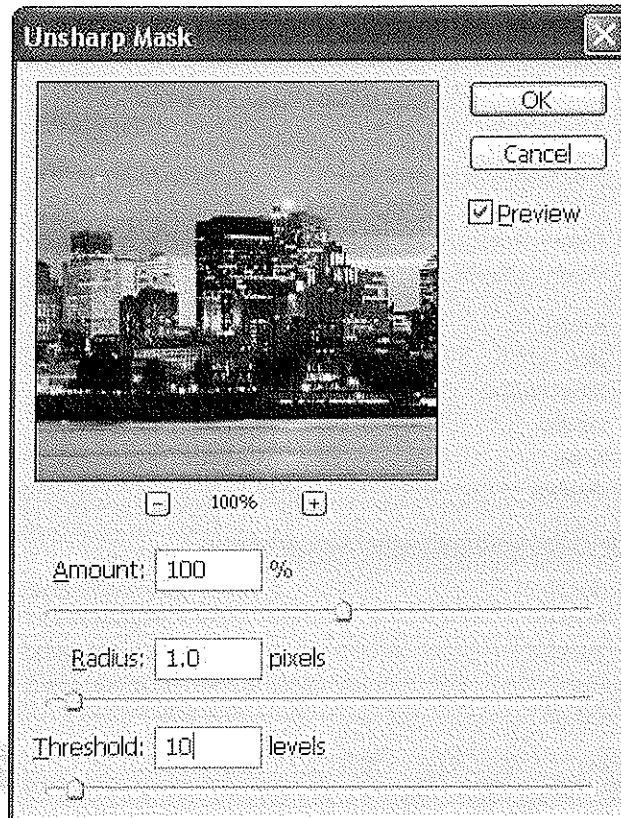
Another Sharpen filter is simply called Sharpen. This filter is used to bring a blurred image into focus. There are no parameters for the Sharpen filter; it is applied when you click the menu command. If this filter is not strong enough, you can apply the Sharpen More filter. You can also sharpen the edges simply by selecting the Sharpen Edges filter, which finds the edges and sharpens the contrast without touching the rest of the image.
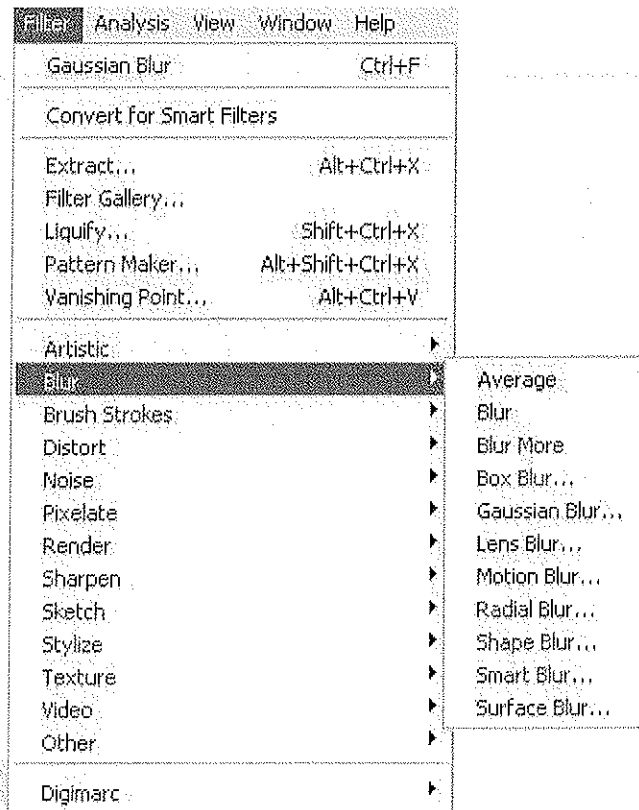
Here is an image before and after sharpening (using Unsharp Mask):
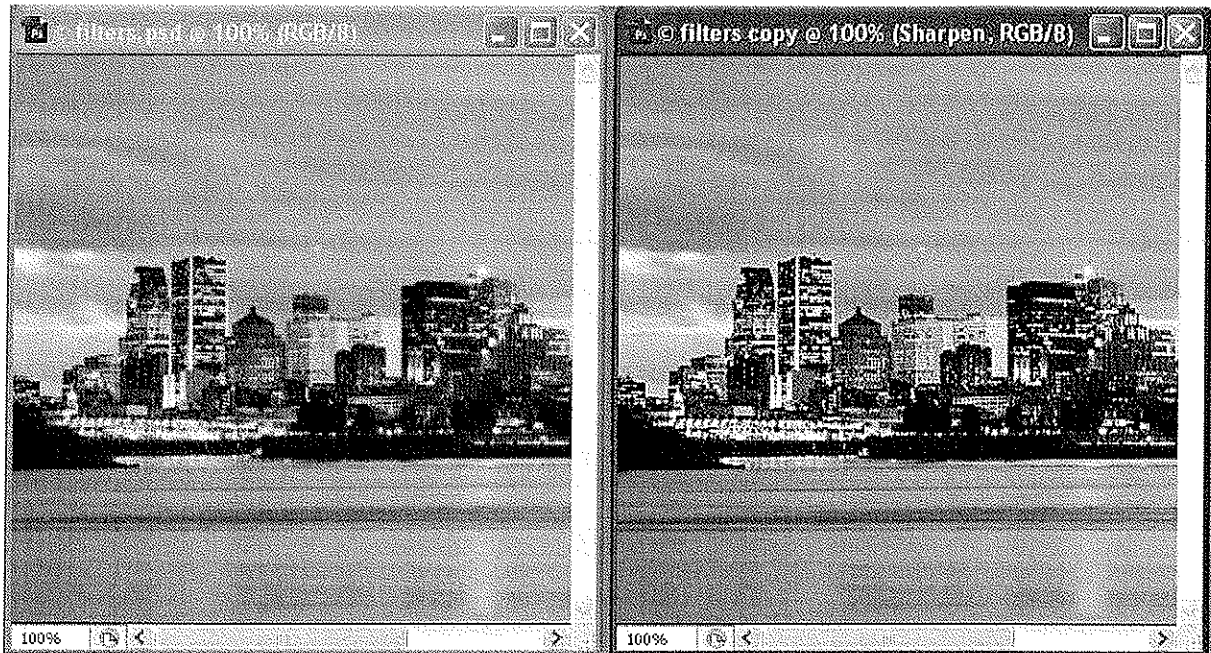
Note that after applying many of the filters, you can immediately reapply it to strengthen the effect.

Working with Blur Filters

Blur filters do just that: they blur. To blur an image, choose Filter – Blur and then choose the desired filter.

Filter	Analysis	View	Window	Help

Gaussian Blur	Ctrl+F

Convert for Smart Filters

Extract...	Alt+Ctrl+X
Filter Gallery...	
Liquify...	Shift+Ctrl+X
Pattern Maker...	Alt+Shift+Ctrl+X
Vanishing Point...	Alt+Ctrl+V

|			
Artistic	▶		
Blur	▶	Average	
Brush Strokes	▶	Blur	
Distort	▶	Blur More	
Noise	▶	Box Blur...	
Pixelate	▶	Gaussian Blur...	
Render	▶	Lens Blur...	
Sharpen	▶	Motion Blur...	
Sketch	▶	Radial Blur...	
Stylize	▶	Shape Blur...	
Texture	▶	Smart Blur...	
Video	▶	Surface Blur...	
Other	▶		
Digimarc	▶		

Here is an overview of each Blur filter.

Average   Fills in the selection (or image) with the average color. If you average an entire image, you will end up with a one color image.

Blur   Makes the transition between hard edges and their surrounding pixels smoother, softening the image.

Blur More   Has the same effect as the Blur filter, only several times stronger.

Box Blur   You set a radius, and Photoshop averages that number of pixels' color around each pixel. For example, if you set a 2 pixel radius, Photoshop will average each pixel's color with that of those within 2 pixels. The higher the radius, the greater the effect.

Gaussian Blur   Useful for making your image look hazy. Photoshop uses a weighted average for blurring your image, and blurs more at the low end of the frequency scale. You set a radius for Photoshop to use in its calculation; again, the higher the radius, the greater the effect.

Lens Blur   A more complex filter which results in some areas of your image looking blurry and others remaining sharper.

Motion Blur   Simulates the feeling of motion. You choose the degree in which to blur the image and the intensity with which to blur.

Radial Blur   Offers two distinct effects. Zoom keeps the center in focus and blurs around the edges to a degree you choose. Spin blurs with circular lines in an amount you choose.

Shape Blur   Creates a blur using your selected shape as the pattern for blurring. You can decide what radius to use.

Smart Blur   Photoshop searches for dissimilar pixels within a radius you choose, and then blurs them.

Surface Blur   Blurs more at the center of the image than the edges.

Here is an image blurred in two different ways. On the top is a motion blur, and on the bottom is a Gaussian blur.
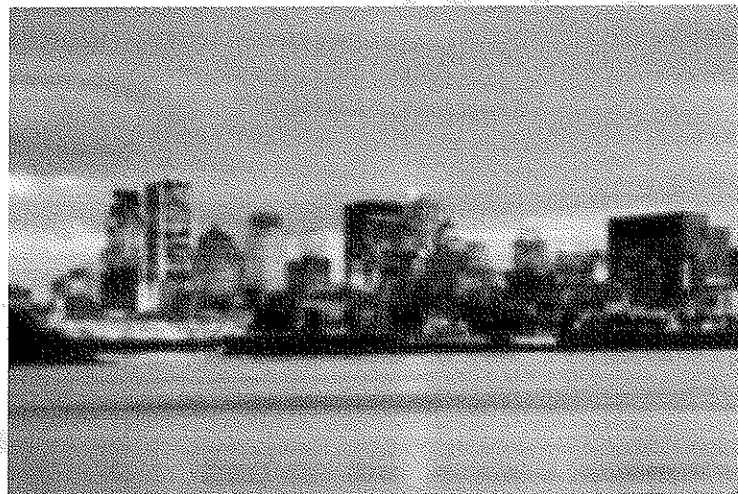
Lesson 4.4: Using Effects Filters

Beyond the Blur and Sharpen filters, there are many special effects you can apply. We saw some of them in the Filter Gallery, but in this lesson we are going to take a closer look at the Artistic filters, the Distort filters, the Pixelate filters, and the Noise filters.

Using the Artistic Filters

The Artistic filters are available in both the Filters Gallery and from the Filter – Artistic menu. They are used to apply effects seen in the art world. There are many artistic filters, and they include things such as:

- Colored pencil
- Watercolor
- Fresco
- Paint daubs
- Rough pastels
- Smudge stick
- Film grain

For the most part they are self-explanatory, but you can have fun experimenting with them to see what kind of effects they produce. This Latte image has had a Watercolor filter with an Overlay blend mode applied.
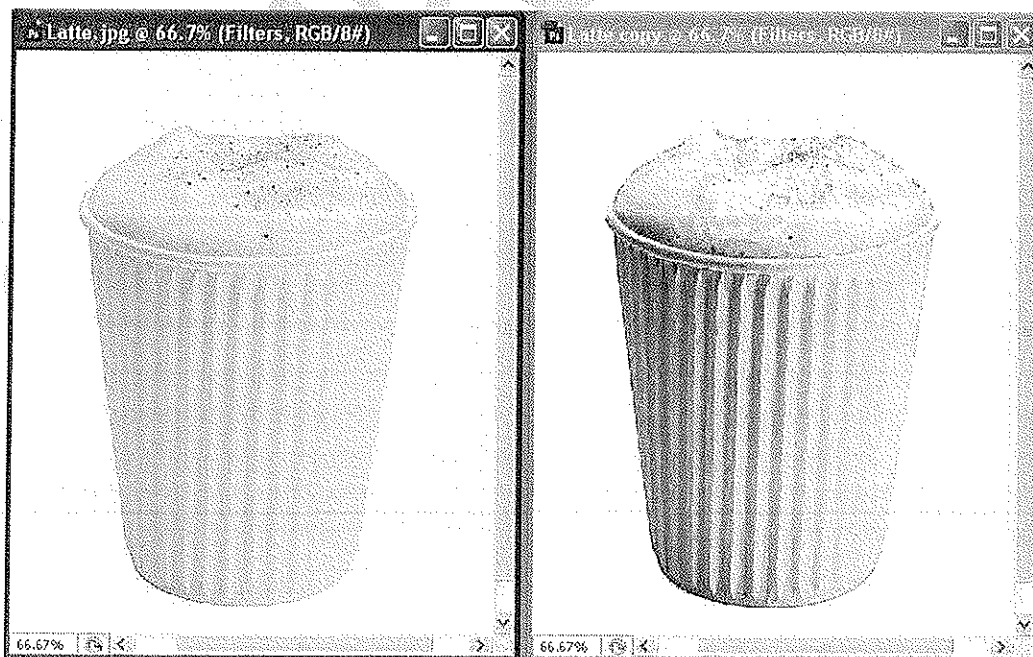
Using the Distort Filters

When you apply a Distort filter, your resulting image is geometrically distorted according to the algorithm of the filter you selected. They can be applied from the Filter – Distort menu. These are very stylized filters, and can be memory intensive. They include filters such as:

- Zigzag
- Glass
- Lens Correction
- Twirl
- Pinch
- Spherize

In this example, our latte has been twirled.
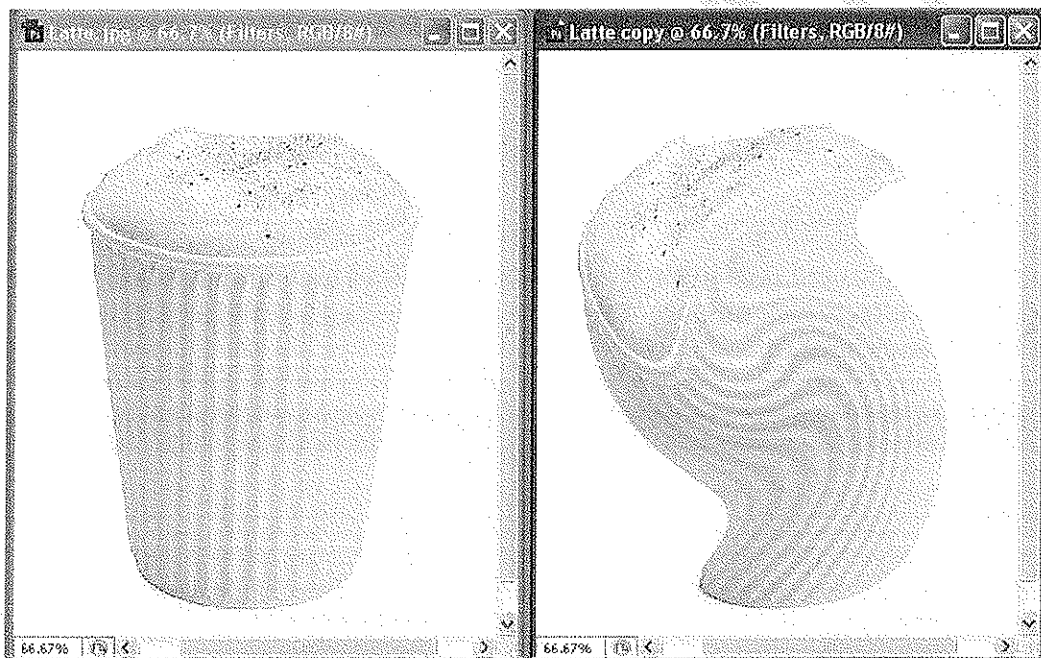
Using the Pixelate Filters

Pixelate filters work by grouping pixels together. To use the Pixelate filters, select Filter – Pixelate, and then choose the filter you want. Exactly how they are grouped together depends on the filter you choose. For example, if you choose the Mosaic filter, the pixels are grouped into tiles. If you choose the Crystallize filter, the pixels are grouped into a solid colored polygon.

In this example, the Mosaic filter has been applied.
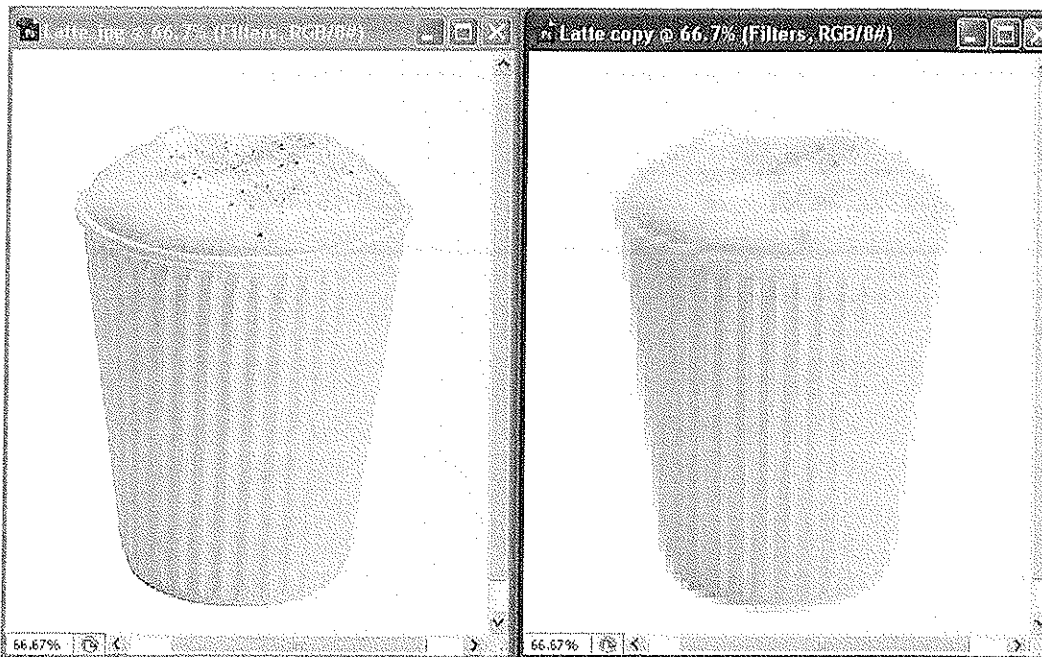
Using the Noise Filters

Image noise refers to random fluctuations of the colors of pixels in an image, such as flecks on the original image or a poor quality image scan. You can use noise filters to artistically add noise or to selectively remove it.

The filters which remove noise include:
- Despeckle, which blurs all of the image except the edges.
- Dust and Scratches, which changes pixels that don't fit into their surroundings.
- Median, which removes pixels whose brightness varies too much from neighboring pixels, and adjusts the center pixel to the average brightness of the pixels around it.
- Reduce Noise, which reduces the overall noise in an image.

The remaining noise filter, the Add Noise filter, adds noise to the level you choose. Can you see the noise in the latte image?
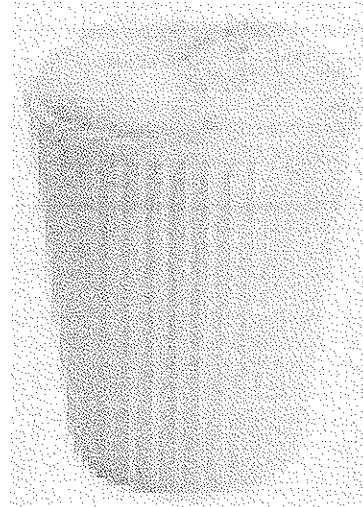
Using Other Filters

There are many other filters you can apply, all found in the Filters menu. Take some time and explore them, so you can add them to your arsenal of special effects. We have examined several categories, but you should also take a look at:

- Brush Strokes, which add more artistic effects to your image, such as Accented Edges or Sprayed Strokes.
- Render, which adds an overlay to your image of clouds, or fibers, or a camera lens flare.
- Sketch filters, which we saw in the Filters Gallery, and which can make an image look sketched or even 3-D.
- Stylize filters, which create highly changed images which have a variety of artistic effects. (You can also access these from the Filters Gallery.)
- Texture filters add a variety of textures to your image. (You can also access these from the Filters Gallery.)
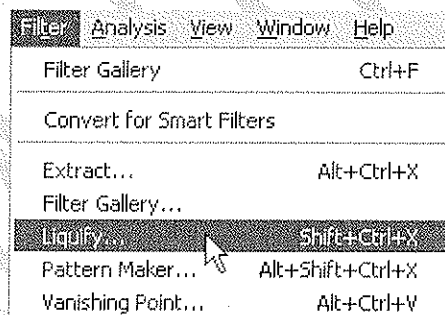
Lesson 4.5: Advanced Filter Tasks

There are several more things you can do with an image. You can apply various special effects using the Liquify filter and you can customize a pattern for your image using the Pattern Maker. If you need a watermark for your image, you can do that with a filter as well! We'll look at all of these in this lesson.
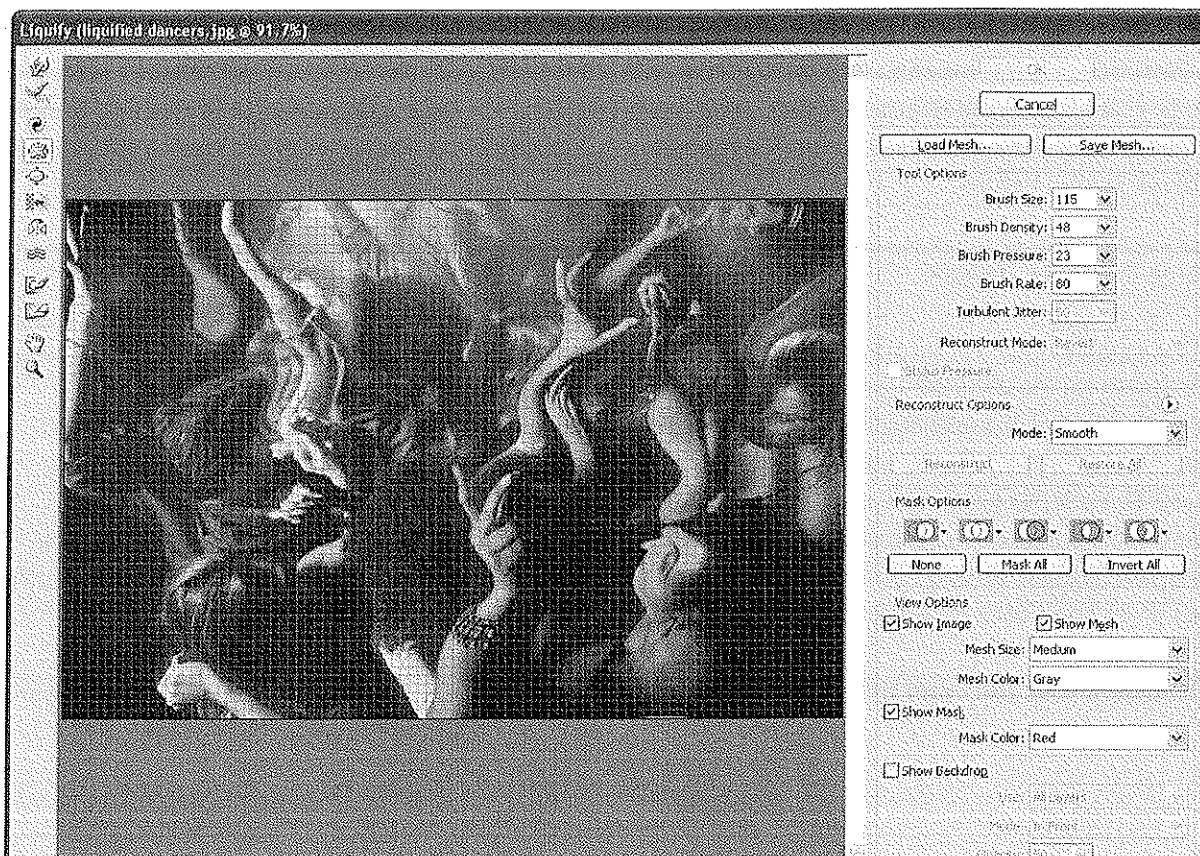
Liquifying an Image

The Liquify filter has a range of tools that you can use to warp or bloat all or part of your image. It works by masking off parts of your image that you don't want to have affected by the application of the effects. The mask tool is contained right in the filter. Areas that you don't want to effect are frozen using the Freeze tool, and when you want to include a frozen area, you Thaw it. As you work, you can adjust this mask, so you can apply with this filter with extreme precision. You can't Liquify a Smart Object layer, so make sure you are working on a duplicate layer so you can apply this filter non-destructively. Not all file formats support Liquify, so it's a good idea to work in a .psd file until you are satisfied with the effect.

To begin, click the Filter menu and click Liquify.

Filter	Analysis	View	Window	Help
Filter Gallery			Ctrl+F	
Convert for Smart Filters				
Extract...			Alt+Ctrl+X	
Filter Gallery...				
Liquify...			Shift+Ctrl+X	
Pattern Maker...			Alt+Shift+Ctrl+X	
Vanishing Point...			Alt+Ctrl+V	

This will open the Liquify dialogue box:

There are several ways you can Liquify an image. After you click the tool for the method, you can set the parameters at the right side of the dialogue box. You can also strengthen the effect by repeatedly stroking an area; the effect becomes stronger the longer you hold the mouse. If you would like a grid to work in, select the Show Mesh checkbox in the View Options area of the dialogue box. Additional options available on the left hand side of the window include:

- Clockwise twirl rotates pixels as you drag. (If you want to rotate the other way, press Alt as you apply the effect.)

- Pucker draws in the pixels surrounding your cursor.

- Bloat pushes pixels away from the cursor as you apply the effect.

- Push left pushes the selected pixels to the left.

- Mirror reflects the pixels perpendicular to the brush stroke.

- Turbulence mixes up the pixels.

If you make a mistake when liquifying your image, you can use the Reconstruct tool to brush back your modifications, or click the Restore All button to start over.

In this example, the dancers on the right have had various effects applied to give them a surreal look.
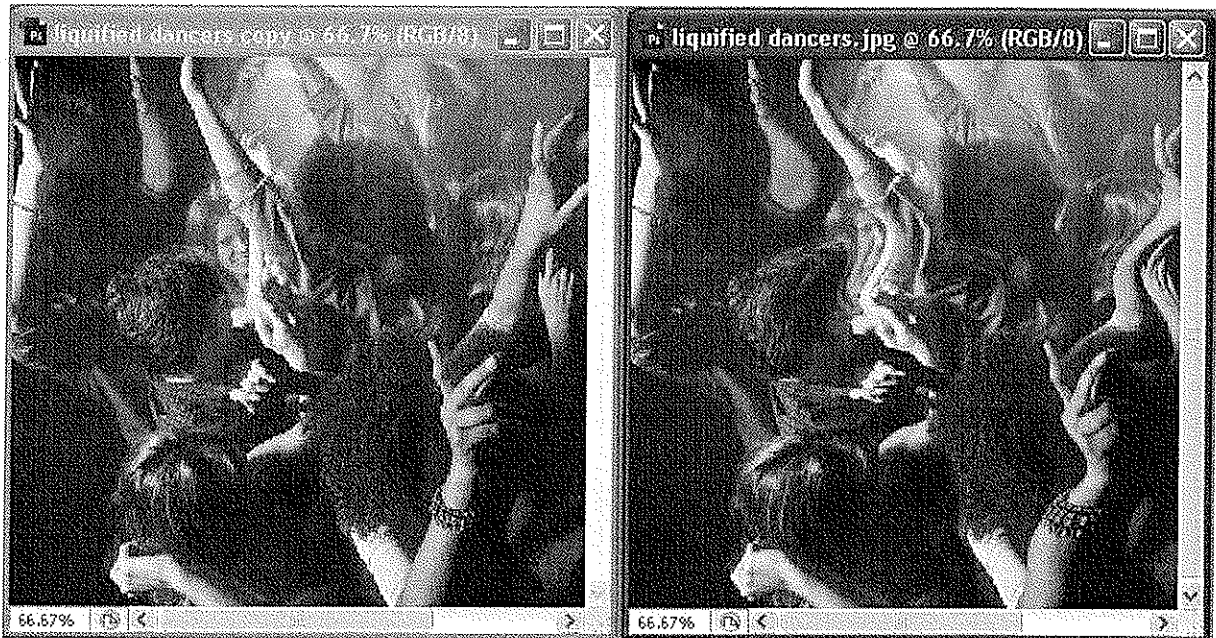

Using the Pattern Maker

The Pattern Maker allows you to create a layer out of all or part of an image. The pattern is tiled to your specifications. You will find the Pattern Maker command under the Filter menu.
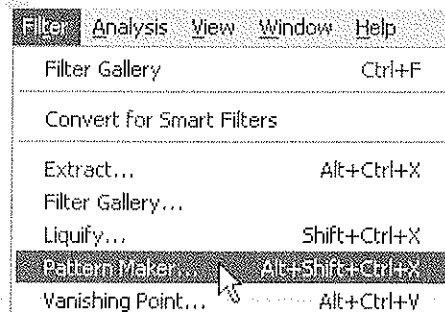
Using the Pattern Maker dialogue box, shown below, you can select a part of the image to create the pattern, and then apply it using the parameters you set. The active layer will be converted to this pattern, so make sure you are working on a duplicate layer, or a layer selected specifically to become a pattern. Not only can you use an element of the current image as a pattern, but you can copy a selection from another image and use it as a pattern.
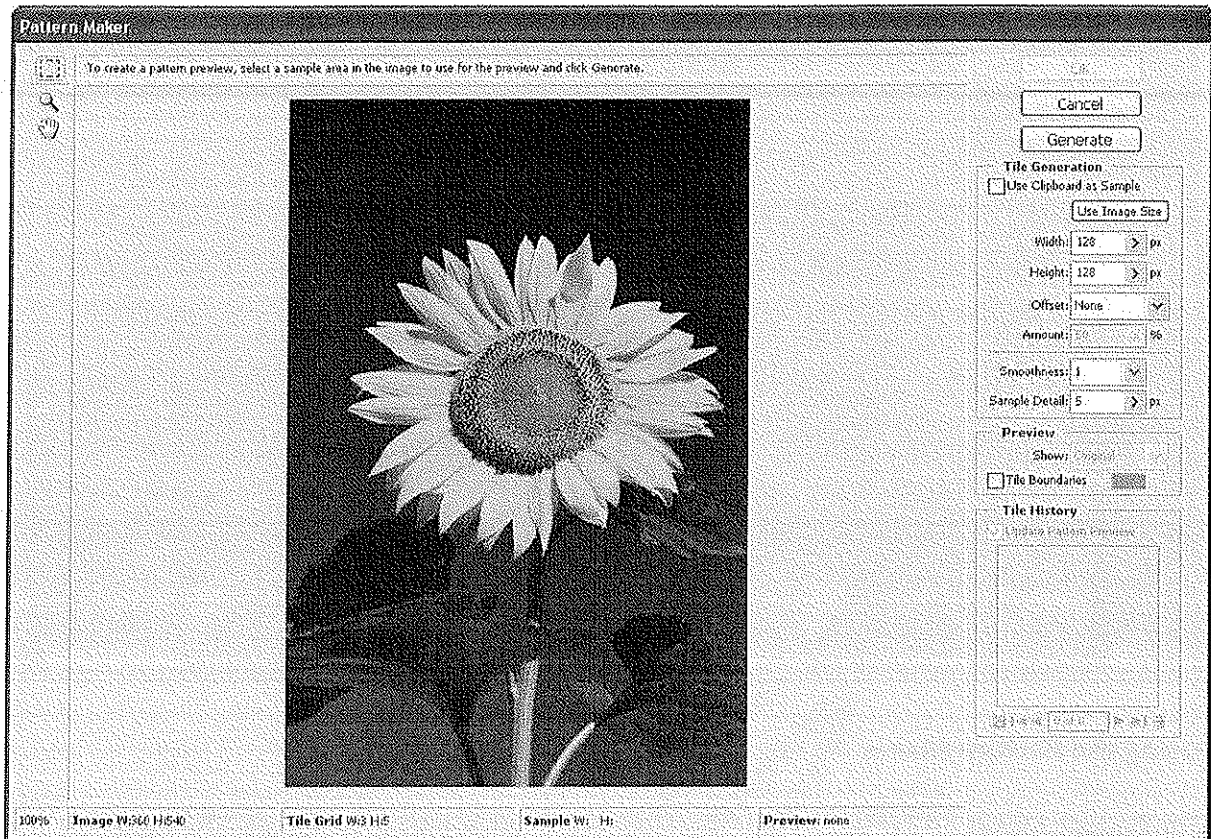
Once you select the area from which to create the pattern, Photoshop can generate different tiles from it. The Generate button changes to a Generate Again button and the Tile History section stores the versions of the tile. We suggest that you generate several, and then using the Tile History buttons, move to your choice. Click OK and the active layer will be covered with your pattern.
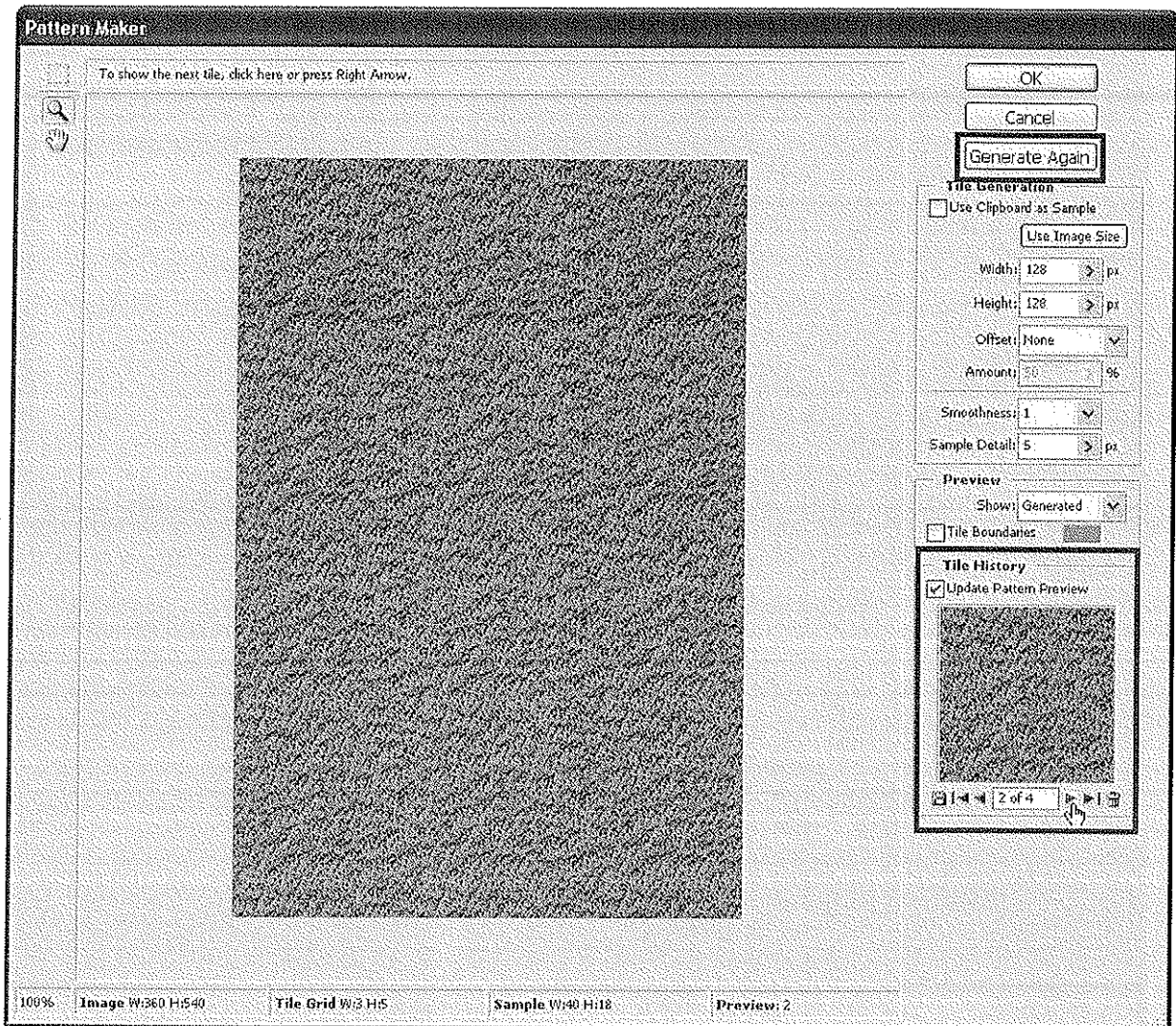
In the example below, the sunflower itself was selected to be the pattern. Then the sunflower was masked off and some adjustment layers were added. The end result is completely different from our starting point.
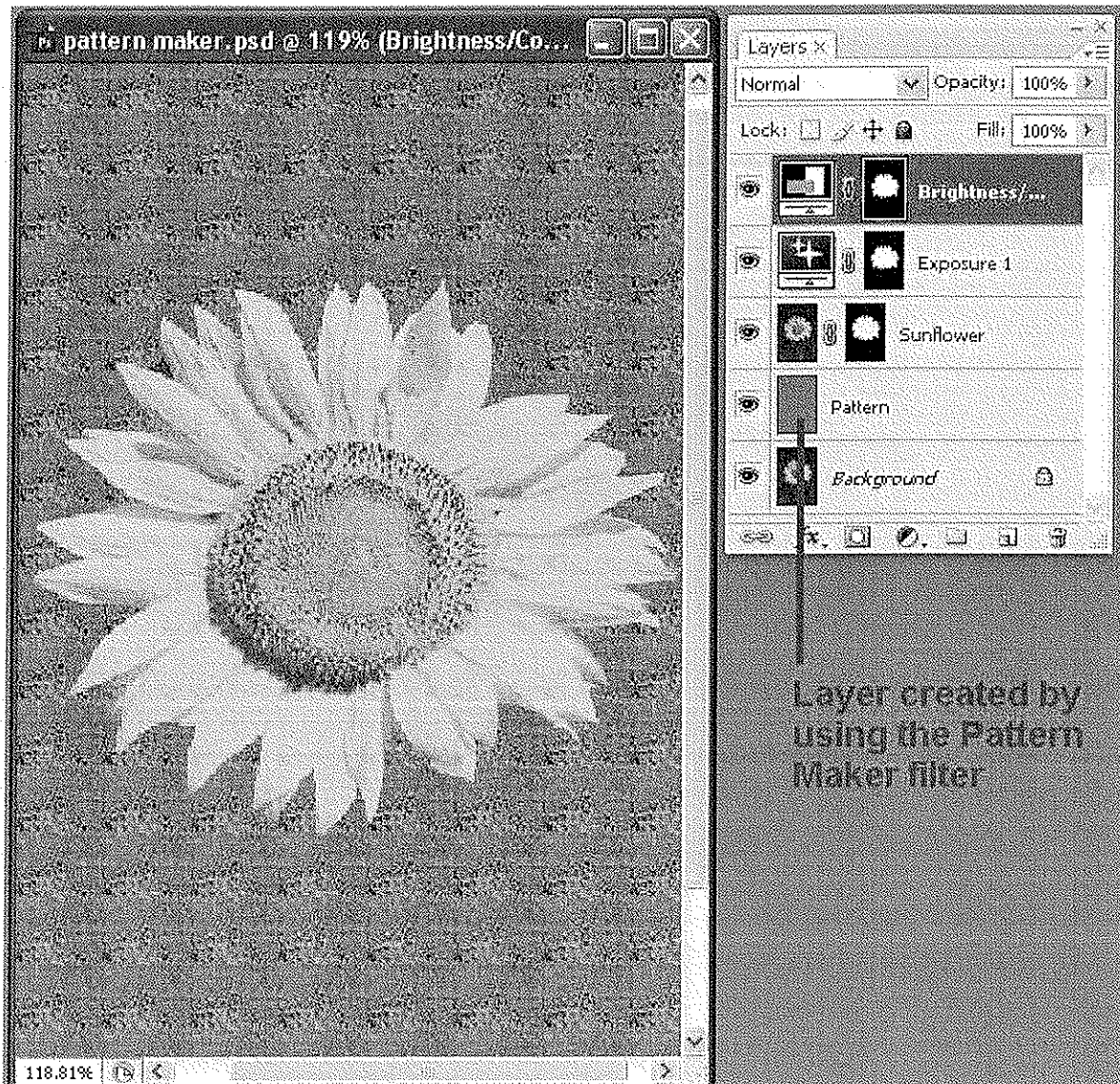

Embedding a Watermark in an Image

Photoshop provides a way to digitally watermark your image to protect it from copyright infringement. For full protection, you need to register with Digimarc.com. This will give you a unique identification that will be invisibly embedded onto your image. Digimarc also backs up your portfolio, and gives users an easy way to link back to you, making your watermark a marketing tool.

Once you have your identification, choose Digimarc from the Filter menu. Click the Personalize button to enter your ID, and then click OK in the Personalize dialogue box.
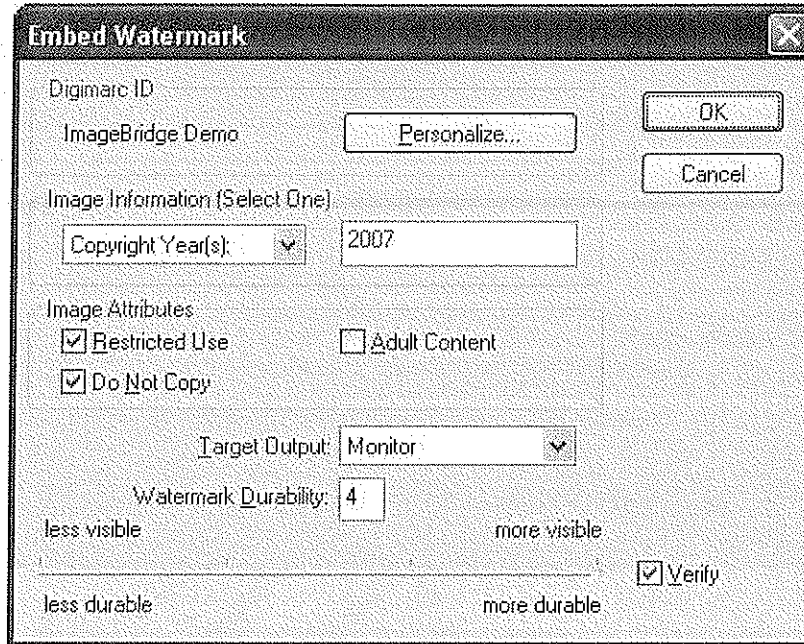
In the Embed Watermark dialogue box, you can select the information you want to display. Shown above is the copyright year, but you could choose to instead display a Transaction ID or Image ID. Add any additional information by checking the appropriate box, and then choose the visibility and durability setting you desire. Click OK to finish your watermark, and you'll see a confirmation dialogue box.
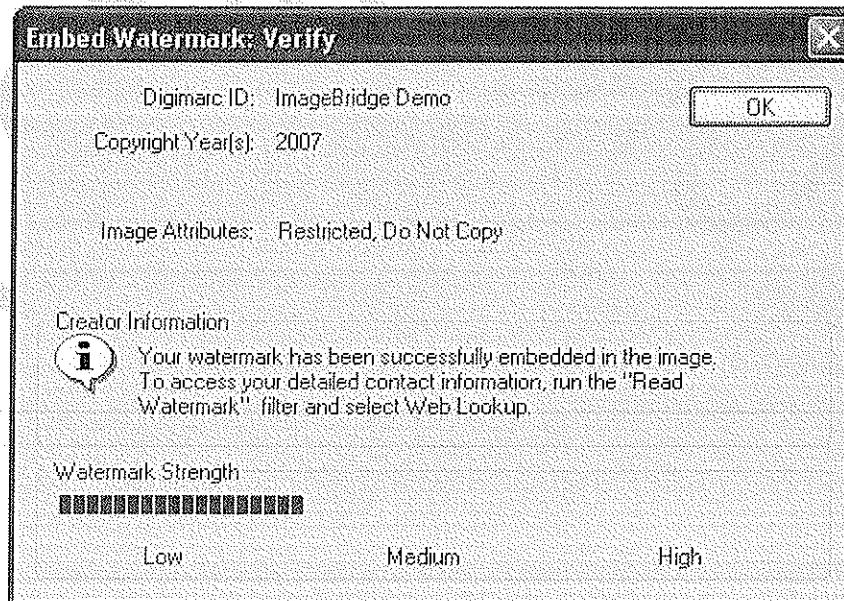
To read a watermark, select Filter – Digimarc – Read Watermark. The Watermark Information dialogue box appears. The URL at the bottom links to the Digimarc page containing your personal information, which you can access by clicking the Web Lookup button.
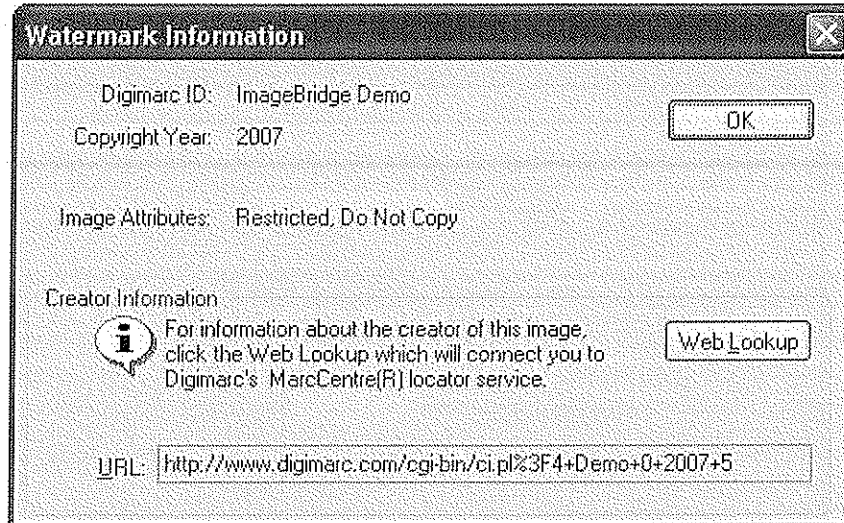
Section 4: Review Questions

1. Which of the following is not a type of mask:
   A. Vector
   B. Channel
   C. Layer
   D. Path

2. When you are working with a Quick Mask, what color do you use to fully mask or protect your image?
   A. Black
   B. White
   C. Gray
   D. Foreground color

3. The default name for the first new channel created from a selection is:
   A. New Channel
   B. Channel 0
   C. Channel 1
   D. Alpha 1

4. The best type of mask to use for blending two layers together is a:
   A. Vector mask
   B. Layer mask
   C. Clipping mask
   D. Channel mask

5. To create a clipping mask with your mouse or keyboard:
   A. Press Alt + Ctrl + G
   B. From the Layer menu, select Create Clipping Mask
   C. In the Layers palette, Alt + click the border between the clipping mask layer and base layer
   D. All of the above

6. Which of the following is not a type of channel?
   A. Color
   B. Spot Color
   C. Filter
   D. Alpha

7. Which of the following filter categories is not available in the Filter Gallery?
   A. Blur
   B. Artistic
   C. Distort
   D. Texture

8. If you wanted to sharpen your image with the greatest control, which filter would you use?
   A. Sharpen
   B. Sharpen More
   C. Sharpen Edges
   D. Unsharp Mask

9. The best way to apply filters non-destructively is to:
   A. Apply the filter to the Background layer
   B. Duplicate the layer before applying the filter
   C. Convert the layer to a Smart Object
   D. None of the above

10. A watermark created in Photoshop can contain:
    A. Copyright date(s)
    B. Your name
    C. The version of Photoshop
    D. File name