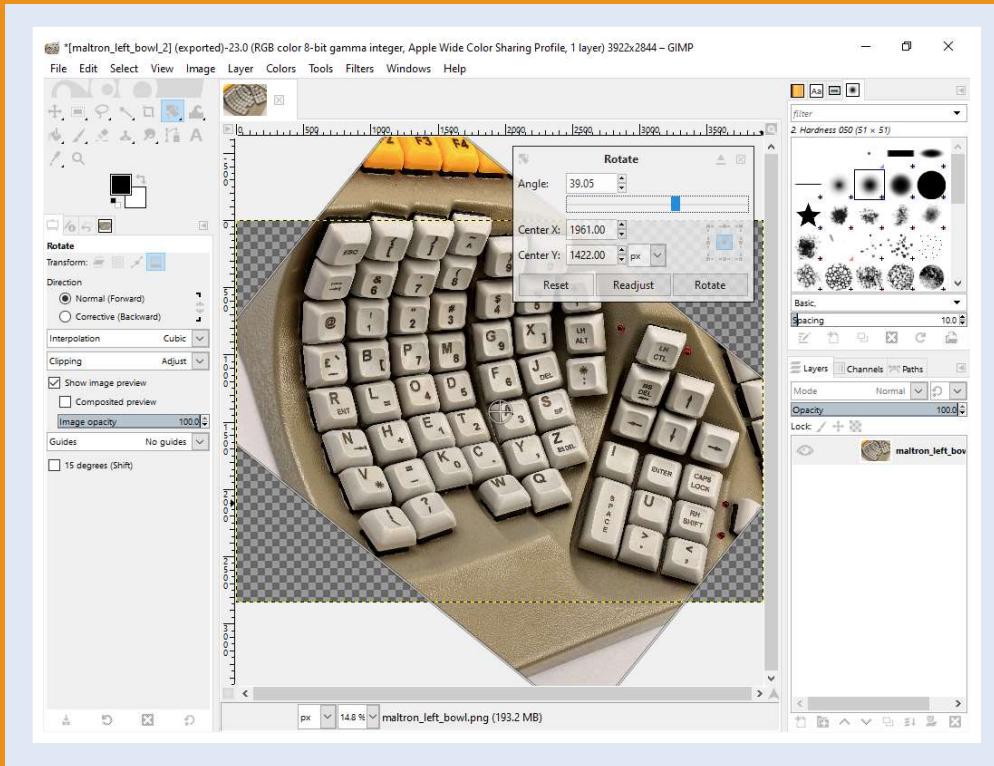


## CHAPTER 4

# Including Images

To make your web pages richer and more appealing, you can include images in them. This chapter shows you how to create suitable image files using GIMP, the GNU Image Manipulation Program; insert images in your web pages and control how they appear; and display alternate text for browsers that cannot display an image file.



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# Grasp the Essentials of Web Image Formats

Computers use many different image formats, from the JPEG format most digital cameras capture to the RAW format preferred by photography professionals, and from the animated GIF format to the business-oriented TIFF format. Most web browsers can display an impressive range of image formats, but to make your website generally accessible and fast to load, you must choose suitable formats for the images you include in your web pages. This section gives you an overview of key image formats. The following sections explain how to use the GIMP app to create suitable image files.

## Understanding Why Image File Size Is Important

If you are creating web pages you will post on the Web, you will likely want to keep file sizes down to a sensible minimum so that your web pages load quickly even when the web server hosting the site is busy and when visitors are using slower Internet connections. If you are developing pages for an internal website that all visitors will access across fast connections, file size may be less of a concern; but even so, most companies and organizations prefer to conserve bandwidth than to squander it.

HTML files and CSS files contain only text, so they have small file sizes and transfer quickly. Image files, audio files, and video files tend to be much larger and can greatly increase the amount of data a browser needs to transfer to load a web page. So you will normally want to choose compact file formats for such media files. You will also want to create files that have suitable quality for the website rather than posting the highest-quality files possible, which will have larger file sizes.

## Identify the Factors Affecting Image File Size

The following factors affect image file size:

- **Resolution.** The larger an image's dimensions, the more pixels the image contains, and the larger the file size. For example, an image 512 pixels wide by 384 pixels high contains 196,608 pixels; an image 1024 pixels wide by 768 pixels high contains 786,432 pixels — four times as many — because it is twice as wide and twice as high. Each pixel contains data that contributes to the file size.
- **File format.** Different file formats use different compression algorithms, which affect the file size. The key difference is between *lossy compression*, which reduces file size but also reduces image quality, and *lossless compression*, which preserves image quality and typically reduces file size less than lossy compression. The JPEG file format uses lossy compression, whereas the PNG file format uses lossless compression. The result is that JPEG files are typically smaller than PNG files but have lower image quality.

- **Color depth.** Each color requires data to represent it in the file, so the more colors an image has, the larger its file size will be.
- **Compression level.** Some file formats, such as JPEG, allow you to adjust the level of compression used. Greater compression delivers smaller file sizes but also usually reduces image quality.
- **Image content.** The more complex the image's content, the more data is needed to represent it in the file. For example, a colorful photo of a landscape contains many colors and requires a lot of data, whereas a simple line drawing — say, a red arrow on a black background — requires relatively little data.
- **Image metadata.** Metadata is data describing the image, such as its GPS location, the camera's shutter speed and aperture, and the number of colors. Metadata typically takes up only a modest amount of space.

### Understanding the Most Widely Used Web Image Formats

Most images on the Web use one of the following four formats:

- **JPEG.** JPEG, Joint Photographic Experts Group, uses lossy compression and can deliver a massive reduction in file size. You can control the level of compression. JPEG is a good choice for photos in web pages.
- **PNG.** PNG, Portable Network Graphics, uses lossless compression to deliver full-quality images with a modest reduction in file size. PNG files are a reasonable choice for photos in web pages but are typically substantially larger than JPEG files of the same content.
- **GIF.** GIF, Graphics Interchange Format, is an older file format that has a maximum of 256 different colors. This limitation keeps down the file size, and GIF uses lossless compression to reduce it further. The color restriction makes GIF unsuitable for photos, but it is good for logos and other graphics that need only a restricted color set. GIF also enables you to create simple moving images.
- **SVG.** SVG, Scalable Vector Graphics, uses text in the Extensible Markup Language, XML, to describe two-dimensional images. SVG is suitable for creating images that use shapes and lines.

Most photo and graphics editors can create JPEG, PNG, and GIF files, along with various other formats. Most illustration apps can export drawings as SVG files.

# Launch GIMP and Perform Essential Moves

GIMP — the GNU Image Manipulation Program — is a powerful tool for editing image files. In this section, you get started with GIMP by launching the app and opening an image file in it. With the image file open, you zoom in or out, as needed. When you finish making changes to the image file, as discussed in the following sections, you use the Overwrite command to save the changes back to the original image file, overwriting it. You then close the image file — and close GIMP if you have finished working with it. See the section “Install GIMP” in Chapter 1 for instructions on installing GIMP.

## Launch GIMP and Perform Essential Moves

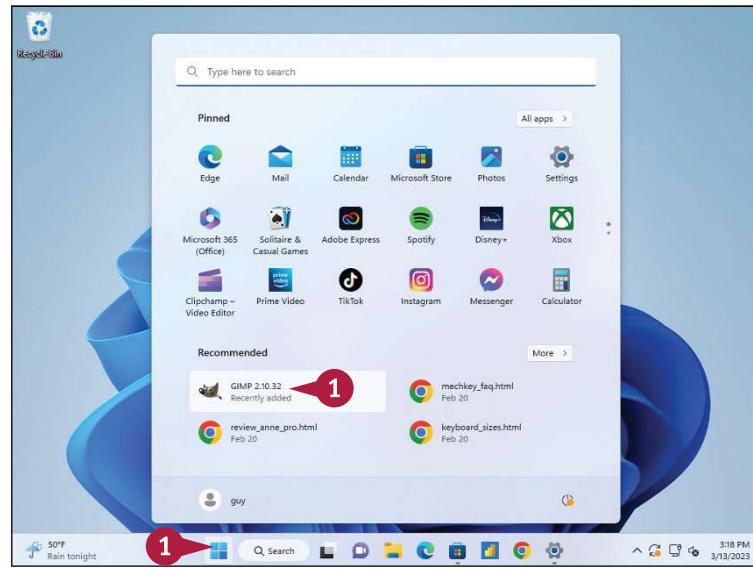
### Launch GIMP and Open an Image File

- 1 Launch GIMP using the standard technique for your computer’s operating system.

For example, on Windows, click **Start** to open the Start menu, and then click **GIMP** (☞).

**Note:** On the Mac, click **Launchpad** (grid) to display the Launchpad screen, and then click **GIMP** (☞).

On Linux, display the list of apps and click **GIMP** (☞).



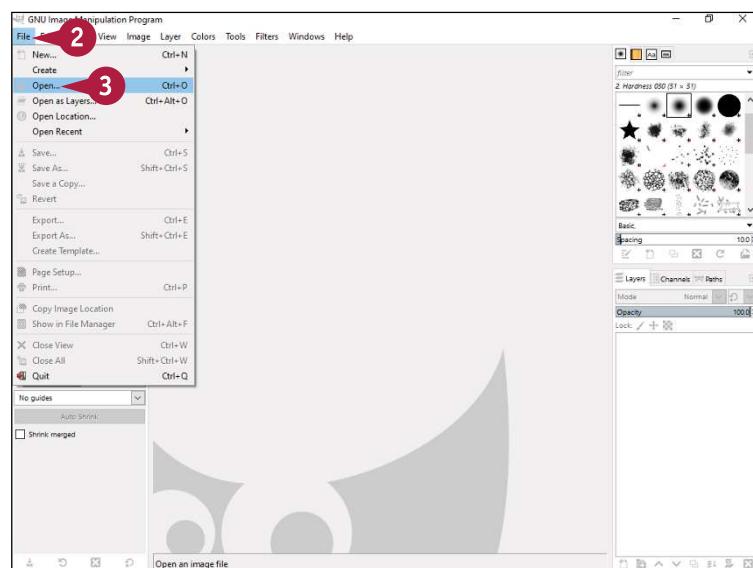
GIMP opens.

- 2 Click **File**.

The File menu opens.

- 3 Click **Open**.

**Note:** On Windows and Linux, you can press **Control**+**O** to display the Open dialog box. On macOS, press **⌘**+**O**.



The Open Image dialog box appears.

- 4 Navigate to the folder that contains the image file you want to open.
- A The breadcrumb bar shows the trail of folders to the current folder.
- 5 Click the image file.
- B The Preview box shows a preview of the image.

**Note:** If the message *Click to create preview* appears in the Preview box, click it to create a preview of the current image.

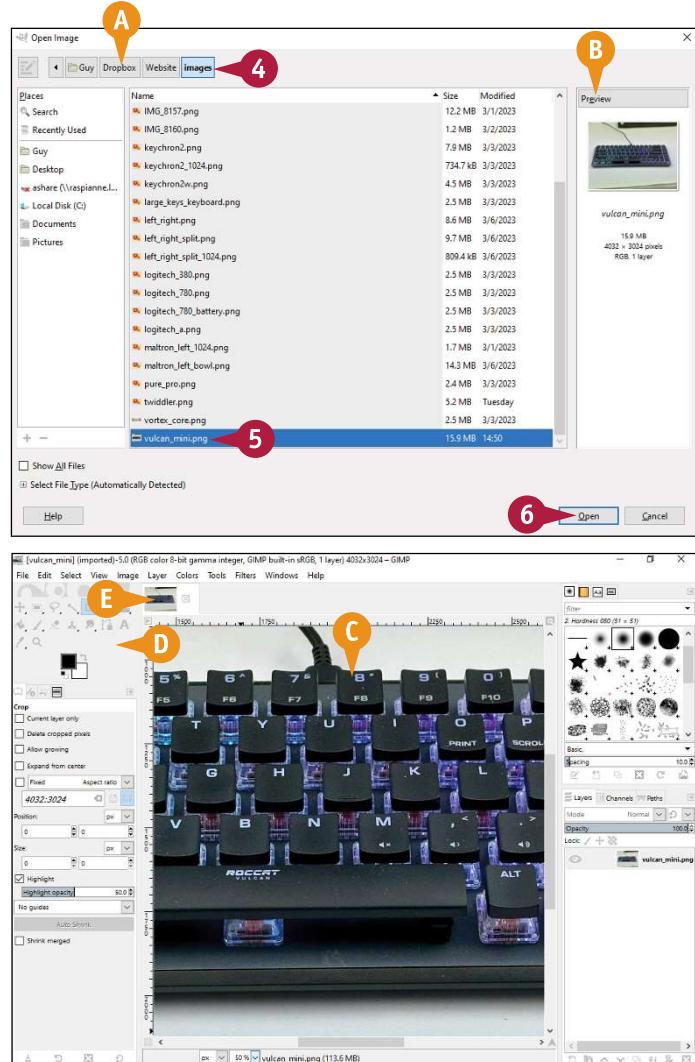
- 6 Click **Open**.

**Note:** If the *Convert to RGB Working Space?* dialog box opens, offering to convert the image's embedded color profile to GIMP's built-in sRGB color profile, click **Keep**.

The image file opens.

**Note:** You can open multiple image files at once.

- C The image appears in the center part of the window.
- D The Toolbox appears in the upper-left corner.
- E The image's thumbnail appears on the image's tab on the tab bar, which enables you to navigate from one open image to another.



### TIP

#### Why does GIMP have a dark interface on my computer, unlike in the book?

GIMP enables you to choose from different color themes for the user interface. To change themes, click **Edit** and **Preferences** to open the Preferences dialog box, and then click **Theme** in the left pane. In the Theme pane, go to the Select Them box and click the theme you want, and then click **OK**. The default theme is Dark; this book uses the System theme, which is more readable on the printed page than Dark is.

continued ►

## Launch GIMP and Perform Essential Moves (continued)

GIMP enables you to zoom in or out on an image to see the area with which you want to work. GIMP provides two easy means of zooming: first, the Zoom continuation menu on the View menu on the menu bar; and second, the Zoom pop-up menu on the status bar. The Zoom pop-up menu provides a variety of preset zoom percentages, such as 800%, 400%, 200%, 100%, 50%, 25%, and 12.5%. The Zoom continuation menu offers greater flexibility, including the Fit Image in Window command and the Zoom to Selection command, so it is typically more helpful.

### Launch GIMP and Perform Essential Moves (continued)

#### Zoom In or Out on the Image File

- A To zoom quickly to a preset percentage, you can click **Zoom**, and then click the percentage on the Zoom pop-up menu.

1 Click **View**.

The View menu opens.

2 Click **Zoom**.

The Zoom continuation menu opens.

- B To zoom to a different percentage, click **Other**; specify the zoom ratio, such as 1:6, or the zoom percentage, such as 18%, in the Zoom Ratio dialog box; and then click **OK**.

- C You can click **Revert Zoom** to revert to the previous zoom level.

3 Click **Fit Image in Window**.

The image appears at the zoom you specified.

Following the example, the full image appears in the window.



## Save Changes to an Image File and Close It

**Note:** After making changes to an image file, you use GIMP's Overwrite command to save those changes to the original file. You then close the file. This procedure may seem peculiar, but it is effective. The alternative is to save the changes to a file in GIMP's XCF format and then export that file in the image format you want.

- After making changes to an image file, click **File**.

The File menu opens.

- Click **Overwrite**. This command shows the name of the file you will overwrite — for example, *Overwrite vulcan\_mini.png*.

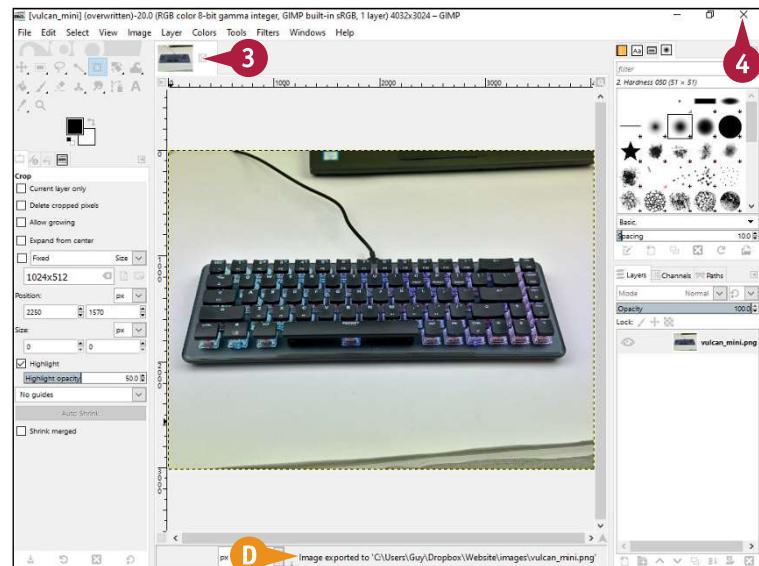
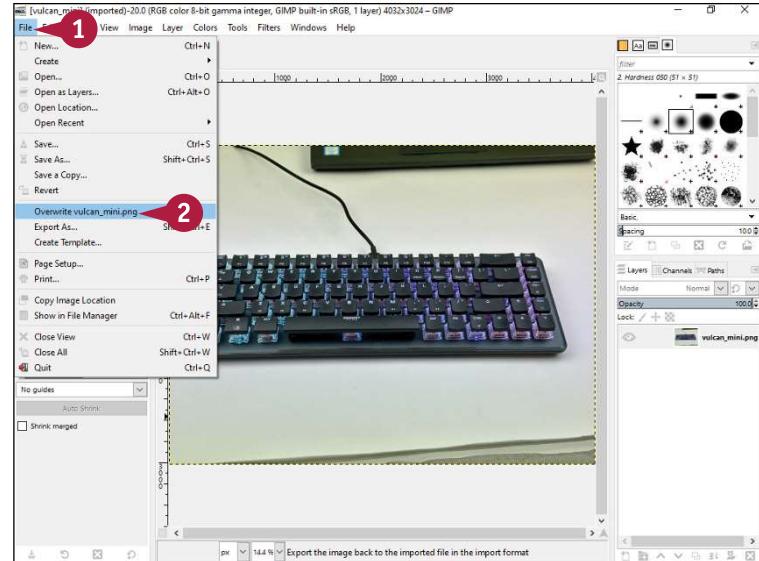
GIMP exports the file, including the changes you have made, overwriting the existing file.

- The status bar readout shows that the file has been exported.
- Click **Close (X)**.

The image file closes.

- If you are ready to close GIMP, click **Close (X)**.

GIMP closes.



### TIPS

#### Can I zoom in and out using keyboard shortcuts?

Yes. Press **-** to zoom out or **+** to zoom in. Press **Control + Shift + J** to give the Fit Image in Window command. Press **5** to zoom to 1600%, **4** for 800%, **3** for 400%, **2** for 200%, or **1** for 100%. Add **Shift** to the key combinations for fractional values: Press **Shift + 2** for 50%, **Shift + 3** for 25%, **Shift + 4** for 12.5%, or **Shift + 5** for 6.25%.

#### What is XCF?

XCF is GIMP's native image format, the format in which GIMP stores image data by default. The abbreviation stands for eXperimental Computing Facility.

# Rotate or Straighten an Image

GIMP enables you to rotate an image 90° clockwise, 90° counterclockwise, or 180°. These quick rotations are great for fixing photos taken with the camera upside down or in the wrong orientation. GIMP also provides the Arbitrary Rotation command, which lets you rotate an image by exactly the angle you need. Arbitrary Rotation is especially useful for straightening an image shot askew.

GIMP also allows you to flip an image horizontally or vertically. Flipping an image horizontally switches left and right, whereas flipping an image vertically switches the top and bottom.

## Rotate or Straighten an Image

- 1 Open the image file you want to rotate or straighten.
- 2 If necessary, zoom in or out on the image.

**Note:** If you need to straighten the image but not rotate it, go to step 6.

- 3 Click **Image**.

The Image menu opens.

- 4 Click **Transform**.

The Transform continuation menu opens.

- A You can click **Flip Horizontally** to flip the image horizontally.

- B You can click **Flip Vertically** to flip the image vertically.

- 5 Click the appropriate Rotate command. In this example, you would click **Rotate 180°**.

- C The image rotates the way you specified.

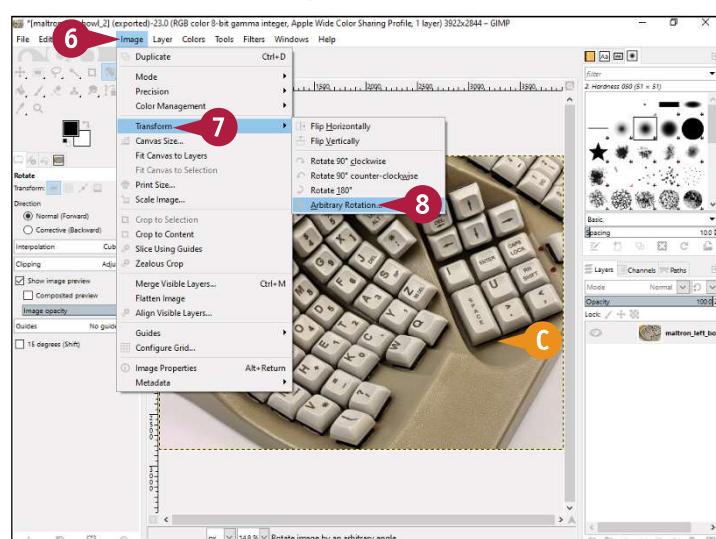
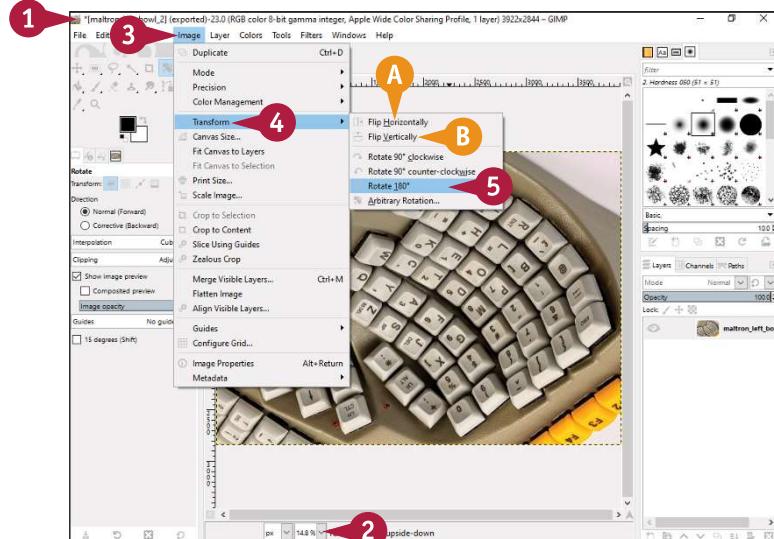
- 6 If you need to straighten the image, click **Image**.

The Image menu opens.

- 7 Click **Transform**.

The Transform continuation menu opens.

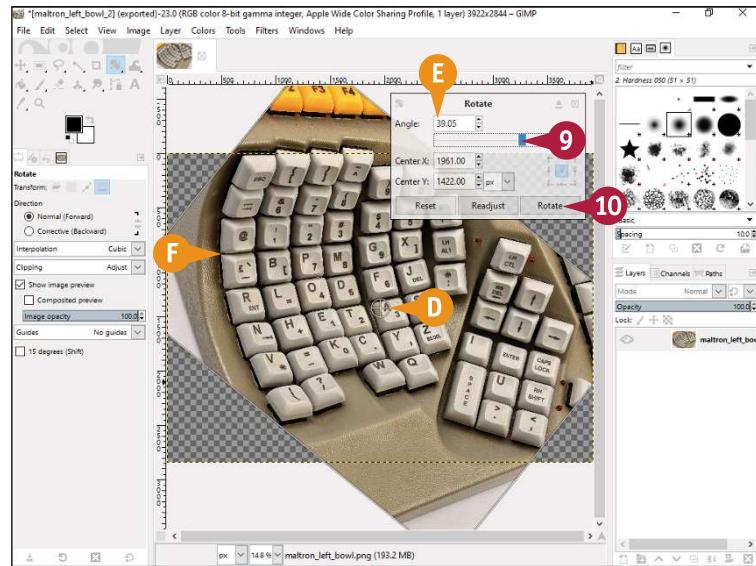
- 8 Click **Arbitrary Rotation**.



The Rotate dialog box opens.

- D The crosshair (⊕) indicates the center of rotation. See the tip.
- 9 Drag the slider to adjust the angle.
- E If you know the precise angle of rotation needed, you can enter it in the Angle box.
- F The image rotates, enabling you to preview the effect of the rotation before applying it.

- 10 Click **Rotate**.



The Rotate dialog box closes.

- G The image rotates the way you specified.

You can now modify the image further, as needed; save it; and close it.



### TIP

#### How do I use the Center X box and Center Y box in the Rotate dialog box?

By default, GIMP rotates the image around its center point, which is what you would typically want. If you need to rotate the image around another point, indicate the point either by dragging the crosshair (⊕) there or by adjusting the values in the Center X box and Center Y box manually. The Center X value controls the horizontal position; the Center Y value controls the vertical position. You can click **Reset** to reset the rotation and the crosshair position. Click **Rotate** when ready to perform the rotation.

# Crop an Image

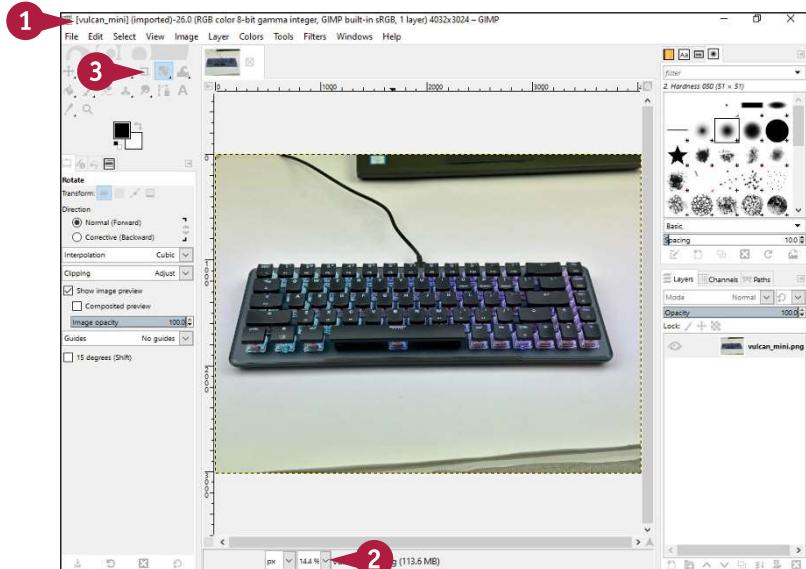
Unless you compose your photos with uncanny accuracy, you will likely need to crop them so that they show exactly what you want, with no extraneous content. GIMP enables you to crop images easily. For many images, you will want to crop freely to the precise dimensions you want. For others, you may want to crop to a specific aspect ratio, such as 3:2 — three units wide for every two units high.

## Crop an Image

- 1 Open the image file you want to crop.
- 2 If necessary, zoom in or out on the image so that you can see more than the area to which you want to crop the image.

You can use either the Zoom pop-up menu or the Zoom continuation menu on the View menu.

- 3 Click **Crop Tool** (✉).

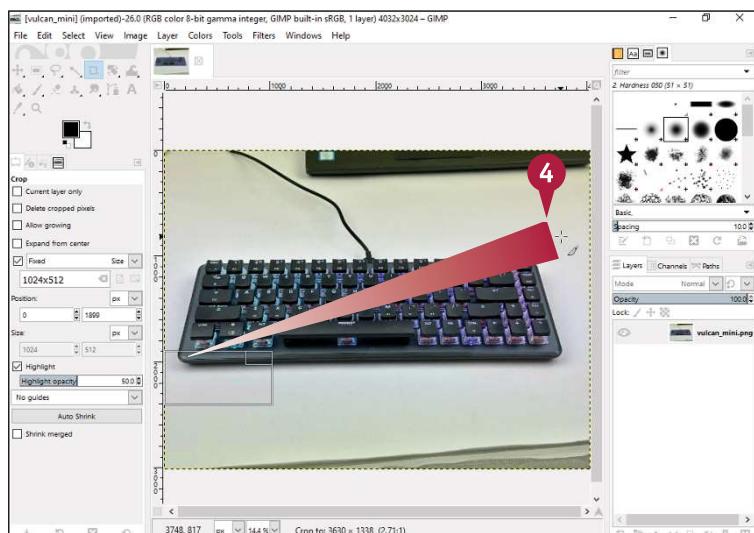


The Crop Tool becomes active.

The crop pointer (✉) appears.

- 4 Drag diagonally to select the area you want to keep.

**Note:** You can drag diagonally in any direction.



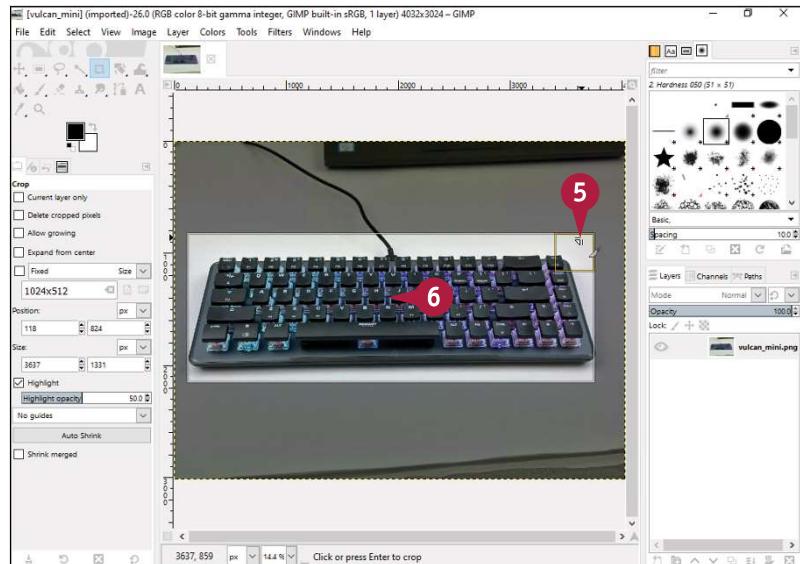
A frame appears around the area you selected.

- 5 If necessary, drag a corner or a side of the frame to adjust the area.

**Note:** You can move the selection area by clicking inside it and dragging.

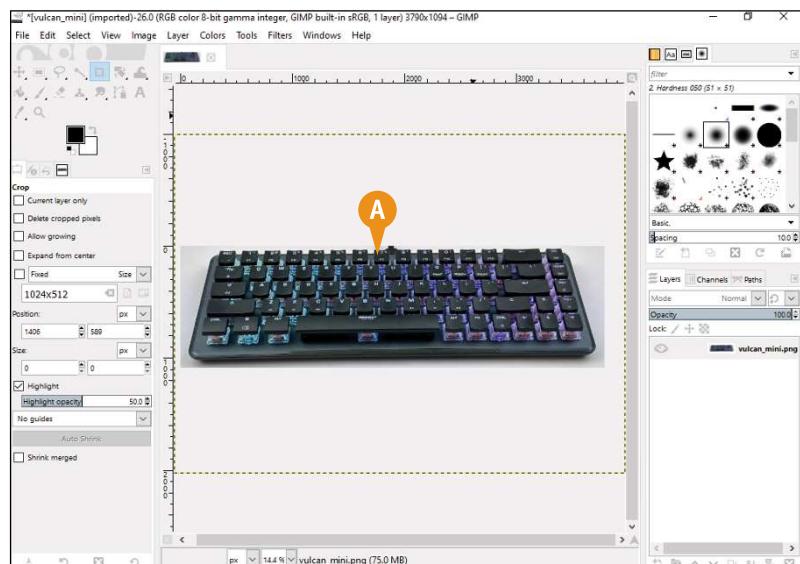
- 6 When you have selected the area you want, double-click inside the frame to execute the crop.

**Note:** You can also press **Enter** to execute the crop.



- A The cropped image appears.

You can now modify the image further, as needed; save it; and close it.



### TIP

#### How do I crop an image to a specific aspect ratio?

Click **Crop Tool** (❑) to activate the Crop Tool. In the Crop pane, on the left side of the GIMP window below the Toolbox, select the check box (❑) to the left of the first, unnamed drop-down list. Click that list's drop-down button (▼), and then click **Aspect ratio**. In the text box below the drop-down list, select the existing aspect ratio and type your aspect ratio, such as **3:2**, over it. GIMP then constrains the crop area as you drag.

# Resize an Image

GIMP enables you to resize an image to the dimensions you need, either increasing or decreasing the image's width and height. Given the high resolutions at which current digital cameras and smartphones shoot photos, you are more likely to need to decrease the image's dimensions when working with photos, but you may need to enlarge smaller graphics.

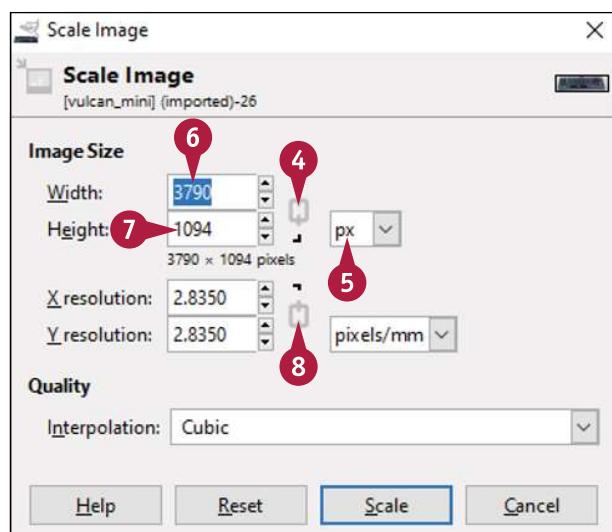
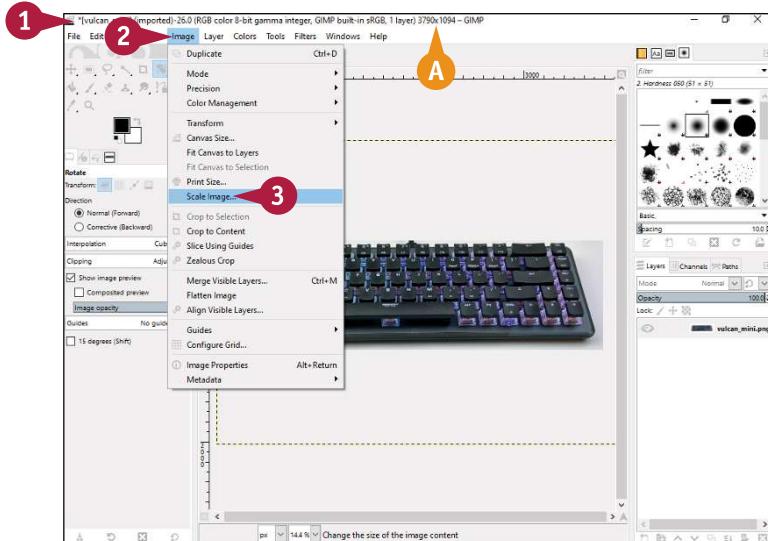
When resizing an image, you can choose what type of interpolation to use. *Interpolation* controls how the app calculates the color values for pixels it inserts when resizing an image. You can also adjust the image's resolution if needed.

## Resize an Image

- 1 Open the image file you want to resize.

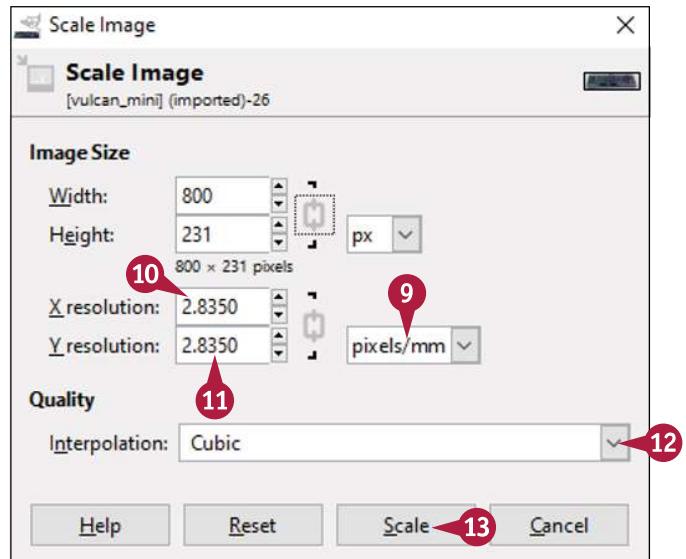
**Note:** Normally, you would rotate, straighten, and crop an image, as needed, before resizing it.

- 2 Click **Image**.
- The Image menu opens.
- 3 Click **Scale Image**.
- 4 If you want to adjust the width and height separately, click **Linked** ( changes to ).
- 5 Verify that **px** appears in this drop-down list. If it does not, click , and then click **pixels**.
- 6 Click **Width** and enter the width in pixels.
- 7 If you unlinked the width and height, click **Height** and enter the height in pixels.
- 8 If you will adjust the resolution and want to adjust the horizontal and vertical resolution separately, click **Linked** ( changes to ).



## Including Images

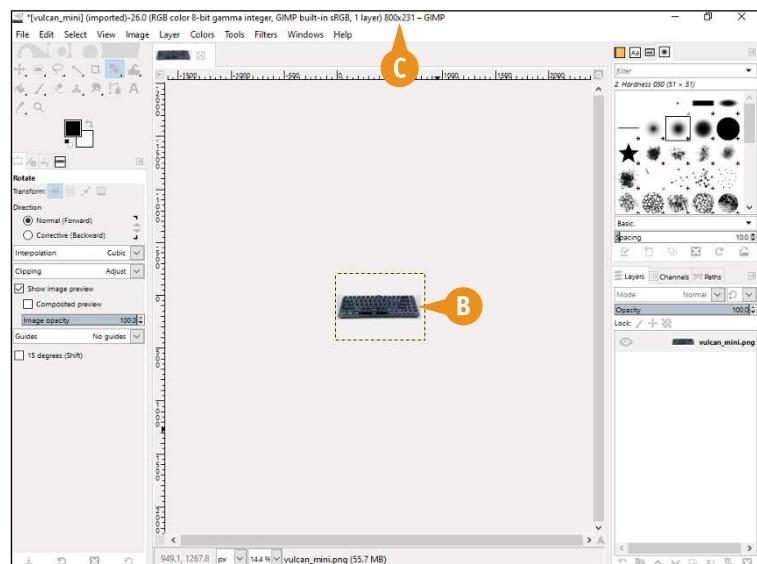
- 9 Verify that **pixels/mm** appears in this drop-down list. If not, click , and then click **pixels/mm**.
- 10 Click **X resolution** and enter the horizontal resolution.
- 11 If you unlinked the resolutions, click **Y resolution** and enter the vertical resolution.
- 12 Click **Interpolation** () , and then click the type of interpolation you want to use: **None**, **Cubic**, **Linear**, **NoHalo**, or **LoHalo**. See the tip for advice.
- 13 Click **Scale**.



The Scale Image dialog box closes.

- B GIMP resizes the image as you specified.
- C The image's adjusted resolution appears in the title bar.

You can now modify the image further, as needed; save it; and close it.



## TIP

**Which type of interpolation should I use when resizing an image?**

When you are reducing the image's size, choose **LoHalo** in the Interpolation drop-down list; if LoHalo delivers a disappointing result for that image, try **NoHalo** instead. When you are increasing the image's size, choose either **Cubic** or **Linear**. Cubic interpolation takes more processing power than linear interpolation, so it may take longer.

If you just need a rough-and-ready resized image, you can choose **None**, which performs no interpolation but instead copies the color of each pixel from the closest adjacent pixel in the original image. The resulting image may be grainy or coarse.

# Reduce the Number of Colors in an Image

The more colors an image contains, the larger its file size will be, so you may want to reduce the number of colors in an image to bring down its file size. GIMP's Indexed Color Conversion feature enables you to reduce the number of colors either to a maximum you specify, such as 256 colors, or to a palette optimized for use on the web. Generally, the web-optimized palette is the best choice for images you will use in your web pages.

## Reduce the Number of Colors in an Image

- 1 Open the image file in which you want to reduce the number of colors.

- 2 Click **Image**.

The Image menu opens.

- 3 Click **Mode**.

The Mode continuation menu opens.

A The dot (■) indicates the current color mode — in this case, RGB.

B You can click **Grayscale** if you want to convert the image's colors to grayscale tones.

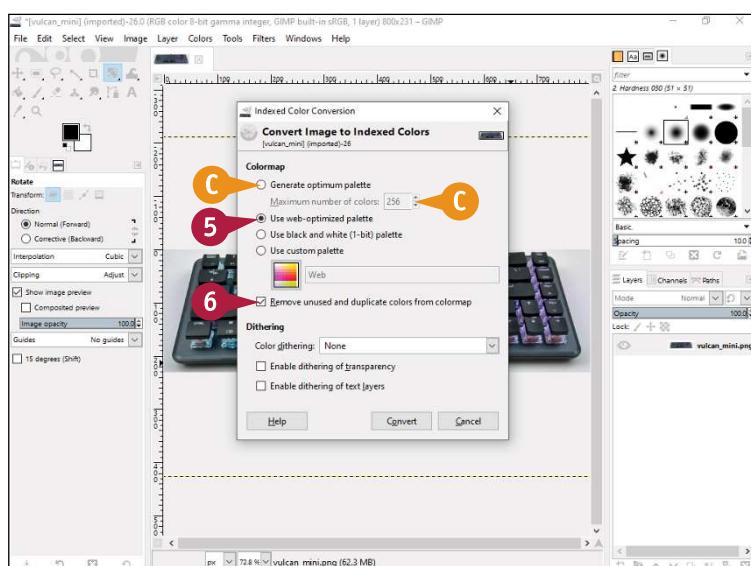
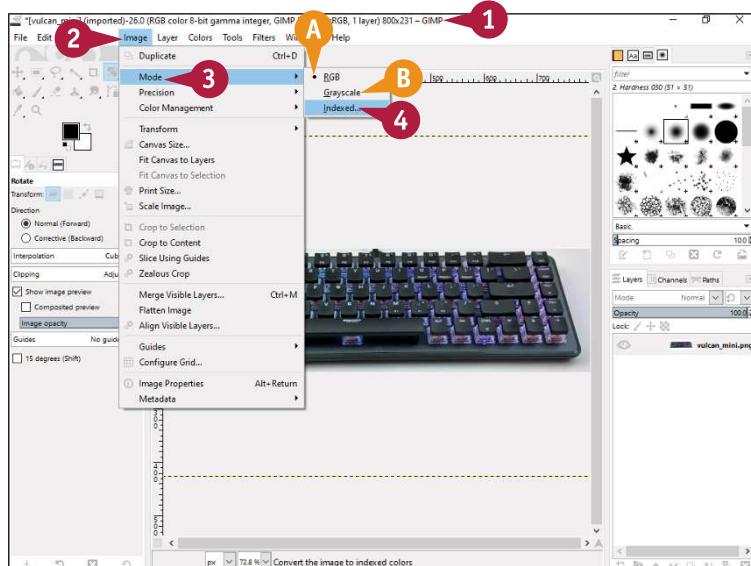
- 4 Click **Indexed**.

The Indexed Color Conversion dialog box opens.

C If you want to reduce the image to a specific number of colors, click **Generate optimum palette** (○ changes to ●). Then click **Maximum number of colors** and enter the number.

5 Click **Use web-optimized palette** (○ changes to ●).

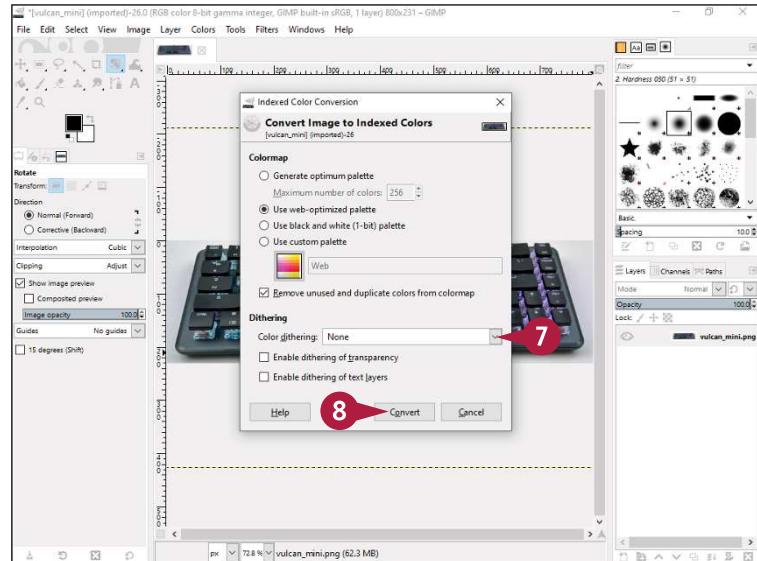
6 Select (✓) **Remove unused and duplicate colors from colormap**.



- 7** Click **Color dithering** (▼), and then click **None**.

**Note:** *Dithering* is a technique used to simulate a larger range of colors using a limited color palette. Dithering places small dots of different colors in close proximity to one another to create the illusion of a new color.

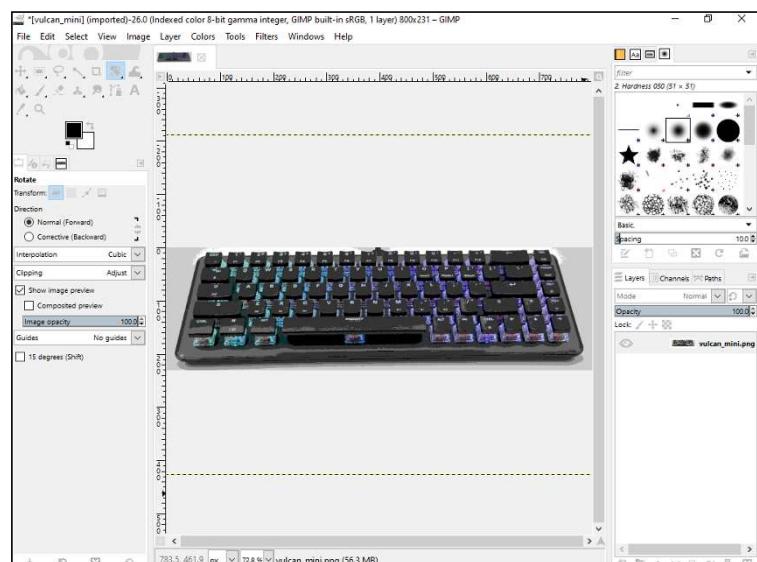
- 8** Click **Convert**.



The Indexed Color Conversion dialog box closes.

GIMP performs the color conversion.

You can now modify the image further, as needed; save it; and close it.



### TIP

#### What is RGB?

RGB is the abbreviation for “Red, Green, Blue,” a color model used to represent colors on computer screens and other digital displays. RGB creates colors combining varying intensities of red, green, and blue light. The amount of each primary color used determines the resulting color. For example, equal amounts of red, green, and blue light create white, while no light at all creates black. In RGB, the resulting color gets lighter as more colors are added together. Each color channel in RGB is represented by a value in the range 0–255, with 0 being the absence of color and 255 being the maximum intensity. Black is RGB(0,0,0); white is RGB(255,255,255).

# Convert an Image to the Format You Need

GIMP enables you to convert an image file from one format to another by opening the image file and then using the Export As command. This capability can be useful for creating the types of image files you need for your web pages. Depending on the export format, you may be able to configure options for the exported file. For example, when exporting a file to the JPEG format, you can adjust the quality setting to strike a balance between image quality and file size. You can also choose whether to include metadata and a thumbnail picture in the exported image.

## Convert an Image to the Format You Need

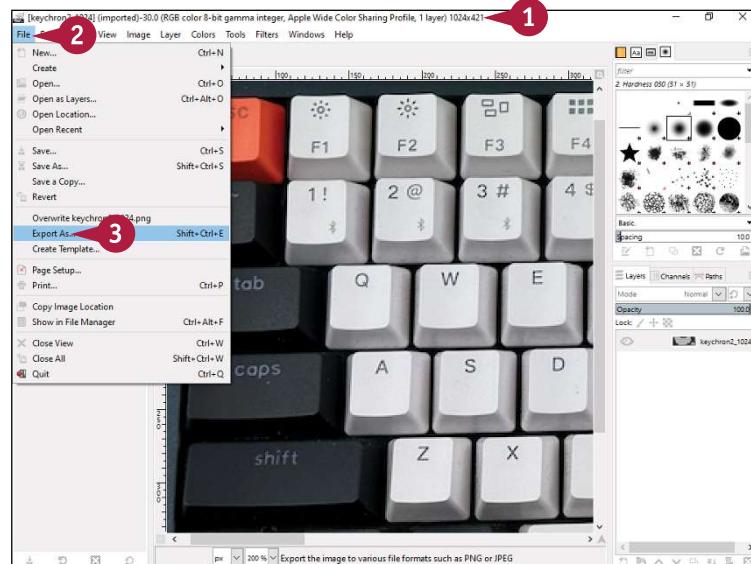
- 1 Open the image file you want to convert to a different format.

- 2 Click **File**.

The File menu opens.

- 3 Click **Export As**.

**Note:** You can press **Control** + **Shift** + **E** to give the Export As command. On the Mac, press **⌘** + **Shift** + **E**.

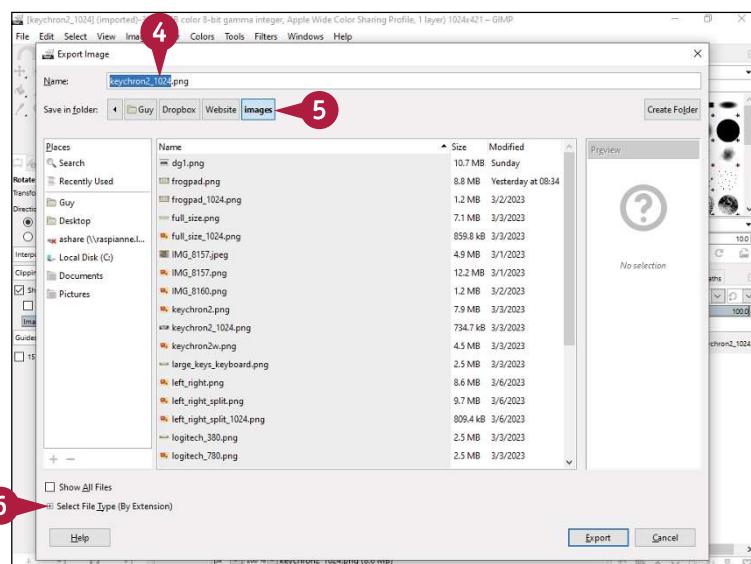


The Export Image dialog box opens.

- 4 In the Name box, edit the filename, as needed.

- 5 Specify a different folder, if needed.

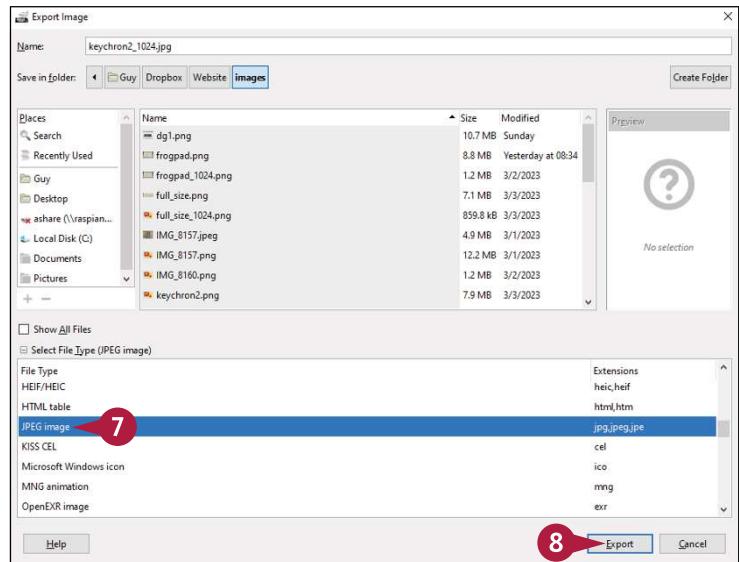
- 6 Click **Expand** (+ changes to ⊞) next to **Select File Type (By Extension)**.



## Including Images

The Select File Type by Extension box expands.

- 7 Click the file type to which you want to convert the image.
- 8 Click **Export**.



Depending on the file type, an Export Image As dialog box may open. For example, when you export to the JPEG format, the Export Image as JPEG dialog box opens.

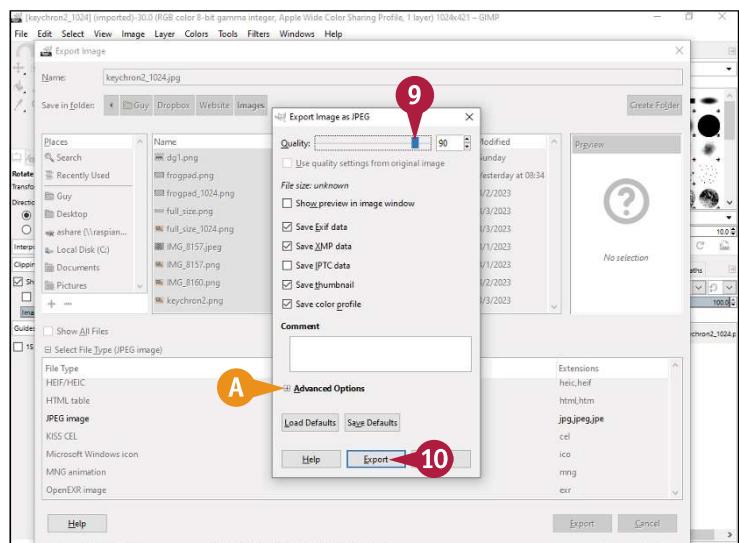
- 9 Choose options for the file format — for example, by dragging the **Quality** slider.
- A You can click **Expand** (+ changes to -) to expand the Advanced Options section of the Export Image as JPEG dialog box.

**Note:** The available options in the Export Image As dialog box depend on the file format.

- 10 Click **Export**.

The Export Image As dialog box closes.

GIMP exports the image to the filename and location you specified.



## TIP

**What are the key options for exporting a JPEG file?**

The most important option is the Quality setting. Because the JPEG format uses lossy compression, a high-quality JPEG file contains much more data than a low-quality JPEG file; the disadvantage is that the high-quality file has a correspondingly higher file size.

Select () **Save Exif Data** if you want to include the file's Exchangeable Image Format data in the exported file. Select () **Save thumbnail** if you want to include a thumbnail image in the exported file.

# Learn the HTML for Images

To place an image file on a web page, you insert an `img` element at the appropriate point in the web page. The `img` element creates a space in which the browser then places the image.

This section introduces you to the syntax for the `img` element. The following section, “Insert an Image,” walks you through an example of using the `img` element to insert an image in a web page.

## Understanding the Syntax for the `img` Element

The `img` element uses a self-closing tag, which looks like this in HTML 5: `<img>`. In earlier versions of HTML, self-closing tags included a space and a forward slash before the closing `>` — for example, `<img />`. These older tags still work, but you no longer need to include the space and forward slash.

The `img` element has two required attributes:

- `src`. This attribute specifies the address at which the image file is located. For example, the `src` attribute for the following `<img>` tag specifies that the image file is called `keyboard1.jpg` and is located in the `images` folder:  
``

- `alt`. This attribute specifies alternate text to display if the image file cannot be shown. For example, the `src` attribute for the following `<img>` tag specifies that the image file is called `keyboard1.jpg` and is located in the `images` folder. The `alt` attribute specifies the text `A keyboard`.

```

```

As well as from the two required attributes, the `<img>` tag has 10 optional attributes:

- `height`. This attribute specifies the display height of the image in pixels. Setting the image’s height by including the `height` attribute in the tag does work, but it is better to use CSS to control image size.
- `width`. This attribute specifies the display width of the image, either in pixels or as a percentage of the available width in the browser window. As with the `height` attribute, including this attribute in the tag does work, but using CSS is preferable. The following example makes the image occupy 90 percent of the available width in the browser window:

```

```

- `sizes`. This attribute specifies different image sizes to use for different web page layouts.
- `srcset`. This attribute specifies a set of image files to use for different clients — for example, a smaller image for smaller screens.
- `ismap`. This attribute, when included, specifies that the image is an image map. See the section “Create Multiple Links from an Image” in Chapter 5 for information about image maps.
- `usemap`. This attribute provides the name of an image to use as an image map. See the section “Create Multiple Links from an Image” in Chapter 5 for an example of how you use this attribute.
- `loading`. This attribute controls how the browser loads the image. You can set `loading` to `eager` to make the browser load the image immediately, to `lazy` to make the browser load the image only when the part of the page containing the image comes into view on the screen, or to `auto` to have the browser determine whether to act `eager` or act `lazy`. Omitting the `loading` attribute from the `<img>` tag also lets the browser use its default behavior; for most browsers, the default behavior is lazy loading.  
``
- `longdesc`. This attribute specifies a URL that provides a detailed description of the image.
- `referrerpolicy`. This attribute tells the browser which referrer information to use when retrieving an image. You can set this attribute to `no-referrer`, `no-referrer-when-downgrade`, `origin`, `origin-when-cross-origin`, or `unsafe-URL`.
- `crossorigin`. This attribute enables the browser to use images from third-party sites that permit cross-origin access.

# Insert an Image

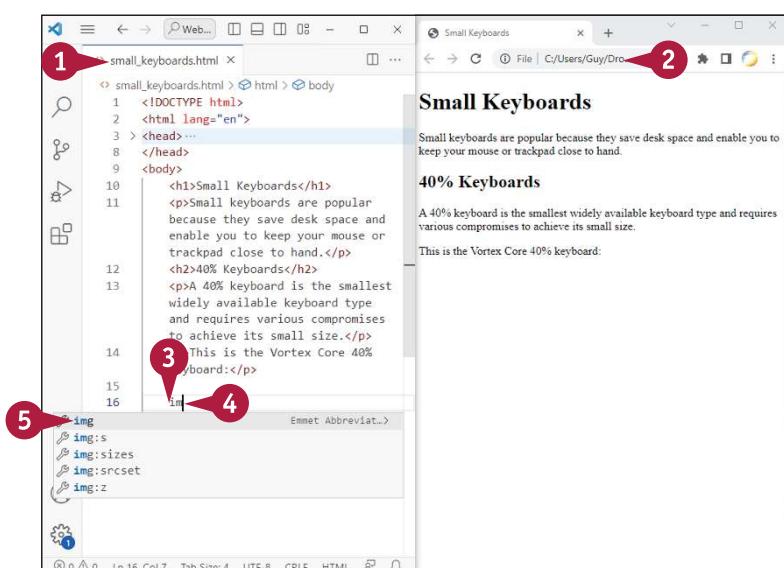
In the previous section, “Learn the HTML for Images,” you met the `img` element, which enables you to display an image in a web page. In this section, you use the `img` element to add a picture to a page. You use the `img` element’s `alt` attribute to specify alternative text to display for accessibility purposes or if the image file is not available; and you use the `width` attribute to control the width at which the image appears relative to the window’s width.

## Insert an Image

- 1 In Visual Studio Code, open the file to which you want to add the image.
- 2 Open the file in a browser window.
- 3 In Visual Studio Code, click to place the insertion point at the appropriate point in the HTML.
- 4 Type `im`.

The expansions list appears.

- 5 Click `img`.



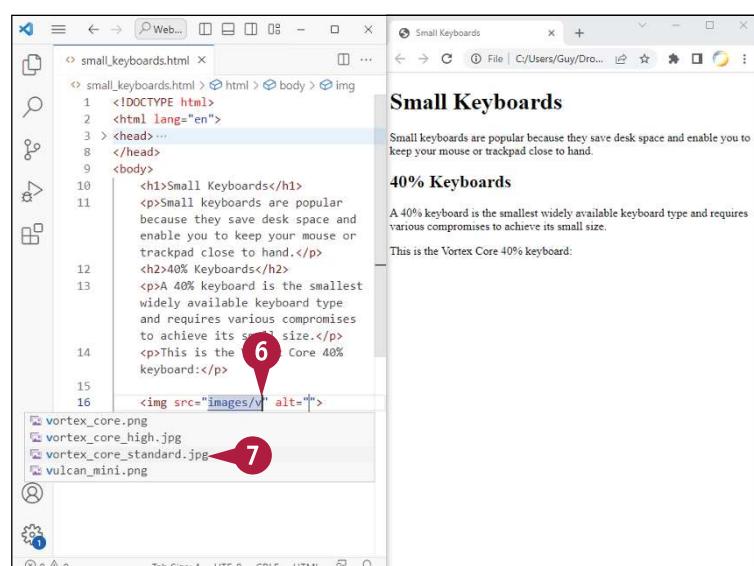
The `<img>` tag appears, including the `src` attribute and the `alt` attribute:

```
<img src="" alt="">
```

- 6 With the insertion point between the double quotation marks after `src=`, start typing the path and filename of the image file.

The list of matching items appears.

- 7 Click the appropriate item.



The path and filename appear within the double quotation marks after `src=`.

- 8 Press **Tab** (not shown).

The insertion point moves to between the double quotation marks after `alt=`.

- 9 Type the text to display if the browser cannot display the image file.

- 10 Click **Refresh** (C).

The web page refreshes.

- A The image appears, but is too wide for the window.

- 11 Click just before the closing `>` of the `<img>` tag.

- 12 Type a space followed by `width="90%"`.

- 13 Click **Refresh** (C).

The web page refreshes.

- B The image changes size so that it is 90 percent of the width of the browser window. The browser automatically adjusts the image's height proportionally.

**Note:** Leave the HTML file to the browser window open so that you can continue working on the page in the next section, “Create a Figure with a Caption.”

### TIP

#### How can I make a browser display the alt text for an image?

One way is to turn off the display of images in the browser. For example, in Chrome, click **Menu** (⋮), click **Settings**, and then click **Privacy and security** (🔒). Next, click **Site settings** (🌐) to display the Site Settings screen, and then click **Images** (🖼️) to display the Images screen. Click **Don't allow sites to show images** (☒; ○ changes to ☑). Now load the web page, and you will see the alt text.

When working on the web page, it is quicker to temporarily change the filename or path — for example, by deleting a character. You can then refresh the page, and the alt text will appear.

```

<small_keyboards.html>
1 <!DOCTYPE html>
2 <html lang="en">
3 <head> ...
4 </head>
5 <body>
6   <h1>Small Keyboards</h1>
7   <p>Small keyboards are popular because they save desk space and enable you to keep your mouse or trackpad close to hand.</p>
8   <h2>40% Keyboards</h2>
9     <p>A 40% keyboard is the smallest widely available keyboard type and requires various compromises to achieve its small size.</p>
10    <p>This is the Vortex Core 40% keyboard:</p>
11      
13    </p>
14  </body>
15 </html>
16
17
18
19

```

```

<small_keyboards.html>
1 <!DOCTYPE html>
2 <html lang="en">
3 <head> ...
4 </head>
5 <body>
6   <h1>Small Keyboards</h1>
7   <p>Small keyboards are popular because they save desk space and enable you to keep your mouse or trackpad close to hand.</p>
8   <h2>40% Keyboards</h2>
9     <p>A 40% keyboard is the smallest widely available keyboard type and requires various compromises to achieve its small size.</p>
10    <p>This is the Vortex Core 40% keyboard:</p>
11      
13    </p>
14  </body>
15 </html>
16
17
18
19

```

# Create a Figure with a Caption

Instead of simply inserting an image in a web page, you can create a `figure` element, which identifies its contents as being a figure. You place the `img` element inside the `figure` element but otherwise specify the image information as usual; you can also use the `figure` element for other graphical items, such as diagrams or charts. You can add a caption to the `figure` element by including the `figcaption` element, which you also place inside the `figure` element.

## Create a Figure with a Caption

- 1 In Visual Studio Code, resume work in the file you used in the previous section, "Insert an Image."
- 2 Click to place the insertion point on the line before the start of the `<img>` tag.
- 3 Type the opening `<figure>` tag, including the `style` attribute to define a simple border that will enable you to see where the `figure` element is:

```
<figure style="border-style:solid;
border-width:thin;
border-color:black">
```

- 4 Click to place the insertion point after the end of the `<img>` tag.
- 5 Type the closing `</figure>` tag to end the `figure` element, enclosing the `img` element inside the `figure` element:

```
</figure>
```

- 6 Click to place the insertion point on the blank line before the `</figure>` tag.
- 7 Click Refresh (C).

Small Keyboards

Small keyboards are popular because they save desk space and enable you to keep your mouse or trackpad close to hand.

## 40% Keyboards

A 40% keyboard is the smallest widely available keyboard type and requires various compromises to achieve its small size.

This is the Vortex Core 40% keyboard:

Small Keyboards

Small keyboards are popular because they save desk space and enable you to keep your mouse or trackpad close to hand.

## 40% Keyboards

A 40% keyboard is the smallest widely available keyboard type and requires various compromises to achieve its small size.

This is the Vortex Core 40% keyboard:

## Including Images

The web page refreshes.

- A** The border shows the extent of the `figure` element.
- B** The image appears in the `figure` element.
- 8** In the Visual Studio Code window, type `fig`.
- The expansions list appears.
- 9** Click `figcaption`.

```

<small_keyboards.html>
1  <!DOCTYPE html>
2  <html lang="en">
3  <head>...
4  </head>
5  <body>
6      <h1>Small Keyboards</h1>
7      <p>Small keyboards are popular because they save desk space and enable you to keep your mouse or trackpad close to hand.</p>
8          <h2>40% Keyboards</h2>
9          <p>A 40% keyboard is the smallest widely available keyboard type and requires various compromises to achieve its small size.</p>
10         <p>This is the Vortex Core 40% keyboard:</p>
11             <figure style="border-style:solid; border-width:thin; border-color:#black">
12                 
13             </figure>
14         <caption>Fewer keys means fewer typos!</caption>
15     </body>
16 </html>
17 </small_keyboards.html>
18 <!-- 0 0 0 Ln 18, Col 8 Tab Size: 4 UTF-8 CRLF HTML -->
```

Visual Studio Code inserts the opening `<figcaption>` tag and closing `</figcaption>` tag, placing the insertion point between them.

- 10** Type the text of the caption.
- 11** Click Refresh (C).
- The web page refreshes.
- C** The figure caption appears.

```

<small_keyboards.html>
1  <!DOCTYPE html>
2  <html lang="en">
3  <head>...
4  </head>
5  <body>
6      <h1>Small Keyboards</h1>
7      <p>Small keyboards are popular because they save desk space and enable you to keep your mouse or trackpad close to hand.</p>
8          <h2>40% Keyboards</h2>
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10         <p>This is the Vortex Core 40% keyboard:</p>
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14         <caption>Fewer keys means fewer typos!</caption>
15     </body>
16 </html>
17 </small_keyboards.html>
18 <!-- 0 0 0 Ln 18, Col 8 Tab Size: 4 UTF-8 CRLF HTML -->
```

## TIP

**What is the advantage of using the `figure` element?**

Using the `figure` element has several benefits. First, the element improves accessibility for those with disabilities, because screen readers and other assistive technologies can identify the element and convey the relationship between the graphical element and its caption. Second, the `figure` element helps search engines determine the page's context and relevance, which can help improve your site's search rankings and visibility. Third, you can format the `figure` element and its contents more easily via CSS, as discussed in Chapter 7 and subsequent chapters. Fourth, your page is easier for yourself and your colleagues to read, understand, and maintain.