



Voxeland is a next generation of a cubic-style terrain seen in Minecraft, Ace of Spades and others, but a bit more than that: it is a subdivided and adroitly smoothed cubical structure.

The tool comes with all the assets can be seen in demo: land and grass textures, tree objects, shaders, scripts and even a simple sky. Actually, there is enough assets to make a simple game basics. It will be a good help in a game creation or prototyping.

Special Grass feature automatically plants a shader-animated grass above a selected surface blocks. And possibility to assign any object as a terrain block gives an ability to bind objects to terrain, add or remove them in-game like any other block or even create terrains made of objects.

Watch [this video](#) for a quick tutorial.

Quick Tutorial

To create Voxeland click GameObject -> Create Other -> Voxeland Terrain. A creation window will popup.

As a Unity standard terrain, all block types data is stored in a separate asset file. The upper upper part of a creation window devoted to terrain data. New data could be created or assigned the existing one:

- to create data choose Land Data: -> create, then press Create Data In button. Save file somewhere inside the project the Assets folder (or one of subfolders).
- to assign choose Land Data: -> assign, then select data asset or drag-and-drop it into Data object field.

In the lower part of the creation window terrain size is set up. All the terrain is split into a separate meshes - chunks.

- Chunk Size: Each chunk is 10 meters in width and length by default. To change the chunk size enter a new int value. It is recommended to leave chunk size unchanged.
- Chunks X and Chunks Y: the dimensions of the terrain in chunks. The final length and width of the terrain will be a product of a chunk size and terrain dimensions in chunks.
- Size Y: the height of the terrain is independent from chunk size. It is always one chunk in height and the size of a chunk is set by Size Y.

When the size of the terrain is set press "Create Terrain". It will add a Voxeland object to the scene. Select Voxeland in a Hierarchy list, and you are ready to edit your terrain:

- To add block click left mouse button above the selected block.
- To remove a block click left mouse button shift pressed
- To replace a block click left mouse button control pressed

Block type could be selected in a Block Types foldout by clicking a block type card. A new terrain has only one block type, it is named "Ground" and this block has a white texture. To change the name click on "Ground" label. To change the texture - assign it into a texture slot and press "Rebuild" button in "Update and Rebuild" foldout. Note that a texture must have a special tiling layout - otherwise it will not be tiled (see "Preparing textures" section below). To add a new press "Add" button.

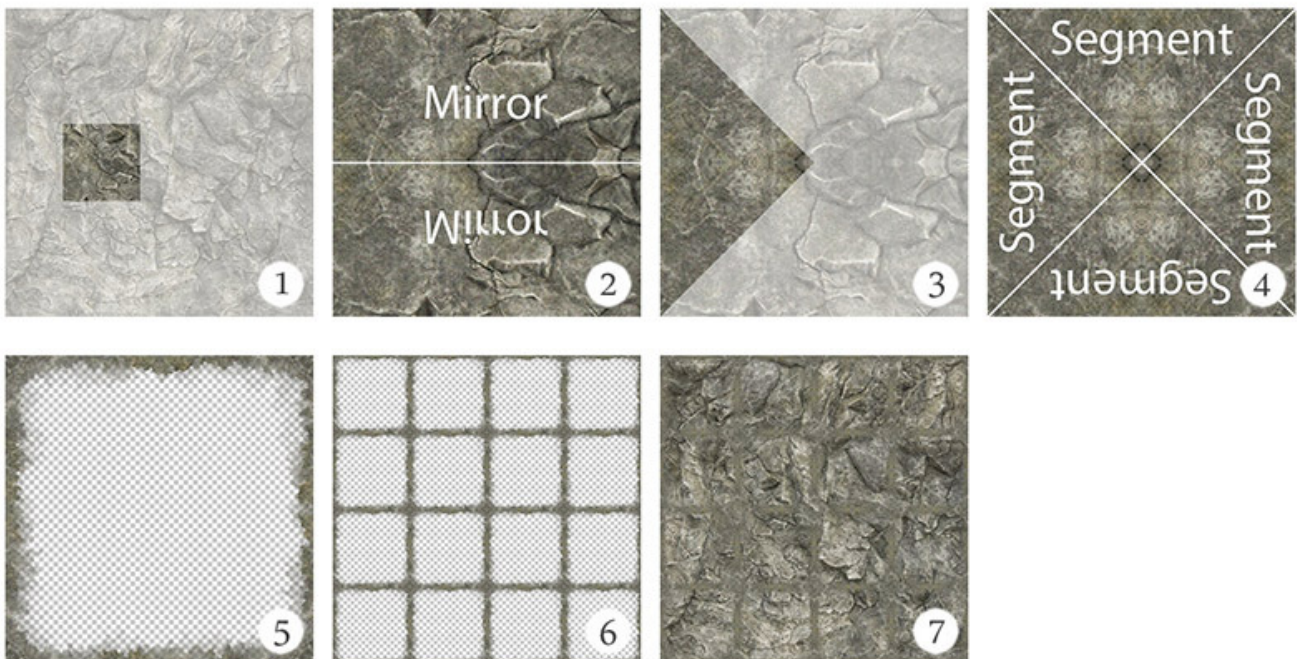
To enable terrain editing during playmode enable "Playmode Edit" in "Settings" foldout. Note that the changes made with the terrain are saved not in a scene, but in a data file, so they will remain if the playmode will be stopped. If you do not want the changes remain - check "Do NOT Save Playmode Changes" - this will duplicate data file on a playmode start and return it back if a game is stopped.

Properties

Data	Terrain data file. In broad terms, it is a three-dimensional array of ints (block types). The type of each block in a matrix is stored in the data file. Data file does not define block texture or even if this block filled - only the number of block type is stored in this file.
Brush Size	The number of blocks which is edited at once. Only the blocks which share an edge with a central one are added to brush (recursive. Brush size is a number of recursive operations).
Block Types	A list of block type cards. Each card corresponds to a block type on terrain. All block settings changes require Rebuild operation.
Block name label	Unnecessary text field, but the block name assignment will help to find block type quickly.
Filled	Check this the block is filled with stratum, and uncheck if it is the air or object block.
Texture (filled blocks only)	Diffuse texture map used by this block. Has to be 4x4 tile matrix to be tiled seamlessly (see Textures section below).

Bump (filled blocks only)	Normal map used by this block. Has to be 4x4 tile matrix to be tiled seamlessly (see Textures section below).
Object (non-filled blocks only)	Block object prefab. Objects could be placed or removed using terrain editor. If a block with an object is replaced with a filled block the object will be automatically removed to avoid lost objects under the ground.
Settings	Changing setting requires Rebuild to take an effect (except 'Playmode Edit' and 'Do Not Save In Playmode').
Playmode Edit	Enables in-game terrain editing.
Do Not Save In Playmode	By default all the terrain blocks data is stored in the Data asset file. Editing a terrain in-game will modify that file, so the changes from in-game modifications will remain. This feature deep-copies terrain Data on a playmode start and returns the original data on playmode stop.
Land Shader	A shader used in all chunks materials. Voxeland comes with 2 demo shaders - 4 blended textures with bump-maps and 4 blended textures with no bump. Assign the last one if you are not planning to use terrain with normal maps.
Additional Ambient	The amount of light added to the brighter parts of the terrain, while the dark ones (caves or canyons) will not receive a light. It can simulate ambient-occlusion on the terrain. The effect is strongest when scene ambient is dimmed.
Land Specular	Land material specular color. Equivalent to material specular color.
Land Shininess	Land material shininess. Equivalent to material shininess.
Grass Material	Polygonal grass material. Requires a grass shader and a grass texture with a special layout.
Grass Animation Speed	How fast the grass is animated by the terrain. And the magnitude is set in a grass material.
Hightlight Material	The material of a brush hightlight. Material with another color or transparency could be assigned.
Lightmap Padding	Second uv layout padding for lightmap baking. Try increase or reduce padding if you encounter lighmap bugs.
Rebuild	Destroys all the terrain chunks, objects and children and creates a new once using the terrain data.

Preparing textures



Voxeland textures have 4x4 elements, each of them could be tiled in any direction. To prepare a texture you have to create 16 tilable elements. All elements have to be tiled among themselves regardless the tile side.

The easiest way to do prepare a texture is:

1. Open the square texture source (for example, it will be 1024*1024), select 1/16 of it (256*256) and crop.
2. Mirror the cropped texture vertically.
3. Select triangle with two sides on the edge of cropped texture, and the last one is in the center. Note that the mirror seam should be inside the triangle.
4. Copy the triangle four times, each time rotating on 90 degrees around image center.
5. Mask or erase all the central part of the image. Actually, only thin borders will remain which are gradually fade. The thinner the borders - the better will be a result, but the sharper will be a transition between borders and base texture.
6. Tile the resulting frame four times in length and four times in height - so we get back 1024*1024 texture, made of 16 frames
7. Apply 16-frames texture over the base texture. Now you got tiled and prepared for use in Voxeland texture.

The grass texture consists of 4 squares, each of them contains 2 triangles of grass. Each staright angle of a triangle - is the top grass point, and two others - a the bottom (ground) corners. Please use a demo grass texture as a reference.