

Blend modes notes

These are my notes on blend modes, garnered from a range of sources, including the official Affinity Photo videos (by James Ritson). – Dave (dmstraker)

Contents

History	3
Basics.....	3
Normal category	4
Normal	4
Dissolve	4
Darken Category	4
Darken.....	4
Multiply.....	5
Colour Burn	5
Linear Burn.....	5
Darker Colour	5
Lighten category	5
Lighten.....	6
Screen.....	6
Colour Dodge	6
Linear Dodge (Add)	6
Lighter Colour.....	6
Contrast category.....	6
Overlay	7
Soft Light	8
Hard Light.....	8
Vivid Light.....	8
Linear Light.....	9
Pin Light.....	9
Hard Mix.....	9
Inversion category.....	9
Difference.....	9
Exclusion	10
Subtract.....	10

Divide	10
Component category	10
Hue	10
Saturation.....	10
Colour.....	10
Luminosity.....	11
Painting modes	11
Behind	11
Clear	11
Affinity adds	11
Average	11
Negation.....	11
Reflect	11
Glow	12
Contrast Negate	12
Erase.....	12
Group blending	12

History

The 19 original blends first appeared in Photoshop 3.0 in 1994 when Layers first appeared.

- Normal, Dissolve | Darken, Multiply, Colour Burn, Darken Colour | Lighten, Screen Colour Dodge, Lighter Colour | Overlay, Soft light, Hard light | Difference, Exclusion | Hue, Saturation, Colour, Luminosity

Five further blends added in Photoshop 7 in 2002.

- | Linear Burn | Linear Dodge (add) | Vivid Light, Linear Light, Pin Light | |

Another in Photoshop CS 2003

- | | | Hard Mix | |

And in Photoshop CS5 2010

- | | | | Subtract, Divide | |

Painting modes also include

- Behind, Clear

Overall, then, there are 27 PS blend modes:

- Normal: Normal, Dissolve, (plus Behind and Clear in paint tools only)
- Darken: Darken, Multiply, Colour Burn, Linear Burn, Darken Colour
- Lighten: Lighten, Screen Colour Dodge, Linear Dodge (Add), Lighter Colour
- Blend: Overlay, Soft light, Hard light, Vivid Light, Linear Light, Pin Light, Hard Mix
- Inversion: Difference, Exclusion, Subtract, Divide
- Colour: Hue, Saturation, Colour, Luminosity

Affinity Photo additions:

- Average
- Negation
- Reflect
- Glow
- Contrast Negate
- Erase

Basics

- Any item in layers panel can use blending modes, including pixel layers, adjustment layers and groups.
- Blends happen one pixel at a time, between top *blend* layer and bottom *base* layer, giving a *result* layer. Base + Blend = Result.
- Opacity and Fill have the same result in 19 of the 27 blend modes.
- Many stronger blends work better at low opacity. Try changing this before giving up on a blend.

Normal category

<i>Action</i>	Basic
<i>Effect</i>	
<i>Use</i>	

Normal

<i>Action</i>	Top layer only is visible except when transparent.
<i>Effect</i>	Layers below invisible.
<i>Use</i>	Use in merged layer that combines layers below. Use in frequency separation portraits to blend out hotspots and uneven skin. Low opacity. Do before dodge/burn. Non-destructive painting: New pixel layer, Blend Mode: Normal. Paint on empty layer. Lets you play with Opacity, blend, etc.

Dissolve

<i>Action</i>	Reducing Opacity shows a diffusion dither pattern over base layer.
<i>Effect</i>	Looks like Normal when 100% Opacity. Pixels are not blended. You get either a blend pixel or base pixel.
<i>Use</i>	To create granulated or grainy effects over an image or layer.

Darken Category

<i>Action</i>	Darker pixels on blend layer are visible. Lighter ones become translucent.
<i>Effect</i>	Anything white becomes invisible. Anything darker than white has some darkening effect on pixels below.
<i>Use</i>	Create darker elements of image. Affinity: Unsharp Mask and Blend Mode. Radius right up. Blend Mode: Darken. This 'thickens up' only darker areas such as window frames.

Darken

<i>Action</i>	Looks at luminance of blend and base pixels. Selects whichever is darker. Uses RGB channels separately (unlike Darker Colour).
<i>Effect</i>	Black opaque. White transparent. Greys look kind of translucent (as individual pixels vary). Not very attractive.
<i>Use</i>	Often need to reduce Opacity. Creates a darkened/faded look at about 65% Opacity. Use with Lighten to create a soft-focus effect. Blur two layers and apply Darken mode to one and Lighten mode to the other to do this. The Opacity of each layer can be adjusted for the best effect. Use with Unsharp Mask to 'thicken up' darker areas such as window frames. Also to increase contrast in underexposed images (radius slider right up). To remove halo after haze removal: Add Gaussian Blur, checking 'Preserve alpha', blend mode: Darken, radius about 20. This gives darkish halo. Then invert the Gaussian Blur layer (Layer/Invert). Then paint in white over any visible haloing (this uses built-in mask for all adjustments) to restore dark halo. Then reopen Gaussian Blur and reduce Opacity

	until halo disappears (dark halo is counterbalancing light halo). Note: Multiply often better for general darkening.
--	---

Multiply

<i>Action</i>	Multiplies base luminosity by blend luminosity to give result luminosity. So $0.5 \times 0.5 = 0.25$ (darker). White in blend layer has no effect. Darker greys progressively darken the image.
<i>Effect</i>	Nicer version of Darken. Image looks more 'real' than Darken as colours are retained.
<i>Use</i>	25-75% Opacity often best. Two similar layers with Multiply result in darker image. Can be a useful trick to cope with under-exposure. Even better: Add curves or levels layer rather than duplicate image as this saves a lot on file size (and offers adjustment too). Multiply makes white disappear, so white page with black text on top of image shows image underneath. Opacity makes white page transparent. Intensifying lighting: Duplicate lighting layer and set blend mode to Multiply. Increase Ambient, Specular and Shininess. Retweak Ambience on original layer and widen the cone a bit. Add colour cast: Layers/New Adjustment Layer/Recolour. Change Hue to orange. Turn down saturation for faint brown (woody scene). Blend Mode: Multiply. Come back later to tinker with this if needed to take edge off orange hue.

Colour Burn

<i>Action</i>	Darkens the base pixel to reflect the blend pixel by increasing the contrast between the two.
<i>Effect</i>	Darker than Multiply. Darkens the bottom colour pixels relative to the values of the top colour pixels. More highly saturated mid tones. Reduced highlights. Looks very similar to using Burn tool. Changes with Opacity.
<i>Use</i>	Often better at 50% Opacity to boost saturation and contrast.

Linear Burn

<i>Action</i>	Darkens base pixel, based on the value of the blend pixel colour.
<i>Effect</i>	Darker than Multiply. Less saturated than Colour Burn. So heavy, but ok. Creates the greatest contrast in dark tones than any other blend mode in this Darken category.
<i>Use</i>	Create washed-out effects and dark, vintage fades at about 75% Opacity.

Darker Colour

<i>Action</i>	Compares the total of all channel values for the blend and base colour and displays the lower value colour. Note: does not blend just pixels. Looks at composite of RGB channels, not individually (which Darken does).
<i>Effect</i>	Very similar to Darken. Unattractive.
<i>Use</i>	Odd effects.

Lighten category

<i>Action</i>	Lightens parts of image.
---------------	--------------------------

<i>Effect</i>	Opposites of each Darken mode.
<i>Use</i>	Selective lightening.

Lighten

<i>Action</i>	Looks at the colour information in each channel and selects the lightest base or blend colour. As with Darken, uses RGB channels separately.
<i>Effect</i>	Looks a bit like a foggy day with increasing blend layer lightness. Dark is transparent, White just goes white.
<i>Use</i>	Use in frequency separation portraits to lighten areas such as under eyes. Perk up dominant eye in portrait: Select background layer. Layer/New Live Filter Layer/Live Unsharp Mask layer. Radius 100. Blend mode: Lighten. Layer/Invert, then paint in white on eye to sharpen/brighten it. Ensure Opacity high enough. Sharpen stars: Filters/Sharpen/Unsharp Mask. Blend Mode: Lighten. Radius right up.

Screen

<i>Action</i>	Multiplies the inverse of the blend and base colours.
<i>Effect</i>	Nicer version of Lighten. Black is transparent. White remains.
<i>Use</i>	Popular blend mode. Creating brightened/faded look. Screen makes Black disappear. So white text on black background on top of image. Reduce Opacity to make black background fade. Useful for blending image taken on black background into other images.

Colour Dodge

<i>Action</i>	Brightens the base colour to reflect the blend colour by decreasing contrast between them.
<i>Effect</i>	Similar to Dodge brush. Saturated mid-tones, blown-out highlights.
<i>Use</i>	Reduce Opacity.

Linear Dodge (Add)

<i>Action</i>	Brightens the base colour to reflect the blend colour by increasing the brightness.
<i>Effect</i>	Stronger than Screen or Colour Dodge.
<i>Use</i>	Create bright/flat fade.

Lighter Colour

<i>Action</i>	Compares the total of all channel values for the blend and base colour and displays the higher value colour.
<i>Effect</i>	Similar to Lighten.
<i>Use</i>	Not often. e.g. Put image of fire on top of person in dark coat. Lighter Colour blend makes fire replace coat.

Contrast category

<i>Action</i>	Use both lighten and darken to increase contrast. Compares against 50% grey. Darker uses darken mode, lighter uses lighten mode.
---------------	--

<i>Effect</i>	All modes in this category, except for Hard Mix, make 50% grey transparent.
<i>Use</i>	Change contrast of image.

Overlay

<i>Action</i>	Uses Screen at half strength on colours lighter than 50% grey, and Multiply at half strength for colours darker than 50% grey. 'Half strength' does not mean 50% Opacity. This mode uses brightness of base layer. All other Contrast modes use the brightness of the blend layer. Overlay and Hard Light are 'commuted' as applying one to the blend layer has the same result as applying the other to the base layer and reversing the order of the layers.
<i>Effect</i>	Adds contrast. Dark blend colours shift mid-tones to darker colours. Light blend colours shift mid-tones to lighter colours.
<i>Use</i>	Along with Multiply and Screen, this is a very popular mode. Increasing contrast: Duplicate layer (or add curves/levels layer). Set Overlay mode. Adjust with Opacity. Duplicate layer for stronger effect. Add Gaussian blur to top layer for glow effect. Dodge/burn: Add layer with 50% grey. Set Overlay blend mode. Paint on with black brush to burn in dark tones. Use white brush and to lighten mid-tones and highlights. Control with Opacity. Colour intensification: Paint in black with Blend Mode: Overlay. Change strength of effect with Opacity. Add structure to sky: Paint texture brush, black, Blend Mode: Overlay. Diffuse glow: Layer/New Live Filter layer/Gaussian Blur. Check 'Preserve Alpha' [to stop image boundary blurring]. Increase radius (to about middle). Blend Mode: Overlay. Blend Ranges (cogwheel icon on layer): drag down left node. Uncheck Linear and drag down middle of left curve to apply effect only to highlights. Diffuse glow alternative: Select highlights: Select/Tonal range/Highlights. (or Ctrl-Shift-click on pixel layer icon.) Layer/New Live layer/Lens Blur. Check 'Preserve Alpha'. Increase radius (to about middle). Blend Mode: Overlay. Tweak radius to suit. Bring out lights: New pixel layer. Blend Mode: Overlay. Soft brush. Colour: white (sliders all right) with tweaks downwards (typically yellow, to bring out lights). Opacity about 40%. Paint over areas where there are lights or are lit, to bring out light more. Intensify colours: New pixel layer. Blend Mode: Overlay. Opacity about 25%. Click-drag colour dropper on colour panel to pick up common mid colour (eg orange) and click small circle by dropper to assign to brush colour. Tweak colour sliders to add drama. Paint over the areas where the colour is prevalent, particularly to strengthen key areas for visual attention. [Experiment with final tweak with Opacity] Colour toning: Rather than use adjustments, start with a white vector rectangle (LH toolbar) drawn over the image. Blend Mode: Overlay. Play with colour sliders to tint image. Reflect lights onto buildings: Add pixel layer. Blend Mode Overlay. Opacity 20-30%. Colour is light version of illumination colour (eg. Blue) and single-click paint hints of light on buildings or surroundings. Darken background: Layer/New Fill Layer. This starts with Gradient Tool selected. Set gradient to separate background from subject. Blend Mode: Overlay. Right gradient node a dark grey. Opacity right down to decrease white node effect.

	Intensify eyes: New pixel layer. Blend Mode: Overlay. Opacity 50%. Soft Paintbrush. Alt-click to pick up main colour in eye. Then vary this on the colour panel to something stronger. Paint around iris. Adjust with Opacity.
--	--

Soft Light

<i>Action</i>	If the blend colour (light source) is lighter than 50% grey, the image is lightened as if it were dodged. If the blend colour is darker than 50% grey, the image is darkened as if it were burned in. Pure black or white produces a distinctly darker or lighter area, but does not result in pure black or white.
<i>Effect</i>	Like to Overlay, but softer and without the harsh contrast. Similar to shining a diffused spotlight on the image.
<i>Use</i>	Create soft contrast. Add texture layer with Soft Light to create subtle texture. Control with Opacity.

Hard Light

<i>Action</i>	If the blend colour is lighter than 50% grey, the result is lightened, as if it were Screened. If the blend colour is darker than 50% grey, the image is darkened, as if it were Multiplied. This is the 'reverse' of Overlay. It is not related to Soft Light. Reverse order of layers and it will look like Overlay.
<i>Effect</i>	Similar to shining a harsh spotlight on the image.
<i>Use</i>	Useful for adding highlights. Reducing Opacity is often needed to get useful results. Put image of fire on top of person in dark coat. Bringing out water detail: Layer/New Live Filter Layer/High Pass filter. Monochrome. Radius 30-40 px. Select just HP layer. Right-click Invert (inverts mask). Soft paintbrush. Paint white to restore HP over water. Don't worry about a bit of overspill. Blend Mode: Hard light. Adjust opacity. Lighting glow: Add glow with Gaussian Blur, check 'Preserve alpha', radius 9, Blend Mode: Hard light. Layer/Invert. Soft paint brush, Opacity 50%, paint where light is hitting most strongly. Opacity 25%, paint the blur into darker areas at edges. Colour pop: White balance adjustment. Tweak. Blend Mode: Hard light. Pops colours, increases contrast. Adding fog or haze: Add pixel layer. Draw fog: Gradient tool. Shift-drag down from top of screen to paint grey gradient. Ease off on darks: Blend Mode: Hard light. Blend ranges: pull down left side of left graph.

Vivid Light

<i>Action</i>	If the blend colour is lighter than 50% grey, the image is lightened by decreasing the contrast. If the blend colour is darker than 50% grey, the image is darkened by increasing the contrast.
<i>Effect</i>	Extreme version of Overlay or Soft Light.
<i>Use</i>	Adds punch. Reducing Opacity is often needed to get useful results. Changing Fill also changes the effect.

Linear Light

<i>Action</i>	If the blend colour is lighter than 50% grey, the image is lightened by increasing the brightness. If the blend colour is darker than 50% grey, the image is darkened by decreasing the brightness. Uses Linear Dodge on lighter pixels and Linear Burn on darker pixels.
<i>Effect</i>	Extreme contrastive effects.
<i>Use</i>	Adds punch. Reducing Opacity or Fill is often needed to get useful results. Bringing out water detail: Layer/New Live Filter Layer/High Pass filter. Monochrome. Radius 30-40 px. Select just HP layer. Right-click Invert (inverts mask). Soft paintbrush. Paint white to restore HP over water. Don't worry about a bit of overspill. Blend Mode: Linear light. Adjust opacity. Sharpen eye more: Select background. Add High Pass filter layer. Select Monochrome. Radius 2px. Select High Pass layer. Layer/Invert. Paint white over eye to expose High Pass. Blend Mode: Linear Light. Sharpening: Duplicate main layer. Filters/Sharpen/High Pass. Change radius to select amount of high frequency data to sharpen. To stick to smaller details, the mask will look less obvious. Blend Mode: Linear Light.

Pin Light

<i>Action</i>	If the blend colour is lighter than 50% grey, pixels darker than the blend colour are replaced, and pixels lighter than the blend colour do not change. If the blend colour is darker than 50% grey, pixels lighter than the blend colour are replaced, and pixels darker than the blend colour do not change.
<i>Effect</i>	Blotchy. Removes all mid-tones.
<i>Use</i>	

Hard Mix

<i>Action</i>	Adds the red, green and blue channel values of the blend colour to the RGB values of the base colour. If the resulting sum for a channel is 255 or greater, it receives a value of 255; if less than 255, a value of 0. Therefore, all blended pixels have red, green, and blue channel values of either 0 or 255.
<i>Effect</i>	Changes all pixels to RGB, CMY, white, or black. Consequent solarizing effect.
<i>Use</i>	Reduce Opacity for useful results.

Inversion category

<i>Action</i>	Blends layers based on difference between two layers.
<i>Effect</i>	
<i>Use</i>	Various uses not related to changing final image (more for temporarily highlighting aspects image).

Difference

<i>Action</i>	Subtracts either the blend colour from the base colour or the base colour from the blend colour, depending on which has the greater brightness value.
<i>Effect</i>	White inverts colour. Black has no effect. Two identical images will appear black.
<i>Use</i>	Aligning image stack pairs – any lack of alignment is seen clearly.

Exclusion

<i>Action</i>	
<i>Effect</i>	Similar but lower contrast than Difference. White inverts, Black no effect. Mid-tones: 50% grey shows 50% grey.
<i>Use</i>	A neat use: Exclusion duplicate layer twice. B/W. Invert. Gives soft grey mono picture. Blend back with original. Several modes work, such as Multiply (play with Curves), Colour Burn (reduce Opacity) Soft Light, Colour (interesting mono).

Subtract

<i>Action</i>	Subtracts the blend colour from the base colour. Negative values are clipped to zero.
<i>Effect</i>	Progressively darkens by subtracting brightness.
<i>Use</i>	Sharpening: Duplicate layer. Filters/Detect/Detect Edges. Blend Mode: Subtract. Strong sharpening effect. Correct colours with HSL layer (nest under pixel layer) and turn Saturation right down. Add Gaussian Blur layer under pixel layer, small blur (.7).

Divide

<i>Action</i>	Divides the blend colour from the base colour.
<i>Effect</i>	Opposite to Subtract.
<i>Use</i>	

Component category

<i>Action</i>	Use combination of HSL to create blend.
<i>Effect</i>	
<i>Use</i>	

Hue

<i>Action</i>	Creates a result colour with the luminance and saturation of the base colour and the hue of the blend colour.
<i>Effect</i>	Colour change effect. Creates mono image with any mono blend layer. Blend layer hues have weird psychedelic action.
<i>Use</i>	

Saturation

<i>Action</i>	Creates a result colour with the luminance and hue of the base colour and the saturation of the blend colour.
<i>Effect</i>	Colour change effect. Creates mono image with any mono blend layer.
<i>Use</i>	Good for isolating areas of colour. Works well for fading and intensifying colour.

Colour

<i>Action</i>	Creates a result colour with the luminance of the base colour and the hue and saturation of the blend colour.
<i>Effect</i>	Preserves base layer luminosity. Colour comes from blend layer.
<i>Use</i>	Colouring monochrome images and for tinting colour images. Colour change/tint: New layer. Paint over existing colour area (eg. car) with new colour. Blend Mode: Colour. (Constrain by selecting/refining area first). Turn down Opacity for

	tint. Use in frequency separation portraits to smooth out skin.
--	--

Luminosity

<i>Action</i>	Creates a result colour with the hue and saturation of the base colour and the luminance of the blend colour. Reverse (commuted) effect of Colour mode.
<i>Effect</i>	Preserves colour of base layer. Luminosity comes from blend layer.
<i>Use</i>	Useful for sustaining colour. Used in colour correction and colour toning. Add b/w adjustment layer. Turns b/w. Changing blue changes the luminosity of the sky. Blend Mode: Luminosity. Now colour picture again. Changing blue still changes luminosity of sky. Great for darkening skies (and other colours) !

Painting modes

<i>Action</i>	
<i>Effect</i>	
<i>Use</i>	Only available in paint brush modes.

Behind

<i>Action</i>	Only lets you paint on transparent pixels.
<i>Effect</i>	
<i>Use</i>	Useful for preserving image while painting in holes, borders, etc.

Clear

<i>Action</i>	Painting deletes pixels.
<i>Effect</i>	
<i>Use</i>	Much like eraser tool.

Affinity adds

<i>Action</i>	These are blend modes added by Affinity Photo.
<i>Effect</i>	
<i>Use</i>	

Average

<i>Action</i>	
<i>Effect</i>	
<i>Use</i>	

Negation

<i>Action</i>	
<i>Effect</i>	
<i>Use</i>	

Reflect

<i>Action</i>	
---------------	--

<i>Effect</i>	
<i>Use</i>	Changing eye colour: New pixel layer. Blend mode Reflect. 25% opacity. Darken colour of brush. Paint over eyes again to give more depth. Experiment with Opacity and blending of two pixel layers. Improve stone texture: Layer/New Adjustment Layer/Recolour. Orange. Lower saturation. Blend Mode: Reflect.

Glow

<i>Action</i>	
<i>Effect</i>	
<i>Use</i>	Radial blend to create glowing punch: New pixel layer. Set radial gradient centred on focal point in image. In gradient colour (top context toolbar towards left) darken outer (right) colour. Blend Mode: glow. Darken white end of gradient to improve visibility in image. Re-adjust gradient nodes on photo. Improve stone texture: Layer/New Adjustment Layer/Recolour. Orange. Lower saturation. Blend Mode: Glow. Adjust opacity. Add radiance to lights: Add another pixel layer. Colour: light version of illumination colour (eg blue). Blend Mode: Glow. Opacity about 20%. Paint around illuminated areas of same colour to spread light, including reflections. Use cautiously as this doesn't blend as subtly as Overlay blending.

Contrast Negate

<i>Action</i>	
<i>Effect</i>	
<i>Use</i>	

Erase

<i>Action</i>	
<i>Effect</i>	
<i>Use</i>	

Group blending

<i>Action</i>	Group has default of pass-through blending mode, that does nothing. Change this and (a) layers in group are blended by their rules, then (b) the group composite is blended with layers below according to the group blend mode.
<i>Effect</i>	
<i>Use</i>	Useful in compositing. Make group mode 'Normal'. Apply weird effect within group (eg. zany curves). Effect only happens to group. Copying group copies this effect to second group.