



**Tutorial**



# Adobe Photoshop™

*Macintosh Version*



# **Adobe Photoshop™**

## **Tutorial**

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# Before You Begin

Welcome to the Adobe Photoshop™ program — extraordinary photo-retouching, image editing, and color painting software. Whether you are a novice or an expert in image editing and color separating, the Adobe Photoshop program offers you the tools you need to get professional-quality results.

You'll find that the Adobe Photoshop program excels as a new art production tool, whether you are an art director or electronic publisher who needs to merge and edit color images, a photographer who wants to retouch proofs, or a graphic designer who is creating original or composite artwork including collages and photo montages. The software is equally useful to printers and service bureaus that want to generate color separations; animators who want to colorize images and produce audio-visual materials quickly; and artists who want to create new artwork using the latest media and custom tools.

The *Adobe Photoshop Tutorial* is a series of lessons designed to give you hands-on practice in learning the program. Ideally, you should work through the entire tutorial, then refer to the *Adobe Photoshop User Guide* for reference information.

The tutorial begins by explaining the basic concepts of the Adobe Photoshop program, and progresses through four lessons that give you practical experience using a variety of tools and techniques. This tutorial is divided into the following sections:

## **Getting Started**

This section explains the image types that Adobe Photoshop software supports. It also covers getting started with the program, opening, closing, and saving documents, using the toolbox, and correcting mistakes.

## **Lesson 1: Retouching a Gray-Scale Image**

Lesson 1 introduces a gray-scale image that you will retouch using several of the tools. The lesson covers determining the size of an image, cropping an image, and using the zoom, grabber, eraser, and rubber stamp tools. It also includes making selections with the lasso, and rectangular and elliptical marqueses, copying and pasting selections, and adding text to an image.

## **Lesson 2: Producing and Printing a Halftone**

Lesson 2 uses the gray-scale image from lesson 1 to print a halftone. The lesson covers setting up the halftone screen, adjusting brightness levels in an image, sharpening and blurring an image, and printing a halftone.

### **Lesson 3: Retouching a Color Image**

Lesson 3 introduces a color image that you will retouch using the painting tools. The lesson covers selecting color, and using the paint bucket, magic wand, pencil, paint brush, airbrush, line, and smudge tools. It also includes a brief explanation of how to use channels and filters.

### **Lesson 4: Producing and Printing a Color Separation**

Lesson 4 uses the color image from lesson 3 to print a color separation. The lesson covers resampling an image, setting up the screen for printing, printing a test proof, and adjusting the color balance. The last part of the lesson explains how to convert an RGB (red, green, blue) image to CMYK (cyan, magenta, yellow, black) in order to print a color separation.

Upon completing the tutorial, you will have covered the basic features of the Adobe Photoshop program. Although the tutorial does not introduce the myriad options that Adobe Photoshop offers, it will teach you the skills necessary to experiment with all of its features.

The tutorial assumes that you have a good working knowledge of Macintosh® usage and conventions. If you do not feel comfortable with these, refer to your Macintosh documentation before starting to use Adobe Photoshop.

## **System requirements**

To use the Adobe Photoshop program, you need:

- A Macintosh® SE or SE/30, II, IIfx, IICi, or IICx with a minimum of 2 megabytes of random-access memory (RAM)
- Apple® system software 6.0.3 or later
- A hard disk
- A color monitor (for color work)

Adobe Systems recommends:

- An 8- or 32-bit video display card
- A Macintosh-compatible scanner
- A laser printer
- A gray-scale monitor, if you are using a Macintosh SE

## The Adobe Photoshop software package

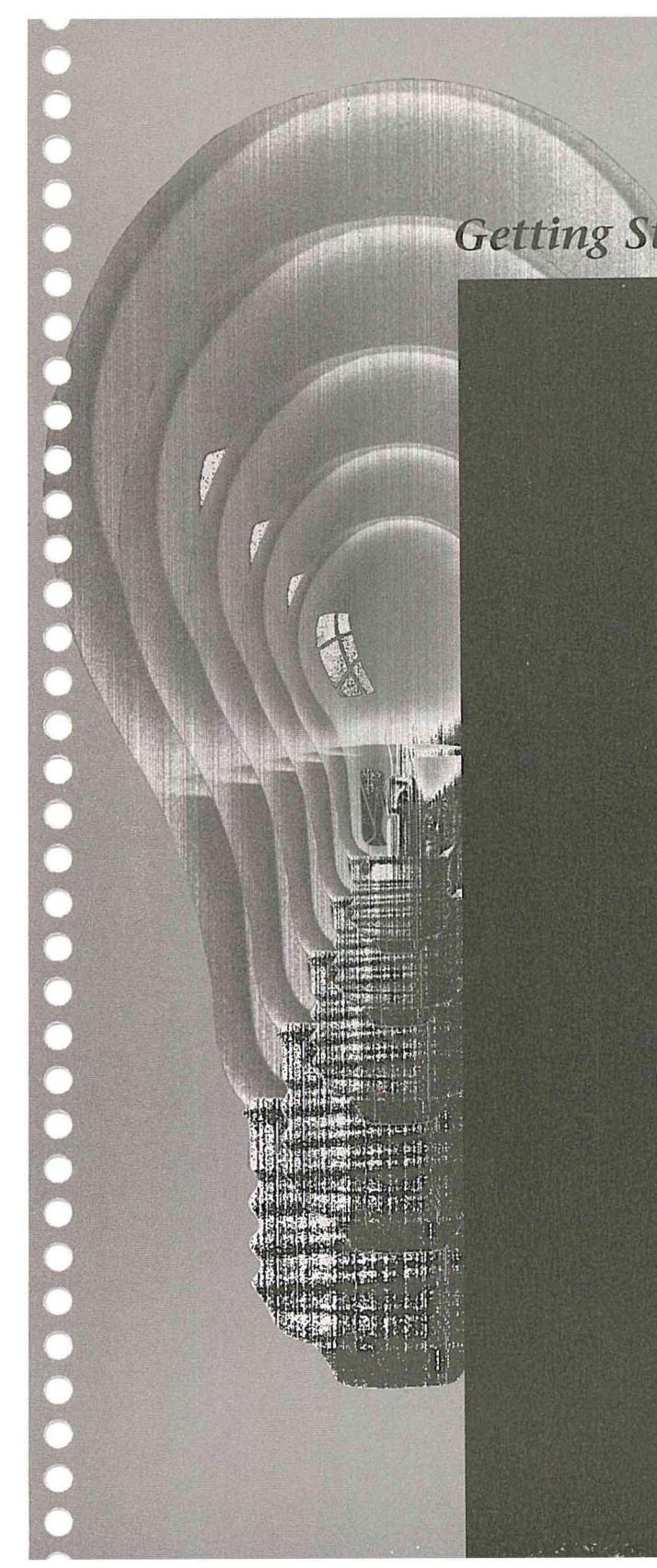
The Adobe Photoshop software package contains:

- The program disk
- The tutorial disk, containing two sample images
- The calibration disk
- A third-party software disk, containing plug-in modules
- Third-party software documentation
- *Adobe Photoshop User Guide*
- *Adobe Photoshop Tutorial*
- Adobe Photoshop Quick Reference Card
- Registration card and envelope

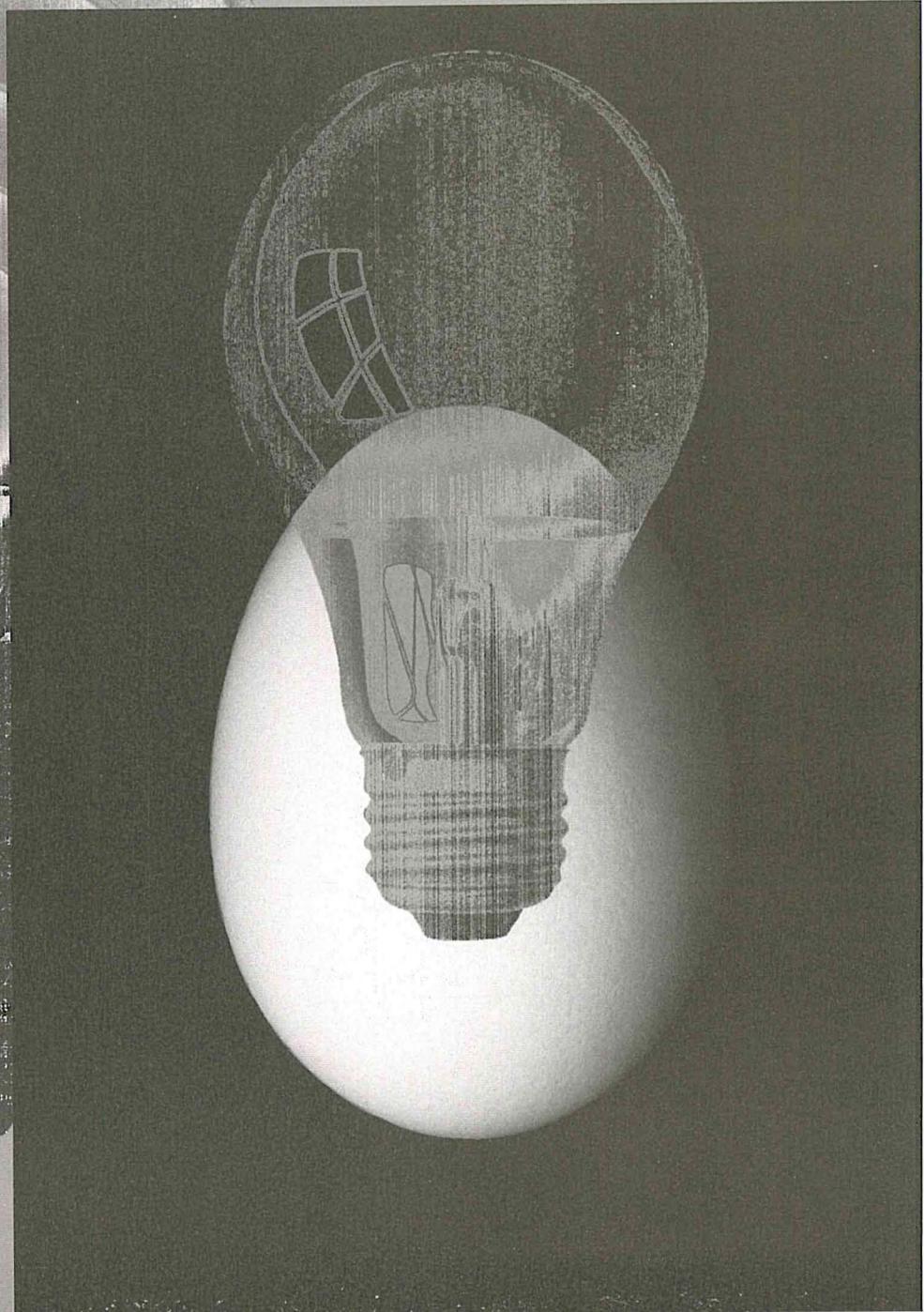
## Registration

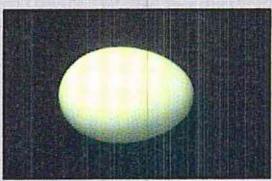
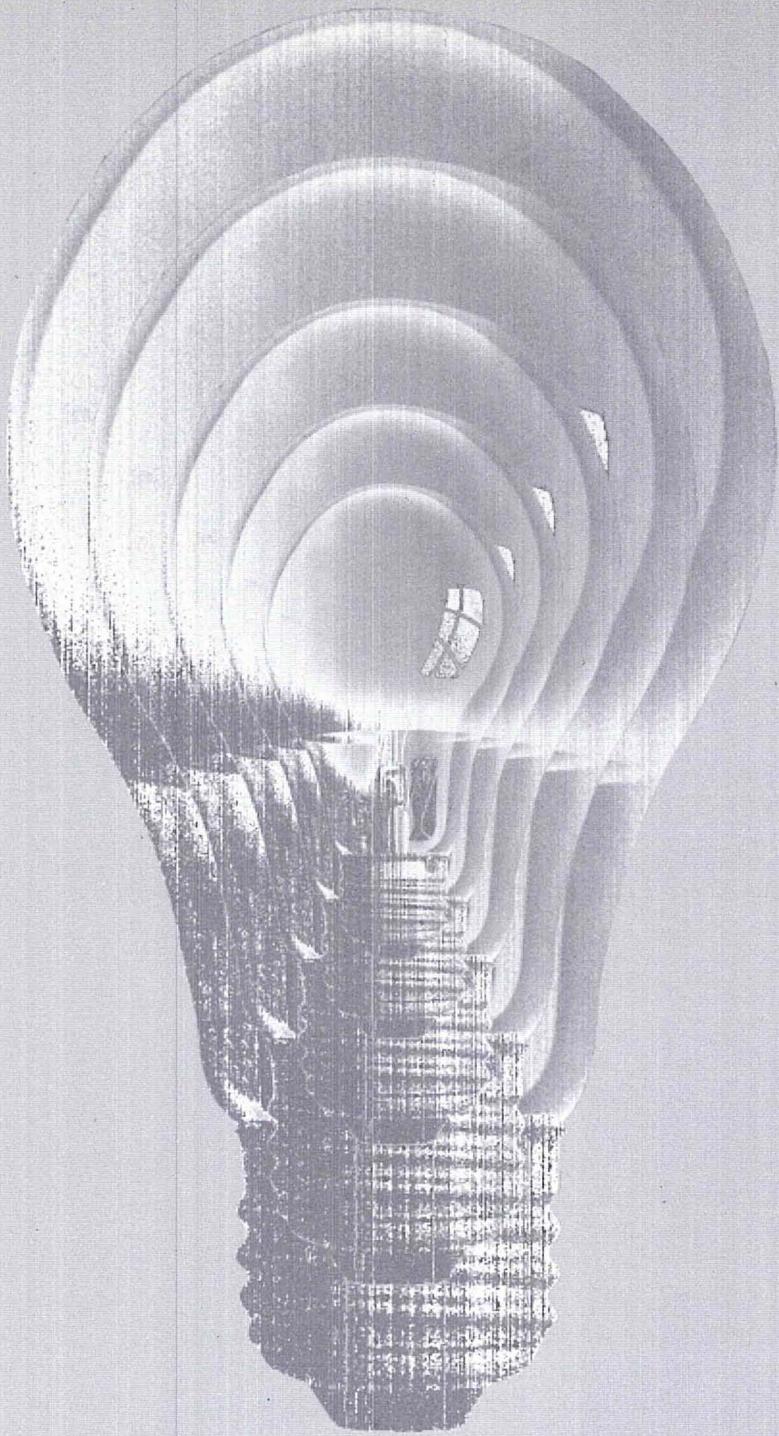
We are confident that you will find that the Adobe Photoshop program greatly increases your productivity. So we can continue to provide you with the highest quality software, offer technical support, and keep you informed about new Adobe Photoshop software developments, please send in the enclosed warranty registration card.





## *Getting Started*





Working with an image of a lightbulb, the designer created a mask of the image, inverted its colors, and created an arbitrary map to plot them. Using paste controls and the Find Edges filter, she further manipulated the image, then resized it several times.

The designer scanned in a 35mm slide of an egg and converted it to a gray-scale image. She then adjusted its color levels including the brightness and contrast, and created a mask of the results to further manipulate it.

# Getting Started

This introduction covers the basic concepts of the Adobe Photoshop program and the fundamental skills you need to use the software effectively. Once you have completed this section, you will be ready to use all of the features of the Adobe Photoshop program.

The Adobe Photoshop program combines a full range of painting and editing tools, sophisticated selection tools, and methods for adjusting gray levels and color in continuous-tone images. The Adobe Photoshop program features allow you to transform scanned photographs, slides, or original artwork in many ways. For example, you can crop, rotate, or resize an image. You can also alter it using almost two dozen filters that range in effect from blurring to mosaics.

Once you've finished retouching or editing your image, you can produce it as a halftone or color separation. The printing options within the Adobe Photoshop program allow you to make precise adjustments to your output, and to produce high-quality, camera-ready artwork and film.

The Getting Started section includes:

- The basic concepts of the Adobe Photoshop program
- Starting out using the Adobe Photoshop program
- Using the toolbox
- Opening and closing documents
- Saving documents
- Correcting mistakes

## Adobe Photoshop program basics

The Adobe Photoshop program supports a wide variety of image types used in applications that range from painting and color correction, to pre-press and dark-room technology. An image can be bitmapped, gray-scale, indexed color, RGB (red, green, blue), CMYK (cyan, magenta, yellow, black), HSL (hue, saturation, luminance), HSB (hue, saturation, brightness), or multichannel. It is important to get a basic understanding of these different image types before you begin using the Adobe Photoshop program.

The Adobe Photoshop program supports a number of different file formats. For more information on these formats, refer to the *Adobe Photoshop User Guide*.

One of the most fundamental concepts is that the Adobe Photoshop program treats images as a series of channels. A description of the various image types follows.

- A bitmapped image is the simplest type of image. A bitmapped image is a single-channel image, with one bit of color information per pixel. This means that the only colors displayed are black and white.
  - A gray-scale image is another single-channel image, with 8 bits of information per pixel. When you are working on a black-and-white image, you will typically display it as a gray-scale image. In a gray-scale image, 256 shades of gray may be displayed. You can use all the painting tools on a gray-scale image.
  - An indexed color image is a single-channel image, with 8 bits of color information per pixel. The “index” is a color lookup table containing 256 different colors. This table can restrict editing a color image because it may not contain every color you wish to use. Also, the airbrush, paintbrush, rubber stamp, smudge, blur, and sharpen tools do not work in the indexed color mode. If you plan to do extensive editing, you will usually want to convert an indexed color image to an RGB image.
  - An RGB (red, green, blue) image usually consists of three channels: a red, green, and blue channel, each holding 8 bits of color information for a total of 24 bits of color information per pixel. An RGB image also can have additional channels, known as alpha channels, which are discussed in lesson 3. An RGB image can be displayed with all three channels at the same time, creating a full-color image on a computer screen. You may also view each of these channels separately. All of the painting tools work on an RGB image. Editing a color image is most easily done in the RGB mode.
  - A CMYK image consists of four channels. Additional channels, called alpha channels, can be added, and are discussed in lesson 3. The four basic channels are cyan, magenta, yellow, and black. A CMYK image cannot be displayed in full color on a computer screen; only one channel at a time is displayed. You generally convert an RGB image to CMYK to print a color separation.
  - An HSL image is an RGB image that is displayed in three channels: hue, saturation, and luminance. Only one channel is displayed at a time.
  - An HSB image is an RGB image that is displayed in three channels: hue, saturation, and brightness. Only one channel is displayed at a time.
  - A multichannel image consists of two or more gray-scale channels grouped together. Multichannel images are generally gray-scale images with alpha channels. Images can be converted from one type to another, although there are restrictions on which types of images can be converted to other types. For further information on converting images, refer to the *Adobe Photoshop User Guide*.
- If you are new to the Macintosh, review your Macintosh owner's guide. You should be familiar with such terms as click, double-click, drag, and select before you begin using the Adobe Photoshop program.

## Starting out

Before you begin the lessons in this tutorial, you should copy the Adobe Photoshop program and the Tutorial sample image files onto your hard disk. If you need help doing this, refer to your Macintosh documentation.

### Starting the Adobe Photoshop program

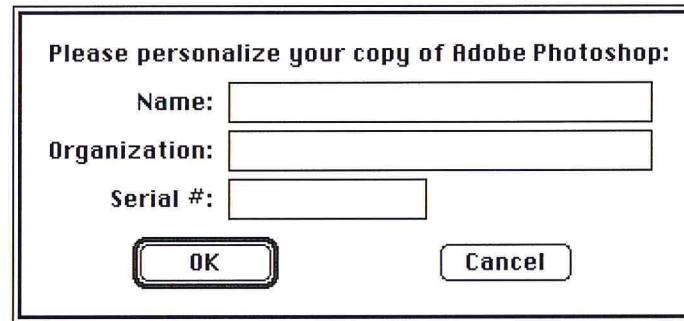
The first time you open the Adobe Photoshop program, you will need to personalize your copy of the program and set up a preferences file. A preferences file is not included with the Adobe Photoshop program. You will only need to enter this information the first time you start the program.

#### To start the Adobe Photoshop program:



1. Double-click on the Adobe Photoshop program icon.

The first time you start the program, a dialog box appears asking you to personalize your copy of the program.



2. Type your name and the name of the organization you work for. The organization is optional, but you are required to enter the serial number of your Adobe Photoshop program. The serial number can be found on your registration card and on your manuals.

3. Click OK.

A dialog box appears, asking where your preferences file is.

4. Click New to create a new preferences file.

A dialog box appears, asking where you want to store your PS Prefs file.

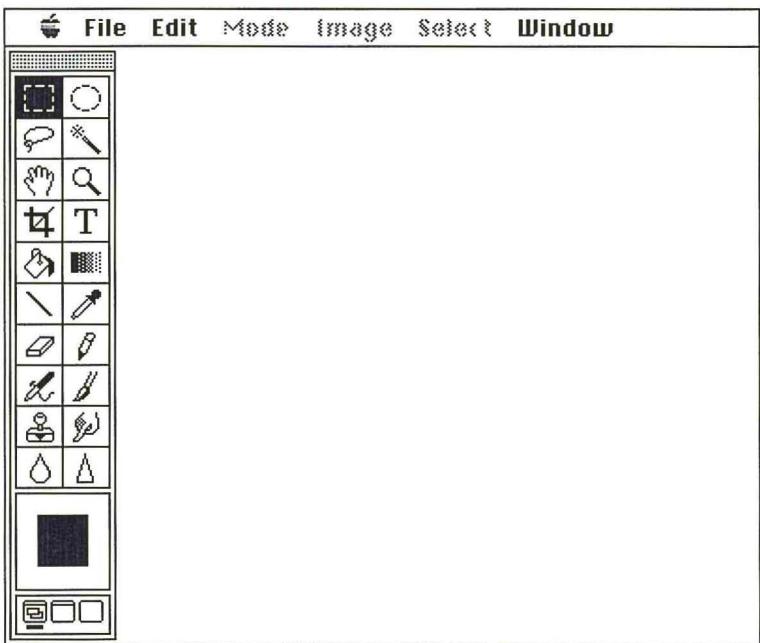
**NOTE:** Do not store the PS Prefs file in your system folder. It is recommended that you store the Adobe Photoshop program and the PS Prefs file in the same folder.

5. Click Save.

Your preferences file is saved as PS Prefs.

6. Click Cancel to return to the Adobe Photoshop program.

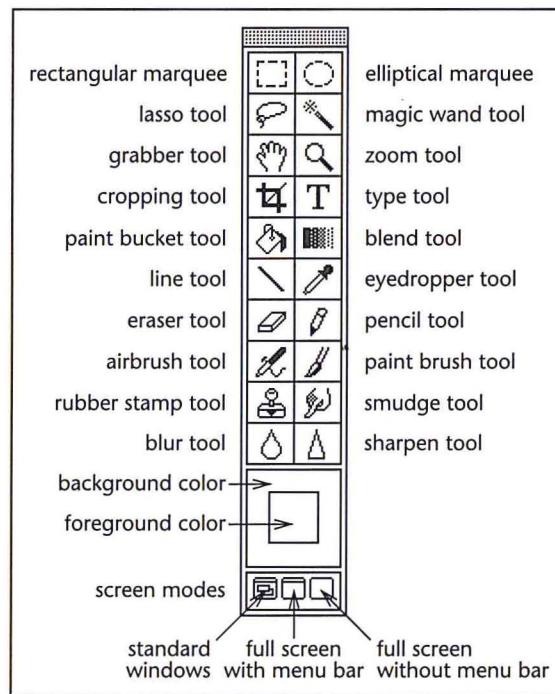
The Adobe Photoshop program desktop appears.



You are ready to open a document and start working.

## Using the toolbox

The toolbox contains tools that allow you to select, paint, edit, and view images. Each tool is represented by an icon.



A brief description of each tool follows.

- The rectangular marquee is a selection tool. It allows you to make rectangular selections.
- The elliptical marquee is another selection tool. It lets you make elliptical selections.
- The lasso tool is a selection tool that lets you make freehand selections.
- The magic wand tool is a selection tool that allows you to select images based upon the color similarities of adjacent pixels. This tool can be useful when you want to select part of an image (for example, a red flower) without tracing the outline with the lasso tool.
- The grabber tool lets you scroll through an image that is too big to fit in the active window.
- The zoom tool allows you to magnify areas of an image when you are performing close, detailed work, and reduce them to get an overall view of the image.
- The cropping tool lets you select part of an image, and discard the remainder.
- The type tool lets you enter text on an image.

- The paint bucket tool lets you fill areas that are similar in color with the foreground paint color.
- The blend tool allows you to create a gradient fill, which displays a gradual transition from the foreground to the background color.
- The line tool lets you paint straight line segments.
- The eyedropper tool lets you select the current foreground and background colors from colors in an image.
- The eraser tool lets you erase pixels until they are the same color as the background color. The eraser, in “magic eraser” mode, also allows you to restore part of an image to the last saved version.
- The pencil tool lets you paint freehand or straight lines with the foreground color. The pencil tool creates hard-edged lines.
- The airbrush tool allows you to lay down a diffused spray of the foreground color on an image.
- The paint brush tool lets you paint with the foreground color. Its stroke is soft-edged.
- The rubber stamp tool allows you to take a sample of part of an image, and place an exact copy (or “clone”) of that image elsewhere in the same image or in another image. It also lets you sample textures, and create an “impressionist” effect.
- The smudge tool lets you simulate the effect of dragging a finger through wet paint.
- The blur tool allows you to blur part of an image.
- The sharpen tool allows you to sharpen part of an image.
- The foreground color is the color you use with the painting tools (paint bucket, line, pencil, airbrush, and paint brush tools).
- The background color is the color that appears when you use the eraser or the blend tool, or when a selection is moved.
- The standard windows mode displays an image in standard Macintosh windows, with a menu bar at the top and scroll bars on the sides.
- The full screen with menu bar mode displays the image as a full-screen image with a menu bar at the top, but without scroll bars on the sides.
- The full screen without menu bar mode displays the image as a full-screen image without a menu bar or scroll bars.

## Using the tools

You select a tool by clicking it once. Most of the tools have options associated with them. To access the options, you double-click the tool.

## Using the tool pointers

When you click one of the tools, and position the pointer on the image, the pointer changes into the icon of the tool you selected. Each of the pointers has a different “hot spot,” the point where a selection or action such as painting begins. When you want to apply paint or edit with real precision, you may want to change the pointer into a cross hair pointer. The cross hair pointer gives you greater accuracy because you can focus the “hot spot” of the cross hairs (the intersection of the cross hairs) on the area you want to paint or edit.

**To use the cross hair pointer while using another tool:**

1. Press down the Caps Lock key.

The tool pointer changes into a cross hair pointer .

2. Release the Caps Lock key to resume using the tool’s normal pointer.

## Opening a document

The Adobe Photoshop tutorial provides two sample images: one gray-scale image called “Still Life,” which is a still life of grapes, an apple, garlic, leeks and a teapot; and one color image called “Flowers,” which is bouquet of flowers in a vase. You will first work with the gray-scale image, which you have copied onto your hard disk.

**To open the “Still Life” image:**

1. Choose Open from the File menu.
2. Select the “Still Life” file.
3. Click Open.

The “Still Life” image appears on-screen.

## Saving a document

After you have made changes to an image, you can save the changes using two Save commands in the File menu: Save and Save As.

You should use the Save command when you have made changes to a document and want these changes to be permanent. When you use the Save As command, you create another document with a new name, and leave the original document unchanged. You should use the Save As command when you want to leave the original document intact, and save your edited document separately. You can also use the Save As command to convert your file into a different file format. (See the *Adobe Photoshop User Guide* for further information on the file formats the Adobe Photoshop program supports).

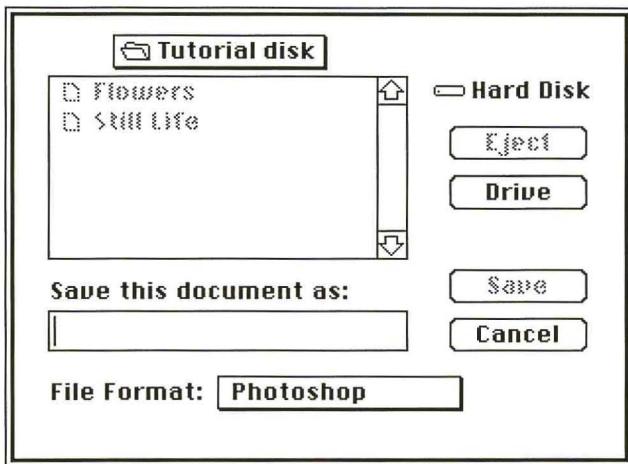
It is important that you understand the difference between these two commands so that you don't inadvertently alter an image irrevocably. Do not use the Save command unless you want to alter the original image permanently.

Try using the Save command now. To save the "Still Life" image using the Save command, choose Save from the File menu.

You should now make a copy of the original "Still Life" image. You will use the copy as your working document. By leaving the original image unchanged, you will have a reference document so that you can compare your retouched photo to the original photo. To copy the "Still Life" image under a new name, use the Save As command.

#### To save a document using the Save As command:

1. Choose Save As from the File menu.
2. Type the name you wish to assign to the new document in the Save As text box.



3. Press the Return key.

Your document is now saved under a new name, and the original document remains unaltered. The document that appears on the screen is the new document.

### Correcting a mistake

You need not be overly concerned about making mistakes while using the Adobe Photoshop program. You can make adjustments as you touch up images. Often, operations can be undone, and operations that have been undone can be redone. You can easily correct most mistakes using the Undo command.

You must choose the Undo command immediately after the operation you just performed, before you click anywhere or perform any other operation. The wording of the Undo command corresponds to the operation you have just performed. For example, in the next lesson, you will perform a cropping operation. If you choose the Undo command immediately after cropping an image, the Undo command reads “Undo Crop.”

If an operation cannot be undone, the Undo choice is dimmed and will read “Can’t Undo.”

To use the Undo command, choose Undo from the Edit menu.

## Using the Revert command

At times, you may want to undo a series of operations you have performed. In this case, you would use the Revert command rather than the Undo command. In reverting, you will lose all changes you have made to the image since the last time you saved it, and return to the previously saved version of the image. Reverting can be done at any point in your manipulation of an image. If, at any point in working through the tutorial, you would like to retrieve the last saved version of the document, you may use the Revert command.

**To revert to the last saved version of the image:**

1. Choose Revert from the File menu.

You will receive a message asking if you wish to revert to the previously saved image.

2. Click OK.

You are back to the most recently saved version of the image.

## Closing a document

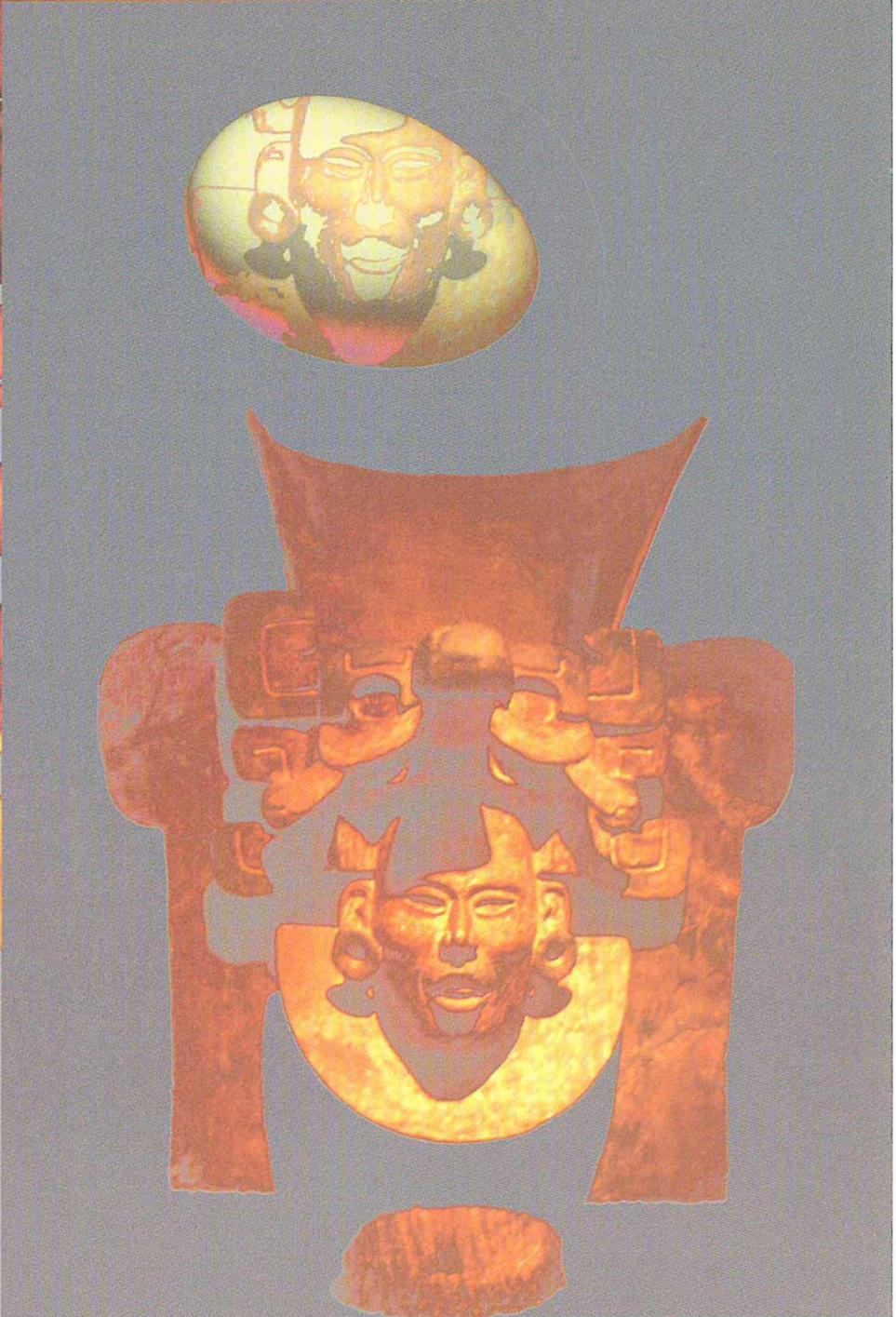
There are two ways to close documents in the Adobe Photoshop program.

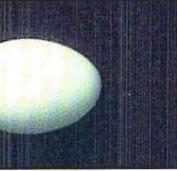
To close a document, click the close box in the upper-left corner of the image, or choose Close from the File menu. You will be asked if you want to save your changes before closing. Click OK.

Your image is closed, and disappears from the screen. You need to reopen it in order to continue.



## Lesson 1: Retouching a Gray-Scale Image





From a scan of a 35mm slide of an egg, the designer created a mask, rotated the selection, and adjusted the green and blue color levels.

Using a 35mm slide of an ancient artifact, she created a mask, and used paste controls to alter it. Then she made a selection using the magic wand tool, stretched the selection, and used paste controls. The underglow effect was created by adjusting color levels.

# Lesson 1: *Retouching a Gray-Scale Image*

One of the most common needs of photographers, desktop publishers, and graphic designers is the ability to retouch and enhance images. The Adobe Photoshop program offers a number of painting and editing tools to help you perform both of these functions. In this lesson, you will learn how to begin using the Adobe Photoshop program and how to use its basic tools as you work with a gray-scale image.

## Overview

This lesson will teach you how to check the size of an image to see if it meets any size requirements you may have, and how to crop an image to trim it if you need to do so. Since you'll frequently need to magnify areas of an image to perform detail work, you'll learn how to zoom in on an image, and how to scroll through a magnified image. You will also learn how to use several selection tools so that you can select certain areas to edit while you leave the rest of an image unchanged.

Another skill you will acquire will be copying selections so that you can paste them elsewhere in the same image (or, into another image). You will learn about feathering selections to make changes appear more subtle. You will use the eraser tool to clear parts of the image, and the magic eraser to restore the image. You will use the rubber stamp tool to take a sample from the image, and paint a duplicate of the sample elsewhere in the image. Finally, you will learn how to add text to an image.

The features covered in this lesson include:

- Determining the size of an image
- Cropping an image
- Zooming in and out of an image
- Scrolling through a magnified image
- Making selections with the lasso tool and with the rectangular and elliptical marqueses
- Copying and pasting selections
- Erasing part of an image
- Using the rubber stamp tool
- Adding text to an image

This lesson uses the image of a still life of grapes, an apple, garlic, leeks, and a teapot introduced in the "Getting Started" section. The image, "Still Life," is on the first tutorial disk. You will be making extensive changes to the image as you work through this lesson. If you are not satisfied with your changes, you may revert to the original image at any time by choosing Revert from the File menu.

To begin the lesson, open the image.

## Determining the size of an image

You may have size specifications for an image and may therefore want to verify that your image will fit into a designated area. For example, imagine that you need an image for a magazine, and have to fit that image into a 3-inch-by-5-inch space.

There are three ways to check the size of your image. You can use the size box on the lower-left corner of the screen, the Size/Rulers option in the Page Setup dialog box, or the Show Rulers option in the Window menu. The size box on the lower-left corner of the screen also allows you to preview the way an image will print on an 8-1/2-inch-by-11-inch page.

**To use the size box on the screen to check the size of an image:**

1. Open the "Still Life" image if it is not already opened.
2. Position the pointer on the lower-left corner of your screen where the image's size is displayed (e.g., 191K).



3. While pressing the Option key, hold down the mouse button.

A size box will display:

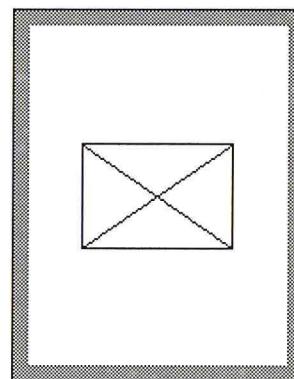
Width: 525 pixels (5.25 inches)
Height: 372 pixels (3.72 inches)
Channels: 1 (Gray Scale)
Resolution: 100 pixels/inch

- Width (in pixels and inches)
- Height (in pixels and inches)
- Number of channels
- Resolution (number of pixels/inch)

4. After you have confirmed the image's size, release the mouse button.

To see how an image will appear on a printed page:

1. Position the pointer on the size box in the lower-left corner of the screen.
2. Press the mouse button to see the Page Preview box.

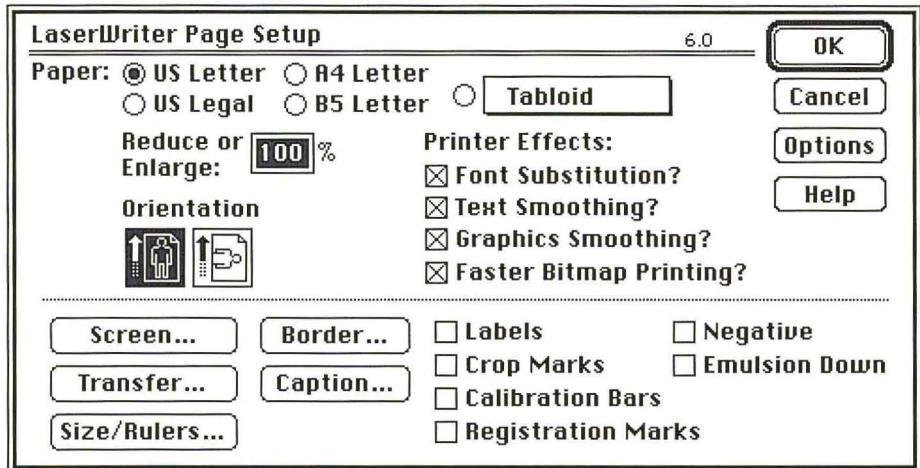


3. After you have previewed the page, release the mouse button.

To use the Page Setup dialog box to check the size of an image:

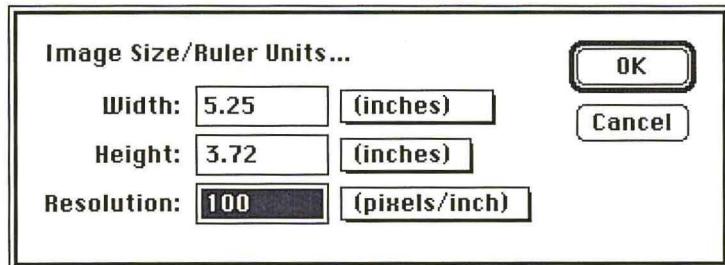
1. Choose Page Setup from the File menu.

The Page Setup dialog box appears.



2. Click Size/Rulers.

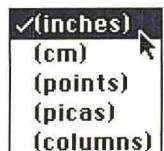
The Image Size/Ruler Units dialog box appears.



The default size unit is inches, but you may choose to display the image size in centimeters, points, picas, or columns.

To change ruler units:

1. Position the pointer on the size unit (inches).
2. Hold down the mouse button to display the other unit options.

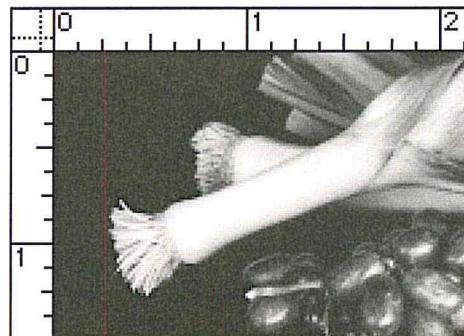


3. Drag to highlight the unit of your choice.
4. Release the mouse button.

When you have verified the size of your image, click OK. Click OK again.

To display rulers on an image, choose Show Rulers from the Window menu.

The rulers will appear in the size units you specified in the Image Size/Ruler Units dialog box.



Still Life image with rulers displayed

You may hide the rulers by choosing Hide Rulers from the Window menu.

## Cropping an image

Frequently, you may want to select part of an image, without using the rest. For example, you may need a photograph of the president of your company for your annual report, but only have an image of the president talking with several other people. You could crop just the president in the image, and discard the remainder.

You may trim your image using either the cropping tool in the toolbox, or the Crop command in the Edit menu. The cropping tool lets you rotate a selection while you crop it.

In this section, you will crop the grapes in the "Still Life" image as an exercise, then revert to the original image so that you will have the whole image to use for the rest of the lesson.

**To crop an image using the cropping tool:**

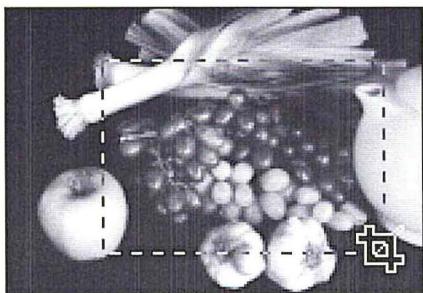


1. Click the cropping tool.

The pointer changes into the cropping pointer, which looks like the cropping tool.

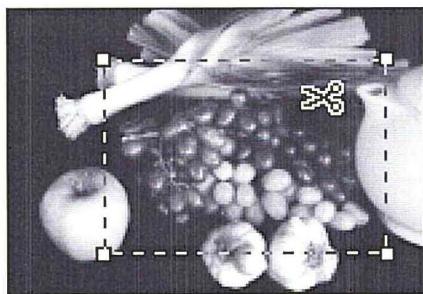
2. Position the pointer where you would like to start cropping your image.

3. Hold down the mouse button, and drag diagonally until your image is the desired size.



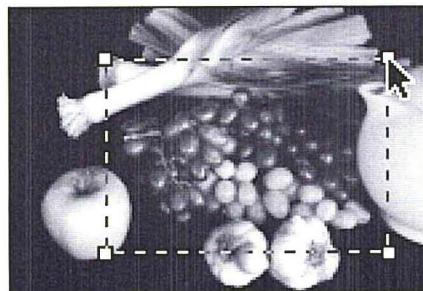
4. Release the mouse button.

You will see a rectangular marquee surrounding the area to be cropped. Notice that the cropping pointer turns into a scissors pointer when it is inside the selection marquee.



**To adjust the size of the cropped image:**

1. Position the pointer on any one of the four handles on the selection marquee. Adjust your position until the cropping tool turns into an arrow.



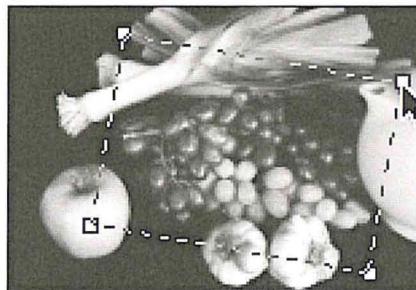
2. Hold down the mouse button, and drag the border of the cropped image to the desired size.

#### To move the selection:

1. Position the pointer on any one of the four handles on the selection marquee.
2. Hold down the Command key and the mouse button, and drag the marquee in any direction.

#### To rotate the selection:

1. Position the pointer on one of the handles on the marquee.
2. Hold down the Option key, and press the mouse button.
3. Drag in a clockwise or counterclockwise direction to rotate the selection.



Rotating a cropped selection

You are now ready to crop the image.

You may cancel a cropping operation by clicking once anywhere outside the marquee selection.

To crop the image, click once inside the cropped area. The extraneous areas are discarded, and the cropped, rotated image appears on-screen.

To undo the crop, choose Undo from the Edit menu.

#### Reverting to the original image

Now that you have successfully cropped the grapes, you will revert to the last saved version of the image so that you will be able to use the entire image in this lesson. You can use the Undo Crop command from the Edit menu to undo the last cropping operation, or revert to the last saved version of the image.

#### To revert to the last saved version of the image:

1. Choose Revert from the File menu.

An alert box appears, asking you to confirm whether you want to revert to the previously saved version of the document.

2. Click OK.

The wristwatch icon appears while the Adobe Photoshop program retrieves the previous version of the image.

## Zooming in for a closer look

You may want to take a closer look at part of an image to see the image in greater detail. The zoom tool lets you magnify any area of the image. Each zooming action magnifies the image by two times its original size.

To zoom in for a closer look:

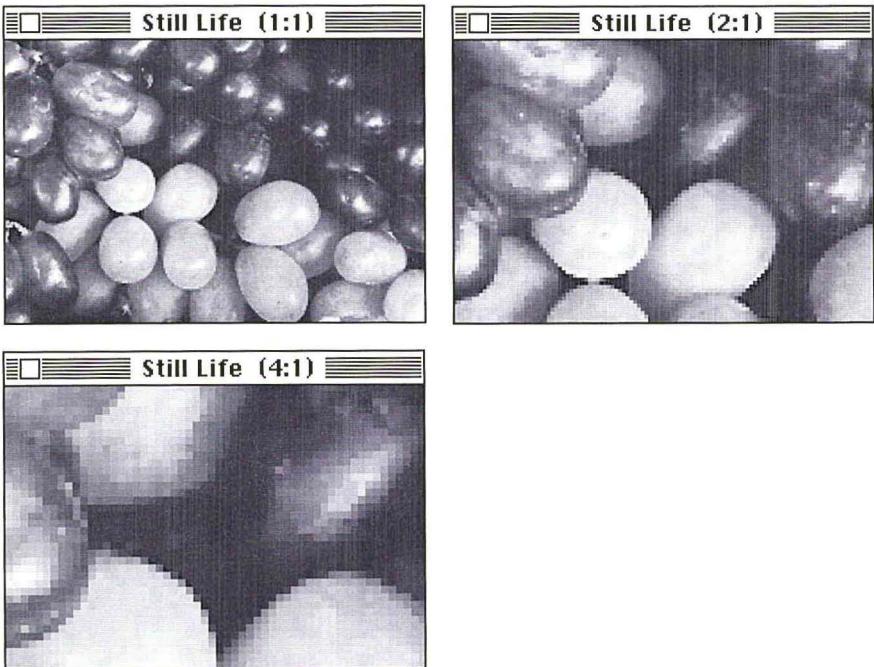


1. Click the zoom tool in the toolbox.
2. Position the zoom tool on the grapes.

The pointer changes into the zoom pointer.

3. Click the mouse button once.

The grapes are magnified by two times their original size. Each time you click the mouse button, the magnification doubles (2:1, 4:1, 8:1, and so on). The magnification factor is displayed at the top of the image, after the file name.



## Scrolling through an image

Once you have magnified your image, only a portion of it may fit in the window. The grabber tool lets you move the image in any direction so that you can see the entire image. You can also use the scroll bars by clicking on the arrows in the scroll bar in the direction you want the window to move. Before you start this section, make sure your image is magnified by at least 2:1 so that you will be able to scroll through the image.

### To scroll through an image:



1. Click the grabber tool in the toolbox or hold down the spacebar.

The pointer changes into the grabber pointer, which looks like the grabber tool icon.

2. Hold down the mouse button, and drag in the direction you want to move. You may scroll in any direction.

The grabber tool is useful only when an image is too big to fit in the active window.

To return to the image's original, 1:1 size, double-click the zoom tool.

### Selecting part of an image with the lasso tool

You may decide to modify only parts of an image at a time while leaving the rest of the image unchanged. The Adobe Photoshop program lets you isolate areas of an image using a number of selection tools, including the marquee and lasso tools. When an area is selected, any editing you do will affect only the selected area.

The lasso tool is a freehand tool that lets you trace the outline of an arbitrary area you wish to select. Once you make your selection, you can easily add to it or subtract from it. You can also use the lasso tool to select straight line segments, or a combination of straight and freehand lines.

#### To make a selection using the lasso tool:

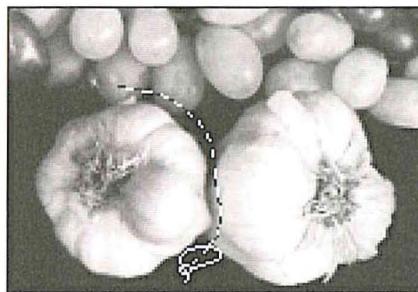


1. Click the lasso tool in the toolbox.

2. Position the lasso tool at the edge of the left garlic bulb.

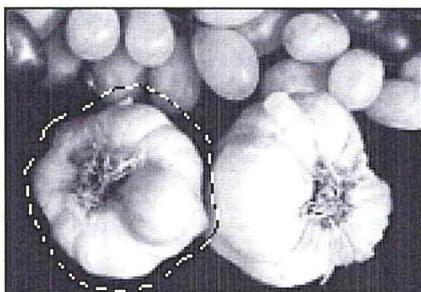
The pointer changes into the lasso pointer, which looks like the lasso tool.

3. Hold down the mouse button, and trace the outline of the entire garlic. Your outline does not have to be precise because you can make adjustments to it later. If you do not connect the two ends of the lasso, a straight line will automatically be drawn between the unconnected end points of the lasso.



4. Release the mouse button.

You now have a lasso around the left garlic bulb.

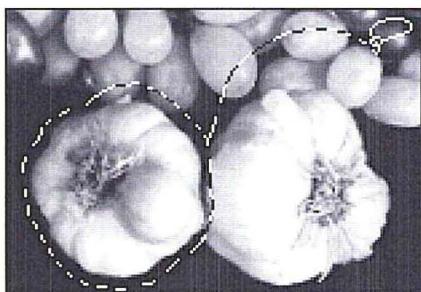


### Adding to and subtracting from a selection

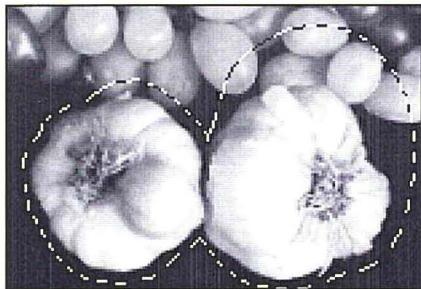
If you have not selected the exact area you wanted, you may alter the selection by adding to it or subtracting from it.

#### To add to a selected area:

1. Press the Shift key, and continue to hold it down as you press the mouse button.  
*NOTE: If you click the mouse button without first pressing the Shift key, you will lose the first selection.*
2. Drag to trace the outline of the second bulb of garlic, to add it to the original lassoed selection.

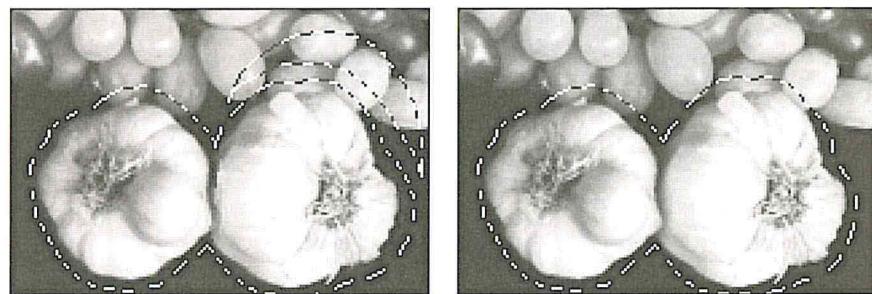


3. Release the Shift key and the mouse button. A new lasso appears around the two garlic bulbs.



### To subtract from a selected area:

1. Hold down the Command key, and press the mouse button.
2. Trace the outline of the right garlic bulb. Make sure that you completely surround the first lasso border. If you do not connect the end points of your new lasso that is selecting the area to be removed, you will bisect your lasso into two, separate lassos.
3. Release the Command key and the mouse button. The new, reduced lasso appears around the right garlic bulb.



### Selecting a combination of straight and freehand lines

You can use a combination of straight line segments and freehand drawing with the lasso tool. This is useful on an object such as the leek in this image because it combines straight lines and curves. As you select a combination of straight and freehand lines, you must continue holding down the Option key. Click to define starting and end points of straight line segments; to draw freehand lines, hold down the mouse button and drag.

#### To select straight and freehand lines with the lasso tool:

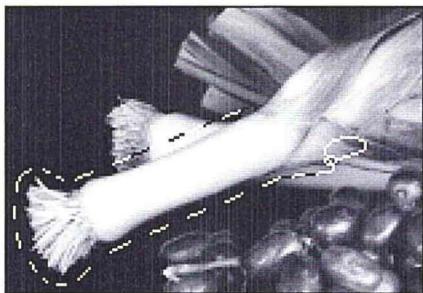
1. Position the lasso pointer on the upper edge of the leek stalk, where it starts to branch out into leaves.
2. Hold down the Option key, and click the mouse button to define the starting point of the straight line segment.
3. Continue holding the Option key, but release the mouse button; drag along the stalk of the leek. A straight line extends from the starting point.
4. Continue holding down the Option key; when you want to begin drawing freehand lines again, hold down the mouse button as you drag to draw a freehand line around the edge of the roots.

**NOTE:** You must continue to hold the Option key or a straight line will automatically be drawn between the two end points of the lasso.

5. When you want to select another straight line segment, continue holding the Option key, and release the mouse button.

Notice how a line “rubber-bands” to the last anchor point.

6. Move the cursor to the point on the lower edge of the stalk where the leaves begin, and click to select a straight line segment along the lower edge of the leek.



7. Continue to outline the leeks using freehand and straight line segments.
8. When you have finished making your selection, release the Option key and the mouse button.

**NOTE:** You can move a lassoed selection. To do so, position the lasso pointer inside the selection, press the mouse button, and drag the selection to the desired location. Release the mouse button. To undo the move, choose Undo from the Edit menu.

### Deselecting a lassoed area

You may decide that you want to edit the whole image at once, instead of editing the lassoed selection. You will need to take away the lasso around your selection.

To remove the lasso entirely, click the mouse button anywhere on the image, or choose None from the Select menu. You can use the None command to deselect a selection made with any of the selection tools.

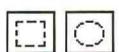
## Making selections with the rectangular and elliptical marqueses

The Adobe Photoshop program has tools that let you make rectangular or elliptical selections. Both tools make selections that start from the upper-left corner of the selection marquee.

You also have the option of making selections that start from the center point of the rectangular or elliptical marquee. You access this option by holding down the Option key as you drag out the selection.

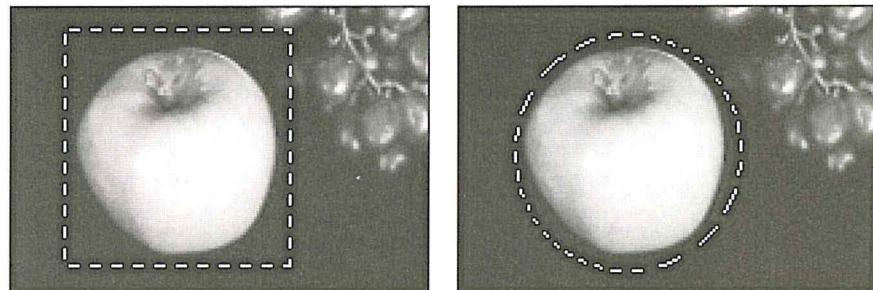
In this section, try selecting the apple using both marquee tools.

#### To make a selection:



1. Click either the rectangular or elliptical marquee in the toolbox.
2. Position the pointer above and to the left of the apple's leftmost edge.
3. Hold down the mouse button, and drag diagonally to enclose the selection.

A border appears around your selection.



4. Release the mouse button.

## Rotating a selection

Once you have made a selection, you can rotate the selection. The Rotate command allows you to make gradual or dramatic adjustments to your selection.

In this section, you will select the apple with the elliptical marquee, and rotate it. Once you have rotated the apple, you will undo the rotation so that you can work with the original image as you work through the remainder of the lesson. You begin by making a circular selection around the apple.

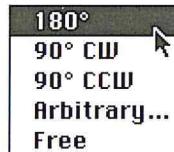
### To make a circular selection:

1. With the apple deselected, double-click the elliptical marquee to access the Elliptical Marquee Options dialog box.
2. In the Elliptical Marquee Options dialog box, select “Constrained Aspect Ratio” with width and height set to 1; these are the default values.
3. Click OK.
4. Position the pointer in the center of the apple.
5. Hold down the Option key and the mouse button, and drag outward from the center to the edge of the apple.
6. Release the mouse button, then the Option key.

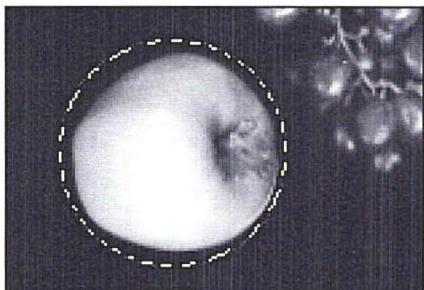
A circular selection is drawn around the apple.

### To rotate the selection:

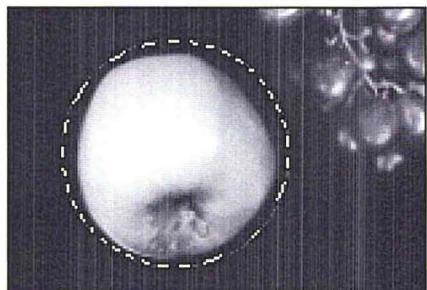
1. Choose Rotate from the Image menu.
2. Drag the mouse to select one of five options:



- $180^\circ$  rotates the apple 180 degrees.
- $90^\circ$  CW (clockwise) rotates the apple 90 degrees to the right.
- $90^\circ$  CCW (counterclockwise) rotates the apple 90 degrees to the left.



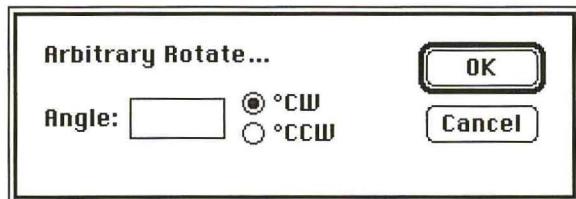
Rotation:  $90^\circ$  CW



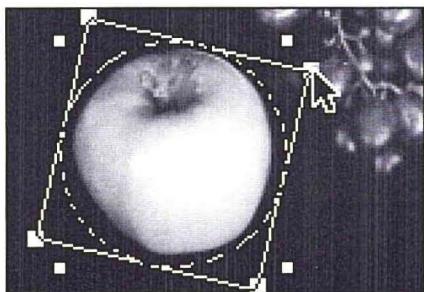
Rotation:  $180^\circ$

- Arbitrary rotates the apple at an angle you specify.
- Free lets you rotate the apple manually.

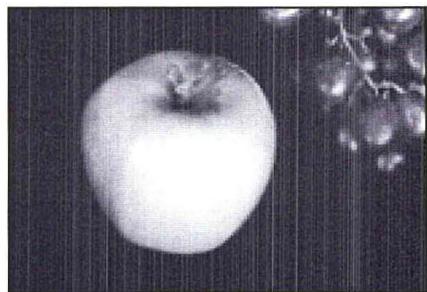
If you choose Arbitrary, the Arbitrary Rotate dialog box appears. Enter the angle of rotation, and click the rotation direction either CW for clockwise or CCW for counterclockwise. Click OK.



If you chose Free, position the pointer on one of the four handles of the selection border, and drag the apple at an angle.



Free rotation



After free rotation

3. Choose Undo Rotate from the Edit menu, or, if you have rotated the apple more than once, choose Revert from the File menu.

The apple is back in its original position.

## Copying and pasting a selection

The Adobe Photoshop program gives you the tools to make a copy of a selection and paste it elsewhere in the image, or into another image, while leaving the original selection intact.

The selection tools ordinarily make hard-edged selections, as if they were cut with a razor-sharp knife. Thus, when selections made with these tools are cut or pasted into an image, the individual pixels along the border can be seen very clearly. This often results in an image that appears unnatural. A more photorealistic effect can be achieved by softening the edges. You can create these gradual transitions by defining a feather edge around a selection. By creating a feather edge, you can make changes to a selection without making the selection stand out dramatically from its surroundings.

You define a feather edge, or border, around a lassoed selection using the Lasso Options dialog box. Once you specify a range for the border, that value remains in effect until you redefine the feather edge range.

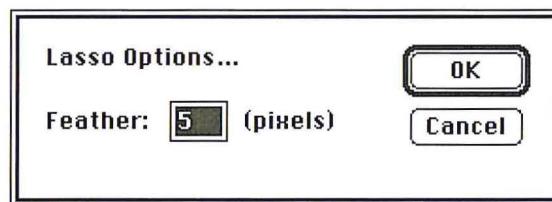
In this section, you will select the apple with the lasso tool, make a copy of the apple, and paste the copy next to the original apple. First, you will define a feather edge for the lasso tool.

### To define a feather edge for the lasso tool:

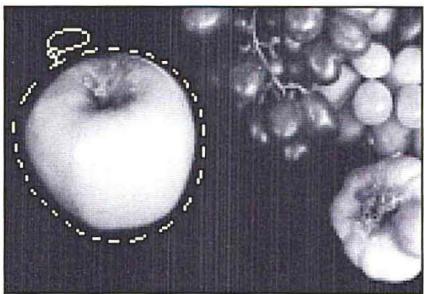
1. Double-click the lasso tool.

The Lasso Options dialog box appears.

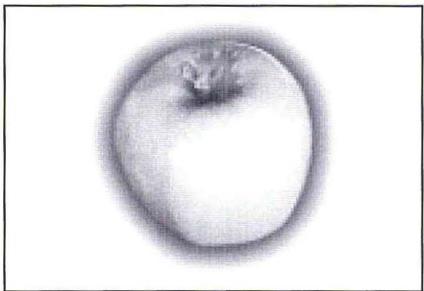
2. Enter 5 for the range (in pixels) outside the selection border that you want to be affected by changes. Click OK.



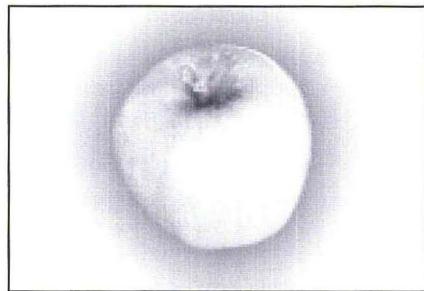
Now you are ready to make your selection. Use the lasso tool to trace the outline of the apple.



The illustrations below show how the copied selections would appear with different feather values on a white background.



Feather: 5 pixels



Feather: 15 pixels

**To copy and paste the selection:**

1. Choose Copy from the Edit menu.
2. Choose Paste from the Edit menu.

The copy is pasted on top of the current selection. You cannot see that another copy is on top of the original selection until you move the copy elsewhere in the image.

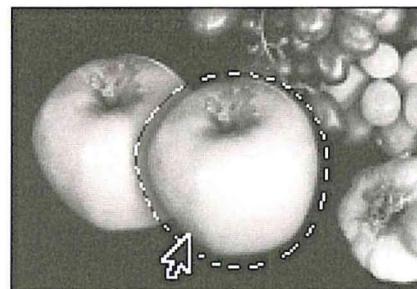
**Moving a pasted selection into place**

Now that you have completed a copy and paste operation, you will want to move the copied selection to a new location so that you can view the copy.

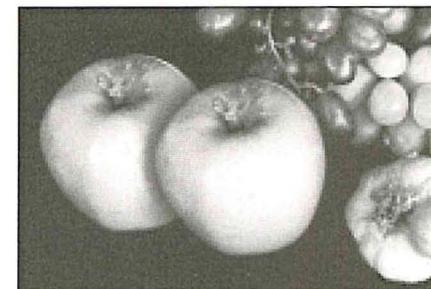
**To move a pasted selection:**

1. Position the mouse on an edge of the apple until the pointer turns into an arrow.
2. Hold down the mouse button, and drag the second apple to the right of the first apple.

3. Release the mouse button.



Pasted apple remains selected



Pasted apple after deselection

Notice a dark shadow between the two apples. The black shadow has a soft edge, and makes a gradual transition into the light color of the apple. This occurs because you feathered the selection 5 pixels, and thus blended the black background into the apple.

4. Keep the apple selected for the “Using paste controls” section.

### Using paste controls

The paste controls allow you to alter the appearance of a selection after you have pasted it into an image. The paste controls only work after you have just pasted a selection and the selection is still selected. If you have not pasted a selection, the Paste Controls option is dimmed in the Edit menu. You access the Paste Controls dialog box by choosing Paste Controls from the Edit menu.

The selection you have pasted is called a floating selection as long as it remains selected. Normally, the floating selection completely covers the underlying image. You saw this when you pasted a copy of the apple next to the first apple; the pasted apple completely covered the underlying area.

Using the paste controls, you can specify how much of the underlying image shows through. By changing the opacity percentage to a lower percentage from the default of 100 percent, you will make the pasted apple appear partially transparent.

Other options you have are the Normal, Darken Only and Lighten Only options. These options let you compare the pixels in the floating selection with those in the underlying image. In Normal mode, which is the default, every pixel in the floating selection appears. In Darken Only mode, only the pixels in the underlying image that are lighter than those in the floating selection are replaced. In Lighten Only mode, only the pixels in the underlying image that are darker than those in the floating selection are replaced.

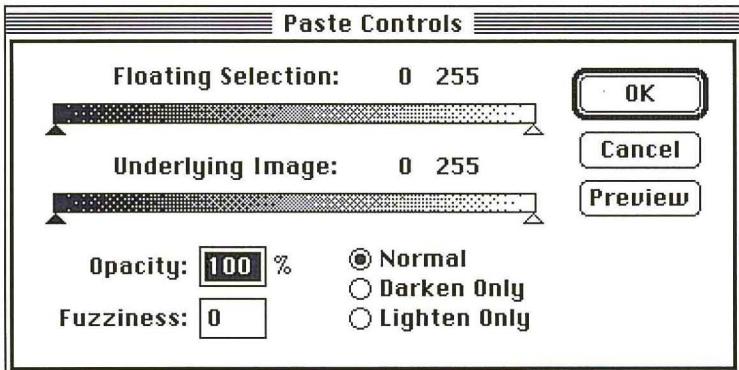
Additional options are available only when you are in RGB mode. They include Color Only and color tolerance levels. You may want to try some of these options when you retouch a color image in Lesson 3. For further information on paste controls, refer to the *Adobe Photoshop User Guide*.

In this section, you will use the paste controls to alter the apple you just pasted in the copy and paste section.

**To alter the appearance of a selection that has been pasted:**

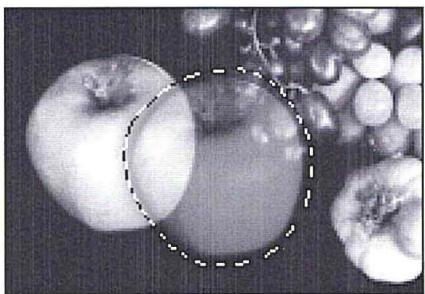
1. Make sure that your pasted selection of the copy of the apple is still selected.
2. Choose Paste Controls from the Edit menu.

The Paste Controls dialog box appears.



**To change the opacity of a pasted selection:**

3. Enter 50 in the Opacity text box to make the floating selection 50 percent opaque.
4. Click Preview to view the change.

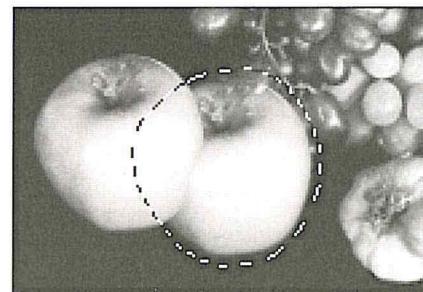


Paste Controls Opacity: 50%

**To use color modes when pasting:**

5. Enter 100 in the Opacity text box to make the selection 100 percent opaque.
6. Click Lighten Only to change only the pixels that are darker than those in the floating selection.

7. Click Preview to view the change.



Notice that the pasted apple fully covers the black background because the background pixels are darker than those of the apple. The original apple, however, is not covered by the pasted apple because its pixels are not darker than those of the pasted selection.

You can also try the Darken Only option to see what results you attain.

8. When you are satisfied with your results, click OK.

## Erasing part of an image

You can use the eraser tool to erase a portion of an image. The eraser tool actually erases the image, leaving the background color showing through; white is the default background color. If you wanted to erase the entire image, you would double-click the eraser tool in the toolbox. You can use the Undo command in the Edit menu to undo the erasing.

You may find the eraser tool useful for creating a “blank slate” on part of the image.

In this section, you will simply learn how the tool works. You may want to experiment with the eraser later when you begin working with a color image.

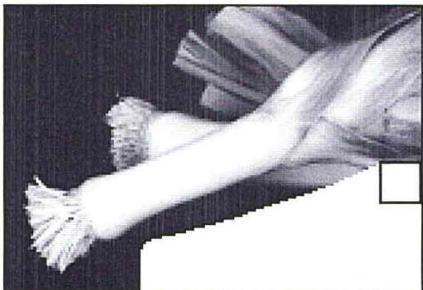
### To erase part of an image:



1. Make sure that nothing in the image is selected.
2. Click the eraser tool.
3. Position the eraser in the center of the image.

The pointer changes into the eraser pointer, which is a white square.

4. Hold down the mouse button, and drag through the area you want to erase.



Partially erased image

## Restoring part of an image to a previous version

The “magic eraser” is a variation of the eraser tool. Instead of erasing the image, the magic eraser restores part of an image to its state when you last saved the document. This function is similar to the Revert command in the File menu, except that it allows you to select a limited area to revert, rather than the entire image. If you have made a minor mistake, you would usually opt for the magic eraser instead of the Revert command.

You will use the magic eraser in this section to restore the area you erased in the previous section. However, you cannot use the magic eraser tool if you have changed the image mode, or if the image has been cropped or resized since the previously saved version.

### To restore part of an image using the magic eraser:

1. Click the eraser tool.
2. Position the eraser where you want to start restoring the image.
3. Hold down the Option key.

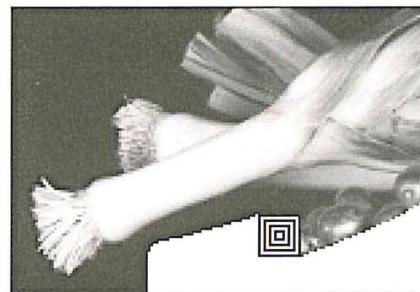
The eraser pointer changes into the magic eraser pointer .

Hold down the mouse button and the Option key, and drag over the area you want to restore.

The first time you use this tool, the wristwatch icon appears to indicate that a copy of the image is being read from the disk. Subsequent operations are quicker.

4. Release the Option key and the mouse button.

You have restored the area to the way it looked in the last saved version of the document.



Partially restored image

## Using the rubber stamp tool to duplicate part of an image

You can use the rubber stamp tool to take a sample of a particular area of an image, and paint an exact copy, or “clone,” of that area elsewhere in the image. Creating a clone can be useful in several ways. You can use the clone feature to touch up small dust spots or imperfections by taking a sample of the surrounding area and stamping that sample over the imperfection. You can also do dramatic cloning, such as recreating entire parts of images elsewhere.

As you duplicate part of an image with the rubber stamp tool, you will see a cross hair pointer moving through the area from which you took your sample. This pointer constantly shows you the origin of the area you are using.

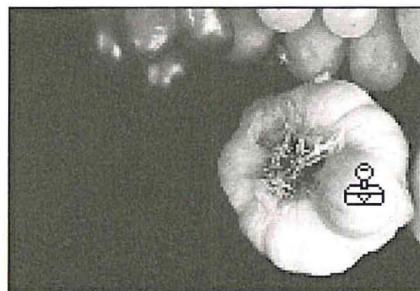
In this section, you will create a third bulb of garlic by taking a sample of one bulb, and cloning a new bulb next to it.

To select a sample of an area with the rubber stamp tool:



1. Click the rubber stamp tool.
2. Position the rubber stamp pointer on the left garlic bulb.

The pointer changes into the rubber stamp pointer, which looks like the rubber stamp tool.



Rubber Stamp tool sampling garlic

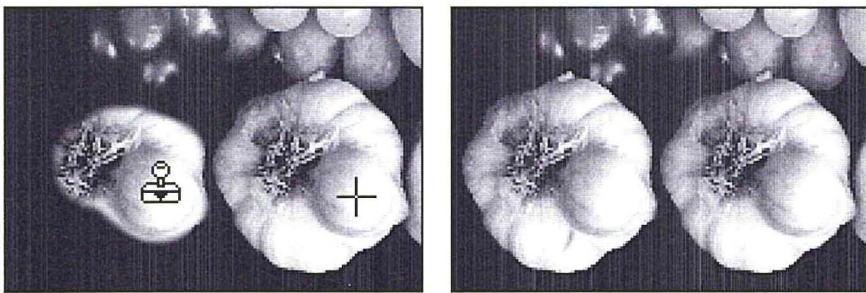
3. Hold down the Option key.
4. Click the mouse button anywhere on the garlic to take a sample of the entire garlic bulb.

You may now clone the entire bulb into another area of the image.

**To paint a cloned selection into an image:**

1. Position the rubber stamp pointer to the left of the garlic bulb you sampled.
2. Hold down the mouse button, and drag through the area to clone a new bulb of garlic.

The cross hair pointer appears to show you what part of your original selection you are using.



Rubber Stamp "cloning" garlic

After "cloning"

When you sampled the garlic, you defined a starting point for the cloning, but you actually sampled the entire image. If you wanted to, you could reproduce the whole image with the rubber stamp tool. If, however, you wanted to clone another distinct object, such as the apple, you could take a sample of the apple, and clone just a copy of the apple.

The rubber stamp tool has a number of other features and options, which are discussed in detail in the *Adobe Photoshop User Guide*.

## Adding text to an image

You can add text to your image to create a special treatment or poster-like effect. You add text using the type tool.

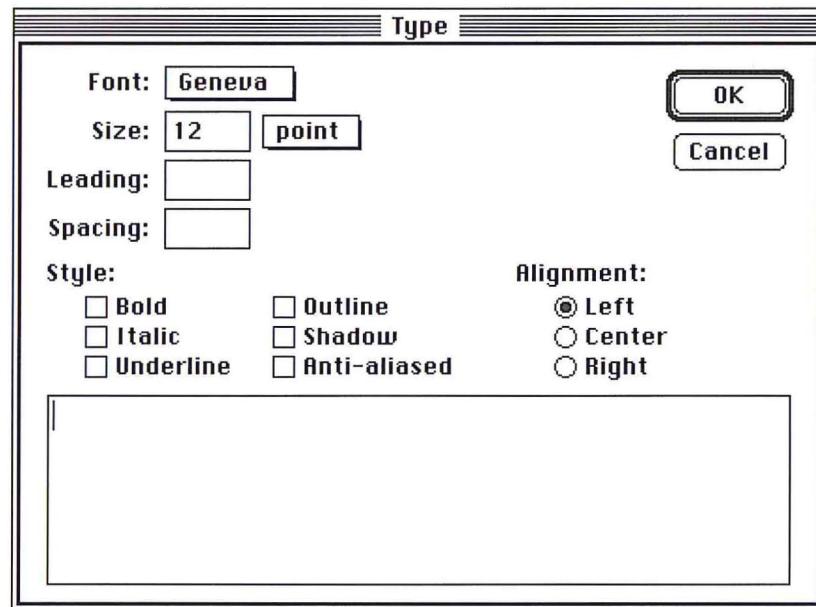
You may select a number of options, such as font and styles (for example, italics, bold, underlined, and anti-aliased), or you may use the default font (12-point Geneva).

**NOTE:** Anti-aliased text is soft-edged text, which helps the text blend into the image. Using the anti-aliased text option requires Adobe Type Manager™ software.

Before entering text, you first specify a font, point size, and style option using the Type dialog box.

To add text to an image:

- T** 1. Click the type tool in the toolbox.  
2. Position the pointer on the upper-left corner of the image.  
The pointer changes into the type pointer   
3. Click the mouse button.  
The Type dialog box appears.

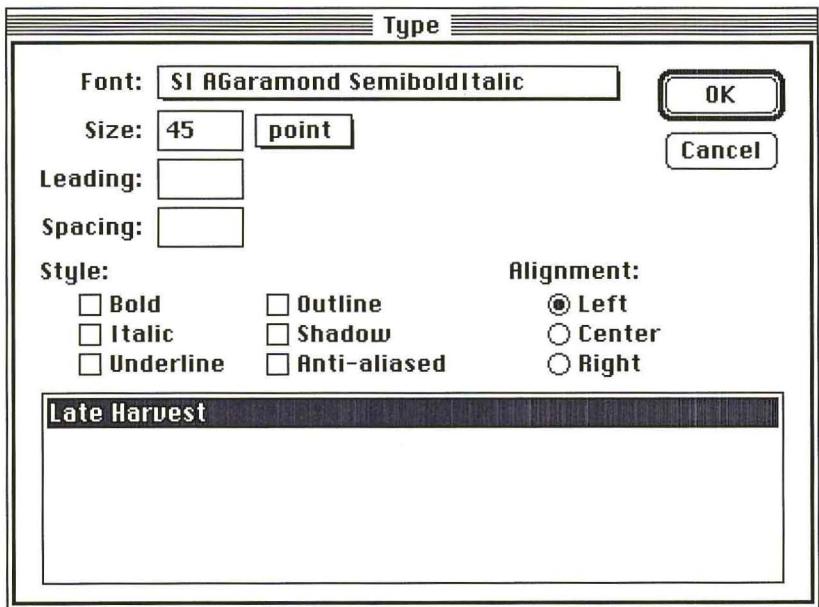


To select a font, font size, and style:

1. Position the pointer on the font name box, and hold down the mouse button.  
A pop-up menu lists the available fonts.
2. Drag to highlight the font you want, and release the mouse button.  
The font you select appears in the text box.
3. Enter a value from 4 to 1000 in the Size text box to select a font size.
4. Click the typeface style you desire to select the style options. The box next to the style option is automatically checked.

## Entering text

When you have specified the font and its size and style, you are ready to enter text. Simply type it in the box in the Type dialog box. You may enter up to 255 characters. For this exercise, enter the words "Late Harvest." If you entered a longer line of text, it would automatically wrap around to the next line in the text box. The text will not, however, automatically wrap on the image. To specify the end of a line, press Return.



When you have finished entering the text, click OK.

The text appears as the current selection on the image.

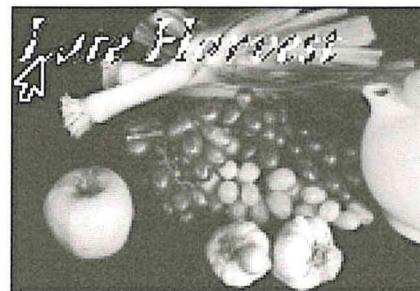


## Moving text within an image

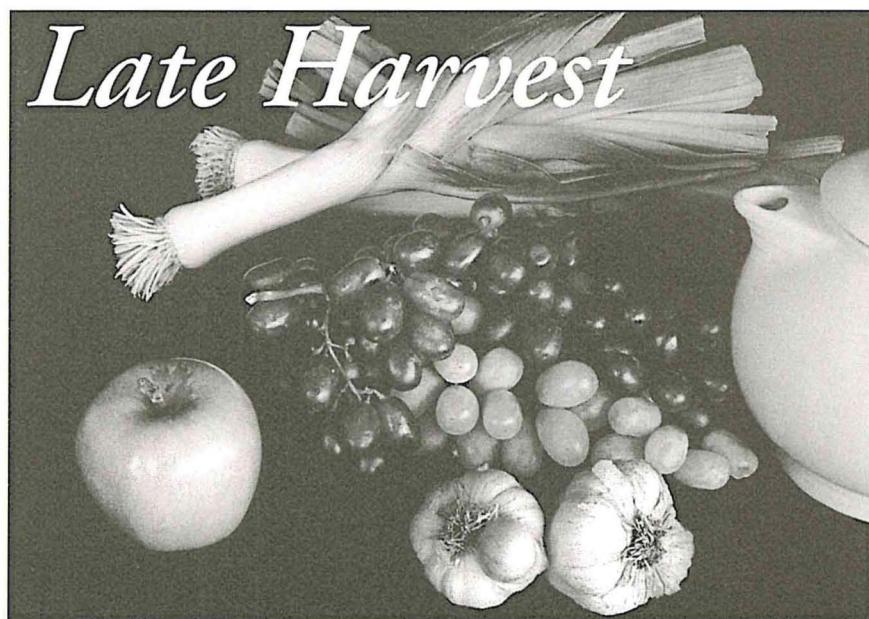
If you wish to move the text you have just created, it must remain selected. Once you deselect the text, the text becomes part of the image.

**To move the text:**

1. Position the cursor on one of the characters in the block of text.
2. Move the cursor back and forth until the arrow pointer appears.



3. Hold down the mouse button, and drag the text to the position you want it to appear.
4. Release the mouse button.



Final text

## Adjusting the letter spacing

While a text block is selected on an image, you can deselect individual characters and words in the text block, and move the other characters in the block closer to adjust the letter spacing. This procedure is known as kerning.

### To adjust the letter spacing:

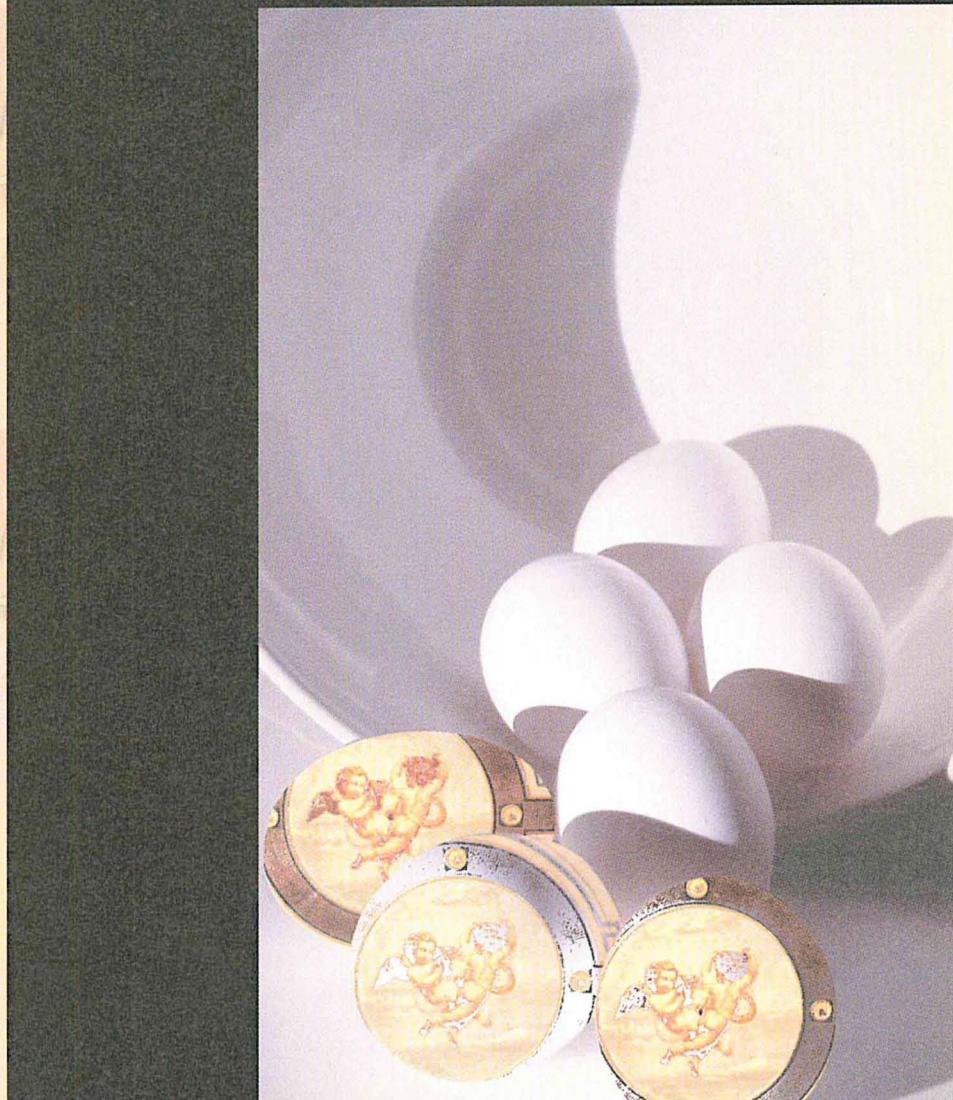
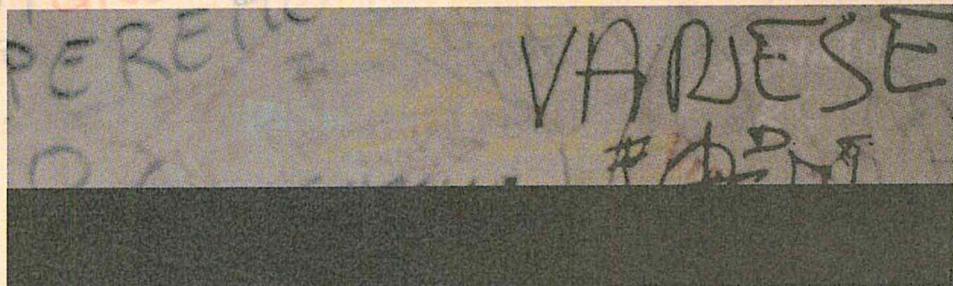
1. Make sure that the type tool is selected.
2. Hold down the Command key and the mouse button.  
The pointer changes into the lasso tool.
3. Drag the lasso tool to encircle the letters L and A of the word "Late."
4. Release the mouse button and the Command key.  
The letters that you encircled with the lasso are deselected.  
You can now move or modify the other characters in the text block without affecting the characters you deselected.
5. Position the pointer on the T in the word "Late."
6. Press the mouse button, and drag the T until it is as close as desired to the A, or use the cursor keys to move the letters closer.
7. Deselect the type by clicking once on the image.  
Once you have deselected the text, you cannot reselect it.

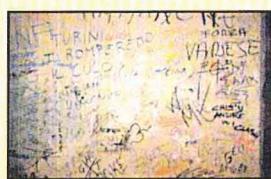
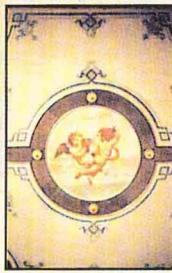
## Conclusion

You have completed Lesson 1, and are ready to use your newly acquired skills to learn more about the many features of the Adobe Photoshop program. Before you continue, however, you may want to try some variations on the manipulations you performed in the lesson.

- Try copying a selection and pasting it into or behind another selection. To do so, use the Paste Into or Paste Behind commands in the Edit menu.
- Try copying and pasting a selection without using the feathering options, and notice the difference between a feathered and an unfeathered selection.
- Double-click the rubber stamp tool, and try some of the other options. Refer to the *Adobe Photoshop User Guide* for more information on this tool.
- Try adding different styles of text to the image.

## Lesson 2: Producing and Printing a Halftone





From a scanned-in 35mm slide of five eggs on a white plate, the designer created an arbitrary map to plot the color values, created several masks of the image, then resampled the image to change its resolution.

Using a 35mm slide of an Italian fresco, she scanned the image, then stretched it, and using paste controls and the Posterize command, further altered the image.

Beginning with a scanned-in 35mm slide of graffiti at the Uffizi Gallery in Florence, she stretched it, and used paste controls and the Posterize command to create translucent bands across the flat color background.

## **Lesson 2: Producing and Printing a Halftone**

In this lesson, you will use the “Still Life” image you retouched in Lesson 1 to print a halftone. A gray-scale image is considered a continuous-tone image because it contains gradient tones from black to white. A continuous-tone image must first be converted into a halftone before it can be printed. A halftone is an image composed of a series of dots of varying sizes. When you produce a halftone of a gray-scale image, the variations in size and spacing between the dots simulate the changes in gray levels that occur in a gray-scale image. A halftone of an image is produced as a single plate, or screen, that is output on a printer or imagesetter in the Adobe Photoshop program. This lesson is geared to printing output on a laser printer.

### **Overview**

To print a halftone, you begin by specifying its screen. The screen converts the image into dots. The screen attributes you specify affect the results of the printed halftone. These attributes include screen frequency, screen angle, and dot shape.

This lesson explains how you set up the halftone screen. You will learn how to adjust the highlights, shadows, and midtone grays, which affect the overall brightness (gamma) in an image. You will also learn how to blur and sharpen an image. The final result of the lesson will be a printed halftone.

The features you will learn in this lesson include:

- Adjusting the brightness and contrast levels of the image
- Sharpening an image
- Blurring an image
- Setting up the halftone screen
- Printing a halftone

### **Adjusting the brightness and contrast levels of an image**

You may wish to adjust the brightness and contrast in the entire image, or in a selected area of the image. This can be done with the Brightness/Contrast controls, or the Levels control in the Adjust menu, respectively. Here, you will learn to use the Adjust Levels command, which is a more powerful way of altering contrast and brightness. In the Adjust Levels dialog box, you increase or decrease the contrast levels, which affect the brightness of an image.

You can adjust the brightness and contrast levels of part or all of an image. If no portion of the image is selected, any adjustments you make will be applied to the entire image.

In this section, you will make adjustments, preview the changes, and then cancel them so that you can start with the original levels each time you make an adjustment.

Brightness and contrast levels are increased in the Adjust Levels dialog box through the input levels, and decreased through the output levels. The gamma, which affects the overall brightness of an image without substantially changing the highlights and shadows, can be increased or decreased by adjusting the gamma control in the input levels.

The top part of the Adjust Levels dialog box (labeled "Input Levels") displays a histogram that plots the brightness levels against the number of pixels at each level. There are 256 possible levels of gray, from black at 0 to white at 255. To increase contrast and adjust gamma, adjust the input levels by using the slider controls.

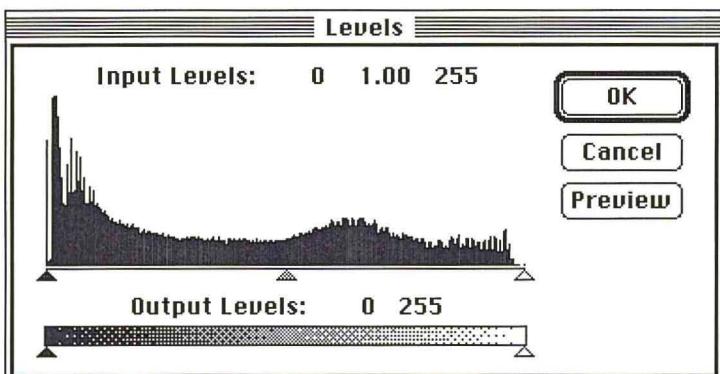
The bottom part of the dialog box is labeled "Output Levels." These values display the range of brightness levels in the image. The Output Levels controls are used to decrease contrast.

When you make adjustments to the contrast or brightness, you may view the changes by clicking Preview in the Levels dialog box. When you are done viewing the changes, click Cancel. If you click OK, you save the changes you have made. Keep in mind that if you increase the contrast, and click OK, you actually lose the information from the pixels at the lowest and highest levels. If you decrease the contrast, and click OK, you lose some information about the midtones. Once you do so, you cannot restore the original levels without reverting to the last saved version of the document or using the Undo command. Therefore, you should always save the file before adjusting it, and preview your adjustments before you click OK.

#### To open the Levels dialog box:

1. Choose Adjust from the Image menu.
2. Choose Levels from the Adjust submenu.

The Levels dialog box appears.



## Reducing the contrast in an image

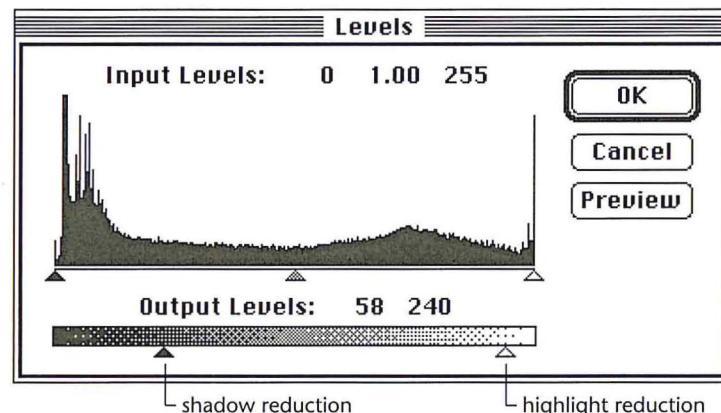
You may choose to reduce the contrast in an image. The Output Levels controls allow you to reduce the contrast in the shadows, the highlights, or both. If you reduce the contrast in the shadows, you eliminate the darkest black in the image; if you reduce the contrast in the highlights, you eliminate the brightest white. In either case, by reducing the contrast, you produce the effect of remapping black and white to a value of gray.

### To reduce the contrast in the shadows:

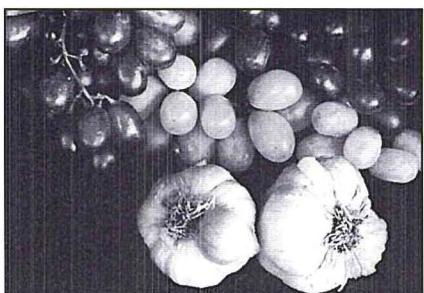
1. Open the Levels dialog box if it is not already opened, by choosing Levels from the Adjust submenu of the Image menu.
2. Position the pointer on the left (black) triangle at the bottom of the dialog box (Output Levels).
3. Press the mouse button, and drag to the right to reduce the contrast in the shadows.
4. Release the mouse button.
5. Click Preview to display the changes you have just made to the image. When you are finished viewing the changes, click Cancel.

### To reduce the contrast in the highlights:

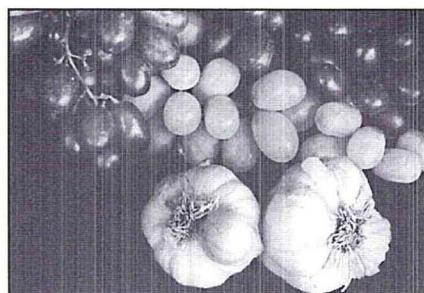
1. Open the Levels dialog box if it is not already opened, by choosing Levels from the Adjust submenu of the Image menu.
2. Position the pointer on the right (white) triangle at the bottom of the dialog box (Output Levels).
3. Press the mouse button, and drag to the left to reduce the contrast in the highlights.



4. Release the mouse button.
5. Click Preview to display the changes you have just made to the image.



Before adjusting contrast in highlights



After reducing contrast in highlights

Notice that the background in the image on the right is no longer deep black, the dark-colored grapes are lighter, and the garlic is grayer where it was formerly white.

6. Click Cancel to return to the original settings.

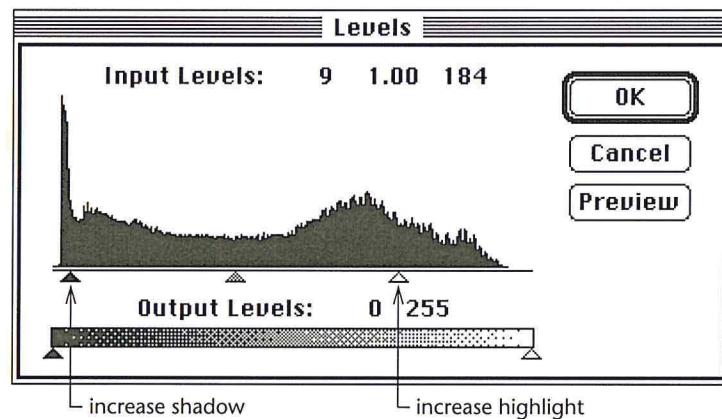
### **Increasing the contrast in an image**

You may choose to increase the contrast in an image. The Input Levels controls allow you to increase the contrast in the shadows, the highlights, or both. If you increase the contrast in the shadows, you darken the dark tones in the images; if you increase the contrast in the highlights, you lighten the light tones in the image.

#### **To increase the contrast in the shadows:**

1. Open the Levels dialog box if it is not already opened by choosing Adjust Levels from the Image menu.
2. Position the pointer on the left (black) triangle beneath the histogram under Input Levels.
3. Press the mouse button, and drag to the right to increase the contrast in the shadows. All colors to the left of the triangle are clipped to black.

Notice that as you drag the triangle, the value (which started at 0) changes.



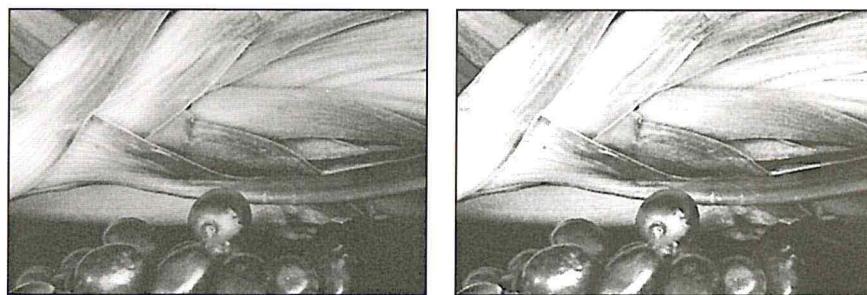
4. Release the mouse button.
5. Click Preview to see the changes you have just made to the image. When you are finished viewing the changes, click Cancel.

**To increase the contrast in the highlights:**

1. Open the Levels dialog box.
2. Position the pointer on the right (white) triangle beneath the histogram.
3. Press the mouse button, and drag to the left to increase the contrast in the highlights.

Notice that as you drag the triangle, the value (which started at 255) changes.

4. Release the mouse button.
5. Click Preview to see the changes you have just made to the image.



Before adjusting contrast in highlights      After increasing contrast in highlights

Notice that the image on the right looks much more black-and-white; the pale grays have become white, and the dark grays have become black. You will notice these differences on the leek stalk and on the grapes.

6. When you have finished viewing the changes, click Cancel.

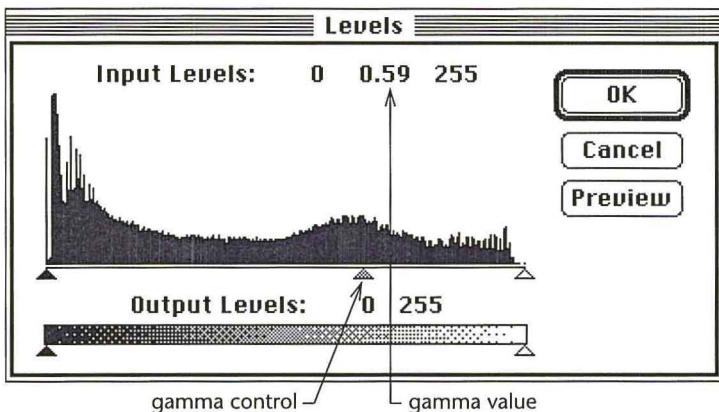
## Adjusting the gamma in an image

You may want to lighten or darken an image without substantially changing the shadows and highlights. You can do this using the gamma control. The gamma control primarily affects the brightness levels of the midtones (the middle-gray levels), and leaves the solid black and white areas unaffected.

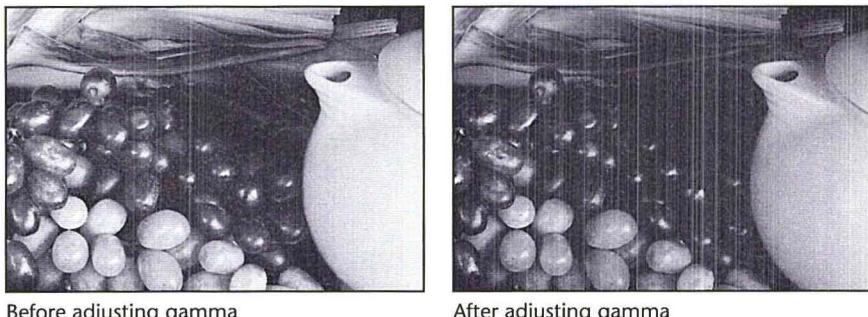
### To adjust the gamma:

1. Open the Levels dialog box.
2. Position the pointer on the middle (gray) triangle beneath the histogram under Input Levels.
3. Press the mouse button, and drag to the right to darken the image.

Notice that as you drag the triangle, the value (which started at 1.00) changes.



4. Release the mouse button.
5. Click Preview to see the changes you have just made to the image.



Notice that the image on the right has become darker overall. You may also try lightening the image by dragging the triangle to the left.

6. Click Cancel to return to the original settings.

## Sharpening an image

You may decide that you would like to sharpen part, or all, of the image before your print your halftone. In sharpening an image, the Adobe Photoshop program is actually increasing the differences in adjacent pixels to give the image a crisper, more focused look. You may sharpen images in two ways: using the sharpen tool in the toolbox or using the Sharpen filter in the Image menu.

In this section, you will sharpen the garlic bulb. The effect is subtle, but you will notice sharper edges on the roots of the garlic bulb than before the sharpening. You will begin by using the sharpen tool. The advantage of using the sharpen tool is that you can work on a very small area at a time. The advantage of using the Sharpen filter is that you can work on a selected area of an image or the entire image at once.

### Using the sharpen tool

The sharpen tool should be used when you want to sharpen a small area of an image.

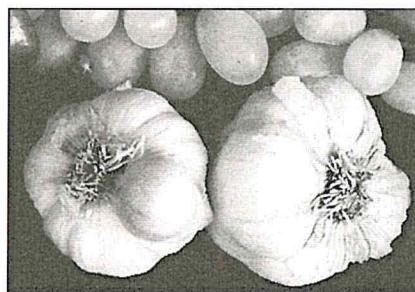
#### To use the sharpen tool:



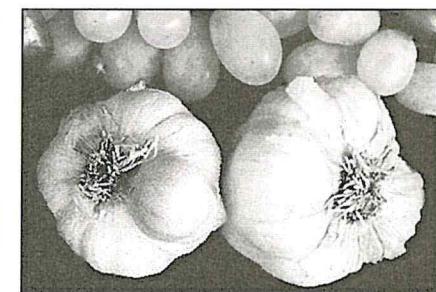
1. Click the sharpen tool.

The pointer changes into the sharpen pointer, which looks like the sharpen tool.

2. Position the sharpen pointer on the roots of the left garlic bulb.
3. Hold down the mouse button, and drag around the center of the garlic bulb.
4. Release the mouse button when you have finished sharpening the image.



Before sharpening



After sharpening

5. Choose Undo Sharpen from the Edit menu to undo your changes.

## Using the Sharpen filter

You may also sharpen your image with the Sharpen filter or the Sharpen Edges filter in the Image menu. You may sharpen the whole image, or a selected area of the image. If nothing is selected, the sharpening will affect the entire image. The effects of an overall sharpening may be extremely subtle.

### To use the Sharpen filter:

1. Select part or all of the image to which you will apply the filter.
2. Choose Filter from the Image menu, and choose Sharpen from the Filter submenu.



A wristwatch icon appears as the sharpening takes place.

3. Choose Undo Sharpen from the Edit menu to undo your changes.

## Blurring an image

You may also blur parts, or all, of an image before you print your halftone. The techniques of blurring an image are similar to those for sharpening an image. You may blur an image in two ways: using the blur tool in the toolbox or using the Blur filter in the image menu.

In this section, you will blur the light-colored grapes, on the right side of the image. The effect is subtle, but you will notice a general blurring of the grapes.

## Using the blur tool

The blur tool should be used when you want to blur a small area of an image.

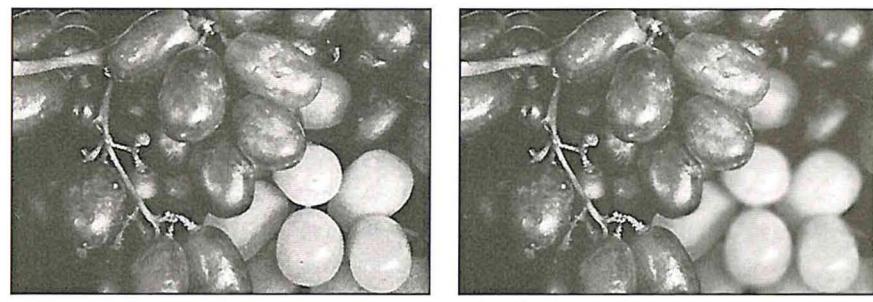
**To use the blur tool:**



1. Click the blur tool.

The pointer changes into the blur pointer, which looks like the blur tool.

2. Position the blur pointer on the light-colored grapes, on the right side of the image.
3. Hold down the mouse button, and drag through the grapes. You may need to use multiple strokes as you blur the grapes.
4. Release the mouse button when you have finished blurring the grapes.



Before blurring

After blurring

5. Choose Undo Blur from the Edit menu to undo your changes.

## Using the Blur filter

You may also blur your image with the Blur filter or the Blur Edges filter in the Image menu. You can blur the whole image, or a selected area of the image. If nothing is selected, the blurring will affect the entire image. The effects of the Blur filter, like those of the Sharpen filter, may be extremely subtle.

**To use the Blur filter:**

1. Select part or all of the image to which you will apply the filter.
2. Choose Filter from the Image menu, and choose Blur from the Filter submenu.  
A wristwatch icon appears as the blurring takes place.
3. Choose Undo Blur from the Edit menu to undo your changes.

## Setting up the halftone screen

You create a halftone screen to print a gray-scale image using the Halftone Screen option in the Page Setup dialog box. The results of setting the halftone screen will be apparent only on the printed copy, not on the Macintosh screen. Before you can set up the halftone screen, you must be connected to a printer. If your computer is not already connected to a printer, refer to your Macintosh documentation for more information.

You will be adjusting the screen frequencies and dot shapes in your image in this lesson. The screen frequency controls the density of dots on the screen. The dots are arranged in lines on the screen, and the common measurement for screen frequency is lines per inch (lpi). The screen frequency you will set depends primarily on the quality of the printing press and the type of paper that will be used to print the image. The higher the screen frequency, the finer the image produced.

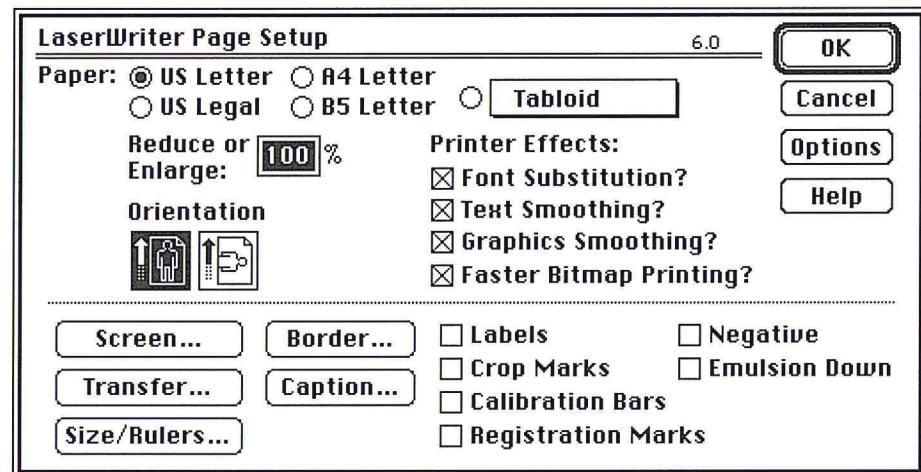
The recommended screen angle is 45; you should not change this value unless you have a specific reason for doing so. When you print color separations (lesson 4), four different screen angles are used. It is important to set precise screen angles to avoid moiré patterns on a printed image. Moiré patterns are the undesirable screen patterns caused by incorrect screen angles when printing halftones.

The dot shape also affects the printed halftone. Elliptical dots are most commonly used; however, you may also choose round, line, square, and cross-shaped dots. You may want to experiment with different dot shapes to see how they affect the appearance of the halftone you produce. In this lesson, you will try a few different options to see what kind of results to expect.

To set up a halftone screen, you use the Screen option in the Page Setup dialog box under the File menu. The option displays the Halftone Screen dialog box, which allows you to specify the frequency and angle of the screen, as well as the dot shape of the screen.

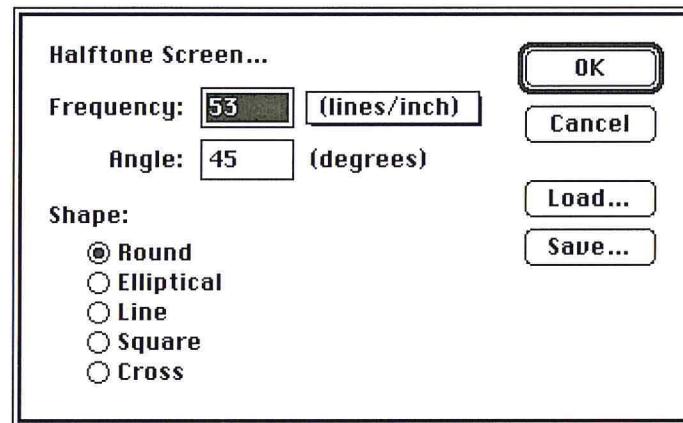
To set up the halftone screen:

1. Open the "Still Life" image if it is not already opened.
2. Choose Page Setup from the File menu.



3. Click Screen.

The Halftone Screen dialog box appears.



4. To specify the screen frequency, enter 50 in the Frequency text box. This is a relatively low frequency. You will later enter a higher frequency to compare the results of the printed image. To specify the screen angle, accept the default of 45.
5. Click the elliptical dot shape to select the dot shape of the screen.

When you have chosen the screen frequency, angle, and dot shape, click OK.

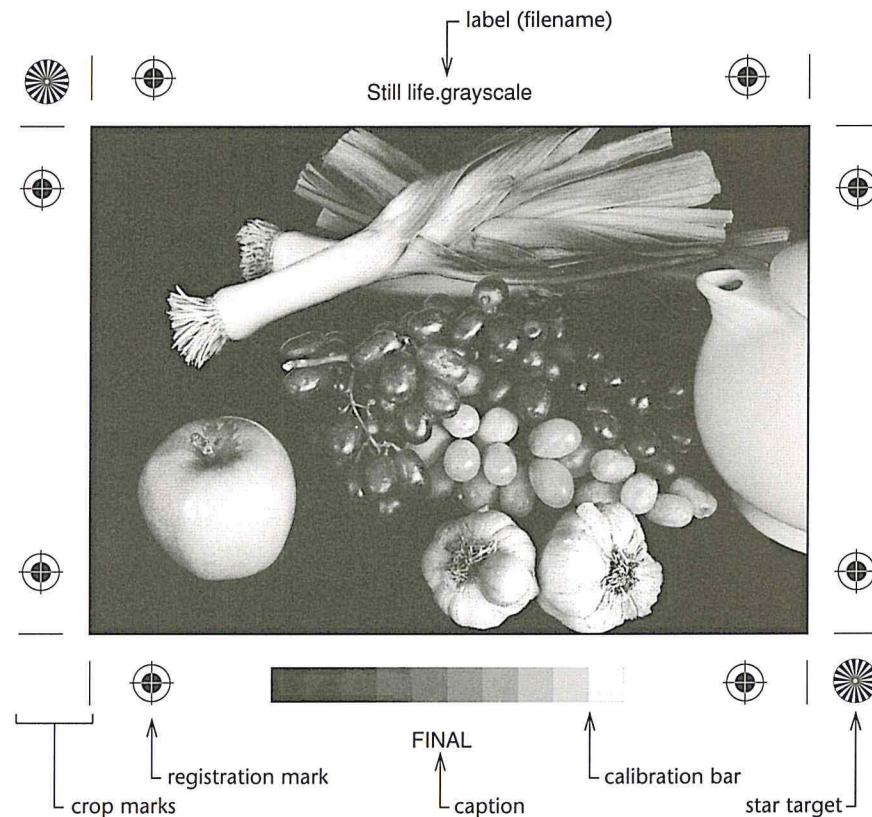
## Printing a halftone

At this point, you are ready to print a halftone. Before you print, you should choose what marks you wish to appear on your printout. You choose these marks by clicking the appropriate option in the Page Setup dialog box.

- The Labels checkbox lets you choose to have the image's file name printed above the image.
- The Crop Marks option prints marks near the edges of the image. The crop marks indicate where the image is to be trimmed.
- The Calibration Bars option adds a gray calibration bar at the bottom of a grayscale image, and colored calibration bars at the sides of a color image.
- The Registration Marks option prints registration marks around the edges of the image. These marks are useful mainly for printing color separations. This option also prints star targets on the image. Star targets are pinwheels that are used to measure image resolution and dot doubling, grain, and slurring during printing, which degrade the quality of the printed image.
- The Negative option prints an inverted version of the image. Only the output (not the image on-screen) is converted to a negative when you use this option. If you are printing separations directly to film, you will probably want a negative. If you are printing to paper, you will want a positive. You should also check with your print shop to determine whether it prefers a positive or negative of your image.
- The Emulsion Down option refers to the photosensitive layer on a piece of film or paper. Normally, images to be printed on paper should be printed Emulsion Up, whereas images to be printed on film should be printed Emulsion Down. Check with your print shop first to determine which direction the emulsion should read. You will first print a halftone with a screen frequency of 50 lpi and elliptical dots.

### To print a halftone:

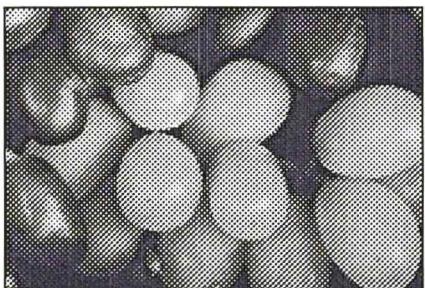
1. Open the Page Setup dialog box if it is not already opened, and choose Screen.
2. Enter 50 in the Frequency text box, and choose Elliptical dots. Click OK.
3. Click the appropriate print marks that will appear on your printout. Click OK.
4. Choose Print from the File menu. Click OK.



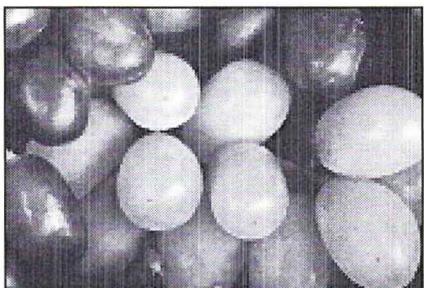
## Comparing print results

After you have printed the image with a screen frequency of 50 lpi and elliptical dots, go back to the Page Setup dialog box under the File menu and click Screen. Enter 100 lpi and line-shaped dots. Print the image again.

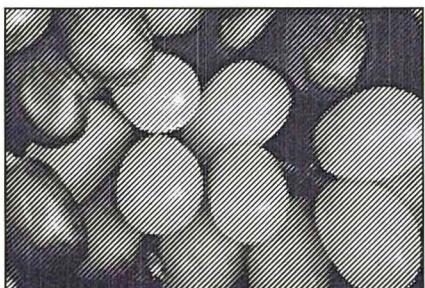
You can compare the results you achieve with different screen frequencies and dot shapes. You will notice that in the 50 lpi proofs, the dots will be more easily visible than they are at 100 lpi. You will also note that the elliptical dots produce a softer, more natural effect than the line-shaped dots produce.



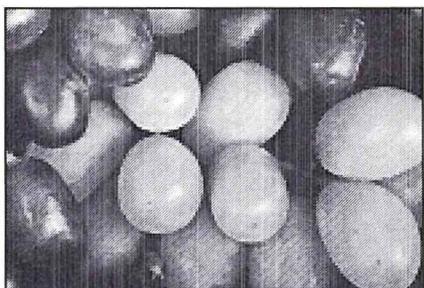
Elliptical dot; 50 lpi



Elliptical dot; 100 lpi



Line-shaped dot; 50 lpi



Line-shaped dot; 100 lpi

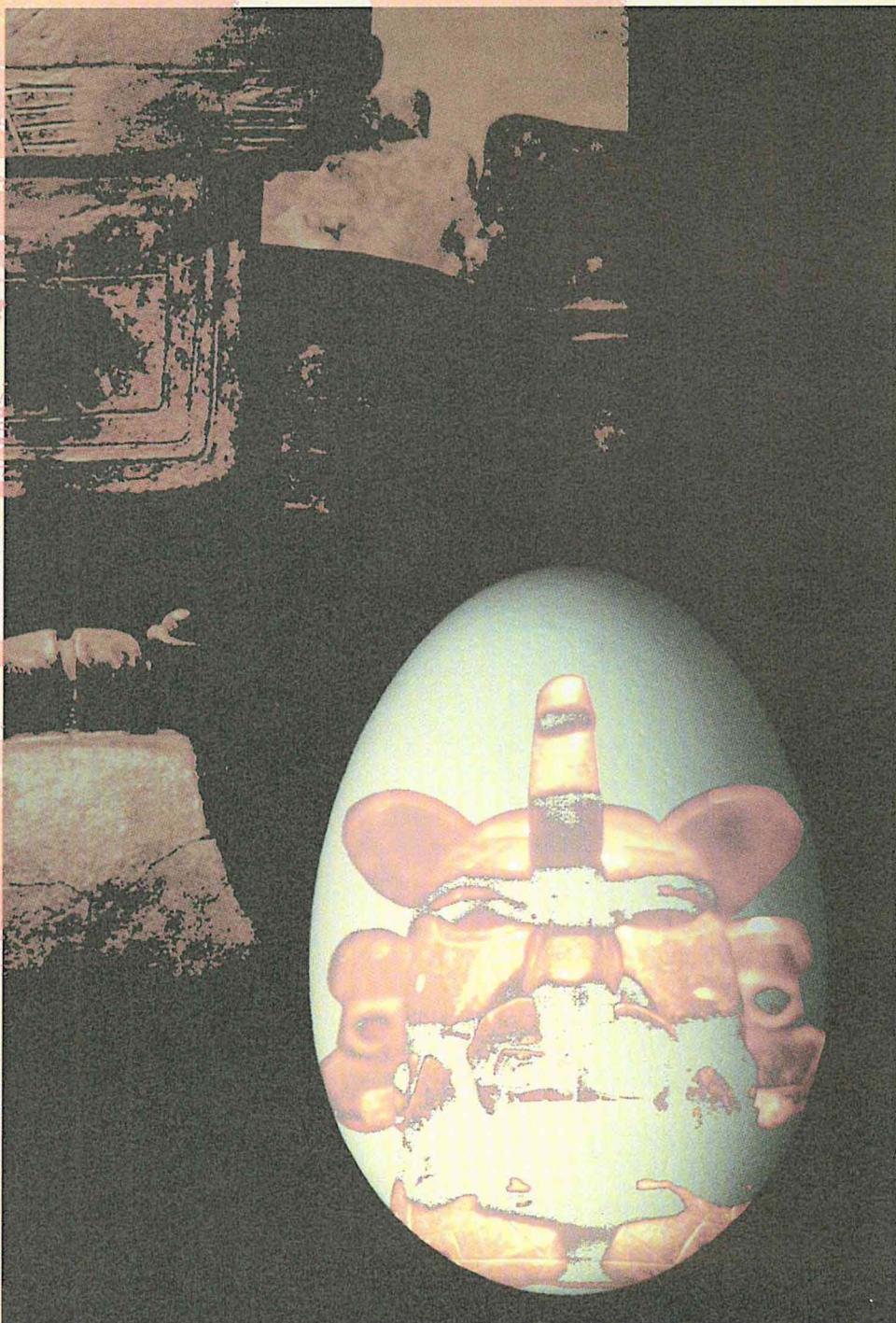
## Conclusion

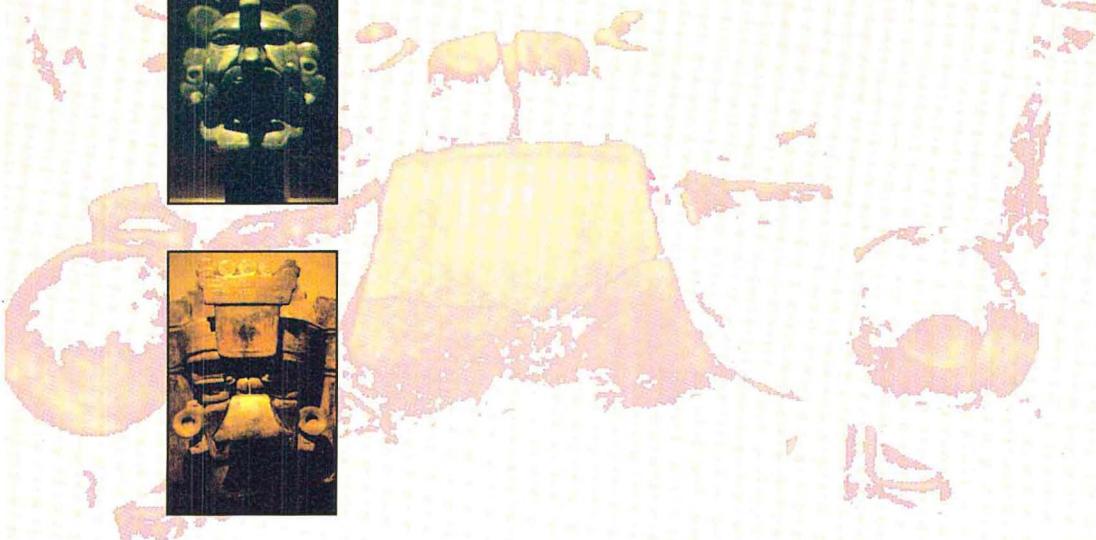
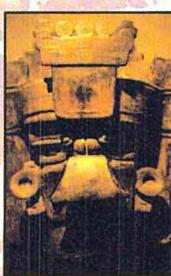
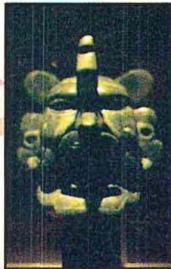
You have now learned how to print a gray-scale image as a halftone. You have also learned how to use the sharpen and blur tools and filters. The quality of the halftone you produced may not be satisfactory to you. You could make adjustments to the screen setup.

You may want to experiment with some of the features you have just learned.

- Try using different screen frequencies and dot shapes, and compare the results of your printed output.
- Try adjusting the brightness levels in a small selection within an image. Experiment with very subtle or very dramatic adjustments.
- Try using the sharpen and blur tool options to achieve different effects. You access the options by double-clicking the individual tools in the toolbox.

## Lesson 3: Retouching a Color Image

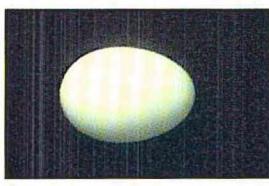




From a scanned-in 35mm slide of an egg, the designer created a mask to alter the image.

Using a 35mm slide of an ancient jade mask, she scanned the image, adjusted the color balance, levels, and contrast. Then she created a mask and used paste controls to alter it.

The designer scanned in a 35mm slide of an ancient sculpture, stretched the image, adjusted the color balance, then used paste controls to blend it into the background.



## Lesson 3: *Retouching a Color Image*

In this lesson, you will learn to manipulate the Adobe Photoshop program's painting tools as you touch up and enhance a color image, "Flowers." You will also learn about using channels and filters.

The color image used in this lesson is a 24-bit color image. If you have an 8-bit video card, your screen can display only 256 colors at one time. The 24-bit color image may contain up to 16 million different colors. In order to simulate these 16 million colors, the Adobe Photoshop program uses a process called dithering. The dithering process is similar to halftoning; dot patterns are used to simulate colors. If you have an 8-bit video card, you may see these dot patterns on the screen. If you have a 32-bit video card, and you switch to 8-bit mode, you also will see dot patterns. Keep in mind, however, that on-screen dithering will not affect your printed results.

### Overview

In this lesson, you will learn the various ways to select colors to use with the painting tools, and you will learn how to use the pencil, paint brush, airbrush, line, and smudge tools. All of the painting tools have default settings for brush size, spacing, fade-out rate, repeat rate, and opacity of paint. In this lesson, you will primarily use the default settings, but you can access the tool options by double-clicking the individual tools.

You will also get a brief introduction to alpha channels as well as filters. These sections are meant to acquaint you with the features without going into great depth.

For a thorough discussion of any of these topics, refer to the *Adobe Photoshop User Guide*.

The features you will learn in this lesson are:

- Selecting color with the eyedropper tool
- Selecting color with the color palette
- Using the magic wand tool to make selections
- Painting with the pencil tool
- Painting with the line tool
- Painting with the paint brush tool
- Painting with the airbrush tool
- Using the smudge tool
- Adjusting the color balance
- Using filters
- Working with channels

## Starting the lesson

To start the lesson, you need to open the image named “Flowers” on the Adobe Photoshop Tutorial disk. The image is a bouquet of flowers in a brass vase. The bouquet contains a pink-and-white lily, a pink rose, an orange rose, and several other assorted flowers.

As you work through this lesson, you will be making dramatic changes to the image. You may want to undo changes you make, or even revert to the original image. Feel free to experiment, and use the Undo command from the Edit menu or the Revert command from the File menu whenever you choose.

## Selecting a painting color

Before you begin painting, you need to understand one of the basic principles of the Adobe Photoshop program, the functions of the foreground and background color. The painting tools paint by default with the foreground color, which is displayed in the toolbox. The background color is used for making gradient fills and erasing. When you erase, you expose the background color.

You can paint with the default colors (black in the foreground and white in the background), or you can select new colors using the eyedropper tool. The eyedropper tool takes samples of color from the image in the active window, or from an inactive document.

If you want to use a color that does not appear in the active image, you have several options. You can select color from another image with the eyedropper tool, you can use the color palette to modify a sample of a color, or you can select a new color using the color palette. The color palette is discussed in the section following the eyedropper tool section.

## Selecting the foreground color with the eyedropper tool

To paint, you use the foreground color. The simplest way to change the foreground color is to use the eyedropper tool. The eyedropper tool lets you select a color from anywhere in the image by taking a sample of that color. If you wish to return to the default color, simply double-click the eyedropper tool in the toolbox. The foreground color returns to black, and the background color returns to white.

Another important feature of the eyedropper tool is that you can access it while using a painting tool without having to return to the toolbox.

### To select the foreground color using the eyedropper tool:

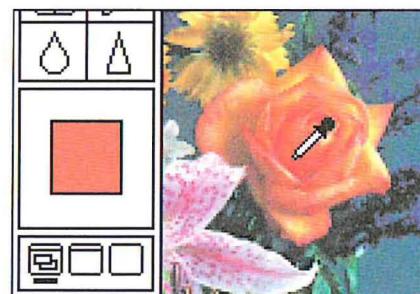


1. Open the “Flowers” image if it is not already opened.
2. Click the eyedropper tool.

The pointer changes into the eyedropper pointer, which looks like the eyedropper tool.

3. Position the pointer on the rose on the right side of the image.

The pointer changes into the eyedropper pointer.



4. Click the mouse button.

Notice that the foreground color in the toolbox changes from black to the reddish-orange color of the rose.

You can also hold down the mouse button while you move through the image, and watch the foreground color in the toolbox change. Release the mouse button when you have found the desired color.

You may now use this color with the painting tools to add color to the image.

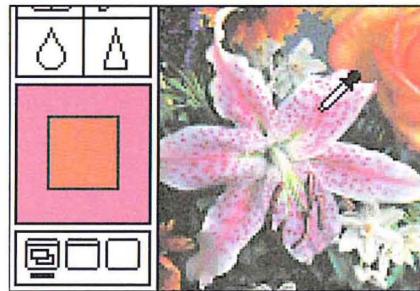
### Selecting the background color with the eyedropper tool

When you erase an image, the background color is revealed. You may want to change this color from white, the default background color, to another color.

**To select the background color using the eyedropper tool:**

1. Click the eyedropper tool.
2. Position the pointer on the deep pink color on the petals of the pink and white lily.

The pointer changes into the eyedropper pointer.



3. Hold down the Option key, and click the mouse button.

The deep pink of the lily appears as the new background color in the toolbox.

4. Release the Option key and the mouse button.

**NOTE:** You can also use the eyedropper tool to sample color from another image. To do so, open another document, and use the eyedropper tool to sample a new color. You can close the second document and continue to use the sampled color.

### Switching to the eyedropper tool while painting

You can conveniently switch to the eyedropper tool to sample a new color while you are painting.

To select the eyedropper while using one of the painting tools:

1. Select a painting tool (pencil, line, paint brush, or airbrush tool) by clicking it in the tool box.
2. Press the Option key.
3. Position the pointer on the color in the image you want to select.

The painting pointer (pencil, line, paint brush, airbrush) turns into the eyedropper pointer.

4. Click the mouse button.

The foreground color changes, and the pointer changes back to the painting tool you were using.

You can try this feature as you use the pencil, line, paint brush, and airbrush tools.

### Selecting color with the color palette

The color palette is a floating window that you can leave on-screen or hide. The Adobe Photoshop program's color palette lets you select the foreground or background color using one of three color models: RGB, HSB, or CMYK. The "Flowers" image is currently displayed in RGB mode.

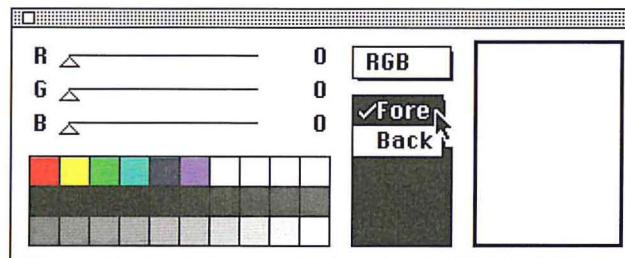
When the CMYK color model is active, you might notice that the color sample is occasionally different from the color you selected. This is because in CMYK mode, the color selection box on the color palette displays the colors that can be printed, while the color selection box on the tool palette displays RGB colors. Some RGB colors, such as extremely bright or fluorescent colors, cannot be printed as CMYK colors. If you select an RGB color that cannot be printed, the Adobe Photoshop program displays the closest printable color.

The color palette includes color swatches and slider controls. You can click one of the color swatches to choose one of the displayed colors, and you can alter the color by adjusting the levels of RGB, HSB, or CMYK. When you are using the RGB or CMYK color model, you select a color by using the slider controls to specify the levels of red, green, and blue; or cyan, magenta, yellow, and black.

To select a color, you first need to specify whether you are selecting the foreground or background color, then you select it.

**To select a color from the color palette:**

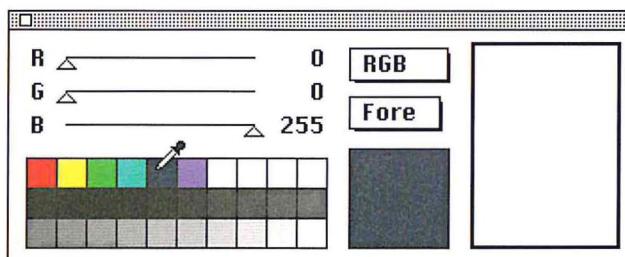
1. Choose Show Palette from the Window menu.
- The color palette appears.
2. Position the pointer on the color selection box labeled Fore or Back.
3. To change either the foreground or background color being displayed, hold down the mouse button, and drag to highlight Fore to choose the foreground color, or Back to choose the background color.



Your choice appears in the color selection box.

**To select a color from one of the color swatches on the palette:**

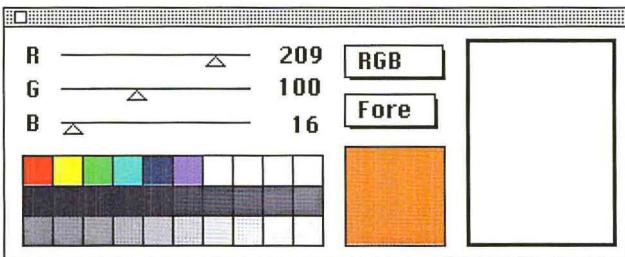
1. Select the foreground color by holding down the mouse button, and drag to highlight Fore.
2. Position the pointer on the dark blue color.
- The pointer changes into the eyedropper tool.
3. Click the mouse button.



**To specify the color levels in the RGB model:**

1. Position the pointer on the red slider control (R).
2. Click and drag the triangle to increase the red as close to 209 as possible.
3. Position the pointer on the green slider control (G).
4. Click and drag the triangle to increase the green as close to 100 as possible.
5. Position the pointer on the blue slider control (B).

6. Click and drag the triangle to increase the blue as close to 16 as possible.



The color you have specified is a light brown. You will notice that the foreground color changes to light brown in the toolbox.

When you are finished using the color palette, you may hide it if you wish.

To hide the color palette, either click the close box in the upper-left corner of the palette, or choose Hide Palette from the Window menu.

You may retrieve the color palette at any time by choosing Show Palette from the Window menu.

## Using the magic wand tool to make a selection

The magic wand tool is a selection tool that allows you to select images, or parts of images, based on color similarities of pixels. The magic wand evaluates colors according to the color values of adjacent pixels to determine if they are within the specified range, or tolerance. All pixels that fall within the specified tolerance are selected. You control the tolerance, and can therefore decide how extensive you want a selection to be.

The magic wand tool makes selecting distinct objects quick and easy. Rather than tracing the outline of an object with the lasso tool, one touch of the magic wand tool can often select the whole object. In this section, you will first specify the tolerance of the magic wand, then select the yellow flower on the left side of the image.

### Specifying the range of colors for a selection

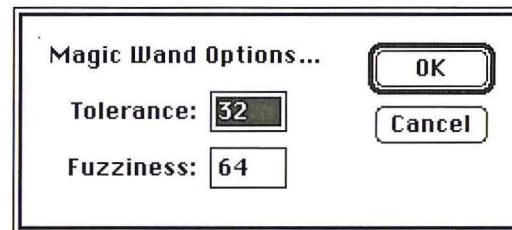
The Tolerance parameter determines how similar pixels must be to be included in a selection. Tolerance specifies a range of colors, from very similar to very dissimilar. Specify a low value to select only very similar colors; specify a high value to select a broader range of colors. The range of values for tolerance is from 0 to 255; the default value for tolerance is 32.

To specify a range of colors for a selection:



1. Double-click the magic wand tool.

The Magic Wand Options dialog box appears.



2. Click OK to accept the default of 32. Later you will change the tolerance value.

### Determining the smoothness of a selection

The magic wand tool has a parameter called fuzziness that allows you to control the smoothness of the edges of a selection. The fuzziness feature smoothes a one-pixel border on the edge of the selection.

**NOTE:** If you want to soften the transition of a magic wand selection over an area greater than one pixel, use the magic wand tool to make the selection, and then use the Feather command from the Select menu.

For now, leave the fuzziness at its default value of 64. The range of fuzziness is from 0 to 255. Later, as you experiment with the program, you can adjust the fuzziness of selections.

### Making a selection with the magic wand tool

You have set the tolerance and fuzziness values for the magic wand tool, and are now ready to make your selection. You will use the magic wand tool to select the yellow flower that appears on the left side of the image.

#### To make a selection using the magic wand tool:

1. Position the magic wand pointer in the bright yellow in the right portion of the flower.
2. Click the mouse button.

The areas of the image that fall within the specified tolerance are selected.
3. Double-click the magic wand tool to access the Magic Wand Options dialog box.
4. Enter 64 for the tolerance. Click OK.
5. To deselect a selection made with the magic wand tool, click once inside the selection, or choose None from the Select menu.

6. Position the magic wand pointer on the same spot in the yellow flower, and click once to deselect the first selection. Click again to make a new selection.



Tolerance: 32



Tolerance: 64

### Extending a magic wand selection

You may find that the selection hasn't included the entire flower. Once an area has been selected, you can extend the selection in several ways. One way to extend a magic wand selection is to use the Grow or Similar commands in the Select menu. The Grow command extends the selection to include adjacent pixels that fall within the specified tolerance and fuzziness range. The Similar command selects pixels throughout the image, not just the ones next to the selection, that fall within the specified range.

To extend a magic wand selection using the Grow command, choose Grow from the Select menu. You may have to use the Grow command several times to extend the selection to the edge of the flower.



Now you should have the whole flower selected, but you may see small dots of unselected areas. If your whole flower is selected, you can skip the next section. If there are still unselected areas, you can add these areas to the selection by using the lasso tool.

**To extend a magic wand selection using the lasso tool:**

1. Click the lasso tool in the toolbox.
2. While holding down the Shift key and the mouse button, drag to surround the unselected dots with the lasso tool.



3. Release the Shift key and the mouse button.

The entire flower should be selected.

**Subtracting from a magic wand selection**

If you set the tolerance above 100 in the Magic Wand Options dialog box, you may have selected areas outside of the yellow flower. You can deselect an area using the magic wand or the lasso tool. Before you deselect an area, set the tolerance back to its default value of 32.

**To deselect an area with the magic wand tool:**

1. Click the magic wand tool in the toolbox.
2. Position the pointer on the area you want to deselect.
3. Hold down the Command key, and click the mouse button.

The area is deselected. Continue to deselect any extraneous areas that are included in the selection.

**To deselect an area with the lasso tool:**

1. Click the lasso tool in the toolbox.
2. Position the pointer on the area you want to deselect.
3. While holding down the Command key and the mouse button, drag to enclose the area to be deselected. Make sure that you completely surround the unwanted area.
4. Release the Command key and the mouse button.

The area is deselected.

## **Painting with the pencil tool**

You can use the pencil tool to create freehand lines. The pencil tool is the only painting tool that creates a hard edge. The other tools paint with a soft edge.

If the yellow flower is still selected, deselect it by choosing None from the Select menu.

**To paint with the pencil tool:**



1. Click the pencil tool.
2. Press the Option key to access the eyedropper tool
3. Position the eyedropper tool on the yellow flower in the upper right of the image.
4. Click the mouse button to sample the yellow as the foreground color.
5. Release the Option key, and position the pencil pointer on the inside of the rose in the upper right of the image.
6. Hold down the mouse button, and drag to draw lines on the rose petals.



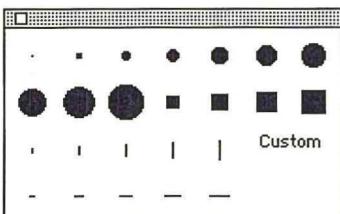
7. Release the mouse button when you have finished painting.

## **Selecting a brush shape**

You may change the size and shape of the brush you are using with any of the painting tools by using the Show Brushes option from the Window menu.

**To select a brush shape:**

1. Choose Show brushes from the Window menu.  
A floating window with different brushes appears.



2. Click the brush with which you want to paint.

A bounding box will appear around the selected brush. The brush you select will be used with the currently selected painting tool. If you select a new painting tool, however, the default brush for that tool will be selected.

You may want to experiment with different brush shapes and sizes as you use the painting tools in the next sections.

You can keep the brush window on the screen, or you can close it by clicking the close box, or by choosing Hide Brushes from the Window menu.

## **Painting with the line tool**

You can use the line tool to create straight lines. The line tool is anti-aliased, or soft-edged. In this section, you will draw a box around the dark-pink rose.

**To paint with the line tool:**



1. Click the line tool.
2. Position the pointer outside of the dark-pink rose.  
The pointer turns into the line pointer.
3. Press the mouse button, and drag in any direction to draw a straight line.
4. Release the mouse button at the end point of the line.
5. Continue to paint straight lines to enclose the rose in a box.



## **Painting with the paint brush tool**

The paint brush tool can be used to lay down a softer-edged layer of paint than that obtained from the pencil tool. In this section, you will paint the pink-and-white lily.

**To paint with the paint brush tool:**



1. Click the paint brush tool.
2. Position the paint brush pointer on the center of one of the petals of the lily.  
The pointer changes into the paint brush pointer.

3. Hold down the mouse button, and drag to lay down a brush stroke. The paint brush tool paints with the current foreground color.



## Using the airbrush tool to retouch an image

The airbrush tool lays down a diffused spray of paint, just as a real airbrush does, and may be used for touch-up work. You will have a chance to try some of the available options while using the airbrush tool.

You can customize the airbrush tool with the options you select. You can select the size and shape of the brush, as well as the spacing, fade-out rate, repeat rate, pressure, and extent of opacity of the paint.

You select the shape and size of your airbrush tool by using the Airbrush Options dialog box, or by choosing Show Brushes from the Window menu. You have a choice of various sizes of round, square, vertically-oriented, and horizontally-oriented brushes.

You can also specify the spacing of the paint as it is applied to an image. For example, if you specify a spacing value of 5 pixels, the airbrush tool will lay down paint once every 5 pixels.

You can specify the rate at which the airbrush tool fades out as you paint with it. The fade-out rate determines how much paint is applied with each stroke before the paint level fades to a pressure of zero. The higher the fade-out rate, the longer the paint will flow before it fades out. A negative value makes the paint fade from the foreground color to the background color.

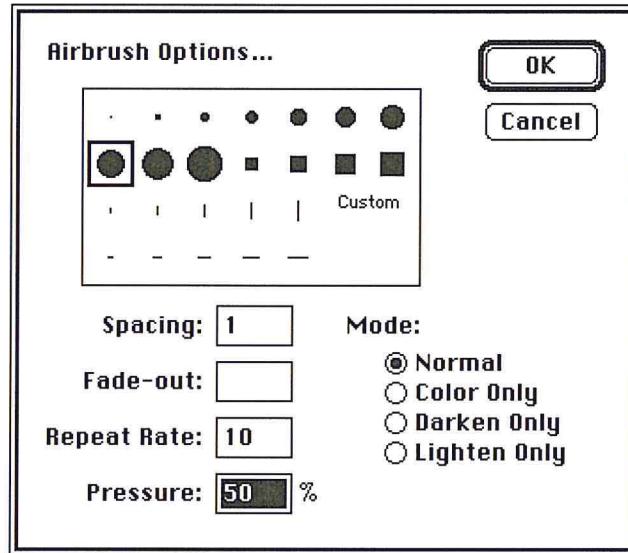
The repeat rate is the rate at which paint is deposited on the image when the cursor is not moving. The higher the repeat rate, the more paint is deposited. For less concentrated paint, choose a lower repeat rate. Note that the repeat rate has no effect if the cursor is moving.

The pressure controls how long it takes for paint to build up as you apply it with the airbrush tool. The higher the pressure, the faster the paint builds up.

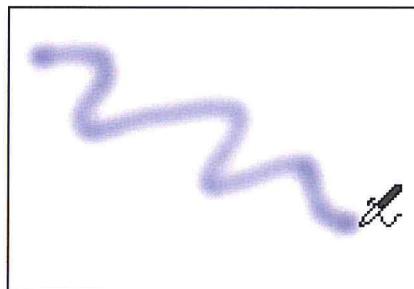
To customize the airbrush tool for retouching an image:

1. To select a brush shape, double-click the airbrush tool to access the Airbrush Options dialog box.

The Airbrush Options dialog box appears.



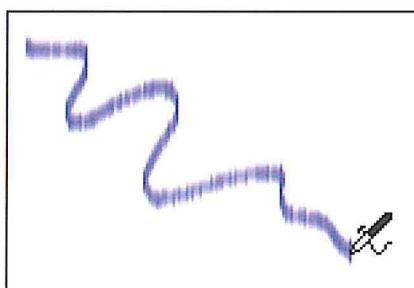
2. Position the pointer on the brush you want to use.



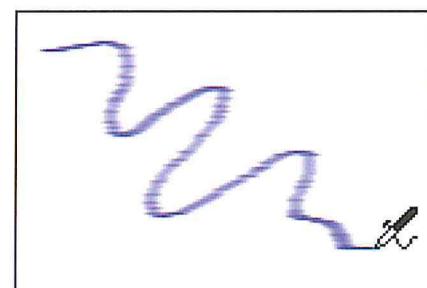
Round brush



Square brush

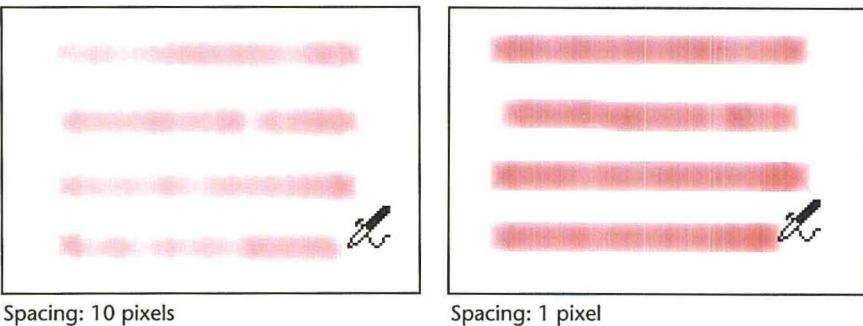


Vertically-oriented brush

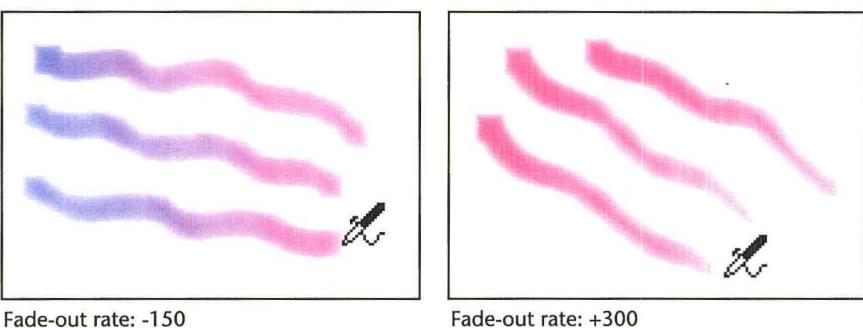


Horizontally-oriented brush

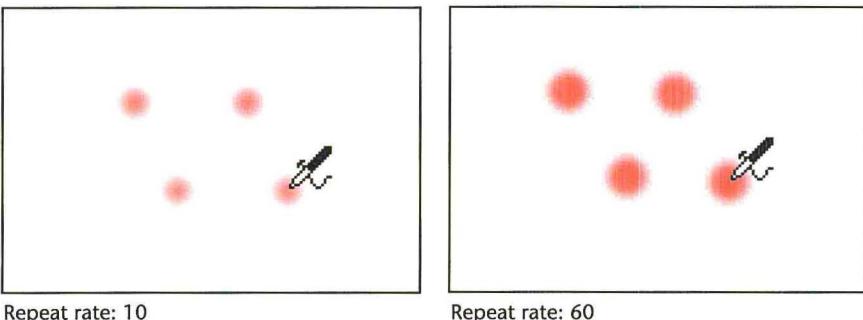
3. Click the mouse button.
4. To specify a spacing value, click in the Spacing text box.
5. Enter 10 for the spacing value. The range for spacing values is from 1 to 999.



6. To specify the fade-out rate, click in the Fade-out text box.
7. Enter -150 for the fade-out rate. The range for fade-out rate values is from -999 to 999.

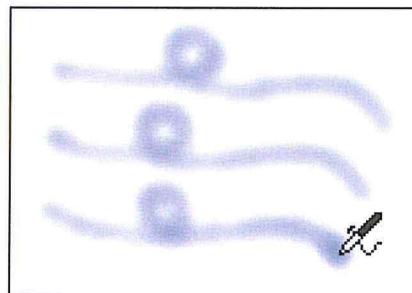


8. To select the repeat rate, click in the Repeat Rate text box.
9. Enter 60 for the repeat rate. The range for repeat rate values is from 1 to 60.

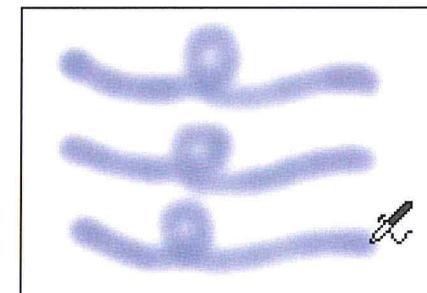


10. To select the pressure, click in the Pressure text box.

11. Enter 50 for the pressure. The range for pressure values is from 1 to 100 percent.



Pressure: 45



Pressure: 85

12. Click OK.

### Applying paint with the airbrush tool

Now that you have customized the airbrush tool, you are ready to airbrush the image.

#### To apply paint with the airbrush tool:

1. Position the pointer on one of the petals of the pink-and-white lily.
2. Hold down the mouse button, and drag to airbrush the image.



Before airbrushing



After airbrushing

3. Release the mouse button when you have finished airbrushing.

### Using the smudge tool

The smudge tool lets you simulate the action of dragging a finger through wet paint. You can define a short or a long smudge. For shorter smudges, select a value close to 1; for longer smudges, select a higher value.

#### To use the smudge tool:

-  1. Click the smudge tool.

The pointer changes into the smudge pointer, which looks like the smudge tool.

2. Position the smudge pointer on one of the petals of the pink-and-white lily.
3. Hold down the mouse button, and drag through the area to create a smudge.



Before smudging

After smudging

Notice how the clearly defined dots on the flower have been smudged into a generally pink area.

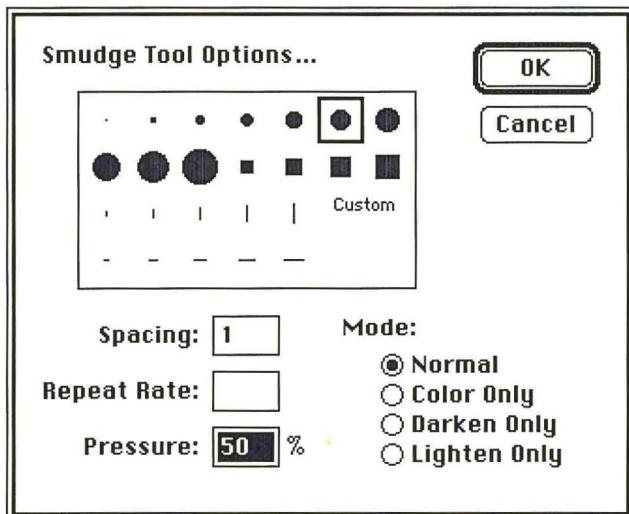
### Defining the smudge length

You use the pressure parameter to specify the length of a smudge. A smudge can have a subtle effect if you specify a low pressure value, or a dramatic effect if you specify a high pressure value. The range of values for the pressure parameter is from 1 to 100 percent.

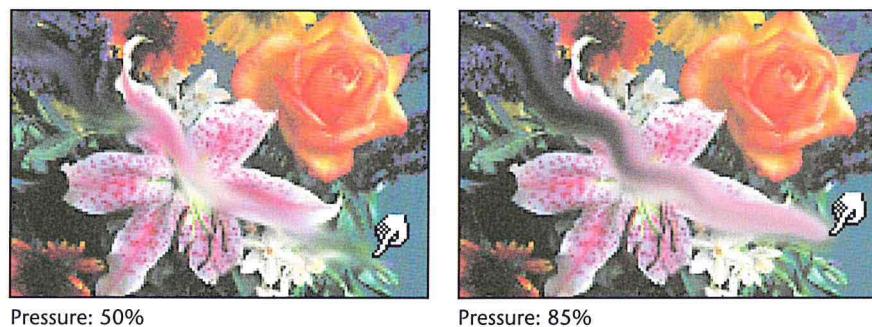
#### To specify the length of the smudge:

1. Double-click the smudge tool.

The Smudge Tool Options dialog box appears.



2. Double-click in the Pressure text box.
3. Enter a value of 85 for the pressure percentage.



4. Click OK.

Try a few different pressure values to see what effects you can achieve.

## Adjusting the highlights, midtones, and shadows

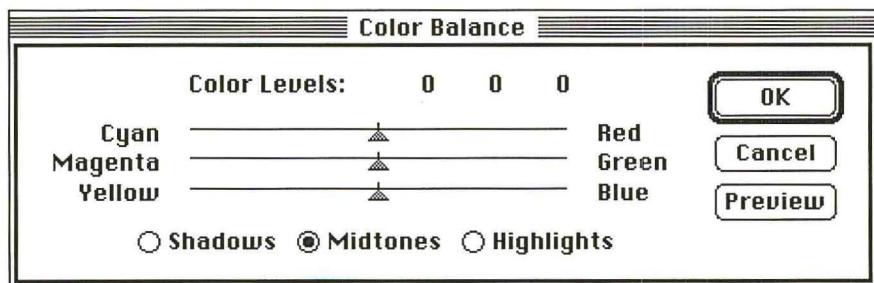
You may want to make some adjustments to the color balance of the image as it appears on-screen. You can adjust the highlights, midtones, and shadows to alter the color balance in an image.

### To adjust the color balance:

1. Choose Adjust from the Image menu.
2. Choose Color Balance from the Adjust submenu.



The Color Balance dialog box appears.



You may choose to adjust shadows, midtones, or highlights by clicking the circle next to each option.

3. Position the pointer under the gray triangle on any of the three color balance slider controls.



Before adjustment

4. Slide the triangle towards the color you want to increase (for example, for more red, drag the triangle to the right).
5. If you make a series of changes, click Preview to preview your changes. If you are dissatisfied with the changes, click Cancel, and repeat steps 3 and 4.

6. Click OK when you are satisfied with the color balance.



After adjustment

## Using filters

The Adobe Photoshop program offers 22 different filters that can be used on an image. In lesson 2, you used the Blur and Sharpen filters. To soften an image, you can use the Blur, Blur More, Diffuse, Despeckle, Gaussian Blur, or Motion Blur. To invert colors in an image, use the High Pass filter. To sharpen an image, choose from the Sharpen, Sharpen More, Sharpen Edges, or Unsharp Mask filters. You can create special effects by using the Add Noise, Facet, Fragment, Mosaic, or Offset filters. Use the Find Edges or Trace Contour filters to outline images. To brighten an image, choose the Minimum, Median, or Maximum filters. Finally, you can create a custom filter by choosing the Custom filter.

You can use a filter on a selected part of an image, or on the entire image. If something is selected, only that selection is affected by the filter. You can undo any filter by immediately choosing the Undo command from the Edit menu.

In this section, you should first select part of the image (such as the rose) before you use any of the filters. The illustrations that follow show the results of the various filters on the orange rose, on the right side of the image. Filtering a small part of the image takes less time than filtering the entire image. You can also feather the edge of this selection if you would like the filter's effect to blend in with the rest of the image. You feather a selection by using the Feather option in the Lasso Options dialog box, or by choosing feather from the Select menu.

**To use a filter:**

1. Select part of the image to which you will apply the filter.
2. Choose Filter from the Image menu.

A submenu appears listing the 22 filters.



3. Choose Mosaic from the Filter submenu.

The wristwatch icon appears while the filtering takes place.

You will notice that the Mosaic filter has grouped the pixels together into blocks of pixels.



Selection before filter



Mosaic filter



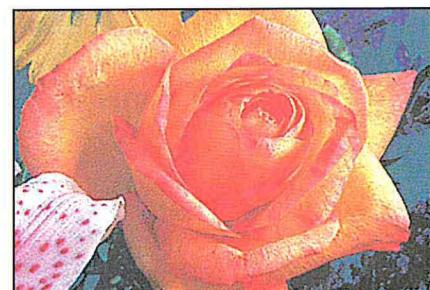
Facet filter



Find Edges filter



Gaussian Blur filter



Sharpen More filter

4. Undo the filter by using the Undo command in the Edit menu.

Now try using the Facet filter, the Find Edges filter, the Gaussian Blur filter, and the Sharpen More filter on the same selection.

For a description of each of the individual filters, refer to the *Adobe Photoshop User Guide*.

## Working with channels

The Adobe Photoshop program treats images as a series of channels. Bitmapped, gray-scale, and indexed color images are single-channel images. RGB, HSL, and HSB images have three channels, and CMYK images have four channels.

The Adobe Photoshop software supports up to 16 channels per document. The red, green, and blue channels are the first three channels of an RGB image; you, therefore, can create 13 alpha channels. When you use the Selection → Alpha command in the Select menu, you create a new alpha channel. The first alpha channel is labeled 4 at the top of the screen because it is the fourth channel. If you create additional alpha channels, they will be numbered 5, 6, and so on.

The Adobe Photoshop program lets you view the individual channels of an image so that you can work on each channel separately. You can work on just an individual channel. You can also create an alpha channel to work on a selected part of an image.

An alpha channel is essentially a separate gray-scale image within a document, used for isolating, modifying, and storing masks. The alpha channel displays the mask as a gray-scale representation.

When you use one of the selection tools to select an area of an image, you create what is known as a selection mask. A selection mask is similar to a rubylith used to mask a mechanical. The selection mask floats above the underlying image. What you have selected appears transparent over the underlying image; the remainder of the mask is opaque. As long as a selection is active, it is called a selection mask; once stored in an alpha channel, it is called a mask.

When you view the selection mask superimposed on any image, you see only the flickering black-and-white edges of the mask. When you transfer the selection to an alpha channel, however, you see the selection in white, and the rest of the image in black.

Working on a selection in an alpha channel has several advantages. You can easily see a selection independently of the surrounding image, edit the selection, and store the selection so that you don't have to reselect it. You can alter a selection in an alpha channel using any of the painting and editing tools. You can paint on a selection, change its borders, use filters, and so on.

When a selection is transferred to an alpha channel by the Selection → Alpha command, the selection you have made appears in white, and the rest of the image appears in black. If the selection is feathered, the feather edge will appear as a gray area. The black area is masked off from the selection, and is impervious to painting and filtering. The gray areas are partially affected by any image manipulations. Only the white selection is affected by editing, painting, and filtering.

The Adobe Photoshop program lets you view a selection mask as an image. As a result, you can use any of the painting or image editing tools to alter the selection, just as you alter an image.

If you paint with black paint on the white areas in a mask in an alpha channel, and copy the alpha channel back into the image using the Alpha → Selection command in the Select menu, you will notice that you cannot paint on top of the areas that you painted black in the alpha channel. This is because you actually masked off those areas with the black paint, and made the black areas unalterable. If you use gray paint in the alpha channel, the areas covered with gray paint will be partially transparent to painting or filtering. The degree of transparency depends on the gray paint's color level.

While you are working in an alpha channel, you can edit the mask, retouch it, or add to it. You can use the painting tools, and the blur, sharpen, and smudge tools, as well as the filters. In this section, you will use the Blur filter in an alpha channel to blur the edges of a mask. Therefore, when you return the mask to the original image, the selection blends in subtly, without harsh edges.

Alpha channels are automatically saved when you save your document unless you delete them. Keep in mind, however, that alpha channels substantially increase the disk space that your image requires. If you have a shortage of disk space, you may want to delete alpha channels before saving the document.

In this section, you will learn to apply some of the image adjustment commands within an alpha channel to help you create a mask for everything but the small, white flower in the lower center of the image. This section is somewhat more advanced than most of the other sections in the tutorial, and is designed to demonstrate some of the complex capabilities of the Adobe Photoshop program.

This section will take you through several different procedures. If you wanted to create an alpha channel very simply, you could select the small, white flower with the lasso tool; this would create a selection mask. Then you would choose Selection → Alpha in the Select menu. In this lesson, however, you will use a few advanced techniques.

In this procedure, you will isolate the small white flower below the pink-and-white lily and select it so that you can alter it, then add a copy of it to the "Flowers" image.

If you examine the red, green, and blue channels individually, you will note that the blue channel best isolates the white flower from the rest of the image. Because your goal is to work with the white flower, you will start with the channel that has the greatest contrast between the element you want to mask and the rest of the image.

You will first access the blue channel of the image in order to isolate the white flower from its background in a selection mask so you can manipulate it easily. You will then copy the blue channel into an alpha channel to display the image as a gray-scale image. In the alpha channel, you will use the Threshold command to convert the image to black and white. The conversion allows you to select the white flower easily with the magic wand tool without selecting anything else. The Threshold command converts an image with multiple gray levels to an image with only two gray levels: black and white.

Next, you will edit part of the white flower, then using the magic wand tool, select all of the flower to mask off everything but the flower. You will blur the mask in the alpha channel. Finally, you will return the mask to the original image, paste a copy of the flower elsewhere in the image, and delete the alpha channel. By following the procedures described in this section, you will attain high-quality results.

Before you start this section, make sure that the foreground and background colors are reset to their default (black foreground, white background). To reset the default colors, double-click the eyedropper tool in the toolbox.

**To access the blue channel:**

1. Choose Channel from the Mode menu.  
The Channel submenu appears.
2. Choose Blue from the Channel submenu.  
The blue channel appears.

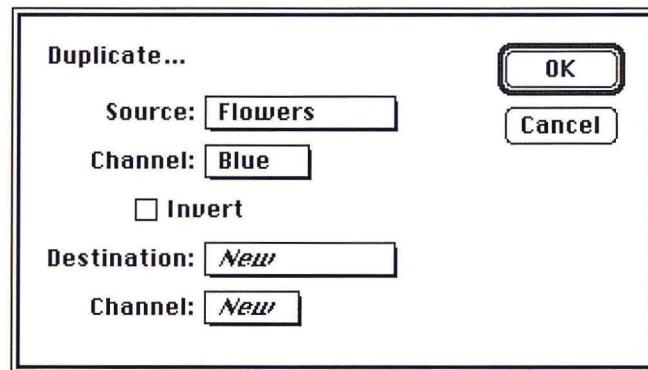


The next step is to make a copy of the blue channel, and thus create an alpha channel. In this example, you will use the Duplicate command to create a new channel, and copy the blue channel into it.

**To create an alpha channel using the Duplicate command:**

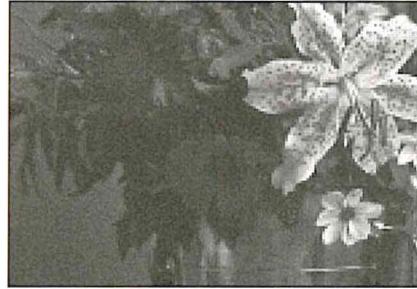
1. Choose Calculate from the Image menu.  
The Calculate submenu appears.
2. Choose Duplicate from the Calculate submenu.

The Duplicate dialog box appears.



3. Position the pointer on the word "New" in the text box next to Destination.
4. Press the mouse button.  
A pop-up menu appears, showing "New" and "Flowers."
5. Drag to highlight "Flowers." This means that the alpha channel will be part of the Flowers document, rather than a new document.  
"Flowers" appears in the destination text box.
6. Click OK.

The gray-scale alpha channel, labeled 4, appears.

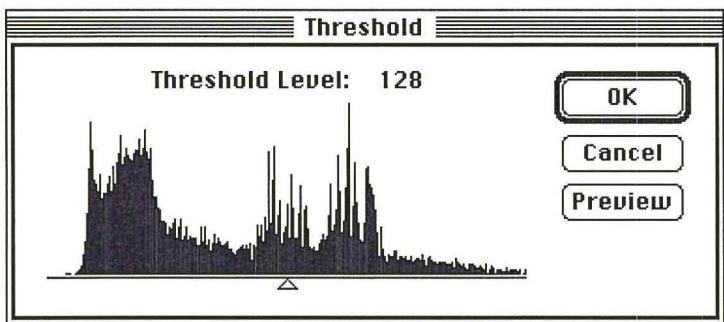


To isolate the small white flower beneath the pink-and-white lily, you need to convert the image to black and white, using the Threshold command.

**To use the Threshold command:**

1. Choose Map from the Image menu.  
The Map submenu appears.
2. Choose Threshold from the Map submenu.

The Threshold dialog box appears.



3. Position the pointer on the slider control, and drag the triangle to 120.
4. Click OK.

The selection mask appears in the alpha channel as a black and white image.



To select the small, white flower in its entirety, you first need to change the black center of the flower to white.

**To edit the selection:**

1. Click the magic wand tool.
2. Position the pointer on the black center of the flower.
3. Click the mouse button.

The magic wand selects the black center of the flower.

4. Press the Delete key.

The black center is erased to the current background color, which is white. The entire flower is now white.

**To select the whole flower:**

1. Position the magic wand pointer anywhere on the flower.
2. Click the mouse button.

The flower is selected.

Now you need to make the remainder of the image black, so that everything except the flower is completely masked off.

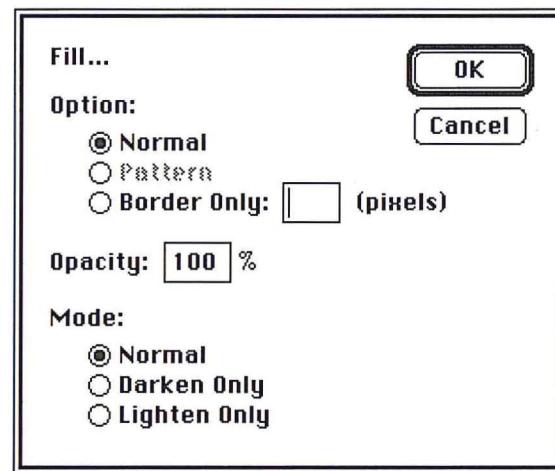
**To mask off everything except the flower:**

1. Choose Inverse from the Select menu.

Everything except the flower is selected.

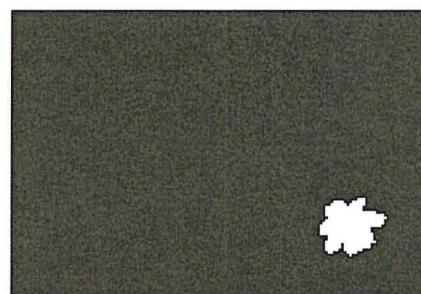
2. Choose Fill from the Edit menu.

The Fill dialog box appears.



3. Click OK to accept the default settings.

The selection is filled with the current foreground color, which is black, leaving only the white flower showing.



4. Choose None from the Select menu to deselect everything.

The last thing you need to do before returning the selection to the original image is to blur the selection in the alpha channel. Blurring the selection will soften the edges when it is copied back into the image.

**To blur the selection in the alpha channel:**

1. Choose Filter from the Image menu.

The Filter submenu appears.

2. Choose Blur from the Filter submenu.

The wristwatch icon appears as the blurring takes place. Notice that the blurring slightly softens the edge of the selection. When the pointer reappears, you are ready to return the selection to the image.

To move a selection from an alpha channel to the original image, choose Alpha → Selection from the Select menu.

The white flower is the current selection in the image.

You will now make a copy of the flower and place it to the left of the original flower. Since you made an extremely precise selection, and blurred its edges, you will see how subtly the copied flower fits into the image.

**To copy the flower:**

1. Position the pointer on the current selection, the white flower in the lower center of the image.



2. While holding down the Option key and the mouse button, drag a copy of the flower to the left side of the image, below the yellow flower on the left side of the image.
3. Release the Option key and the mouse button.
4. Choose None from the Select menu.

The copy of the flower blends into the image as if it had always been there.



You may decide that you will not need to use this selection again. If this is the case, you can delete the alpha channel.

**To delete an alpha channel:**

1. Open the alpha channel you wish to delete (4, for example) by choosing 4 from the Channel submenu under the Mode menu.
2. Choose Delete Channel in the Mode menu.  
Alpha channel 4 is deleted, and the Adobe Photoshop program displays the blue channel.
3. To return to the full-color image, choose RGB from the Channel submenu under the Mode menu.

## Conclusion

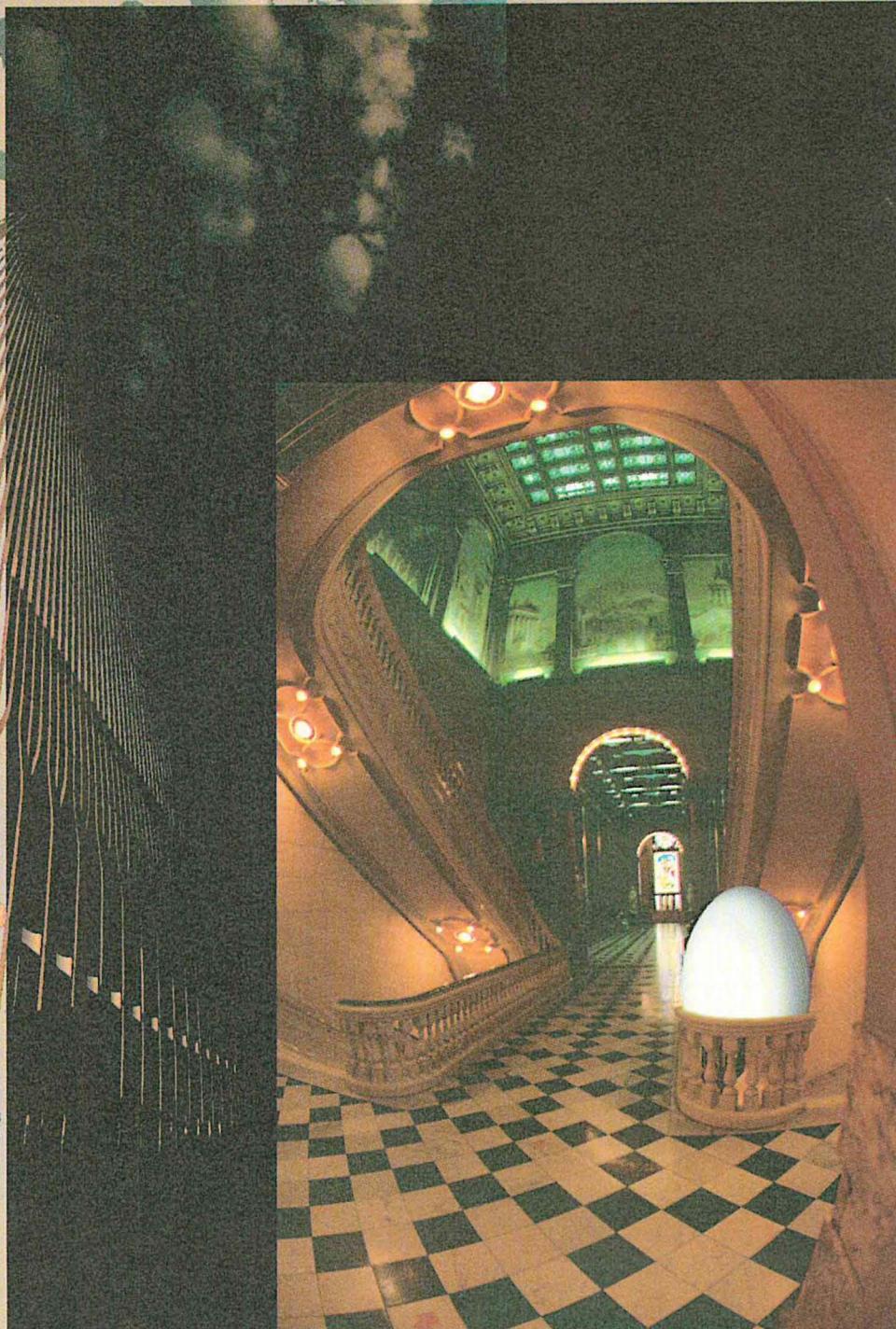
In this lesson, you learned how to select colors and use the painting tools to manipulate a color image. You learned how to use the magic wand tool. You also learned about adjusting color balance and using filters. Finally, you learned how to use alpha channels to edit and save selections.

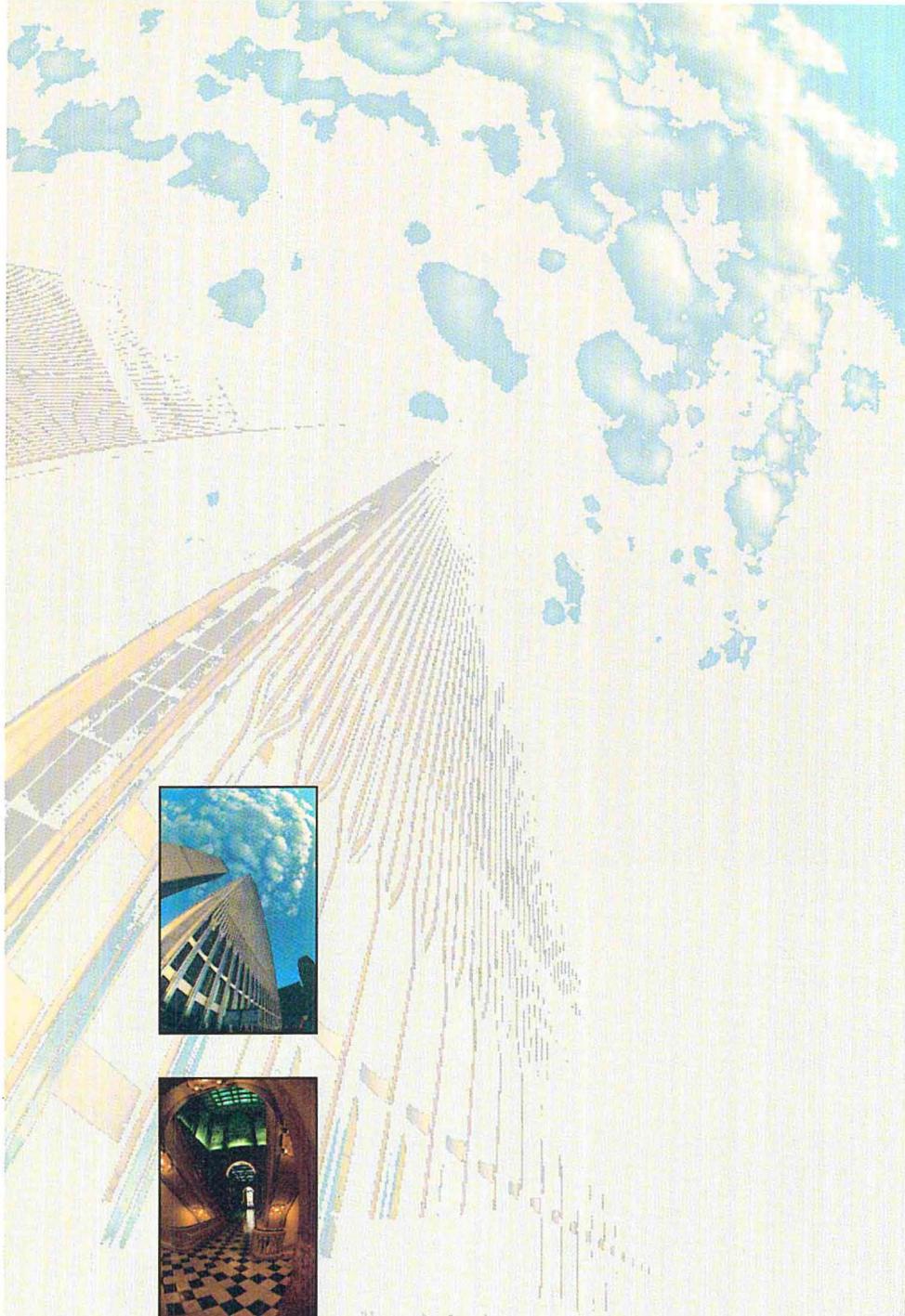
You may want to experiment further with some of these features. You may try:

- Selecting new colors using the color picker. You access the color picker by clicking the foreground color in the toolbox.
- Entering different values for the Fuzziness parameter of the magic wand tool. Once you've made a magic wand selection, try editing the selection (by painting it a new color, for example), and notice how different fuzziness values determine how the selection blends in or stands out from the surrounding areas.
- Changing the options for each of the painting tools. You access the painting tool options by double-clicking the tool.
- Experimenting with selections in alpha channels.
- Using all 22 filters.



## *Lesson 4: Producing and Printing a Color Separation*

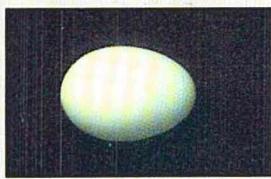




From a scanned-in 35mm slide of an egg, the designer created a mask to alter the image.

A 35mm slide of the World Trade Center in New York City was the starting point for the image. The designer used paste controls, then adjusted the brightness and contrast separately in the clouds and building.

The designer scanned in a 35mm slide of the atrium of the Masonic Temple in Philadelphia, resized it, then adjusted the image's color levels and contrast.



## Lesson 4: *Producing and Printing a Color Separation*

In this lesson, you will use the “Flowers” color image from lesson 3 to print a test color proof, and, ultimately, a four-process color separation. A full-color reproduction of a color image is generally produced by splitting the image into four separate images. An individual plate, or piece of film, is created for each process color, and the four plates are then superimposed on each other. Images are separated into four process colors: cyan, magenta, yellow, and black. The Adobe Photoshop program converts your RGB image into a CMYK image so that you can print a color separation.

### Overview

You will be able to print a color separation if you have access to an imagesetter. If you are using a color printer or a laser writer, you will be limited to printing a test proof.

In this lesson, you will learn how to resample an image in relation to the output device you plan to use to print the image. Resampling adjusts the resolution of an image by adding or subtracting pixels so that the image resolution corresponds to the resolution of the output device. You will learn how to set up the screen for printing by specifying a screen frequency and dot shape. You will learn about calibration and setting up the separation. Finally, if you have access to an imagesetter, you will convert the image to CMYK mode, and print a high-quality color separation.

The features you will learn in this lesson are:

- Resampling an image
- Adjusting your monitor to achieve high-quality output
- Calibrating the monitor to match the printed output
- Setting up the screen for printing
- Printing a test proof
- Converting an RGB image to a CMYK image
- Printing a separated image

## Resampling an image

Resampling lets you resize an image to specific dimensions while controlling its resolution; resampling either adds or subtracts pixels. An image's resolution expresses the density of information within a given file. For example, a resolution of 100 pixels per inch means that 100 screen pixels are available to create a one-inch-long segment on the printed page.

Your image's resolution is a critical factor in determining the quality of your printed output. If the resolution is too low, the PostScript language will use a single pixel's color values to create more than one halftone dot. This will result in *pixelization*, or very coarse-looking output. If the resolution is too high, you will send more information than your printer needs, resulting in long printing times.

The required resolution is dependent upon the quality of output that you need, as well as the resolution of your printer. If you are printing to a color printer using a 65-lines per inch (lpi) screen at 300 dots per inch (dpi), you will need a lower resolution than if you are outputting to an imagesetter with a 133-lpi screen at 2540 dpi. The lower screen density used for the color printer means that there are fewer halftone dots in the color printer output than there would be in the imagesetter output. Fewer halftone dots imply that fewer screen pixels are needed to create these dots, and, thus, you need a lower resolution.

You should also be aware that an image's resolution and size affect the physical size of the image file. The file size, in turn, has an effect on how long it takes the Adobe Photoshop program to process an image. Large files will require longer processing times than smaller images. The size of a file is proportional to the square of its resolution. Therefore, an image with a resolution of 200 pixels per inch will be four times as large as an image with a resolution of 100 pixels per inch.

If you are using the Adobe Photoshop program to manipulate scanned images, you will achieve the highest quality output when you create scans in the same resolution as that needed by your printer. If this is not possible, you can use the Resample command to change the resolution of your image. If you are resampling down, or decreasing the resolution, the program will delete information from the image to achieve the desired resolution. If you are resampling up, or increasing the resolution, the Adobe Photoshop program will create new pixel information based on the existing color values.

The Resample command is "intelligent" because it uses a sophisticated interpolation scheme to create new pixels from the existing color information in your image file. (The interpolation scheme is set in the Preferences dialog box under the Edit menu, and is covered in the *Adobe Photoshop User Guide*).

Note that if you sample down (decrease the resolution of) an image to a low resolution, and then sample up (increase the resolution of) that image to its original resolution, the image will have changed. This change occurs because once an image is sampled down, the original color information is irretrievably lost as pixels are deleted. During the sampling up process, the Adobe Photoshop program will do its best to reconstruct the original file based on the current color information. Keep in mind that while the sampled-up file will, in most cases, give you good printed results, it is only an approximation of the original image and will not be as sharp as the original image.

If you only have a color printer, you will resample down in this lesson. If, however, you have an imagesetter, you will resample up to increase the image's resolution.

The Resample command preserves an image's height-to-width ratio. Therefore, if you change one dimension, the other dimension is automatically resized to maintain the image's original proportions. You may change the image's width and height, and its current resolution; to do so, you use the Resample dialog box under the Resample command in the Image menu. The dialog box displays the current size of the document on disk, the image's width and height, and its current resolution. As a result of the changes you make, the size of the document on disk may change.

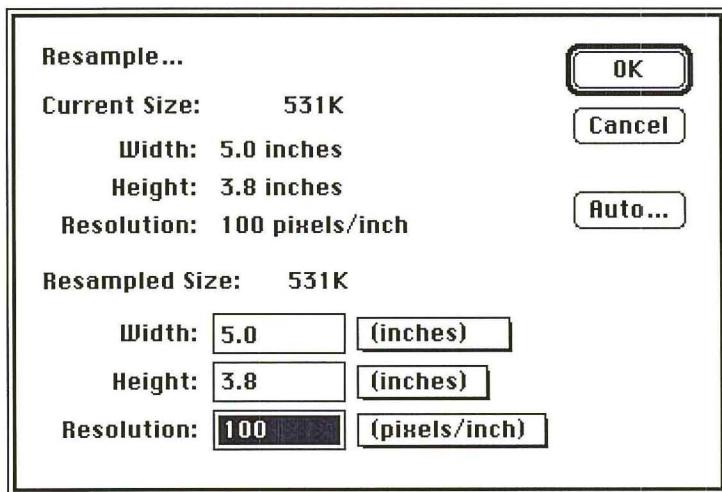
If you are unsure of the appropriate resolution for the resized image, you can have the Adobe Photoshop program suggest a resolution for resampling. You do so by entering information that will determine the suggested resolution for the resampling in the Auto Resolution dialog box. You can enter the resolution of your output device, the ruling of the screen you will use, and the desired quality of the output.

Normally, you would enter the resolution value for your output device. For the purposes of this tutorial, values are suggested for you to enter based on a color printer such as the QMS Colorscript, or an imagesetter such as the Linotronic\* 300.

#### **To resample an image:**

1. Open the "Flowers" image if it is not already opened.
2. Choose Resample from the Image menu to display the image's current dimensions and resolution.

The Resample dialog box appears.

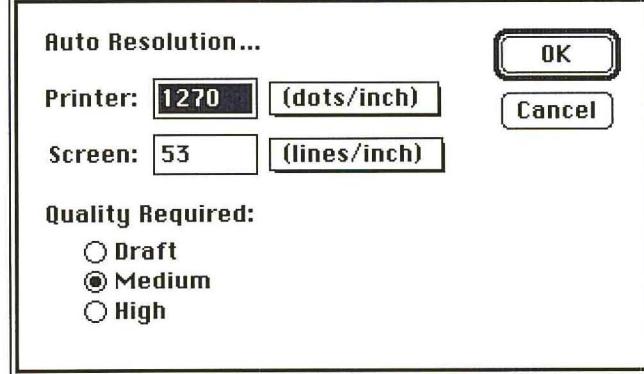


3. To change the height and width, enter 4.75 inches for the new width in the Width text box.

The Adobe Photoshop program automatically enters a value for the new height (3.439 inches).

4. If you already know what image resolution you want, enter the value you want for the resolution in the Resolution text box.
5. Or, to determine the suggested resolution for resampling an image, click Auto.

The Auto Resolution dialog box appears.



6. Specify the resolution. If you are printing to a color printer, such as the QMS Colorscrip™, enter 300 for the printer resolution. If you are printing to an imagesetter, such as the Linotronic\* 300, enter 1270 for the printer resolution. The resolution of your output device may differ from these values. You should enter the appropriate value for your output device.
7. To enter the screen information, click in the Screen text box; enter 60 for a color printer, or 133 for an imagesetter.
8. Click medium for the quality of the output you want.
9. Click OK.

The suggested resolution now appears in the Resample dialog box (75 pixels per inch for a color printer, 199.5 pixels per inch for an imagesetter).

10. To resample and resize the image, click OK.

The progress bar appears while the operation is taking place. When the progress bar disappears, the newly resampled and resized image appears on-screen.

You will notice the difference in the file size. If you resampled for a QMS Colorscrip printer, the file size has decreased to 270K; if you resampled for a Linotronic\* 300, the file size has increased to 1906K.

## Adjusting your monitor

Converting an RGB image to a CMYK image, and getting high-quality output is as much an art as it is a science. This conversion process traditionally has been carried out at pre-press shops with highly-trained operators using equipment costing hundreds of thousands of dollars. The Adobe Photoshop program has an extremely high-quality color separator that can produce professional-quality separations. However, because your Macintosh is a general-purpose computer and not a dedicated pre-press workstation, there are a number of parameters you must set before you do your separations. The quality of your results is highly dependent upon how conscientiously and accurately you adjust these parameters.

The Adobe Photoshop program was designed with the belief that you should be able to create printed output to match the image on your monitor (what you see is what you get, or "WYSIWYG"). For this to be possible, your computer and monitor setup and office environment must be controlled against variations. If your monitor setting and office lighting conditions vary, your perception of the monitor screen will also change, making it impossible for you to consistently match your screen to the printed output.

In this section, you will adjust the contrast and brightness dials on your monitor. You will use tape to hold the dials in place after you have set them. This will prevent any accidental changing of contrast and brightness values that could ruin the calibration between your monitor and the Adobe Photoshop color separator. Keep in mind that if you physically change your monitor settings, you must repeat this calibration procedure.

It is recommended for the next set of adjustments that you keep your office lights on the way you normally do when you work on your computer monitor. The lighting of your office strongly affects your perception of the screen image

**To adjust your monitor:**

1. Adjust the contrast and brightness dials on your monitor until you are comfortable with the image's appearance. The controls for contrast and brightness of your monitor generally are found directly beneath the screen.
2. Use a piece of tape to fix the contrast and brightness controls so they will not move.

## Calibrating the monitor to match the printed output

Before the Adobe Photoshop program performs a color separation, it must first know how several known color values appear on the screen. In this section, you will use the Separation Setup dialog box, which you access using the Preferences command in the Edit menu, to calibrate your monitor.

To calibrate your monitor, you first determine your monitor gamma, then compare printed color swatches with those that appear on-screen.

You can use the printed color swatches located in the *Adobe Photoshop User Guide*. These swatches are the printed values for the screen color swatches that appear in the Separation Setup dialog box. A more accurate way to calibrate your monitor, however, is to print a copy of the Photoshop Color Swatches file, which can be found on the Calibration disk. Once you print the file, you should get a press proof of it, then calibrate your monitor to match your printed output. When you print your own copy of the color swatches, your calibration will be more accurate because the printed copy is generated by the output device you will be using.

The printed color swatches will help you specify setup parameters for creating separations using standard printing inks. If you are printing to a device that uses a different mechanism for printing color (such as dye-sublimation, or wax transfer), or if you are using non-standard printing inks, you will want to create a custom set of color swatches. You may also want to create custom swatches if you are printing to paper stock (such as newsprint) that differs significantly from that of the color swatches card.

Specifications for black generation and total ink limit also are included in the Adobe Photoshop program. It is recommended that you use the default values in the Separation Setup option in the Preferences dialog box under the Edit menu, unless you have reason to believe that different values are more appropriate for your particular image. For an explanation of these values, refer to the *Adobe Photoshop User Guide*.

If you use several different printers, you can save and recall these calibration settings in different files using the “Load” and “Save” commands. The last set of loaded settings are saved in the Adobe Photoshop Preferences file, and will be loaded in when the program is started.

Before you calibrate your monitor to match the color swatches, you will adjust your monitor gamma. If you use a calibration system such as the Radius Calibrator, or a calibrated monitor such as those supplied by Barco, you can set the gamma of your monitor. Gamma values for standard Apple RGB monitors average about 1.4, although the values can vary significantly for individual monitors. If your gamma is set too high, printed images will tend to be too dark. If your gamma is too low, your printed images will tend to look too light or washed-out.

In this section, you will use a file found on the Calibration disk to determine your monitor gamma, the Gamma Gray Ramp file. The file contains a dithered black-to-white ramp superimposed on a gray-scale black-to-white ramp. The black-to-white ramp displays a gradual transition from black on the left to white on the right. You will use the Adjust Levels command in the Image menu to adjust the gray-scale ramp until it matches the dithered ramp as closely as possible. The dithered ramp is the ramp with visible dots. You will need to observe the middle of the ramp to see the adjustments clearly. Imagine a vertical line down the middle of the ramp, and focus your attention on that line.

**To determine your monitor gamma:**

1. Open the Gamma Gray Ramp file on your Calibration disk.
2. Choose Adjust from the Image menu, and choose Levels from the Adjust submenu.

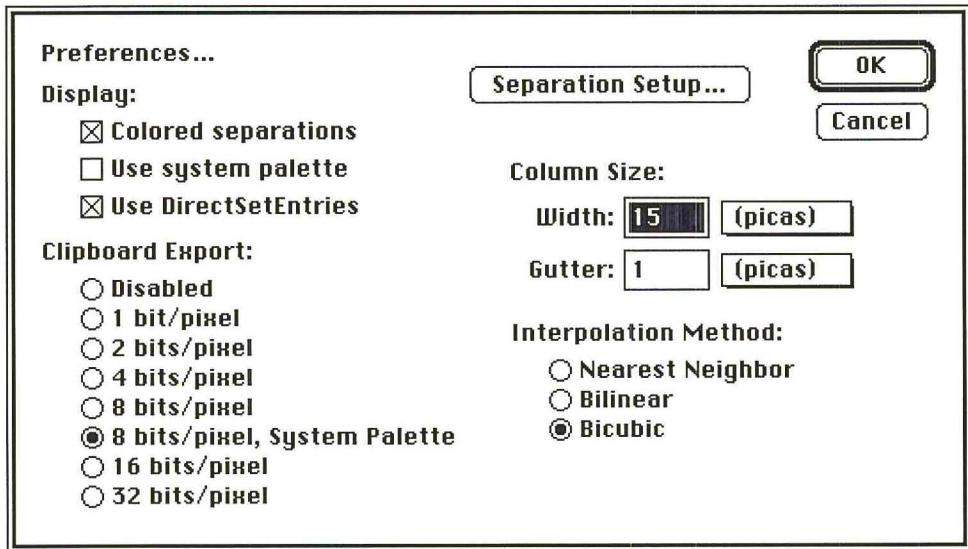
The Adjust Levels dialog box appears.
3. Drag the Adjust Levels dialog box into a position that allows you to see the gray ramp clearly.
4. Position the pointer on the middle triangle on the Input Levels. This is the gamma control.
5. Hold down the mouse button, and drag the triangle either to the right or left until the middle of the gray-scale ramp matches the middle of the dithered ramp in the Gamma Gray Ramp file.
6. When the middle of the two ramps match, note the gamma value (the middle value of the Input Levels). It will typically be around 1.4, but can vary slightly.
7. Click Cancel.
8. Close the Gamma Gray Ramp file by clicking the close box in the upper-left corner of the image.

Now you will enter this gamma value in the Separation Setup dialog box.

To enter the monitor gamma:

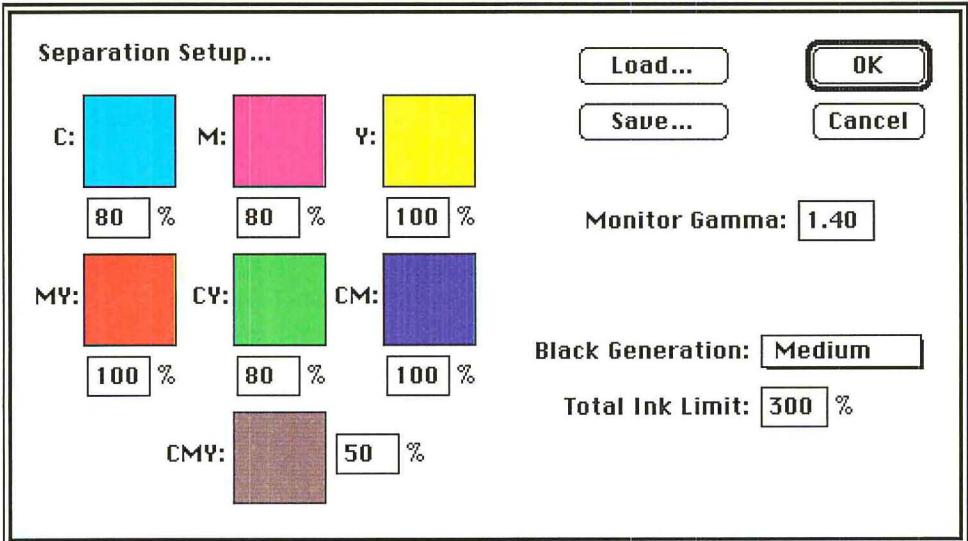
1. Choose Preferences from the Edit menu.

The Preferences dialog box appears.



2. Click Separation Setup.

The Separation Setup dialog box appears. You will see a set of seven color swatches, and several fields for separation parameters.



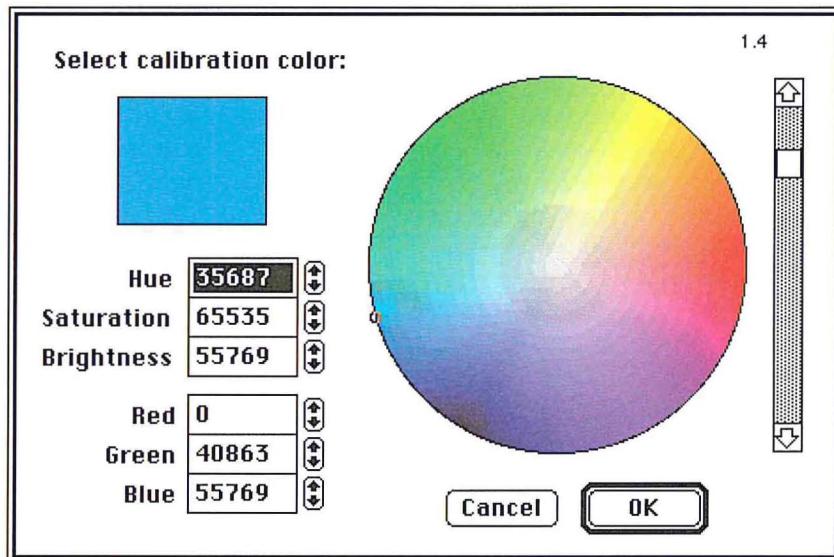
3. Enter the gamma of your monitor in the Monitor Gamma text box.

Next, you must tell the Adobe Photoshop program what screen colors represent process cyan, magenta, and yellow. You do this by comparing the printed color swatches to the swatches displayed in the Separation Setup dialog box.

To calibrate the monitor to match the printed color swatches:

1. Examine each color swatch in the Separation Setup dialog box one at a time. If the printed sample matches the screen, go on to the next swatch.
2. If it does not match, click the non-matching swatch.

The Color Wheel dialog box appears.



3. Position the pointer on the color wheel, and adjust the brightness slider until the color that matches the printed swatch appears. Click OK.

The original swatch is replaced by one displaying the color you have just chosen.

4. Repeat steps 4 and 5 until you have examined all seven swatches.

You have now calibrated your screen to the swatches. You should not have to recalibrate unless your monitor or office lighting changes.

5. Click OK in the Separation Setup dialog box. Click OK again.

## Setting the screen specifications for printing

Before you print a test proof or a color separation, you will specify the screen frequency and angle for printing the image, as you did in lesson 2 when you printed a halftone.

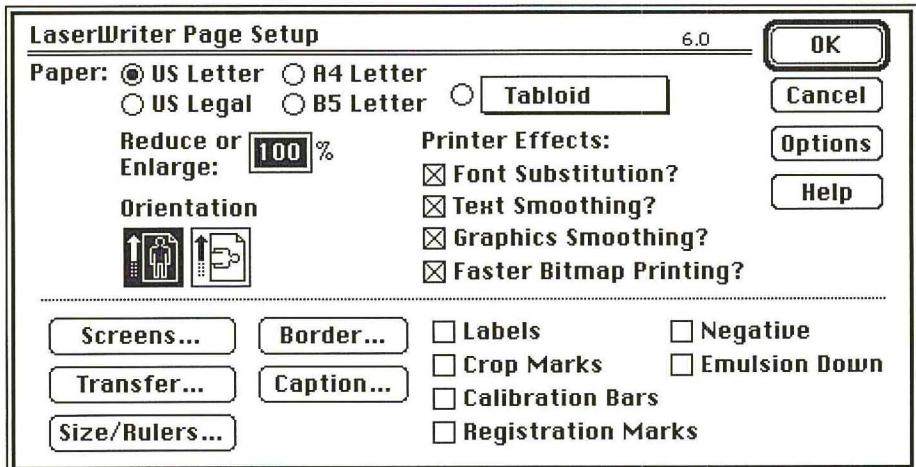
To determine the appropriate screen frequency and angle for the image, you enter information about your printer. The Adobe Photoshop program then calculates the correct screen frequencies and angles. You will note that the halftone angles and screen frequencies vary from those used in traditional printing. The Adobe Photoshop program uses the Adobe Minimum Moiré halftone angles and frequencies to reduce the occurrence of moiré patterns in four-color separations. While the program allows you to specify your own sets of frequencies and angles, it is strongly recommended that you use those generated by the Auto option.

The Adobe Photoshop program also lets you specify a Transfer option to adjust for dot gain and dot loss through the printing process. Dot gain and dot loss are defects in printing that causes dots to print larger or smaller than they should, causing darker or lighter tones or colors. The Transfer option you choose will depend on the type of press you plan to use and the paper stock on which you print. The Transfer option is an advanced feature, and is covered in the *Adobe Photoshop User Guide*.

### To determine the screen specifications:

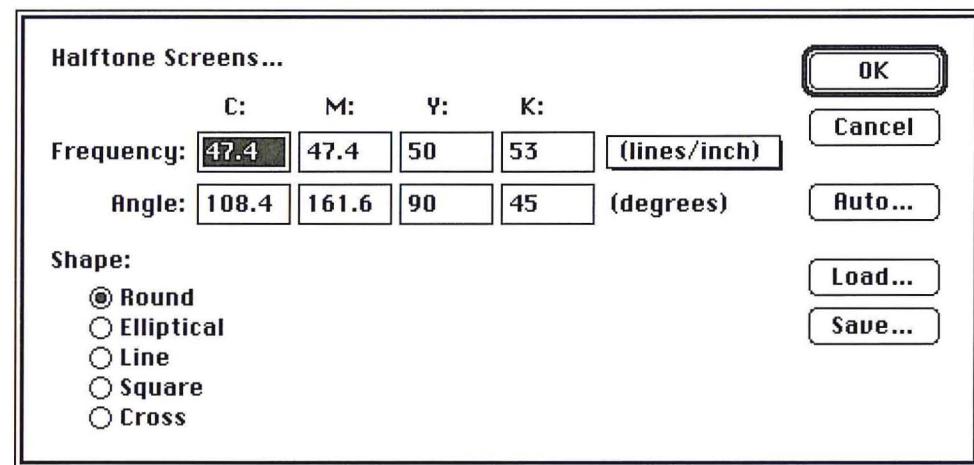
1. Choose Page Setup from the File menu.

The Page Setup dialog box appears.



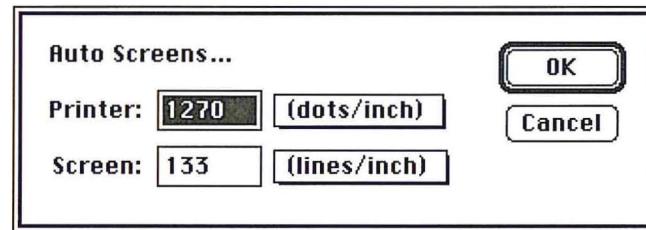
2. Click Screens in the Page Setup dialog box.

The Halftone Screens dialog box appears.



3. Click Auto in the Halftone Screens dialog box.

The Auto Screens dialog box appears



4. For the Printer resolution, enter 300 in the Printer text box for a color printer such as the QMS Colorscript, or 1270 for an imagesetter such as the Linotronic\* 300. This number must correspond exactly to the resolution of the imagesetter you are using, so you should verify that 1270 is appropriate for your output device.
  5. For the screen resolution, enter 60 in the Screen text box for a color printer, or 133 for an imagesetter.
  6. Click OK.
- The Halftone Screens dialog box reappears, displaying the new frequency and angle.
7. Click OK to return to the Page Setup dialog box.
  8. To specify the page setup, click Caption, and enter a caption to appear on the printed image.
  9. Click to check Labels, Crop Marks, Calibration Bars, and Registration Marks, if they are not already selected.
  10. Click OK.

## Printing a test proof

If you are using a color printer, you are now ready to print a test proof. If you are printing to an imagesetter, you can skip this section, and proceed directly to the section, "Converting an RGB image to a CMYK image."

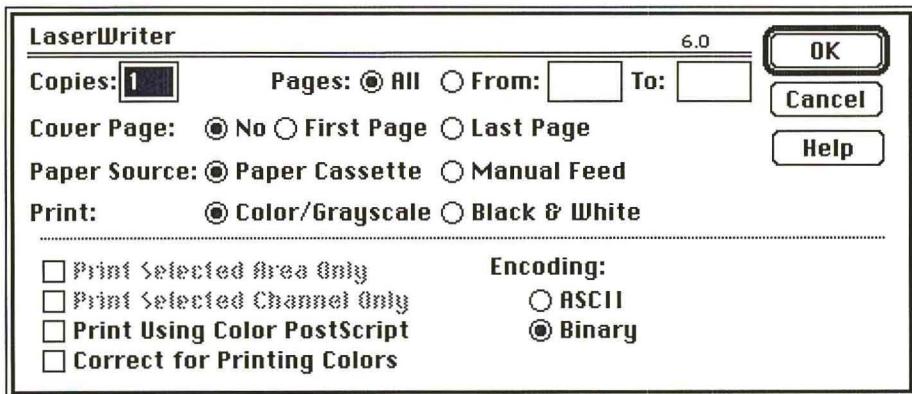
When you print a test proof, select the Print Using Color PostScript option in the Print dialog box. This tells the printer to produce color output. If you do not select this option, the file will print as a gray-scale image.

You also choose the Correct for Printing Colors option in the Print dialog box. When this option is selected, the Adobe Photoshop program does an internal color separation of the image. This option adds processing time, but it produces truer colors than if the printer itself performs the separation. If you do not select this option, the printer does the separation itself.

### To print a test proof:

1. Make sure that the appropriate printer is selected using the Chooser in the Apple menu.
2. Choose Print from the File menu.

The Print dialog box appears.



3. Click the Print Using Color PostScript option.
4. Click the Correct for Printing Colors option.
5. Click OK.

You may now examine your test proof.

## Converting an RGB image to a CMYK image

In order to print a four-color separation of your image, you must first convert all pixels in the image from RGB to CMYK. In RGB mode, each pixel is represented by red, green, and blue values, resulting in a three-channel image. In RGB mode, each channel can be viewed individually, or they can be combined, allowing you to view your file as a full-color image.

Because traditional printing uses a four-color process employing cyan, magenta, yellow, and black plates, each RGB pixel must first be converted into a corresponding CMYK representation. The image, consequently, becomes a four-channel image consisting of cyan, magenta, yellow, and black channels. Because your color monitor displays only red, green, and blue, CMYK images cannot be viewed as full-color images. You can only view the individual channel separately. However, in CMYK mode, you can use any painting or image manipulation functions that you can use in RGB mode.

If you have an imagesetter, you will now want to convert your image into a four-color separation. This process is done using the Mode menu. The process can be lengthy, depending on the size of your file. When the operation is complete, the black channel is displayed.

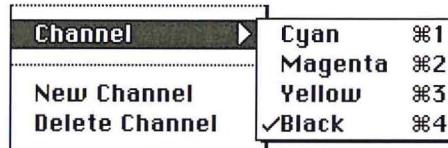
### To convert the RGB image into a CMYK image:

1. Choose CMYK color from the Mode menu.

A progress bar appears as the Adobe Photoshop program converts the RGB image to a CMYK image.

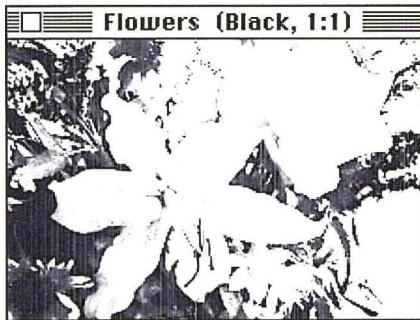
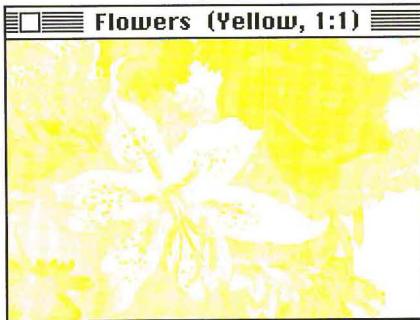
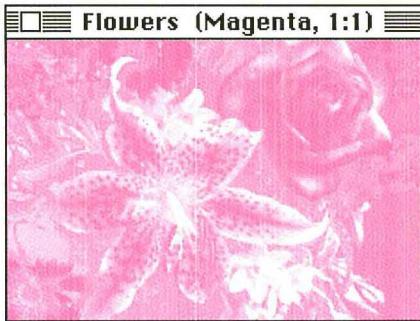
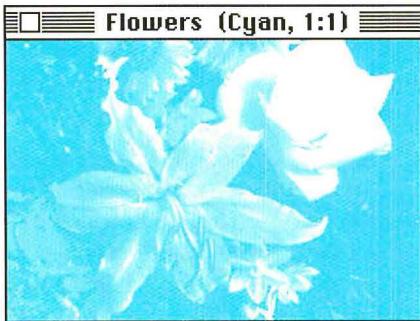
You may want to look at each of the four color channels separately to review its color.

2. To view the separate channels, choose Channel from the Mode menu.
3. Choose one of the four colors (cyan, magenta, yellow, or black) from the Channels submenu.



The selected channel appears.

4. To switch to another channel, choose Channel from the mode menu; choose another of the four colors from the Channel submenu.



## Printing a separated image

If you have made all of the adjustments that you want to make, you are ready to print the separated image. You will print the film with a caption, a label, crop marks, calibration bars, and registration marks. Depending on your printing requirements, you will also use the Negative and Emulsion Down options. If you are unsure of which options are appropriate, ask your print shop.

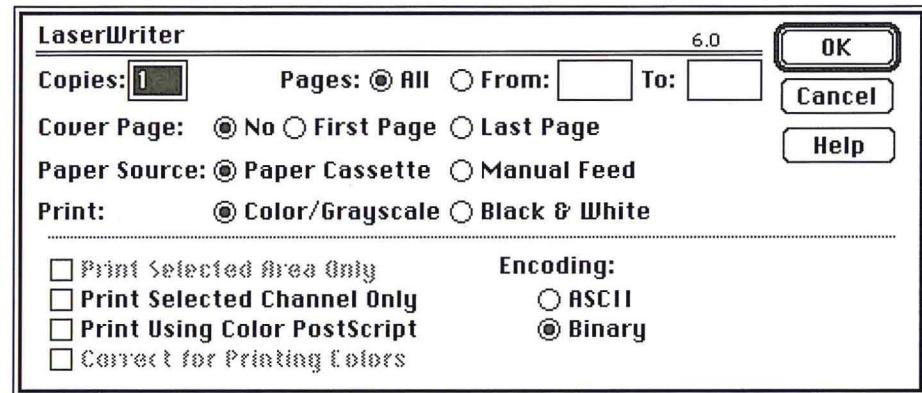
### To specify the print options:

1. Choose Page Setup from the File menu.
2. Click to check Labels, Crop Marks, Calibration Bars, Registration Marks, Negative, Emulsion Down, if they are not already selected.
3. Click OK.

**To print a separated image:**

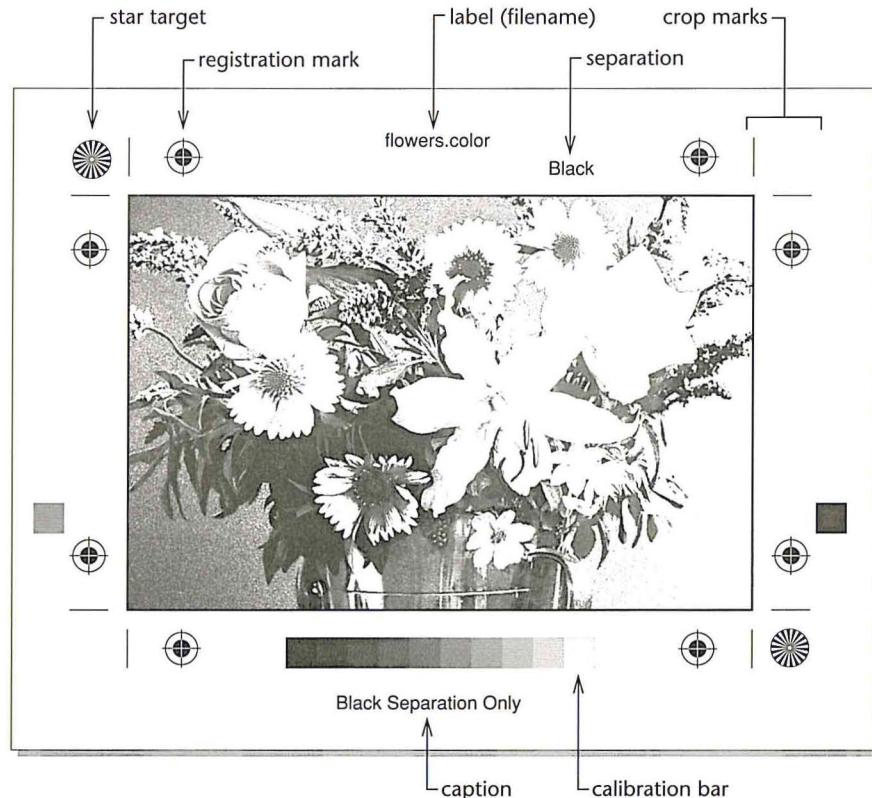
1. Choose Print from the File menu.

The Print dialog box appears. Make sure that the Print Using Color PostScript option is *not* checked.



2. Click OK.

The image prints as four, separate pieces of film.





## Conclusion

You have now printed a color separation, or a color proof if you do not have an imagesetter, and have completed the *Adobe Photoshop Tutorial*.

You have learned to use the majority of the program's features, and have acquired the skills that will allow you to experiment with any of the Adobe Photoshop features. As you gain additional expertise using the program, you will find that the Adobe Photoshop program lets you achieve professional-quality results in retouching, editing, and creating images.

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