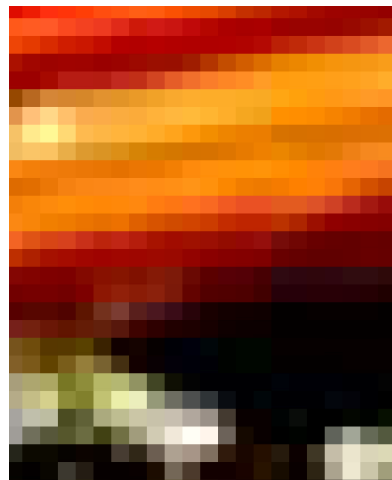




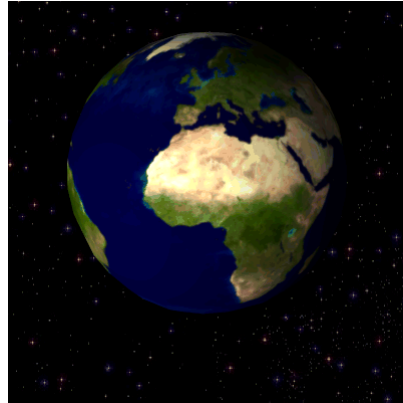
## Types of Images - Bitmap

- Made up of small color squares called *pixels*
- The number of pixels in an image can range from a few hundred to millions
- The image will become distorted if you zoom in (like the image to the right)



## Types of Images - Animated Bitmap

- A set of bitmap images that play in sequence.
- Usually loops
- Impractical for long animations
- Used to made banner ads



## Types of Images - Vector

- A visual representation of numerical lines and curves – sometimes filled in with color
- Does not distort when zoomed in
- Very useful for representing text



## Image Modes - Colors: Grayscale

- Each pixel can only represent black, white or a shade of gray
- Creates much smaller image files
- Not all pictures that appear black and white are done in grayscale



## Image Modes - Colors: Indexed Color

- These images contain a listing (index) of all the colors used
- File size is reduced, but with a loss of precision
- More useful for small images
- The gif file format uses indexed color



## Image Modes - Colors: RGB

- RGB (or Red, Green, Blue) is the color system modern monitors use to display
- Most images intended for use on a computer are RGB images
- Red, Green, and Blue are the three primary colors in light (not Red, Yellow, and Blue)
- RGB is an *additive* color model because colors are added to a black base



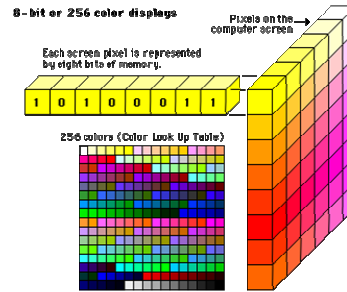
## Image Modes - Colors: CMYK

- CMYK (Cyan, Magenta, Yellow, and Black) is most commonly used for printing
- It is a subtractive color model, because the colors are darkening the white background
- Photoshop can convert an image from RGB to CMYK and back easily, but with a possible loss of information



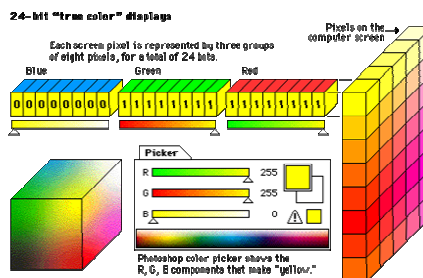
# Image Modes - Channels

- In Photoshop, color information about an image is separated into *channels*; RGB images have three channels, CMYK images have four
- Outside of Photoshop, color modes are often referred to by the total number of bits per pixel – for example 8-bit color is capable of displaying 256 different colors



# Image Modes - Channels: 8 bits / channel

- The range of colors available depends on how long the binary numbers used to represent each pixel are
- 8 bits per channel (a.k.a. 24-bit color) is adequate for candid digital photos or desktop backgrounds





## Image Modes - Channels: 16 bits / channel

- 16 bits per channel allows for a much greater range of color
- These images take up much more space on a hard drive
- Many file formats do **not** support 16-bit color including jpg, gif, and pct
- Converting from 16 to 8-bit color is a *lossy* transformation – information is permanently discarded

## Image Modes - Channels: 32 bits / channel

- 32-bit color is a misnomer, it is actually 24-bit color with the remaining 8 bits used to store *alpha* information
- Alpha information can define parts of an image as transparent, and unlike transparent gifs, there can be partial transparency





## Photoshop Notes

- Photoshop is made by Adobe and is currently in version 10 (a.k.a. CS3) – it has been around a long time and has improved a lot since its inception
- It is **the** industry standard for bitmap picture editing, nothing else comes close
- Photoshop can be very resource intensive – depending on how large the images you're working with are – lots of RAM (> 1GB) is very helpful
- Almost any action in Photoshop can be undone. In fact you can step backwards many times. Try using the History Palette (Window -> History)



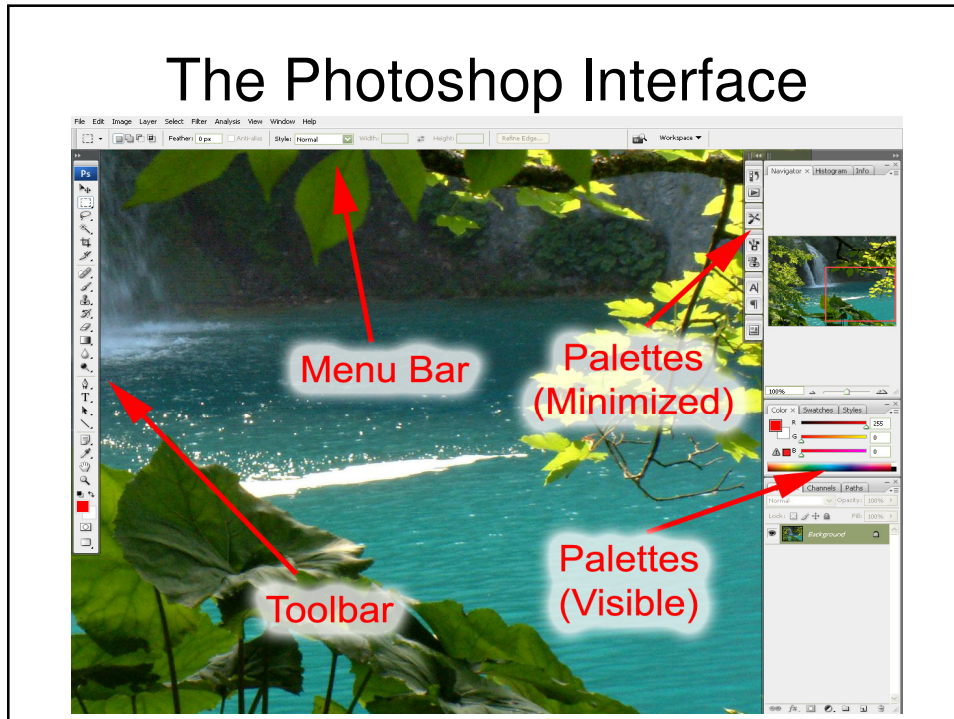
## The Photoshop File Format (.psd)



- Photoshop has its own type of image files, the PhotoShop Document or PSD
- PSDs are very flexible, can use any color mode, and can have 8, 16, or 32-bit color
- They can also get quite large, up to hundreds of megabytes
- PSDs are the only file format that can save layers
- Typically, a Photoshop user will save their project as a PSD, then export into other file formats



# The Photoshop Interface



## Toolbar Finding hidden tools

- Many of the tools in the toolbar share a location with other related tools
- Left-click and hold the mouse button down to bring up all the related tools
- If using a shortcut key, hold down shift and hit the key repeatedly to cycle through the tools







## Toolbar Shortcut keys

- In many cases, it is faster and easier to type shortcut keys than to go through a menu
- When using the menus, Photoshop displays shortcuts to the right of the item which they are assigned to
- Navigation is one of the most important uses of the keyboard:
  - Spacebar + click and drag to pan around the image.
  - Ctrl + Spacebar + left click to zoom in
  - Ctrl + Alt + Spacebar + left click to zoom out

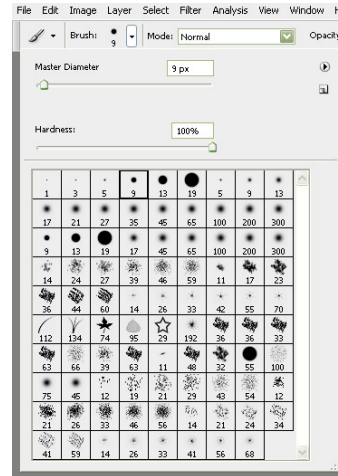
## Toolbar Brush Tool (B)

- The Brush tool paints a consistent solid color over the image
- This is not usually desirable when working with photographs
- With experience, useful techniques can be discovered



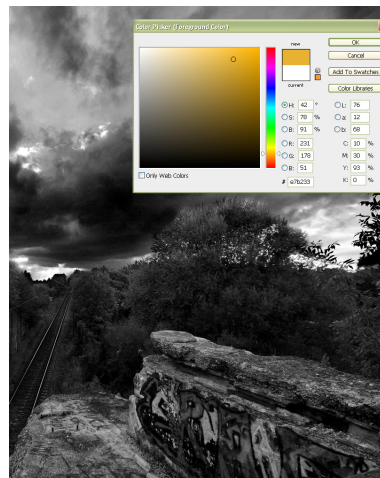
## Toolbar Brush Presets

- On the menu bar at the top of the screen there is a thumbnail of your current brush with the size (in pixels) below it
- Clicking on the thumbnail will open the brush presets and sliders that allow you to control the size and *Hardness* of the brush



## Toolbar Color Picker

- There are many ways to choose a color in Photoshop
- Near the bottom of the tools palate are two overlapping squares – the foreground and background colors.
- Click on the square on the top left to bring up a color picker



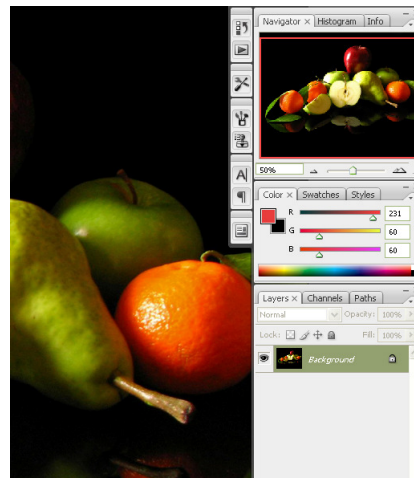
## Toolbar Gradient Tool (G)

- The Gradient Tool creates an even fade from one color into transparency or another color
- The menu bar has options for colors as well as shapes
- By default the foreground and background colors are used



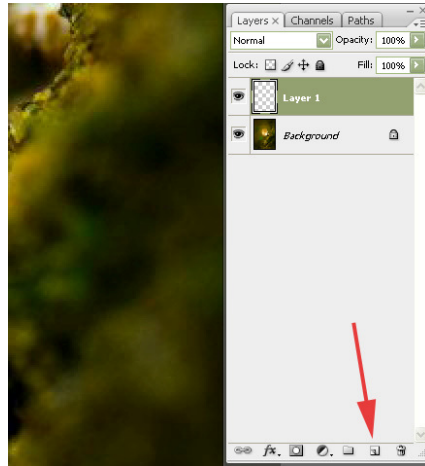
## Palette Navigator

- The Navigator palette shows the whole image, even when you are zoomed in
- Dragging the red square around the palette will pan your view of the image
- The slider at the bottom controls your zoom level



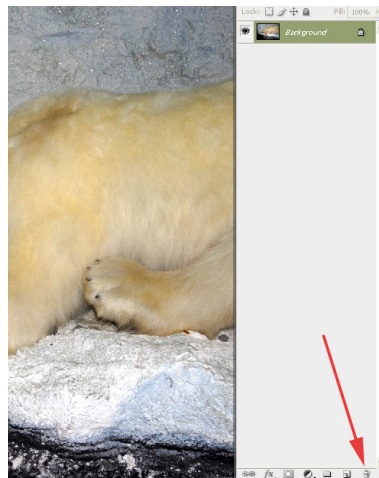
## Palette Layers: New

- Layers are parts of images that are stacked on top of each other and affect the images below them
- Complex images can have many layers interacting in different ways
- To create a new layer, click the icon at the bottom of the layers palette, as shown here



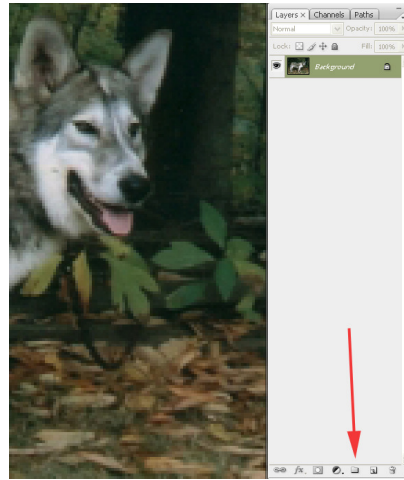
## Palette Layers: Delete

- To delete a layer, highlight it on the layers palette, then click on the trash can icon at the bottom
- Note that there must always be at least one layer present.



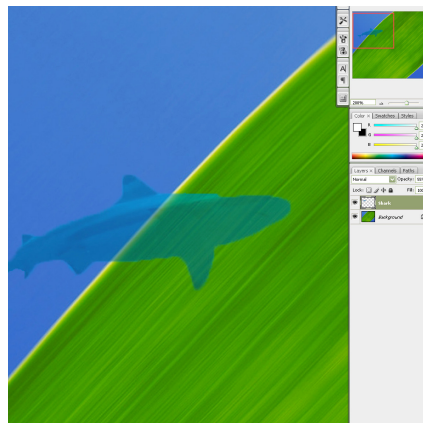
## Palette Layers: Folders

- If the number of layers becomes unwieldy, layers can be put into folders
- Click the folders button to create a new folder
- Double click folder and layer names to rename them



## Palette Layers: Transparency

- Any layer except the background can be made transparent
- Select the layer you wish to alter on the layers palette, then adjust the opacity – 0% is invisible, 100% is fully opaque



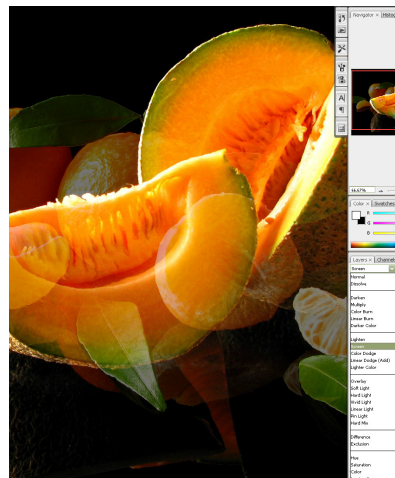
## Toolbar Eraser (E)

- The Eraser Tool does exactly what it sounds like – **however**, it will not work on the Background layer
- The grid of gray and white squares indicates that there is no color information on that part of the image
- Lower layers will show through erased areas



## Palette Layers: Styles

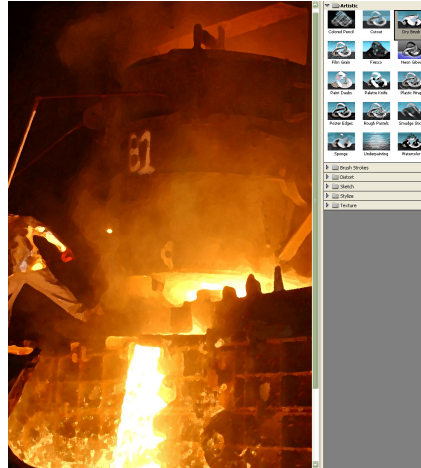
- There are many ways for overlapping layers to interact
- A partially transparent upper layer can be altered by bring up the styles menu (Layer -> Layer Style)
- The General Blending Options allows you to “soften” or “harden” upper layers
- The only way to learn what an option does is to try it!





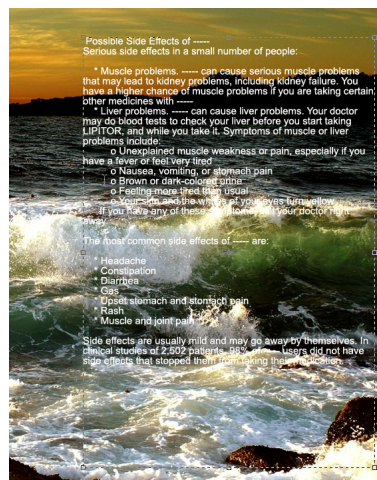
## Palette Layers: Filters

- Filters are powerful algorithms that alter the image in a variety of ways
- The Filter Gallery (Filter menu) allows you to preview how a filter would look applied to the current layer
- Filters are often overused by beginners, try to use them to achieve a goal, not just for their own sake



## Toolbar Type Tool

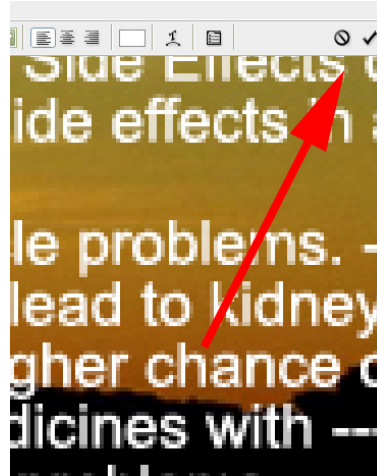
- Compositing text and images is a very common use for Photoshop
- Click on an image with the Type Tool and begin typing to add text
- Clicking and dragging restricts the text to a rectangular area





## Toolbar Type Tool

- When you are done typing, you must click the check box (or Ctrl + Enter) to *commit* the changes
- Clicking the 'no' symbol (or hitting the Escape key) will exit the tool without any changes being made
- Basic formatting tools are on the menu bar



## Selections: Marquee Tool (M)

- The Marquee Tool is used to select an area evenly
- The tool has rectangular and elliptical modes
- While a rectangle is selected choosing crop (Image -> Crop) will cut out the unselected part of the image



## Selections: Magic Wand Tool (W)

- The Magic Wand Tool allows to select colors that are similar to a chosen color
- Clicking anywhere on the image will select pixels that are “similar” to the chosen pixel, as defined by the tolerance value
- Shift clicking will add new selections to the current selection

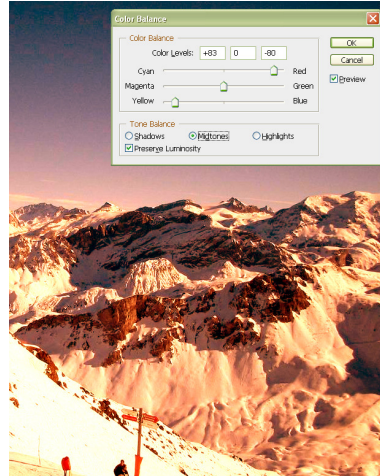


## Selections: Other Tools

- To invert the selection on an image go to Select -> Inverse
- To select the area covered by a particular layer, hold down Ctrl and click on the **thumbnail** portion of the layer on the Layers Palette
- Selection tools can complement each other – with any selection tool active holding down Shift will add to the selection, holding down Alt will subtract from the selection

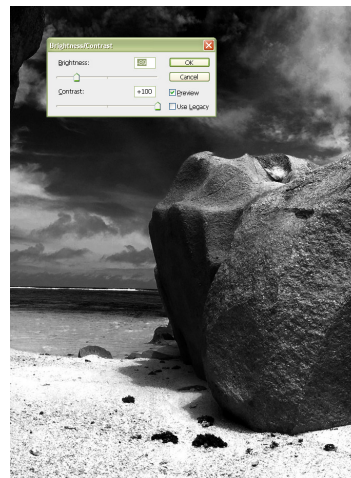
## Image Adjustments: Color Balance

- This palette (Image -> Adjustments -> Color Balance or Ctrl + B) is very useful for adjusting the overall colors in an image or selection
- The controls are divided into Shadows, Midtones, and Highlights, so adjustments will effect dark and light areas differently



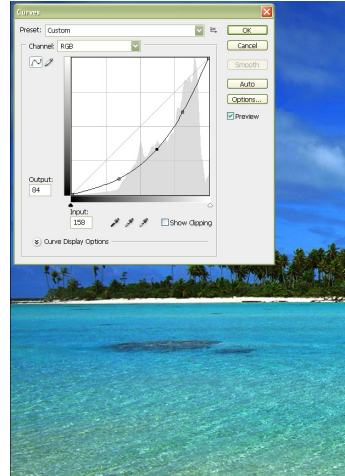
## Image Adjustments: Brightness/Contrast

- A simple but useful tool (Image -> Adjustments -> Brightness/Contrast)
- Increasing the contrast can make an image “pop”
- Decreasing the contrast will made an image look faded



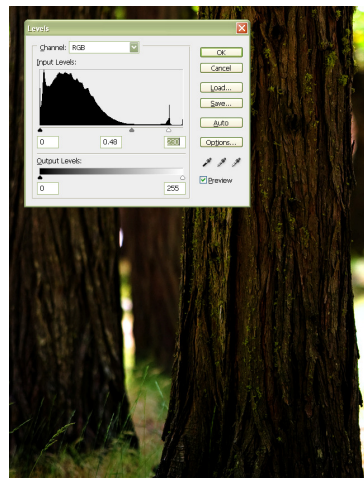
## Image Adjustments: Curves

- An incredibly powerful tool (Ctrl + M)
- The diagonal line represents the transition from dark (bottom left) to light (upper right)
- Dragging a point in the line will effect pixels at that level of brightness more
- For example, clicking near the top of the line and dragging down would make the lightest pixels darker
- Clicking on the line (without dragging) allows you to place more points



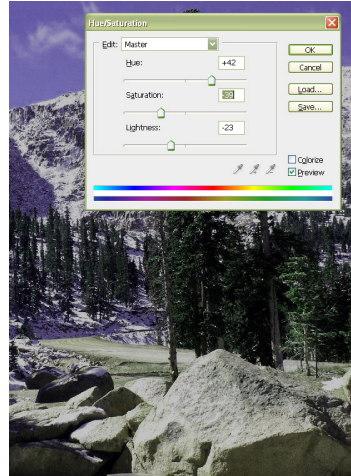
## Image Adjustments: Levels

- One of the most useful and powerful tools in Photoshop (Ctrl + L)
- Like the Curves tool, left to right here represents the actual distribution of pixels (by brightness) in the current image
- The three control points below the graph can be dragged to adjust the brightness of each area
- Clicking on the *Auto* button makes Photoshop guess how to adjust the image



## Image Adjustments: Hue/Saturation

- Another useful tool (Ctrl + U)
- Hue is the exact color (Red-Orange vs. Orange)
- Saturation is the *amount* of color for that hue (e.g. the difference between red and pink)
- Lightness is the relative brightness of the color
- These are very important and commonly used digital color terms



## Toolbar Dodge & Burn (O)

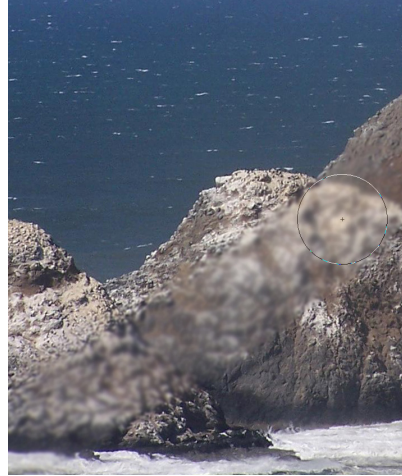
- Dodge and Burn simulate traditional tools used in photography
- They can be used to create highlights and shadows while maintaining the appearance of an unedited photograph
- Good brush selection is key





## Toolbar Blur (R)

- The Blur tool removes detail
- It can be used to “soften” an image, smooth human skin, and blur sharp edges
- It’s best to zoom out frequently when using this tool to see the effect on the whole image



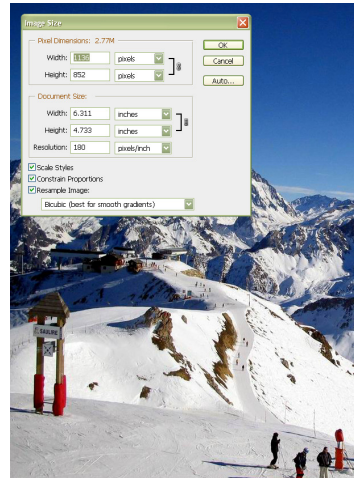
## Toolbar Rubber Stamp (S)

- The Rubber Stamp Tool copies information from one part of an image to another via a brush
- Hold down Alt and click to set the *source* area – then click elsewhere on the image to paint
- Skillful use of this tool can make unwanted parts of images disappear
- Try using the tool with less than 100% opacity (set on the menu bar)



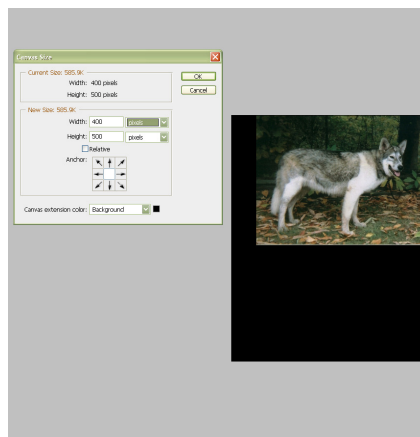
## Image Adjustments: Image Size

- Image size (Image -> Image Size) is a critical aspect of all digital images, and can be adjusted via this tool
- Pixel Dimensions are the more important part, Document Size is for printing
- Constrain Proportions should be checked in most cases



## Image Adjustments: Canvas Size

- If an the area *around* an image needs to be bigger, it can be adjusted with Canvas Size (Image -> Canvas Size)
- The nine-square box with arrows allows you to choose which direction the image will expand to





## Transformations: Free Transform

- With part of the image or a non-background layer selected, hit Ctrl-T to free transform
- The transformed area can then be moved, rotated, squashed, stretched, and distorted
- Hold down Shift while dragging a corner to size proportionally
- Hitting Enter will commit the changes, Esc will cancel the operation

