

# Introduction to digital imaging using Photoshop

## Practical workbook

### Aims and Learning Objectives

The aim of this document is to introduce the basics of image processing using Adobe Photoshop.

By the end of this course you will be able to:

- crop an image;
- correct perspective problems;
- adjust the tone and colours of an image;
- sharpen an image;
- scale an image;
- retouch a damaged photograph;
- save an image in a suitable format;
- make selections using a variety of tools;
- blend images to create a seamless montage;
- add and edit text.

## Document Information

### Course documents and files

If you are working in the training room the files you need are in **C:\User\Graphics\**

If you want to work through the practical tasks shown in this document on your own system, obtain the necessary files from:

<http://www.bristol.ac.uk/is/info/websupport/resources/photoshop-t1.html>

### Related documentation

None.

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## **Introduction**

There is little doubt that the use of digital images in learning, teaching and research projects is growing. Typical uses include: supporting lectures and other presentations; creating Web-based instruction and creating digital image archives. Another advantage of digital images is that they can be delivered on a variety of supports: PowerPoint, Web, image database, CD-ROM and print. It is therefore important to be familiar with image digitisation processes in order to obtain images that are 'fit for purpose'.

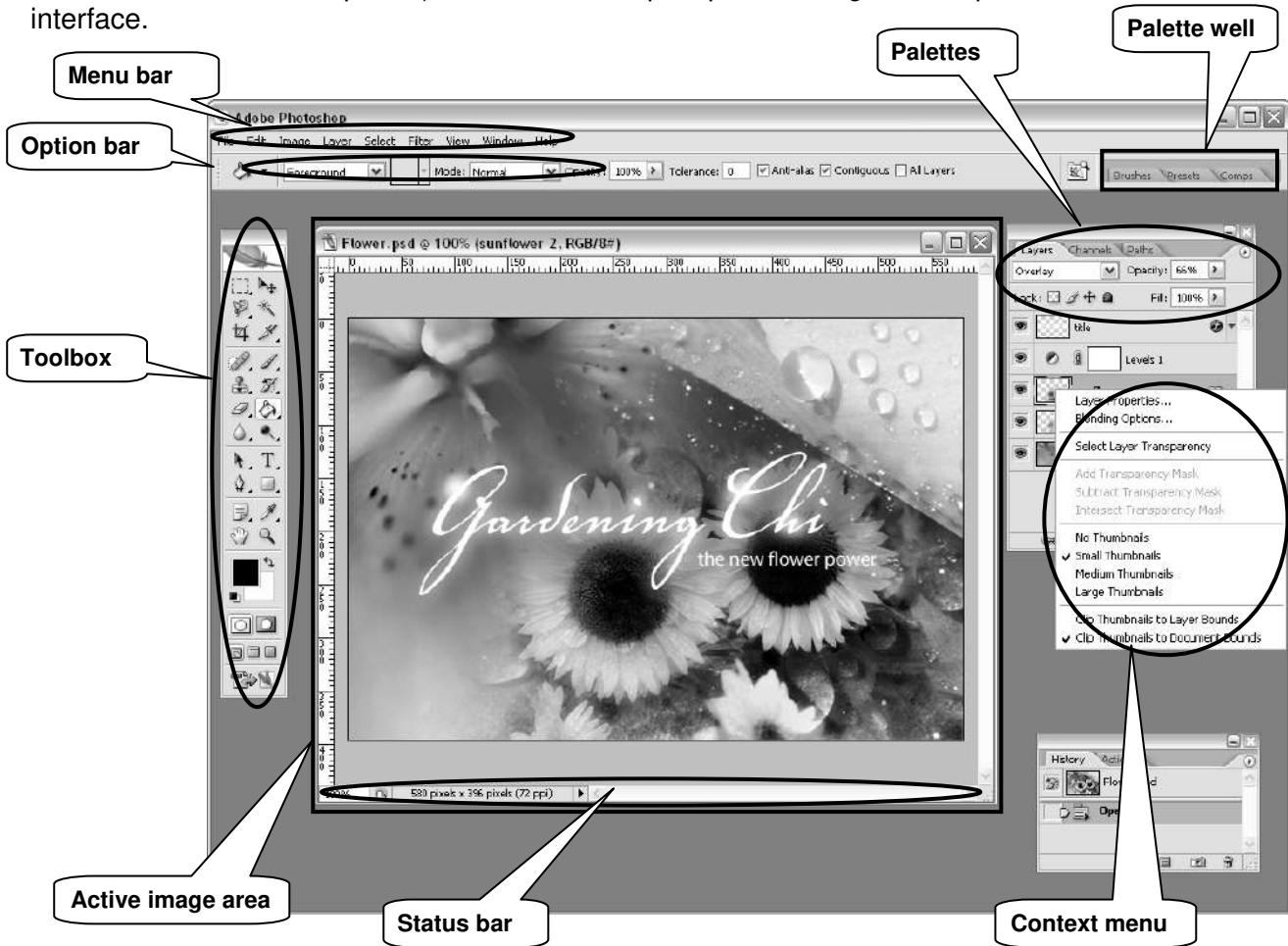
This document shows you how to apply image enhancement techniques using Adobe Photoshop CS2.

## **Prerequisites**

This document assumes that you are familiar with the use of a computer keyboard and mouse, Microsoft Windows-based products and the use of a Web browser such as Netscape or Internet Explorer.

# Introduction to Photoshop

Photoshop is the ultimate Swiss army knife for all your imaging needs, from basic to highly sophisticated image editing. For example you can simply enhance a photograph (remove red eye effect and scratches, crop, etc.), or create a complex photo collage or a sophisticated Web interface.



The main components of the Photoshop work area are:

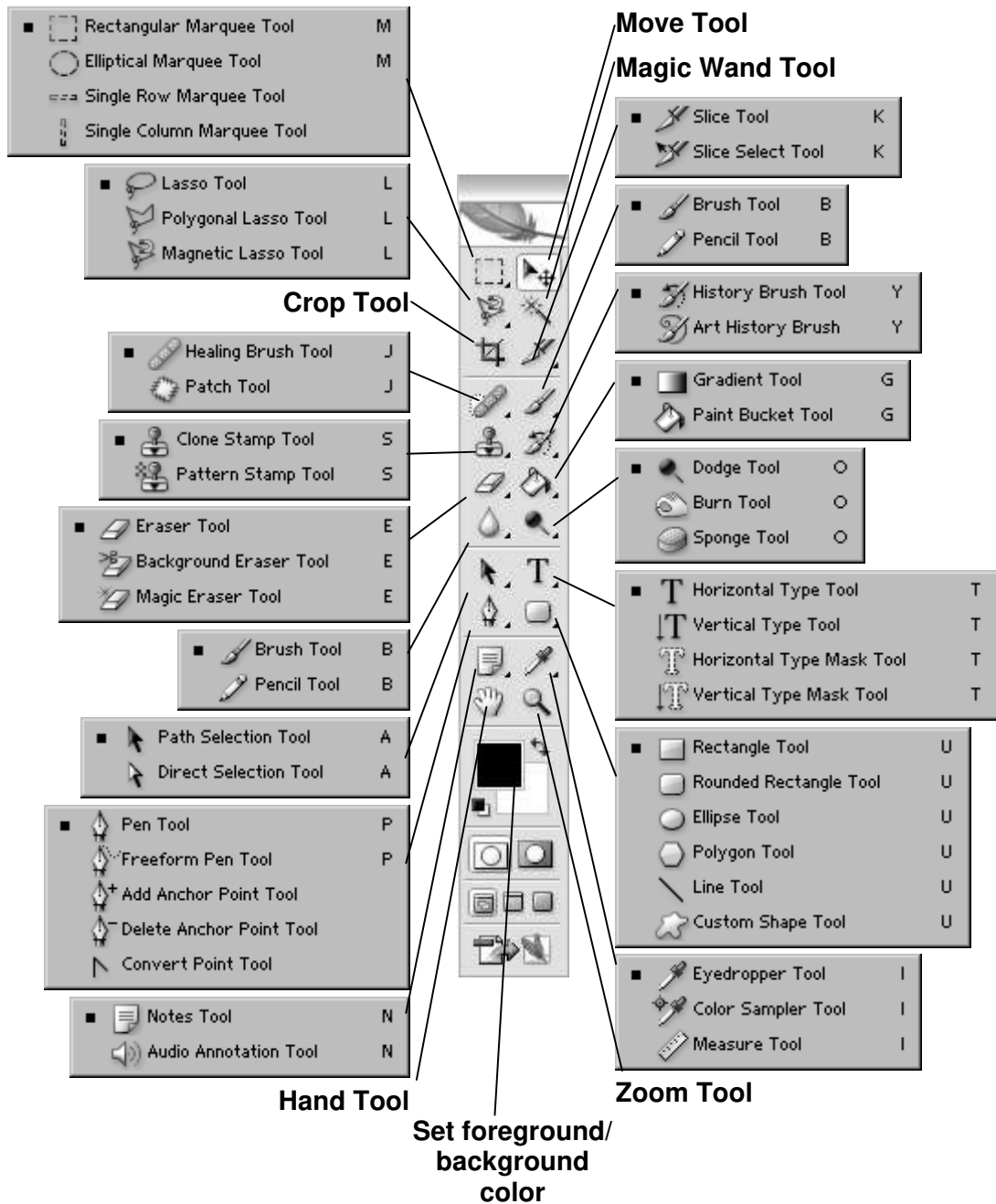
- **Menu bar** - contains menus organised by tasks. For example, the **Layers** menu contains commands for working with layers.
- **Toolbox** - contains tools for creating and editing images.
- **Options bar** – provides options for the currently active tool.
- **Active image area** (also called **Document window**) – displays the active open file. Several images can be open at the same time, but only one can be active at a time.
- **Palettes** – help you monitor and modify images. They can be nested by dragging the title tab of one into the body of another. Use the **Window** menu to show/hide palettes

Other useful elements are:

- **Palette well** – helps you organize the palettes in your work area.
- **Status bar** – located at the bottom of every document window, it displays useful information about the image and brief instructions for using the active tool.
- **Context menu** – display commands relevant to the active tool, selection, or palette. You access them by right-clicking on an image or palette item.

The **Toolbox**, **Palettes** and **Active image area** can easily be moved around the workspace by clicking the top bar and dragging them.

## The Toolbox



The Photoshop CS2 **Toolbox** contains all the tools you need for manipulating and creating images, for example, making selections, cropping, drawing, painting, erasing, moving, magnifying, etc.

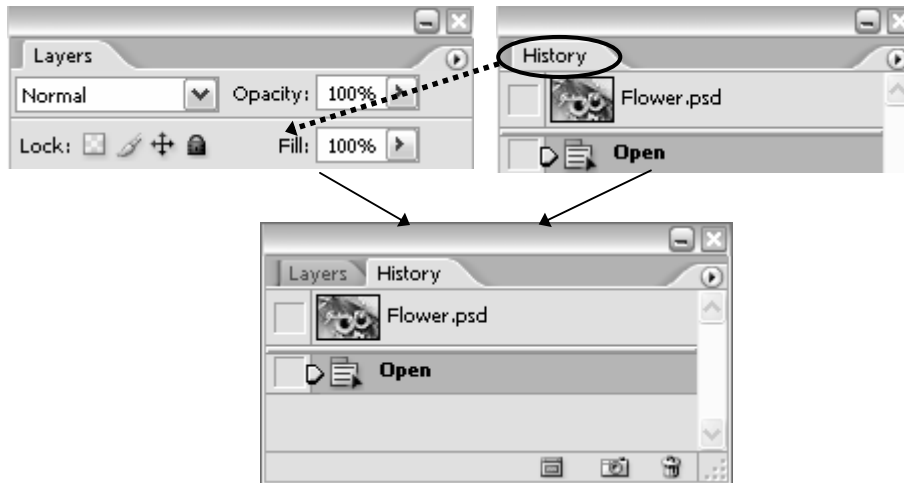
Some of the buttons represent families of tools rather than single tools. For example, the **Rectangular Marquee Tool** is the default for selecting geometrical shapes, but if you right-click on it, a palette pops out with more choices such as an **Elliptical Marquee Tool**.

Further options are available when you hold down the **<Shift>**, **<Ctrl>** or **<Alt>** keys as you use a tool. For example, hold down **<Shift>** to select a circular shape with the Elliptical Marquee Tool.

## Palettes

**Palettes** are one of the main means of accessing many of the features of Photoshop. You can show and hide them using the **Window** menu. Alternatively, you can press the **<Tab>** key while holding down **<Shift>** to hide/show them all.


**Palettes** can be moved around or nested (stacked behind one another) by dragging the title tab of one palette onto the body of another.

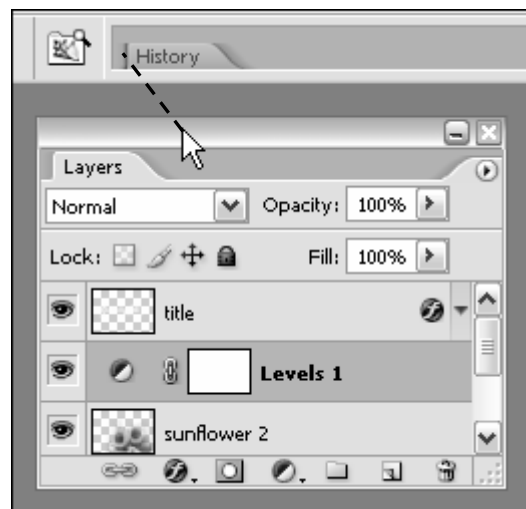


To bring a palette to the front, just click its title tab.

You can also expand/collapse them by double-clicking on the title tabs.

If you don't like having palettes floating around, you may prefer accessing them from the **Palette well**. To add a palette to the Palette well, simply drag it into it as illustrated on the right.

Clicking on the right pointing arrow  in the top right corner will bring out a menu specific to the active palette.

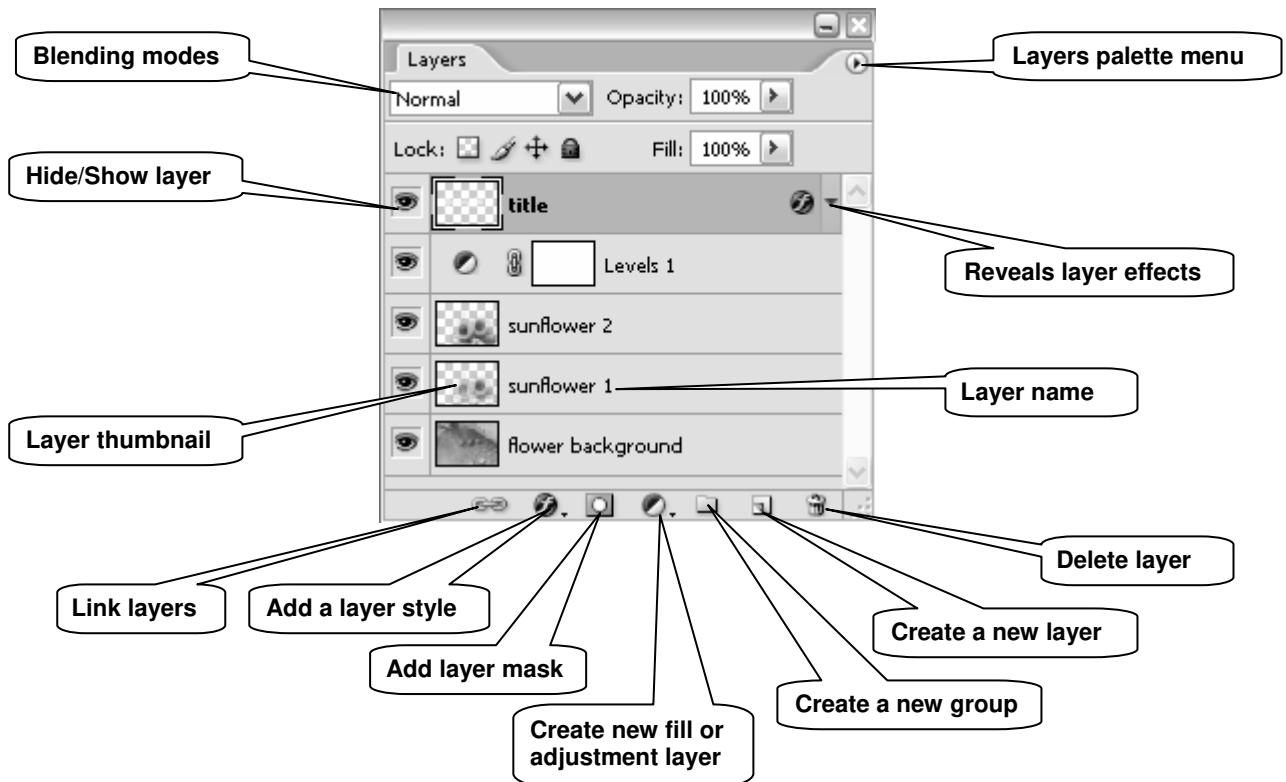


Two of the most useful palettes are the **Layers** palette and the **History** palette:

### The Layers palette

Layers are an essential part of Photoshop and you need to think of them as the building blocks to every image that you create. Individual palettes and the toolbar can be displayed or hidden using the **Window** menu (those with a tick mark next to them are visible).

The **Layers** palette enables you to control elements of an image by assigning separate layers to each individual element. Layers allow you to work on one element of an image without disturbing the others.



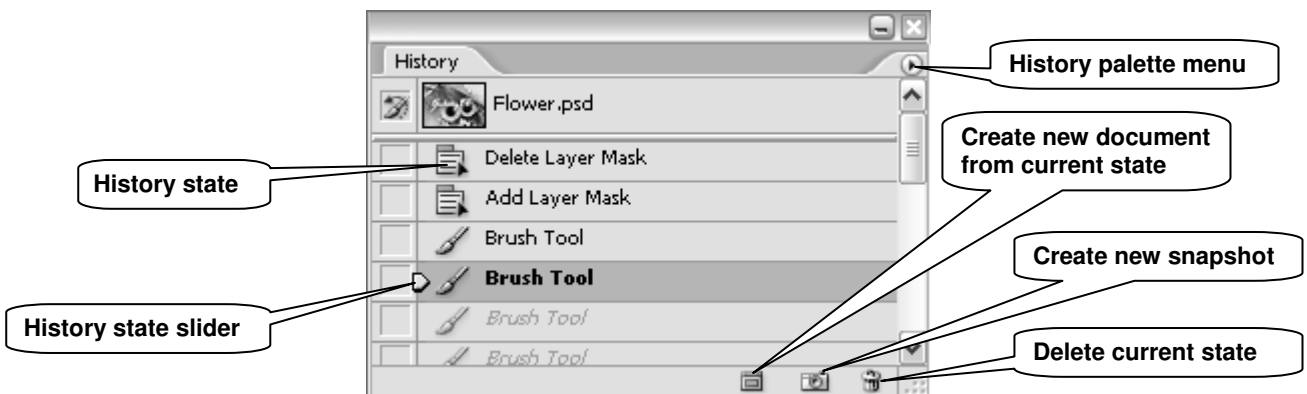
The idea is that you stack layers (in the same way that you would stack sheets of acetate transparencies) containing the various elements that will form your final image. There are different types of layers:

- **Image layers** are transparent and may contain images or part of images. They can also be used for drawing, filling with colour, etc. They contain pixel information only.
- **Adjustment and fill layers** allow you to make colour and tonal adjustments to your image without permanently changing its pixel values.
- **Type layers** allow you to insert text in your image. A new **Type** layer is automatically added above the active layer when using the **Type Tool**.
- **Shape layers** are filled with solid colours and the outline is defined with a vector mask and/or a layer mask. A new **Shape** layer is automatically added above the active layer when using one of the shape tools (**Rectangle/Rounded Rectangle/Line/etc Tool**).

In addition, you can manipulate each layer individually by applying various styles and effects (blending, drop shadow, etc.), filters and masks.

## The History palette

Every change that you make to your image is recorded in the **History** palette as a history state.





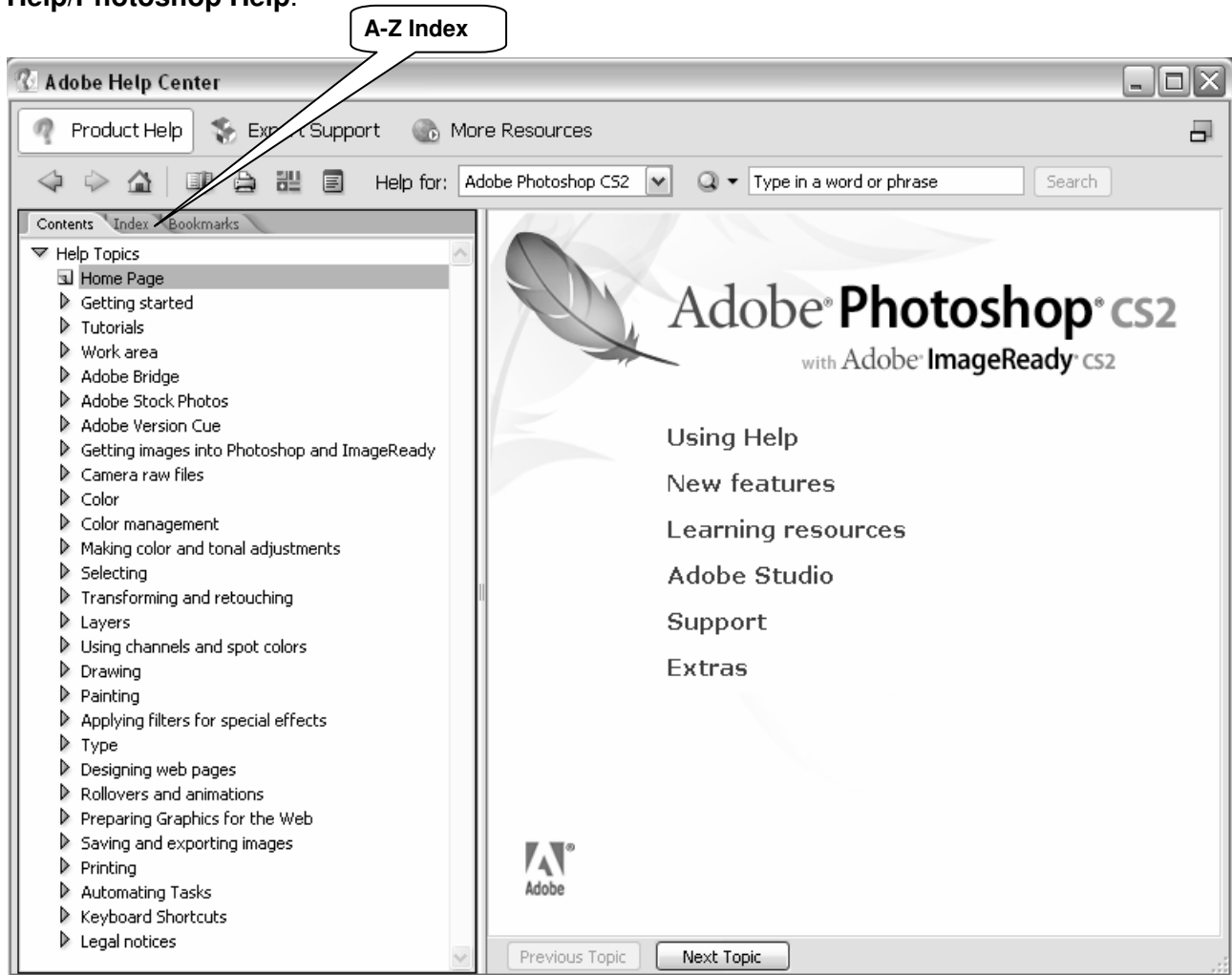
Just click on a state in the **History** palette to go back to that state (alternatively drag the **History state slider** up or down to point to the state you wish to move to). The states below the one you click on are dimmed and will be discarded if you continue to work from the selected state.

You can also delete states by dragging them into the wastebasket icon in the bottom right corner of the palette (alternatively right-click on the name of the state you want to delete, then choose **Delete** from the pop-up menu). Notice that this action will also delete all the subsequent states.

By default, the **History** palette will remember 20 states. You can change this by going to **Edit/Preferences/General**.

## Getting help

Photoshop has a comprehensive help tool (see illustration below). To open it, go to **Help/Photoshop Help**.



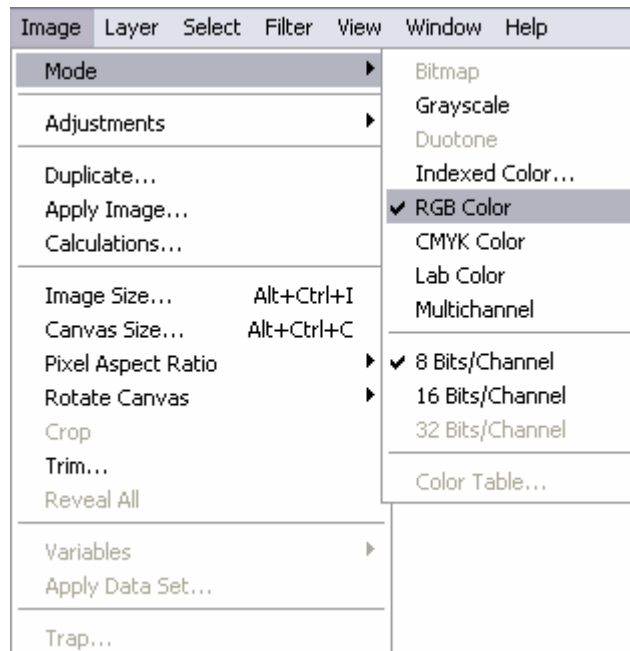
**Adobe Photoshop Help Center**

# Colour management

## Colour settings

One problem with imaging software is the issue of screen, scanner and printer inconsistency. For example, monitor brightness, contrast and resolution all affect the way an image is displayed. Photoshop includes features to help ensure that screen colours will, as far as possible, resemble the final image.

As a rule of thumb, the image mode should be set to **RGB Color** when working for screen display and **CMYK Color** for printing. To check this, from the main menu, select **Image/Mode**.



The reason for this is the differing nature of colour creation between media.

Printers use **Cyan**, **Magenta**, **Yellow** and **Black** to simulate the full spectrum. This is known as the **subtractive** method; remove all of these colours and you will end up with white (hence the standard paper colour). Adding 100 percent cyan, magenta and yellow would, in theory, result in black. However, in practice, results are never perfect, so printers include black ink; this is also a more economical way to work.

Computer screens, along with other digital media such as scanners and digital cameras, replicate colour using the **additive** method. **Red**, **Green** and **Blue** are combined to create a range of millions of colours: Adding 100 percent of each colour results in white light, whereas 0 percent will render black, in other words, no light.

If converting from a screen image to a printed version, all changes should be made in RGB mode before a final conversion to CMYK, using the menu shown above. This will remove any colours that can only be displayed on screen, replacing them with their nearest printable equivalents. If you need to work on an image that has been saved in **Indexed Color** mode, you will need to convert it to **RGB Color** in order for it to be fully editable. **Indexed Color** uses a smaller palette to cut down on file size.

The advantage of working in **RGB Color** is that you have access to all the bells and whistles of Photoshop which would otherwise be hidden or greyed out in **CMYK Color**.

## Choosing an RGB working space

The colour working space refers to the gamut (range of colours) that can be displayed or printed. This range varies for different RGB working spaces and for different devices and can be changed in Photoshop.

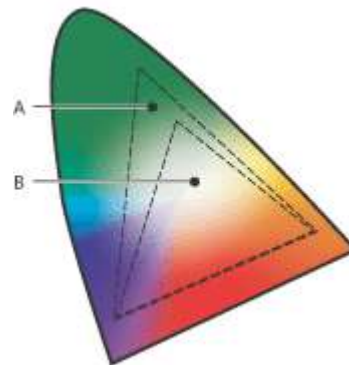
## sRGB IEC-61966-2.1

sRGB is the standard colour space for PC computer monitors and is the colour space assumed by many applications (including Web browsers and Photoshop). However, it has a limited gamut, sufficient for on-screen use (e.g. Web design, PowerPoint presentations), but unsuitable for quality printing, since it clips colours in the CMYK gamut.

## Adobe RGB (1998)

Adobe RGB (1998) has become the recommended RGB editing space for RGB files that are destined to be converted to CMYK for print output. It provides a much wider gamut and consequently it has a much better ability to capture very deep or bright colours.

The figure on the right shows the full colour gamut (billions of colours) visible to the human eye. **A** shows the typical **Adobe RGB (1998)** colour space and **B** the **sRGB** colour space.



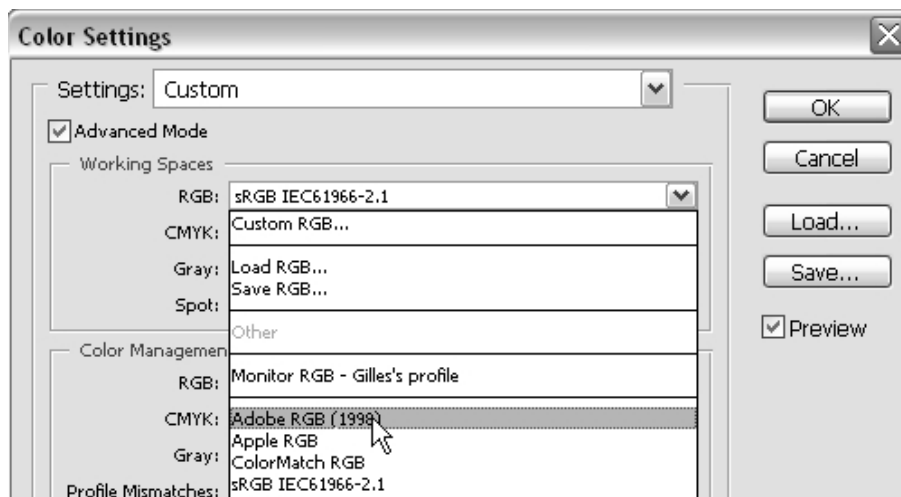
Chromatic diagram

As you can see, **A** covers a greater range of colours than **B**.

There are other RGB colour spaces that have a much wider gamut (Wide Gamut RGB), however, these are intended for highly specialised applications.

To summarise, you should stick to **sRGB** for images intended to be used on the Web or for on-screen presentations, and convert to **Adobe RGB (1998)** for images intended for print (after conversion to CMYK)

- To change the RGB colour space from sRGB to Adobe RGB, go to **Edit/Color Settings**. In the **Color Settings** dialogue box, in the **RGB** drop-down menu (under **Working Spaces**) select **Adobe RGB (1998)** as shown below:



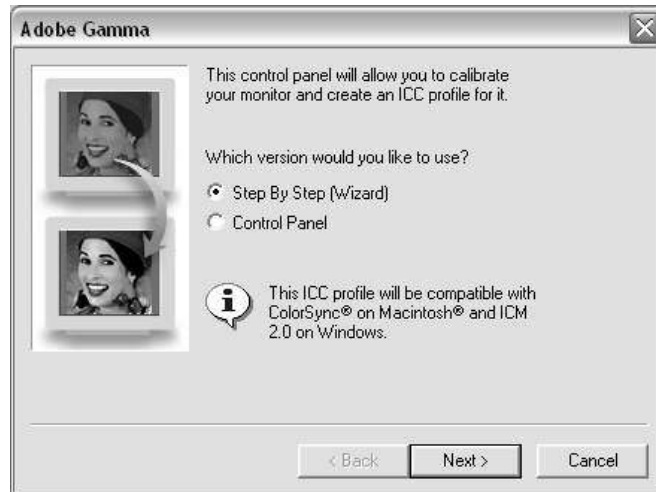
- To convert from RGB mode to CMYK, go to **Image/Mode** and select **CMYK Color** from the list.

## Monitor calibration

The **Adobe Gamma** utility comes bundled with Photoshop and can be used to calibrate a monitor's settings: RGB colour balance, brightness, contrast and white point (the point at which colour will be displayed as white).

To launch the **Adobe Gamma** wizard, go to **Settings/Control Panel** and double-click on the icon labelled **Adobe Gamma**.

The wizard will appear as follows:



Make sure the **Step By Step (Wizard)** radio button is checked and click the **Next** button to proceed.

Leave the default monitor profile selected unless you know of a better match for your screen, in which case click the **load** button and choose from the list displayed.

Click the **Next** button and follow the on-screen instructions to set the **brightness** and **contrast** of the monitor.

Again, click **Next** to display the **Phosphors** pop-up. This should be left unchanged, unless you know for certain that your monitor's phosphors differ from the default option.

Proceed by clicking the **Next** button. Uncheck the **View Single Gamma Only** box and set the **gamma** (mid-tone) brightness of your screen for each primary colour by following the on-screen instructions.



Assuming you are using a PC, from the dropdown menu, select **Windows Default**. There is also a **Macintosh** option. The **Custom** setting is only available to Macintosh users.

Having clicked **Next** to continue, leave the **Hardware White Point** as displayed unless you know it is incorrect. Continue to the next screen, leave **Adjusted White Point** as set and proceed to the final screen. You have an option to view the screen with before and after settings, before clicking the **Finish** button to name and store your monitor's new profile.

See Ian Lyons' article, *Photoshop CS - Colour Management* ([www.computer-darkroom.com/ps8\\_colour/ps8\\_1.htm](http://www.computer-darkroom.com/ps8_colour/ps8_1.htm)) for a more detailed introduction to colour management.

## Task 1 Getting started

**Objectives** To open an image and learn to use some basic tools and menus.

**Comments** Cropping consists of selecting the area of an image that you want to keep and eliminating what is deemed superfluous. It is probably the first thing you will want to do to a photograph.

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**1.1** Start Photoshop and open an image:

- Go to **Start/Programs/Web Graphics/Photoshop CS2/Adobe Photoshop CS2**.
- Click **No** to the question ‘**Do you want to customize your color management settings now?**’.
- Go to **File / Open** and in **C:\User\Graphics\**, open the file: **egypt150.tif**.

**Note** This image was scanned at a resolution of 150 dpi (dots per inch) at 100% of its original size.

**1.2** Make a copy of the image:

- Go to **Image / Duplicate**.
- Accept the suggested file name (**egypt150 copy**) and click on **OK**.
- Close the original image by clicking the **Close** icon in the top right corner of the **Image Window**.



**Note** It is good practice to work on a copy rather than on the original version of a photograph, so that you have a backup in case something goes wrong!

### The View menu

**1.3** The **View** menu contains various utilities that make working with Photoshop easier:

- Go to the **View** menu and select the following options (selected options have a tick mark next to them):
  - **Rulers** (it may already be selected) – to display rulers along the top and left edge of the Document Window.
  - **Show / Grid** – to display a grid on the image (grids are useful for aligning elements).  
To alter the grid spacing go to **Edit / Preferences / Guides, Grids & Slices**.
  - **Show / Guides** – guides can then be positioned anywhere in the image area and used for the precise positioning and alignment of image elements

**Note** You can switch grids and guides on and off by (de)selecting **Extras** in the **View** menu, or using the keyboard shortcut **<Ctrl> + H**.

**1.4** The ‘Snap to’ feature is particularly useful for precise aligning or positioning of image elements (eg text, cropping marquee, etc):

- Go to **View / Snap to** to specify the elements (eg **Guides, Grid, Document bounds**, etc) to which you want to snap when snapping is enabled.

**Note** However, sometimes snapping prevents you from correctly placing elements, so it is important to be able to switch it on and off quickly. Use the keyboard shortcut **<Ctrl> + <Shift> + ;** to enable or disable snapping – alternatively go to **View / Snap**.

## The Document window

### 1.5 Change the ruler unit:

- Right-click anywhere on the left or top ruler to open the context menu and select a different unit than the one selected – settle for **Pixels** in the end (Figure 1).

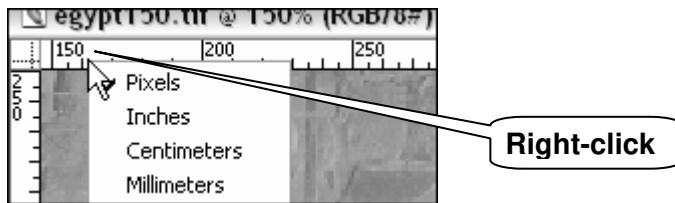


Figure 1 - changing the ruler unit

### 1.6 Insert guides:

- Click and hold anywhere in the top ruler, and drag down the mouse cursor until you see a horizontal blue line.
- Similarly, add a vertical guide starting in the left ruler and dragging to the right.
- To reposition a guide select the **Move Tool** in the **Toolbox**, then grab a guide and move it up or down, or left or right.

**Note** To enable or disable guides quickly use the keyboard shortcut **<Ctrl> + ;**;

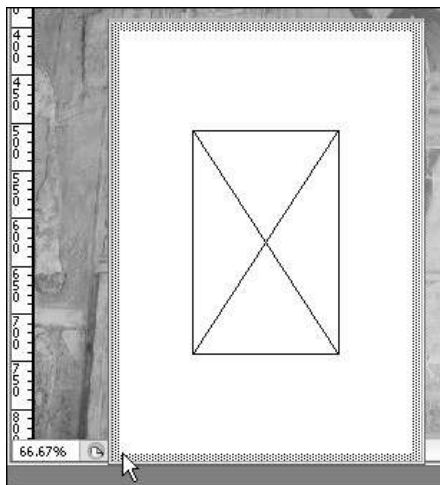


Figure 2 - scaled preview in the Status bar

### 1.7 The **Status bar** at the bottom of the **Document window** provides useful information:

- Click anywhere in the status information box containing size / dimension etc information, and keep the mouse button down.
- This will bring up a scaled preview showing the size and position the image will be printed at with the current page setup (Figure 2).

**Note** To check or change the page setup, go to **File / Page Setup**. The default page setup should be A4 portrait.

- Try the same thing but this time pressing the **<Alt>** key as you left-click in the status information box. This will display the image dimensions, the colour mode and resolution (Figure 3).



**Figure 3 - image information in the Status bar**

- Finally, click on the arrow next to the status information box (Figure 4), select **Show** and try the different options:




**Figure 4 - accessing the status information options**

- **Version Cue:** a tool for working collaboratively on projects – not relevant to most users.
- **Document Sizes:** the first figure shows the file size of a flattened version of the image. The second, the size if saved with all the layers.
- **Document Profile:** the current profile (colour mode and pixel bit depth) assigned to the image.
- **Document Dimensions:** the image dimensions expressed in the unit set for the rulers.
- **Scratch Sizes:** the first figure displays the amount of RAM memory used. The second shows the total RAM available to Photoshop.
- **Efficiency:** summarises how efficiently Photoshop is working.
- **Timing:** shows the time it took to complete the last operation. Reset every time you change tools or execute a new operation.
- **Current Tool:** displays the name of the tool currently selected.
- **32-bit exposure:** Option for adjusting the preview image for viewing 32-bits-per-channel high dynamic range (HDR) images – not relevant to most users.

## Zooming in and out of an image

### 1.8 Using the **Zoom Tool**:

- In the **Toolbox** select the **Zoom Tool**. As you hover the mouse pointer over the image notice how it changes into a magnifying glass icon with a + sign inside. 
- To zoom in:
  - either click on the image repeatedly until you reach the desired level of magnification (up to 1600%),
  - or drag the magnifying glass to delimit the area you wish to magnify.
- To zoom out, hold down the **<Alt>** key – notice how the plus sign in the magnification glass icon changes to minus – and click on the image until you reach the desired level of magnification (down to 0.4%).



## Task 2 Cropping and correcting perspective problems

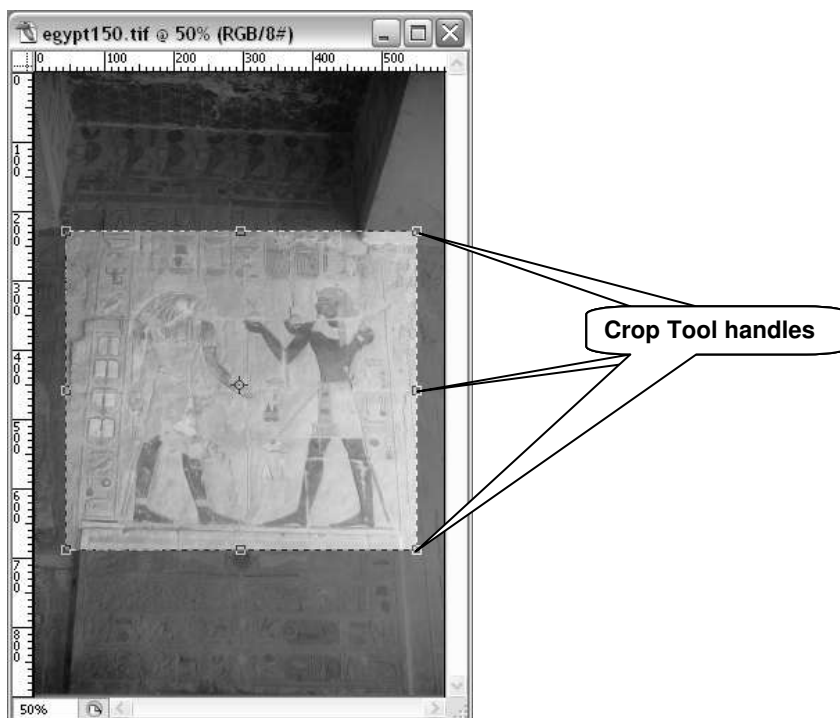
**Objectives** To crop an image and straighten out keystone distortion.

**Comments** Cropping consists of selecting the area of an image that you want to keep and eliminating the outer crop area. The Photoshop crop tool also allows you to correct perspective problems (keystone distortion) such as the vanishing vertical edges of a building photographed from ground level.

### Simple cropping operation

#### 2.1 Define the crop area:

- In the **Toolbox** select the **Crop Tool**.
- Click in the top left corner of the area you want to select and drag towards the bottom right to mark out the area that you want to keep (crop marquee). Notice how the area outside the crop selection dims.
- Adjust the crop marquee to cover an area similar to that in Figure 5:
  - To scale the crop marquee grab and drag one of the handles – to constrain the proportions, hold down **<Shift>** as you drag a corner handle.
  - To reposition the crop marquee, place the cursor inside the marquee – it will change to a black arrow – and drag.



**Figure 5 - the crop marquee in the image window**

**Note** You can also rotate the crop marquee. Place the cursor just outside one of the corners until it changes into a curved arrow, then click and drag. To move the centre point around which the crop marquee is rotated, click and drag the centre point around which the marquee rotates.

## 2.2 Commit the crop:

- When you are satisfied with the position and size of the crop marquee, click the **Commit** button, press **<Enter>**, double-click in the crop marquee, or right-click and choose **Crop** from the context menu.



**Note** Until the cropping operation has been either committed or cancelled, no other tool or menu can be used. To cancel the cropping operation, press **<Esc>** or click the **Cancel** button in the **Options bar**.



## Cropping with perspective correction

### 2.3 Define a new crop area:

- Undo your previous crop – either use **Edit / Undo Crop**, or the **History palette**.
- Define another crop marquee, this time making sure you include the vertical lines on either side of the characters, as well as the horizontal line below their feet, as shown in Figure 7.

### 2.4 Correct the keystone distortion:

- In the **Options bar** that appears at the top of the screen when you choose the **Crop Tool**, tick the **Perspective** box (Figure 6).

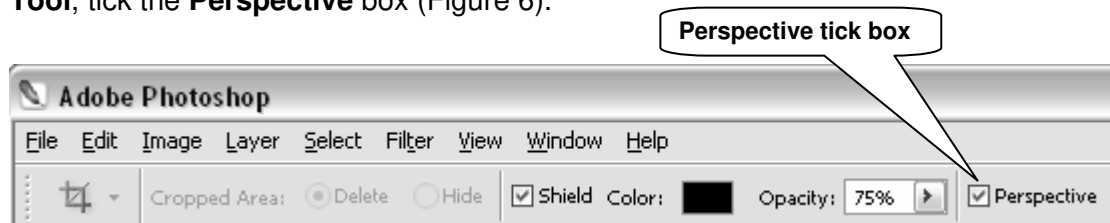


Figure 6 - the crop tool option bar

- Click the top left corner handle and drag it to the right until the left marquee border is parallel to the vertical line in the image.

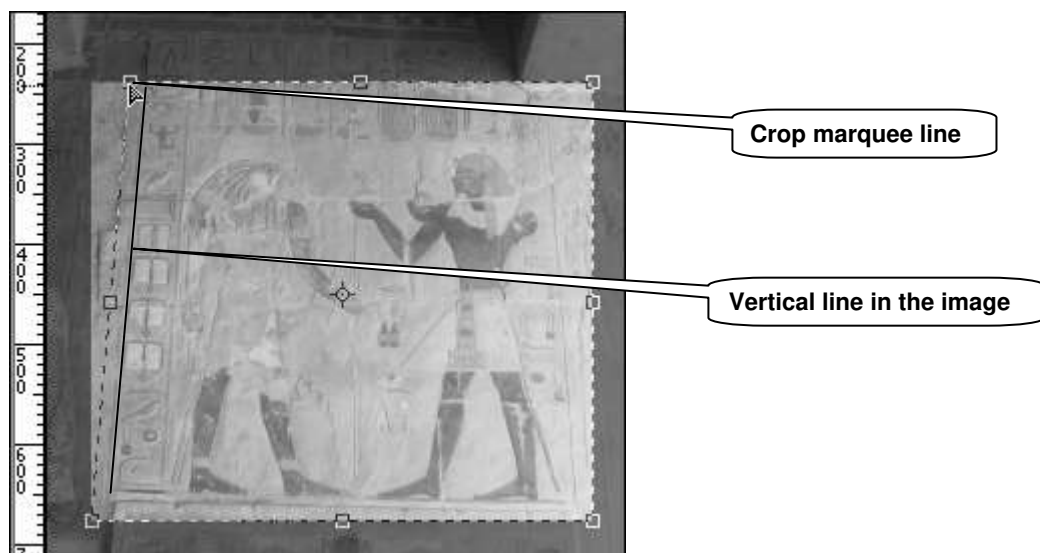


Figure 7 - correcting perspective

- Repeat, using the other corner handles to level the bottom and top horizontal marquee borders with the horizontal lines in the image, and the right marquee border with the right side vertical line in the image.
- Once you are satisfied with your selection, commit the crop.

Your image should now have perfect vertical and horizontal lines, as illustrated in Figure 8:



**Figure 8 - cropped image after perspective correction**

**Note** This operation can be fiddly, particularly with images that do not have clear vertical and horizontal lines. Trial and error and a little patience should overcome any difficulty!

## **Saving the cropped image**

**2.5** To save your image:

- Go to **File / Save As**.
- In the **Save In** box of the **Save As** window, go to **C:\User\Graphics\**, in the **File Name** box replace the suggested file name with **egypt\_mural\_before**, and in the **Format** box select **TIFF(\*.TIF)**.
- Click on **Save**.
- In the **TIFF Options** pop-up window, leave the options as they are and click on **OK**.

## Task 3 Adjusting overall tone and colour

**Objectives** To make basic image corrections using Photoshop's image correction tools.

**Comments** Once you have cropped your image, the next thing you will want to do is improve its appearance. For example it may lack contrast, have a colour cast, be too bright, or display any combination of these faults.

- 3.1** Make a duplicate of your **egypt\_mural\_before.tif** image:
- Choose **Image / Duplicate** and rename the copy as **egypt\_mural\_after**.
  - Close **egypt\_mural\_before.tif**.

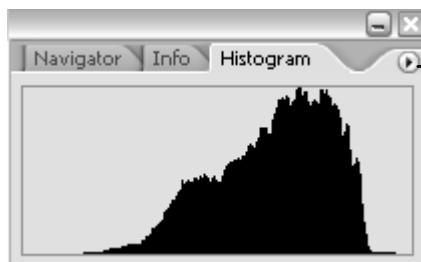
**Note** Having a 'before' and 'after' image will enable you to compare your modified image to the original later.

### Interpreting an image

- 3.2** Before making any adjustment, it is important to be able to analyse the image you are working on.

We can use our eyes to make subjective judgements about how the picture looks, but for more useful and objective information we can also use the image histogram.

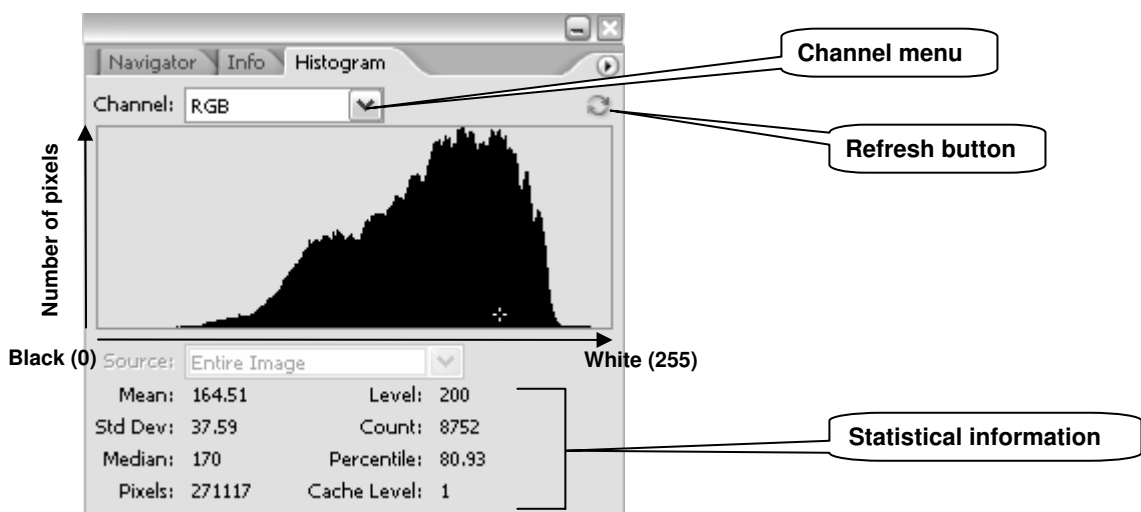
- In the **Window** menu, select **Histogram**. Then open the palette menu and select **Expanded View** (see Figure 9 below):



Click here to open the palette menu

**Figure 9 - expanding the view of the Histogram palette**

The **Expanded View** displays some extra options (Figure 10):



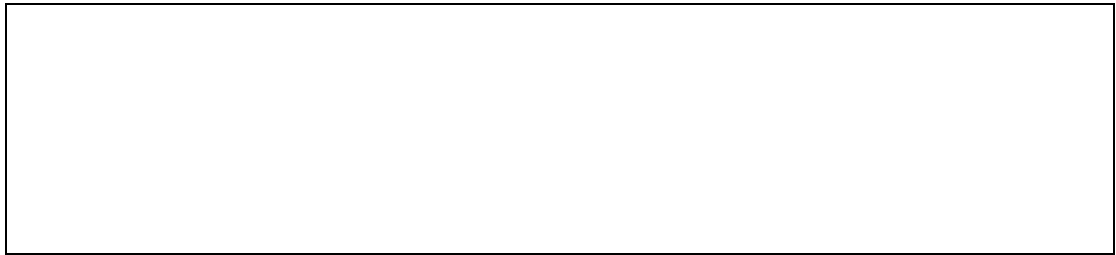
Channel menu

Refresh button

Statistical information

**Figure 10 - the Histogram palette Expanded View**

- The histogram shows the shades of tones (pixels) that make up an image as well as their distribution for all 3 channels at once (**RGB**) or individual channels.
- What does the information provided by the **Histogram palette** tell you about the current image?



## Adjusting brightness and contrast with Levels

**Note** Open the **Layers** palette if it is not already open. Go to the **Window** menu and select **Layers**.

### 3.3 Resetting the input shadow and highlight levels:

- At the bottom of the **Layers** palette, click on the **Create new fill or adjustment layer** icon and select **Levels** to open the **Levels** dialogue box (Figure 11):

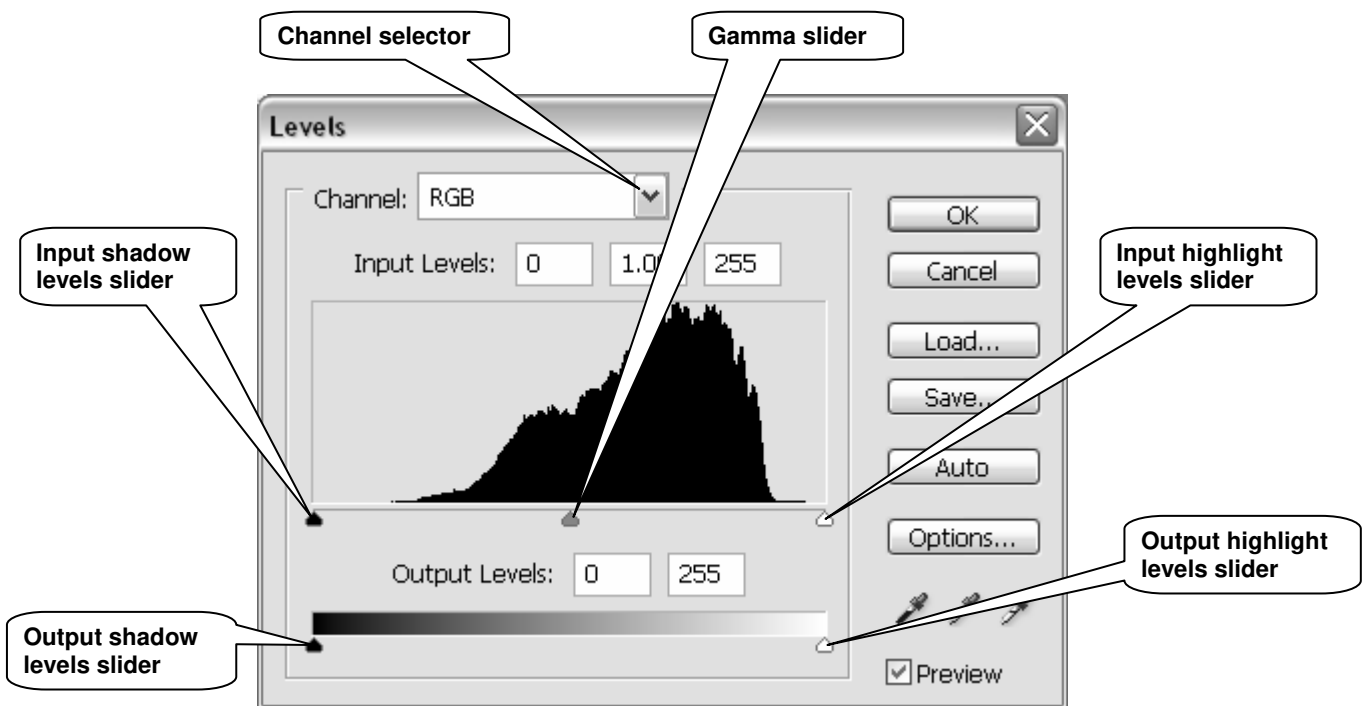


Figure 11 - the levels dialogue box

### Input Levels

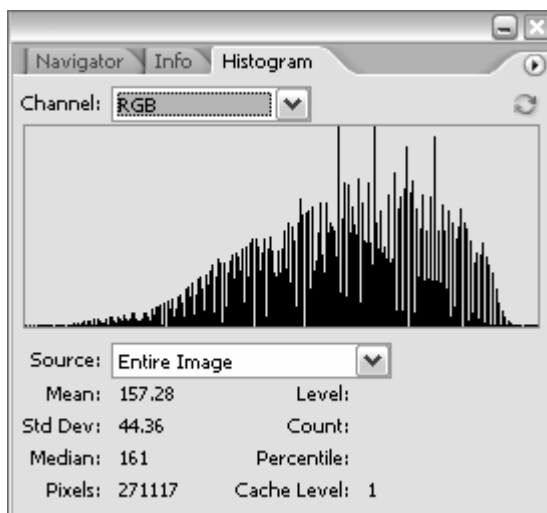
- The **Input Levels**' sliders and entry boxes allow you to increase the contrast by adjusting the input **shadows** and **highlights**.
- The **Gamma** and **entry box** allow you to adjust the relative image brightness between the shadows and highlights (drag the slider left to lighten and right to darken the image).

## Output Levels

The **Output Levels**' sliders allow you to reduce the tonal range (contrast) in an image. It is best not to touch these because they inevitably result in loss of data in the shadows and highlights – unless you deliberately want to reduce the output contrast.

The histogram in Figure 11 shows that the image has limited contrast, in other words we have no dark blacks or bright whites. So the first adjustment we are going to make is to reset the darkest shadow and lightest highlight points for each of the RGB colour channels:

- Make sure the **Preview** box in the bottom right is checked so you can see the changes taking place.
- In the dropdown **Channel** selector, select **Red**.
- Holding down the <Alt> key, first drag the **Shadows input slider** to the right and set it just before you see some shadow detail in the image. Then drag the **Highlights input slider** to the left and set it just before you see some highlight detail.
- Repeat the previous step for the **Green** and **Blue** channels and click **OK** once you are satisfied.
- Notice how these changes have affected the **RGB** histogram in the **Histogram** palette (Figure 12):



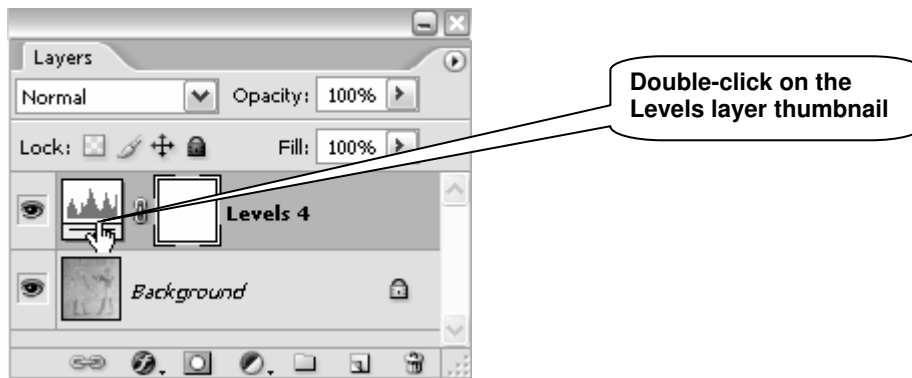
**Figure 12 - image histogram after Levels changes**

- You should now have a better spread of pixel levels between shadows and highlights, but notice how some information has been lost at some levels (hence the comb-like effect).

## Adjusting the colour balance with Levels

In the previous task, we used the composite RGB channel of the **Levels** adjustments to correct the overall contrast of the image. We are now going to use the same tool to correct colour casts.

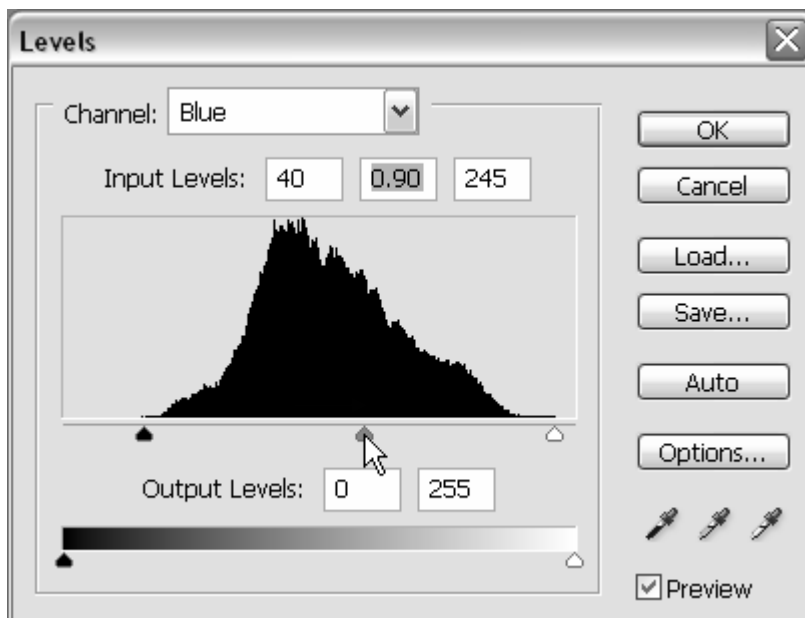
- Re-open the **Levels adjustment layer** you created in the previous task by double-clicking on its thumbnail in the **Layers palette** (Figure 13):



**Figure 13 - re-open the Levels layer**

At this point you need to decide whether your image has a colour cast and if yes which colour. So let's say your picture looks too blue and you want to add more yellow:

- Go to the **Channel** menu and select the **Blue** channel.
- Move the **Gamma slider** slightly to the right as in Figure 14:



**Figure 14 - correcting a blue cast using Levels**

If your image has a different colour cast, use the following table to decide which channel to use:

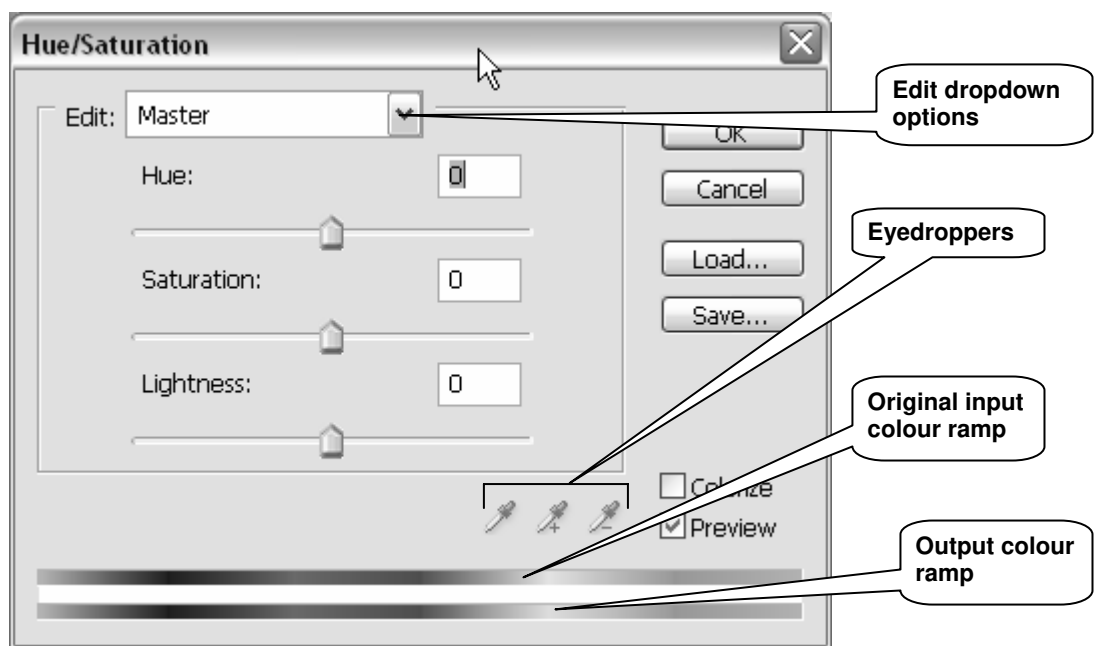
Colour cast:	Use the colour channel:	Move the Gamma slider:	Colour added:
Red	Red	Right	Cyan
Green	Green	Right	Magenta
Blue	Blue	Right	Yellow
Cyan	Red	Left	Red
Magenta	Green	Left	Green
Yellow	Blue	Left	Blue

**Note** When dealing with black and white photographs, you don't need to adjust each colour channel separately. To correct the overall contrast and brightness you can use the composite **RGB** channel instead. Use the **Input Levels** to improve the overall contrast, and then the **Input Gamma** to correct the brightness.

## More colour adjustments with Hue/Saturation

**3.4** The **Hue/Saturation** dialogue box allows you to adjust the **hue** (colour), **saturation** (colour intensity), and **lightness** of the entire image or of individual colour components in an image.

- Click on the **Create new fill or adjustment layer** icon at the bottom of the **Layers** palette and select **Hue / Saturation** to open the corresponding dialogue box (Figure 15):



**Figure 15 - the Hue/Saturation dialogue box**

The two colour spectrum ramps at the bottom of the **Hue/Saturation** dialogue box provide a visual clue as to how the colours are being mapped from one colour to another.

The **Edit** dropdown menu at the top defaults to **Master**, which means any adjustment will affect all the colours in an image. The other six options (eg **Reds**, **Greens**, **Blues**, **Cyans**, etc.) allow you to narrow the **Hue/Saturation** adjustments to predefined colour ranges. You can also redefine these ranges using the eyedroppers or markers between the colour ramps.

- In the **Edit** dropdown menu box, select **Reds** to start with.
- Adjust the **Hue**, **Saturation** and **Lightness** by dragging the sliders left or right or by entering a value in the corresponding box ( $-180$  to  $+180$  for **Hue** and  $-100$  to  $+100$  for **Saturation** and **Lightness**).
- Repeat with other colours – notice that some may have little effect, which indicates that these colour ranges are not present in the image.
- Click **OK** once you are satisfied with the results.



## Task 4 Sharpening an image

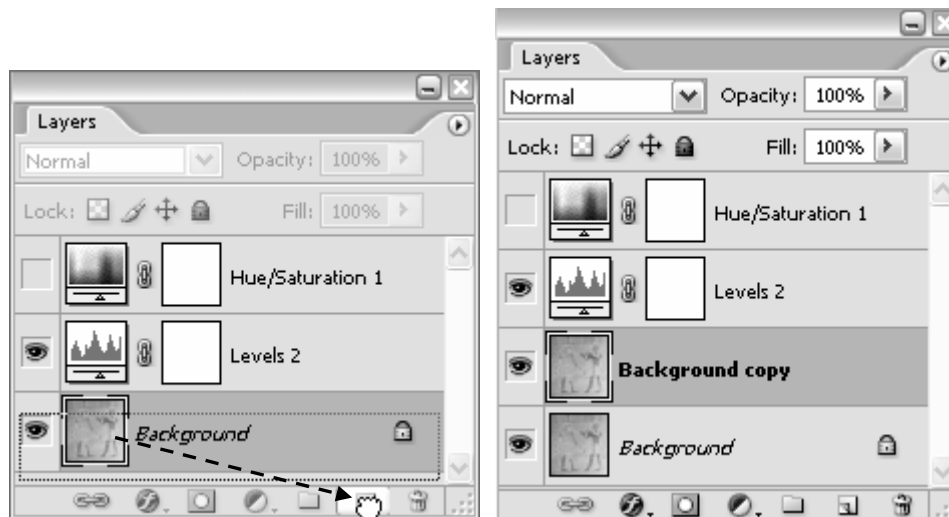
**Objectives** To sharpen an image.

**Comments** Photoshop provides four sharpening filters – **Sharpen**, **Sharpen More**, **Sharpen Edges** and **Unsharp Mask**. **Unsharp Mask** is the one that gives you the most control.

- The **Unsharp Mask** works by increasing the contrast between pixels. Unlike tone and colour adjustments, **Unsharp Mask** is applied to the **Background** layer (or even better a copy of the **Background** layer), that is the layer containing the original image.

### 4.1 Create a copy of the **Background** layer:

- In the **Layers** palette, drag the **Background** layer onto the **Create a new layer** icon to make a copy of it. It will appear as a new layer as shown in Figure 16:



**Figure 16 - creating a copy of the Background layer**

Creating a copy of your background image protects the original image because it is easier to delete a layer rather than undo changes to the background image.

### 4.2 Sharpen the image:

- Make sure the **Background copy** layer is selected.
- In the Photoshop **Filter** menu, choose **Sharpen / Unsharp Mask**.

In the **Unsharp Mask** dialogue box (Figure 17) you can set three parameters:

- **Amount** controls the amount of sharpening applied to the edges (1% to 500%). Values up to 50% produce subtle effect; values between 50% and 250% produce moderate effects.
- **Radius** controls the depth of pixel along the high-contrast edges that are changed. Values of up to 2.0 produce acceptable sharpening.
- **Threshold** sets a level for the minimum amount of contrast between pixels that an area must have before it will be modified. Use a low value to apply the filter more generally throughout the image.

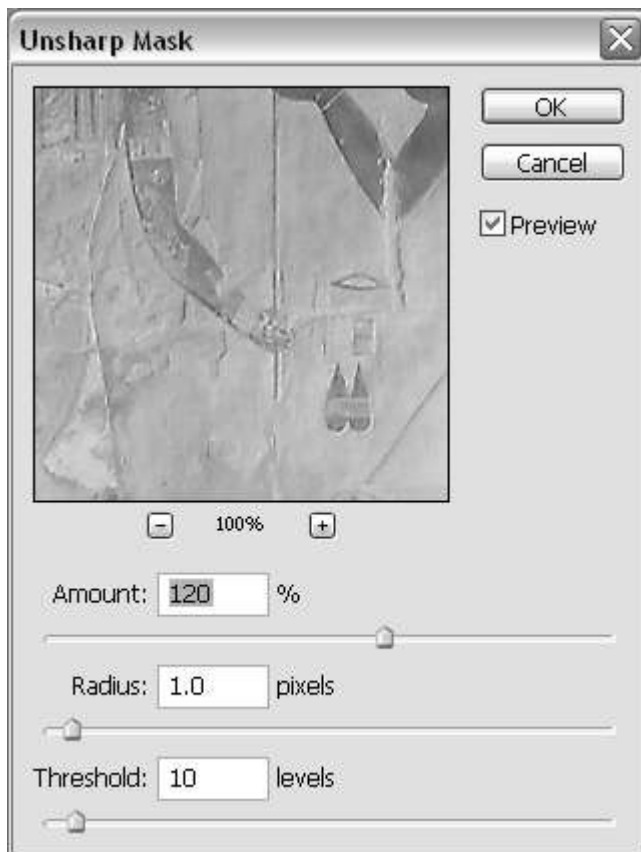


Figure 17 - the Unsharp Mask dialogue box

- Experiment with the different settings described above and observe the changes to the image.

As a general rule, apply an amount of between **100%** and **200%**, a radius of between **1.0** and **2.0**, and a threshold of between **0** and **10**.

**Note** Sharpening for output should be applied at the end of a Photoshop session and after the image has been resized to the final print size.

#### 4.3 Save a copy of your image in the Photoshop format.

- Go to **File / Save As**.
- In the **Save In** box of the **Save As** window, go to **C:\User\Graphics\**. In the **File Name** box replace the suggested file name with **egypt\_mural\_after**, and in the **Format** box select **Photoshop (\*.PSD,\*.PDD)**.
- Click on **Save**.

**Note** The reason for saving in the Photoshop format is that it will preserve all the layers, which will allow you to make further changes to them at a later stage.

#### 4.4 Make a copy of **egypt\_mural\_after.psd**:

- Choose the **Image / Duplicate** command and accept the suggested name **egypt\_mural\_after copy**.
- Close **egypt\_mural\_after.psd**.

#### 4.5 You are now going to 'flatten' the image (that is, merge the layers) and save this new file as a **TIFF** image.

- Click on the black pointed arrow in the top right hand corner of the **Layers** palette and click on **Flatten Image** in the pop-up box (Figure 18):

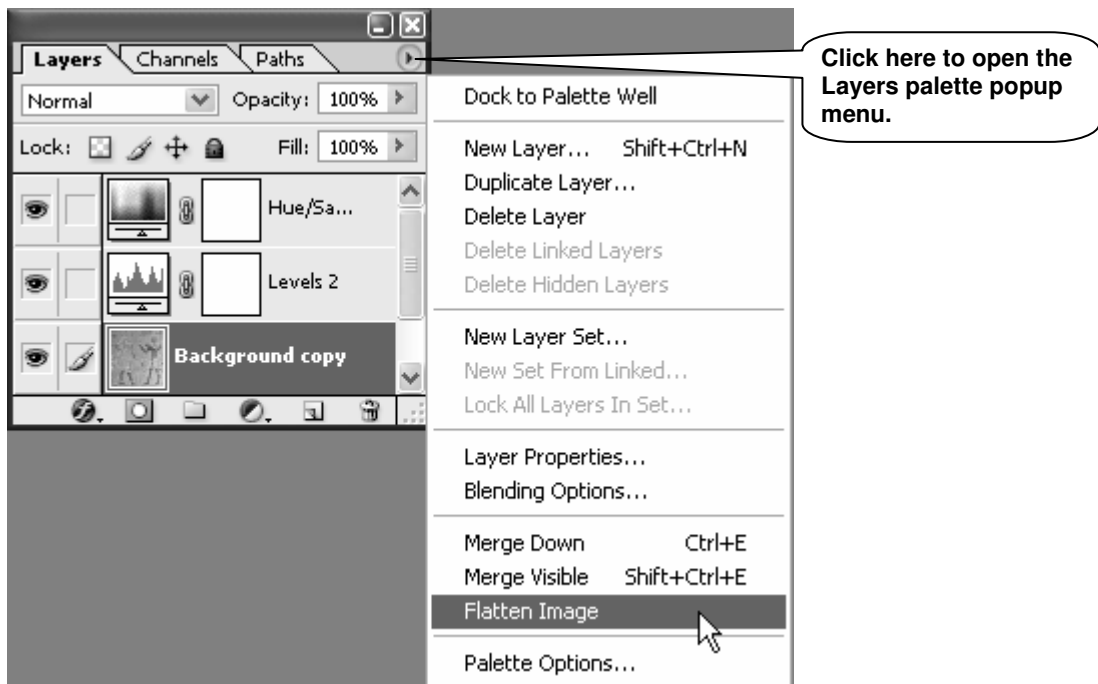


Figure 18 - flattening an image

**Note** You could also use **Flatten Image** in the **Layers** menu.

- Go to **File / Save As**.
- In the **Save In** box of the **Save As** window, go to **C:\User\Graphics\**. In the **File Name** box replace the suggested file name with **egypt\_mural\_after**, and in the **Format** box select **TIFF(\*.TIF)**.
- Click on **Save**.
- In the **TIFF Options** pop-up window, make sure **IBM PC** is selected and that **LZW Compression** is unchecked.
- Click on **OK**.

## Task 5 Resampling an image

**Objectives** To resize and/or resample an image.

**Comments** There are times when you will want to modify the size of an image. When preparing an image for screen display, you do this by resampling – or interpolating – the image.

### 5.1 Make a copy of **egypt\_mural\_after.tif**:

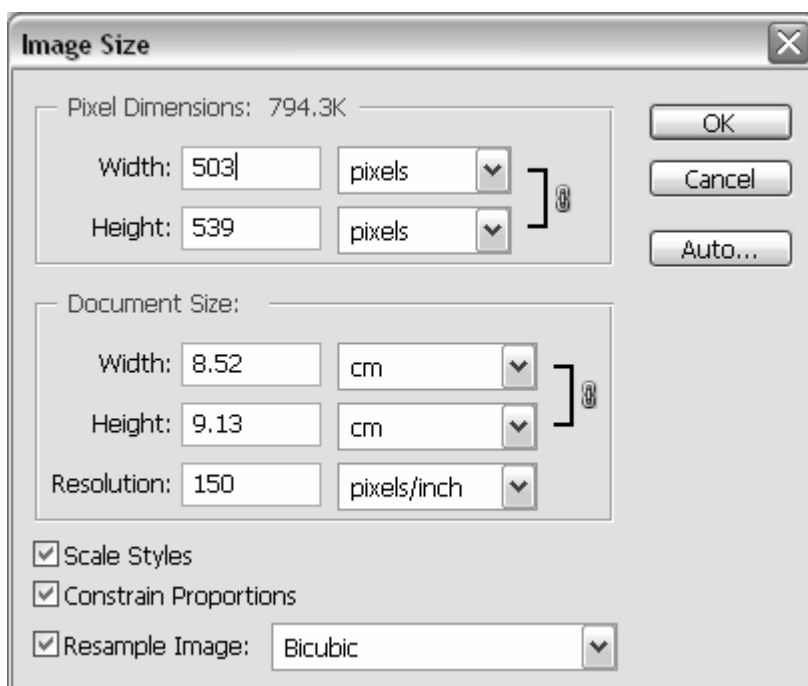
- Open **egypt\_mural\_after.tif** (it may already be opened).
- Make a copy of it using the **Image/Duplicate** command and give it the name **resample**.

### 5.2 Set the rulers:

- In the **View** menu, select **Rulers**.
- Next, right-click anywhere on the ruler and select **Pixels**.

### 5.3 Prepare to resample the image:

- Go to **Images / Image Size** to open the **Image Size** dialogue box (Figure 19).



**Figure 19 - the image size dialogue box**

- Select **Resample Image** at the bottom if it is not already selected.

**Note** When **Resample Image** is selected, the **Pixel Dimensions** box, at the top, becomes active. This allows you to change the pixel dimension of the image.

- Check that **Constrain Proportions** is also selected

### Resampling up

Interpolating up is a process that consists of adding new information (pixels) to an image in order to increase its dimensions or resolution, or both. The file size increases as a consequence. This process is useful in cases where you cannot rescan the original at the correct settings.

#### 5.4 Increasing the **Pixel Dimensions** of the image:

- Select **Bicubic Smoother** as the interpolation method from the drop-down list next to the **Resample Image** check box.

**Note** **Bicubic Smoother** is the ideal choice when making the image bigger.

- If you want to increase the physical dimensions of the image without changing the resolution, enter a higher value (for example **800**) in the **Pixel Dimensions Width** box.

Observe the changes in the **Document Size** options: the **Width** and **Height** have increased, but the **Resolution** is unchanged.

- Click **OK** and look at your resampled image.
- Undo the changes that you have just made (Hint: use **Edit / Undo Image Size**).

#### 5.5 Increasing the image **Resolution**:

- Return to **Image / Image Size**.
- If you want to increase the image resolution without changing its physical dimensions, enter a higher value in the **Resolution** box (for example **300**).

Observe the changes in the **Pixel Dimensions** options: the **Width** and **Height** have increased accordingly.

**Note** There is a simple rule to help you calculate the relationship between pixel dimension, resolution and physical dimension:  
pixel dimension = physical dimension (inches/centimetres) x resolution (points per inch/centimetre).

- Click on **OK** and look at your resampled image.
- Undo the changes that you have just made.

**Warning!** Resampling up is a compromise solution since all you do is add pixels to the image without increasing the quality and detail. You may need to use the **Unsharp Mask** filter to compensate for blurring, which may occur due to the interpolation process. You will obtain better results if you can rescan the image at the right size and resolution for its intended use.

### Resampling down

Interpolating down consists of discarding pixels and results in a smaller file size. There are two ways of achieving this: either by decreasing the resolution or by decreasing the dimensions of the image.

#### 5.6 The procedures are the same as for resampling up:

- If you want to reduce the file size and the total number of pixels while retaining the physical dimensions, enter a lower value in the **Resolution** box.
- If you want to reduce the physical dimensions while keeping the same resolution, enter a lower value in either the **Document Size Width** or **Height** entry box.

Interpolating down is particularly useful when you want to create a thumbnail image for a Web page.

**Note** A thumbnail is a small image that downloads quickly and can link to another page containing the full size image. The advantage of using thumbnails for large images is that users of your site can decide whether to view the larger images (and therefore wait for them to download) or not.

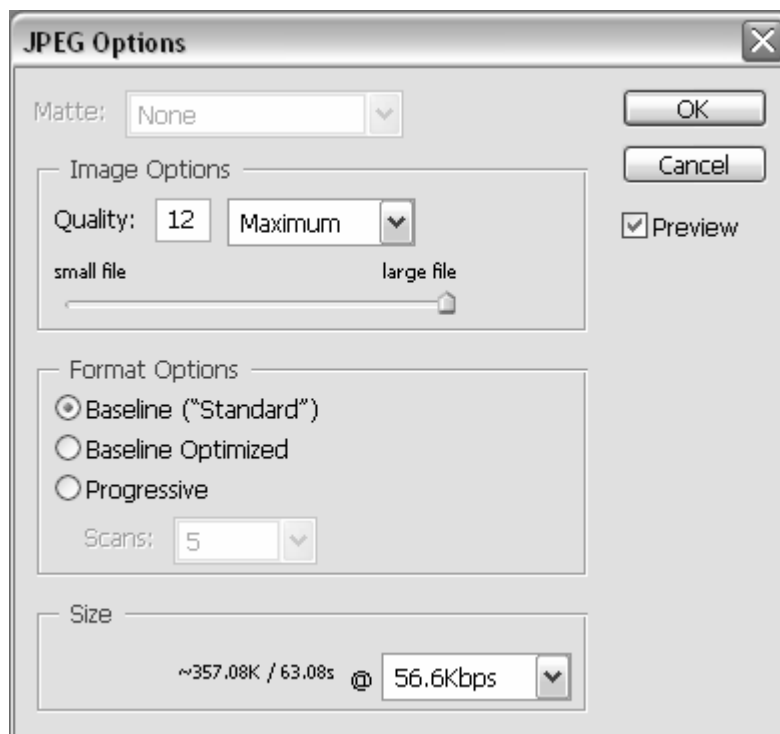
- Open the **Image Size** dialogue box again, make sure the **Resample Image** check box is selected and select **Bicubic Sharper** from the dropdown list.

**Note** With Bicubic Sharper, the scaled down image will retain more detail and sharpness.

- Set the **Pixel Dimensions Width** to **150** and observe the changes to the **Document Size** dimensions. Click on **OK**.

### 5.7 Save the thumbnail image:

- Go to **File / Save As**. Enter **egypt\_mural\_thumbnail** in the **File name** box and choose **JPEG (\*.JPG; \*.JPE)** in the **Format** box. Make sure you are saving in **C:\User\Graphics\**, and click on **Save**.
- In the **JPEG Options** dialogue box (Figure 20), move the **Quality** slider in **Image Options** from **small file** to **large file** (alternatively you could use the entry box or the dropdown menu).



**Figure 20 - JPEG saving options**

- Under **Format Options**, select **Baseline ("Standard")**.

**Note** **Baseline ("Standard")** is the most universally understood JPEG format. **Baseline Optimised** will often produce a slightly more compressed sized file, but some web browsers may not be able to read it correctly. **Progressive** creates a file that will download in an interlaced fashion – the image downloads in a series of passes and appears blurry at first, until it gradually comes into focus.

Notice the changes in the **Size** box at the bottom, it tells you how long your file will take to download at different connection speeds – select **56.6Kbps**, which is the most common telephone modem connection speed.

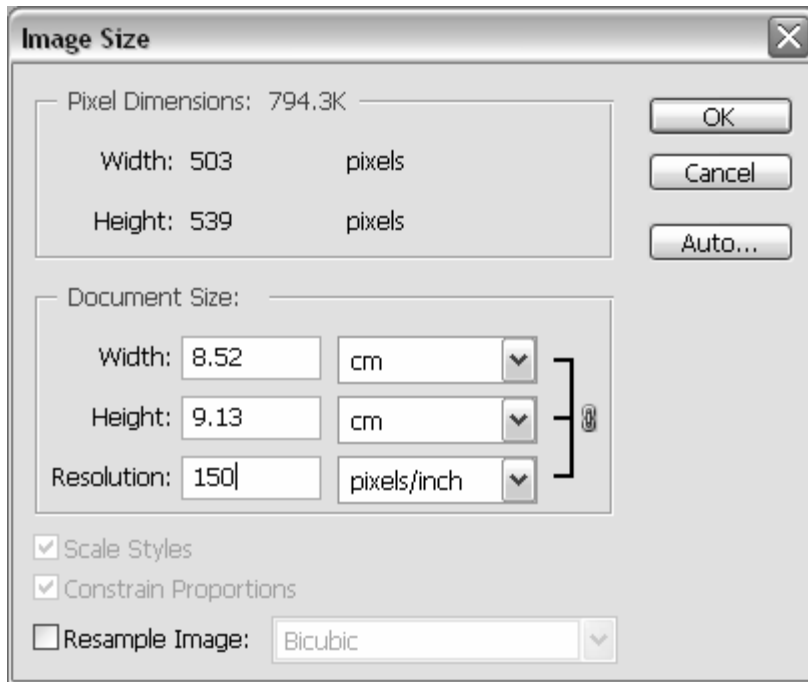
- Settle for a high quality (for example **10**) image and click on **OK**.

**Note** JPEG is a compressed format widely used for Web images. We cover image formats in more detail in Task 6.

## Checking the print size of an image

You can also use the **Image Size** dialogue box to check the print size of an image at different resolutions without resampling it.

- Reopen **egypt\_mural\_after.tif** if you closed it and go to **Image / Image Size**.
- In the **Image Size** dialogue box, uncheck the **Resample Image** option – the **Pixel Dimensions** options will grey out and become un-editable (Figure 21):



**Figure 21 - Image Size dialogue box with Resample Image option off**

- Change the **Resolution** (for example try 225 and 300 pixels/inch) to see the changes to the **Document Size Width** and **Height**. This is useful so that you can check the size of a print out of your image at different resolutions.
- Go to **File / Print with Preview** to get an idea of the print size in relation to an A4 sheet of paper.

**Note** If you find image sizing confusing, use the **Resize Image Assistant** wizard located in the **Help** menu to guide you. It can be used to resize images both for print and for the web.

## Task 6 Optimising an image to a suitable format

**Objectives** To save an image in a suitable format for its intended purpose.

**Comments** There are many image/graphic file formats to choose from. However, you don't need to know them all. On this course you have used three different formats so far (**TIFF**, **Photoshop** and **JPEG**). We will introduce a fourth one, **GIF**, which is a popular format for screen display.

Let's start with a brief summary of the four common file formats used on this course:

- **TIFF:** The most common cross-platform format for images. TIFF is the format of choice for scanned images and archival purposes because it keeps all image data intact. The downside is the large file size that makes it unsuitable for the Web.
- **PSD:** PSD is Photoshop's own file format. For flexibility in what you can do with the file in the future (all layers are preserved), it's a good idea to save a working copy of your image in this format.
- **JPEG:** This is one of two standard compression formats used for preparing images for the Web (the other one being **GIF**). It offers a smaller file size than **TIFF** and is the format of choice to compress photographic images for the Web.
- **GIF:** This is the other image file format used for preparing images for the Web. It is mostly used for saving logos, typography, etc. It is an 8-bit colour display mode that indexes specific colours to each of the 256 (or fewer) numeric values.

6.1 Open your **egypt\_mural\_after.tif** again if it's not already open.

- Go to **File / Save for Web** to open the **Save For Web** dialogue box (Figure 22) and click on the **4-Up** tab in the top left corner if necessary.



Figure 22 - the save for web dialogue box



## Saving as a GIF

- In the **4-Up** view, select one of the preview images and set the format to **GIF** (Figure 23)

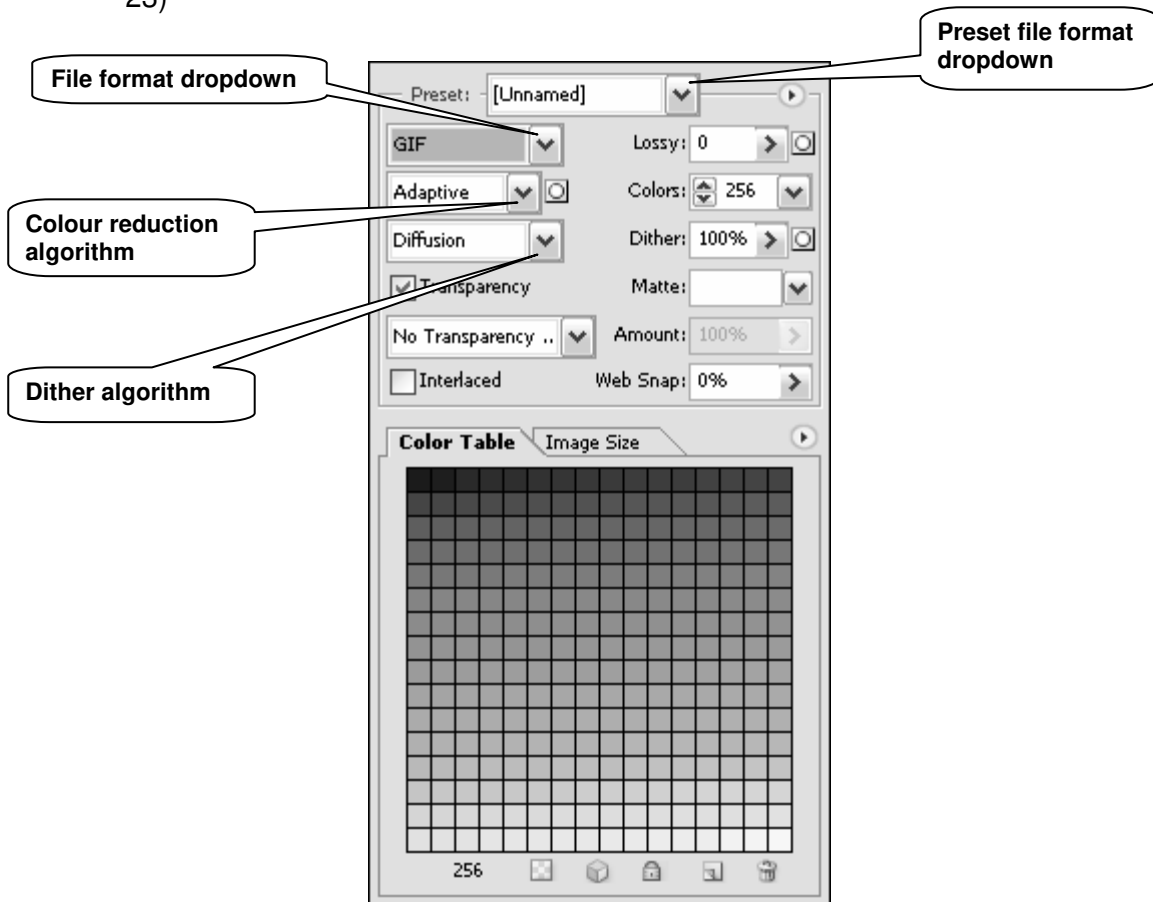


Figure 23 - saving options for GIF format

- Try out the various options (**Lossy**, **Colors**, **Dither**, etc.) and observe the changes to the GIF preview image – it may help if you zoom in using the **Zoom Tool** in the top left.



Notice the changes to the file size at the bottom of the selected preview image as you change the settings.

## Saving as a JPEG

- Select the top right image and select **JPEG** from the format dropdown box (Figure 24):

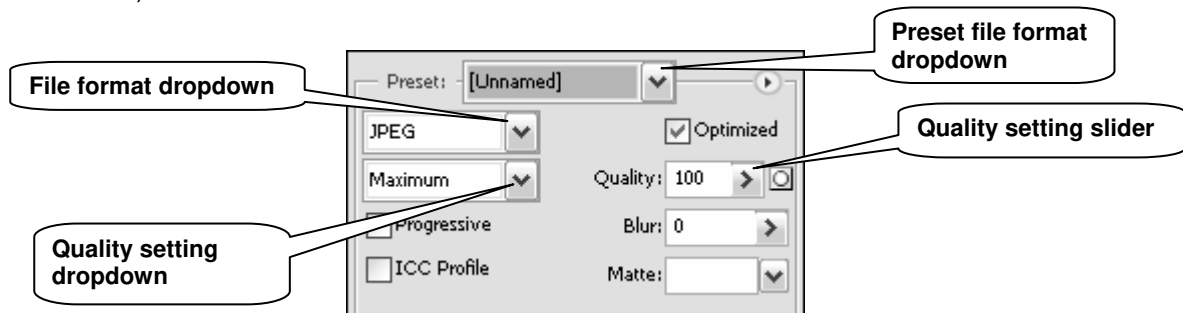


Figure 24 - saving options for JPEG format

- Then set the quality to **Maximum (100)**.

- Select the bottom left image, then select **JPEG** as format and set the quality to **High (60)**.
- Repeat for the bottom right image, setting the quality to **Low (10)**.

Notice that the more compressed the image is, the lower the quality, file size and download time:

<b>Format</b>	<b>File size</b>	<b>Download time</b>
TIFF	794K	N/A
JPEG Maximum quality	336.5K	62s @ 56.6Kps
JPEG High quality	81.47K	16s @ 56.6Kps
JPEG Low quality	22.41K	5s @56.6Kps

- Use the **Zoom Tool** in the top left corner to magnify the four images and compare the differences in quality.

You can probably see that there is not that much difference in quality between the original image, the **JPEG 100 quality** and the **JPEG 60 quality**. For this reason, if file size and download time are important criteria then the **JPEG 60 quality** would be a good option. If quality were the most important criterion, then you would optimise your image at **Maximum** quality.

## Task 7 Retouching a damaged photograph

**Objectives** To remove scratches and dust spots from an image.

**Comments** Old or neglected photographs often suffer from a variety of defects (scratches, dust spots, creases, etc) that devalue them. Photoshop provides a range of tools to correct these defects and with a little bit of practice it is easy to repair damaged images.

---

7.1 Open a new image:

- Go to **File / Open** and in **C:\User\Graphics\**, open the file **old\_image\_before.jpg** and make a copy of it using the **Image / Duplicate** command.
- Replace the suggested name with **old\_image\_after** and close **old\_image\_before.jpg**.

### Applying the Dust & Scratches filter to the whole image

7.2 Create a copy of the **Background** layer as described in task 4.1 (p. 22):

You should now have a **Background copy** layer above your original **Background** layer.

7.3 Remove dust and scratches:

- Make sure the newly created **Background copy** layer is selected in the **Layers** palette.
- Go to **Filter / Noise / Dust & Scratches** to open the **Dust & Scratches** dialogue box (Figure 25):



Figure 25 - the Dust & Scratches dialogue box

- Make sure the **Radius** and **Threshold** sliders are all the way to the left to start with.

- Slowly move the **Radius** slider to the right and observe the changes: the spots disappear, but the image loses its inherent noise or film grain. Settle for a value of **6 pixels**.
- Now move the **Threshold** slider to the right until the spots begin to reappear. Settle for a value of around **25 levels** and click on **OK**.

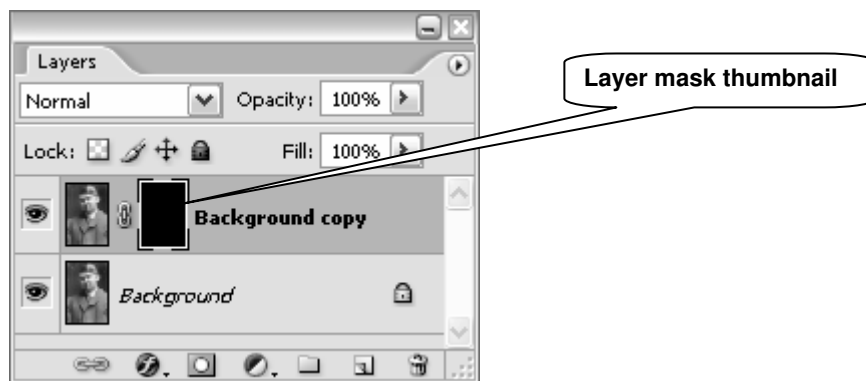
**Note** The degree of success you have with the **Dust & Scratches** filter depends largely on the image or selection to which you apply it.

## Applying the Dust & Scratches filter selectively

- 7.4** Although the spots and scratches are mostly gone and the grain restored, you will probably notice that some of the important detail has been eliminated. This is because the **Dust & Scratches** filter can't tell the difference between a scratch and an eyelash!

To remedy this problem, we'll use a **Layer Mask** to hide the filtered image and then 'burn holes' in it to apply the filter only to the damaged areas of the image.

- Go to **Layer / Layer Mask / Hide All**. You should see a new, black-filled **Layer Mask** in the **Layers** palette (Figure 26):



**Figure 26 - new layer mask in the Layers palette**

- Make sure the **Layer Mask** thumbnail is active (it should be framed within a double-line border); click on it if it's not.
- Make sure foreground colour is set to white in the **Set foreground/background color** tools located in the **Toolbox** (use the double arrow in the top right corner to inverse foreground and background, if necessary).
- In the **Toolbox**, choose the **Brush Tool** and in the **Options bar** at the top of the screen, set **Opacity** and **Flow** to **100%** (Figure 27).



**Figure 27 - the Brush Tool option bar**

- Click the triangle next to the **Brush Preset picker** and choose a soft-edged brush tip about the size of the specks you need to hide (about **17 px**).
- Dab with the **Brush Tool** where you see specks in the image.

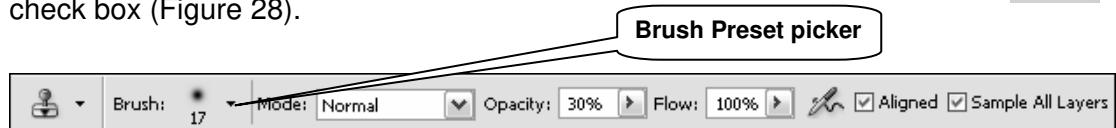
Notice the changes on the **Layer Mask thumbnail** in the **Layers** palette.

**Note** The dabs are like burning little white holes in the mask, allowing the filtered image to cover the spots in those areas.

## Using the Clone Tool to correct the remaining blemishes

**7.5** Next you will add a “repairs” layer above the filtered layer, where you can make your “hand-painted” alterations. This protects the image from painting mistakes and also makes it easy to make changes to your repairs later if you need to.

- Add another layer by clicking on the **Create a new layer** icon at the bottom of the **Layers** palette.
- Choose the **Clone Stamp Tool** in the **Toolbox**, and in the **Options** bar set the **Opacity** low (for example **30%**) and select the **Sample All Layers** check box (Figure 28).



**Figure 28 - the Clone Stamp Tool options bar**

- Click the triangle next to the **Brush Preset picker** and choose a soft-edge brush tip (for example, **17 px**) about the size of the specks you need to hide.
- To start the repairs, hold down the **<Alt>** key and click in an area near the flaw you want the repair to sample from. Release the **<Alt>** key and move the cursor over to the point where you want to clone to and click, several times if necessary, to cover the flaw.

**Note** The **Clone Stamp Tool** works by sampling colours in an area and copying (cloning) them to a damaged area. This is a fiddly job which requires frequent sampling, but which can ultimately give excellent results.

## Adjusting contrast and sharpening

**7.6** Finally, you could refine your image by adjusting tone, colours and sharpening using the methods described in Tasks 3 and 4.

For this task, we are simply going to apply a “quick fix” to adjust the image contrast.

- Click the **Create new adjustment layer** icon at the bottom of the **Layers** palette and choose **Levels**.
- Click on **Auto** and then click on **OK**.

**7.7** Save your image:

- Go to **File / Save As**.
- In the **Save As** dialogue box, navigate to: **C:\User\Graphics\**
- Save your file as **old\_image\_after** as a **JPEG** with maximum quality.

**7.8** Open **old\_image\_before.jpg** to compare it side by side with **old\_image\_after.jpg**. Observe the differences.

## Task 8 Working with selections

**Objectives** To select part of an image and discard what you don't want to keep, or manipulate the selected area.

**Comments** Selecting parts of an image is an essential skill in Photoshop. It is often the starting point for further manipulations, such as combining images together and applying filters/effects or making tonal adjustments to part rather than all of the image/layer that you are working on.

### Selections using the Marquee Tool

To “frame” a selection with a clear geometrical shape, you can use either the **Rectangular** or **Elliptical Marquee Tool**.

#### 8.1 Select part of an image with the **Marquee Tool**:

➤ Open the photograph **manneken\_pis.jpg** in **C:\User\Graphics\** and duplicate it (**Image/Duplicate**).

➤ In the **Toolbox**, right-click on the **Rectangular Marquee Tool** (right) and select the **Elliptical Marquee Tool**.



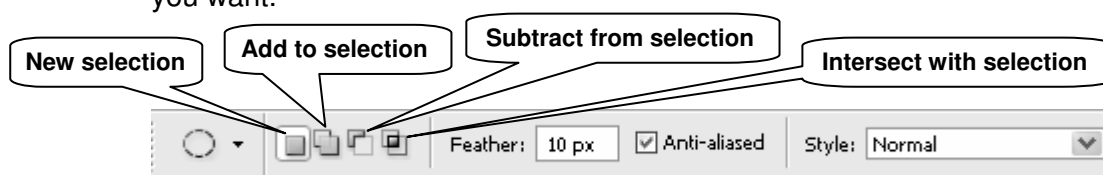
➤ Select an area of the image (for example the head of the statue) – it is easier to select from top-left to bottom-right.

**TIP:** Hold down the **<Shift>** key as you draw your marquee, to obtain a circular or square shape, rather than an elliptical or rectangular shape.

➤ Reposition your selection if necessary by clicking inside it and dragging to a new position.

**Note** You can add to selections by holding down **<Shift>**, or subtract from a selection by holding down **<Alt>** (alternatively you can use the **Add to selection** or **Subtract from selection** buttons in the **Options bar** – see Figure 29).

➤ Experiment using the **Add to selection**, **Subtract from selection** options, modifying the feathering (Figure 29) and using the **Rectangular Marquee Tool** if you want.



**Figure 29 - the Marquee Tool Options bar**

**Note** Feathering creates a soft edged border around the selection that blends gradually into the background. This technique is known as **vignetting**.

#### 8.2 Use your final selection to create a vignette image:

➤ Using the **Set foreground / background color** tools located in the **Toolbox**, set the background colour to white or black.

➤ Go to the **Select** menu and choose **Inverse** – this will inverse the selection so that the area outside your selection becomes selected (notice the marching ants around the edges of the image).

➤ Press the **<Delete>** key to get rid of the inversed selection area. You should be left with a cut-out of the statue blending smoothly with a black or white background.

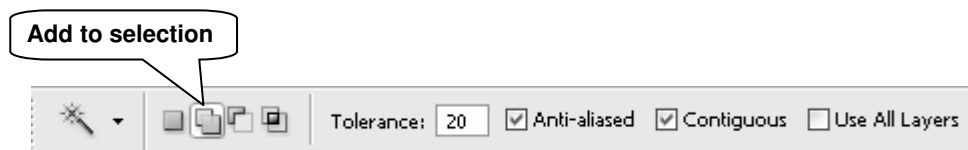
- Close these images without saving.

## Selections using the Magic Wand Tool

The **Magic Wand** allows selections by colour-matching. It is particularly useful when selecting an area containing pixels whose luminosity values are close, such as a blue sky for example.

### 8.3 Select part of an image with the **Magic Wand**:

- Open the photograph **willstower.jpg** in **C:\User\Graphics\** and duplicate it (**Image/Duplicate**).
- In the Toolbox, select the **Magic Wand Tool**.
- In the **Options bar**, select the **Add to Selection** option (Figure 30):



**Figure 30 - the Magic Wand Tool Options bar**

- Set **Tolerance** to **1** and make sure **Contiguous** is checked.

**Note** The **Tolerance** option controls the range of pixels that will be included in the selection on either side of the pixel you click on. The **Contiguous** option only allows neighbouring areas to be selected. If it is unchecked, similar colours in unrelated parts of the image will also be selected.

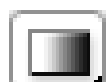
- Click four or five times in different parts of the blue sky area, noting the low tolerance. Change the tolerance to **10** and continue; you will notice that the whole sky soon becomes selected, outlined by a marquee (Figure 31):



**Figure 31 - sky selected using the Magic Wand Tool**

### 8.4 Add a gradient to the selection:

- In the **Toolbox**, select the **Gradient Tool** – if it is not displayed, right-click on the **Paint Bucket Tool** and select it from the list.



- Referring to the **Tool Options** bar, near the top of the screen, make sure **Linear Gradient** is selected (Figure 32):



**Figure 32 - the Gradient Tool Options bar**

- In the **Toolbox**, click the **Set foreground color** square to launch the **Color Picker** palette. For optimum flexibility, ensure that the option **Only Web Colors** is unchecked. Choose a medium dark to dark colour and click **OK**.
- Repeat for the **Set background color** square, this time choosing a lighter shade of the colour you selected for the foreground.
- Place the cursor against the left-hand side edge of the blue selection and, holding down the left mouse button, drag the cursor in a straight line to the right edge of the sky and release.

You will notice that a gradient has been applied, but only to the selected area. If you are unhappy with the result, you can simply drag a new gradient over the selected area.

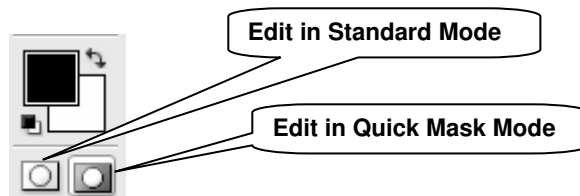
- Click **<Ctrl> + D** to deselect the sky – alternatively, go to **Select / Deselect**.
- Close the image without saving.

## Selections using the Quick Mask mode

Working in the **Quick Mask** mode, you can isolate an area by painting over it.

### 8.5 Select part of an image in **Quick Mask** mode:

- Open the photograph **hockey.jpg** in **C:\User\Graphics\**.
- Select the **Edit in Quick Mask Mode** icon, situated below the foreground/background colour picker (Figure 33).



**Figure 33 - Standard/Quick Mask Mode icons**

- Select **Brush Tool** from the **Toolbox**.
- Click the **Brush Preset picker** in the options bar (Figure 34):



**Figure 34 - the Brush Tool Options bar**

- The **Brush Preset picker** displays brushes varying in hardness and diameter. Choose a hard brush (indicated by a sharp circle), and set the size to **16**.
- Paint over the area you wish to select, in this case the middle hockey player (ignore the hockey stick).

Note how the selected area is highlighted in semi-transparent red (Figure 35):







**Figure 35 - Quick Mask applied to middle hockey player**


- When you have finished, revert to the **Edit in Standard Mode** (see Figure 33) – notice the marquee (marching ants) around the hockey player and around the edges of the image.
- If necessary, tidy up the edges by returning to **Edit in Quick Mask Mode**, using the **Brush Tool** to add to, and the **Eraser Tool** to subtract from the selection.
- Once you are happy with your selection, make sure you return to **Edit in Standard Mode** and in the **Select** menu, choose **Inverse**.



#### 8.6 Create a simple photo montage:

- Open the photograph **royalfort.jpg** in **C:\User\Graphics\**.
- Return to image **hockey.jpg** and, having selected the **Move Tool**, place the cursor on the highlighted hockey player and drag the selection on to the Royal Fort image. A new, independent layer will be created. 
- Position the hockey player where you want it on the Royal Fort image.
- Check that the top layer containing the hockey player is highlighted in the **Layers** palette. Select the **Clone Stamp Tool** and in the **Options** bar set **Opacity** to **100%**, **Flow** to **68%**, and make sure the box labelled **Sample All Layers** is checked. 
- 'Clone' the flowers surrounding the hockey player, and use them to paint over the join in the images (see task 7.5).
- If any traces of hockey stick are visible in the player's hand, try using the same technique to remove them.
- Save the image as **success.psd** in **C:\User\Graphics\**.

### Selections using the Lasso Tool

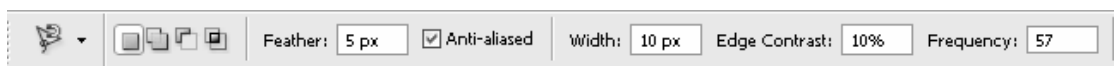
The **Lasso Tool** is useful for selecting irregular shapes. There are three versions, which come under one icon in the **Toolbox**:

- The default **Lasso Tool** is a free-hand tool useful to select very detailed edges and requires a good deal of practice and patience! To use it, hold down the left mouse button and drag a line around the desired area. Then release to make the selection. 

- The **Polygonal Lasso Tool** enables you to select a series of short, straight line segments, which makes it better to select shapes with a smoother edge. To use it, click the left mouse button once and move the mouse around the image, clicking each time you change direction. A series of nodes will be created to join the lines. When you arrive back at the starting point, click on the first node to create the selection. 
- The **Magnetic Lasso Tool** has a sensing area (that can be changed in the **Options** bar). When you move the cursor along the edges in a picture, the **Magnetic Lasso** can sense where that edge is and create a selection that follows it. It is probably the most useful of the three lasso tools. 

### 8.7 Make a selection with the **Magnetic Lasso Tool**:

- Open the image **autumnleaf.jpg** in **C:\User\Graphics\**.
- Select the **Magnetic Lasso Tool** (right-click on the **Lasso Tool** icon in the **Toolbox** and choose **Magnetic Lasso Tool**).
- In the **Options bar**, set **Feather** to 5 px and accept the default **Anti-alias**, **Width**, **Edge contrast** and **Frequency** options (Figure 36):



**Figure 36 - Magnetic Lasso Tool Options bar**

**Note** You can change the settings in the options bar for the **Magnetic Lasso Tool**: **Feather** (see second Note in task 8.1), **Anti-alias** smooths the jagged edges of a selection, **Width** sets the radius of the area where the tool looks for the edge, **Edge Contrast** specifies how much contrast the tool should look for in finding the edge and **Frequency** specifies how often locking points are laid down.

- Place the cursor anywhere on the edge of the main leaf, release the mouse button and drag the cursor around the leaf – notice how the tool automatically follows the edge created by colour or tone contrast.
- If you make a mistake, just press **<Delete>** to undo a segment. Where there is no contrast for the **Magnetic Lasso Tool** to follow, regularly click on the edge to increase the frequency of locking points.
- When you have come full circle, click the node at the starting point to make the selection.
- From the main menu choose **Select / Inverse** and press the **<Delete>** key. This will leave the selection set against a transparent background.
- Close the image without saving.

## Task 9 Blending images

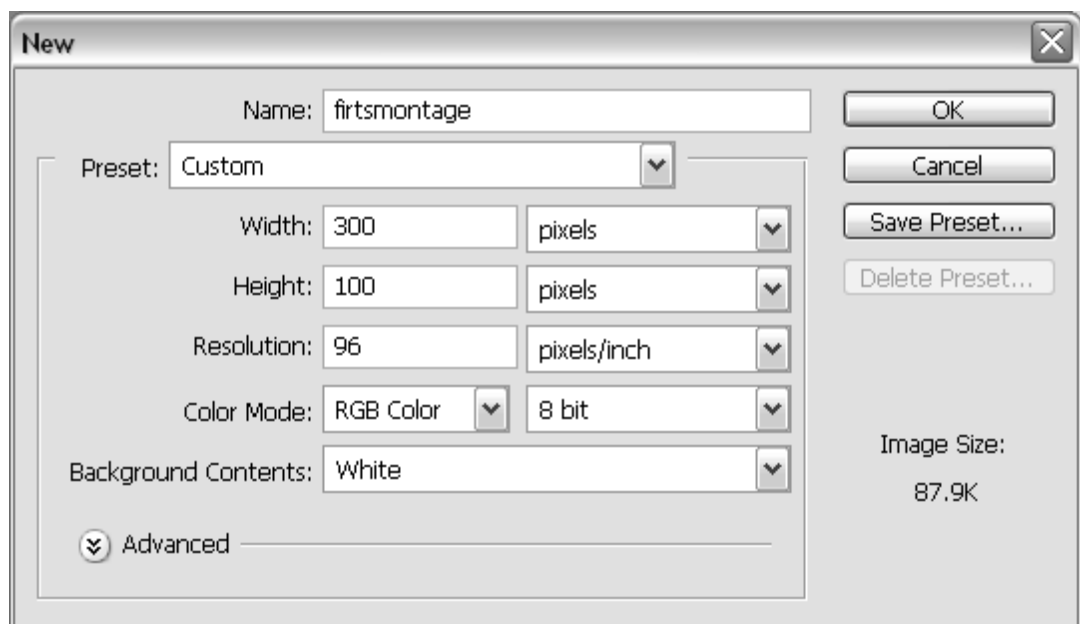
**Objectives** To merge images together in a smooth transition.

**Comments** This technique is ideal for creating seamless photomontages.

### Creating a new document

9.1 Create a new file:

- Go to **File / New**. In the **New** dialogue box, give your new image a name (eg **firstmontage**). Set the **Width** to **300 pixels** and **Height** to **100 pixels**, the **Color Mode** to **RGB Color** and **Background Contents** to **White** (Figure 37):



**Figure 37 - New file dialogue box**

9.2 Move images to the new document:

- Open the images **library.jpg** located in **C:\User\Graphics\**.
- Using the **Move Tool**, drag the image **library.jpg** on to the new blank image.



Notice that a new layer containing the image has been created above the white **Background** layer.

**Note** If rulers are not displayed, click **View / Rulers**. Right-click somewhere inside the ruler and set the unit of measurement to **Pixels**.

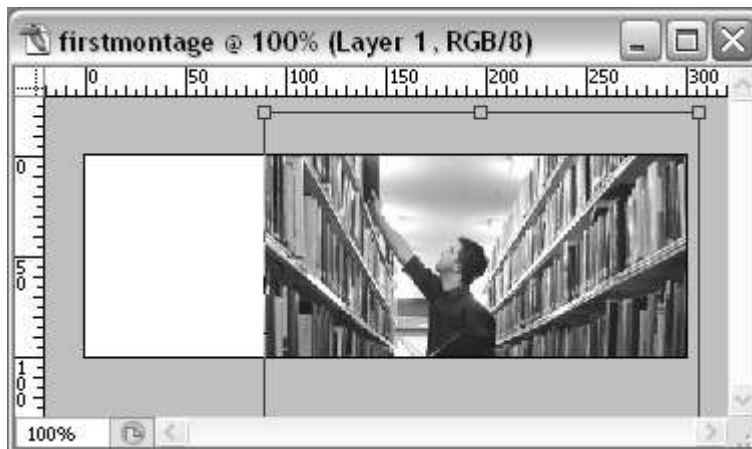
9.3 Resize the image to make it smaller:

- Ensure the top layer is selected in the **Layers** palette. In the **Edit** menu, select **Transform / Scale**.

This will display sizing handles around the image – if you cannot see the handles, you can increase the canvas size by dragging its edges.

- Hold down **<Shift>** to preserve the aspect ratio, and move the corner points inwards until you can see enough of the student in the image.

As you do this, you can reposition the image by placing the cursor inside the transform boundaries, pressing the left mouse button and dragging. Drag the image to the right of the canvas, leaving approximately 1/3 of the canvas uncovered and experiment with vertical alignment until you are happy with the position of the student (see Figure 38):



**Figure 38 - scaling down and positioning the library image**

- Click **<Enter>** to commit the change – at this point, you can reposition the image if you wish.

**Note** If the image keeps snapping to edges of the canvas, turn the **Snap** feature off by selecting **View / Snap** and making sure the **Snap** option is unchecked. Repeat this process to reset it if required.

- 9.4** Repeat steps 9.1 to 9.3 with the image **computer.jpg**, aligning it left, overlapping the library image. It should cover just over 1/2 the canvas (see Figure 39):



**Figure 39 - two overlapping layers**

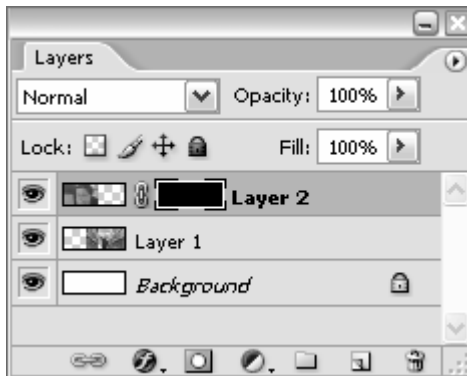
**Note** It is important that the images overlap sufficiently for the blending effect to work.

## Blending the images

- 9.5** Blend the images as follows:

- Make a note of the computer image's right edge on the horizontal ruler (around 150 to 170 pixels), and in the **Layers** palette, make sure **Layer 2** (the computer image) is selected.
- Then in the menu bar at the top, go to **Layer / Layer Mask / Hide All** to add a layer mask.

You should now see the Layer Mask as illustrated in Figure 40:



**Figure 40 - Layer Mask applied to top layer**

This renders the layer invisible, indicated by a black thumbnail in the layers palette.

Various tools can be used to 'paint the layer back'. In this case, the **Gradient Tool** is used to achieve a smooth transition from transparent to fully visible.

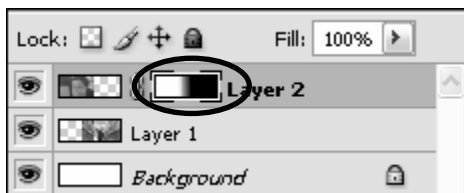


- Having made sure the foreground colour is set to black, select the **Gradient Tool** – if you can't see it, right-click on the **Paint Bucket Tool** and select it.



- Place the cursor just inside the right-hand edge of the computer image (refer to the note you made earlier), roughly in the middle vertically. Click, hold down the left mouse button and drag the mouse to the left, in a straight, horizontal line, stopping just on the left edge of the library image, and release.

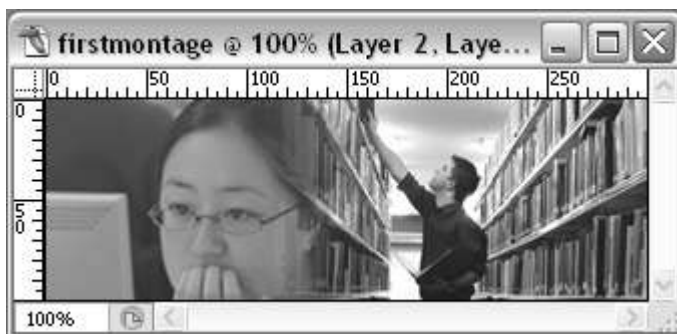
You will notice the computer image gradually appearing. The image becomes 100% visible at the point at which the mouse is released. You will notice that the black thumbnail now displays the applied gradient.



**Figure 41 - Layer Mask after the Gradient Tool has been applied to it**

If you are unhappy with your gradient, simply click and drag the mouse again. The shorter the drag, the less gradual the transition between invisible and opaque.

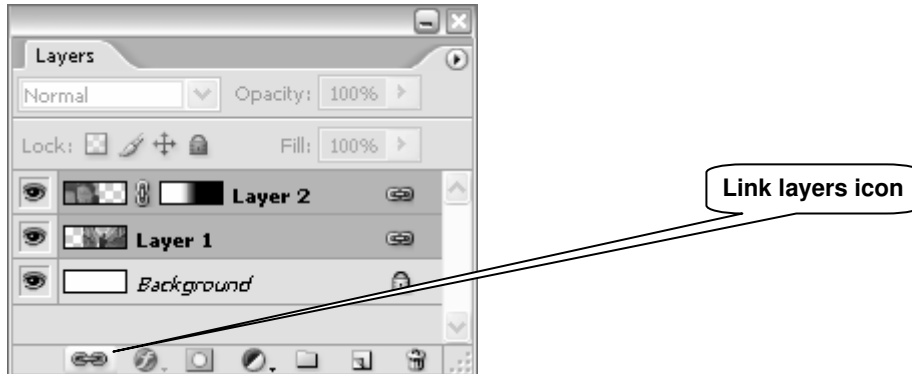
Your blended image should look something like Figure 42:



**Figure 42 - Layers gradually blended together**

## 9.6 Merge the two layers:

- In the **Layers** palette, select one of the image layers, press **<Shift>** and select the other image layer.
- With the two image layers selected, click on the **Link layers** icon at the bottom of the **Layers** palette (Figure 43):

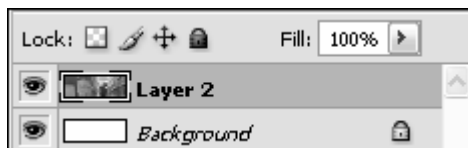


**Figure 43 - linking the two image layers**

Notice the link symbol is now displayed to the right of each image layer, indicating that these layers are linked.

**Note** Linking layers is particularly useful when you want to apply the same changes (eg repositioning, styles, etc.) to several layers.

- In the **Layers** menu, select **Merge Layers**. As a result, the two linked layers will become one (Figure 44):



**Figure 44 - merged linked image layers**

- Save the image as **firstmontage.psd** in **C:\User\Graphics\**.

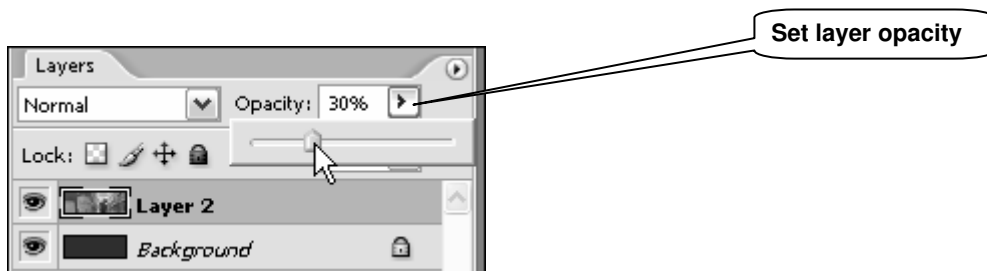
## Task 10 Working with text layers

**Objectives** To add and manipulate text layers.

**Comments** You can create type (text) anywhere in an image in Photoshop. When you create type, a new type layer is added to the **Layers** palette. You can then manipulate it like any other object (image, shape, selection, etc), and the text itself will remain editable.

### Preparing the text background image

- 10.1** In order to work as a background for text, the photo needs to be less opaque. A background colour needs to be set, to bleed through as the image transparency increases:
- In the **Toolbox**, click on the **Set foreground color** square and choose a fairly dark colour.
- In the **Layers** palette:
- Select the **Background** layer (currently white) and use the **Paint Bucket Tool** to flood fill the whole canvas.
  - Next, select **Layer 2** (i.e. the photo montage) and click the **Opacity** settings triangle at the top right of the **Layers** palette (Figure 45):



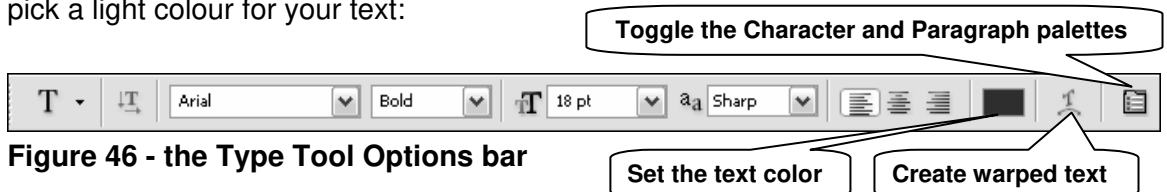
**Figure 45 - changing the opacity level of a layer**

Moving the slider to the left will gradually reveal the background layer. Set opacity between **30%** and **50%**.

You should now have a suitable background for your text.

### Adding text

- 10.2** Add some text:
- In the **Toolbox**, select **Type Tool** and click somewhere in the image. Note that a new layer appears in the **Layers** palette.
  - In the **Type Tool Option bar** (Figure 46) click on the **Set the text color** option and pick a light colour for your text:



**Figure 46 - the Type Tool Options bar**

- Choose a font, style, size and anti-aliasing method from the font options (for example **Arial**, **18pt**, **Bold**, **Sharp**).

**Note** Anti-aliasing smoothes jagged edges by adding shading or colours.

**Note** Working at different image resolutions will result in variations in apparent text size. For example text will appear much smaller in a 300dpi image than in a 72dpi (typical screen display resolution) image.

- Type **Information Services**, press <Enter> to start a new line and type **Open Day**.

### 10.3 Edit and position the text:

- Make sure the **Type Tool** is selected in the **Toolbox** and highlight the second line of text.
- Using the **Set the text color** picker, choose a new colour and, when you are happy with your choice, deselect the text by clicking outside it.
- Use the **Move Tool** to position your text on the canvas.

## Enhancing the text

Several effects can be added to the text. A subtle drop-shadow can add definition when text is set over a slightly 'busy' background.

### 10.4 Add a drop-shadow:

- In the **Layers** palette, make sure the **Type** layer is selected and click the **Add a layer style** icon at the bottom (Figure 47):

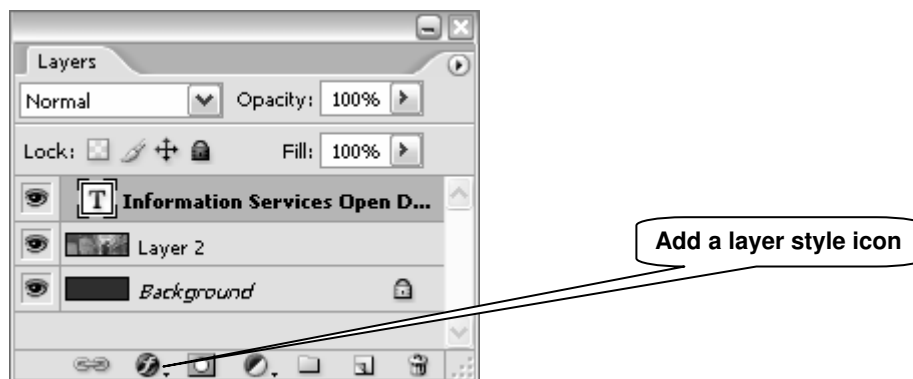


Figure 47 - the Type layer in the Layers palette

- From the pop-up menu, select **Drop Shadow**. This will launch the drop shadow options palette, adding a default shadow to the text.
- Experiment with the **Structure** options (**Blend Mode**, **Colour**, **Opacity**, **Angle**, **Distance**, **Spread** and **Size**) and click the **OK** button when you are happy.

**Note** Layer styles are applied to every object within a layer.

Your image should now be similar to Figure 48:

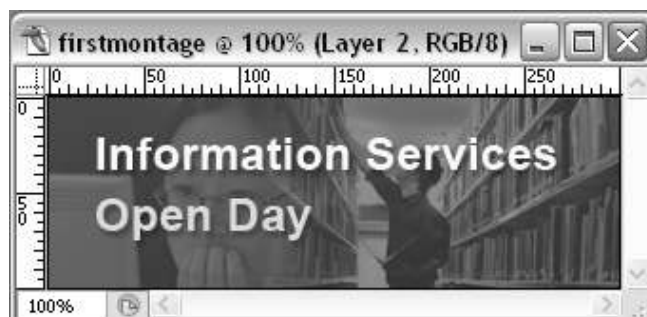


Figure 48 - banner comprising text over background image



- When you are happy with your image, save as **firstmontage.psd** in **C:\User\Graphics\**. By saving in this format, text will remain editable.

**10.5** Save a copy for the Web (see Task 6.1). As the image includes photographs, the file should be saved as a JPEG.

**Note** Further text editing is possible via the **Paragraph** and **Character** palettes (open by clicking the **Toggle the Character and Paragraph palettes** icon on the **Type Tool Options bar**. By default, the palettes are bundled together. Toggle between them by clicking the labelled tabs. The **Paragraph** palette enables line spacing, alignment and so on to be set. The **Character** palette provides a shortcut to several formatting elements also found elsewhere (anti-aliasing, font colour, font size etc.)

You can also warp text in many different ways by using the **Create warped text** option. Feel free to try these out.

## Appendix A Resolution and image size for printing

Pixel size	Megapixels	RGB size (MB)	CMYK size (MB)	Print size at:	
				150 ppi	300 ppi
1600 x 1200	2	6	7.5	11 x 8 inch (28 x 20 cm)	5.5 x 4 inch (14 x 10 cm)
2400 x 1800	4.3	12.5	16.5	16 x 12 inch (40 x 30 cm)	8 x 6 inch (20 x 15 cm)
3000 x 2000	6	17.5	23.5	20 x 13 inch (51 x 33 cm)	10 x 6.5 inch (25 x 16.5 cm)
3500 x 2500	8.75	25	33.5	23 x 17 inch (58.5 x 43 cm)	11.5 x 8.5 inch (29 x 21.5 cm)

**Table 1 – Comparison of pixel resolution, megapixels, megabyte file size and print output dimensions at different resolutions in inches (and centimetres)**

Output use	Screen ruling	x 1.5 Standard quality output resolution	x 2 High quality output resolution
Newspaper	65 – 100 lpi	97 – 150 ppi	130 – 200 ppi
Books	120 – 150 lpi	160 – 225 ppi	240 – 300 ppi
Colour magazine	150 – 175 lpi	225 – 262 ppi	300 – 350 ppi
Art book/magazine	175 – 250 lpi	262 – 375 ppi	300 – 500 ppi
Photo quality inkjet printer	150 – 300 lpi	225 – 450 ppi	300 – 600 ppi

**Table 2 – Rule of thumb screen resolutions for common print devices at lpi x 1.5 and x 2 quality factors**

### Example

Say you want to print a high quality A4 photograph on an inkjet printer:

A4 size = Width 8.268 x Length 11.693 inches (21 x 29.7 cm)

Printer resolution = 200 lpi

Quality factor = x 1.5

Print length x Printer resolution x Quality factor = number of pixels required in length

11.693 x 200 x 1.5 ≈ 3500 pixels in length

Print width x Printer resolution x Quality factor = number of pixels required in width

8.268 x 200 x 1.5 ≈ 2480 pixels in width

## Appendix B Further resources

### General information

TASI (Technical Advisory Service for Images) – <http://www.tasi.ac.uk>

The advice section is highly informative. Any questions that you may have regarding all stages of image digitisation will be answered. The sub-section entitled 'Creating Digital Images' is particularly relevant to this course.

Internet for Digital Photography – <http://www.vts.rdn.ac.uk/acl/tutorial/digiphoto>

### Scanning

Apart from the TASI website, you may find the following site very useful for all scanning issues:

A few scanning tips, by Wayne Fulton – <http://www.scantips.com>

### Photoshop tutorials

These tutorials cover most things you can do in Photoshop, including some useful tutorials on image enhancement and restoration:

Adobe's Photoshop tutorials – <http://www.adobe.com/products/tips/photoshop.html>

Janee's Photoshop tutorials – <http://myjanee.home.insightbb.com/tutorials.htm>

'Computer Arts' Photoshop tutorials – <http://www.computerarts.co.uk/tutorials/2d/>