

2D Particles Filter Tutorial

The 2D Particles filter includes a lot of parameters, but don't let that discourage you. You don't have to use them all. A few parameters provide the most important controls while the others are simply for fine tuning the effect. This tutorial goes over all of the parameters in turn, starting with the most important controls for creating a simple effect, and then exploring the more advanced possibilities.

Basic Particle Effect

By far, the two most important parameters are **Scatter** and **Particle X**.

Scatter is probably the only parameter that should be animated; it determines how far into the effect we are (it's like time elapsed, but of course, it can also be animated backwards). All other parameters should use Hold as their interpolation type. For the most ease of use, set your default interpolation to Hold by choosing Preferences from the Edit menu and changing the default interpolation. Then make sure you set **Scatter** to Linear interpolation. This is very important concept for learning to use Particles.

If you animate **Scatter** from 0 to 3,000, the image starts whole and then scatters apart, revealing the image beneath. This creates a very basic explosion type of effect. Of course, you can also animate **Scatter** from 3,000 to 0 to create the reverse type of effect.



* **Particle X** determines the general number of particles. If it is set to 1, the particle(s) are large and blocky and each will look like a part of the original image. If it is set to 1000, the effect will include lots of tiny particles, which will look more like dots of color than pieces of an image.

Tweaking the Effect

Simply using the Scatter and Particle X parameters may not create the effect you need. There are various ways of tweaking the effect to create what you want. **Count** allows you to create a more precise number of particles. The actual number of particles is exactly **Count** multiplied by **Particle X**. Keep in mind that the number of particles is the main factor in determining render time.

You can use **Opacity** if you want your particles to fade away while scattering. For example, if you want the image to scatter and fade, animate the opacity from 100 to 0 in your effect.

XY Ratio allows you to change the dimensions of the particles. A larger **XY Ratio** breaks the image into taller, thinner particles, and a lower **XY Ratio** breaks it into wider particles. An **XY Ratio** near 0 breaks the image up into particles with a dimension close to your media (3x4, for example). To create near-equal dimensions, set the value to around 500 (this is the default).



The Move Tab

The **Move** tab lets you control how the image falls apart. So you know that there will be particles flying all over the place, but what do we mean by “all over the place”?

Speed controls how fast the particles move. A greater **Speed** makes the particles leave the screen earlier (at a lower value of **Scatter**). **Variance** controls the difference between the speeds of each particle. A higher **Variance** creates a greater mix of high-speed and slower particles. A **Variance** of 0 makes all particles move at the same speed.

Velocity Type is the last parameter on the **Move** tab. This parameter determines how the particles move. When you change the type, more controls appear in the tab.

Velocity Type defaults to **Random**, which moves the particles in random directions. However, five other types of movement are available.

Straight velocity moves the particles in a straight line. Set **Velocity Type** to **Straight**. Turn the **Variance** up to 10 and then animate **Scatter** from 0 to 3,000. The image should break up and slide off the screen to the right. Of course, you can change the **Angle** control to make it slide in any direction you want. For fun, you can even change the **Variance** to 0 and have the image slide off the screen without breaking up at all.

Centripetal velocity moves the particles toward a center point. Set **Velocity Type** to **Centripetal**. Now if you animate the effect (as always, animating **Scatter** only), the particles splash through that point and then fly off the screen. Make



sure your **Variance** is around 5-10 if you want a partialized effect. If you check **Stop At Center**, the particles are pulled into that point without passing through it, as if they were vacuumed in. You can also choose your center point using the center point (**CenterX/CenterY**) parameter. Try animating the point itself. Though less conventional, it can create interesting effects.

The Centrifuge velocity option moves the particles away from the center point instead of toward it. This creates an effect almost like fireworks especially when used with **Gravity**, which is explained below. This parameter is similar to Centripetal, except that the particles move in the opposite direction.

The Spiral CW (Spiral Clockwise) and Spiral CCW (Spiral Counter-Clockwise) options move the particles around a center point. The effects are identical except that they move particles in opposite directions. Set **Velocity Type** to Spiral CW. If you animate this effect, your image swirls into a round mass of random particles, an interesting but not necessarily useful effect. Spiral Velocity includes two extra parameters: **Radius** and **Power**. You can animate the **Radius**, along with **Scatter** if you want the particles to spiral closer together or further apart. You could even set **Scatter** to around 500, set the interpolation to Hold, and animate the center point, creating a sort of swirling, screen-saver-like effect. **Power** determines how strong the spiral motion is. If you want a subtle spiral, you might want to turn the **Power** down. However, if you want the spiralling to continue for a long time and want a majority to be the “round mass of random particles” phase, you might want to increase the **Power**.



The Gravity Tab (Advanced 2D Particles)

Setting **Gravity** to any value greater than 0, applies a second force besides the particles' movement, to the effect. The strength of this force is determined by the **Gravity** parameter, and the way in which it acts is determined by the **Gravity Type** option. All of the Gravity types are also Velocity types, so they behave in the same manner. However, instead of moving the particles in those directions, Gravity accelerates them.

For the most predictable results, let's experiment with **Velocity Type** set to Random. The most common type of Gravity is Straight, because that's the way gravity usually works from our terrestrial perspective. First, create a normal Scatter effect and make sure it is working the way you intended. To test your effect, try putting the CTI on the first keyframe and dragging the **Scatter** control from left to right to watch it scatter. Make sure to leave scatter on 0 afterward. Go to the last keyframe (putting the CTI on the last keyframe, but keeping the first keyframe selected), and increase the **Gravity** until it seems like the particles will end where you want. If you render or preview the effect, you will see that besides falling apart, the image also accelerates downward, giving the effect a much more natural feel. You could also use the Gravity to simulate wind by setting the **Angle** to point in a different direction, or a magnet, if the direction is upwards. To create more chaotic movements, try using **Gravity Type** Centripetal or Centerfuge and animating the center point.



Other Advanced Features (and Options Tab)

Scatter Wipe (Options tab) allows you to particulate/scatter the image from one side to the other, creating an effect like a wipe transition. The greater the **Speed** (set in the Move tab) of the particles, the quicker the image unwinds. With a low **Speed**, the image cracks apart and then scatters, but with a higher **Speed**, the particles will fly away as quickly as they can once they've broken free from the image (like an unwinding sweater). To test it out, reset the filter, set the **Speed** to 1000, set **Scatter Wipe** to From Left and then animate Scatter from 0 to 3,000. You should see the image unravel from left to right.

When experimenting with the number of particles in conjunction with **Scatter Wipe**, be aware that the timing of the unraveling is affected by the number of particles. So you may have to adjust your **Speed/Scatter** accordingly. For example, if you set **Particle X** to 10, then your effect doesn't appear as a wipe, because the image is already completely unraveled by the time **Scatter** reaches 60. In that case, you'll want to animate **Scatter** much less (from 0 to 250, for example), but increase your **Speed** (5,000 is good in this particular case).

Shape (Particles tab) determines the shape of each particle. You can choose from various preset shapes, for example, circle blur, scalene triangle, or diamond. The shapes of the particles are much more obvious and look better when **Particle X** is small and thus the particles themselves are rather large. You may notice that between a **Scatter** of 0 and 100, the particle transitions between a rectangle and their given shape. This allows the particles to form a complete image when they move together since all the other shapes are smaller



than the rectangle. Otherwise there would be space between the particles. Non-rectangular shapes also appear smaller (more transparent) when there are many of them because they are, in fact, smaller. You can use the **Size Tweak**, explained below, to increase their size however much you want.

Seed (Particles tab) is the random seed given to the effect. Different values will cause different randomness. If you like the effect, but don't like something particular about its randomness, just change the **Seed**. In general you should not animate **Seed** because it will cause jumps in the movement.

Alpha Only (Particles tab) is a checkbox that allows you to operate only on the image's alpha channel. This is very useful if you want a video stream to break apart as a transition opposed to using it on something static such as text. Use **Alpha Only** if you want the movement in the video to be recognizable as the image falls apart. Apply it to any effect, and the view of the image seems to fall apart, but the image itself does not.

Keep Orig (Particles tab) allows you to keep the original image in the background of the particles. Don't use it with **Alpha Only** or else nothing will happen. **Keep Orig** is useful for creating images with particles that appear scattered, rather than to use them as a transition. Applying a small amount of **Scatter**, changing the **Shape** of the particles, and animating **Seed** can create an effect that looks like an animated painting.

Z-Order (Options tab) is the order in which the particles are drawn on top of each other. This parameter has no effect in



draft mode. It is particularly useful when using **Centripetal Velocity Type**, to have more control over how the particles cross over each other. “Normal” will have the Bottom-Right particles dominate, “Reversed” will let the Top-Left particles dominate, and “Random” will create a random distribution so that no particular part of the image dominates any other.

Apply Mode. (Options tab) These options are your basic Photoshop/After Effects drawing modes, applied to particles. The best way to understand how they work with particles is to try them.

The last feature on the Options tab is **Size Tweak**. The basic explanation is that this parameter increases the size of each particle by a few pixels in each direction. Its use, however, may be less obvious. When you enable it, you’ll notice that the default is 2. The reason that it does not default to 1 is because when each particle is only exactly as large as its piece of the image, the image falls apart too quickly. Therefore, the default is 1 pixel larger, making the particles overlap a little. This creates a better looking effect. You may want to increase the **Size Tweak** when you are using the **Shape** parameter. Also note that when you are working with thousands of particles, a large **Size Tweak** will significantly increase render time.

Last, but not least, you can use the **Pixel Chooser** with **Particles**. This allows you to choose which portion of the image is affected by the filter. Note that particles will scatter in front of the rest of the image, not behind. If you do not know how to use the **Pixel Chooser**, it’s worth getting to know (see the main manual). You can use the **Pixel Chooser**



in a Particle effect the same way you would use it in a color effect.