Creating and Animating Rain in Bryce

Notes

This steps of this tutorial were performed on the PC version of Bryce 5, but should also work for the Mac® version as well. No other software is required to complete this tutorial.

I have tried to use the names the Bryce 5 manual uses for the various tools, dialogues, and panels that appear in this tutorial. For more information on using the Bryce Materials Lab, check the Bryce 5 manual, chapter 7 (pages 127-167). For more information on the Bryce Deep Texture Editor, see chapter 8 (pages 169-200).

Introduction

I use Bryce 5 to make a lot of different landscapes and effects for the online comic books I create. Recently, I needed to create rain for a particular scene. After an afternoon of experimentation, I came up with a volumetric material that gave me the exact effect I wanted. Even better, I discovered that I could easily vary this material to get anything from a light spring shower to a heavy downpour with just a few simple steps. I also discovered that I could change the colors and animate the material as well!

Once I made my rain material, I thought I'd share how it was done. Although this tutorial focuses on that chamber of horrors known as the Bryce Deep Texture Editor, don't be scared off from trying it yourself. To the best of my ability, I've tried to write this tutorial for Bryce beginners as well as advanced users. I've included lots of pictures in this tutorial to help explain all the steps I took. Along the way, I've also tried to explain a little bit about how the Bryce Materials Lab and Deep Texture Editor work.

This tutorial is divided into three parts.

Step One: Create a volumetric texture

Step Two: Create variations on the texture - Coming soon!

Step Three: Animating the texture - Coming soon!

If you have any questions or comments about this tutorial, please e-mail me!

Step One: Create a volumetric texture

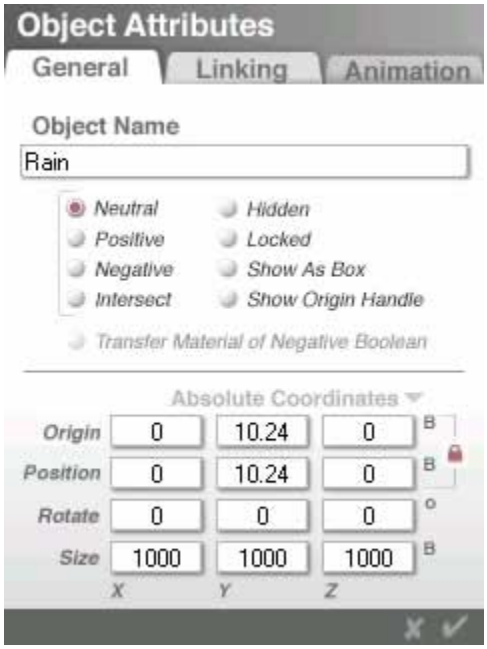
Open up Bryce 5. At the top of the screen you should see the Create Menu, with the various Bryce 3D objects below it. If it's not there, click on the word "Create" to get the menu.

The Bryce Create Menu.

Click the cube object to create a box. You should now have a cube in the center of your screen. When the cube is selected, you should see a small list of icons at its side, like the one below.

Icons for the cube object.

Click the "A" icon to open up the Object Attributes dialogue box. In the Object Name field, rename the cube to "Rain." In the Size fields, enter "1000" for X, Y, and Z. Since we're creating a volumetric texture, we want our cube to be big enough to cover a large area in Bryce.



Object Attributes dialogue box.

Click the check mark at the bottom of the Attributes dialogue to exit. You should now have a much larger cube on screen. In fact, the camera is now probably inside the cube, so if you look at the thumbnail preview window in the upper left corner of Bryce you should only see a dark area. The list of icons for the cube should still be on the main screen. Now however, you'll probably see an up arrow at the bottom of list. Click on this arrow to bring the bottom of the cube to the level of the ground plane.

At this point, go ahead and save your Bryce scene under whatever file name you like. As you go along, you should continue to periodically save. Creating the rain material is a lengthy process, and if you forget to save and your computer locks up, you'll have to start all over again.

After you've saved your file, select the cube again. Click on the "M" icon next to the cube. This will open up the "Bryce Materials Lab" (we'll call it the ML for short).

The Bryce Materials Lab.

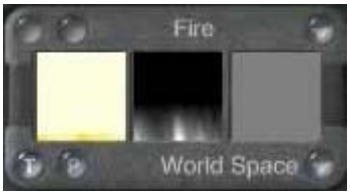
At this point, the ML should look like the image above - that is, pretty boring. Flat gray is the default material Bryce gives an object when it's created. At the center of the ML is a panel called the "Materials Grid." The columns across the top of the panel are the material "Components." The rows down the side are the "Channels" for each component. Each material can be composed of up to fourteen channels from up to four components. Click the empty spot in the "Diffuse" channel in the "A" component. This will create a random procedural material.

Click the first spot in the Diffuse channel to create a random procedural texture.

Now look for the word "Surface" on the Materials Grid. Underneath the word "Surface" is the Material Mode Toggle. It looks like a round glass button with a rock in it. Click this button to switch from a surface material to a volume material. The rock should change to a cloud, the word "Surface" should change to "Volume," and the Materials Grid should now show you a slightly different series of channels. Your material is now a volumetric material.

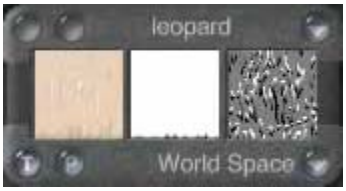
Click the Material Toggle Mode to switch from Surface to Volumetric.

In the upper right corner of the ML, you should see a panel with three windows and some buttons. This is the "Texture Component Window" for your "A" component. If you had clicked any of the buttons in the "B" column, this window would have shown up in the B area instead. Bryce lets you layer up to four components (A through D) to create a material. For this tutorial though, we only need one.



Texture Component Window "A".

We want to use a specific texture for our material. Click the button in the upper right corner of the Texture Component Window to get a list of available textures. Go to "Bump" and choose "Leopard." You should get something that looks like the image below.



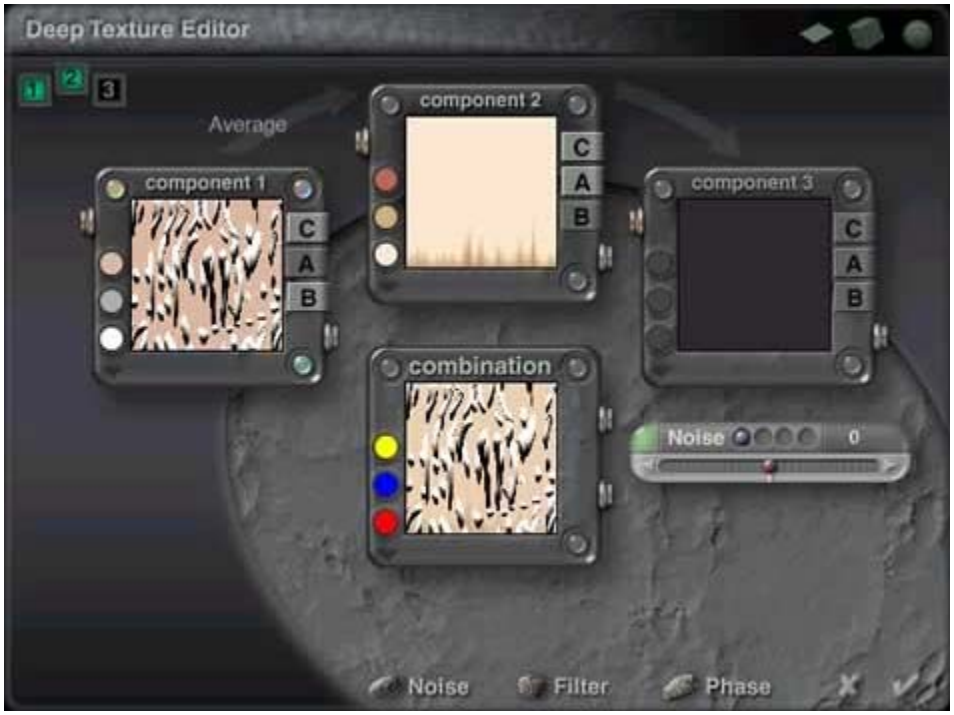
The basic Leopard texture

Go ahead and click the check mark at the bottom of the ML to apply the texture and exit the ML. Save the file again, and then reenter the ML to continue the tutorial. As you continue with the rest of the tutorial, you'll need to exit the ML to save your work. You won't be able to save it while you're in the ML, or later on, while you're in the Deep Texture Editor.

There are two buttons in the upper right corner of Texture Component Window "A". The first one is blue. This opens the "Editor" to let you do basic editing on your material. The second button is pink. It opens the texture source editor, also called the "Deep Texture Editor" (DTE for short). If you have a hard time deciding which button is pink and which is blue, just pass your mouse over the buttons and you'll see their names appear above the panel.

Click on the pink button. This will take you to the Deep Texture Editor.

You should now be in the Deep Texture Editor. This is one of the most flexible and intimidating parts of the Bryce ML. However, there are plenty of good tutorials out there on how to use this tool, and you can learn a lot from experimenting on your own.



The Deep Texture Editor.

This is where we create the *texture* for our rain material. Let's start with the panel labeled "Component 1." Click the "Noise" button at the bottom of the DTE. You can also click the button in the upper left hand corner of Component 1. This will open up the "Noise Palette".

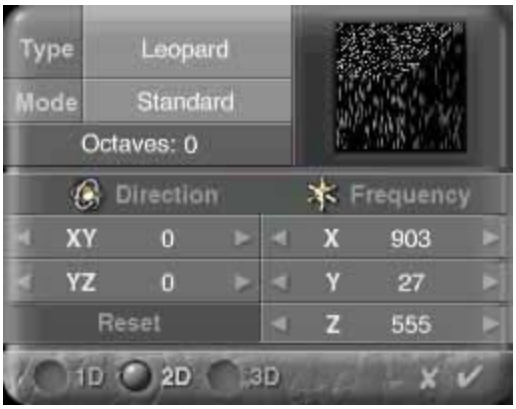
The Noise Palette.

There are four spots on the Noise Palette, one for each component and the final combination you could use to create a texture. Make sure the first one is selected. There should be a little ball in it. Now click the green button in the upper left corner of the Noise Palette (the button will turn green when you place the mouse cursor over it). This will open up the "Noise Editor" for Component 1.

The Noise Editor.

According to the Bryce manual, noise is the background turbulence used to create patterns for textures. It's very similar to the noise or snow you sometimes get on your TV. You use the Noise Editor to create noise from scratch. From here, you can increase or decrease the amount of noise in the texture, change its direction, and set the number of axes the noise is applied to, among other things.

In the Noise Editor, look at the "Type." You should have "Leopard" listed. If you don't, click on the noise type to get a list of the different types of noise you can use and select "Leopard." Beneath Type is "Mode." Click on the mode and select "Standard" from the list that appears. At the very bottom of the Noise Editor are the options for 1D, 2D, and 3D. Select the 2D option. Look under "Direction". For this example, we want our rain to go up and down, so set both the XY and the YZ values to "0". Now look underneath "Frequency." Set the X value to around "900", the Y value to around "30", and the Z value to around "550". You can do this by click/dragging the mouse cursor over the numbers or by clicking on the little arrows to either side of the numbers. Your Noise Editor should now look similar to the picture below. Once you've made these changes, click on the check mark at the bottom of the Noise Editor to close it.



Noise settings for Component 1.

The next thing we need to do is set up the Phase for Component 1. Phase creates turbulence in the noise. Open the Phase Palette by clicking on the Phase button at the bottom of the DTE. Make sure the first spot at the top of the palette is selected.

The Phase Palette.

Click on the green button in the upper left corner of the Phase Palette to open the Phase Editor (the button will turn green when you pass your mouse over it). You'll notice the Phase Editor looks just like the Noise Editor. Since we're trying to create straight up and down rain, we don't really need any phase. So set the Type to "Nothing," the Mode to "Standard," and all the other settings to "0." Your Phase Editor should look like the picture below. Click the check mark at the bottom when you're done.

Phase settings for Component 1.

Now that we've set up the noise and phase for Component 1, we also need to set up the filter. Click on the Filter button at the bottom of the DTE (or you can click the button on the upper right corner of Component 1) to open the Filter Palette.

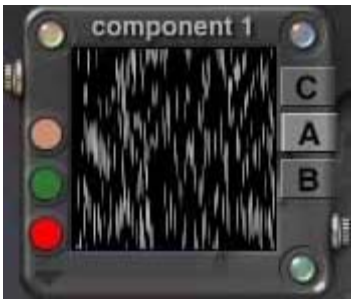
The filter affects the appearance of the noise. It can refine the noise to give it more or less detail, increase the contrast, apply it only to high or low altitudes, or change its orientation.

At the upper right corner of the Filter Palette are four spots, one for each component we could use to make our texture. Make sure the first spot is selected (it should have a small ball in it). In the center of the Filter Palette is graphic depiction of the formula currently being used to filter the component, and below that is the name of the formula. Click on the formula name and you will get a list of all the formulas you can use. Select "Clip aX+b." Set the value of "a" to about "0.78", the value of "b" to about "0.0004", and the value of "c" to "4". To do this, simply click/drag over the numbers. You may have a hard time getting these exact values, since the Filter Palette doesn't have those little arrows to let you adjust the values in small increments. Your Filter Palette should look similar to the image below.

Filter settings for Component 1.

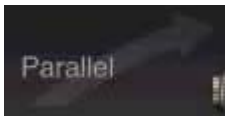
When you are done, click on the Filter button at the bottom of the DTE to hide the Filter palette.

Now go back to the panel for Component 1. At the bottom left corner of the panel is a small down arrow. Click on this arrow to get a list of "Color Modes". Select "Linear Interpol3". On the right side of the panel are buttons labeled C, A, and B. These stand for Color, Alpha, and Bump. The one we're interested in here is the Alpha button. Alpha is what creates transparent areas in a texture. Basically, the Alpha channel interprets the transparency of an image according to its gray scale values. White values are seen as solid, black values as completely transparent, and gray as somewhere in between. In this case, the white (i.e. solid) spots of Component 1 are our rain drops, and the black areas are just the empty spaces in between. Since we're not interested in the color or bump of Component 1, click on the C, A, and B buttons until only the A button is highlighted. Now Component 1 should look like the image below.



Component 1 should look like this now.

At this point, we're done with Component 1. Before we move on to Component 2, we need to check the "Blend Mode". Look at the arrow leading from Component 1 to 2. It should say "Parallel." If it doesn't, click on the text over the arrow to get a list of available modes and select "Parallel".



The Blend Mode.

Now let's look at Component 2. We used Component 1 to create the actual rain drops in the texture. We'll use Component 2 to give them some color. Click on the Noise button at the bottom of the DTE to bring up the Noise Palette again. This time make sure the second spot (for Component 2) is selected.

The Noise Palette again - make sure the second spot is selected!

Click on the green button in the left corner of the Noise Palette to open up the Noise Editor for Component 2. In the Noise Editor, click the Type to open up the list of noise types. Because we're only using Component 2 for color, we can pretty much choose any of the types here. Since I wanted some color variation in my rain, I picked "Voronoi ID1". This gave me a nice erratically banded noise. You can see the rest of the noise settings I used for Component 2 in the image below. You can either use these settings or experiment to find settings you like better.

Noise settings for Component 2.

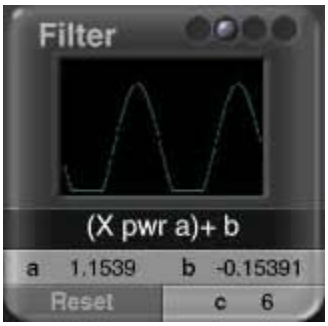
Once you've finished setting up the noise, click the check mark to close the Noise Editor. Next we'll set up the phase for Component 2. Click the Phase button at the bottom of the DTE to open up the Phase Palette. Make sure the second dot is selected and click on the green button in the upper left corner of the palette to open the Phase Editor.

The Phase Palette again - make sure the second spot is selected!

Again, we really don't need any phase here, so you want to set Type to "Nothing" and Mode to "Standard" and then set all the other settings to "0".

Phase settings for Component 2.

Now to set up the filter for Component 2. Click on the Filter button at the bottom of the DTE (or click the button on the upper right hand corner of Component 2) to open the Filter Palette. Make sure the second dot at the top of the Filter Palette is selected. Then click on the formula name and select "(X pwr a)+b". Set "a" to around "1.15", "b" to about "-0.155", and "c" to "6". Once you've finished with these settings, click the Filter button at the bottom of the DTE to close the Filter Palette.

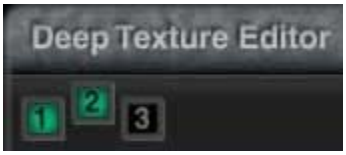


Filter settings for Component 2.

Now go back to the Component 2 panel. At the bottom left corner of the panel is a small down arrow. Click on this arrow to get a list of Color Modes. Select "Linear Interpol3." Next, look along the left side of the Component 2 panel. You will see three colored dots. When you click on one of these dots, your mouse pointer will turn into a dropper and a color scale will appear underneath. To select a color, click/hold the mouse on the color dot to get the color scale, and then drag the dropper over the color you want. To get a more specific color, Alt/click (or Option/click for Mac users) on the dots to get a panel that will allow you to create a color from specific numerical values. You can choose to use RGB, HSV, HLS, or CMY modes. I went with shades of blue and green for my rain material. Once you've selected your colors, go to the C, A, and B buttons on the right side of the Component 2 panel and click those buttons until only the C button is highlighted (see the image below).

Component 2 should look like this now.

At this point, we're done with Component 2. Double check to make sure there is no noise, phase, or filter set for Component 3. If you're not sure, look in the upper left corner of the DTE. You'll seen a small representation of the three components there. Only the first two should be highlighted.



Make sure only Components 1 and 2 are highlighted here.

Components 1 and 2 will combine to create a texture in the panel labeled "Combination" at the bottom of the screen. The final combination should look something like the image below.

The Combination panel.

If it doesn't, check the noise, phase, and filter for the Combination panel. Do this by opening up the editors for each of these and make sure there's nothing there. Keep in mind, what appears in the Combination panel will look nothing like rain at this point. The biggest problem I have when I work with the Bryce DTE is that it fails to give you a decent preview of what your material is actually going to look like. That's probably because the DTE creates the *textures* that are used to create the *material*. And we still have some work to do in the Materials Lab.

When you've finished with the Combination panel, click the check mark at the bottom right side of the DTE to apply the texture and return to the Materials Lab. Once you're back in the ML, check the Texture Component Window. If you've used all the settings from this tutorial, it should look like the image below.

The final result for Texture Component Window A.

Now go back to the Materials Grid in the Material Lab. Click all the dots under the "A" column (Diffuse through Base Density channels). Use the following settings for the bottom two sections of the Materials Grid.

- Diffusion - 20
- Ambience - 20
- Specularity - 25
- Base Density - 50
- Edge Softness - 100
- Fuzzy Factor - 90
- Quality/Speed - 60

The Materials Lab should now look like the image below.

The settings for the Materials Grid.

There's one last step to go. In the upper left corner of the Texture Component Window for Component A is a blue button. This is the Editor button and it lets you do basic editing on your material (if you have a hard time deciding which button is blue, just pass your mouse over the buttons and you'll see their names appear above the panel). Click the blue button to open the Editor for texture A. Along the right side, you'll see a button for each texture component, A through D. Make sure A is selected. There are three sections in the Editor - the Scale control, the Rotate control, and the Offset control. We're only interested in the Scale control. Since we want long slashes of rain, we need to edit the scale of our texture. Set X to 10%, set Y to 10%, and set Z to 100%. Once you're finished with the Editor, click the little down arrow at the bottom of the panel to apply the settings.

The settings for the Editor.

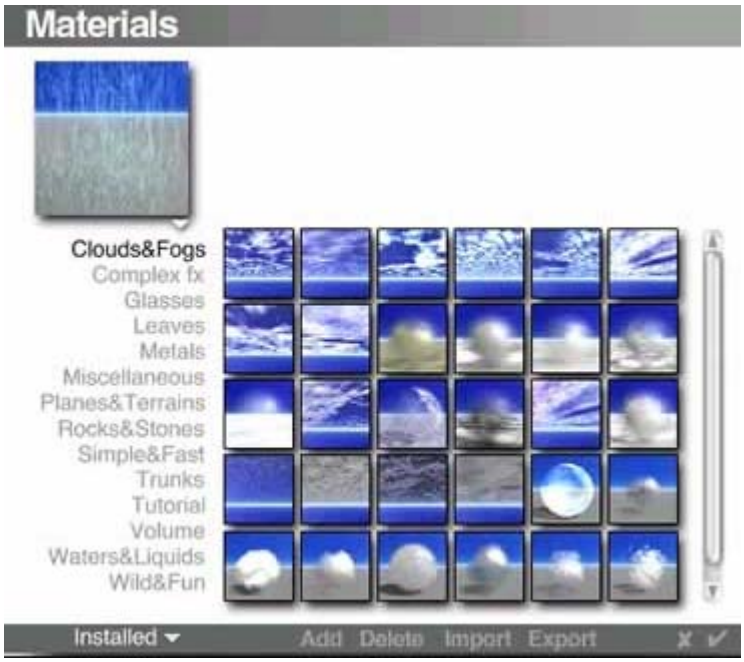
Now click the check mark at the bottom of the ML to apply your rain texture and exit the ML. You should now have a large cube filled with a volumetric rain texture! Try rendering the image to see what it looks like. Keep in mind that rendering may take a little while, since you are using a volumetric texture here. To really get the effect of rain, go to the top of the Bryce screen and click on "Sky and Fog" to edit the sky. If you click on the little arrow next to the words "Sky and Fog," you'll open a library of preset skies. I like the "Mordor" sky the best. Select that one, and render the image again to see what it looks like. Below is a quick render I did after adding a Bryce tree. I also changed the material of the ground plane to "Easter Egg Dye #2."


A quick render of the rain material!

To avoid having to recreate the rain material every time you want to use it, you'll need to add it to the Bryce "Materials Library". Go the Create menu at the top of the screen and click on "Edit" to switch to the "Edit Menu".

The Edit menu.

Making sure that your cube with the rain material is selected, click the small arrow next to the word "Edit" to open the Materials Library.



The Bryce Materials Library.

In the preview window, you should see the block with the rain material in it. At the bottom of the Materials Library, you should see a down arrow next to the word "Installed". Click the arrow to switch to the "User" library. This is a good place to store your own materials. Click "Add" to add the rain material. Bryce will give you a dialogue box to let you give the texture your own name and make a comment about it. Once you've filled this info in, you can click the check mark at the bottom of the dialogue box to add your material to the library. Once you've done this, you can make it rain whenever you want!

That's it for creating the material. The next two parts of this tutorial on modifying the material and animating it will be available soon! Check the Pixel Arcana website for future updates.