Tiling Picture Textures – Approximate Transcript

Objects given a picture texture can be tiled. There are videos going on about this. How about tiling a picture texture on a single object? This can be done in Bryce too – of course. There are two ways: either use a picture that can be tiled, or use any picture and let Bryce do the work for you.

A picture that can be seamlessly tiled must be prepared in such a way that the left and right edges as well as the upper and lower edges match. Every picture can be tiled – but not every picture is a good candidate.

I have four 2D faces with the same picture applied. This is not a good candidate but good enough to show how it works. It shows a design of the Grapple Locomotive by Caspar Leonard Heer-Bétrix for a railway to the Matterhorn. He was granted a concession by the Swiss Confederation for Construction – in 1890. It was never built. I think this is a lovely curiosity to work with.

The picture on the 2D face at lower left is the reference. To match its right edge to the left edge of the neighbouring 2D face, the 2D face to the right must be mirrored, flipped over the X axis.

To match the upper edge of the lower left 2D face with the lower edge of the upper left 2D face, the picture must be flipped upside down, that would be the Y axis.

Finally, the remaining 2D face must be flipped along both axis, X and Y. The result can now be tiled.

Again, this is just to demonstrate how it works in case you are curious. Photoshop has a filter named Offset which can be found under Other. There are also professional programs that can create pictures that can be tiled with much less labour involved.

Oh, and by the way, Bryce does it with a few mouse clicks.

We have a single 2D face with our famous picture applied. To make it fit for tiling, go into the Materials Lab, make sure Parametric mapping mode is selected, set X and Y scale in the Transformation Tools to 50% each, in the drop down enable Scale Picture Size and Symmetric Tiling and there you are.

Copy this 2D face, move the copy to the right; copy it again and move it above: it can be tiled.

The easier way is to set X and Y Scale in the Edit Texture dialog to 25% each.

Everything gets much simpler if we already have a picture that can be tiled. For this example I use a picture I photographed and David made a tile from using Genetica. It is featured in the scene file B7_1_0_109_p33_s10_v1 which comes with the Ground Texture product.

It is applied to a 2D face. If the Scale in the Edit Texture dialogue is set to 50% and Symmetric Tiling is enabled, Bryce creates a picture that can be tiled from a picture that has already been prepared to be tiled and it looks therefore funny.

Using Repeat Tiling, however, gives the desired result.

We can sum this up by saying that if the picture was not prepared for tiling; use Symmetric Tiling if it must be repeated on a surface. If the picture is already prepared for tiling, use Repeat Tiling.

We have not yet explained why we set the Scale in the Edit Texture dialogue the way we set it or why Scale Picture Size was enabled.

We will look at this in a moment.

But first comes a very important snipped of information David found. The resolution of the first picture determines the resolution of the centre one – even if it is deleted afterwards. This fact cannot be stressed enough.

Always load the picture with the desired resolution in the first slot. Copy and paste it into the second. The first slot is for the diffuse, the colour. The second is the alpha map which Bryce can also interpret as a height map for bump – it is of limited use. The third slot is the result.

All three pictures must have the same resolution. Bryce takes the first slot to determine the resolution. If it is deleted after the second slot is populated, the resolution of the second slot is what it was determined from the first before it was deleted. If the second slot is loaded first and then the first slot with whatever resolution, the picture in the second slot will be resampled to the same resolution as the first.

There are many mapping modes. We will concentrate on Parametric Mapping exclusively. There are also some additional options which I will briefly explain.

Below the Mapping Modes, there are seven options that can be enabled or disabled and apply to all mapping modes, not only Parametric. First, the last:

- Pict or Picture Interpolation: This should be on in most of the cases. The picture has a certain resolution – or size. It is mapped on an object. If this option is enabled, the picture is remapped to fit the size of the object it is mapped onto. If this option is not active and the object is larger than the picture, it will get pixelised. This option is enabled by default.
- Alpha Scaling: Usually, if the texture controls the first 4 of the Value (Diffusion, Ambience, Specularity, Metallicity) and Optic qualities (the dot is set), the control has no effect. If Alpha Scaling is enabled, the effect can be scaled down. At max, it is the same as if Alpha Scaling was disabled.
- Decal Colors: The Diffuse colour is modified by alpha channel of the picture – could also be a procedural. The dark parts let the object colour shine through, the bright colours block it. Set the Diffuse colour of the object first, then set the dot in a channel and apply a texture. The object. Only if Decal Colors is enabled, the texture appears on the object.
- Centered Transform: This centres the picture on the object. Without this option enabled, the picture is aligned to the bottom left corner.
- Scale Picture Size: If this option is selected, the Frequency or Scale set in the Edit Texture dialogue determines the size of the picture on the object. If it is disabled, the scale set in the Edit Texture dialogue determines the size of the picture on the object as if it were a procedural texture. This option is mostly the reason this video was made. We will look at it in detail.
- Repeat Tiling: If the picture on the object is smaller than the object, the picture is repeated on the object until its full size is reached. Currently, the Scale in the Edit Texture dialogue is set to 50% and we get 2 x 2 repetitions. If this is lowered to 20%, we get 5 x 5 repetitions. The number of repetitions can be set with the Edit Texture Scale and we will go into that in a moment.
- Symmetric Tiling: This option creates from the original picture one that can be seamlessly tiled and repeats it according to the Edit Texture Scale set. Here we have 5 x 5 tiles of the picture. Set to 50% and here we have 2 x 2 tiles – actually one picture that can be tiled. We have seen this before.

This video is about tiling on a single object. We have now learned how any picture can be made fit to be seamlessly tiled; we know the options to tile or repeat the picture on the object and a few more interesting things. The question is: can we determine how many repetitions or tiles will be on the object? Of course we can, this is Bryce after all.

The hinge is the option Scale Picture Size. Is it enabled or not. Do we use positive or negative Edit Texture Scales? There are several results and all can be determined.

A picture on an object comes with a Size of 0% by default. This makes the picture fit on the surface, no matter whether the aspect ratio of the picture and the object match.

The Scale can be set numerically in the Edit Texture dialogue. The number field accepts up to 3 decimal places and the scale can be set very accurately.

The scale can also be set with the mouse for X, Y and Z separately or move them together.

There is an alternate tool which works a bit arbitrary but it can be used for fine adjustments. The percentage for X, Y and Z are changed at the same time.

If you move the slider fully up and let it go, the percentage will increase by around 2.75%. If it is moved less, then also the percentage will increase less.

If the slider is moved fully down, the percentage will be decreased by around 3.333%, if it is moved less down, the decrease will also be less.

Scale Picture Size enabled

If the Scale Picture Size option is enabled, the scale set in the Edit Texture dialogue determines the size of the picture on the object. If set to 100%, the picture fills the object – just like if it were set to 0%. If the value is reduced to 50%, the picture size is reduced to half.

If the scale is set to 200%, the picture is doubled in size and only the part that fits on the object is visible.

Reducing the scale to 10% gives us 10 x 10 = 100 tiles on the 2D face.

Reducing the scale to 1% gives 100 x 100 = 10,000 tiles.

0% is a special case. 0% is the same as 100%. What happens if we go to a negative size?

Here, we have 2 identical 2D faces with the same picture applied. The size for the left picture is 100%, the one to the right -100%. The right picture is mirrored and also upside down. Using the Resize Options, we flip the right 2D face X and Y. Then we get the same pattern as we have at left.

We can also rotate the 2D face at right by Z=180° a nd get the same effect.

This graph shows the relation of the scale setting and the number of tiles IF Picture Scale is enabled. It works for positive and negative sizes, just keep in mind that the picture is flipped on both axis if negative values are used.

Scale Picture Size disabled

If the Scale Picture Size option is disabled, the scale set in the Edit Texture dialogue determines the size of the picture on the object as if it were a procedural texture. If the scale is at 0%, the picture covers the object exactly. However, if Scale is set to 100, we get 18 x 18 = 324 tiles. This is true whether we have Repeat Tiling enabled or disabled. And if Symmetric Tiling is enabled, we get the tiles.

For each increase by 5.9% an additional tile is added. So 0% = 1 tile, 5.9% 2 x 2 tiles, 11.8 = 3 x 3 tiles and so on. 5.9% is just a bit less of the 6% Susan Kitchens writes in her priceless Real World Bryce 4 book on page 450.

Please note that we speak of positive percentages because it works quite differently when negative percentages are used for the size.

If negative percentage scale values are used, things get a bit more complicated, quite a bit, in fact. For positive percentage values we get an increase of tiles for each 5.9% increase. We have 1 tile – or rather the original picture – at 0% and 2 x 2 tiles for 5.9%.

Going negative to -5.9%, we just get one pixel from the lower left corner of the picture. To be completely exact, the value is between 5.885 and 5.890 but this small difference does not matter, except we want to have the pixel in the lower left corner of the picture fill the object. For practical use, 5.9 is accurate enough.

If we go towards 0%, using -2.95% - which is half of 5.9%, we get a tile the fourth of the original.

If we use -1.475%, which is a fourth of 5.9%, we get a third of a tile.

So if we move up from -5.9 up towards 0%, we can get increasingly larger fractions of one tile, Important to note is that the picture is not flipped.

It gets more exciting – or bewildering – if we decrease percentage from -5.9% to – 11.8%. Again, we get only a part of the picture. But it works the other way around from what we observe between -5.9% to 0%.

Now, what happens if we go more negative than -5.9%? It works like positive percentages. Well, sort of. 0% shows the full picture, one tile. -5.9% shows one pixel of the picture. However, decreasing -5.9 to -11.8 again shows one full tile, just like 0% does. Subtracting another 5.9% we get -17.7% and this results in four tiles, 2 x 2. Subtracting another 5.9%, which brings us to -23.6% and we get 3 x 3 = 9 tiles, and again minus 5.9% = 29.6 results in 4 x 4 = 16 tiles.

Hopefully, you have now the tools to tile a picture on a single object, knowing exactly how the size has to be set to get the desired amount of tiles.

For reference, have a look at the PDF supplied with this video. It is rather theoretical but sums up what we have covered in this video.

Now, happy tiling.