

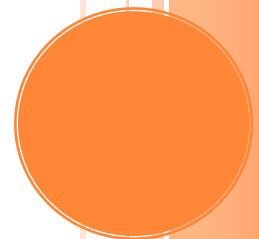
# INFINITE TERRAIN GENERATOR

*A quick guide*

What is Infinite Terrain Generator? ITG procedurally generates any terrain around the player. It's comprehensive set of options allows you, the developer, absolute control over every aspect of the generated terrain.

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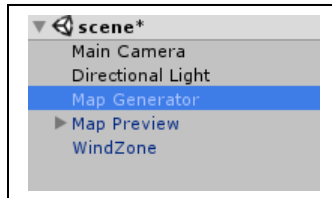


# Infinite Terrain Generator

## Getting started

If you've found your way to this document, we will assume you downloaded and imported the Infinite Terrain Generator in your project. If you haven't yet, please do so now.

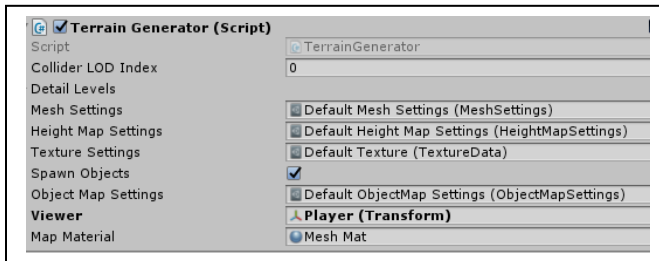
## ADDING THE TERRAIN GENERATOR TO YOUR PROJECT



Navigate to the Prefabs folder. This can be found under C47\Assets. Now drag the following Prefabs into your project: Map Generator, Map Preview and the WindZone.

On the Map Generator you will have to add a reference to your player. If you do not currently have a player, feel free to use a basic Cube or add the FPS controller from the standard Unity assets so move around easily. (Make sure to place it above the terrain, X: 0 Y:10 Z:0 should be fine.) As an alternative you can also use my simplified version of the FPS controller from the DemoAssets. Just drag the Prefab into your scene. (Also remove the default camera)

After you have your player, add it to the Viewer in the Terrain Generator.



If you want to quickly see the Terrain Generator in action then go to the demo scene and press play. (The Demo scene is covered in the next chapter)

Congratulations, you've successfully set up ITG. You can now hit Play to see the default terrain, use escape to stop.

In the next chapters we will cover the options in more detail. But if you want to skip ahead, have a look at the Terrain Assets folder, make sure to expand the collapsed elements.

# THE DEMO SCENE

*Open it up, press play.*

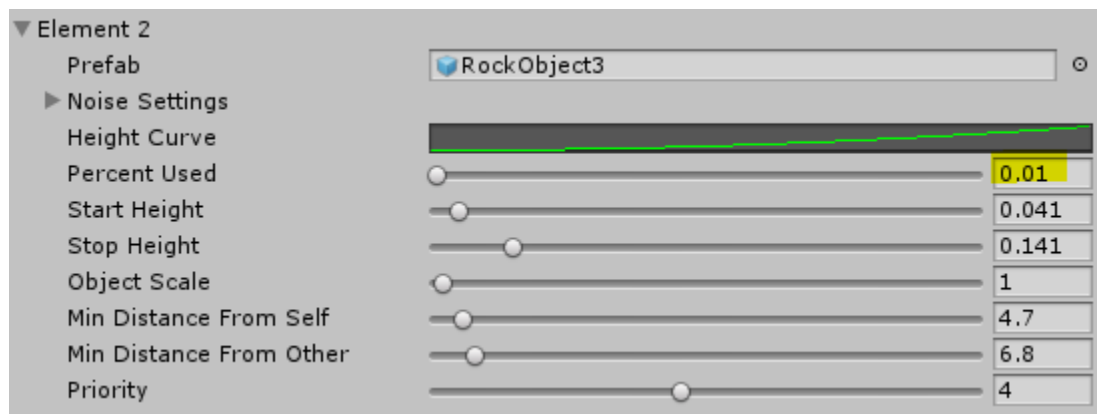
Before we get into all the options, let us take a quick detour by the Demo Scene.

When you start the Demo Scene you will be presented by a list of terrains to choose from. Simply chose one and it will be rendered around you.

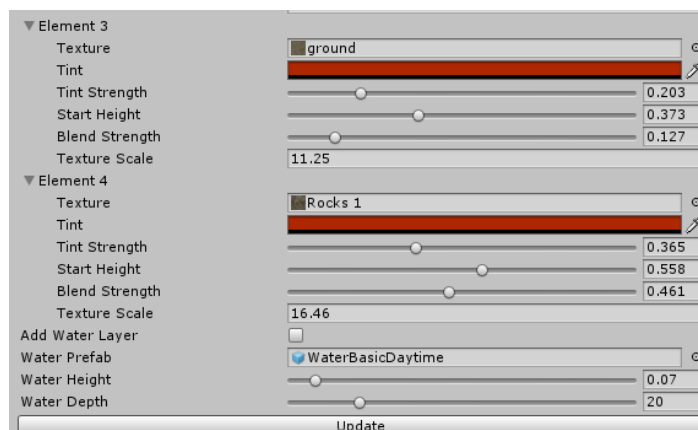
Each scene uses its own set of options, you can find these under the Demo Assets.

Through these settings objects we can control every aspect of the terrain.

Say we wish to see more type 3 rocks in the Mars terrain (as if there aren't enough yet)... we would simply increase the Percent used variable for this object.



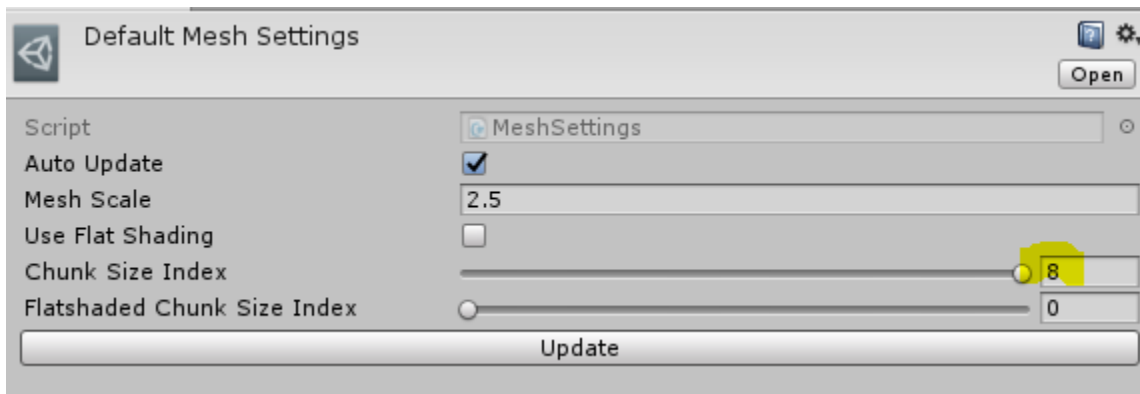
I suggest you play around with the settings and see a new landscape every time you hit Play.



# HOW TO CONFIGURE ITG

## *Understanding the basic components*

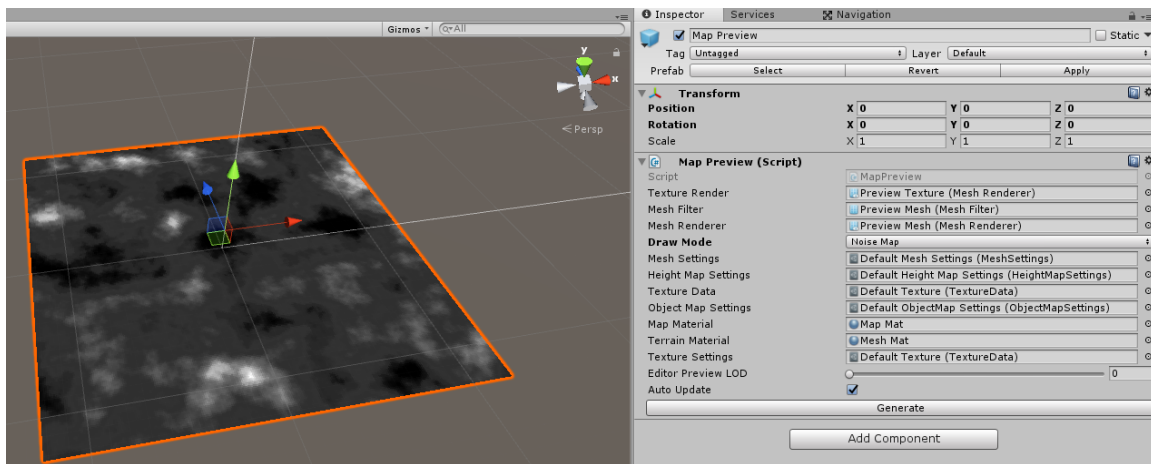
To get a better picture of what is going on, let's quickly go to Terrain assets\Default Mesh settings. Change the Chunk Size index to 8 (max). This will make the results we're about to see a lot bigger. We'll cover this setting later.



## *Noise settings*

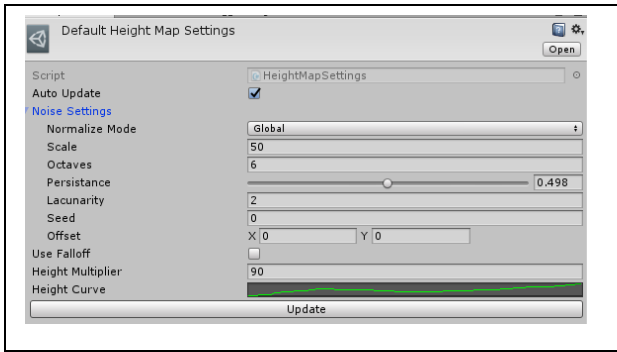
Now select the Map Preview in your scene, select Noise Map for the Draw Mode and hit Generate.

You should be seeing something resembling this:



This is part of the noise map ITG will use to create the terrain. A chunk is one block of the map.

In the Inspector you can see Mesh settings is set to Default Height Settings. These properties can be found in the Terrain Assets.



**Normalize Mode:** Use local for single chunks, use Global to take into account the chunks next to the current chunk.

Recommended setting: Global

**Scale:** This “zooms” in on the noise map. This makes the transitions a lot smoother.

Recommended setting: 50 for the map, 1 for objects maps.

**Octaves:** To make the noise map more interesting,

we use multiple octaves at different frequencies to generate the noise map.

Recommended setting: 6 – 12 for maps, 1-2 for objects.

**Persistence:** The change in amplitude for each frequency.

**Lacunarity:** The increase in frequency for each octave.

**Seed:** The seed used to generate random values, change this to any number between 0 and infinity to generate a totally different map. (Negative values also work)

**Offset:** Moves the noise map on the plane.

**Use Falloff:** Tells the generator to smoothly change the height to 0 at the edge of the chunk.

Recommended setting: Disabled

To see the effect of the next 2 settings, you will need to change the Map Preview to Mesh.

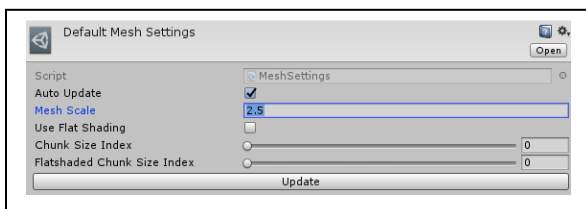
**Height Multiplier:** The noise map generates the heights as a number between 0 and 1, the height multiplier is used (by the Mesh generator) to calculate the actual height.

Recommended setting: 50-120, 90

**Height Curve:** This curve is used to translate the noise map into height data (then multiplied by the Height multiplier). Want more mountains? Want more plains?

Change the curve and watch the terrain change.

## Mesh Settings



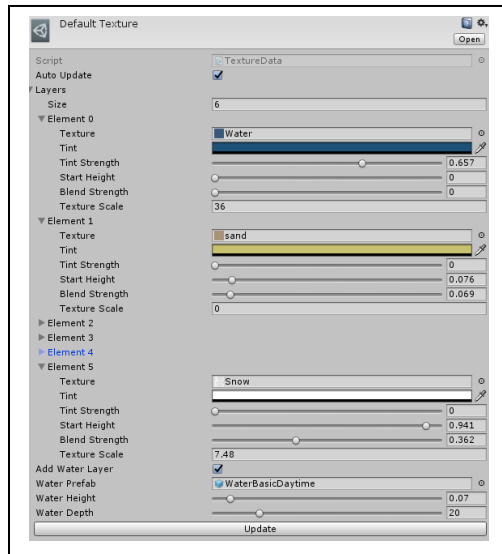
**Mesh Scale:** This setting changes the scale of all ITG generated objects. It is great to match it to other assets you may already have created.

**Use Flat Shading:** Tells ITG to use flat shading.

Chunk size index & Flat shaded chunk size index: Tells ITG how big the chunks generated should be.

Recommended settings: Put this at the max when using the preview, but put it back at 0 when playing the game. Especially when using object generation. The performance of your game will suffer the greater the chunk size is.

### *Texture settings:*



The texture applied to the map is created in multiple layers, you can add or remove layers and configure every aspect of them.

Texture: Changes the texture used for this layer.

Tint: Changes the colour used for this layer. Want red grass? Apply a red tint to your grass texture.

Tint strength: How strongly the tint is applied to the texture.

Blend strength: How far this layer blends into other layers.

Texture scale: Scales your texture.

Besides these layers is also a water Layer:

Add water Layer: Turns on/off the water layer.

Water Prefab: What prefab to use as the water. Want purple goo instead of water? Change the prefab.

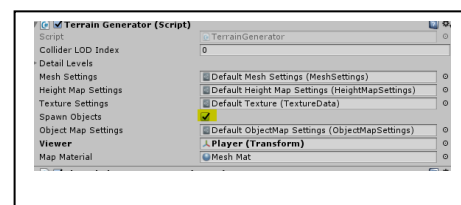
Water Height: The height of the water in the map, want to create a drowning world? Or want very little water? You can achieve this here.

Water Depth: How deep the water should be.

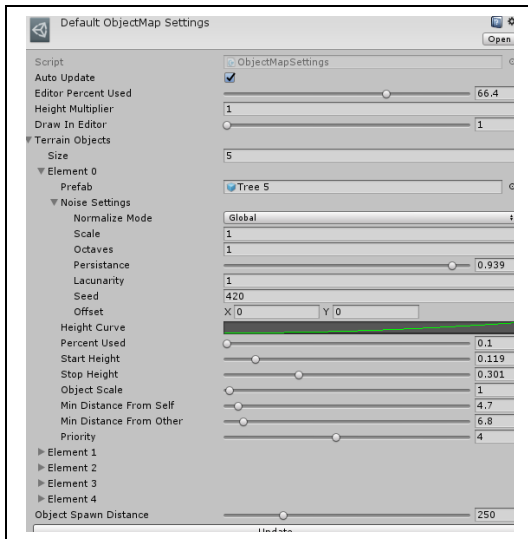
You need to start the game to see the water.

### *Object Map Settings*

Unfortunately, objects cannot yet be previewed. They are only visible in play mode. They can be turned on and off on the Map Generator.



Note: When objects are turned off the collider is applied just before a player steps on a chunk. When objects are turned on however they are applied a lot earlier (the Object spawn distance) as the collider is used to correctly place the objects on the map.



The first 2 settings can be safely ignored, they are only there as the groundworks for adding the objects to the Map Preview.

Draw in editor will draw the selected object map in the Map Preview when it is set to object Map. You will need to click generate after changing the Object Map settings.

Each object spawned has its own settings in the Terrain Objects array.

Prefab: The prefab used to spawn these objects. Noise settings: These are the same noise settings as used by the map generator, but now used to create a very different noise map for the

objects.

Percent used: From all the possible spawn locations on the map, how many should be used for this object.

Recommended setting: 0.01-0.25

Start Height: At what height in the map should these objects start spawning.

Stop Height: At what height in the map should these objects stop spawning.

Object Scale: Changes the scale of your object to match its surroundings.

Min distance from self: How close to another object of the same type can this object spawn.

Min Distance from other: How close to any other object can this object spawn.

Priority: When 2 objects would spawn to close to each other, the lowest priority will win and spawn, the other object will be removed. Setting this value to -1 will spawn it regardless of both distance settings.

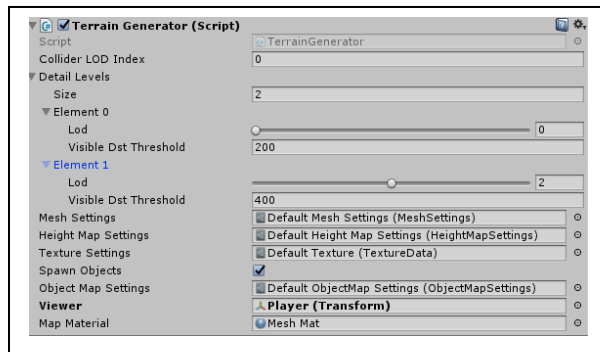
Object Spawn Distance: How far away from the player should Objects start spawning. Note that this setting also overrides the distance the collider will be applied to the chunk.

Important note: When you create a prefab for a new object, make sure to always add the baseObject script or a script deriving from it on this object. It is required for ITG to be able to use this object. Examples can be seen with both the RockObject and the TreeObject in the Objects folder.

When the Object Map and Texture map are used together they create a power full tool that allows you to create biomes throughout the map.

## Terrain Generator

The last settings you'll need are on the Map Generator.



**Collider LOD Index:** This tells ITG what Level Of Detail to use for the Collider.

Lowering this will increase performance at the cost of being less accurate.

Recommended setting: 0 – 2

**Detail Levels:** This is an array, it includes both Level Of Detail or LOD and a Visible distance Threshold. What this allows you to do is set a lower LOD for chunks that

are further away. When a player crosses the threshold for a higher/lower LOD ITG will replace the mesh to a more/less detailed version. Setting a lower LOD for chunks further away will increase performance.

**Mesh Settings, Height Map settings, Texture Settings, Object Map settings:** These refer to the object in the Terrain Assets folder as configured in the previous chapters.

**Spawn Objects:** This tells ITG whether or not to spawn objects on the map.

**Viewer:** This typically holds a reference to the player object. Around this object ITG will spawn the map. When the viewer moves, ITG will update accordingly.

## ROADMAP

*What to expect in future updates?*

- Optimization of object spawning
- Spawning of water in Map Preview
- Spawning of objects in Map Preview
- Use of shaders instead of textures.
- Memory optimization.
- Creating a biomes example.