

Photoshop Blend Modes Explained

Working with blend modes is almost always an experimental process. Because it's nearly impossible to predict the results, you always seem to end up experimenting with different modes and Fill Opacities until you get the results you're looking for.

In this article I'm going to give you a high-level view of what the various blend modes do, and then I'll dig deeper into the nuts and bolts of the blend modes by explaining some of the math involved, and their interrelationships with each other. I'm not going to "show" you how the blend modes work—I'm going to "explain" how they work. By the time you finish reading this article, you should have a better idea of how to use blend modes and where to begin your "experimentation," which in turn should reduce the time it takes to achieve the results you're looking for.

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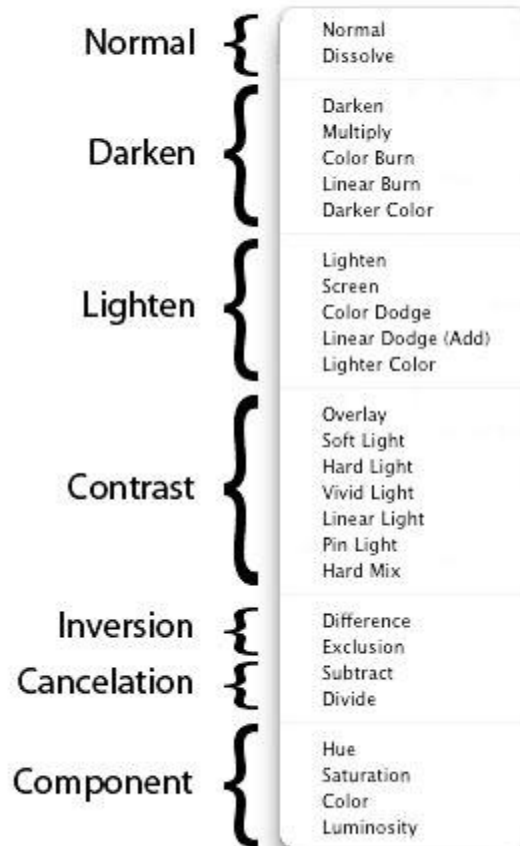
How Blend Modes Work

The Opacity slider in the Layers Panel allows you to blend the active layer with the layers below by making the active layer translucent, which in turn allow the layers below to show through. The blend modes found in Photoshop allow the same process to take place, but by using different mathematical calculations for each blend mode. As of Photoshop CS5, there are 27 blend modes—2 new blend modes, Subtract and Divide, were recently added. Any changes made using blend modes are parametric, i.e., the changes are non-destructive, and you can always revisit your blend mode settings and readjust them as needed without damaging the pixels in your original image.

Blend Mode Groups

While the blend mode names don't make all that much sense, Adobe did group the blend modes into logical groups.

Blend Mode Groups



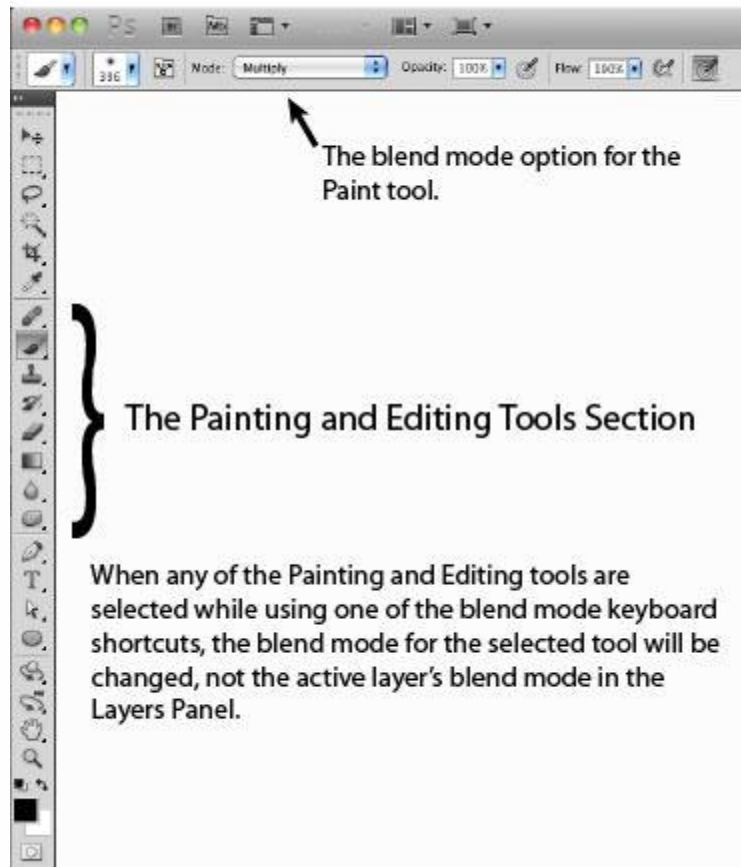
Blend Modes Groups

Keyboard Shortcuts

The majority of blend modes have keyboard shortcuts. To use these shortcuts, your current tool must be something other than one of the tools found in the painting and editing section of the Tools Panel (where the Brush Tool, Healing Brush, Stamp, Eraser, etc. are found—see the illustration below). This is because the tools in the painting and editing section have blend mode settings of their own, and if you have one of these tools selected, their blend mode options will take precedence over the blend mode options found in the Layers Panel. For example, if you use Shift+Option+M to switch to the Multiply blend mode while you have the Paint tool selected, the Paint tool's blend mode will be changed to Multiply, not the blend mode

option in the Layers Panel. The good news is that these same blend mode shortcuts DO work for the painting tools, you just need to pay attention to what tool you have selected when you use the shortcuts.

The Painting and Editing tools in the Tool Panel have their own Blend Mode settings.



The Painting and Editing section of the Tools Panel

It's also possible to scroll up or down the blend mode list by using the keyboard combinations Shift+ (scrolls down the blend mode list), or Shift- (scrolls up the blend mode list). These keyboard shortcuts also work differently depending on what tool you have selected in the Tools Panel. For example, if you have the Paint tool selected and you use Shift+, the blend mode for the Paint tool will scroll down to the next blend mode in the list (not the blend mode in the Layers Panel).

There are also keyboard shortcuts for changing the Standard Opacity and Fill Opacity settings in the Layers Panel. To use these shortcuts, your current tool must be something other than one of the tools found in the painting and editing section of the Tools Panel. To change the Standard Opacity using the keyboard, just hit a number. For example, you can change the opacity to 50% by hitting the 5 key, or change the opacity to 100% by hitting the 0 key. If you press the 0 key two times quickly, you'll change

the opacity to 0%. You can even press two different numbers in sequence. For example you can set the opacity to 35% by pressing the 3 key quickly followed by the 5 key.

Adjusting the Fill Opacity works using the same technique, but you need to use the Shift key when hitting a number. For example, to set the Fill Opacity to 33%, use the keyboard combination Shift+33. These keyboard shortcuts also work when one of the tools in the painting and editing section of the Tools Panel is selected, however once again, the blend mode settings for these tools take precedence over the blend mode settings in the Layers Panel. For example, if you have the Paint tool selected and you use the keyboard combination 22, the opacity for the Paint tool will be changed to 22%. One thing to note is that there isn't a Fill Opacity setting for the any of the tools in the painting and editing section, however, some of the tools do have a Flow setting (the Brush Tool for example). For those tools that have a Flow setting, using Shift+number will change the Flow for the selected tool. For example, if you use Shift+22 with the Paint tool selected, the Flow for the Paint tool will be set to 22%.

Keyboard Shortcuts for Blend Modes

Shift + Option + N	→	Normal
I	→	Dissolve
K	→	Darken
M	→	Multiply
B	→	Color Burn
A	→	Linear Burn Darker Color
G	→	Lighten
S	→	Screen
D	→	Color Dodge
W	→	Linear Dodge (Add) Lighter Color
O	→	Overlay
F	→	Soft Light
H	→	Hard Light
V	→	Vivid Light
J	→	Linear Light
Z	→	Pin Light
L	→	Hard Mix
E	→	Difference
X	→	Exclusion Subtract Divide
U	→	Hue
T	→	Saturation
C	→	Color
Y	→	Luminosity

(Windows: Shift + Alt + Letter)

Commonly Used Blend Modes

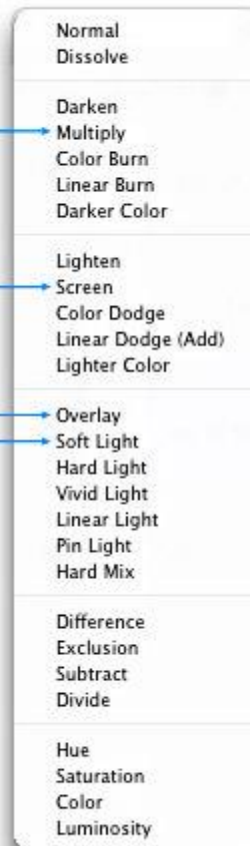
Some of the more commonly used blend modes are Multiply, Screen, Overlay and Soft Light.

Commonly Used Blend Modes

Darkening

Lightening

Contrast



Commonly Used Blend Modes

Blend Mode Opposites

Each of the blend modes in the Darken group have an opposite (complementary) mode in the Lighten group. These “opposites” use slightly different math to arrive at their results, but the logic they use is similar but reversed. For example, with the Darken blend mode, if the pixels on the active layer are darker than the ones on the layers below, they are kept in the image. The opposite blend mode to Darken is Lighten, and with the Lighten blend mode, if the pixels on the active layer are lighter than the ones on the layers below, they are kept in the image.

Opposite Blend Modes

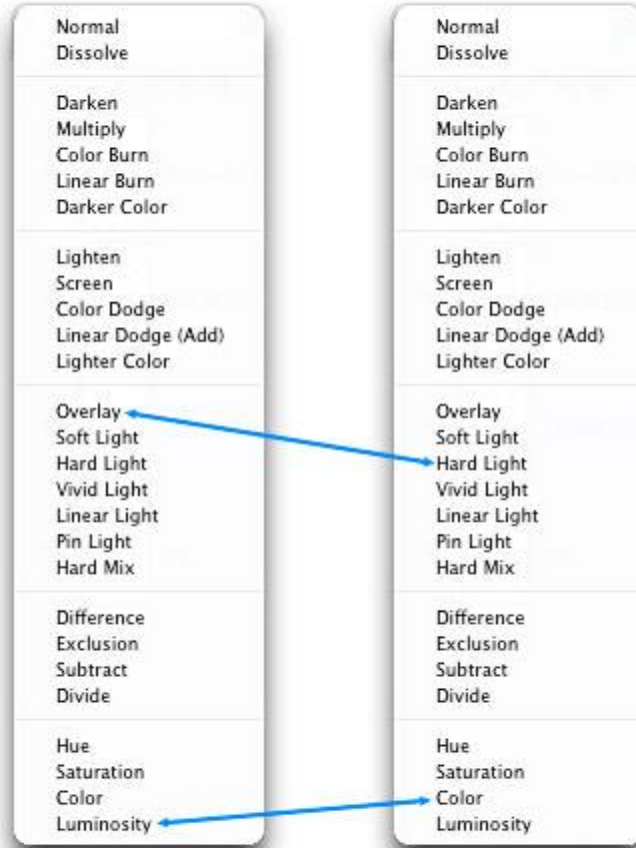


Blend Mode Opposites

Commutated Blend Modes

There are 2 pairs of blend modes that are commuted versions of each other. The first commuted pair is the Overlay and Hard Light modes. The second pair is the Luminosity and Color modes. When 2 blend modes are commuted versions of each other, if you apply one blend mode to the active layer, you will get the same results if you add the other (commuted) blend mode to the underlying layer, and then reverse the order of the layers.

Commutated Blend Modes



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Commutated Blend Modes

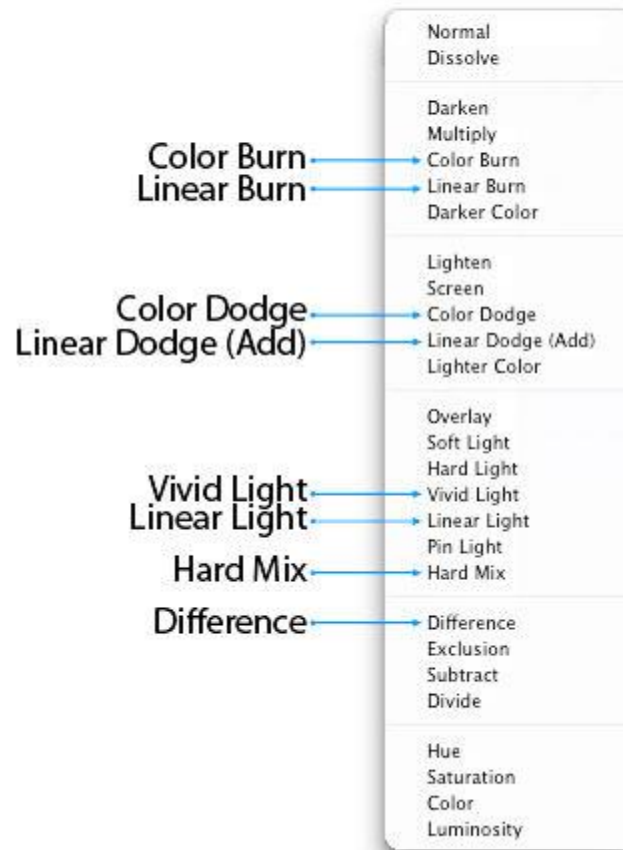
The “*Special 8*” Blend Modes

There are 8 blend modes that I’ll be referring to as the “*Special 8*.” These blend modes behave differently when Fill Opacity is adjusted, compared to when standard Opacity is adjusted. The blend modes that aren’t members of this *Special 8* group react the same to both Fill and Opacity changes (*assuming there are no Layer Effects*), but with these *Special 8* blend modes, 40% Opacity will look different than 40% Fill, or 30% Opacity will look different than 30% Fill, etc. For all of the other blend modes (the modes that aren’t part of the *Special 8*), 40% Opacity looks the same as 40% Fill, or 20% Opacity looks the same as

20% Fill, etc. This is an important concept to understand, because it can extend the capabilities of these blend modes. For example, the Hard Mix blend mode usually doesn't look all that great, but when you adjust the Fill Opacity for this mode, you can get some great results. The blend modes that are members of this *Special 8* group are Color Burn, Linear Burn, Color Dodge, Linear Dodge (Add), Vivid Light, Linear Light, Hard Mix, and Difference.

The "Special 8"

Blend Modes that react differently to Fill Opacity than Standard Opacity



The "Special 8" Blend Modes

Brush Tool-Specific Keyboard Shortcuts

The Brush Tool has some additional blend modes and associated keyboard shortcuts. These blend modes, which aren't found in the Layer panel's blend mode list, are "Behind" and "Clear." There is also an Airbrush option that, while it's not really a blend mode, it does have a keyboard shortcut that's worth mentioning. The behind blend mode will apply paint only on transparent pixels in a layer, and will leave

the opaque pixels intact. The Clear blend mode basically turns your brush into an eraser by making the pixels you paint on transparent.

Brush Specific Blend Mode Keyboard Shortcuts

Shift + Option + P → Airbrush

Shift + Option + N	Normal
I	Dissolve
Q	Behind
R	Clear
K	Darken
M	Multiply
B	Color Burn
A	Linear Burn Darker Color
G	Lighten
S	Screen
D	Color Dodge
W	Linear Dodge (Add) Lighter Color
O	Overlay
F	Soft Light
H	Hard Light
V	Vivid Light
J	Linear Light
Z	Pin Light
L	Hard Mix
E	Difference
X	Exclusion Subtract Divide
U	Hue
T	Saturation
C	Color
Y	Luminosity

(Windows: Shift + Alt + Letter)

Brush-Only Blend Modes Keyboard Shortcuts

Pass Through Mode

The default blend mode for a layer group is “Pass Through.” The Pass Through mode tells Photoshop to act as if there isn’t a group—it’s like temporarily taking the layers out of the group to perform the blending in the usual order. If Pass Through is changed to a different mode, you’re basically changing the order in which the layers are processed—all layers within the group are blended first, and then the resulting

composite is blended with the layers below using the blend mode selected for the group (the layers within the group are acted on first).

Luminance Blending

The luminance blending options can be accessed by double-clicking on a layer near (but not on) the layer name, or by clicking on the “Add a Layer Style” icon in the layers panel, and selecting “Blending Options...” In this dialog box, you will see 2 sliders, the “This Layer” slider, and the “Underlying Layer” slider.

The “This Layer” slider controls which luminance levels are visible in the active layer. The “Underlying Layer” slider controls which luminance levels are visible in the composite view of all of the layers below the active layer (it forces the lower pixels through to the active layer).

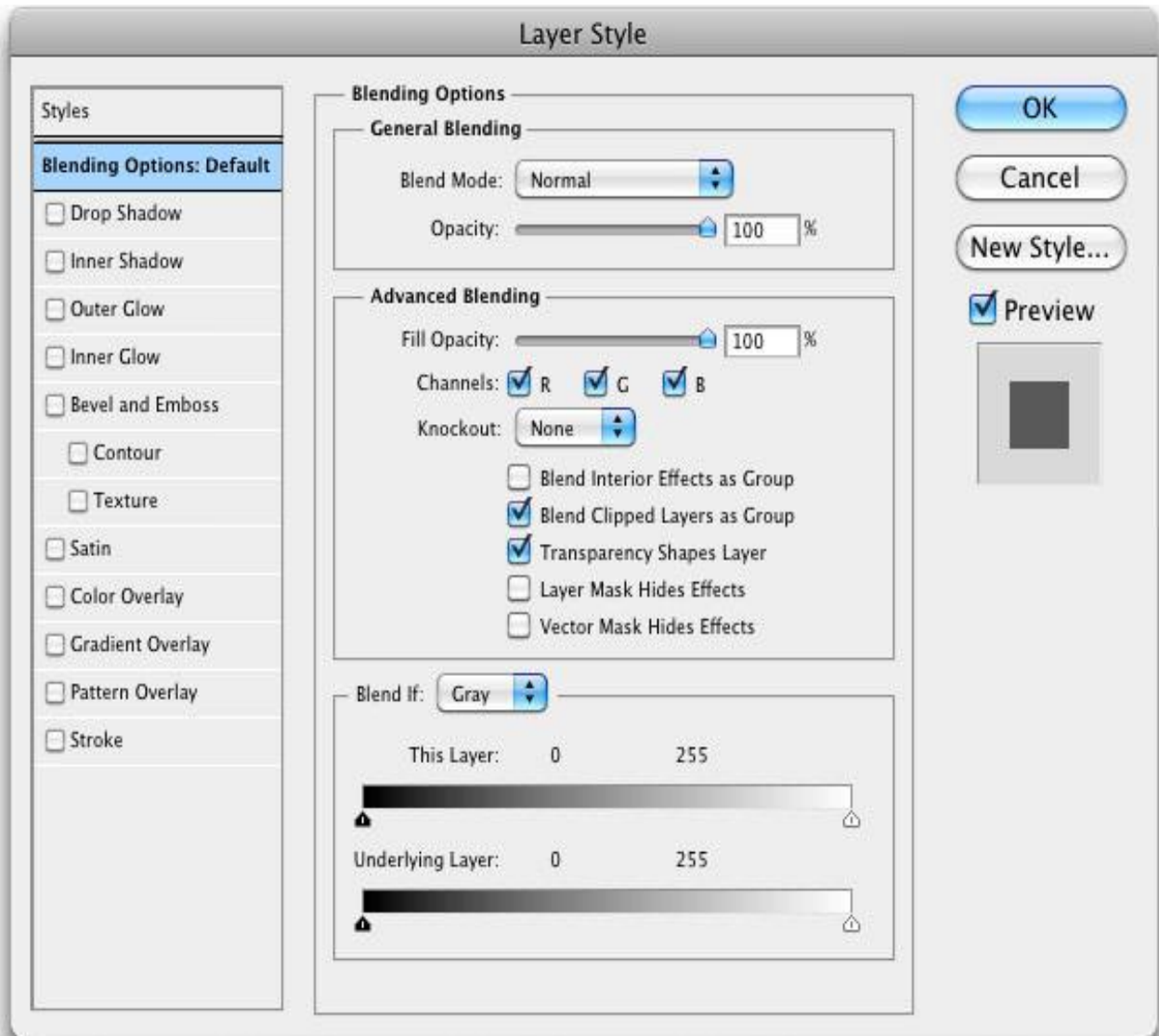
When the “Blend If” option is set to Gray (the default), these 2 sliders will work based on the luminance levels of all RGB color channels. To make luminance blending modifications to just one color channel, select the color of the channel you want to work with (Red, Green or Blue).

When adjusting the “This Layer” slider, if you slide the white triangle to the left, any luminance levels to the right of the triangle will become transparent, and the composite pixels from the layers below will show through. If you slide the black triangle to the right, any luminance levels to the left of the triangle will become transparent, so the composite pixels from the layers below will show through. Any luminance levels between the 2 triangles will be opaque. If you look closely at the black and white triangles, you will notice that there is a cleft running down their centers. This cleft indicates that the triangles can be split. To split the triangles, hold down the Option key (Windows: Alt) while dragging one half of a triangle away from the other half. When you split a triangle, any luminance levels between the 2 halves will gradually range from transparency to opacity. This useful technique is often used to introduce smoother transitions between transparency and opacity.

The “Underlying Layer” adjustments work the same as the “This Layer” adjustments. The only difference is that this slider will determine which luminance levels are visible in the composite view of all of the layers below the active layer—it forces the lower pixels through (up) to the active layer.

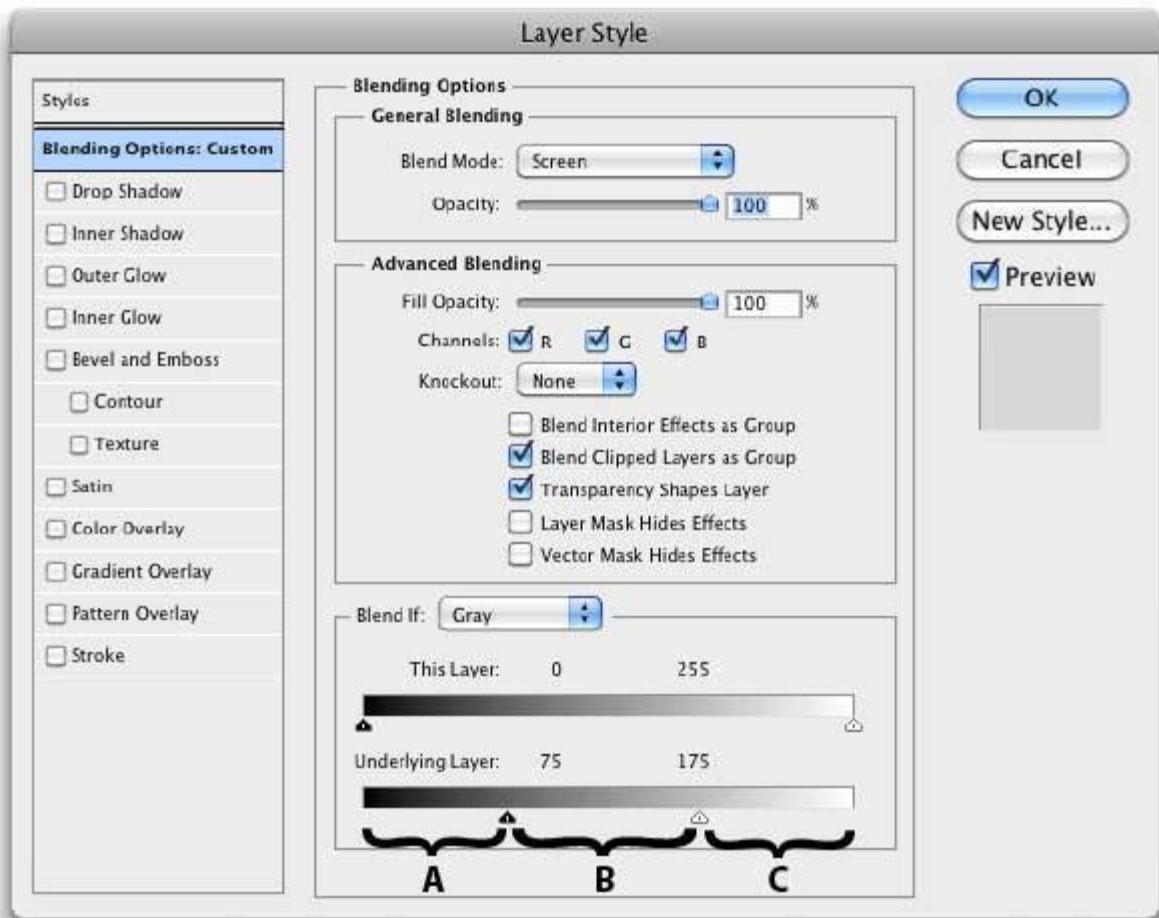
You will also notice that the Blending Options dialog box has a Blend Mode list and Opacity slider. These options mirror the options found in the Layers Panel, so you can make your adjustments in either location. There is also an “Advanced Blending” section in this dialog box that I’ll discuss in a future article.

Default Settings for Luminance Blending



Luminance Blending – Default Settings

Luminance Blending (Blending Options)



- A = Luminance levels below 75 will be transparent**
- B = Luminance levels between 75 and 175 will be opaque**
- C = Luminance levels above 175 will be transparent**

Luminance Blending – Simple Underlying Layers Adjustment

The illustration below shows the use of the “Underlying Layers” slider with both of the triangles split.

- All luminance levels below 30 will be transparent
- Luminance levels between 30 and 57 will gradually be transitioned from transparent to opaque for a smoother effect
- All luminance levels between 57 and 200 will be opaque

- Luminance levels between 200 and 227 will gradually be transitioned from opaque to transparent for a smoother effect
- All luminance levels above 227 will be transparent
- To save it to Lightroom use Control S.



Luminance Blending – Split Triangles for Smooth Transitions