

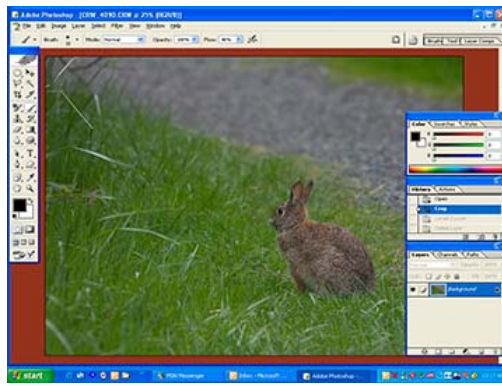
Setting New Black and White Points (Increasing Contrast)

By Gary Ford

This short article will show three ways to set new black and white points in an image thereby increasing contrast, using PhotoShop CS: using Levels, using Curves – Eye Droppers, and using a combination of Threshold and Curves.

Levels

Using a new adjustment layer called levels, black and white points can be easily reset. As an example, we start with an original image of a rabbit near a path, converted from RAW with no changes in the RAW Converter. The contrast in the image is limited and the image is pretty flat in appearance.



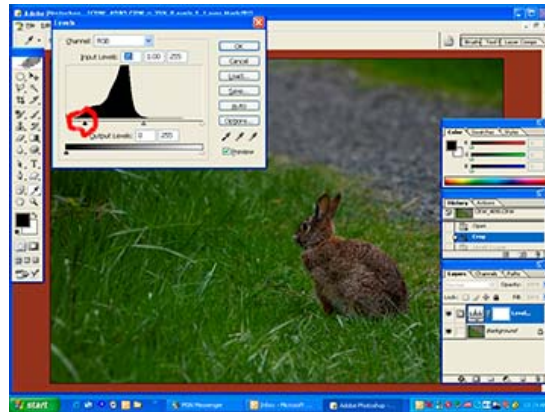
To access a new adjustment layer – Levels go to the upper menu bar and select Layers – New Adjustment Layer – Levels. A window box will occur that gives you an opportunity to make changes to the layer including colour, mode and opacity but we don't wish to make any changes so click okay.



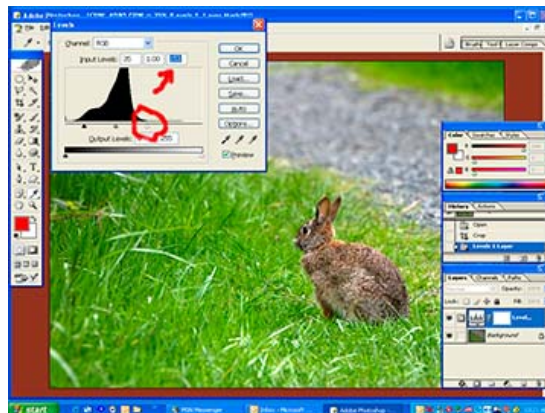
Adjustment layers are like layer masks in that they modify the image but do not change the original image or any other full layer. The effects of the adjustment layer can be made to apply to only part of the image using the masking capability of the adjustment later. More will be offered on using layer masks in a subsequent article.

Once a Levels Adjustment Layer is opened, you will see a histogram with three small triangles below a base line below the histogram – one white, one grey in the middle and

one black. The histogram indicates the distribution of light to dark colours in the image. To set a new black point, point the mouse on the small black triangle, hold down the Alt key, and slide the black triangle to the right until the colour black shows up on the white screen. You may see other colours before you see a speck of black. Those colours indicate that you are clipping off those dark colours that do not fully approximate black. Once the black specs appear, release alt and you will see the effects on the image. In our example, the image definitely got darker.



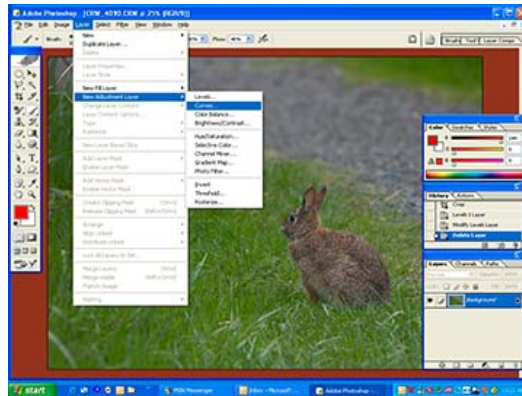
Now point the mouse cursor on the small white triangle, hold down the Alt key and slide the triangle to the left. Again you may see colours other than white – continue to slide the triangle to the left until you see specs of white. Release the Alt key, and you will see the effects of the modification. If you look above the histogram, you will see three boxes containing numbers. These numbers started out as 0, 128, and 255 – 0 represents black, 255 is white, and neutral grey is 128. Having made this modification using levels in this example, we have reset those points at 75 for black and 153 for white. This has dramatically reduced the dark to light range in this image and increased the contrast.



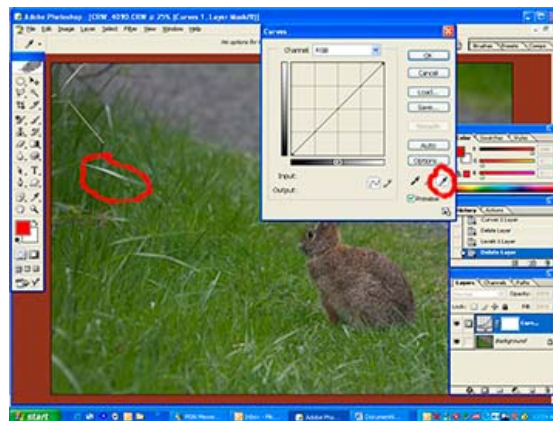
If we wanted to adjust the colour cast of the image, then we would repeat the process with the middle grey triangle sliding it to the right or left – do not hold down the Alt key so you can see the effect this movement of the slider has on the image. Click okay in the histogram window and the changes will be completed.

Curves – Eye Droppers

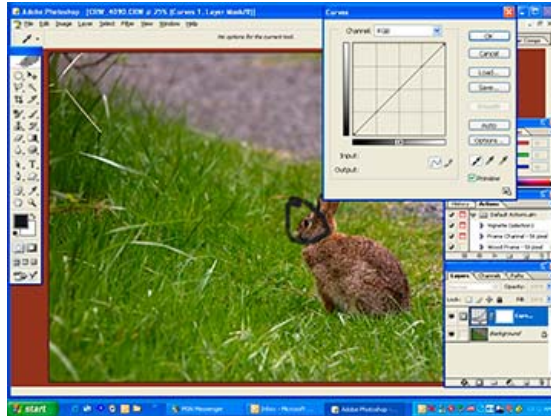
We will start with the same original image. This process would be used instead of the Levels adjustment so the image will be an unchanged original. To access the Curves adjustment layer, click on Layer in the upper menu bar, click on New Adjustment Layer, then click on Curves. A window box will occur that gives you an opportunity to make changes to the layer including colour, mode and opacity but we don't wish to make any changes so click okay.



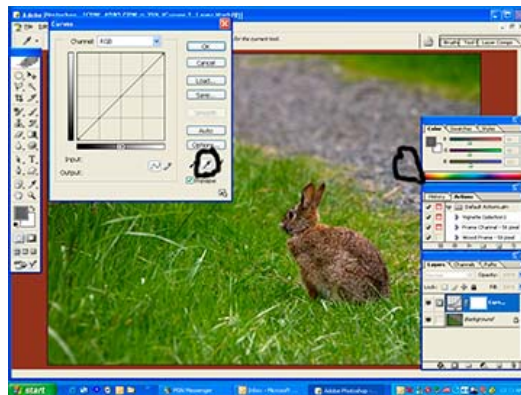
This will open up the Curves window. On the lower right hand corner of this window, you will see three eye droppers, one white, one grey and one black. Click on the white eye dropper and your cursor will change to an eye dropper. Point the tip of that eye dropper on a light area in the image that is close to white. In our example, the white sheen on the blade of grass was used as the white point.



When we click on the white blade of grass, the image lightens considerably. To set the black point, click on the black eye dropper in the Curves window and place it over a point in the image that approximates black. In this case, we clicked on the black of the rabbits eye.



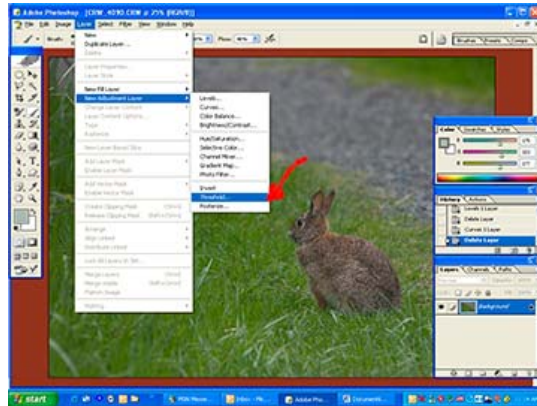
When we click with the eye dropper over the eye, the image will darken considerably. We can similarly modify the neutral grey point by clicking on the image of the grey eyedropper in the curves window and then placing the tip of the eye dropper over a portion of the image that you think should be neutral grey. In the example, we used a portion of the pathway. These adjustments depend on your own sense of what is the darkest portion of the image and what is the lightest, and you can redo any of your selections until the modifications to the image give you the result that pleases you.



Again, as a result of these modifications to the curves layer, we have darkened the darks and lightened the lights. If the histogram for the image fully extended to the black end of the histogram (left side) and fully extended to the white end (right side) and the curve was raised above the bottom line of the histogram at both ends, this will not likely lead to any change in black and white points. This process is to be used for images that have flat contrast and a grayish look, as our original image does.

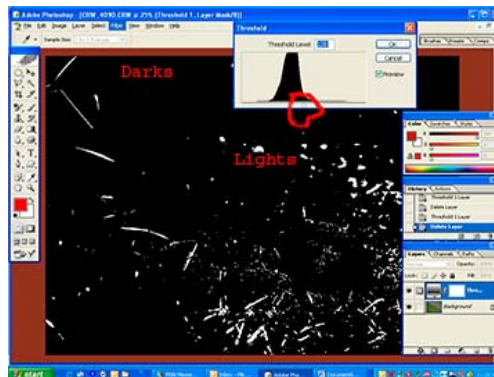
Threshold and Curves

Our third process for setting black and white points and enhancing contrast is much more complex, utilizing two adjustment layers, and actually manipulating the curve line. For this example, we will continue to work on our original image. Create a Thresholds layer by clicking on Layers in the top menu bar, New Adjustment Layer, Thresholds:

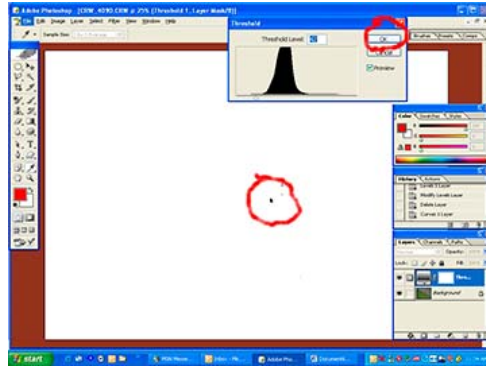


A window box will occur that gives you an opportunity to make changes to the layer including colour, mode and opacity but we don't wish to make any changes so click okay. This creates a temporary Thresholds layer.

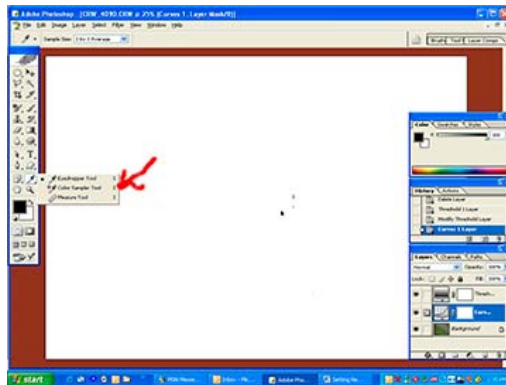
The image screen will go dark, showing some white spots which represent the lightest areas of the image. In our example, the image has more darks than lights so the black area is very large. In addition, the histogram appears with a white triangle below the histogram curve, at the mid point indicating neutral grey.



Place your mouse pointer on that small white triangle, press down the Ctrl key (Command key on a Mac) and slide it to the left. As you do so, you will notice that the screen shifts to white the further left you go and the black areas shrink. Continue to slide to the left until you have small black areas left just large enough to place the tip of an eye dropper. Release the Ctrl key (or Command key on a Mac) and click okay in the Thresholds window to close the histogram.

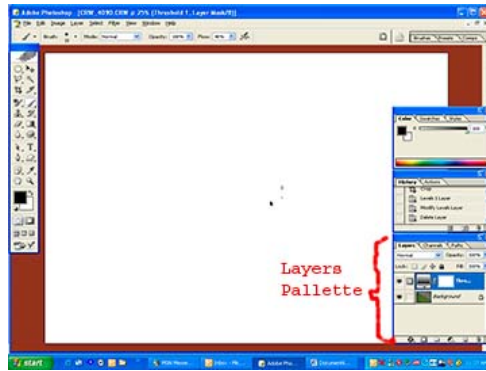


This has located the darkest part of the image, which we will use to set as the black point. In this case, it is the eye of the rabbit. Move your mouse cursor to the far left over the tool bar and the eye dropper tool. You will see a small black mark at the bottom right of the eyedropper tool box. Right click on that black mark and a menu of tools will open up. This is a standard feature of the tool bar. Each tool has several options, accessible by clicking on the little black mark in the lower right of the square for the tool.

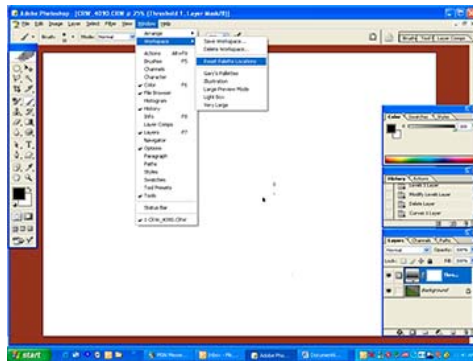


From the menu that emerges from your right click, click on “color sample tool”. Your cursor will change to an eye dropper with a small black square with a white circle in the middle above the eye dropper. Place that cursor over one of the black specs on the sheet of white, and click. A small circle with crosshairs and the number one will appear over that black dot.

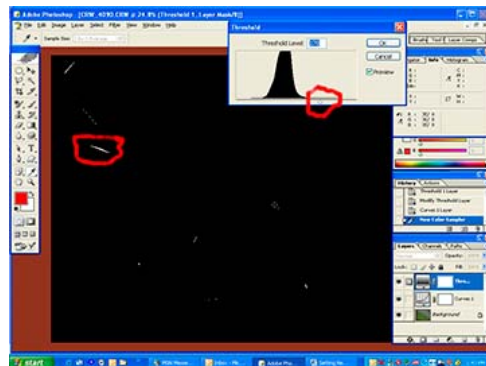
Go down to the layer palette on the lower right portion of the screen, and double click on the symbol of a shaded rectangle with a slider bar below it that is on the left side of the Threshold layer. This will open up the threshold window again.



If you do not find your layers palette, you can bring it on screen, by going to the menu bar at the top of your screen and clicking on Window > Workspace > Reset Palette Locations:

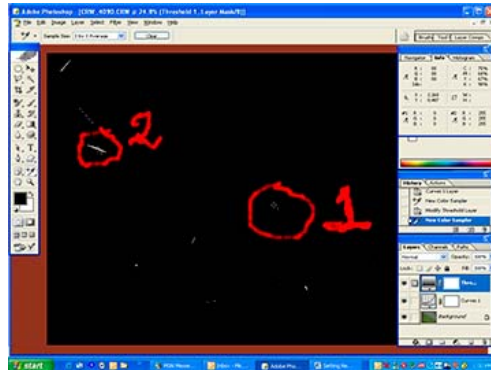


When the threshold window is open. Use your mouse pointer to slide the small white triangle below the histogram to the right. The screen will turn black with diminishing spots of white. When you get to a white spot that is just small enough for the tip of the eye dropper tool, click okay in the threshold window.

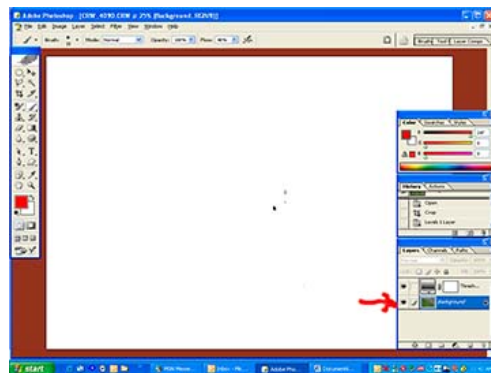


Your cursor should once again be the color sampler tool – if not, go to the tool bar on the left and right click to open the sub menu under the eye dropper tool and select colour sampler. Point the colour sampler cursor so the tip is over the white spot on the screen, and click. You should see a circle with crosshairs and the number two. (NOTE: The colour sampler is different from the standard eye dropper tool and will have a different

effect. If you aren't getting a numbered circle, you aren't using the colour sampler tool) Having done this, we have marked the darkest and lightest spots in the image.

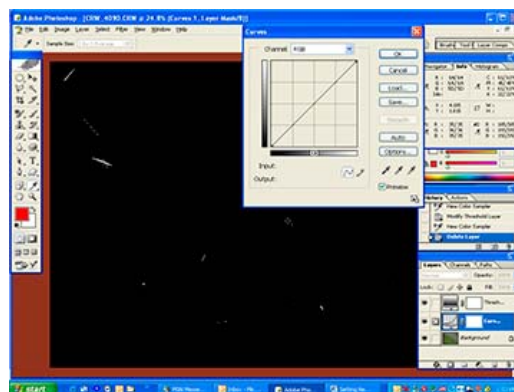


With your mouse cursor, click on the layer titled Background.

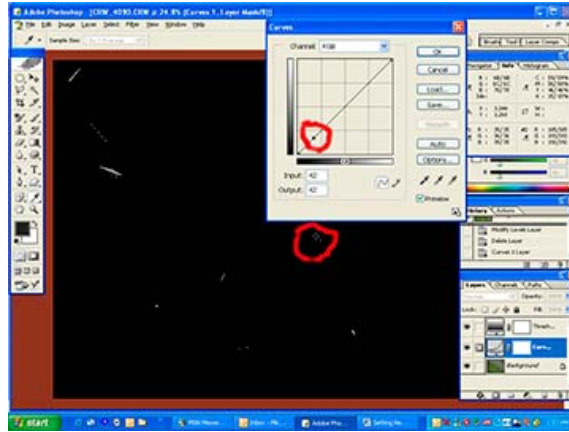


Then point your cursor on Layers in the upper menu bar, click and then click on New Adjustment Layer, then click on Curves. A window box will occur that gives you an opportunity to make changes to the layer including colour, mode and opacity but we don't wish to make any changes so click okay. This will create a Curves Layer in the Layers Palette above the background layer and below the Threshold Layer.

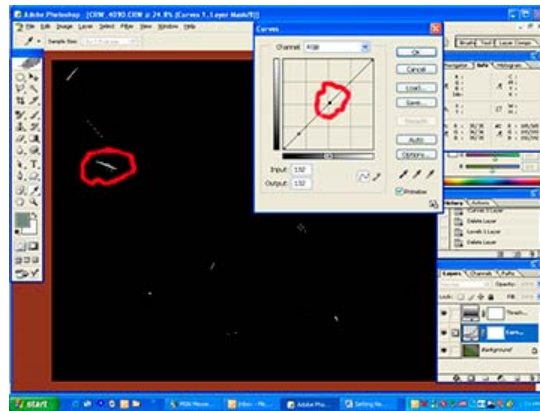
A window will open up with the diagonal curve line.



Move your cursor over the black area in the image, and your cursor will become a standard eye dropper. Place the tip of the eye dropper in the centre of circle #1, hold down the Ctrl Key (Command on a Mac) and click. If you look at the diagonal line, you will see a small black mark on the line in the lower left corner.

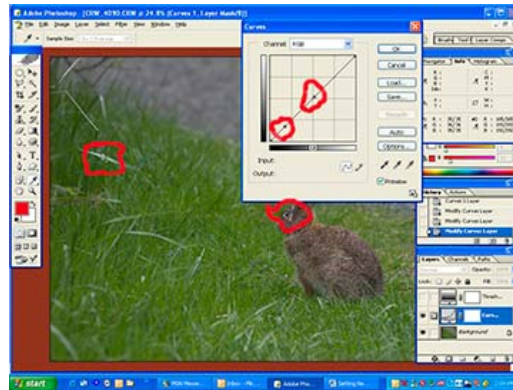


Point the tip of the eye dropper over the centre of circle #2 and click. You will see a black mark appear on the diagonal line in the upper right corner.

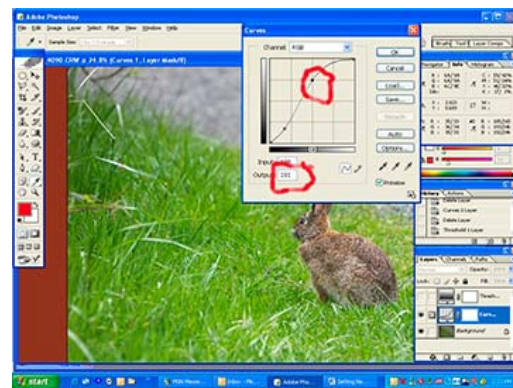


Your diagonal line now has two black marks on it. Click okay in the Curves window and then click on the eye beside the threshold layer in the layer palette and you will see the image again. Clicking on that eye removes the layer from view. It does not delete the layer. You can click these eyes on and off to view or remove any layer from view.

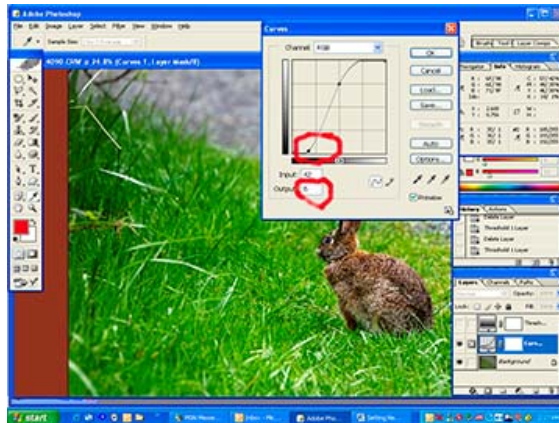
Click on the icon in the curves layer that is a rectangle with a curved and ascending line in it and a slider below the rectangle. This should reopen the Curves window over top of a portion of the image. You will see the circles with cross hatches and numbers and the two corresponding black marks on the curves line.



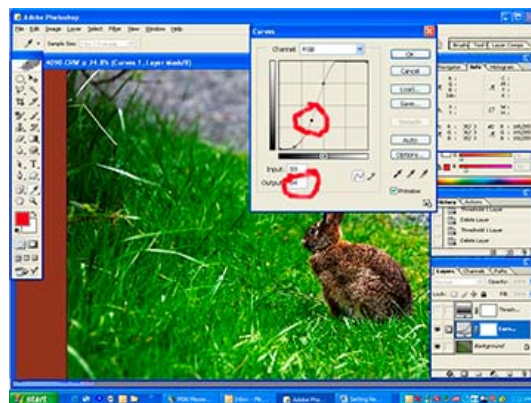
Click on the mark at the top right of the diagonal line. Now use your up arrow key to slowly move the black dot upward. Watch the image lighten as the number beside the output square at the bottom of the curves window gets higher.



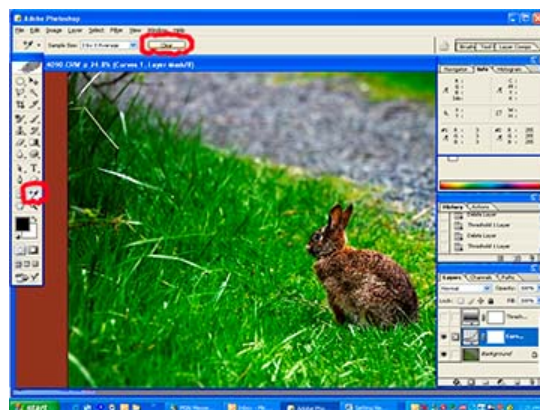
It has been suggested that you wouldn't make that number any higher than 248 or so in any adjustment using this technique. In this example, we adjusted to a setting of 191 and thought that it seemed bright enough. Now click on the lower black mark on the curves line, and use your down arrow key to darken the image. As you do so, notice the number decrease in the output box at the lower left of the curves window as the image darkens. Generally you wouldn't want to take that number any lower than 5 or 6. As you do this, you will also notice that the curve line is getting steeper. This is adding contrast to the image.



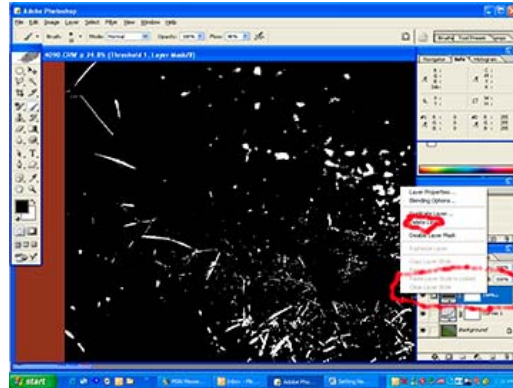
You can use this process to move the two black marks on the curves line to get the image to the place that satisfies you the most. If you click anywhere else on the line, it will add a new point and you can move it as well. The two points at the extreme control the darkest and lightest tones while anything between them controls mid tones. Placing a mark in the mid line and dragging it down will further darken the image.



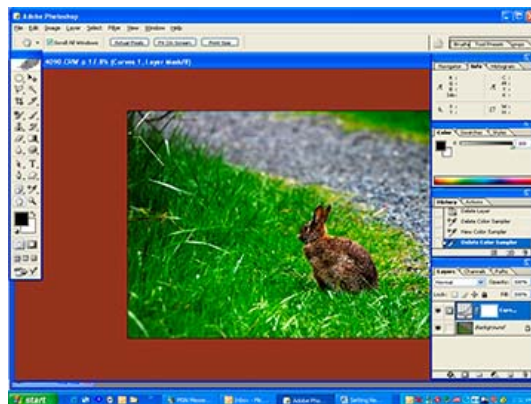
You can make adjustments to taste and when satisfied, click okay in the upper right of the curves window. To clean up after this work, we can remove the numbered circles by making sure we have the colour sampler tool turned on (right click on eye dropper in tool bar and select colour sampler) then clicking clear at the top of the screen.



We should also remove the Threshold Layer from the layer palette as we no longer need it. Click on the Threshold Layer and it will turn blue in the layer palette and the threshold black and white image will reappear. Then with your cursor over that layer, right click. A menu will appear and one of the options is delete layer. Click on that option.



We would then have our image with new white and black points set and contrast enhanced.



We looked at three ways to set black and white points in an image, two of which were relatively simple to use – Levels and Curves Eye Droppers, and one of which was much more complex to use – Thresholds and Curves. You can choose which approach to use for any given image. In general, where you want the most control over contrast adjustments, use the more complex Threshold – Curves approach. Where you think an image needs very little adjustment, or where the histogram shows a large amount of light colors and a large amount of dark colours, use the Levels approach.