

Graphic Design

Learn It, Do It

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File Properties

When it is time to begin production, there are several file properties that must be defined before work in the chosen Adobe application can begin. The intended output for the design, onscreen or print, dictates many of these file properties. The informed designer will make a point to correctly define these properties when creating a new file in order to avoid potential conflicts later. Let's begin with the basics, pixels and resolution.

Resolution

A *pixel* (from the term, *picture element*) is the smallest unit on screen that can be edited. Looking at the photo of fuchsia in Figure 5.1, the natural shapes of the blooms are curved; however, when we zoom in on the photo, we can see the square pixels that make up the blooms and the overall image. At this level of magnification (3200%) the rectangular grid or *raster* that contains the rows and columns of pixels in the image is visible. In Photoshop, the designer has the ability to change the appearance of an image one pixel at a time, though it is more typical to alter many pixels at once.

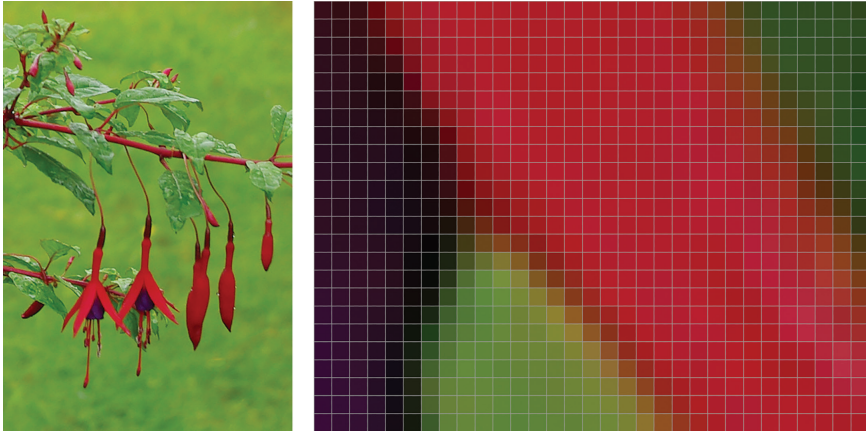


Figure 5.1

Close-up of pixels that compose a photo of fuchsia, Kilkenny Castle, County Kilkenny, Ireland.

Resolution is a measurement of an image's output quality that can be expressed in pixels, dots or lines. The unit of measure varies according to the intended output device. *Pixels per inch* (PPI) refers to the actual image resolution and is used for onscreen resolution; *dots per inch* (DPI) is used for imaging device output including desktop printers; and *lines per inch* (LPI) is used for commercial (generally offset) printing with halftone screens.

Images can be described as either low resolution (low-res) or high resolution (hi-res). Similar to unit of measure, a file's resolution is dependent on where the image will be displayed. Onscreen images use a low resolution of 100 ppi (pixels per inch) or less to facilitate fast loading of images. Web graphics are traditionally created using a resolution of 72 ppi. High resolution applies to images that will be printed, generally using a resolution of 300 ppi or higher. The higher an image's resolution, the greater the image's quality (i.e., more detail and clarity) and the larger is the corresponding file size.

A file's resolution can be changed, which indicates that pixels can vary in size. Figure 5.2 presents a series of images labeled A, B and C, each measuring 1 square inch in size; however, each image illustrates a different resolution. The first image (A) has the lowest resolution (4 ppi) and displays the least amount of detail when compared to the other images. The second image (B) with a resolution of 16 ppi shows more detail than A, yet less than the third image. With a resolution of 64 ppi, the third image (C) allows for a finer level of granularity than that of the other images. However, remember that this increased detail comes at the cost of a larger file size.

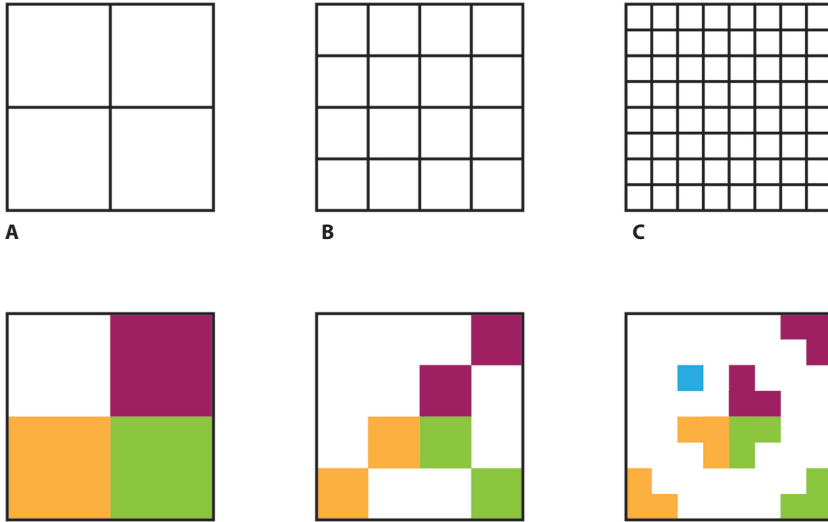


Figure 5.2

Resolution examples: (A) 4 ppi, (B) 16 ppi, and (C) 64 ppi.

Resampling and Interpolation

Situations may arise in which the designer needs to change the resolution of an image file. *Resampling* occurs when a file's resolution is reduced, for example, from 300 to 150 ppi. In this process, data is discarded from the file. When this happens, quality is lost, and the file's dimensions (width and height) are reduced.

When a file's resolution is increased, let's say from 72 to 150 ppi, *interpolation* takes place. No new content is created. Instead the existing context is divided into smaller units; additional details are not added to the image. The designer simply has more pixels with which to work. This process can produce the appearance of jagged or pixelated edges around a shape, particularly on curves or angles.

Neither option is ideal for the sake of an image's clarity, but sometimes changing a file's resolution is necessary. The preferred action is to correctly define the resolution when creating a new document file based on its intended output.

Color Models

Another decision that needs to be made is the file's color model. A *color model* is a system for creating a full range of colors from a small set of primary colors. The two most common color models that the designer is likely to use are the RGB color model for onscreen displays and the CMYK color model for printing. *Note:* The RGB and CMYK color models are not related to the color wheel discussed in *Chapter 3: Color in Design*. Instead, they pertain to how colors are created for their respective output.

RGB Color Model

In the *RGB color model*, also known as the *additive color model* (Figure 5.3), red, green and blue light are added together in various combinations to produce a broad spectrum of colors. The RGB color model contains over 16 million colors. This color model is used for images that will be displayed onscreen, including mobile devices. Each device has the ability to control the amount of RGB light that is visible in every pixel. When an area onscreen displays the maximum intensity of red, green and blue, the color white is visible. Conversely, the lack of intensity among red, green and blue (a.k.a. the absence of light) produces black. Adobe Photoshop uses the RGB color model as its default.

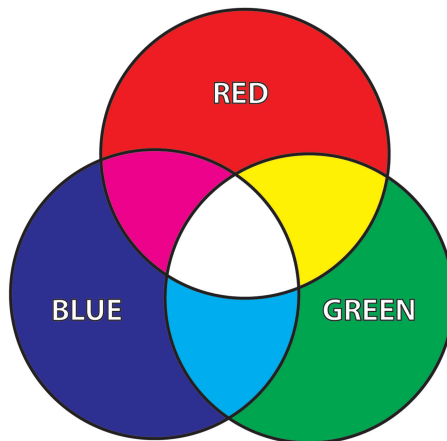


Figure 5.3

RGB color model.

CMYK Color Model

The *CMYK color model* is described as a *subtractive color model* because the printed ink combinations of cyan, magenta, yellow and key* (black) subtract the

* The "K" in CMYK stands for *key*, because in four-color printing, cyan, magenta and yellow printing plates are carefully keyed, or aligned, with a black key plate.

PDF | Portable Document Format | .pdf File Extension

The PDF file format is generally associated with desktop publishing; however, it can also be used to share images and layout designs across platforms. PDF files can be created (i.e., saved, exported) from each of the applications in the Adobe Creative *Cloud* and many other applications. The PDF format can be used to share designs with audiences that do not have access to the Adobe applications and therefore cannot open the applications' native file formats (i.e., PSD, AI and INDD). PDF files can be read in multiple applications, including Adobe Acrobat Reader* and any Web browser.

Uses: Sharing formatted documents across platforms

Raw Images

Raw files contain a lot of data that is uncompressed, which translates to very large image file sizes. These files usually come straight from a digital camera and have not yet been processed, so they cannot be edited or printed. There are many different raw formats; each major camera company has its own proprietary format. Raw files are usually converted to TIFF before image editing begins.

Uses: Capturing details in a photograph

Looking Ahead

This chapter described the connection between intended output of a design and its file properties. As we begin working in the Adobe applications, think about how the selected file properties and file formats support the image's presentation onscreen or in print. Next up, an introduction to Adobe Photoshop, its workspace and tools, is provided.

Discussions

Discussion 5.1: Corresponding File Properties

Scenario: You have volunteered to create a series of graphics for a community clean-up event. The graphics will be used across several media platforms in order to broadly promote the event.

This list describes the graphics and where each will be used:

1. *Graphic 1:* A scalable logo for the event that will be printed on T-shirts for volunteers and will also be on display on a local billboard, a space that has been donated to support the event.

* Adobe Acrobat Reader is a free software application that allows the viewer to view, print, sign and annotate PDF files; for more information about this application, visit <http://acrobat.adobe.com>

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2. *Graphic 2*: A graphic that will be included in a mass email sent to community members. The graphic needs to include photos from last year's event and text announcing this year's dates.
 3. *Graphic 3*: A graphic that will be printed in color in the local newspaper. The graphic's content will match that of *Graphic 2*, it will just be larger.

For each of these graphics, indicate which image type (bitmap, vector), color mode (RGB, CMYK) and resolution (72, 150, 300 ppi) you would recommend using, and why.

Discussion 5.2: A Stylistic Choice: Bitmap vs. Vector

Consider the stylistic differences between bitmap and vector images; refer to Figure 5.6 for reference. Identify a scenario when each of these styles would be well suited. Determine what is included in each design solution (e.g., photo, text or symbols). How does the selected image type best support your design?

Activities

Activity 5.1: Change the Color Mode

Exercise file: Ch05-Ex01-photo.jpg (Refer to Figure 5.7)

If you are familiar with Photoshop, complete the following activity that tasks you with changing the color mode of the provided image, Ch05-Ex01-photo.jpg.

Note: If you are not familiar with Photoshop, proceed to *Chapter 6: Getting Started in Photoshop*, and then return to this activity once you are comfortable navigating the Photoshop workspace.



Figure 5.7

Activity file (Activities 5.1 and 5.2). Mountain goats in Glacier National Park, Montana.

Changing the Color Mode

Step 1: Open the provided file (**Ch05-Ex01-photo.jpg**) in Photoshop.

- From the *File menu*, select the *Open... menu command* [File menu > Open... | ⌘O].
- In the *Open dialog box*, navigate to the downloaded image file.
- Click *Open* to launch the file.

Step 2: Take note of the file's current color mode, which is shown in the Document window tab. In this tab the file name, the current magnification, the color mode and the bit depth are listed.

Step 3: Change the current RGB Color to CMYK Color.

- From the *Image menu*, position the cursor over the *Mode menu command* to view the available options.
- Select *CMYK Color* from the list, clicking on the option.
- This action launches an alert window; click *OK* to close the Photoshop message.

Did you notice any change of color within the photo when the CMYK color mode was applied?

Step 4 (Optional): Use the Undo and Redo menu commands to look for a shift in colors.

- Select the *Undo menu command* from the *Edit menu*, looking for a change in the image colors [Edit menu > Undo | ⌘Z].
- To redo the action, return to the *Edit menu*, and select the *Redo menu command* [Edit menu > Undo | ⌘Z].

Changing an image's color mode is just that straightforward. Remember to consider the image's intended output when selecting a color mode.

Activity 5.2: Changing the Resolution

Exercise file: **Ch05-Ex01-photo.jpg** (Refer to Figure 5.7)

If you are familiar with Photoshop, complete the following activity, which tasks you with changing the resolution of the provided image.

Note: If you are not familiar with Photoshop, continue to *Chapter 6: Getting Started in Photoshop*, then return to this activity once you are comfortable navigating the Photoshop workspace.

Changing the Resolution

Step 1: Open the provided file (**Ch05-Ex01-photo.jpg**) in Photoshop.

- From the *File menu*, select the *Open... menu command* [File menu > Open... | ⌘O].
- In the *Open dialog box*, navigate to the downloaded image file.
- Click *Open* to launch the file.

Step 2: Take note of the file's current resolution.

- From the *Image menu*, select the *Image Size... menu command* [Image menu > Image Size...].
- The *Image Size dialog box* lists the image dimensions, resolution and file size (Figure 5.8).

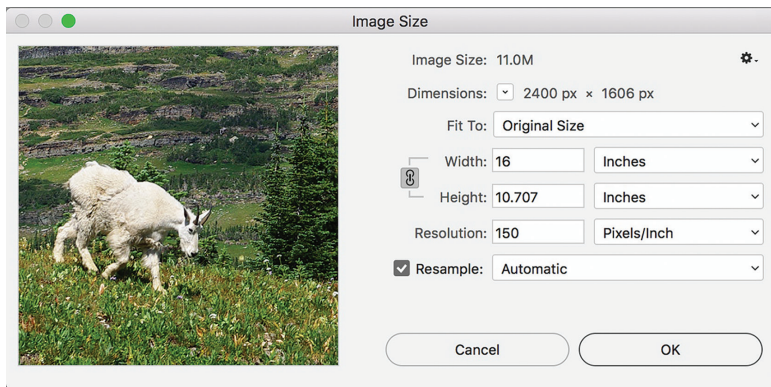


Figure 5.8

Image size dialog box (Photoshop), Image menu > Image size....

Step 3: Reduce the file's resolution (150 ppi) to 72 ppi in the Image Size dialog box.

- In the *Image Size dialog box*, select the current resolution value and enter the new resolution.
- Make sure that the interpolation method (*Resample*) is set to its default "Automatic" option.
- Look for the updated *Image Size* shown in the top row of the dialog box. This value should be less than the original Image Size listed in parentheses "was ##."
- Click *OK* to perform the conversion.

Step 4: Save the adjusted image, adding “-72” to the end of the file name [File menu > Save As...]. *Note:* Do not include the quotation marks in the file name addendum.

- Select *Save As...* from the *File menu* [File menu > Save As... | ⌘S].
- In the *Save As dialog box*, add -72 to the file name, before the punctuation and file extension (**Ch05-Ex01-photo-72.jpg**).

Step 5: Reopen the provided file (**Ch05-Ex01-photo.jpg**) in Photoshop.

Step 6: Increase the file’s resolution (150 ppi) to 300 ppi.

- Again, notice the new Image Size value. It should be larger than the previous value.

Step 7: Save the adjusted image, adding “-300” to the end of the file name.

Step 8: Open all three files in Photoshop in order to compare their dimensions and image quality. *Note:* Use the same magnification for each file. Use the Zoom Tool as needed to adjust these values [View menu > Zoom In (⌘+); View menu > Zoom Out (⌘-)].

What differences do you notice across the three files? In your opinion, is the difference in file size worth the change? Again, think about the image’s intended output when assigning resolution.

Exercise File(s) Available on the Companion Website, URL

Ch05-Ex01-photo.jpg | *Activity file (Activities 5.1 and 5.2)*. Mountain goats in Glacier National Park, Montana.

URL: <http://www.crcpress.com/9780367075347>

External Links Mentioned in the Chapter

Adobe Acrobat Reader | <http://acrobat.adobe.com>