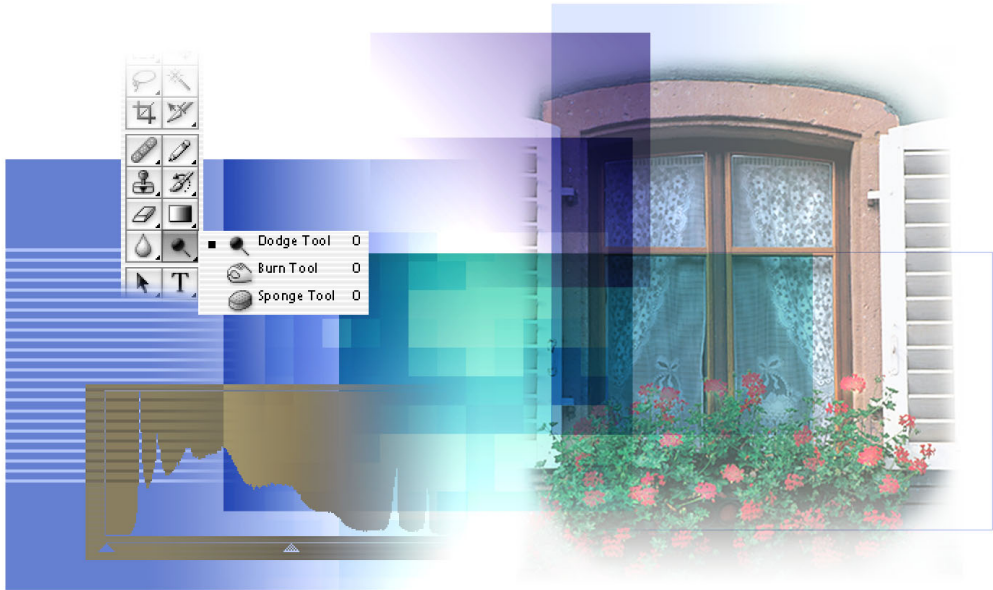


# 3 Basic Photo Corrections



*Adobe Photoshop and Adobe ImageReady include a variety of tools and commands for improving the quality of a photographic image. This lesson steps you through the process of acquiring, resizing, and retouching a photo intended for a print layout. The same workflow applies to Web images.*

In this lesson, you'll learn how to do the following:

- Choose the correct resolution for a scanned photograph.
- Crop an image to final size.
- Adjust the tonal range of an image.
- Remove a color cast from an image Auto Color correction.
- Adjust the saturation and brightness of isolated areas of an image using the sponge and dodge tools.
- Apply the Unsharp Mask filter to finish the photo-retouching process.
- Save an Adobe Photoshop file in a format that can be used by a page-layout program.

This lesson will take about 45 minutes to complete. The lesson is designed to be done in Adobe Photoshop, but information on using similar functionality in Adobe ImageReady is included where appropriate.

If needed, remove the previous lesson folder from your hard drive, and copy the Lesson03 folder onto it. As you work on this lesson, you'll overwrite the start file. If you need to restore the start files, copy them from the *Adobe Photoshop 7.0 Classroom in a Book CD*.

**Note:** Windows users need to unlock the lesson files before using them. For more information, see “Copying the Classroom in a Book files” on page 4.

## Strategy for retouching

You can retouch photographic images in ways once available only to highly trained specialists. You can correct problems in color quality and tonal range created during the original photography or during image scanning. You can also correct problems in composition and sharpen the overall focus of the image.

Photoshop provides a comprehensive set of color-correction tools for adjusting the color and tone of individual images. ImageReady has a more basic set of color-correction tools, including Levels, Auto Levels, Brightness/Contrast, Hue/Saturation, Desaturation, Invert, Variations, and the Unsharp Mask filter.

## Organizing an efficient sequence of tasks

Most retouching follows these six general steps:

- Checking the scan quality and making sure that the resolution is appropriate for the way you will use the image.
- Cropping the image to final size and orientation.
- Adjusting the overall contrast or tonal range of the image.
- Removing any color casts.
- Adjusting the color and tone in specific parts of the image to bring out highlights, midtones, shadows, and desaturated colors.
- Sharpening the overall focus of the image.

Usually, you should complete these processes in the order listed above. Otherwise, the results of one process may cause unintended changes to other aspects of the image, making it necessary for you to redo some of your work.

## Adjusting your process for intended uses

The retouching techniques you apply to an image depend in part on how you will use the image. Whether an image is intended for black-and-white publication on newsprint or for full-color Internet distribution affects everything from the resolution of the initial scan to the type of tonal range and color correction that the image requires. Photoshop supports the CMYK color mode for preparing an image to be printed using process colors, as well as RGB and other color modes. ImageReady supports only RGB mode, used for on-screen display.

To illustrate one application of retouching techniques, this lesson takes you through the steps of correcting a photograph intended for four-color print publication.

For more information about CMYK and RGB color modes, see Lesson 18, “Producing and Printing Consistent Color.”



Original image



Image cropped and retouched



Image placed into page layout

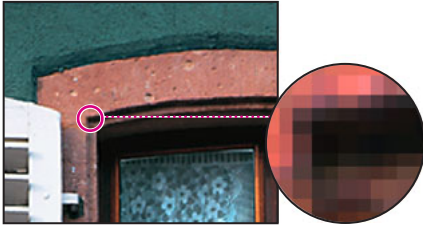
### For the Web: The printed page versus on-screen display

Although you can create publications for both paper and on-screen use, remember that a computer screen and a printed page are very different. Keep these differences in mind when you create publications for either medium—or for both media:

- Text can be small and still very legible on paper, because the dots of ink on paper are much finer than the dots of light used in a monitor. Therefore, avoid small text and finely detailed graphics on-screen. This means that it is more difficult to effectively use formatting such as multiple columns on-screen.
- Computer monitors come in all sizes, and you can rarely guarantee that your online readers all have the same monitor size. You should design for the smallest monitor you expect people to have—typically a 15-inch monitor. By contrast, when you print to paper, you know what size the paper is and can design the publication accordingly. However, a page in an HTML or PDF publication can be any length.
- The larger dimension of a computer screen is horizontal (“landscape”), while in most printed pages, the larger one is vertical (“portrait”). This fact fundamentally affects the format of your pages.
- A printed publication is usually read sequentially—even to flip through the publication the reader must turn from one page to the next. In an online publication, the reader can go anywhere any time, either by indicating what page to go to or by clicking on a link that goes to somewhere else, such as to an entirely different publication.

## Resolution and image size

The first step in retouching a photograph in Photoshop is to make sure that the image is the correct resolution. The term *resolution* refers to the number of small squares known as *pixels* that describe an image and establish its detail. Resolution is determined by *pixel dimensions*, or the number of pixels along the width and height of an image.



*Pixels in a photographic image*

## Types of resolution

In computer graphics, there are different types of resolution:

The number of pixels per unit of length in an image is called the *image resolution*, usually measured in pixels per inch (ppi). An image with a high resolution has more pixels (and therefore a larger file size) than an image of the same dimensions with a low resolution. Images in Photoshop can vary from high resolution (300 ppi or higher) to low resolution (72 ppi or 96 ppi), whereas images in ImageReady are fixed at 72 ppi.

The number of pixels per unit of length on a monitor is the *monitor resolution*, usually measured in dots per inch (dpi). Image pixels are translated directly into monitor pixels. In Photoshop, if the image resolution is higher than the monitor resolution, the image appears larger on-screen than its specified print dimensions. For example, when you display a 1-inch-by-1-inch, 144-ppi image on a 72-dpi monitor, the image fills a 2-inch-by-2-inch area of the screen. ImageReady images have a consistent image resolution of 72 ppi and display at the monitor resolution.



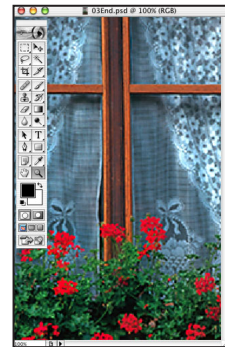
4 in. x 6 in. at 72 ppi;  
file size 342K



100% on-screen view



4 in. x 6 in. at 200 ppi;  
file size 2.48 MB



100% on-screen view

**Note:** It is important to understand what “100% view” means when you work on screen. At 100%, 1 image pixel = 1 monitor pixel. Unless the resolution of your image is exactly the same as the resolution of the monitor, the image size (in inches, for example) on screen may be larger or smaller than the image size will be when printed.

The number of ink dots per inch produced by an imagesetter or laser printer is the *printer* or *output resolution*. Of course, higher-resolution printers combined with higher-resolution images generally produce the best quality. The appropriate resolution for a printed image is determined both by the printer resolution and by the *screen frequency* or lines per inch (lpi) of the halftone screens used to reproduce images.

Keep in mind that the higher the image resolution, the larger the file size and the longer the file takes to download from the Web.

## Resolution for this lesson

To determine the image resolution for the photograph in this lesson, we followed the computer graphics rule of thumb for color or grayscale images intended for print on large commercial printers: Scan at a resolution 1.5 to 2 times the screen frequency used by the printer. Because the magazine in which the image will be printed uses a screen frequency of 133 lpi, the image was scanned at 200 ppi (133 x 1.5).

 For complete information on resolution and image size, see Adobe Photoshop 7.0 online Help.

## Getting started

Before beginning this lesson, restore the default application settings for Adobe Photoshop. See “Restoring default preferences” on page 5.

The image you’ll work on in this lesson is a scanned photograph. In this scenario, you’ll prepare the image to be placed in an Adobe InDesign® layout for a fictitious magazine. The final image size in the print layout will be 2 inches by 3 inches.

You’ll start the lesson by viewing the finished image. The picture you’ll work on shows an interesting window with a window box that is overflowing with blooming red geraniums.

### 1 Start Adobe Photoshop.

If a notice appears asking whether you want to customize your color settings, click No.

### 2 Choose File > Open, and open the file 03End.psd from the Lessons/Lesson03 folder.

### 3 When you have finished viewing the file, either leave the file open for reference or close it without saving changes.

 For some color illustrations of the artwork for this lesson, see the color section.

Now you’ll open the start file and begin the lesson by viewing the photograph you will be retouching.

### 4 Choose File > Open, and open the file 03Start.psd from the Lessons/Lesson03 folder.

The start image shows the same window, but the colors are dull, the scan is crooked, and the dimensions are larger than needed for the requirements of the magazine. These are the qualities that you’ll fix in this lesson using Photoshop retouching techniques.

## Straightening and cropping an image

You'll use the crop tool to trim and scale the photograph for this lesson so that it fits the space designed for it. You can use either the crop tool or the Crop command to crop an image.

You can decide whether to delete or discard the area outside of a rectangular selection, or whether to hide the area outside of the selection. In ImageReady, the Hide option is useful when creating animations with elements that move from off-screen into the live image area.

1 In the toolbox, select the crop tool (✂). Then, in the tool options bar (at the top of the work area), enter the dimensions (in inches) of the finished image: For Width, type 2 and for Height type 3.



**Note:** If you are working in ImageReady, select the Fixed Size option in the tool options bar before entering the dimensions.

2 Draw a marquee around the image. Don't worry about whether or not the entire image is included, because you'll adjust the marquee size later.

As you drag, the marquee retains the same proportion as the dimensions you specified for the target size (2 x 3).

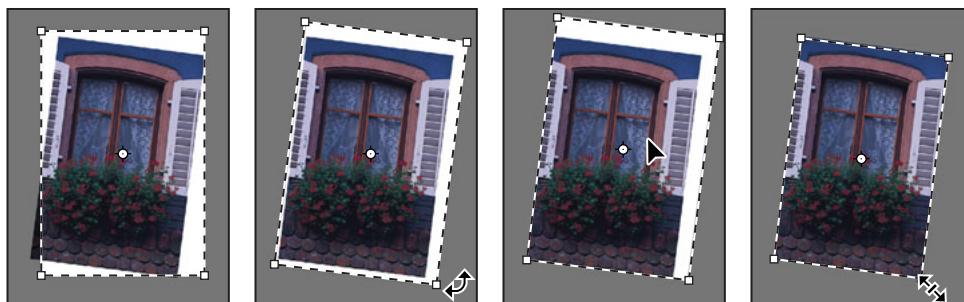
When you release the mouse button, a *cropping shield* covers the area outside the cropping selection, and the tool options bar now displays choices about the cropping shield.

3 In the tool options bar, make sure that the Perspective check box is *not* selected.

4 In the image window, move the pointer outside the crop marquee, so that it appears as a curved double arrow (↻). Drag clockwise to rotate the marquee until it is parallel with the edges of the pictured window frame.



5 Place the pointer inside the crop marquee, and drag the marquee until it contains all the parts of the picture you want shown to produce an artistically pleasing result. If you also want to adjust the size of the marquee, drag one of the corner handles.



*Initial crop marquee*

*Marquee rotated*

*Marquee moved*

*Marquee resized*

6 Press Enter (Windows) or Return (Mac OS). The image is now cropped, and the cropped image now fills the image window, straightened, sized, and cropped according to your specifications.



*Image cropped*

💡 *In Photoshop and ImageReady, you can use the Image > Trim command to discard a border area around the edge of the image, based on transparency or edge color.*

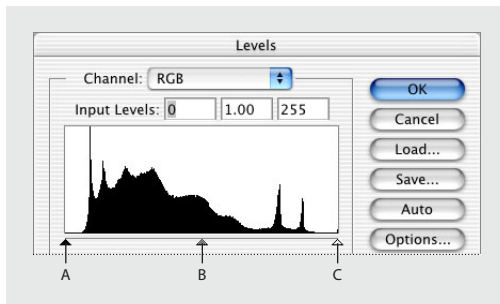
7 Choose File > Save to save your work.

## Adjusting the tonal range

The tonal range of an image represents the amount of *contrast*, or detail, in the image and is determined by the image's distribution of pixels, ranging from the darkest pixels (black) to the lightest pixels (white). You'll now correct the photograph's contrast using the Levels command.

- 1 Choose Image > Adjustments > Levels, to open the Levels dialog box.
- 2 Make sure that the Preview check box is selected, and then move the dialog box aside, as needed, so that you can also see the image window as you work.

In the middle area of the dialog box, the three triangles directly beneath the histogram represent the shadows (black triangle), highlights (white triangle), and midtones or gamma (gray triangle). If your image had colors across the entire brightness range, the graph would extend across the full width of the histogram, from black triangle to white triangle. Instead, the graph is clumped somewhat toward the center, indicating there are no very dark or very light colors.



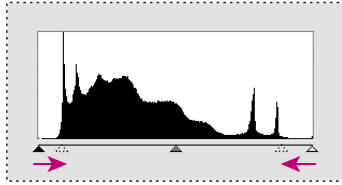
A. Shadows B. Midtones or gamma C. Highlights

You can adjust the black and white points of the image to extend its tonal range and then adjust the midtones.

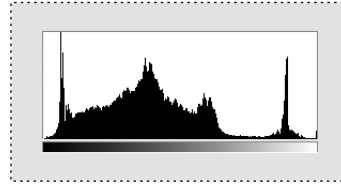
- 3 Drag the left triangle to the right to the point where the histogram indicates that the darkest colors begin.

As you drag, the first Input Levels value (above the histogram) changes and so does the image itself.

4 Drag the right triangle to the left to the point where the histogram indicates that the lightest colors begin. Again, notice the changes in the third Input Levels value and in the image.



Increasing shadows (black triangle) and adding highlights (white triangle)



Result

5 Drag the middle triangle a short distance toward the left side to lighten the midtones. Watch the image updates in the image window to determine how far to drag the middle triangle.

6 When the image looks good to you (the sample uses Input Levels values of 18, 1.30, and 232), click OK to apply the changes.

7 Choose Image > Histogram to view the new histogram. The tonal range now extends throughout the entire range of the histogram. Click OK to close the histogram, and then save your work.

**Note:** ImageReady does not have a Histogram command. To adjust and view a histogram, use the Levels command.

## About Auto Contrast

You can also adjust the contrast (highlights and shadows) and the overall mix of colors in an image automatically using the Image > Adjustments > Auto Contrast command. Adjusting the contrast maps the darkest and lightest pixels in the image to black and white.

This remapping causes the highlights to appear lighter and the shadows to appear darker and can improve the appearance of many photographic or continuous-tone images. (The Auto Contrast command does not improve flat-color images.)

The Auto Contrast command clips white and black pixels by 0.5%—that is, it ignores the first 0.5% of either extreme when identifying the lightest and darkest pixels in the image. This clipping of color values ensures that white and black values are representative areas of the image content rather than extreme pixel values.

For this project, you won't use the Auto Contrast feature, but it's a feature you should know about so that you can use it in your own projects.

## Removing a color cast

Some images contain color casts (imbalanced colors), which may occur during scanning or which may have existed in the original image. This photograph of the window has a blue cast. You'll use the Auto Color feature in Photoshop 7.0 to correct this. (ImageReady does not include the Auto Color command, so this task must be done in Photoshop.)

**Note:** To see a color cast in an image on your monitor, you need a 24-bit monitor (one that can display millions of colors). On monitors that can display only 256 colors (8 bits), a color cast is difficult, if not impossible, to detect.

 For an illustration of color casting, see figure 3-1 in the color section.

1 Choose Image > Adjustments > Auto Color.

Notice that the blue color cast is gone.

2 Choose File > Save.

### **Using the Auto Color command (Photoshop)**

*The Auto Color command adjusts the contrast and color of an image by searching the actual image rather than the channels' histograms for shadows, midtones, and highlights. It neutralizes the midtones and clips the white and black pixels based on the values set in the Auto Correction Options dialog box.*

### **Setting auto correction options (Photoshop)**

*The Auto Correction Options dialog box lets you automatically adjust the overall tonal range of an image, specify clipping percentages, and assign color values to shadows, midtones, and highlights. You can apply the settings during a single use of the Levels dialog box or Curves dialog box, or you can save the settings for future use with the Levels, AutoLevels, Auto Contrast, Auto Color, and Curves commands.*

*To open the Auto Correction Options dialog box, click Options in the Levels dialog box or Curves dialog box.*

—From Adobe Photoshop 7.0 online Help

## Replacing colors in an image

With the Replace Color command, you can create temporary *masks* based on specific colors and then replace these colors. (A mask isolates an area of an image, so that changes affect just the selected area and not the rest of the image.) The Replace Color dialog box contains options for adjusting the hue, saturation, and lightness components of the selection: *Hue* is color, *saturation* is the purity of the color, and *lightness* is how much white or black is in the image.

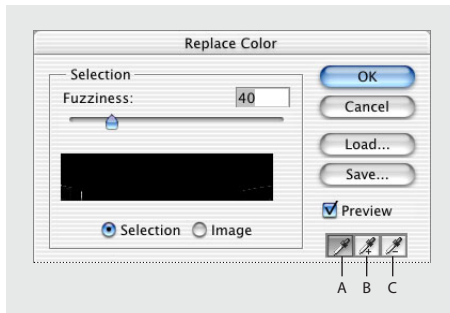
You'll use the Replace Color command to change the color of the wall at the top of the image. The Replace Color command is not available in ImageReady.

- 1 Select the rectangular marquee tool () and draw a selection border around the blue wall at the top of the image. Don't worry about making a perfect selection, but be sure to include all of the blue wall.



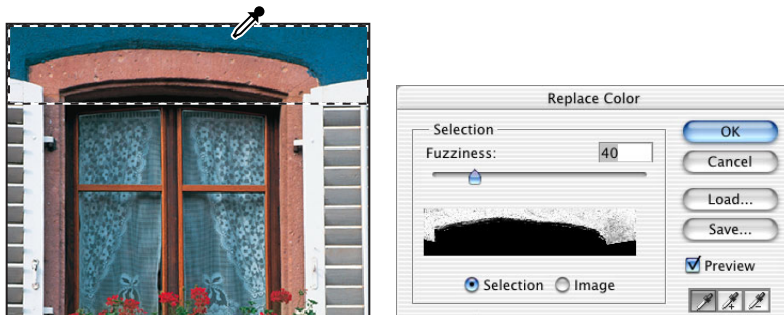
- 2 Choose Image > Adjustments > Replace Color to open the Replace Color dialog box. By default, the Selection area of the Replace Color dialog box displays a black rectangle, representing the current selection.

Notice the three eyedropper tools in the Replace Color dialog box. One selects a single color; another selects additional colors and adds them to the color selection; the third selects colors that it removes from a selection.

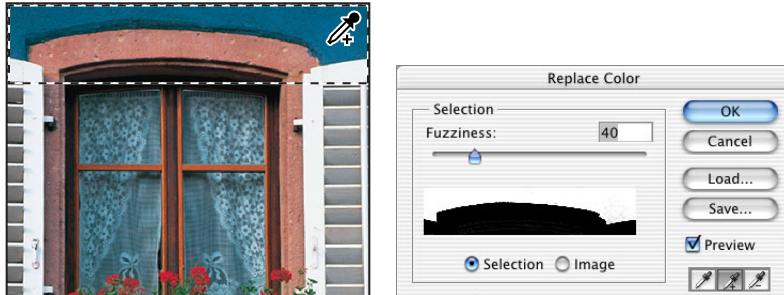


- A. Single-color eyedropper tool
- B. Eyedropper plus tool
- C. Eyedropper minus tool

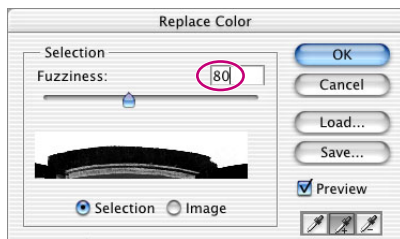
3 Select the first (single-color) eyedropper tool (🔍) in the Replace Color dialog box and click anywhere in the blue-wall area of the image window to select all of the area with that color.



4 In the Replace Color dialog box, select the eyedropper-plus tool (  ), and drag over the other areas of the blue wall until the entire wall shape is highlighted in white in the dialog box.



5 Adjust the tolerance level of the mask by dragging the Fuzziness slider or typing 80.

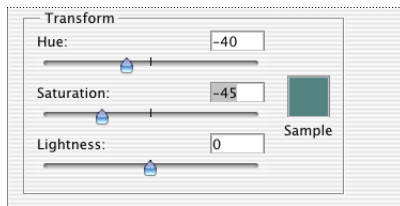


Fuzziness controls the degree to which related colors are included in the mask.

6 If there are any white areas of the mask display in the dialog box that are not part of the wall, select the eyedropper-minus tool (  ) and click in the black area around the selection in the Replace Color dialog box to remove most of the white. (It's OK if a few pixels in the shadowed window inset remain in the selection.)



7 In the Transform area of the Replace Color dialog box, drag the Hue slider to **−40**, the Saturation slider to **−45**, and the Lightness slider to **0**.



As you change the values, the color of the wall changes in hue, saturation, and lightness, so that the wall is now a slaty green color.

8 Click OK to apply the changes.

9 Choose Select > Deselect, and then choose File > Save.

## Adjusting lightness with the dodge tool

You'll use the dodge tool to lighten the highlights and bring out the details of the curtains behind the window. The dodge tool is based on a traditional photographer's method of holding back light during an exposure to lighten an area of the image.

1 In the toolbox, select the dodge tool (🔍).

In ImageReady, the dodge tool is hidden under the clone stamp tool (🖌️).

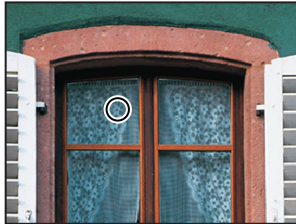
2 In the tool options bar, select the following settings:

- For Brush, select a fairly large feathered brush on the Brush pop-up palette, such as 27. Then click outside the palette to close it.
- In the Range pop-up menu, select Highlights.
- For Exposure, type or use the pop-up slider to enter **15%**.

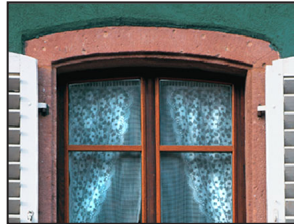




3 Using vertical strokes, drag the dodge tool over the window curtains to bring out the details. You don't always need to use vertical strokes with the dodge tool, but they work well with this particular image. If you make a mistake or don't like the results, choose Edit > Undo and try again until you are satisfied with the results.



*Original*



*Result*

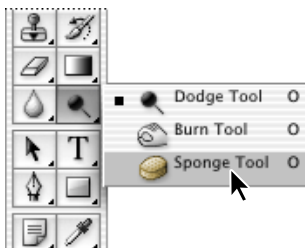
4 Choose File > Save.

## Adjusting saturation with the sponge tool

Next you'll use the sponge tool to saturate the color of the geraniums. When you change the saturation of a color, you adjust its strength or purity. The sponge tool is useful for making subtle saturation changes to specific areas of an image.

For an illustration of saturating with the sponge tool, see figure 3-2 in the color section.

1 Select the sponge tool (🧽), hidden under the dodge tool (🔍).



ImageReady also has a sponge tool hidden under the clone stamp tool (👤).

2 In the tool options bar, select the following settings:

- In the Brush pop-up palette, again select a large, feathered brush, such as 27.
- In the Mode pop-up menu, select Saturate.
- In Flow, type **90** to set the intensity of the saturation effect.



3 Drag the sponge back and forth over the flowers and leaves to saturate their color. The more you drag over an area, the more saturated the color becomes.



*Original*



*Result*

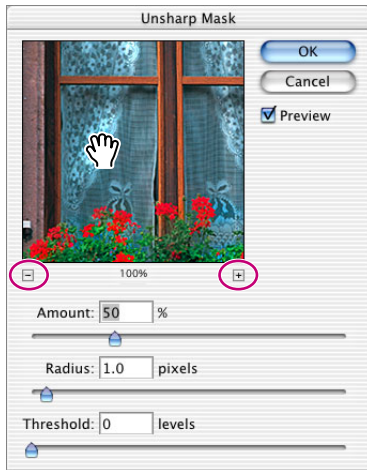
4 Save your work.

## Applying the Unsharp Mask filter

The last step you take when retouching a photo is to apply the Unsharp Mask filter, which adjusts the contrast of the edge detail and creates the illusion of a more focused image.

- 1 Choose Filter > Sharpen > Unsharp Mask.
- 2 In the Unsharp Mask dialog box, make sure that the Preview option is selected so that you can see the results in the image window.

You can drag inside the preview window in the dialog box to see different parts of the image or use the plus (+) and minus (–) buttons below the thumbnail to zoom in and out.



**3** Drag the Amount slider until the image is as sharp as you want (we used 75%).

 As you try different settings, toggle the Preview check box off and on to see how your changes affect the image in the image window. Or, you can just click the image in the dialog box to toggle the filter off and on. If your image is large, using the display in the dialog box can be more efficient because only a small area is redrawn.

**4** Drag the Radius slider to determine the number of pixels surrounding the edge pixels that will affect the sharpening. The higher the resolution, the higher the Radius setting should be. (We used the default value, 1.0 pixel.)

**5** (Optional) You can adjust the Threshold slider. This determines how different the sharpened pixels must be from the surrounding area before they are considered edge pixels and subsequently sharpened by the Unsharp Mask filter. The default Threshold value of 0 sharpens all pixels in the image.

- 6 Click OK to apply the Unsharp Mask filter.

### **Sharpening the image**

*Unsharp masking, or USM, is a traditional film compositing technique used to sharpen edges in an image. The Unsharp Mask filter corrects blurring introduced during photographing, scanning, resampling, or printing. It is useful for images intended for both print and online viewing.*

*The Unsharp Mask locates pixels that differ from surrounding pixels by the threshold you specify and increases the pixels' contrast by the amount you specify. In addition, you specify the radius of the region to which each pixel is compared.*

*The effects of the Unsharp Mask filter are far more pronounced on-screen than in high-resolution output. If your final destination is print, experiment to determine what dialog box settings work best for your image.*

—From Adobe Photoshop 7.0 online Help

## **Saving the image for four-color printing**

Before you save a Photoshop file for use in a four-color publication, you must change the image to CMYK color mode in order to print your publication correctly in four-color process inks. You'll use the Mode command to change the image color mode.

 For more information on color modes, see “Converting between color modes” in Adobe Photoshop 7.0 online Help.

You can perform these tasks only in Photoshop. ImageReady does not have printing capability and uses only one color mode, RGB, for on-screen display.

- 1 Choose Image > Mode > CMYK Color.
  - If you are using Adobe InDesign to create your publication, you can skip the rest of this process and just choose File > Save. InDesign can import native Photoshop files, so there is no need to convert the image to TIFF format.
  - If you are using another layout application, you must save the photo as a TIFF file.
- 2 Choose File > Save As.
- 3 In the Save As dialog box, choose TIFF from the Format menu.
- 4 Click Save.

5 In the TIFF Options dialog box, select the correct Byte Order for your system and click OK.

The image is now fully retouched, saved, and ready for placement in the publication layout.



## Review questions

- 1 What does resolution mean?
- 2 How can you use the crop tool in photo retouching?
- 3 How can you adjust the tonal range of an image?
- 4 What is saturation, and how can you adjust it?
- 5 Why would you use the Unsharp Mask filter on a photo?

## Review answers

- 1 The term *resolution* refers to the number of pixels that describe an image and establish its detail. The three different types of resolution include *image resolution*, measured in pixels per inch (ppi); *monitor resolution*, measured in dots per inch (dpi); and *printer or output resolution*, measured in ink dots per inch.
- 2 You can use the crop tool to trim, scale, and straighten an image.
- 3 You can use the black, white, and gray triangles below the Levels command histogram to control the midpoint and where the darkest and lightest points in the image begin, thus extending its tonal range.
- 4 Saturation is the strength or purity of color in an image. You can increase the saturation in a specific area of an image with the sponge tool.
- 5 The Unsharp Mask filter adjusts the contrast of the edge detail and creates the illusion of a more focused image.