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Quickstart

Navigate to the PREFABS folder.

I recommend using the prefabs in in the *Standard* folder. They are easy to work with and offer the greatest amount of flexibility. They come fully textured, but you can change the textures (or replace them with simple colors) at any time.

If you are sure that you want a stylized, color-only look use the prefabs in the COLOR OPT folder. See section *Prefabs* in this manual for detailed information concerning material options and their respective advantages.

The prefabs work out of the box. Just drag them into your scene. No additional materials, shaders or settings required. Use the "Checker Grid" Prefab to make positioning easier. You can use the example prefabs as inspiration.

Content of this asset pack

Prefabs

There are two sets of prefabs available in this kit. There is no difference in content, but they vary in the way materials are handled on a technical level. This allows this asset pack to fulfill different requirements concerning material management and visual appearance. The following section should help to choose the correct set.

If you are insecure, I recommend using the prefabs in in the *Standard* folder. They are easy to work with and offer the greatest amount of flexibility. They come fully textured, but you can change the textures (or replace them with simple colors) at any time. If you are sure that you want a stylized, color-only look use the prefabs in the COLOR OPT folder.

Prefab Set Standard

  + Works for tileable textures and color-only/textureless looks

  + adding, changing and replacing materials is easy

Prefabs using the Standard model set and the Standard material set. Please see the respective sections below for detailed information.

Prefab Set Color Opt

 - does not work with tileable textures - **stylized color/textureless look only!**

+ performance benefits:

   all models share a single material

   just one texture / bitmap

   => fewer draw calls, better batching opportunities

 - adding, changing and replacing materials requires the editing of texture maps and/or 3D models

The prefabs use the Color Opt model set and the Color Opt material set. Please see the respective sections below for detailed information.

Models

Model Set Standard

UV1: Optimized for tileable textures

UV2: Lightmap UV

Uses multiple materials on a single model where necessary. You can directly assign any material you want to the model.

Model Set Color Opt

For a stylized, color-only look. In this model set, UV1 coordinates are aligned to a color atlas texture. (See section *Material Set Color Opt*). If you want to change a model's color, you have to change the model's UV1 coordinates or the color atlas texture.

UV2: Lightmap UV

Model Set VC

For advanced users only!

This is a "bonus" model set without associated prefabs. If you work with textures, it can be used to reduce the total number of materials to 2, which can improve the game's performance. It requires a custom shader that displays different texture maps depending on the model's vertex colors. If you use HDRP, you can use the layered lit shader for this purpose. The model's vertex colors are set up according to the following table:

Material 1	
White	Brick Wall
Red	Stone
Green	Wood
Blue	Floor
Material 2	
White	Roof
Red	Wood Planks
Green	Wood
Blue	Iron

UV1: Optimized for tileable textures

UV2: Lightmap UV

To change a model's texture, you have to modify its vertex colors. This can be done in any 3D modelling application or with AddIns like Polybrush directly in Unity. You can also create blending effects between materials on a model if you use intermediate vertex color values.

Materials

Material Set Standard

Tileable textures. Some of the materials are full PBR materials, others use fewer maps (we don't want to waste memory without achieving a higher visual quality, right?)

You can also use your own textures (square size, power of 2, seamless/tileable)!

If you want a stylized color-only look with standard materials, remove all additional maps (like normal maps etc.) and assign the simple color textures in the *MATERIAL/_Maps/standard/Colors* folder as albedo/diffuse/base map.

Material Set Color Opt

A single material with a color atlas texture. The color atlas is split into 16 colors, so there is plenty of space to integrate your own colors or additional models. Color atlas explanation:

TERRAIN GRASS			
TERRAIN EARTH			
WOOD PLANKS	ROOF	STONE FLOOR	
BRICK WALL	GRANITE	WOOD	IRON

Modularity concept and positioning

The models are built around a grid size of 3 Unity units (=300 cm). That is also the size of standard wall elements.

If you use textures, do not scale the assets! It will mess up the unified texture scaling. If you use a color-only-material, you can scale the assets as you want.

Corners are only 1.5 units wide to give you more flexibility while you still end up with multiples of 3 as basic dimensions for buildings.

For some models, there are smaller or "half" versions available. They may not fit everywhere or lead to visible texture seams. Use them carefully, mirror them where necessary.

You can use the Checker Grid Prefab and/or vertex snapping (V key) to make positioning easier. All models have clean and sensible pivot positions, so you can work with position transform values (f.e. place one wall element at x = 0, the next one at x = 3 and so on). Keep the base length of 3 units in mind.

For nested models (like cut-out walls + door/window frames), identical position transform values for both parts results in a perfect fit (copy and paste = easy fit).

For buildings with interior: build the exterior first, the interior second. Use the indoor and filler prefabs to match your building's exterior dimensions. For buildings with multiple levels, place the ceilings at a height of 270 cm (= 2.7 units) and the floor of the next level at 300 cm.

Render Pipelines

This asset pack is compatible with URP and HDRP.

By default, this asset pack is set up for URP.

If you use HDRP, please import the file *HDRP_Update.unitypackage* in the MATERIAL folder. Just double click it and import all files. It will update the materials and add a folder with HDRP compatible sample scenes. You will find them in the folder *Scenes/HDRP*.

Performance considerations

Because of the high degree of modularity, you may end up with a great number of game objects. This may affect the game's performance on weaker devices. There are multiple options to improve performance:

1. Export your finished building/fortress/... from unity, merge all the game objects into a single object and reimport it. (Use the fbx exporter Package!) This is the most effective method and costs very little time, but it requires basic 3D modeling software knowledge. Be careful not to mess up the model's smoothing groups and vertex normals. You also have to re-pack the second uv channel for lightmaps or let Unity generate lightmap UVs.

2. Activate static and dynamic batching. This works especially well for the Color OPT prefabs, because all the models share a single material.

3. Activate Instancing. This is especially useful for large buildings when you use the same models over and over again.

FAQ / Troubleshooting

Colliders

There are no colliders in the prefabs because it would not make much sense: I do not know how precise colliders must be for your game - or if you need them at all. It is also very inefficient to have one collider per object for structures that consist of many parts. I recommend you build your castle/fortress/whatever first and add large colliders (f.e. one box collider for the whole floor of one level) manually where you need them. Alternatively, you can add colliders to the existing prefabs.

Error: UV overlap

All prefabs are optimized for a lightmap texel density of **36 texel / meter, 3 texel Padding** and lightmap scaling factors as set in the prefabs. If you go below those values, the error may occur. As long as you do not see any lighting artifacts, it is not much of a problem. You can fix it by increasing your lightmap resolution to the values mentioned above or higher or by increasing the "scale in lightmap" factor for affected prefabs. Please read the according section of the Unity manual to understand the error's origin.

Everything is pink

That happens when your materials utilize shaders which are not compatible with your render pipeline. It is an easy fix - see section **Render Pipelines**.

Something is wrong with the normal maps or the lighting (in game mode only!). Some objects look like they are lit from the wrong side.

That is a problem with the engine. It happens when static batching is enabled and you have prefabs (or their parent objects) with a negative scale value. Disable static batching or avoid using prefabs with negative scales. I reported the bug to the unity team. It is fixed in Unity 2022.2.0a1 and above.

Contact

Feel free to contact me if you find problems with the asset pack's models or materials. However, I cannot help with problems that are unrelated to the content of this asset pack. If I made a mistake, I will fix it - but I cannot explain Unity to you.

Contact address: klabautermannkm@gmail.com