

YuME: Yuponic Map Editor

Version: 1.01

- Added global scale setting
- Added an invert mouse wheel for moving the grid
- Bug fix for Converting tiles with no collision

1. YuME: Yuponc Map Editor

1.1. Introduction

The Yuponc Map Editor (YuME) is a Unity Editor Extension created to allow level designer to rapidly prototype game levels and environments using 3D Tiles, or blocks.

YuME allows you to create your own tilesets and import them in an intuitive way for use in the tool and your game. You can also convert existing tile-based assets for use in the tool.

1.1.1. Why did we create this tool?

Unity is a fantastic game engine that allows amateurs and pro's alike to create the game of their dreams. However, in catering for all possible game types, from MMOs to Flappy Birds, the editor needs to function in a genre neutral way.

Building game levels in Unity can be time consuming and fiddly due to limited grid snapping and the time consuming placement of prefabs.

YuME allows designers to build levels in a more natural way by using a set of prefab brushes and painting them directly into a grid snapped scene.

This approach will be very familiar to 2D game creators, and with YuME I wanted to bring the speed and flexibility of a 2D Tile Mapper to 3D games.

1.1.2. A little history

3D Tiles form a large part of my history in the games industry. I've been fortunate enough to have making games professionally for over 23 years, and throughout that time the techniques and tools for game creation have changed dramatically, but in other ways have also come full circle.

I first worked with a 3D tile based editor on the game Vortex for the Super Nintendo. Back then the maps were built in D-Paint (an industry standard bitmap editor). We had a limited palette which represented game objects and dropping a color on a 64x64 bitmap to place an object in the scene.

A few years later I started working on a concept for a 3D Platform Game that became Croc: Legend of the Gobbos. Realizing we needed a tool to build the levels we ended up creating CrocEd, which used 3D tiles that were placed within a cube grid to build the world.

Although the CrocEd was ultimately limited by what we could create on the Playstation, the tool allowed the design team to be incredibly creative and iterate quickly on levels for the game.

The CrocEd and engine went on to power a bunch of different games, from Disney's Aladdin to Harry Potter.

As the trend to realism kicked in throughout the PS2/PS3 years, tile based games fell out of favor. That is until recently.

As the market broadened I started to see a lot more games go back to using techniques we developed for Croc. Even Nintendo moved over to a more tile-based approach with games like Super Mario 3D World and Captain Toad Treasure Tracker.

These days it's an artistic choice rather than a limitation of technology. And for me, it's a fast and creative way to try out ideas without having to build geometry and hand place it in the scene.

1.1.3. Suitability

YuME is the perfect tool for creating focused, level based games. These can be strategy games, platform games, arena based FPS games, etc.

It's probably better to focus on games YuME isn't so suited to.

If you're looking to create a vast open world game with a naturalistic environment, be it a mystic forest or the streets a cyber-Singapore then YuME isn't going to get you to your end goal. There are tools and techniques better suited to creating those kind of games, and I probably owe you a refund 😊

1.2. Use Cases

There are a few use cases where I can see YuME being the most useful:

- **Tile Based Games:**
Where game environments are designed around the concept of tile prefabs. Suggested games to look at include Captain Toad Treasure Tracker, Atlas Reactor, and the latest batch of Pokémon games for the 3DS.
- **Level Prototypes:**
Where a level designer wants to quickly build out the structure of the level with an eye to an art team taking the basic structure and doing an art pass.
- **Game Jams and Prototypes:**
Where you quickly want to try out ideas and mechanics and make rapid progress.

For some games, YuME will be the only tool you use to build levels. For others it will be the start of the tool chain to help you get up and running quickly and efficiently.

1.3. Feature requests and Bugs

We're always looking for suggests on how to improve YuME, and we're also keen to squash any bug you discover. If you have any suggestions or bugs to report, either drop by the forums at <https://www.facebook.com/groups/723432771140117> or drop me an email on info@yuponic.com

2. Getting Started

2.1. Importing YuME

Once purchased from the Unity Asset Store you'll be prompted to import two key folders, one name Yuponc and the other Gizmos.

The Yuponc folder is the home of YuME and the source for the editor and prototype tileset. The Gizmos folder contains a single image which is used as a guide to where tiles are located in the scene.

YuME has been designed so that folders are not hard-coded. This means that after import you can move the Yuponc folder into a sub-folder of you wish. For example, I like to move all of my 3rd party assets into a specific folder to keep the root of the project tidy.

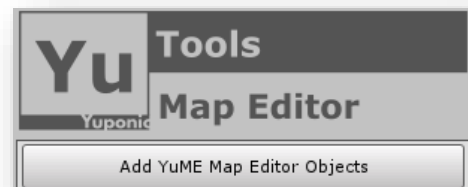
2.2. Opening the Map Editor

Once imported the window drop down will have a new entry named Yuponc. Instead the Yuponc drop down you'll see three items and a sub-folder. Selecting 'YuME: Map Editor' opens up the map editor.

The map editor window can be docked or left floating if based on your preference.

2.3. Adding YuME to a Scene

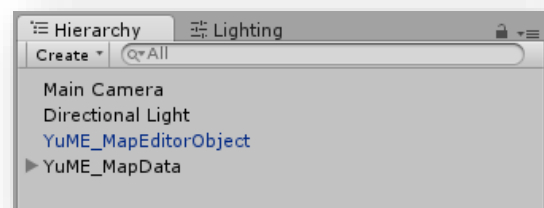
YuME needs to add a couple of game objects to your scene. One object handles the grid and is not active in play mode. The other acts as a container for the tiles you'll be dropping into the scene.



To add these objects to the scene, click on the 'Add YuME Map Editor Objects' button in the map editor window.

The scene will now have two new objects:

- YuME_MapEditorObject
- YuME_MapData

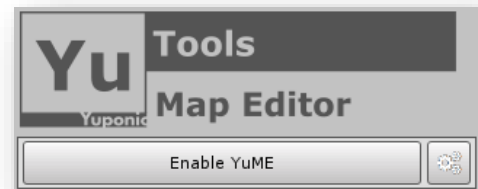


2.4. Enabling YuME

Once the scene and the necessary files are added to the scene, the main map editor interface is displayed.

To start using YuME, click the 'Enable YuME'.

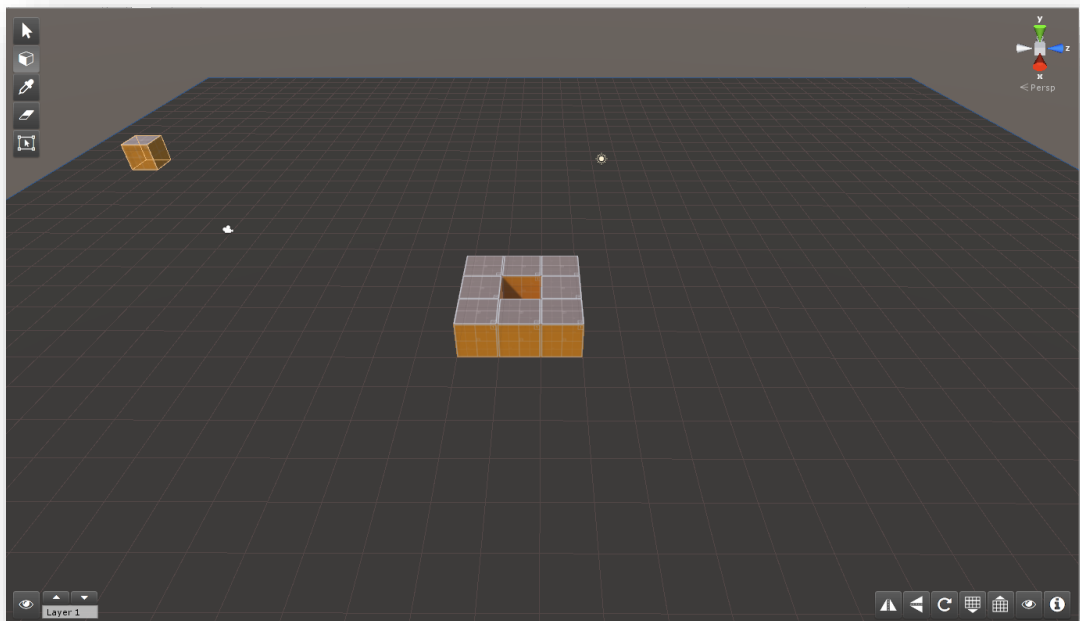
The YuME grid and tool bars will appear in the scene view and you are ready to start building your level.



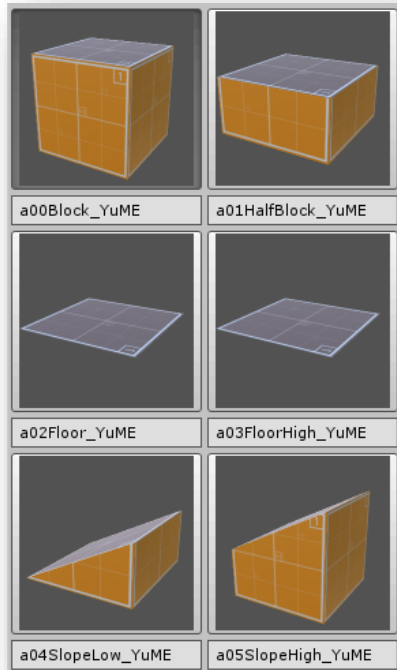
2.5. Building Levels

By default, the Paint Tool (3D cube icon) is active. Using this tool, you can paint the currently selected tile onto the grid.

If this is the first time you've used YuME, the prototype tileset will be set as the current tileset.



As you move your cursor over the scene, you'll see a highlighted copy of the currently selected tile move across the grid. To begin painting tiles in the scene, simply press or hold the left mouse button.



To change the tile that forms the brush simply select a tile from the palette in the map editor window.

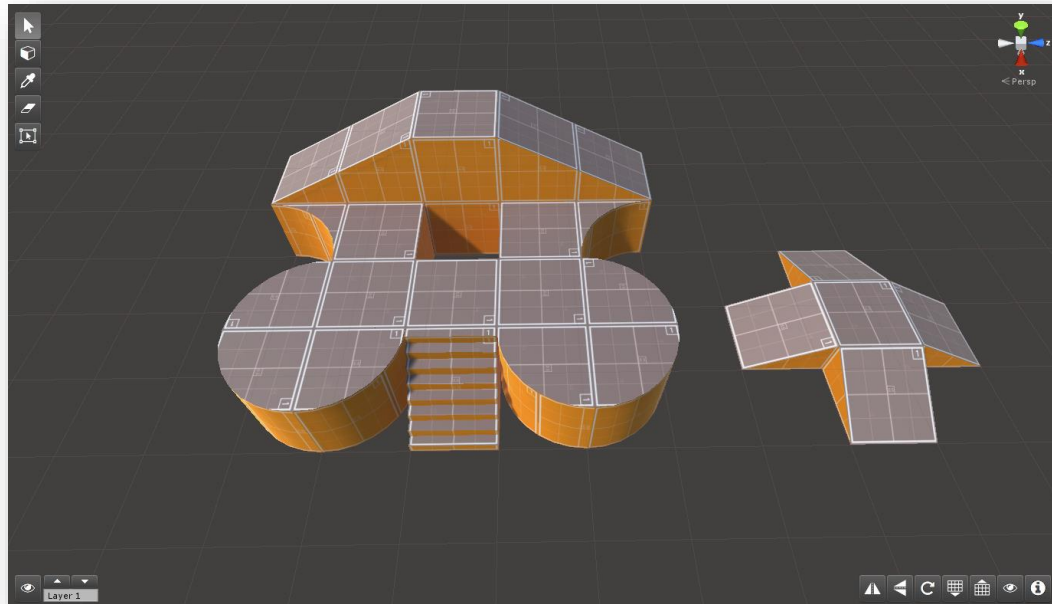
The palette window is a great way to preview the content you can build your levels with. However, if you want to quickly scroll through the available tiles, hold SHIFT and CONTROL and scroll the Mouse Wheel.

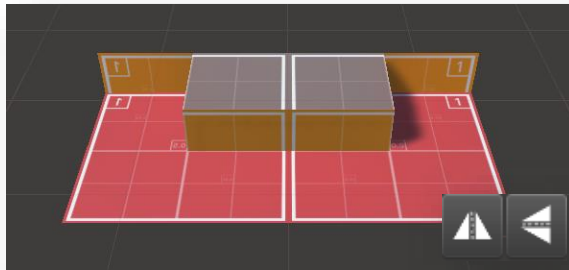
With every scroll of the mouse wheel the brush cursor updates allowing you to stay focused on the scene view as you create your levels.

To build on different levels you can move the grid up and down. This can be done by either clicking on the grid icons or by holding SHIFT and scrolling the Mouse Wheel.



Often you'll want to rotate tiles that are none symmetrical. To rotate the tile, you can either click on the rotate icon or use the Z and X key to rotate clockwise and counter-clockwise.

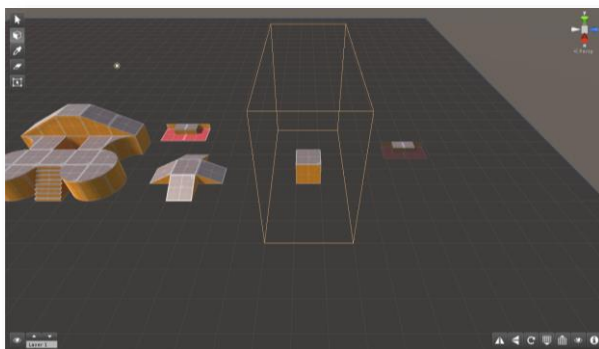
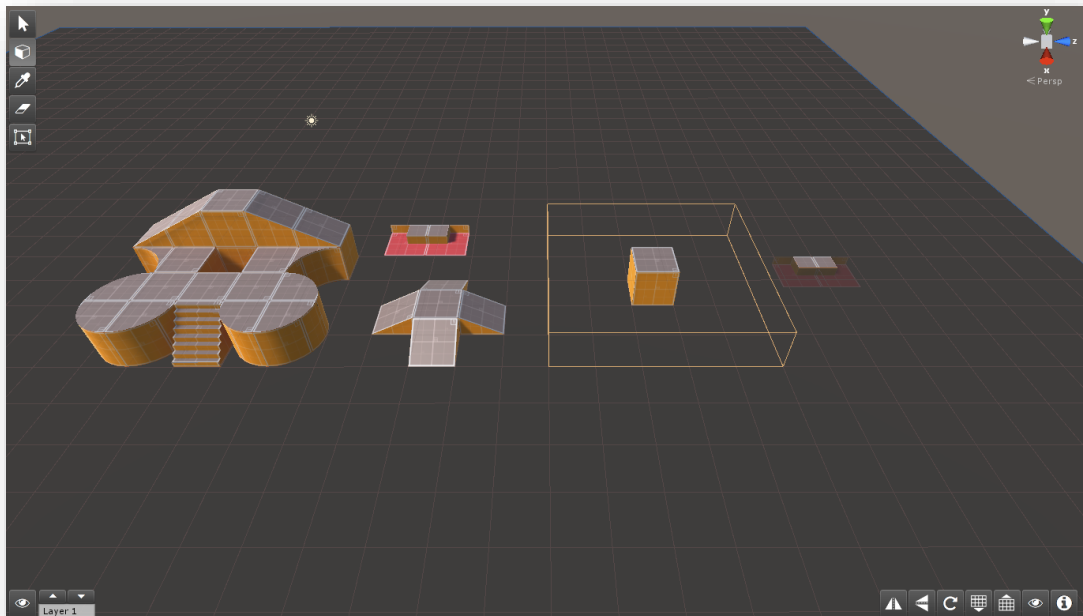




Tiles can also be flipped, allowing for the maximum reuse of the minimum amount of tiles.

To flip a tile horizontally or vertically simply click on the flip icons.

If you want to paint more than one tile at a time you can adjust the brush size. There are a couple of different ways to do this. To simply 2D scale up the brush, use the [and] keys.



You can also independently scale the brush on all axis.

Cursor Left/Right scales the brush on the X axis.






Cursor Up/Down scales the brush on the Z axis. Shift and cursor Up/Down scales the brush on the Y axis.

Scaling on the X and Y always scales to odd numbers (for example 1,3,5,7) to keep the brush centered on the grid. Scaling on the Y is purely incremental.








To reset the brush press Enter/Return.

3. Tools Overview

3.1. Primary Tool Bar





| | |
|---|--|
|  | Standard Tools: Defaults back to the standard unity tools. Tool shortcut: ESC |
|  | Paint Tool: Paint Tiles into the scene. LMB to Paint the current brush. Tool shortcut: A |
|  | Pick Tool: Pick a tile in the scene and make it the current brush. LMB to pick tile. Tool shortcut: S |
|  | Erase Tool: Erase the tile under the brush. LMB to erase the tile. Tool shortcut: D |
|  | Select Tool: Select the tile under the brush. LMB to select the tile. ALT + LMB to deselect. |

3.2. Secondary Tool Bar


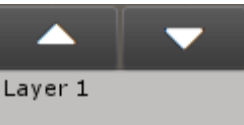
| | |
|---|--|
|  | Info Tool: Show a helper gizmo that identifies the tile pivot. If tiles are selected, additional information about their layer, name, and grid level is shown. |
|  | Isolate Grid Tool: Hides all tiles not on the current grid level. |
|  | Grid Up Tool: Move the grid up 1 position. ALT + click moves the grid 0.25. Tool shortcut: = or SHIFT + Mouse Wheel Up |
|  | Grid Down Tool: Move the grid down 1 position. ALT + click moves the grid 0.25. Tool shortcut: - or SHIFT + Mouse Wheel Down |
|  | Rotate Tool: Rotate the current brush 90 degrees. Tool shortcut: Z / X to rotate clockwise / counter-clockwise |
|  | Flip Z Tool: Flips the brush in the Z axis. |
|  | Flip X Tool: Flips the brush in the X axis. |

3.3. Select Toolbar

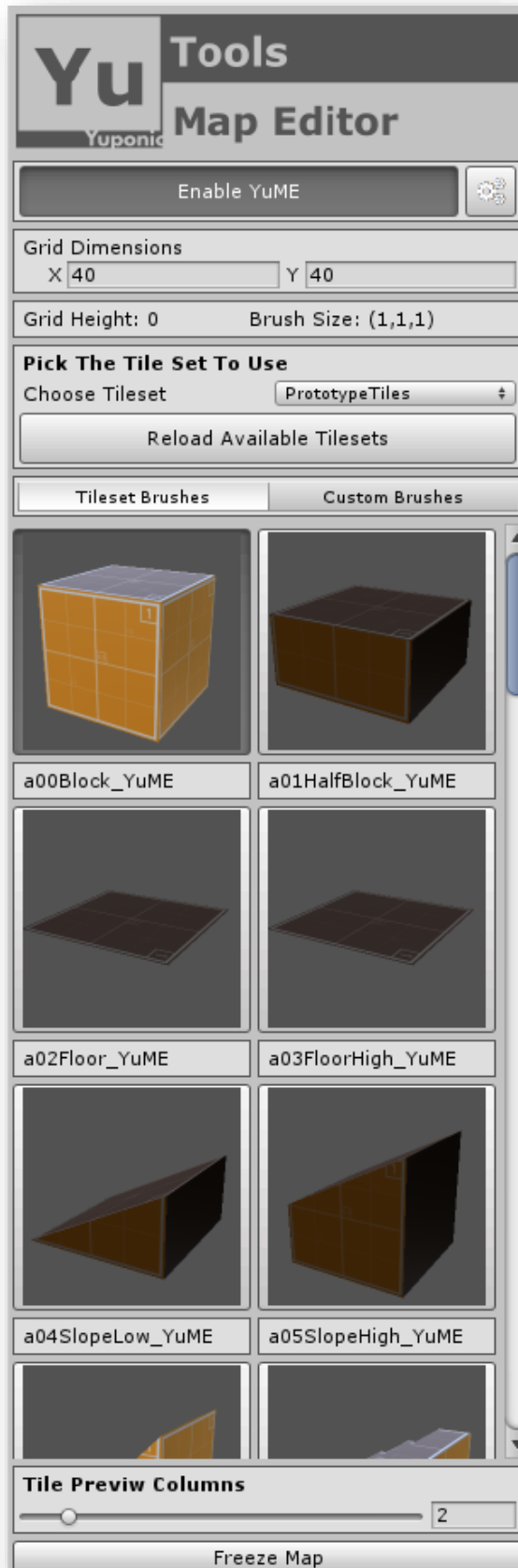
The select toolbar is only active when a tile is selected. To select tiles use the Select Tool or the standard unity tools.

| | |
|---|---|
|  | Copy Brush Tool: Copies the currently selected tiles and makes them the active brush. |
|  | Cut Brush Tool: Cuts the currently selected tiles and makes them the active brush. |
|  | Custom Brush Tool: Creates a saved copy of the selected tile and stores them in the custom brush tab and folder. |
|  | Erase Selected Tiles Tool: Deletes the selected tiles from the scene. Important. When selecting with the default unity tools you should always use the erase tool to prevent additional game objects from being delete. |

3.4. Layer Toolbar

| | |
|---|--|
|  | Layer Isolate Tool: Hide all tiles that are not on the current layer. |
|  | Layer Select Tool: Use the arrows to select the current layer. Note: Layer names can be edited in the settings window. |

4. Map Editor Window



Enable YuME:

Activates the editor in scene. In an off state all standard Unity functionality is restored

Open Settings:

Opens the settings window.

Grid Dimensions:

Change the size of the YuME grid.

Scene Info: Current grid height and brush size.

Choose Tileset: Pick the active tileset dropdown.

Reload Tilesets:

Refreshes the available tileset. Used after import.

Brush Types:

Choose standard tiles or custom brushes

Brush Palette:

Previews of all the current tiles in a tileset. Click select to make a tile the active brush.

Preview Columns:

Change the width of the palette to suit your editor setup.

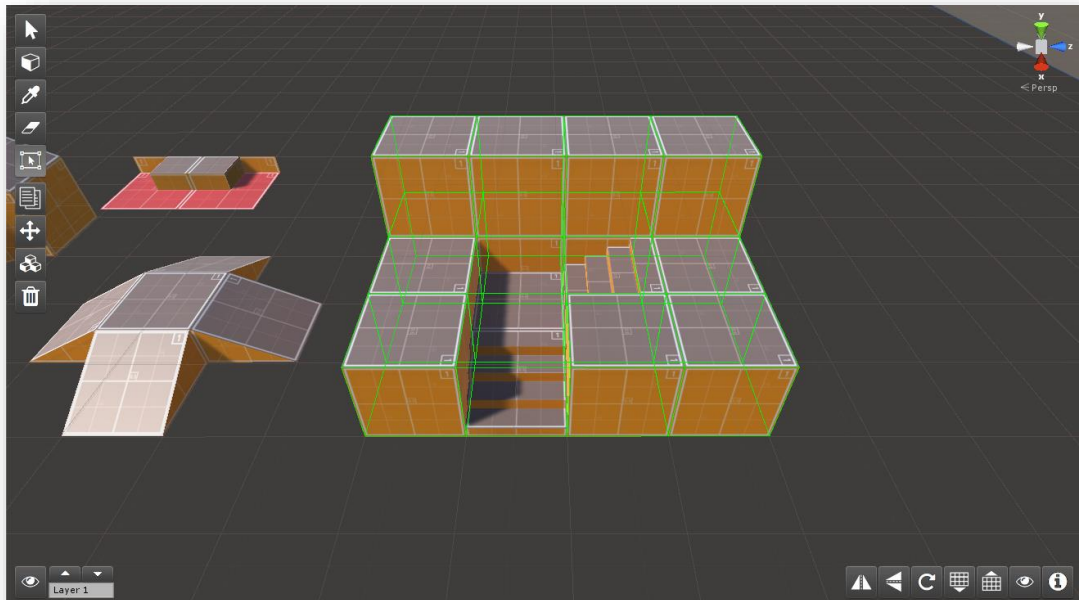
Freeze Map:

Consolidate the map into a single, un-editable mesh.

5. Custom Brushes

5.1. Creating a custom brush

Often you'll find yourself repeating specific tile configurations. To save time in level building you can save a selection of tiles and store them as a custom brush.

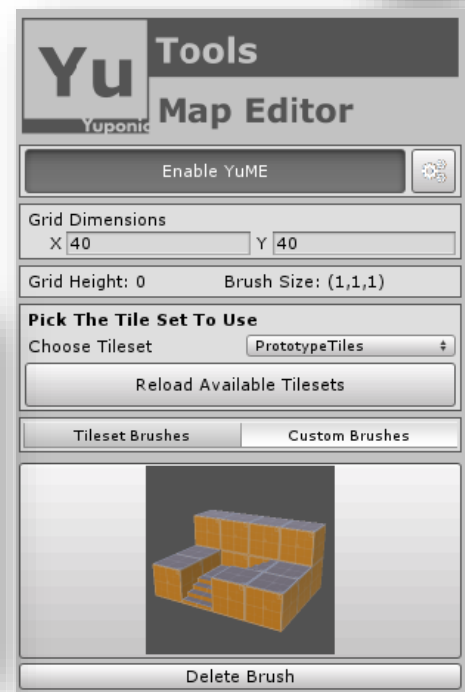
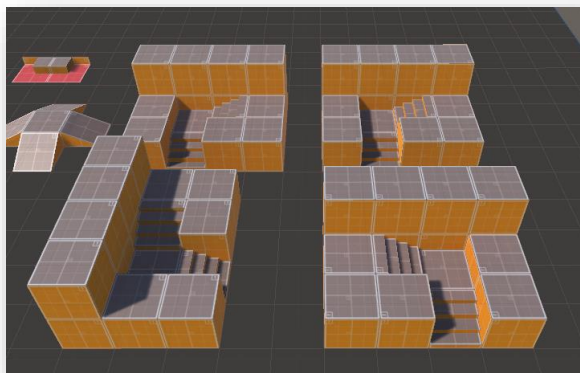


Select the tiles you want to store either using the Select Tool of the standard unity selection tools. Once selected click on the Custom Brush icon.



The custom brush will now be available in the custom brush tab of the main YuME editor window.

To use the custom brush simply select. Custom brushes can be rotated and flipped just like standard tiles.

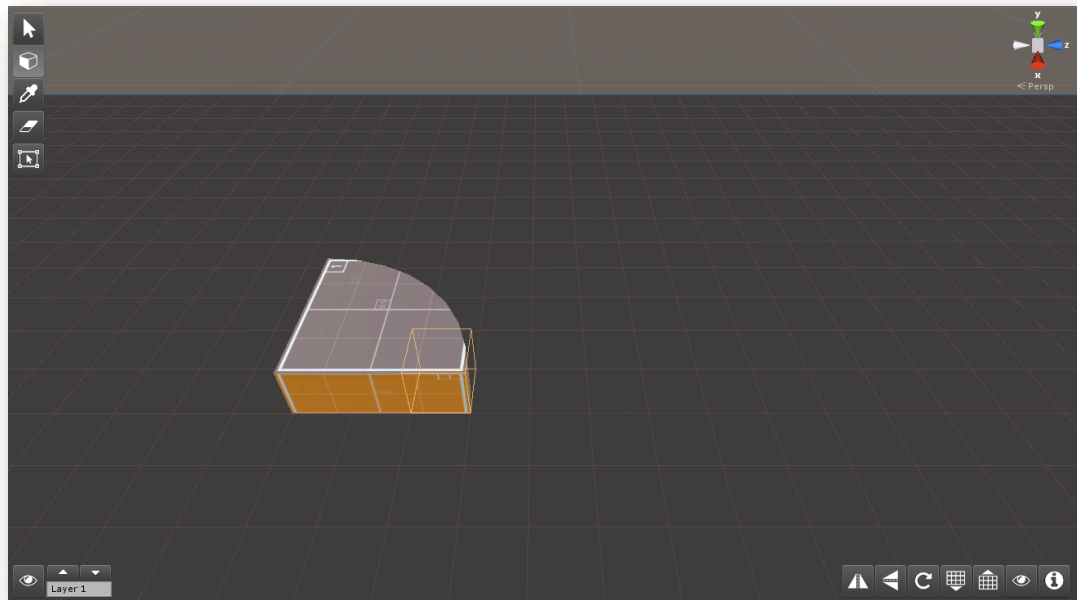


If the brush is no longer needed it can be delete in the editor window.

6. Non-standard Tiles

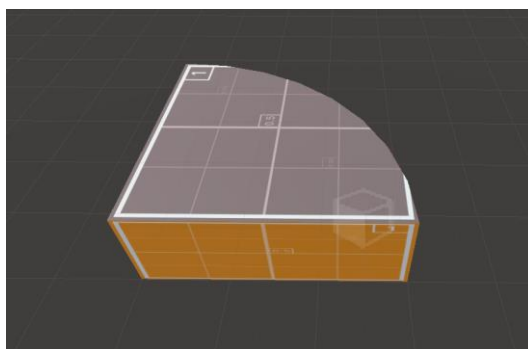
6.1. Considerations for non-standard tiles

YuME is designed to work with tiles built around a 1x1x1 cube. However, tiles of different sizes can be used in YuME with some minor caveats.



In the example above we have a 3x3 tile. If you look closely at the cursor you can see it's pivot is the right side corner. If you wish to delete or pick the tile, then this corner position is the only selectable point on the tile.

To make it easier to see where the pivot point on a placed tile is location you can use the information tool.



Turning on the information places a unity gizmo at the pivot point of each tile in the scene.

Where possible it's best practice to build larger blocks as custom brushes. However, there are obviously cases where this is inefficient or impractical.

7. Freezing a Map

7.1. Using Freeze Map in production

At the bottom of main editor window there is a button named Freeze Map. Clicking this takes all of the tiles in a level and combines them into a single, un-editable, mesh.

This is useful in a number of different situations.

While static batching is set as default when importing a new tileset through the Tile Importer tool, maps built in YuME can contain thousands of individual prefabs which could have an effect on performance.

Another reason to freeze a map is if you want to bake Ambient Occlusion into the vertex colors using a tool such as Mesh Materializer or Vertex Dirt. These tools can bake AO into a mesh instead of using a post process effect and is ideal for mobile development.

You can switch back and forth between active and frozen maps at any time by simply unfreezing the map.

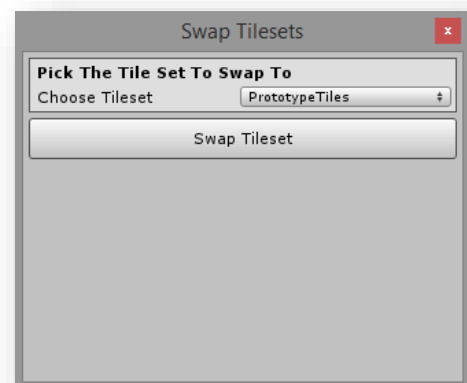
8. Swapping Tilesets

8.1. Move your map over to a new set of tiles

As part of your production process you might want to build all your levels using a generic set of tiles, such as the prototype tileset included with YuME. If you had to rebuild your level once a level specific tileset was available, that would be bad – right?

In YuME you can swap out tilesets using a tool location in the Windows menu under Yuponic/Utils.

This simple tool allows you to select a tileset that has previously been imported into YuME and replace any tiles in the map with tiles in the new tileset that match their name.



9. YuME Settings

9.1. Changing the editor settings

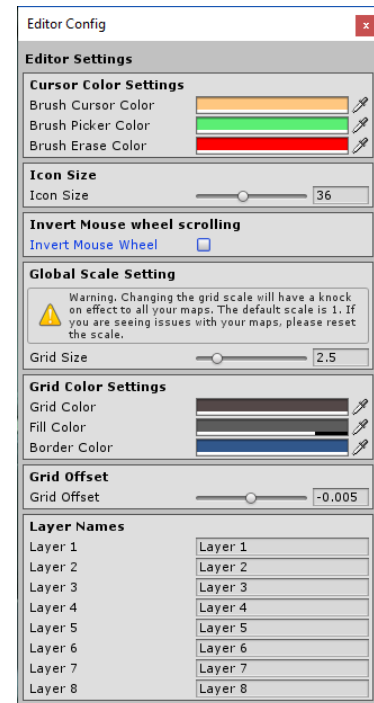
Various aspects of YuME can be customized in the Editor Config window. The window can be accessed by clicking on the config button next the 'Enable YuME' button.

Once the editor config is open you can select colors for the brush cursor, the editor icon size, and the grid colors and opacity.

Grid offset allows you to fine tune the offset of the grid. This is useful for certain tilesets that either sit under or over the normal grid position.

You can rename the YuME's layers. This can be very useful for projects where specific tiles need to be dropped on set layers.

New in v1.01 is the option to change the global scale (see notes on global scale below), as well as invert the mouse wheel scroll when changing the grid height.



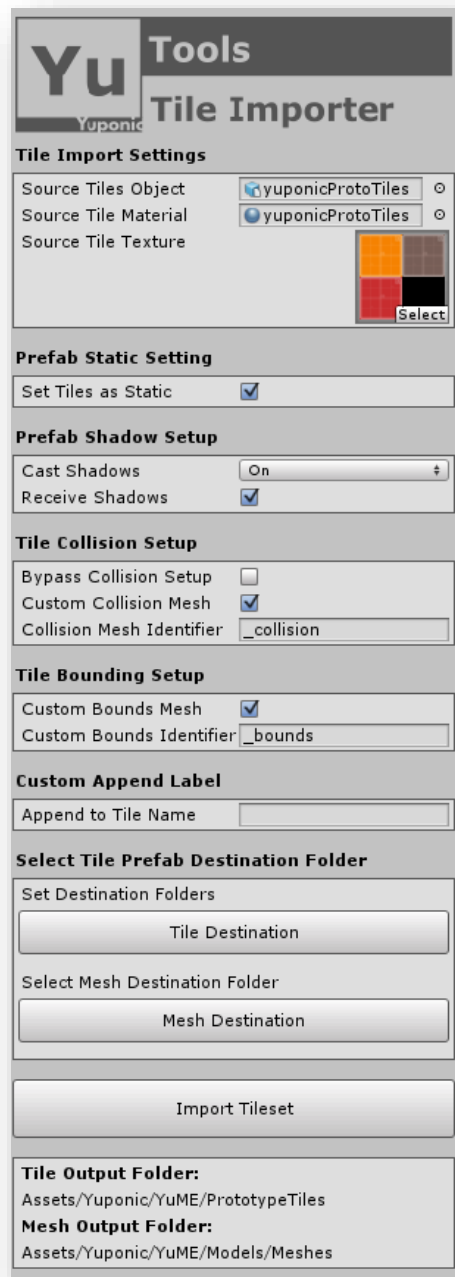
9.1.1. Global Scale

In the config window you can change the global scale. This allows you to set a base scale of YuME to better match your existing assets. For example, a global scale setting of 2.5 makes YuME play nice with UFPS.

The global scale should be set at the start of your project. Loading up a map built on a different scale will result in editing issues, such as not being able to select tiles that have already been placed.

It's worth experimenting with the global scale to find a value that suits your project before getting too deep into map building.

10. YuME Tile Importer



The YuME Tile Importer is found under Window/Yuponic. This tool allows you to import your own artwork and tiles into YuME.

Once you have created your tileset, drag it into the Source Tile Object.

To assign a material to the tileset you can either drag in the texture you want to use or a predefined material. If you simply add the texture a standard shader will be created in the destination folder of the tileset.

Once you have your assets in place you can change various import option such setting the tiles as static, their shadow and collision settings.

The importer allows you to setup a custom collision mesh in your source file. This will be named the same as the object you are building collision for with an added extension, such as `_collision` (the default). If you wish to use a different collision extension name you can customize it here.

The importer automatically moves all objects to the origin. If you have an object that needs to be offset from the origin you can create a custom bounds object in your source file. In the same way collision is setup, the bounds need to be named the same as the source object with the extension `_bounds` (default).

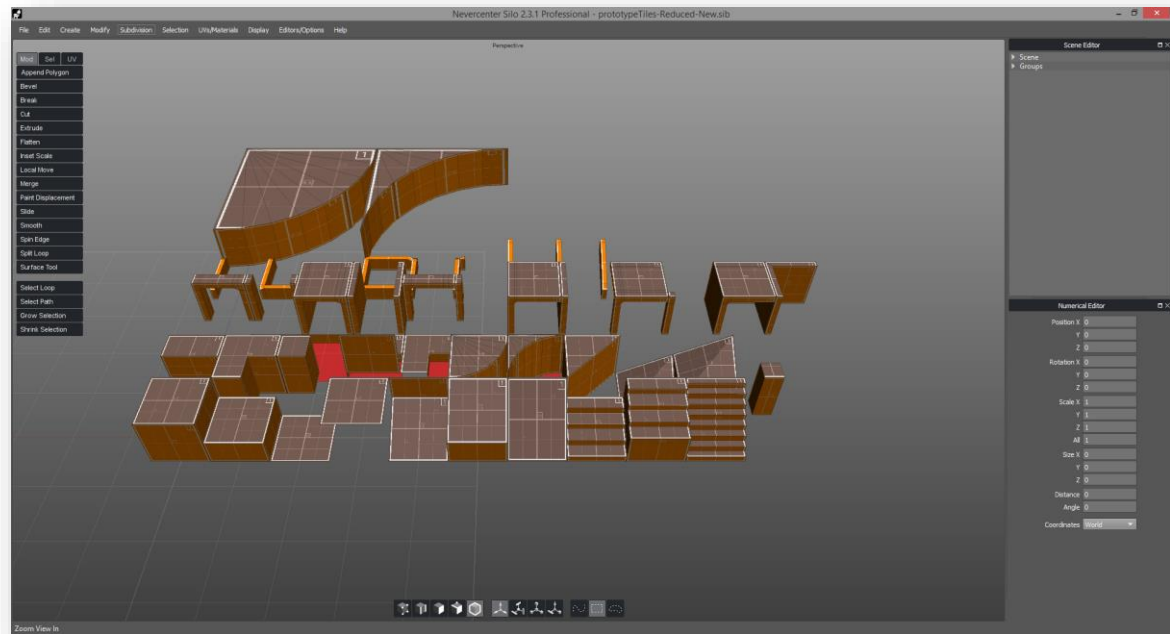
If you wish to append a name to the imported tileset you can add one in the Append to Tile Name.

Finally, you need to setup the destination for the tile prefabs as well as the destination the new meshes that the importer creates.

Once you are happy with the settings simply press the Import Tileset button to create your YuME tiles.

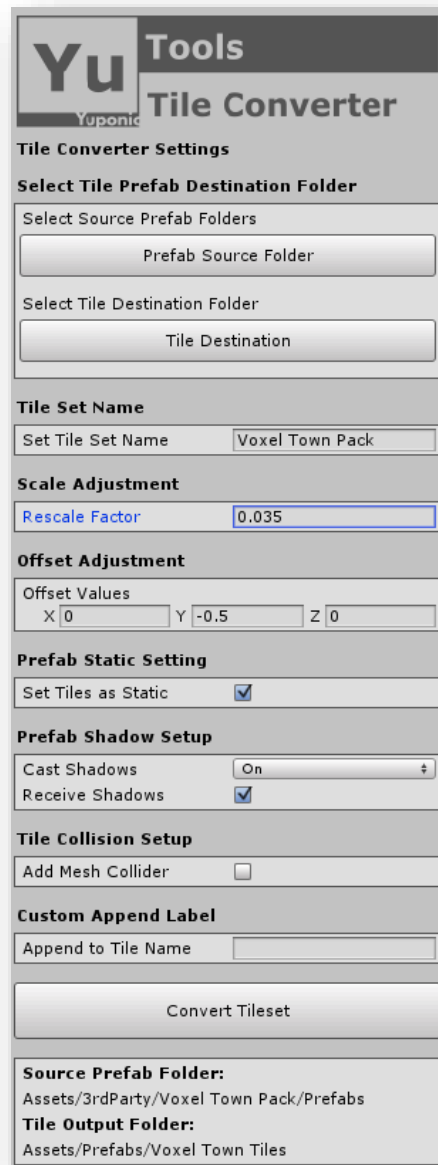
11. Creating Tilesets

Tilesets in YuME are created from a single scene file that contains multiple objects. This process for creation is useful because when creating modular tilesets you often want to reference existing tiles to make sure they line up perfectly.



When creating your first tilesets it's useful to use the Prototype Tiles that come with YuME as a reference. The source .obj file is found in the folder Yuponc/YuME/Models.

12. YuME Tile Convertor



The screenshot shows the 'YuME Tools Tile Converter' window. It has a title bar with the 'YuME Tools' logo and 'Tile Converter' text. Below the title bar is a 'Tile Converter Settings' section. This section contains several sub-sections: 'Select Tile Prefab Destination Folder' with buttons for 'Select Source Prefab Folders' and 'Prefab Source Folder', and 'Select Tile Destination Folder' with a 'Tile Destination' button. 'Tile Set Name' has a text field with 'Voxel Town Pack'. 'Scale Adjustment' has a 'Rescale Factor' field with '0.035'. 'Offset Adjustment' has 'Offset Values' fields for X (0), Y (-0.5), and Z (0). 'Prefab Static Setting' has a 'Set Tiles as Static' checkbox checked. 'Prefab Shadow Setup' has 'Cast Shadows' set to 'On' and 'Receive Shadows' checked. 'Tile Collision Setup' has an 'Add Mesh Collider' checkbox unchecked. 'Custom Append Label' has an 'Append to Tile Name' text field. A large 'Convert Tileset' button is at the bottom. At the very bottom, it shows 'Source Prefab Folder: Assets/3rdParty/Voxel Town Pack/Prefabs' and 'Tile Output Folder: Assets/Prefabs/Voxel Town Tiles'.

Often you'll have pre-existing assets that you want to use in YuME. To bring these assets into YuME you can use the Tile Convertor.

It needs to be said that the Tile Convertor is not a magic bullet that automatically converts any type of object into a usable tile. Assets need to be tile based, so built to be modular and placed on a grid. Also, some tiles that look like they should be suitable are built with little regard for pivots and grid snapping.

We'll keep on updating the converter to try and deal with difficult tilesets.

To begin converting a tileset you first need to tell the converter where the source files are located. Secondly we need to set a destination folder for the created tiles.

Finally, you can assign a unique name that will be referenced by the main map editor.

The next set of options allow you to adjust the scale and offset values for the created tiles. Often you'll find the overall scale of converted tiles to be too larger. You can change the scale value until they fit perfectly on the YuME grid.

You may also find that tiles are offset from the grid. You can change the offset values to make the tile align with the grid.

Finally, you can setup the static and shadow settings for the tile. Collision can also be automatically setup. However, if you have complex tiles being converted

the mesh collider will probably not be the most efficient way to setup collision in your level.

If you want to append a name to the tiles you can add it here.

Once you're happy with the settings, click on the Convert Tileset button to bring the tiles into the editor.

It might take a few attempts to get the settings just right so keep tuning the conversion until you're happy.



13. Shortcuts

| | |
|----------------------|-------------------------------|
| Select Tool: | ESC key |
| Paint Tool: | A |
| Pick Tool: | S or Paint Tool + CONTROL |
| Erase Tool: | D or Paint Tool + SHIFT |
| Cycle through Tiles: | SHIFT + CONTROL + Mouse Wheel |
| Grid Up/Down: | = - or SHIFT + Mouse Wheel |
| Grid Up/Down 0.25: | SHIFT + ALT + Mouse Wheel |
| Brush Size 2D: | [] |
| Brush Size +X: | Cursor Right |
| Brush Size -X: | Cursor Left |
| Brush Size +Z: | Cursor Up |
| Brush Size -Z: | Cursor Down |
| Brush Size +Y: | SHIFT + Cursor Up |
| Brush Size -Y: | SHIFT + Cursor Down |
| Reset Brush: | Enter/Return |