



# Using Adobe Photoshop

## 1 - Introduction to Digital Images

### 1 - Advantages of Digital Imaging

Until the 70s, using computers for images was unheard of outside academic circles. As general purpose computers have become faster with more capabilities, it has become increasingly common for images to be created, stored and edited in digital form. Traditionally, most professional photographers, and graphic artists have continued to rely upon traditional media for their work as digital image quality was not sufficient to produce the quality they needed. However in recent years, improvements in software, increases in personal computing power and improvements in the quality of digital cameras and printers have made professional quality digital imaging far more readily available. It is now possible for a home user with the right equipment, software and know-how to create professional quality work from their own home.



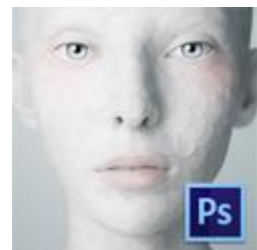
If you have a good quality digital camera, a good quality printer and good software like Photoshop you can edit / touch up photos and even print your own photos on photo paper (which is now readily available and good enough to rival the quality of professional prints). In addition to digital imaging catching up with traditional tools in quality, there are some applications these days that are only possible through digital forms.

Before we delve in to the capabilities of Adobe Photoshop, it is important to gain a clear understanding of some common digital imaging concepts.

## 2 - History of Photoshop

The first version of Photoshop was released by Adobe in 1990. It was mainly intended as a tool for editing images from scanners, which were expensive and uncommon at the time. Over the years, as scanners and then digital cameras began to become more common, Photoshop became increasingly popular as an image editing application and has established itself as the industry standard in the field. For many years it was aimed primarily at working with images that were to be printed, though the increase in popularity of the World Wide Web has led to an increase in the number of people using Photoshop for online use. For this reason, recent versions of Photoshop have incorporated more and more features aimed at online images.

Version 8 of Photoshop was rebranded as Photoshop CS while version 13 is branded as **Photoshop CS6**. Recent versions have again been rebranded as Photoshop CC<sup>1</sup> as it is part of Adobe's Creative Cloud suite of applications, which also includes other Adobe applications such as **Illustrator**, **In Design**, **Acrobat** and **Animate**. These applications have all been modified so that they work better together. For example, while using In Design for desktop publishing, you can import a Photoshop file directly in to a page without having to convert the image to a different format first. Photoshop can also be used with other Adobe products. For example, Photoshop can be used to create the background for a video clip in **Adobe Premier** or create images for a website being created in **Adobe Dreamweaver**.



<sup>1</sup> Photoshop CC2017 is also identified as Photoshop version 19

### 3 - Raster Graphics vs. Vector Graphics

A **raster image** (also referred to as a **bitmap image**) is a digital image which consists of dots or **pixels**. The range of colours available for each pixel in the image varies depending on the image and can be adjusted to determine the look of the image. The dimensions or number of dots in an image can also determine the quality of the image. Common raster file formats include windows Bitmap (**bmp**), Graphic Interchange Format (**gif**), Joint Photographic Experts Group (**jpg**), Tagged Image File Format (**tif**) and Portable Network Graphic (**png**). Some Common raster graphic editing applications include Adobe Photoshop, Adobe Fireworks, Corel Paint Shop Pro and GNU Image Manipulation Program (or just GIMP).

A **Vector image** is made up of geometric objects such as lines, curves and polygons. A common vector file format is windows metafile (**wmf**), though many vector image formats are specific to certain vector image editing applications such as Adobe Illustrator (**ai**), and Corel Draw (**cdr**). Some applications, such as Adobe Animate also rely heavily on vector graphics.

The following example shows the difference between a raster image and a vector image.

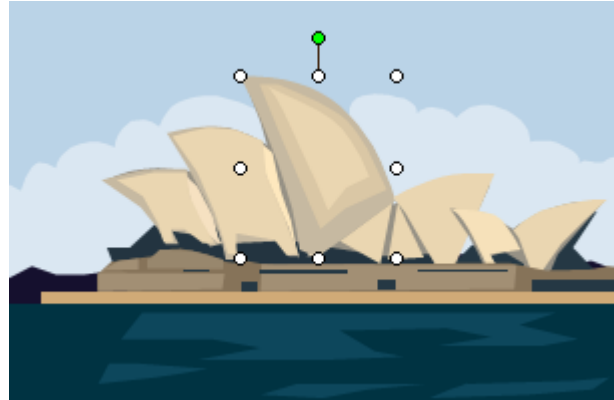


As you can see from the Sydney Opera House example, the raster image looks more realistic as you can more accurately reproduce a realistic image out of thousands of coloured dots than you can with a collection of coloured shapes. Both formats have their advantages however. In the next example, the top portion of the highest sail on the opera house has been enlarged considerably.



In this example, you can see the decrease in quality with the raster graphic. If you zoom in or enlarge a raster graphic, then the individual pixels become clearly visible. Since the vector graphic is made out of shapes, you can resize or zoom in as much as you want and the quality will remain unchanged.

Vector graphics can also be a little easier to edit. As the picture is made of shapes, it is easier to select and edit individual parts. For example, in both of the examples below, a sail of the opera house has been selected. In the vector example on the right it was a simple matter of clicking a shape to select it. With the raster graphic on the left, however, it was a much more painstaking process as the computer doesn't know that all of those pixels are part of the same object. It's all coloured dots as far as the computer is concerned so applications like Photoshop need to include complex selection tools to make it easier for the user to select parts of an image.



The table below summarises some of the differences between raster and vector graphics.

### Raster Graphics

- Good for complex artwork and realistic images such as photos.
- Large file sizes since information is stored about thousands of pixels.
- More complex to edit.
- Quality can decrease with resizing and editing.
- Common on the web.

### Vector Graphics

- Best for simpler artwork such as diagrams and logos.
- Smaller file sizes as only information about several shapes is being stored.
- Can be simpler to edit.
- Quality not affected by resizing and editing.
- Not as common on the web but becoming more common thanks to recent HTML5 standards.

**Note** Some raster image editing applications such as **Photoshop** also allow for limited vector editing. For more than just basic vector editing though you're better off using a more suitable application such as **Adobe Illustrator**.

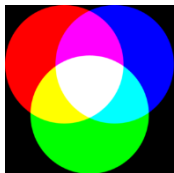
## 4 - Online vs. Print

Photoshop is well suited to working with images for both online use and print use. There are a few important considerations to keep in mind though when preparing images.

First of all, you need to consider the **Resolution**. Resolution refers to the amount of pixels that can be displayed in a particular area. The higher the resolution, the better the image quality. Printers generally have a much higher resolution than a computer monitor. Consider the example below.



Both images are 7cm wide. The only difference is the resolution. The one on the left has been saved at 300 dots per inch which is suitable for printed work. The one on the right has been saved at 72 dots per inch which would probably look fine in a web page, but looks slightly blurry in a document intended for print such as this one.



Another consideration is the **colour**. A computer's monitor displays colours as a combination of red, green and blue light. These three colours are combined to produce the millions of colours that a modern computer is capable of displaying. If you are working on images that are going to be displayed on screen, it is best to work in an **RGB** colour mode.



Colour printers generally use a mixture of different coloured inks to create the range of colours needed. The standard colours used are cyan, magenta, yellow and black. Generally, the combination of cyan, magenta and yellow can mix to make most colours, but black is added for a couple of reasons. One reason is that the other three inks combined usually make a murky dark colour which isn't quite black. Another reason is that mixing three inks every time black is needed, especially in the case of text, would require an unnecessary level of precision and ink. If you are working on images that are going to be printed, it is best to work in a **CMYK** colour mode (the K represents black) as RGB images usually don't look as good when printed using professional processes.

## 5 - Photoshop Requirements

These exercises will be created using Adobe Photoshop CC2017. Although some features shown may not be present or may be different in earlier versions, many of the exercises will be possible even with some of the earliest versions of Photoshop. In some cases, differences between versions of Photoshop will be pointed out. The exercises show images from the Windows version of Photoshop, though there is very little difference in the Apple version.

Since you may be editing large image files in Photoshop, it can place a large amount of strain on your computer's capabilities. According to Adobe, the requirements for Photoshop CC2017 are:

### Microsoft Windows

- Intel® Core 2 or AMD Athlon® 64 processor; 2 GHz or faster processor
- Microsoft Windows 7 with Service Pack 1, Windows 8.1, or Windows 10
- 2 GB or more of RAM (8 GB recommended)
- 2.6 GB or more of available hard-disk space for 32-bit installation; 3.1 GB or more of available hard-disk space for 64-bit installation; additional free space required during installation (cannot install on a volume that uses a case-sensitive file system)
- 1024 x 768 display (1280x800 recommended) with 16-bit color and 512 MB or more of dedicated VRAM; 2 GB is recommended
- OpenGL 2.0-capable system
- Internet connection and registration are necessary for required software activation, validation of subscriptions, and access to online services

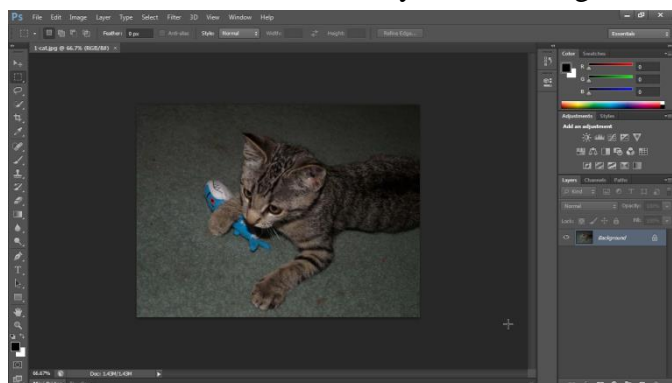
### Apple MacOS

- Multicore Intel processor with 64-bit support
- macOS version 10.13 (High Sierra), macOS version 10.12 (Sierra), or Mac OS X version 10.11 (El Capitan)
- 2 GB or more of RAM (8 GB recommended)
- 4 GB or more of available hard-disk space for installation; additional free space required during installation (cannot install on a volume that uses a case-sensitive file system)
- 1024 x 768 display (1280x800 recommended) with 16-bit color and 512 MB or more of dedicated VRAM; 2 GB is recommended
- OpenGL 2.0-capable system
- Internet connection and registration are necessary for required software activation, membership validation, and access to online services.

The exercises in this series will use images that are small enough to not put a huge strain on your internet connection, though it is not uncommon for Photoshop users to work on individual image files that are hundreds of megabytes in size. Remember that the requirements listed above are a minimum only. A fast processor, fast graphics card, fast hard drive and plenty of RAM will greatly benefit any serious Photoshop user. A large monitor with your computer set to a high resolution is also handy as it gives you more room to work with when you are editing.



800 x 600 pixels shows less editing area



1280 x 768 - a lot more working space