How to correct color

Once you've opened an image in Photoshop, you may want to adjust color quality or light levels, convert it to black and white, or correct color or lens distortions. This can improve an image's appearance and correct problems that arise during scanning or taking a photograph.

Note: Most of the tasks in this guide apply primarily to photographs.

Using automatic adjustments

Photoshop includes several commands to adjust image quality automatically. In many cases, these will be all you need. The latter part of this guide covers how to make such adjustments manually.

The Auto Color command adjusts the contrast and color of an image by searching the image to identify shadows, midtones, and highlights.

To use Auto Color:

1. Open the image you wish to correct.
2. Do one of the following:
   - Click the Levels or Curves icon in the Adjustments panel (**Figure 1**).
   - Choose Layer > New Adjustment Layer and choose either Levels or Curves. Click OK in the New Layer dialog box.

   The Properties panel opens (**Figure 2**).

   Note: You can also choose Image > Auto Color to apply the adjustment directly to the image layer. Keep in mind that this method discards image information and is automatic. You cannot adjust any of the options described in the following steps.

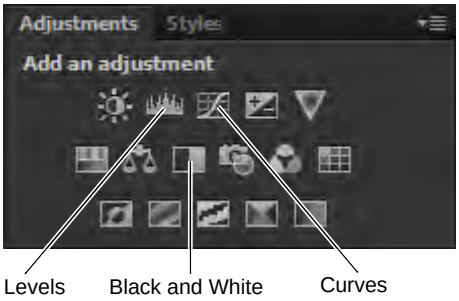

Figure 1 Adjustments panel

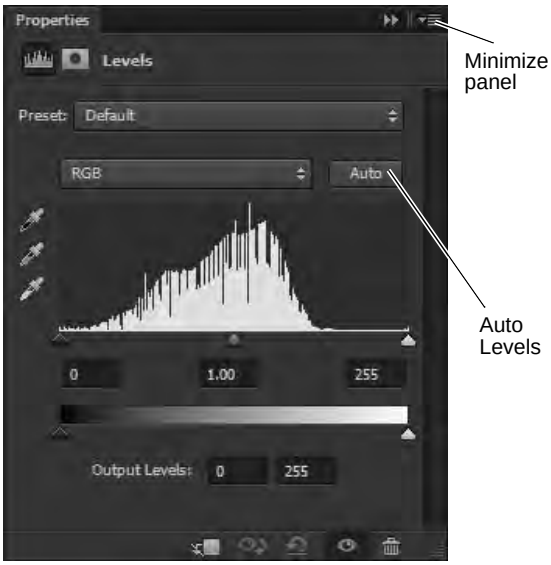

Figure 2 Properties panel with Levels options

3. In the Properties panel, Alt-click (Windows) or Option-click (Mac OS) the Auto button.

   The Auto Color Correction Options dialog box opens (**Figure 3**).

4. In the Algorithms section of the Auto Color Correction Options dialog box, select the Find Dark & Light Colors option.

   Color correction *algorithms* adjust tonal ranges using specific settings such as clippping all channels identically, adjusting channels individually, or finding an average of lightest and darkest pixels in a image.

5. Select the Snap Neutral Midtones option.

   Photoshop finds an average nearly-neutral color in an image and then adjusts the gamma (midtone) values to make the color neutral.

6. Specify the shadows and highlights that are clipped, and adjust the target color for the midtones.

   By default, Photoshop clips the black and white pixels by 0.1%—that is, it ignores the first 0.1% of either extreme when identifying the lightest and darkest pixels in the image.

7. Confirm Save As Default is not selected and click OK to apply Auto Color.

   Photoshop applies Auto Color to the image.

   Observe the changes in the photo. It should lighten in some areas and darken in others. Overall, the color's clarity (though not its sharpness) should improve.

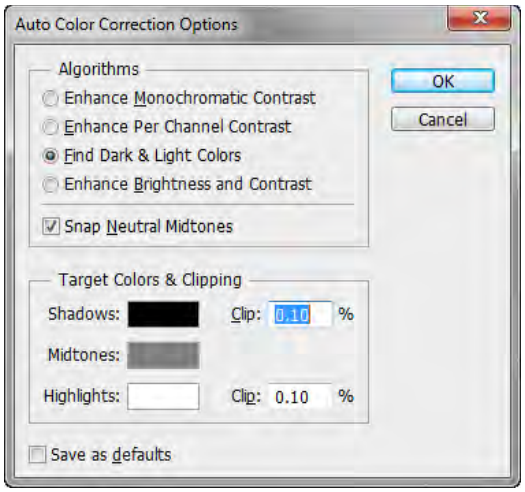

Figure 3 Auto Color Correction Options dialog box

Adjusting levels with an adjustment layer

Every image has a range of tone, from the darkest pixels to the lightest pixels. Photographs tend to look better when their darkest pixels are close to black and their lightest pixels are close to white, giving the photograph a wide *tonal range*. You can use the Levels command in Photoshop to adjust the darkest and lightest pixels in your picture. You can also adjust the *midtones*: the gray or gamma tones of your picture that are in the middle of the brightness range.

In an adjustment layer, you can make changes to tonal levels while preserving the original image. *Nondestructive editing* means you can experiment endlessly without worrying about losing or changing your original photo. By using adjustment layers to alter an image, your original remains intact. At any point, you can turn layers on or off to fine-tune your image.

To use the Levels command through the Adjustments panel:

1. Make sure nothing in the photo is selected. (You want to apply your changes to the entire image.)

2. If the Adjustments panel is not visible, choose Window > Adjustments.

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3. In the Adjustments panel, click the Levels button (**Figure 1**).

   The Properties panel opens dispaying a histogram, levels options and some commonly used presets (**Figure 4**).

   You can try some options in the Preset menu or use the histogram to tonal range of the image.

   A *histogram* illustrates how pixels in an image are distributed by graphing the number of pixels at each color intensity level. The histogram shows detail in the shadows (shown in the left part of the histogram), midtones (shown in the middle), and highlights (shown in the right part). A histogram can help you determine whether an image has enough detail to make a good correction.

4. Drag the left (black) triangle to the point where the darkest colors begin.

   Observe that the darker parts of the image become darker.

5. Drag the right (white) triangle to the point where the lightest colors begin.

   Observe that the lighter parts of the image become lighter.

6. Drag the middle (gray) triangle slightly to the left.

   Observe that the midtones lighten.

7. When the image looks right to you, close the Properties panel.

   Note: The Adjustments panel with Levels options includes an Auto button. The Auto button automatically adjusts the black point and white point in an image. This may give good results in certain images that need a simple increase in contrast; however, because the Auto option adjusts each color channel individually, it may remove color or introduce color casts. Manually adjusting levels often yields more subtle adjustments to your images.

8. Choose Windows > Layers.

   The Layers panel appears. Notice that a new adjustment layer named Levels 1 has been created (**Figure 5**). The original image remains unaltered in the Background layer.

Figure 4 Properties panel with levels options

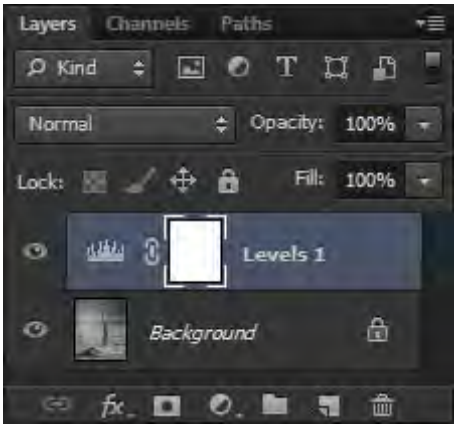

Figure 5 Layers panel with levels adjustment layer

Adjusting lightness and darkness with the Dodge and Burn tools

The commands in the previous section change lightness and darkness in the image as a whole. Sometimes you might need to lighten or darken particular areas of an image. For example, you might want to lighten the shadows on someone's face or brighten the colors in an area of the image without much light.

You can use the Dodge and Burn tools to change the lightness and darkness of particular areas of an image. Dodging and burning may seem like odd names, but like many other features in Photoshop, they are named after film-

development processes. *Dodging* allows more light to show through the negative, making the area lighter, while *burning* allows less light to show, making the area darker.

Both tools are available in the Tools panel above the Pen tool. The Dodge tool appears by default. To access the Burn tool, click the Dodge tool and hold down the mouse button (**Figure 6**).

To use the Dodge tool:

1. Select the Dodge tool in the Tools panel (**Figure 6**).

   The pointer changes to a brush. Usually, the brush appears as a circle.

2. You can change the size and shape of the brush in the Options bar (**Figure 7**).

   Size the brush in proportion to the area you want to lighten.

3. Drag the brush across the photograph in the areas you want to lighten.

   Note: Dodging requires some practice. You may want to keep the History panel open so you can undo your actions.

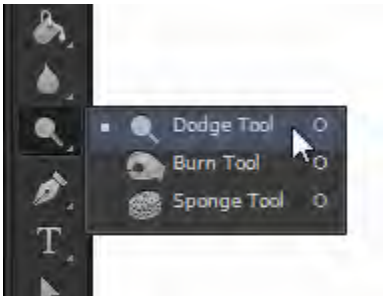

Figure 6 Dodge and Burn tools in the Tools panel

Figure 7 Brush options

To use the Burn tool:

1. Select the Dodge tool in the Tools panel, hold down the mouse button, and select the Burn tool (**Figure 6**).

   The pointer changes to a brush. Usually, the brush appears as a circle.

2. You can change the size and shape of the brush in the Options bar (**Figure 7**).

   Size the brush in proportion to the area you want to darken.

3. Drag the brush across the photograph in the areas you want to darken.

   Note: Burning requires some practice. You may want to keep the History panel open so you can undo actions.

Applying the Unsharp Mask filter

After retouching a photo, many Photoshop professionals apply a filter called the Unsharp Mask filter. When you apply color corrections, you can sometimes produce subtle blurriness in the image. The Unsharp Mask filter makes the image appear sharper by adjusting the contrast of edge detail.

Note: The Unsharp Mask filter is just one of Photoshop's many powerful filters. Many of these apply an artistic look to images. You can experiment with these by selecting different options in the Filter menu.

How to apply Unsharp Mask

1. Make sure nothing in the photo is selected. (You want to apply changes to the entire image.)

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2. Choose Filter > Sharpen > Unsharp Mask.

   The Unsharp Mask dialog box appears (**Figure 8**).

3. Make sure the Preview option is selected so you can see changes in the image as you make them.
4. Drag the Amount slider until your image is as sharp as you want it.
5. Drag the Radius slider to change its setting.

   The Radius slider determines the number of pixels surrounding the edge pixels that affect sharpening. *Edge pixels* are pixels located where two different colors meet. The default setting is 1 pixel. Higher-resolution photos may benefit from a higher setting.

6. Set the Threshold setting to 0 pixels.

   Threshold determines how different pixels need to be before they are considered edge pixels. A setting of 0 sharpens all pixels in the image. Generally, set Threshold between 0 and 20 to avoid introducing unwanted "noise" into the image.

7. When the image looks right to you, click OK to apply changes and close the Unsharp Mask dialog box.

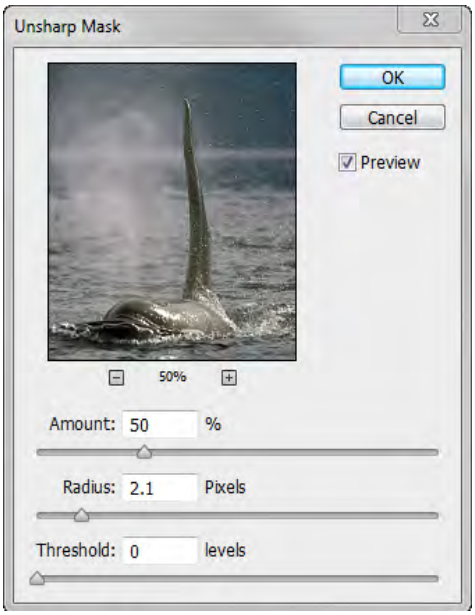

Figure 8 Unsharp Mask dialog box

Converting images to black and white

The Black & White adjustment enables you to convert a color image to grayscale while maintaining full control over how individual colors are converted. You can also tint the grayscale by applying a color tone to the image, to create a sepia effect, for example. Black & White functions like the Channel Mixer, which also converts color images to monochrome while allowing you to adjust color channel input.

How to convert images to black and white:

1. Do one of the following:
   - In the Adjustments panel, click the Black & White icon.
   - Choose Layer > New Adjustment Layer > Black & White. In the New Layer dialog box, type a name for the adjustment layer and then click OK.

   Photoshop applies a default grayscale conversion and the Properties panel opens with Black & White options (**Figure 9**).

   Note: You can also choose Image > Adjustments > Black & White. But keep in mind that this method makes direct adjustments to the image layer and discards image information.

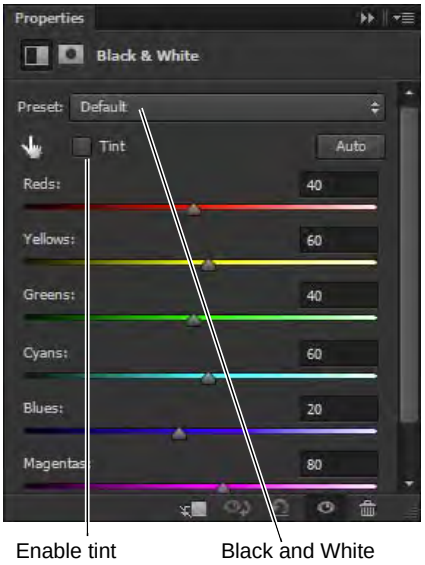

Figure 9 Properties panel with Black & White options

2. In the Properties panel, manually adjust the conversion using the color sliders, apply an Auto conversion, or select a Preset grayscale mix (**Figure 9**).

   Preset menu Select a predefined grayscale mix or a previously saved mix (**Figure 10**). To save a mix, choose Save Black & White Preset from the panel menu.

   Auto Sets a grayscale mix based on the color values of the images, maximizing the distribution of gray values. The Auto mix often produces excellent results, or can be used as the starting point for tweaking gray values using the color sliders.

   Color sliders Adjust the gray tones of specific colors in an image. Drag a slider left to darken or right to lighten the gray tones of an image's original color.

3. (Optional) To apply a color tone such as a sepia tint, select the Tint option in the Properties panel (**Figure 9**). To fine-tune the tint color, click the Tint color swatch to open the Color Picker.

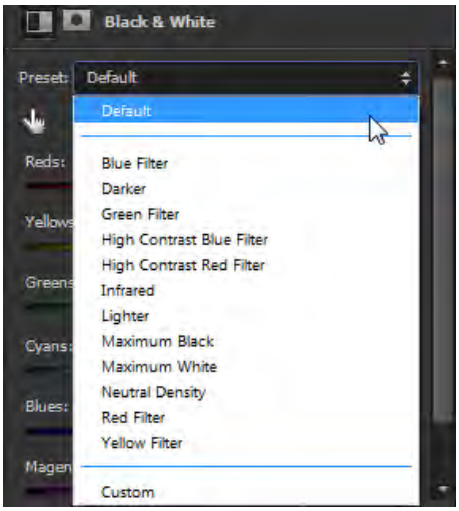

Figure 10 Black and White Preset menu

Correct lens distortion and adjust perspective

The Lens Correction filter fixes common lens flaws such as barrel and pincushion distortion, vignetting, and chromatic aberration. The filter only works with 8- and 16-bits-per-channel images.

You can also use the filter to rotate an image or fix image perspective caused by vertical or horizontal camera tilt. The filter's image grid makes these adjustments easier and more accurate than using the Transform command.

How to correct lens distortion

1. Choose Filter > Lens Correction.
2. Click the Custom tab in the Lens Correction dialog box (**Figure 11**).
3. Select the Show Grid option. As you work you may want to adjust the grid lines to help you judge the amount of correction to make. You can also use the Zoom controls to adjust the level of magnification.

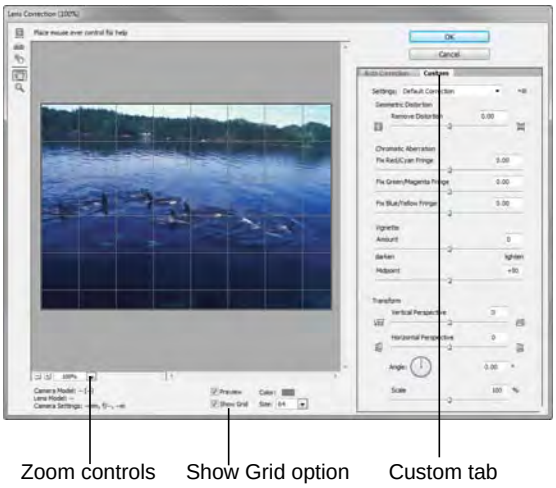

Figure 11 Lens Correction dialog box

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4. Set any of the following options to correct your image, and then click OK to close the dialog box

   Remove Distortion Corrects lens barrel or pincushion distortion. Move the slider to straighten horizontal and vertical lines that bend either away from or toward the center of the image. You can also use the Remove Distortion tool to make this correction. Drag toward the center of the image to correct for barrel distortion and toward the edge of the image to correct for pincushion distortion.

   Chromatic Aberration Corrects Red/Cyan, Green/Magenta, or Blue/Yellow fringing. Zoom in on the image preview to get a closer view of the fringing as you make the correction.

   Vignette Corrects images that have darkened edges caused by lens faults or improper lens shading.

   Amount Sets the amount of lightening or darkening along the edges of an image.

   Midpoint Specifies the width of area affected by the Amount slider. Specify a lower number to affect more of the image. Specify a higher number to restrict the effect to the edges of the image.

   Vertical Perspective Corrects image perspective caused by tilting the camera up or down. Makes vertical lines in an image parallel.

   Horizontal Perspective Corrects image perspective, making horizontal lines parallel.

   Angle Rotates the image to correct for camera tilt or to make adjustments after correcting perspective. You can also use the Straighten tool to make this correction. Drag along a line in the image that you want to make vertical or horizontal.

   Scale Adjusts the image scale up or down. The image pixel dimensions aren't changed. The main use is to remove blank areas of the image caused by pincushion, rotation, or perspective corrections. Scaling up effectively results in cropping the image and interpolating up to the original pixel dimensions.

   Note: Fixing images with similar problems is easy with the preset settings. You can also use some preset list of Lens Correction settings, available from the Settings menu. Lens Default uses settings that you previously saved for the camera, lens, focal length, and f-stop combination used to make an image. Previous Conversion uses the settings used in your last lens correction. Any group of custom settings you saved are listed at the bottom of the menu.

5. Choose File > Save to save the image.

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