

**Image Editing  
by using Adobe Photoshop CC  
2014 Application**



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## **How to use this Manual**

This is a practical guide for anyone using Adobe Photoshop CC 2014 software.

Go to: [www.specto.co/data](http://www.specto.co/data). Follow the on screen instructions to download the appropriate data file. Copy and paste the complete Image Editing folder to the hard drive of your computer. This folder contains files that you will need to open during the course. Create a new folder on your hard drive named ImageEditing. All newly created or edited files can be saved in this folder during exercises, unless otherwise instructed. Note that during a test you will be required to save to a different location.

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## 1. Imaging Concepts

### 1.1 Digital Images

The digital image is a digital representation for any physical object that can be seen by eye, using the binary numbering system (0, 1). The image has two dimensions (X, Y). The image can be captured either by the computer, a digital camera or at least supported by either of them. The image can be dealt with, saved, uploaded, and downloaded on the computer or on the internet.



#### 1.1.1. Identifying Common Uses of Digital Images

A lot of work is needed to convert normal images to digital format.. However, when using the digital camera, the image is digitized the moment it is captured. This, in turn, makes it extremely easy to use and share. For example, you can list it within the word processor documents, send it via email or even publish it on the internet so that anyone in the world can see it.

**The following are some other reasons that make you use digital imaging:**

- The switch to digital imaging saves you time, film and developing costs. You no longer need to drop the films at the lab, then come back to take the pictures.
- Digital cameras display the images instantly. Thus, you avoid the disappointment that you may have after a couple of days when you finish developing the pictures.
- You can see the pictures before printing them. Therefore, if you do not like what you see, you can modify or even delete.
- Digital imaging is environmentally friendly since it does not use chemicals.
- The cost of digital imaging is low.

**Digital images can be used for a number of purposes:**

- **Web and print publishing:** you can publish the images on webpages, social networking websites or even on image sharing websites. You can also use these digital images in printed publications such as magazines and other publications.
- **Distributing by e-mail and mobile phones:** You can send your pictures to your friends, colleagues and classmates easily as long as you are connected to the internet.
- **Home printing:** You can print images using ordinary printers or image printers.
- **Digital photo frames:** You can display images in a wonderful digital photo frame.

## 1.1.2. The Key Features of a Digital Image

### 1.1.2.1. Understanding the Term 'Pixel'

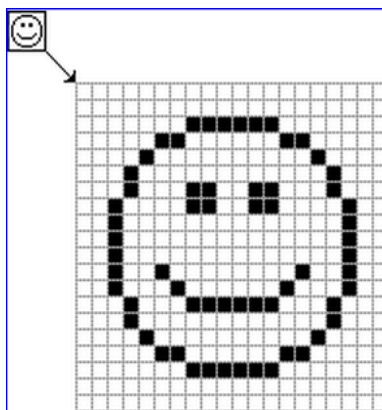
The pixel is the smallest element of the digital image that appears on the screen. It can also be seen as a point in 'Raster Graphics'. The word 'pixel' is an abbreviation of the two letters of each word of 'Picture Element'.

Although a digital image looks smooth and continuous like a regular one, it, in fact, consists of millions of tiny squares. When the computer starts drawing a picture, it divides the screen or the printed page into a network of pixels. Then, it uses the stored values of the digital image in order to give each pixel its color and brightness.

The quality of the image depends on the number of the pixels it is consisted of. The more pixels the image has, the better quality we get. So, when we zoom in the digital image to a certain extent (varies from one image to another), we notice some sort of distortion resulting from the fact that the image consists of pixels. This distortion is usually called 'Pixelization'. The more pixels in an image, the longer it takes pixelization to appear when we zoom in, so we can enlarge the image more.

The image size can be determined in two ways: either by the dimensions in pixels or by the number of pixels. For instance, the size of a certain image is (1600x1800) pixels or 2.88 mega pixel (equivalent to 1600x1800).

The Image below consists of a matrix of pixels with dimension 16x16, magnified 8 times.



### 1.1.2.2. Understanding the Term Resolution

The resolution of the digital image is the precision and quality of the details that the image reflects. The image resolution is measured by the number of pixels in each inch. The more pixels there are in an inch, the clearer the image is. This has nothing to do with the size of the screen whether small or big.

Generally, the image with high resolution produces a high quality printed image. The image below, for example, is the same image but once with 72 pixels/inch and another with 300 pixels/inch when zooming it in by 200%.



The image resolution indicates its clarity. The clarity of a web image is different from the clarity of an image which is intended for printing only since the latter has a clarity of 300 pixel/inch whereas the web image has only 72 pixel/inch.

#### 1.1.2.3. Identifying the Key Features of a Digital Image

As explained above, the digital image is:

- Composed of discrete pixels.
- Represented digitally in a binary code.

#### 1.1.3. Understanding the Terms 'Lossy' and 'Lossless' Image File Compression

Data compression is a coding process so that data would take less space. When compressing image files, you need to be familiar with the following terms:

- **Lossy Image File Compression:** or lost compression, is a way of compressing image files by discarding unnecessary data. This type of compression results in reducing the image size and resolution when the absolute resolution is not required, or when the loss of the data or pixels is unnoticeable.
- **Lossless Image File Compression:** or unlost compression, is a way of compressing image files through recording patterned data. If the image has a red-colored area, it can be compressed without losing data by considering (200 red points) rather than considering (red point, red point, ... 200 times). This kind of compression does not lead to the loss of any original pixels when decompressing the file. On the contrary, it is possible to reconstruct data exactly as in the original image.
- This type of compression is used for medical X-ray images and images of the sort as the data of these images must not be lost.

### 1.1.4. Copyright for Image

#### 1.1.4.1. Understanding the Term 'Copyright'

Copyrights are the rights that allow you to use the images or any parts of the work, publish and distribute it for a specific period of time.

#### 1.1.4.2. The Implications for Image Use

The use of images includes being familiar with some issues related to the two following terms:

- **Royalty-Free Images:** images that have copyrights. The user pays fees for one time only. However, The images can be used as many times as the user wants without paying extra fees, but with some limitations and restrictions.

Generally speaking, the Royalty-Free Images are:

- **Non-transferable:** this means that the license is for the buyer only. Therefore, the Royalty-Free Images cannot be transferred to other people by means of reselling or giving as a present etc.
- **Non-exclusive:** the Royalty-Free Image can be used by many people since it represents a license for using the image. If, however, you wish to use it exclusively, you have to buy it under different license terms.
- **Permanent:** you can use the image as long as you wish to do so, with no time limitation. (unless the owner of the image states otherwise).
- **Worldwide:** the Royalty-Free Images allow you to use the images worldwide.
- **Multipurpose:** this indicates that the Royalty-Free Images do not have packaging, wrapping and distributing fees. Most Royalty-Free Images allow you to print or show the images for a specific number of times (250,000 or more in some cases).

You can use these images, which are bought either individually or collectively on a drive, as you want, but with some restrictions. The price of these free-of-right images depends on the file size. The bigger the file, the better the quality, and the higher the price.

If you use these images for the web, you'd rather use the smaller files to save cost. If you use the Royalty-Free Images for printing, you will need to buy the bigger files.

- **Right-Managed Images:** These images have licenses related to copyrights. When the user buys them, he/she can use them for one time only as shown in the license. So, if the user wants to use them for other purposes, additional licenses should be purchased. This process is similar to paying money for renting or borrowing the image. The price is dependent on the purpose of using the image: printing, publishing on the internet ... etc.

The positive side of using the right-managed images is that no-one else can use the same image and this will strengthen the product's value. The negative side, however, is the price; since it will cost you double or triple the price of the Royalty-Free Images.

**Exercise (1-1)**

Circle the correct answer in the following statements (see answers on page 104)

- 1. Which one of the following statements is NOT true about digital images?**
  - a. They are represented in binary format (0,1).
  - b. They are 3D Images.
  - c. They consist of discrete pixel units.
  - d. They can be edited and modified.
- 2. Which one of the following digital image uses does not enable you to send your images to your friends?**
  - a. Publishing them on the web.
  - b. Publishing them on social networking sites.
  - c. Distributing through emails.
  - d. Printing from home.
- 3. The 'pixel' is:**
  - a. The smallest element of the digital image that appears on the screen.
  - b. the quality of details that the digital image displays.
  - c. a way of compressing image files through discarding unnecessary data.
  - d. a way of compressing image files through recording patterned data.
- 4. The resolution of the image can be measured by:**
  - a. Binary coding.
  - b. Bit/second.
  - c. The number of pixels per inch.
  - d. Megabyte.
- 5. The lossless compression of the digital image is:**
  - a. The smallest element of the digital image that appears on the screen.
  - b. A way of compressing image files through recording patterned data.
  - c. Away of compressing image files through discarding unnecessary data.
  - d. A digital representation of the image in the binary coding (0,1).
- 6. The rights that enable you to use images or any other parts of the work and publish or distribute them for a specific period of time is called:**
  - a. Copyrights.
  - b. Distribution rights.
  - c. Intellectual Property Rights.
  - d. Use rights.
- 7. Which one of the following is true about the royalty-free images?**
  - a. They are images that have copyrights.
  - b. They can be used only once.
  - c. They are free images.
  - d. They can be used only for web purposes.