

Cart Scene

Mike Pickton



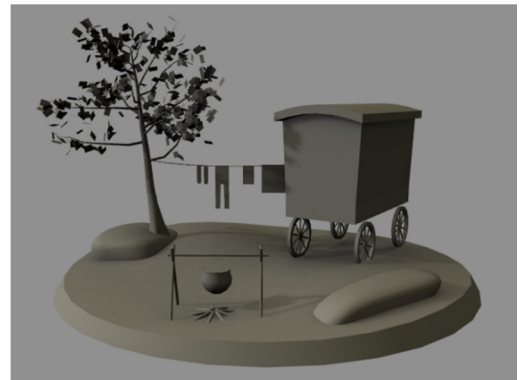
Brief

"We would like you to model, texture and light, a typical old wooden cart of your own design, and place in a small 6 x 6 metre scene."

- 5,000 triangles allowed.
- Maximum texture size 1024x1024.
- Up to 10 diffuse, 10 specular and 10 normal textures.

Design and Planning

I sketched a few ideas down and came upon the idea of a gypsy caravan out in the woods. I created a whitebox for the idea and got some feedback. The brief indicated to focus on quality and not quantity, so I dropped the clothesline and campfire and began planning.



Triangle budget

Caravan	2500
Tree	1200
Base (ground)	350
Grass	200
Rocks	500
Total	4750

Texture budget

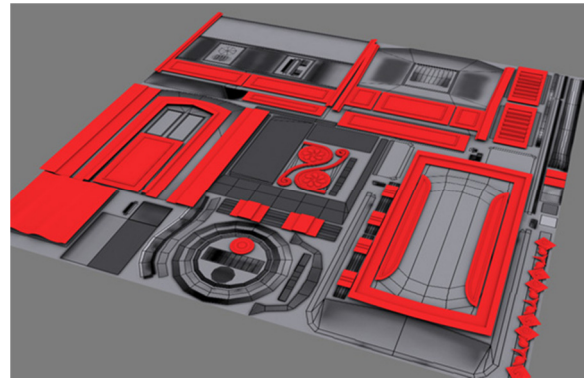
caravan	1024x1024	
base	1024x1024	Rim, rocks, ground mixmap
bark_tile	512x512	
branchesleaves	512x512	Branches and leaves
dirt_tile	512x512	Ground texture
Grass_tile	512x512	Ground texture

Caravan (2,468 tris)

The brief asked for a cart which used unique UVs so that ambient occlusion could be baked into the diffuse texture. I used a little discretion to achieve this end while still reusing texture space. I would confirm this with my manager before proceeding... if I had one!

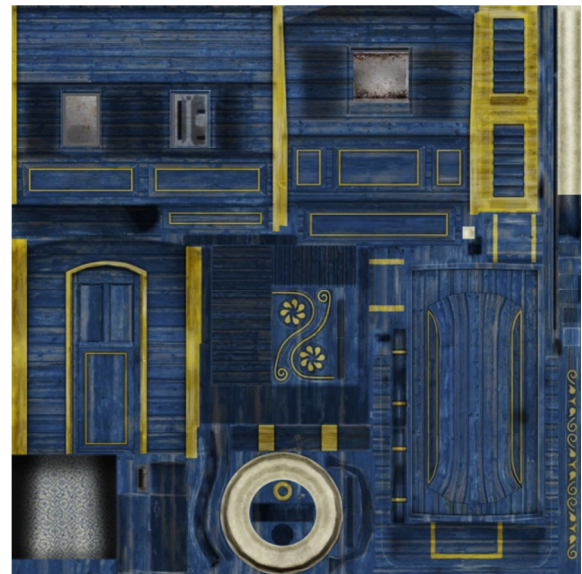


I created the low poly version of the cart and unwrapped it. I used some procedural modifiers to create a high-poly with more natural edges, from which I baked normals and ambient occlusion. However, rather than modelling the high-poly detail on the model, I chose a different technique because of the shared texture space. I created a new scene and modelled onto a plane which showed my texture. I then baked normals and ambient occlusion for this too.



After trying out various colours and getting some feedback, I settled on blue with yellow trim. I overlaid my ambient occlusion bakes from the caravan model and the surface detail model. I used textures from CGTextures.com and painted in details. I generated normals for the wood grain using CrazyBump and combined these with my two bakes. I generated the specular map using the final normal map and the diffuse map, and hand-painting corrections.

The PSD is neatly organised and labelled and the colours can be changed in a couple of clicks with no loss of quality.



Tree (1,166 tris)

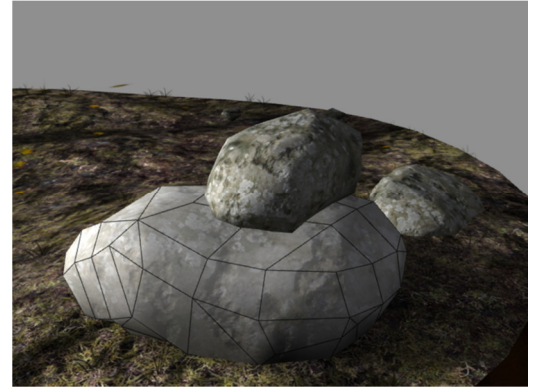
The tree has been made fairly typically. Each leaf on the texture sheet has been kept quite far apart to allow me to place many leaves with just one or two triangles, without them feeling clustered. In this way, I was able to save triangles on the tree. The resolution (512x512) allowed a 1-bit alpha to be suitable for the transparency, which is significantly cheaper in most engines.

Normal direction was kept distinct for each leaf to avoid the leaves looking as though placed on a single plane. Additionally, each leaf and branch had normal shape to prevent them looking flat.



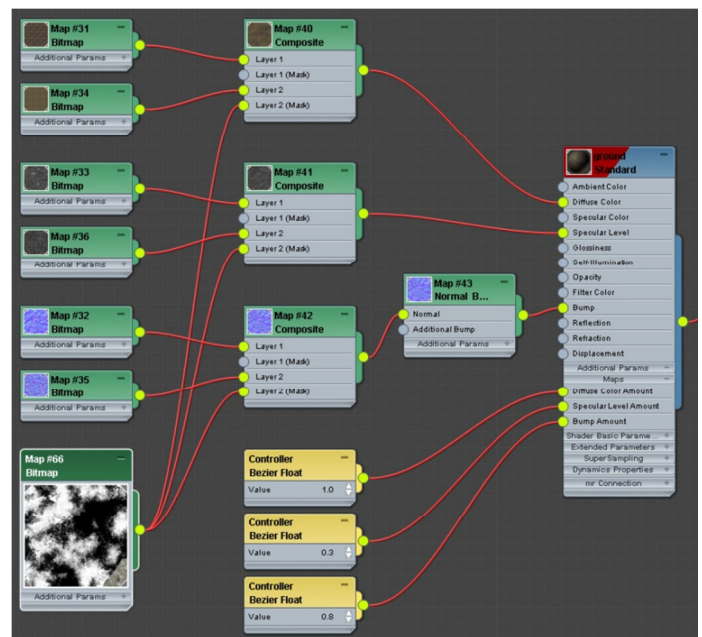
Rocks (50-210 tris each)

The rocks were made procedurally using displacement modifiers with noise maps. These were created at a very high polygon density and then baked down. This allowed the complicated geometry to be made quickly, and allowed for lots of experimentation. I retopologised them by hand in 3DS Max. The same rock is used in every instance, but by distorting, rotating and optimising the rock, they look distinct from one another while retaining the geological unity one might expect.



Base (321 tris + 343 tris of grass and leaves)

The ground material (shown right) is comprised of two textures, tiled 4 times over the top of each other and composited with a mixmap. The grass planes were placed using scatter over the surface of the ground, then tweaked by hand to create a pleasing result.



Result

- 4,994 triangles used
- 2 dds x 1024x1024 x D, S, N at DXT1 w/mipmaps = 4.00MB
- 4 dds x 512x512 x D, S, N at DXT1 w/mipmaps = 2.00MB