Introduction to photoshop elements

Image Size & Resolution

In order to produce high-quality images, it is important to understand how the pixel data of images is measured and displayed.

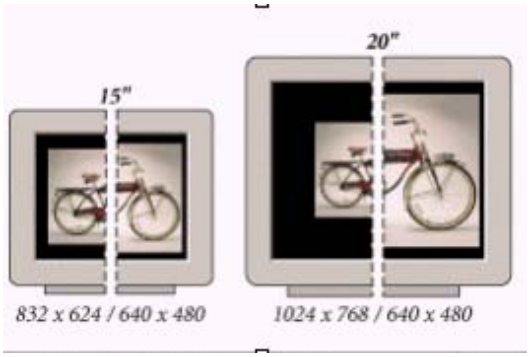
Pixel dimensions
Image resolution
Monitor resolution
Printer resolution
Printer resolution
File size

Pixel dimensions

The number of pixels along the height and width of a bitmap image. The display size of an image on-screen is determined by the pixel dimensions of the image plus the size and setting of the monitor.

For example, a 15-inch monitor typically displays 800 pixels horizontally and 600 vertically. An image with dimensions of 800 pixels by 600 pixels would fill this small screen. On a larger monitor with an 800-by-600-pixel setting, the same image (with 800-by-600-pixel dimensions) would still fill the screen, but each pixel would appear larger. Changing the setting of this larger monitor to 1024-by-768 pixels would display the image at a smaller size, occupying only part of the screen.

When preparing an image for online display (for example, a Web page that will be viewed on a variety of monitors), pixel dimensions become especially important. Because your image may be viewed on a 15-inch monitor, you may want to limit the size of your image to less than 800-by-600 pixels to allow room for the Web browser window controls.



How large an image appears on-screen depends on a combination of factors--the pixel dimensions of the image, the monitor size, and the monitor resolution setting. The examples above show a 620-by-400-pixel image displayed on monitors of various sizes and

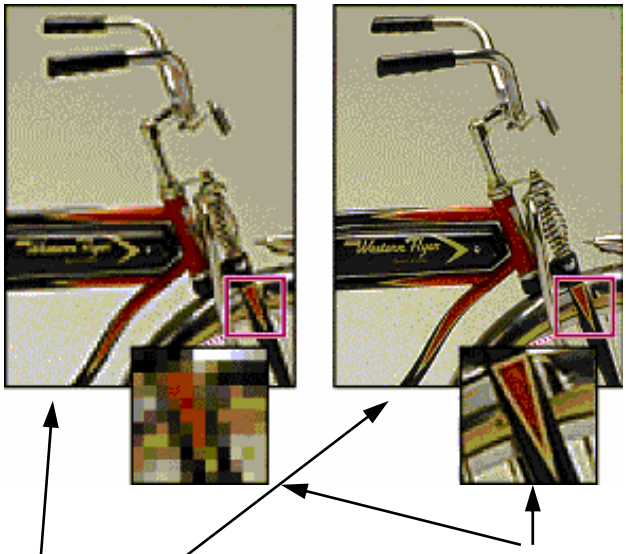
Image resolution

The number of pixels displayed per unit of printed length in an image, usually measured in pixels per inch (ppi). In Photoshop Elements, you can change the resolution of an image because image resolution and pixel dimensions are interdependent.

The amount of detail in an image depends on its pixel dimensions, while the image resolution controls how much space the pixels are printed over. For example, you can modify an image's resolution without changing the actual pixel data in the image--all you change is the printed size of the image. However, if you want to maintain the same output dimensions, changing the image's resolution requires a change in the total number of pixels.

When printed, an image with a high resolution contains more, and therefore smaller, pixels than an image with a low resolution. For example, a 1-by-1-inch image with a resolution of 72 ppi contains a total of 5184 pixels (72 pixels wide x 72 pixels high = 5184). The same 1-by-1-inch image with a resolution of 300 ppi contains a total of 90,000 pixels. Higher resolution images usually reproduce more detail and subtler color transitions than lower resolution images. However, increasing the resolution of a low-resolution image only spreads the original pixel information across a greater number of pixels; it rarely improves image quality.

Using too low a resolution for a printed image results in *pixelation*--output with large, coarse-looking pixels. Using too high a resolution



72-ppi and 300-ppi images; inset zoom 200%

Monitor resolution

The number of pixels or dots displayed per unit of length on the monitor, usually measured in dots per inch (dpi). Monitor resolution depends on the size of the monitor plus its pixel setting. Most new monitors have a resolution of about 96 dpi, while older Mac OS monitors have a resolution of 72 dpi.

Understanding monitor resolution helps explain why the display size of an image on-screen often differs from its printed size. Image pixels are translated directly into monitor pixels. This means that when 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-by-1 inch, 144-ppi image on a 72-dpi monitor, it appears in a 2-by-2 inch area on-screen. Because the monitor can display only 72 pixels per inch, it needs 2 inches to display the 144 pixels that make up one edge of the image.

Printer resolution

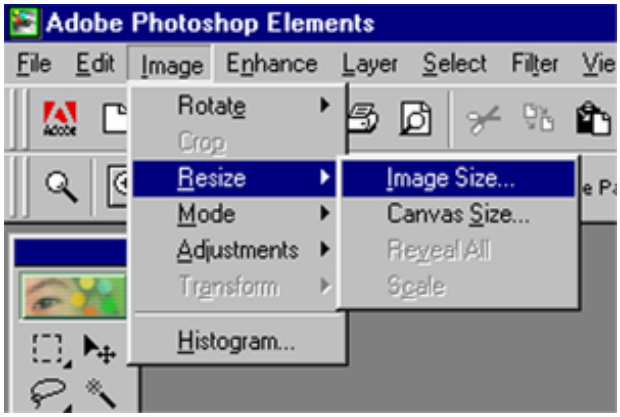
The number of ink dots per inch (dpi) produced by all laser printers. Most desktop laser printers have a resolution of 600 dpi. Ink jet printers produce a spray of ink, not actual dots; however, most ink jet printers have an approximate resolution of 300 to 600 dpi and produce good results when printing images up to 150 ppi.

File size

The digital size of an image, measured in kilobytes (K), megabytes (MB), or gigabytes (GB). File size is proportional to the pixel dimensions of the image. Images with more pixels may produce more detail at a given printed size, but they require more disk space to store and may be slower to edit and print. For instance, a 1-by-1-inch, 200-ppi image contains four times as many pixels as a 1-by-1-inch, 100-ppi image and so has four times the file size. Image resolution thus becomes a compromise between image quality (capturing all the data you need) and file size.

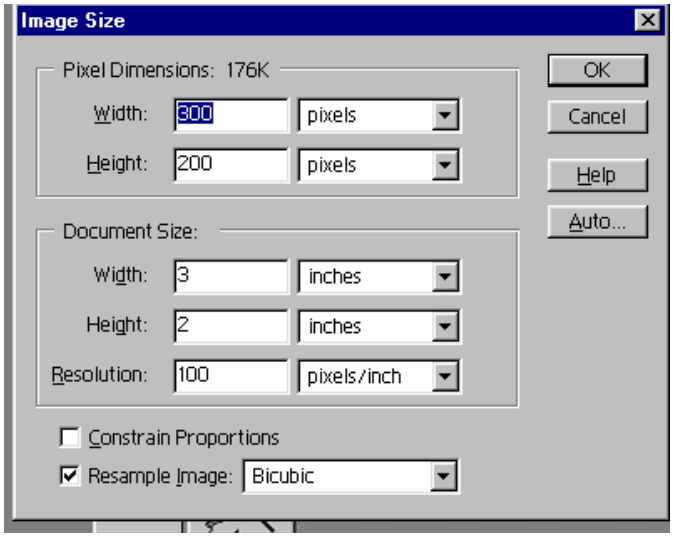
Image Size & Resolution

1 1 Choose Image > Resize > Image Size.



2 2 Change the print dimensions, image resolution, or both:
To change only the print dimensions or only the resolution and adjust the total number of pixels in the image proportionately, make sure that Resample Image is selected. Then choose an interpolation method. (See About interpolation methods.) To change the print dimensions and resolution without changing the total number of pixels in the image, deselect Resample Image.

3 To maintain the current proportions of image width to image height, select Constrain Proportions. This option automatically updates the width as you change the height, and vice versa.



4 Under Document Size, enter new values for the height and width. If desired, choose a new unit of measurement. Note that for Width, the Columns option uses the width and gutter sizes specified in the Units & Rulers preferences. (See Using rulers and the grid.)

5 For Resolution, enter a new value. If desired, choose a new unit of measure-

6 Click OK.

7 To return to the original values displayed in the Image Size dialog box, hold down Alt (Windows) or Option (Mac OS), and click Reset.