# Photoshop (Image Processing)

Photoshop is a paint program developed by Adobe. It allows a user to operate on pixels on the screen. The basic concept of Photoshop (and any other paint program) is to simulate a real painting environment, with brushes, canvases, palettes, etc. Photoshop runs on both MacIntosh and Windows and behaves exactly the same. To run the program, simply place the cursor on top of the Photoshop icon and double-click.

When started the user is presented with a *menu* bar (at the top), set of *tools* (on the left side), a *canvas* (the white area that occupies most of the screen) and little floating windows called *palettes*.
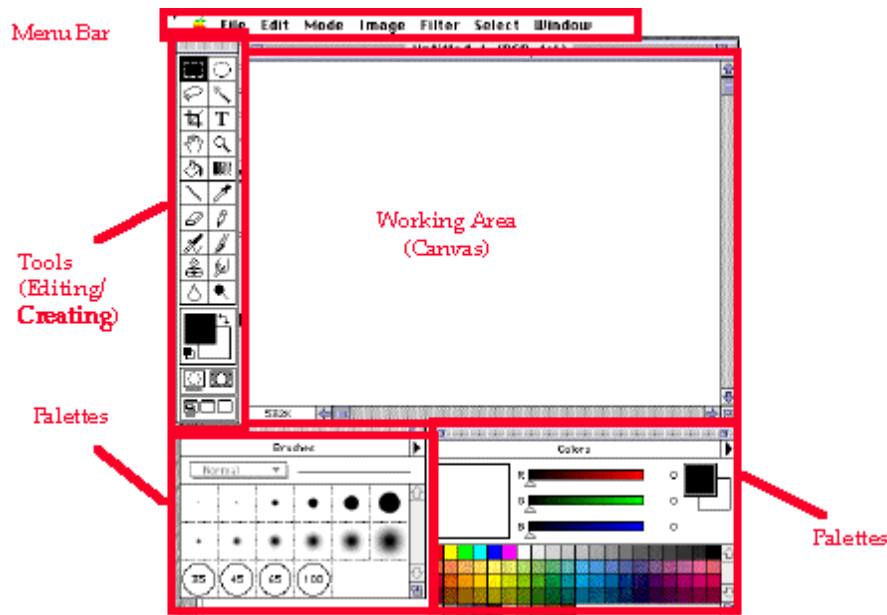
Creating an Image

To create a new image select **New…** from the **File** menu. An options window appears requesting information such as the name to be called, the size, and color mode of the image. If the image will be gray select **grayscale**, if there will be color select **RGB** mode.

To open an image select **Open...** from the **File** menu. Select the file to open. There are different image formats that exist and they have to do with the way information is stored in the image and the type of compression used. The most common formats are:
- **TIFF** (Tagged-Image File Format) used to exchange image between different applications
- **PICT** (a Macintosh file format)
- **TGA** or Targa (a DOS file format)

- **GIF** (Graphics Interchange Format - a Compuserve format for compressing and sending images over the network) and
- **JPEG** (Joint Photographic Expert Group - a compressed format for sending images over the network).

Normally, Photoshop should open automatically any format file. If there is a problem manually choose the format of the picture.

To save an imagefile select the **Save** command in the **File** menu.

Tools

Once open and ready use any of the following tools:
- **Selecting**
- **Duplicating**
- **Erasing**
- **Cropping**
- **Eyedropper**
- **Flipping**
- **Scaling**
- **Rotating**
- **Line, brush, airbrush, and pencil**
- **Mixing images**
- **Area Fill**

Selecting:

The user can select an area using a standard shape, i.e. a **rectangle**.

Selections can be also made on an arbitrary area using the **lasso** tools
The lasso tool behaves like a **polygon** when the Alt key is pressed (on the keyboard)

The **magic wand** ( ) is a function that selects areas on the basis of a color. If the magic wand is placed on top of a red pixel, all the surrounding red pixels will be selected. For all selections: the **Shift key adds** to the selection and the **Ctrl key** subtracts**.

Duplicating

To create copies of a selection use the **copy and paste** commands in the Edit menu.

Select the area to duplicate. Select the Copy command from the Edit menu. Then select the Paste command from the Edit menu. The selection is copied and placed on top of the selected area. Move the selected area to a new position.

Erasing
To erase a selection, press the Del or Backspace key on the keyboard.

To erase an area from the canvas select the eraser tool ( ). This will paint the foreground with the background color.

Cropping
Cropping is the function of selecting a part of a canvas and creating with it a new canvas.

To crop an image use the crop tool and select the area that is useful. Then press inside the selected area (the cursor will look like a pair of scissors). The rest of the canvas will be discarded.
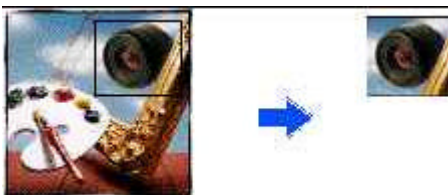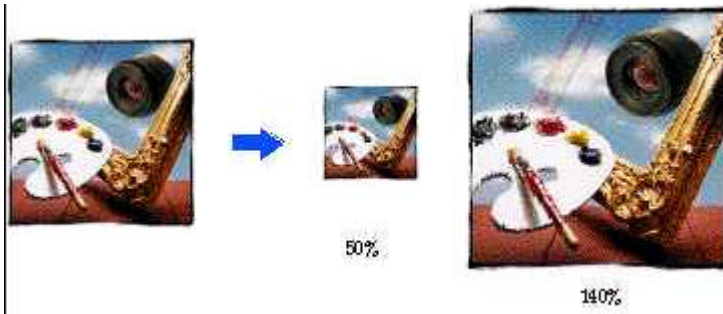

Flipping (a.k.a. mirror or reflect)
To flip an image (or a selected area) choose the **Flip** command in the **Image** menu.

Scale
To scale an image (or a selected area) choose **Scale** from the **Image** menu.

50%

140%

Notice: when scaled out, an image does not give any more information. It is the same image but the pixels are bigger. Reversibly, when scaled down the image loses information.

Rotate

To rotate images (or a selected area) choose **Rotate** from the **Image** menu. There are several choices such as 90 degrees clockwise, or arbitrary angle rotation.

Filters

To change the appearance of the image (or a selected area) choose any filter from the **Filter** menu. Filters are operations on pixels that change the color value of the pixel or its surrounding pixels. They can produce dramatic results such as a whirlpool or an impressionistic effect.

Area Fill

To fill a selected area click on the **bucket** tool ( ). This will fill all the selected area with the current color.   To change the opacity of the filling color select the opacity slide-bar in the brushes palette window. To get that window, select Palettes in the Windows menu.
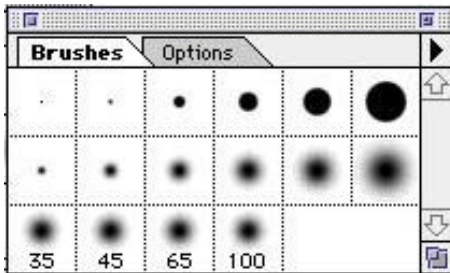
Eyedropper

The **eyedropper** tool ✐ returns the value of a selected color.

Line ＼ **, pencil** ✐ **, brush** ✐ **, and airbrush** ✐ **.**
These tools simulate a real line, pencil, brush, or airbrush. Simply select the appropriate tool and then place the cursor on the canvas and press the mouse while moving (this is called *dragging*).
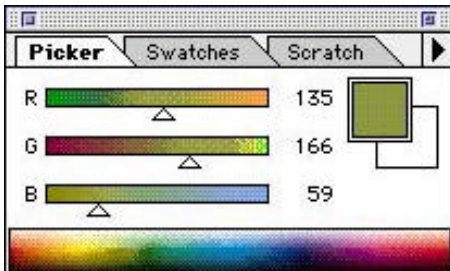To change the size of the brush select any size from the brush palette.

To change the opacity of the filling color select the opacity slide-bar in the brushes palette window (to get that window select **Palettes** in the **Windows** menu)
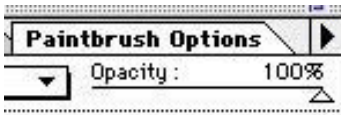
To select a different color use the picker palette window (to get that window select **Palettes** in the **Windows** menu)
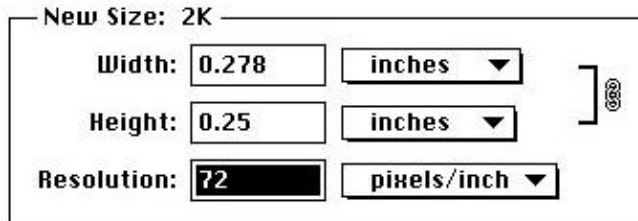

To produce special effects use the smudge ✐ ,Blur ◯ ,and Burn ✐ tools.

Text

To add text select the text tool T . Then place the cursor on the canvas and press the mouse button. A window with options will appear. Make the proper selections.

Image Size...
The **Image Size** selection in the **Image** menu allows the user to specify the actual size of the image in inches (or pixels). If the image is bigger than the piece of paper it will be printed on the size width or height need to be changed. The **locked proportions** will preserve the x by y proportions of the image.

```
┌─ New Size: 2K ──────────────────────┐
│  Width:  [0.278]    [ inches    ▼]   │
│                                    ┐ │
│  Height: [0.25]     [ inches    ▼] │▓│
│                                    ┘ │
│  Resolution: [72]   [ pixels/inch ▼] │
└─────────────────────────────────────┘
```

Canvas Size...
The **Canvas Size** in the **Image** menu affect the size of the background canvas. The canvas size does not change the size of the image, it only adds more canvas space.
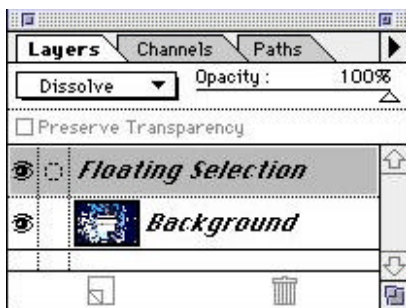
Mixing Images
To mix two images into one follow the steps.
Open both images using the **Open** command in the **File** Menu. Go to image A and select the area or the whole image. Then select **Copy** from the Edit menu.
Go to image B and select **Paste** from the Edit menu. The selection from image A will be placed on top of image B.
Open the **Layers** command from the **Palettes** in the **Windows** menu.

```
┌────────────────────────────────────┐
│ Layers \ Channels \ Paths       ▶  │
│ [Dissolve    ▼]  Opacity:    100%  │
│                                 △  │
│ ☐ Preserve Transparency            │
│ ◉ ☐  Floating Selection         ⇧  │
│ ◉  [img] Background                │
│                                 ⇩  │
│    [▢]          [🗑]            [▣] │
└────────────────────────────────────┘
```

Select **dissolve** and use the slide bar to control the **opacity** of the image A over image B.

When Done
To save an image file select the **Save** command in the **File** menu.

DO NOT FORGET:

An image makes sense to humans because it represents something from the real world, but for the computer it is just **a collection of pixels.** For example, a line is just neighboring pixels that form the shape of a line and do not have a "line" identity. If any point on the line is selected it will affect only the one pixel selected and not the whole line.

Since the computer screen is a grid of pixels, to avoid the jagging of diagonal lines a technique called **anti-aliasing** is used. When two pixels with different colors are neighboring their color is changed to the average of the two colors. This effect produces a smooth transition from one color to another.

Anti-aliasing