13 Preparing Images for Two-Color Printing

Not every commercially printed publication requires four-color reproduction. Printing in two colors using a grayscale image and spot color can be an effective and inexpensive alternative. In this lesson, you'll learn how to use Adobe Photoshop to prepare full-color images for two-color printing.

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

- Convert a color image to monochrome, and improve its overall quality.
- Adjust the tonal range of the image by assigning black and white points.
- Sharpen the image.
- Convert a color image to grayscale.
- Add spot color to selected areas of the image.

This lesson will take about 45 minutes to complete. The lesson is designed to be done in Adobe Photoshop. ImageReady does not support channels or spot color.

If needed, remove the previous lesson folder from your hard drive, and copy the Lesson13 folder onto it. As you work on this lesson, you'll overwrite the start files. If you need to restore the start files, copy them from the *Adobe Photoshop 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 3.*

Printing in color

Color publications are expensive to print commercially because they require four passes through the press—one for each of the four process colors used to create the full-color effect. The colors in the publication must be separated into cyan, magenta, yellow, and black plates for the press, which also adds to the expense.

Printing images in two colors can be a much less costly yet effective approach for many projects, even if they begin with an image in full color. With Photoshop, you can convert color to grayscale without sacrificing image quality. You can also add a second spot color for accent, and Photoshop will create the two-color separations needed for the printing process.

Note: *Spot color is intended for images that will be printed to film during the printing process. The spot color techniques covered in this lesson are not appropriate for color images printed to desktop printers or for images designed for electronic distribution.*

Using channels and the Channels palette

Channels in Adobe Photoshop are used for storing information, and they play an important role in this lesson. *Color channels* store the color information for an image, and *alpha channels* store selections or masks that let you edit specific parts of an image. A third channel type, *spot color channels*, lets you specify color separations for printing an image with spot color inks. For more information about channels, see Lesson 5, "Masks and Channels."

In this lesson, you'll use all three types of channels. You'll learn to mix color channels to improve the quality of an image. You'll select areas of the image by loading a selection from an alpha channel. And you'll use a spot color channel to add a second color to the image.

Getting started

Before beginning this lesson, restore the default application settings for Adobe Photoshop. See "Restoring default preferences" on page 4.

You'll start the lesson by viewing the final Lesson file to see the duotone image that you will create.

1 Start Adobe Photoshop.

2 Choose File > Open, and open the 13End.psd file, located in the Lessons/Lesson13 folder.

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

Now you'll open the start file for the lesson.

4 Choose File > Open, and open the 13Start.psd file in the Lessons/Lesson13 folder on your hard drive.

5 If guides are showing, choose View > Show Extras or View > Show > Guides to hide guides.

Mixing color channels

Sometimes it's possible to improve the quality of an image by blending two or more color channels. For instance, one channel in an image may look particularly strong but would look even better if you could add some detail from another channel. In Photoshop, you can blend color channels with the Channel Mixer command in either RGB mode (for on-screen display) or CMYK mode (for printing). For more information on color modes, see Lesson 11, "Setting Up Your Monitor for Color Management."

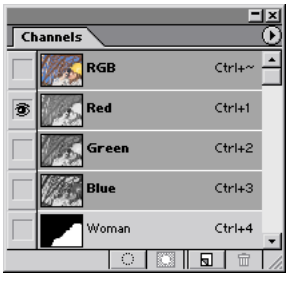
In this lesson, you'll use the Channel Mixer command to improve the quality of an RGB image that you'll then convert to Grayscale mode. But first, you'll use the Channels palette to view the different channels in the image.

1 Choose Window > Show Channels, click the Channels tab, and drag the palette from the Layers and Paths palette group. Place the Channels palette on your screen where you can easily access it.

Drag the Channels palette from the Layers palette to make both palettes visible at the same time.

Because the image is in RGB mode, the Channels palette displays the image's red, green, and blue channels. Notice that all the color channels are currently visible, including the RGB channel, which is a composite of the separate red, green, and blue channels. To see the individual channels, you can use the palette's eye icons.

2 Click the eye icons to turn off all color channels in the Channels palette except the red channel. The colors in the document image change to shades of gray.



All channels off except red

Red channel

3 Drag the eye icon from the red channel to the green channel and then to the blue channel. Notice how the monochrome image in the document window changes with each channel. The green channel shows the best overall contrast and the best detail in the woman's face, while the blue channel shows good contrast in the framework behind the woman.

Green channel

Blue channel

4 In the Channels palette, click the eye icon column for the composite RGB channel to display all the color channels in the image.

All channels displayed

RGB image

Now you'll use the Channel Mixer command to improve the image in this lesson. Specifically, you'll divide the image into two areas, the woman and the framework, and mix different amounts of source channels in each selection.

Mixing the woman's image

First you'll select the woman's image by loading a premade selection.

1 In the Layers palette, make sure that the background is selected.

2 Choose Select > Load Selection. In the dialog box, select Woman from the Channel menu to load a selection that outlines the image of the woman. Click OK.

Now you'll mix the green and blue channels to improve the selection's contrast. You'll use green as the base channel because it has the best overall contrast for the image.

3 Choose Image > Adjust > Channel Mixer.

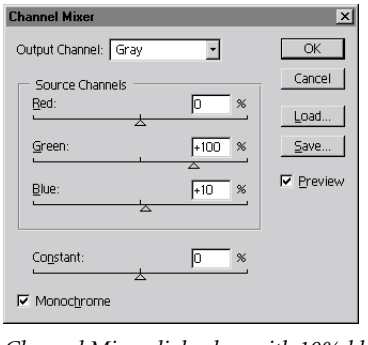
4 In the Channel Mixer dialog box, choose Green for the Output Channel. The Source Channel for Green changes to 100%.

5 Select Monochrome to change the image to shades of gray. This option gives you an idea of how the selection will look in Grayscale mode, so that you can more accurately adjust the selection's tonal range.

The resulting image is a little flat. You can bring out the contrast and improve the highlights by blending in some of the blue channel.

6 Drag the slider for the Blue Source Channel to 10%. Click OK.

Selection loaded



Channel Mixer dialog box with 10% blue

Mixing the framework's image

Next you'll select the framework, convert this part of the image to monochrome, and again mix channels to improve the contrast and detail.

1 Choose Select > Inverse to select the framework behind the woman.

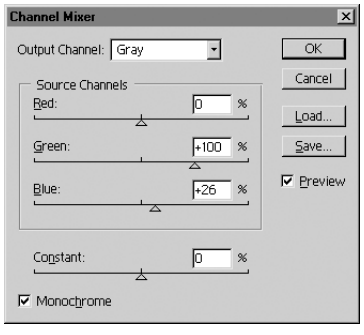
2 Choose Image > Adjust > Channel Mixer.

3 In the Channel Mixer dialog box, choose Green for the Output Channel, and select Monochrome.

This time the resulting image is dark and lacks contrast. You can improve the image again by blending in some of the blue channel to increase the contrast.

4 Drag the slider for the Blue Source Channel to 26%. Click OK.

Inverse of selection



Channel Mixer dialog box with 26% blue

5 Choose Select > Deselect.

Both the woman and the framework now show better contrast and detail. But the image is still an RGB color image (one that contains only gray values). To convert the image to Grayscale mode, you will use the Grayscale command.

6 Choose Image > Mode > Grayscale. When prompted, select Don't Flatten to keep the image's two layers intact. (You'll use the second layer later in this lesson.) The image converts to Grayscale mode, and the color channels in the Channels palette are replaced by a single Gray channel.

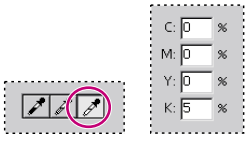
7 Choose File > Save to save your work.

Assigning values to the black and white points

You can further improve the quality of the image by adjusting the black and white limits of its tonal range. In Lesson 6, "Photo Retouching," you learned to use the sliders on the Levels command histogram to adjust the range. In this lesson, you'll control the range more accurately by using the Levels command eyedropper to assign specific values to the darkest and lightest points.

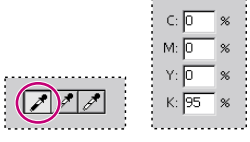
1 Choose Image > Adjust > Levels.

2 In the Levels dialog box, double-click the white eyedropper tool ( ) to open the color picker for the white point.



3 Enter **0**, **0**, **0**, and **5** in the CMYK text boxes, and click OK. These values generally produce the best results when printing the white points (highlights) of a grayscale image onto white paper.

4 Next double-click the black eyedropper tool ( ) in the Levels dialog box to open the color picker for the black point.



5 Enter **0**, **0**, **0**, and **95** in the CMYK text boxes, and click OK. These values generally produce the best results when printing the black points (shadows) of a grayscale image onto white paper.

Now that you've defined the values for the black and white points, you'll use the Levels command eyedropper to assign the values to the darkest and lightest areas in the image.

6 Make sure that the black eyedropper tool is selected, and position it in the darkest area of the framework behind the woman's elbow. Click to assign this area the values you set in step 5.

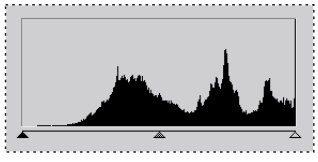
7 Next select the white eyedropper tool in the Levels dialog box, position the tool in the lightest area of the woman's collar, and click to assign this area the values you set in step 3.

Black eyedropper selecting darkest area behind elbow

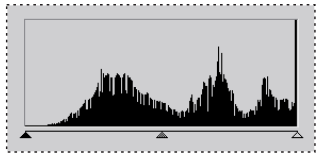
White eyedropper selecting lightest area in collar

8 Click OK to close the dialog box and apply the changes.

Assigning the black and white points shifts the image's histogram to produce a more evenly distributed tonal range.



Original



Result

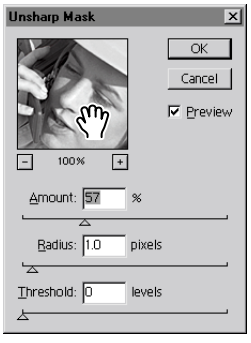
9 Choose File > Save.

Sharpening the image

By applying the Unsharp Mask filter to the image, you can create the illusion of a more focused image.

1 Choose Filter > Sharpen > Unsharp Mask. Make sure that the Preview option is selected so that you can view the effect before you apply it. To get a better view, you can place the pointer within the preview window and drag to see different parts of the image (we focused on the woman's face). You can also change the magnification of the preview image with the plus and minus buttons located below the window.

2 Drag the Amount slider until the image is as sharp as you want (we used 57%), and make sure that the Radius is set to 1 pixel.



3 Click OK to apply the Unsharp Mask filter to the image.

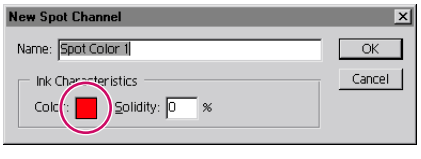
Setting up for spot color

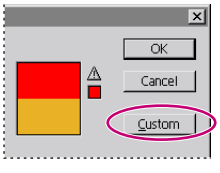
Spot colors, also called *custom colors*, are premixed inks that are used instead of, or in addition to, the cyan, magenta, yellow, and black process color inks. Each spot color requires its own color separation or printing plate. Graphic designers use spot colors to specify colors that would be difficult or impossible to achieve by combining the four process inks.

You'll now add spot color to the image in this lesson by creating a spot color channel.

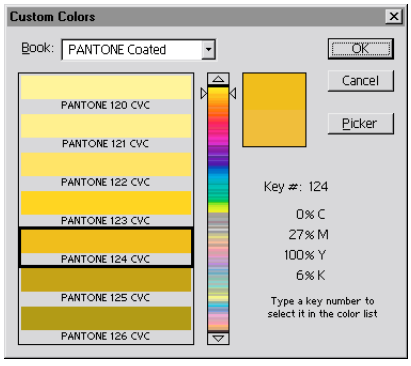
1 In the Channels palette, choose New Spot Channel from the palette menu.

2 In the New Spot Channel dialog box, click the color box, and select Custom in the color picker.

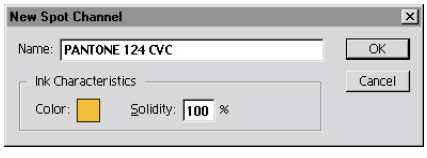




3 In the Custom Colors dialog box, type **124** for the Pantone® custom color 124. (Because there is no text box for the number, you must type it quickly.) Then click OK.



4 In the New Spot Channel dialog box, enter **100**% for Solidity. The solidity setting lets you simulate on-screen the ink solidity of the printed spot color. Inks range from transparent (0% solidity) to opaque (100% solidity). The Solidity option affects the on-screen preview only and has no effect on the printed output.



5 Click OK to create the spot color channel. A new spot color channel named PANTONE 124 CVC is added to the Channels palette.

6 Choose File > Save.

About spot colors

Note the following when working with spot colors:

- *For spot color graphics that have crisp edges and knock out the underlying image, consider creating the additional artwork in a page-layout or illustration application.*
- *To apply spot color as a tint throughout an image, convert the image to Duotone mode and apply the spot color to one of the duotone plates. You can use up to four spot colors, one per plate. (See "Printing color separations" in the Photoshop 6.0 User Guide, Chapter 14, "Printing."*
- *The names of the spot colors print on the separations.*
- *Spot colors are overprinted on top of the fully composited image. Each spot channel is overprinted in the order in which it appears in the Channels palette.*
- *You cannot move spot colors above a default channel in the Channels palette except in Multichannel mode.*
- *Spot colors can't be applied to individual layers.*
- *If you print an image that includes spot color channels to a composite printer, the spot colors print as extra pages.*
- *You can merge spot channels with color channels, splitting the spot color into its color channel components. Merging spot channels lets you print a single-page proof of your spot color image on a desktop printer.*
- *You can create new spot channels or convert an existing alpha channel to a spot channel.*
- *Like alpha channels, spot channels can be edited or deleted at any time.*

–From Adobe Photoshop 6.0 online Help

Adding spot color

You can add spot color to selected areas of an image in different ways with varying effects. For instance, you can apply spot color to part of a grayscale image so that the selection prints in the spot color rather than in the base ink. Because spot colors in Photoshop print over the top of a fully composited image, you may also need to remove the base color in an image when adding spot color to it. If you do not remove the base color, it may show through the semitransparent spot color ink used in the printing process.

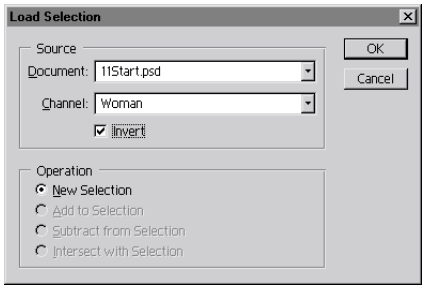
You can also use spot color to add solid and screened blocks of color to an image. By screening the spot color, you can create the illusion of adding an extra, lighter color to the printed piece.

Removing a grayscale area and adding spot color

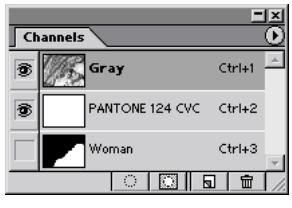
You'll begin your work in spot color by changing the framework behind the woman to the color. You must first select the framework, remove it from the grayscale image, and then add the selection to the spot color channel.

1 In the Channels palette, select the Gray channel.

2 Choose Select > Load Selection. In the dialog box, choose Woman from the Channel menu and select Invert. Click OK to load a selection of the framework behind the woman.



3 Choose Edit > Cut to cut the selection from the image. Make sure that black is set as the foreground color.



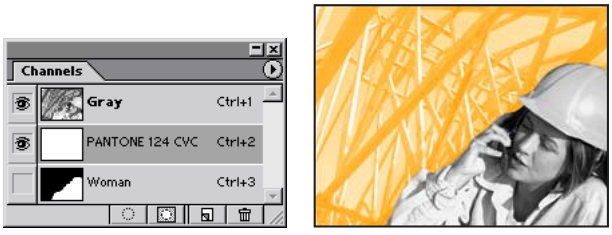
Gray channel active

Selection made in Gray channel

Selection cut from Gray channel

4 In the Channels palette, select the PANTONE 124 CVC channel.

5 Choose Edit > Paste to paste the framework selection into the spot color channel. In the 13Start window, the framework reappears in the Pantone color.



Selection pasted into spot color channel

6 Choose Select > Deselect.

7 Choose File > Save.

Removing spot color from a grayscale area

Now you'll remove some spot color where it overlaps the grayscale area of a second layer of the image.

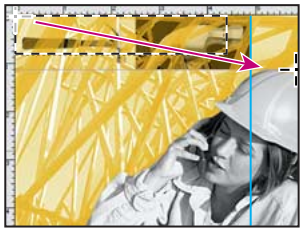
1 In the Layers palette, click the eye icon column next to the Hammers layer to make it visible. (Click just the eye icon column. Do not select the layer.)

Notice that the spot color of the framework overlaps part of the Hammers layer. You'll remove this overlap by making a new selection and cutting it from the spot color channel.

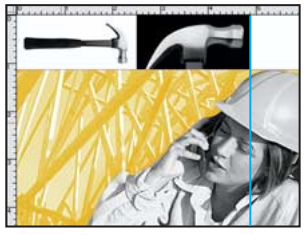
2 Choose View > Show Extras. If guides do not appear over the image, choose View > Show > Guides.

3 Select the rectangular marquee tool (⬚), and drag a selection from the top left edge of the image to the right horizontal guide and top vertical guide. Normal should be chosen for Style in the Marquee tool options bar.

4 Make sure that the spot channel in the Channels palette is still active, and press Delete to remove the rectangular selection from the channel. In the document window, the spot color disappears from the hammers image.



Making selection



Selection cut from spot color channel

5 Choose Select > Deselect.

6 Choose File > Save.

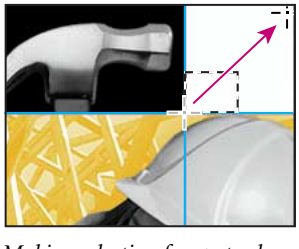
Adding solid and screened areas of spot color

Next you'll vary the effect of adding spot color by adding a solid block of the color and then a block of the color screened to 50%. The two areas will appear to be different colors even though you have used the same Pantone custom color on the same color separation.

First you'll make a selection for the solid block of color and fill the selection using a keyboard shortcut.

1 With the rectangular marquee tool still selected, make a selection in the upper right corner of the image bounded by the two guides.

2 Hold down Alt (Windows) or Option (Mac OS), and press Delete to fill the selection with the foreground color. Because you are in the PANTONE 124 CVC channel, the foreground color is PANTONE 124 and fills the square with solid color.



Making selection for spot color

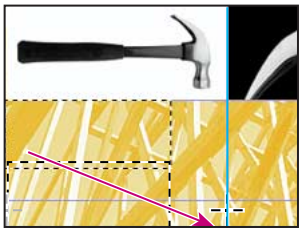
Selection filled with solid color

Now you can add a lighter block of spot color to the image.

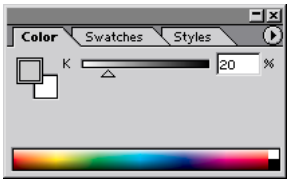
3 Make a rectangular selection directly below the left hammer and bounded by the guides.

4 In the Color palette, drag the color slider to 20% to set the value for the new block of color.

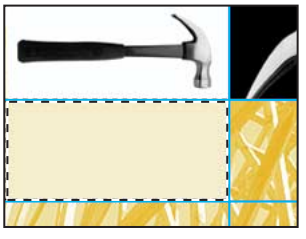
5 Hold down Alt/Option and press Delete to fill the selection with a 20% screen of PANTONE 124.



Making selection



Color value set to 20%



Selection filled with 20% color

6 Choose Select > Deselect.

7 Choose View > Show Extras or View > Show > Guides to hide guides.

8 Choose File > Save.

Adding spot color to text

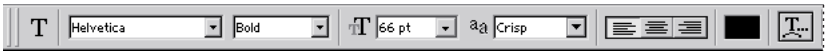
Text in an image can also appear in spot color. There are different methods for creating this effect, but the most straightforward is to add the text directly to the spot color channel. Note that text in a spot channel behaves differently from text created on a type layer. Spot channel text is uneditable. Once you create the type, you cannot change its specifications, and once you deselect the type, you cannot reposition it.

Now you'll add text to the spot color channel and place the text in the light block of spot color.

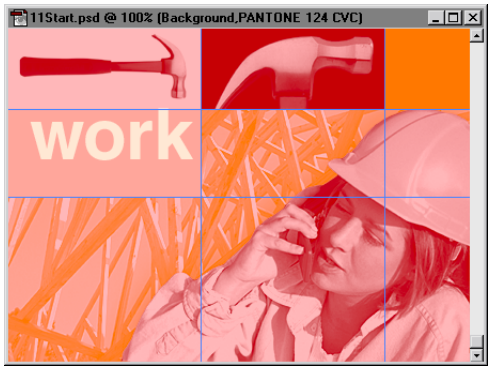
1 In the Color palette, return the color slider to 100%.

2 Select the type tool (T), and click the image in the light block of color. A red mask appears over the artwork, and an insertion point for the text flashes.

3 In the Type tool options bar, choose a sans serif bold typeface from the Font menus, and enter **66** for the point size in the Size text box. We chose Helvetica®.



4 Type **work** in the image window.



5 Select the move tool (), and drag the text so that it is centered in the light block of color.

6 Choose Select > Deselect.

7 Choose File > Save.

You have finished preparing the image for two-color printing. To see how the color separations for the printed piece will look, try alternately hiding and displaying the two color channels in the Channels palette.

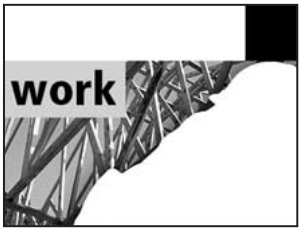
8 Click the eye icon for the Gray channel in the Channels palette. The Gray channel is hidden, and the image window changes to just the areas of the image that will print in the spot color.

9 Redisplay the Gray channel by clicking its eye icon column. Then hide the PANTONE 124 CVC channel by clicking its eye icon. Just the grayscale areas of the image appear in the image window.

10 Click the eye icon column for the PANTONE 124 CVC channel to display both channels.

Final image


Black channel



PANTONE 124 CVC channel

If you have a printer available, you can also try printing the image. You'll find that it prints on two sheets of paper—one representing the color separation for the spot color and one representing the grayscale areas of the image.

For the Web: Creating two-color Web graphics

Two-color images are used in print to keep costs down and expand the tonal range of grayscale images. Even when printing costs aren't an issue, you can use two-color images for effect. Try this technique in ImageReady for creating effective two-color graphics for the Web that give maximum impact without increasing the file size. You can start with an image in Photoshop, or you can work exclusively in ImageReady.

1 For a duotone effect, start by creating a grayscale image in Photoshop or by desaturating an ImageReady image. To convert your color Photoshop image to grayscale, choose Image > Mode > Grayscale.

In ImageReady, it's not possible to create a grayscale image, but you can use the Image > Adjust > Desaturate command. ImageReady only supports RGB files. Even an image that may appear to be grayscale in ImageReady is actually an RGB file.

2 In Photoshop, to convert your grayscale image to RGB mode, choose Image > Mode > RGB Color.

3 Create a new layer and position it beneath the grayscale image in the Layers palette.

In Photoshop, if the grayscale image is the Background, you must convert the Background to a layer by double-clicking the Background in the Layers palette and naming it in the Make Layer window.

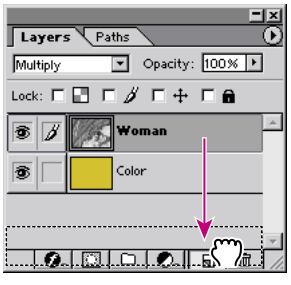
4 In the image, fill the new layer with the second color of choice.

5 Select the top layer of the image and choose Multiply from the Layers palette mode menu.

Multiply mode looks at the color information in each layer and multiplies the base color by the blend color. The result color is always a darker color. Multiplying any color with a color produces progressively darker colors.

6 Duplicate the top layer by dragging it to the New Layer button at the bottom of the Layers palette.

Grayscale image with color layer beneath



Duplicating the top layer

7 With the new layer selected, choose Hard Light from the Layers palette mode menu. This mode brings out the color underneath.

Hard Light filter applied

This technique works most effectively on the top layer of an image with the Hard Light mode applied. Hard Light mode multiplies or screens the colors, depending on the blend color. The effect is similar to shining a harsh spotlight on the image. If the blend color (light source) is lighter than 50% gray, the image is lightened, as if it were screened. This is useful for adding highlights to an image. If the blend color is darker than 50% gray, the image is darkened as if it were multiplied. This is useful for adding shadows to an image.

8 Select the middle layer. Choose Image > Adjust > Levels, and adjust the histogram using the sliders to let more or less color from the bottom layer show through.

9 If desired, decrease the opacity of the different layers and note the effect.

10 Save the file in the GIF file format for the Web, optimizing the file as needed.

As a variation, select the dodge or burn tool and adjust one detail or object in your image at a time.

Review questions

1 What are the three types of channels in Photoshop, and how are they used?

2 How can you improve the quality of a color image that has been converted to grayscale?

3 How do you assign specific values to the black and white points in an image?

4 How do you set up a spot color channel?

5 How do you add spot color to a specific area in a grayscale image?

6 How can you apply spot color to text?

Review answers

1 Channels in Photoshop are used for storing information. Color channels store the color information for an image; alpha channels store selections or masks for editing specific parts of an image; and spot color channels create color separations for printing an image with spot color inks.

2 You can use the Color Mixer command to blend color channels to bring out the contrast and detail in an image. You can extend the tonal range of the image by adjusting its black and white points. You can also sharpen the image by applying the Unsharp Mask filter.

3 You assign specific values with the Levels command black and white eyedropper tools.

4 You set up a spot color channel by choosing New Spot Channel from the pop-up menu on the Channels palette and by specifying a color from the Custom color picker in the New Spot Channel dialog box.

5 With the Gray channel active, you select the area, cut it from the Gray channel, and paste it into the spot color channel.

6 You can add the text to the spot color channel. However, text created in this way is not editable and cannot be repositioned once it is deselected.