Recipes

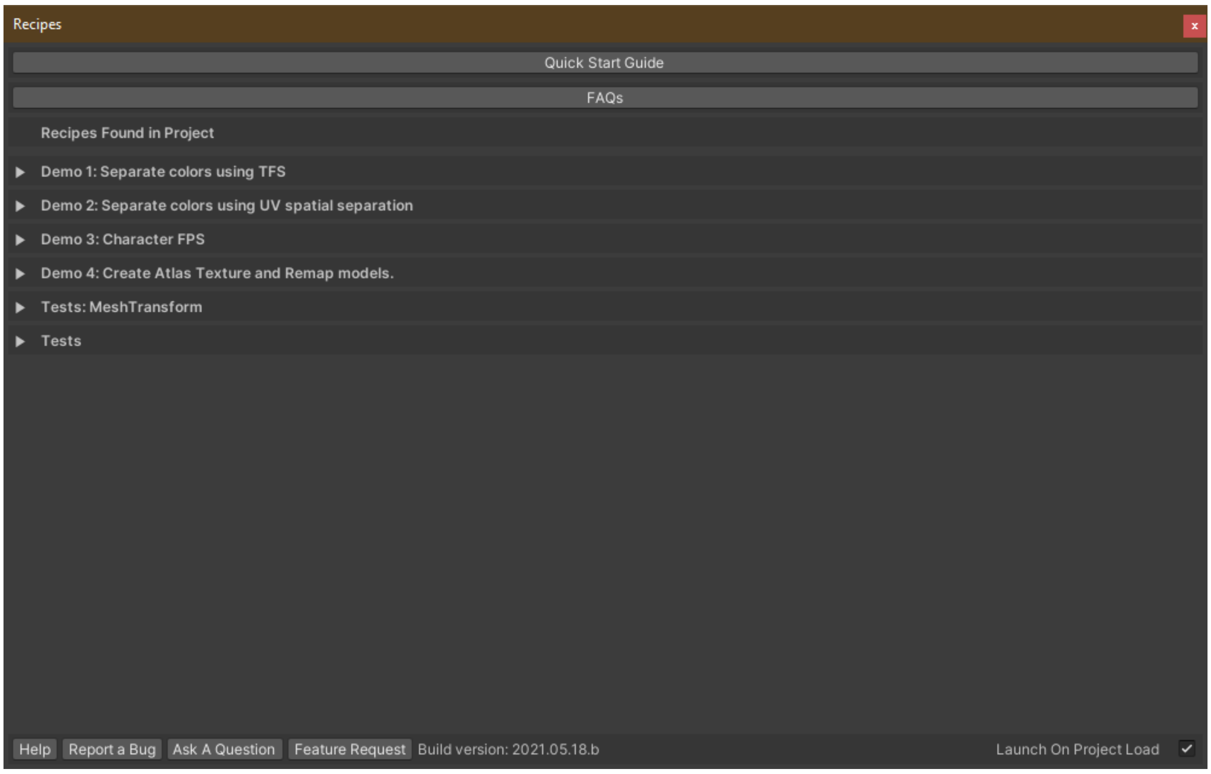
User Guide

Online help: https://github.com/h3b7/lowpoly-recipes-support/wiki
FAQs: https://github.com/h3b7/lowpoly-recipes-support/wiki/FAQ
Ask a question: (GitHub) lowpoly-recipes-support
Request a feature: (GitHub) lowpoly-recipes-support
Report a bug: (GitHub) lowpoly-recipes-support
Support email: support@h3b7.com

Table of Contents

QuickStart

On installation you should be presented with the Launcher window

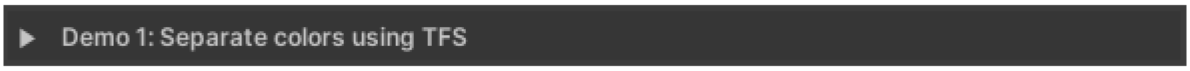


Recipes Found in Project

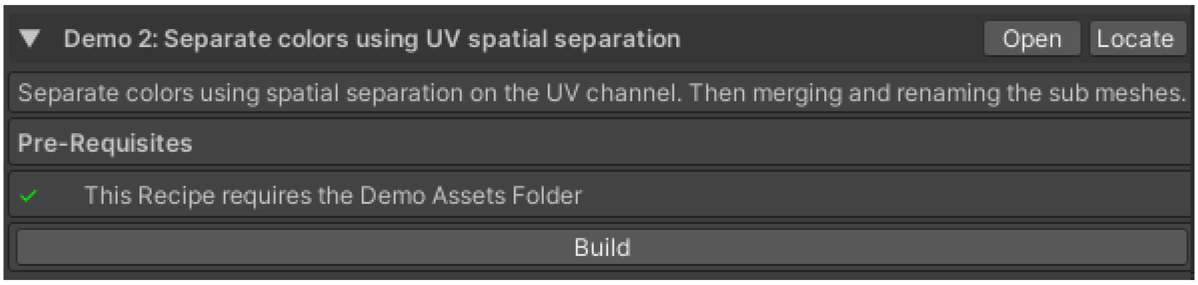
▶ Demo 1: Separate colors using TFS
▶ Demo 2: Separate colors using UV spatial separation
▶ Demo 3: Character FPS
▶ Demo 4: Create Atlas Texture and Remap models.
▶ Tests: MeshTransform
▶ Tests

Build version: 2021.05.18.b

Expand the Demo 1 entry…



▶ Demo 1: Separate colors using TFS



▼ Demo 2: Separate colors using UV spatial separation

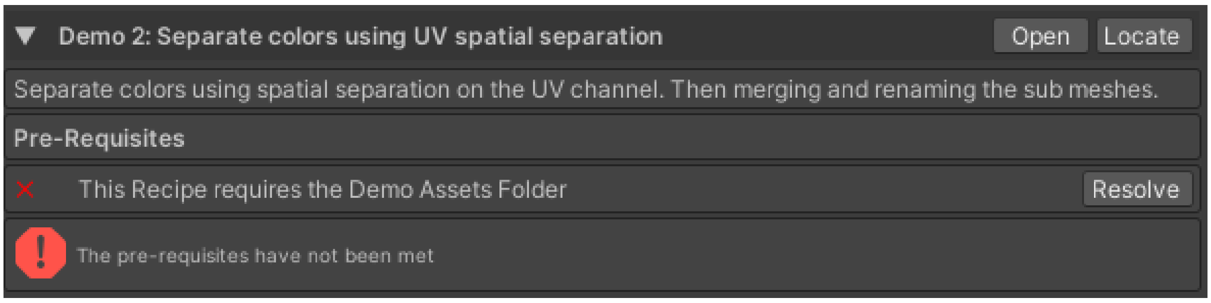
Separate colors using spatial separation on the UV channel. Then merging and renaming the sub meshes.

Pre-Requisites

✓ This Recipe requires the Demo Assets Folder

We can see here that all the prerequisites have been met – namely the Demo assets folder exists.

If the Demo Assets folder was missing, then the following message would show:



▼ Demo 2: Separate colors using UV spatial separation

Separate colors using spatial separation on the UV channel. Then merging and renaming the sub meshes.

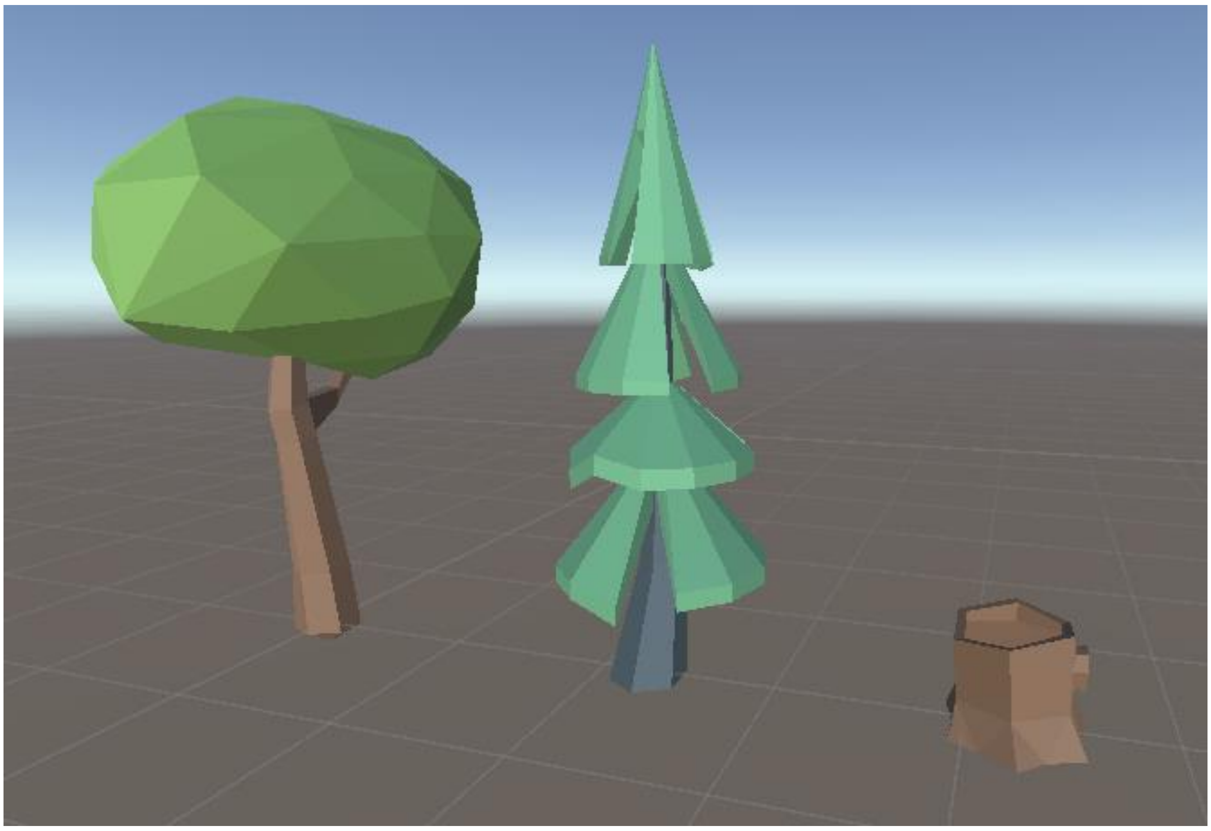
Pre-Requisites

✗ This Recipe requires the Demo Assets Folder

The pre-requisites have not been met

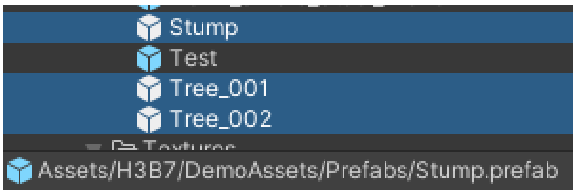
In this case, clicking the Resolve button would open a browser to the Asset Store entry for this Package, enabling you to download the missing assets.

Once the Pre-Requisites have been met, we can proceed to build the Recipe. Click the Build button.



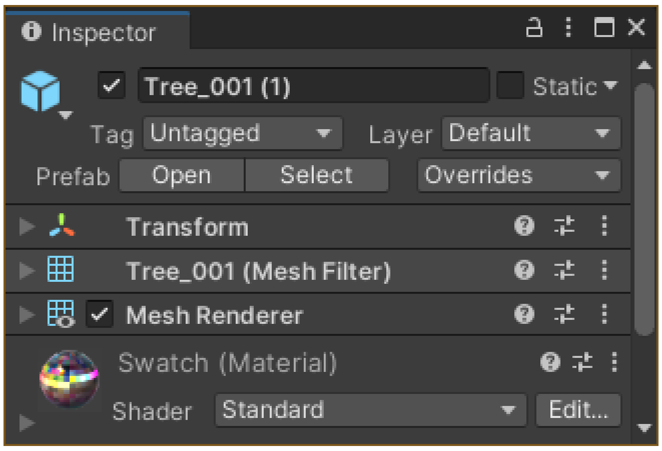
The Recipe is built to the current Scene.

Note. At this point you may wish to add the originals into the Scene for comparison:

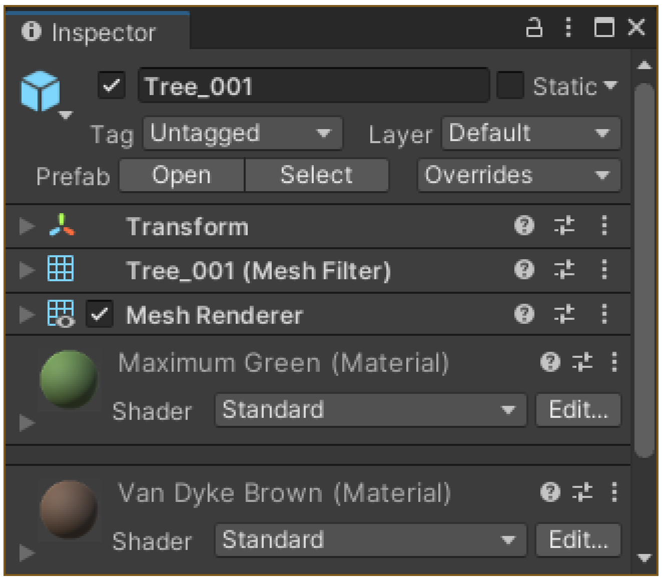


Now let us inspect what has been created. Let us compare Tree_001 in the Hierarchy.

The original has a single material.

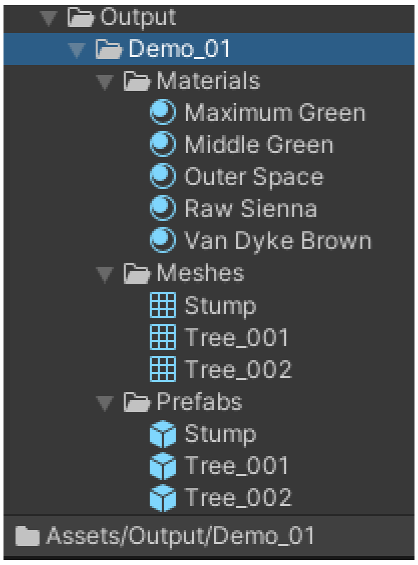


The result of building this recipe is to separate into sub meshes with different materials.



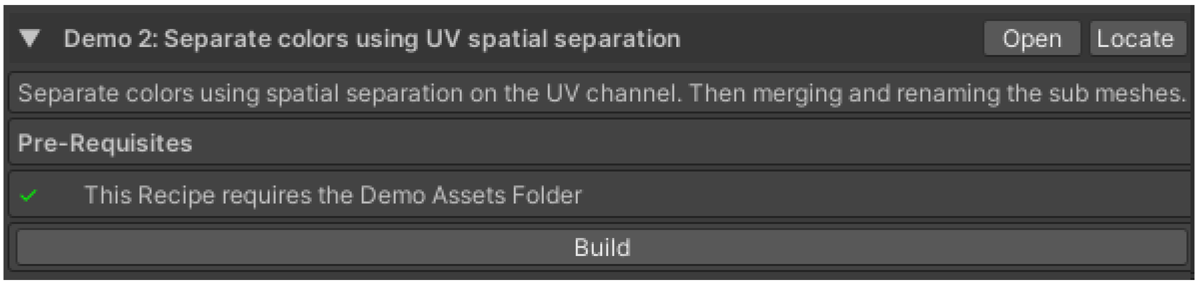
The original has been separated into two separate parts.

Navigate the Project window to the resulting files:



We can see three new prefabs were created with corresponding meshes and materials.

Look back at the Launcher.

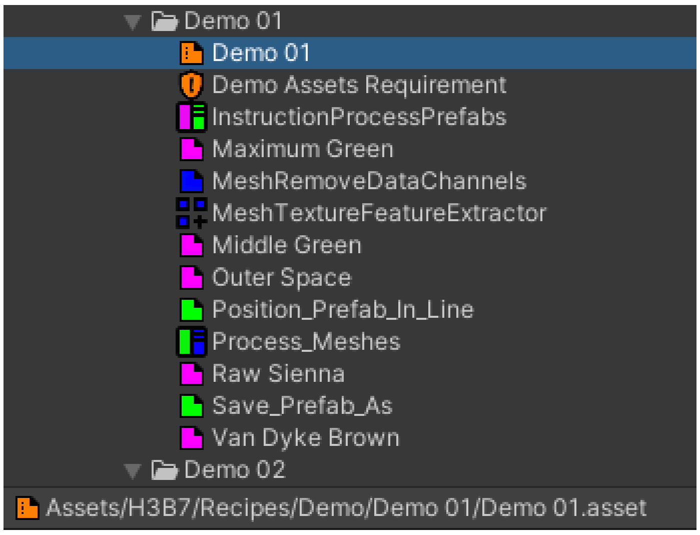

Demo 2: Separate colors using UV spatial separation

Separate colors using spatial separation on the UV channel. Then merging and renaming the sub meshes.

Pre-Requisites

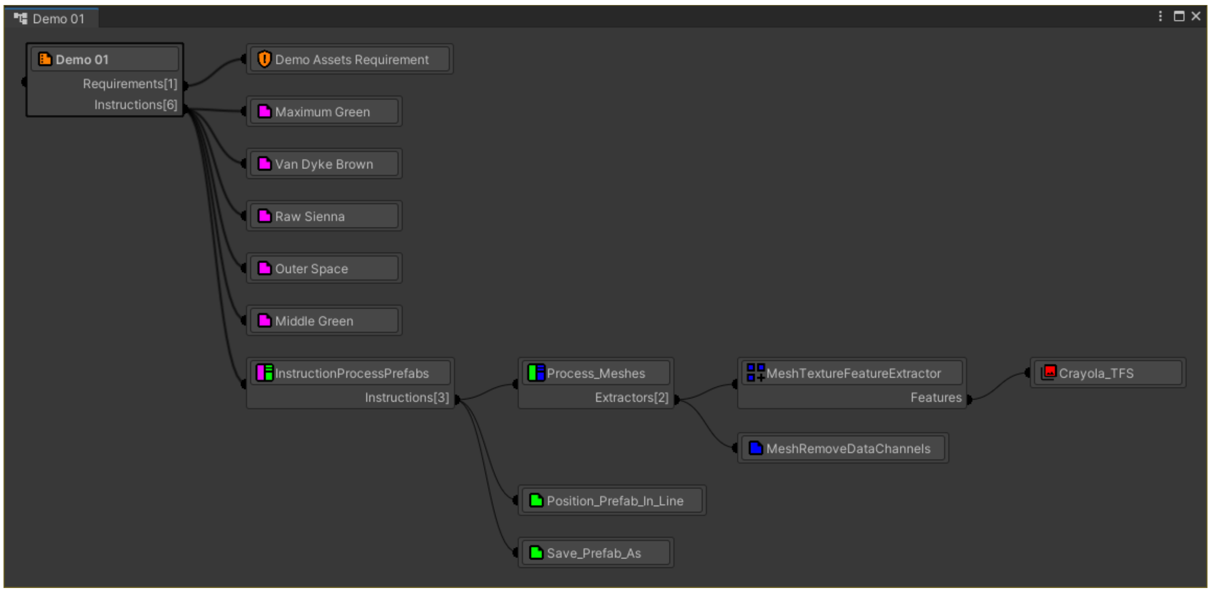
✓ This Recipe requires the Demo Assets Folder

Click the Locate Button to find the Recipe in the Project window.



```
Demo 01
    Demo 01
    Demo Assets Requirement
    InstructionProcessPrefabs
    Maximum Green
    MeshRemoveDataChannels
    MeshTextureFeatureExtractor
    Middle Green
    Outer Space
    Position_Prefab_In_Line
    Process_Meshes
    Raw Sienna
    Save_Prefab_As
    Van Dyke Brown
Demo 02
Assets/H3B7/Recipes/Demo/Demo 01/Demo 01.asset
```

Click the Open button on the Launcher or double-click the ‘Demo 01’ recipe will open the Node Viewer.



This window shows the interaction of the recipe’s parts. Use the centre mouse button the pan and the scroll wheel to zoom. The [Home] key will reset pan and zoom as well as select the Recipe. You can click on the nodes to select them in the inspector. The selection also responds to selections in the project widow. You can navigate with the arrow keys.

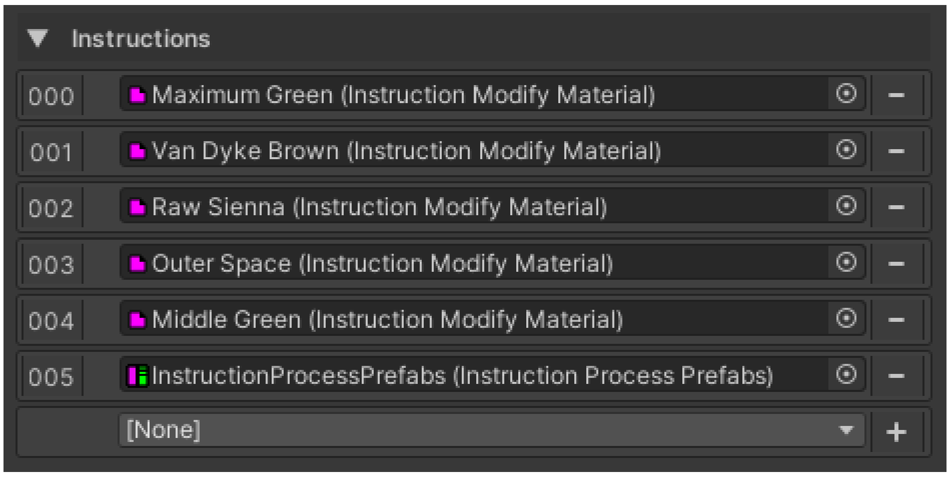
The Recipe is composed of reusable Instructions.

- **Recipe**: The root container.
    - **Asset Requirement**: This checks for the existence of an Asset required by the Recipe.
    - **Modify Material**: ‘Maximum Green’ etc. Creates / modifies materials.
    - **Process Prefabs**: Loads A source Prefab into the Scene and runs operation on it.
        - **Process Meshes**: Looks for Meshes referenced by the instantiated Prefab, runs Mesh Instructions on them and saves the result to the output location.

        - **MeshTextureReatureExtractor**: splits the mesh on the linked Texture feature Set (TFS). The TFS describes how the texture is laid out.
        - **MeshRemoveDataChannels**: This is used to remove the UV channel as it is no longer needed.
    - **Save Prefab As**: Save the modified GameObject as a new Prefab in the output folder.

Select Instructions from the Node Viewer to look at their Inspectors.

Select the Recipe (Demo 01) and look at the Instructions section.

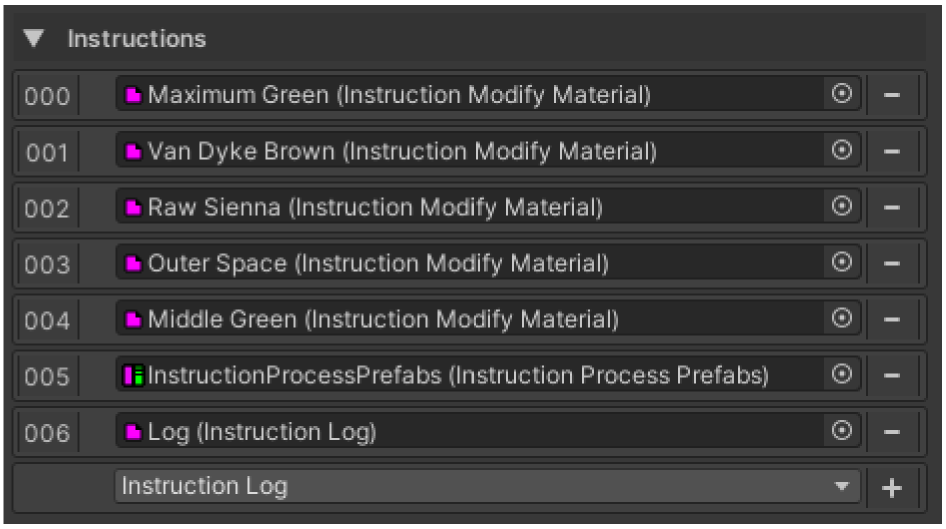


Instructions

```
000  Maximum Green (Instruction Modify Material)
001  Van Dyke Brown (Instruction Modify Material)
002  Raw Sienna (Instruction Modify Material)
003  Outer Space (Instruction Modify Material)
004  Middle Green (Instruction Modify Material)
005  InstructionProcessPrefabs (Instruction Process Prefabs)
     [None]
```

Arrays have an option at the bottom to select what type of Instruction to add.

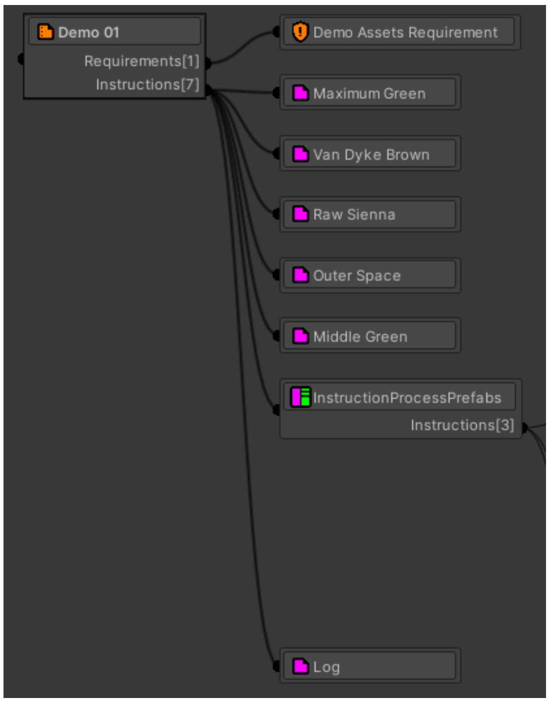
[None] will create an empty slot. If we change this to Recipes/Instructions/Log via the dropdown then adding will create a new Log Instruction in the same directory as the Recipe.



Instructions

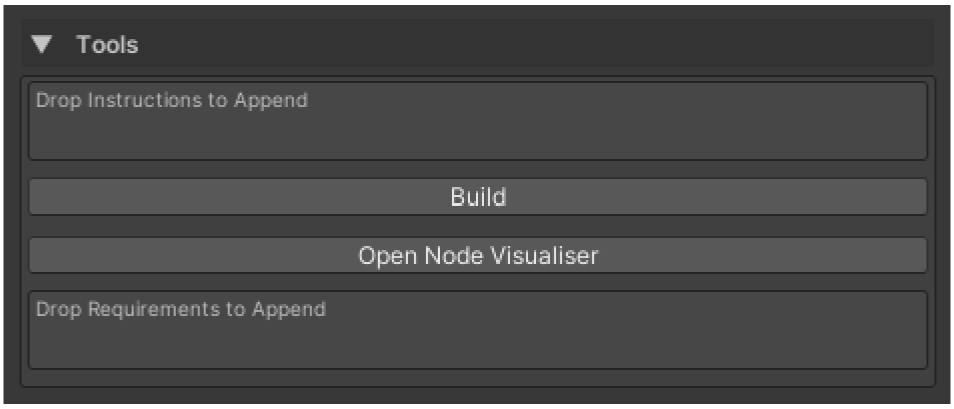
```
000  Maximum Green (Instruction Modify Material)
001  Van Dyke Brown (Instruction Modify Material)
002  Raw Sienna (Instruction Modify Material)
003  Outer Space (Instruction Modify Material)
004  Middle Green (Instruction Modify Material)
005  InstructionProcessPrefabs (Instruction Process Prefabs)
006  Log (Instruction Log)
     Instruction Log
```

We can click and drag on the line numbers to rearrange.



The Instruction has now been added to the Recipe.

We can also create Instructions via the Create menu in the Project Window. These can be dragged and dripped onto the Instruction in the Node Viewer or onto a tool at the bottom of the inspector.



Many instructions have their own set of tools. It is also possible to add your own via the API.

Package Overview

Package Structure:

H3B7/DemoAssets

This folder contains assets used by the Demos and Tests.

H3B7/Menus

These are menus that provide helpful functions not necessarily related to the Recipes.

- **CopyHierarchyPath.cs**: Provides a menu on the Hierarchy context menu to "Copy Hierarchy Path". This builds a path from the root object and adds that to the clipboard. Useful for Target Fields.
- **DeleteDeactivatedChildren.cs**: Provides a menu on the Hierarchy context menu to "Delete Deactivated Children". This will delete any child GameObject that is currently deactivated.

H3B7/Recipes

This is where you will find the main package.

H3B7/Recipes/Demo

All demos are in this folder.

- **Common**: Reusable Instructions.
- **Demo XX**: See the Example section for more info on specific examples.
- **Scripts**: Contains scripts specific to the Demo Scene.
- **Getting Started**: A Demo Scene. This Provides access to the example Recipes.

H3B7/Recipes/Icons

Contains any Icons used in the package.

H3B7/Recipes/Script

The scripts sit within their own Assembly: H3B7.Recipes. This ensures they are for Editor use only. By their nature, many Instructions will not work outside the Editor and so need to be protected from accidental inclusion.

H3B7/Recipes/Script/Attributes

- **SectionAttribute.cs**: used by Elements (Recipes, Instructions, etc) to separate fields into collapsible groups – similar to the HeadingAttribute in Unity.
- **ToolAttribute.cs**: Adds a button or Drag-Drop target onto the Element's Inspector window. Add to an instance method on the Element sub-class or to a static method on a public static class with the target sub-class as the first parameter. No Additional parameters will generate a button; one additional parameter will be a Drag-Drop target.

H3B7/Recipes/Script/Common

Contains Scripts used by all parts of asset.

- **Element.cs**: All Elements (Recipes, Instructions, etc) derive from this class. It provides base functionality and a common reference point for the Inspector GUI.
- **IAssetDatabase.cs**: An Interface to provide separation between the Instructions and Unity's **AssetDatabase**.
- **IProgressBar.cs**: Provides separation between Instructions and the implementation of the progress bar.

- **PathProcessingOperations.cs**: An enumeration for how to treat name items.
- **StringMatcher.cs**: Helper class to process String matches. Supports wildcards at the start and/or end. Supports regex by prefixing with a '#'.

H3B7/Recipes/Script/Core

This folder contains the core functionality and common base classes.

- **Blackboard.cs**: When a recipe is built a Blackboard is passed to the Instructions. This contains the data for Instructions to work on.
- **BlackboardExtensions.cs**: C# extension methods for the blackboard. The preference is wherever possible the core functionality of an instruction should be implemented in an extension, either on the Blackboard or relevant Type (GameObject, Transform etc).
- **BlackboardPrefabExtensions.cs**: C# extension methods for the blackboard related to Prefabs.
- **Element.cs**: The base class for Recipes, Instructions, etc. This derives from ScriptableObject.
- **Instruction.cs**: Base class for Instructions.
- **InstructionValidation.cs**: a base class for validation instructions. These don't change anything but are used in tests to report success / failure.
- **MeshBlackboard.cs**: A blackboard for Mesh operations.
- **MeshBlackboardExtensions.cs**: C# extension methods for the Mesh Blackboard.
- **MeshExtractor.cs**: A base class for Mesh Processors that extract Sub-Meshes.
- **MeshProcessor.cs**: Base class for Mesh Instructions.
- **RecipeBase.cs**: Base class for Recipes. This lets us add specialised Recipes.
- **RecipesSettings.cs**: ScriptableObject for holding settings. The settings are stored in Recipes/Script/Settings/.
- **Requirement.cs**: Base class for Recipe Requirements.

H3B7/Recipes/Script/Editor

Scripts that are Editor related.

Note: The entire Script folder is covered by an Editor only Assembly.

- **AssetHelper.cs**: Implementation of IAssetDatabase.
- **CommonEditor.cs** The Inspector GUI common to all Elements.
- **EditorGroup.cs**: Disposable wrapper for calls requiring end methods such as `EditorGUILayout.EndVertical`.
- **H3B7EditorUtilities.cs**: GUI Helper methods
- **ProgressBar.cs**: Disposable wrapper for Unity's progress bar. Implements IProgressBar.
- **RecipesOnLoad.cs**: Helper to check if the Recipe Launcher should be opened.
- **RecipesWindow.cs**: The Recipe Launcher.
- **ToolDiscovery.cs**: Used by the Inspector to find ToolAttributes.

H3B7/Recipes/Script/GameObjects

This folder contains the Instructions that require a target GameObject, usually instantiated via InstructionProcessPrefabs.

- **GameObjectBuildAvatar**
- **GameObjectDebug**
- **GameObjectPopulateMeshPlaceholderSet**
- **GameObjectPositionInLine**

- **GameObjectProcessMesh**
- **GameObjectProcessMeshes**
- **GameObjectPurgeInactive**
- **GameObjectRemoveChild**
- **GameObjectRemoveComponent**
- **GameObjectRenameTarget**
- **GameObjectSaveAsPrefab**
- **GameObjectSetMesh**
- **GameObjectSetScaleToOne**
- **GameObjectSetTarget**
- **GameObjectStartPosition**
- **GameObjectTransform**
- **GameObjectValidation**

H3B7/Recipes/Script/Instructions
This folder contains general Instructions.

- **InstructionCreateTexture**
- **InstructionLog**
- **InstructionMaterialMapping**
- **InstructionModifyMaterial**
- **InstructionProcessPrefabs**
- **InstructionProcessPrefabsAtPath**
- **InstructionSet**
- **InstructionTextureImportSetting**

H3B7/Recipes/Script/Menus
This Folder Contains any menu specific to Recipes.

- **CreateUVExtractorFromSelectedMenu**

H3B7/Recipes/Script/Meshes
This folder contains Mesh Processors. They are called by GameObjectProcessMeshes to process any meshes referenced by the Target GameObject or its children.

- **MeshAxisExtractor**
- **MeshBoneWeightExtractor**
- **MeshConditional**
- **MeshConditionalSet**
- **MeshDiagnosticProcessor**
- **MeshLeftoverExtractor**
- **MeshMergeExtractor**
- **MeshMergeSet**
- **MeshPlaceholderSet**
- **MeshRemoveDataChannels**
- **MeshRename**
- **MeshSet**
- **MeshSpatialExtractor**
- **MeshTextureFeatureExtractor**

- **MeshTransform**
- **MeshUVExtractor**
- **MeshUVRemap**

H3B7/Recipes/Script/Recipes

This folder contains any Recipe types that can be created.

- **Recipe**

H3B7/Recipes/Script/Requirements

This folder contains any Requirement types that can be created.

- **AssetRequirement.cs**

H3B7/Recipes/Script/Settings

This folder contains the settings file.

- **Settings.asset**: The current setting for the Recipe Tool

H3B7/Recipes/Script/Support

This Folder contains support classes with extension / helper methods. It is broken down into separate classes for each supported type.

H3B7/Recipes/Script/TextureBuilder

This folder contains classes used by InstructionCreateTexture to create new Textures.

- **ColorFeature.cs**: Blocks of color. Specify Size, Colors, Orientation.
- **ColorFeatureOrientations.cs**: The orientation of Color Features: Vertical, Horizontal etc.
- **ComplexFeature.cs**: A collection of other Features pre-arranged relative to a common origin.
- **Feature.cs**: Base class for Features.
- **FeaturePacker.cs**: Helper class to pack features into the texture.
- **ImageFeature.cs**: A Feature containing a reference to a Region in an existing Texture. Used for amalgamating Textures.

H3B7/Recipes/Script/TextureFeatures

This folder contains the TextureFeatureSet (TFS) functionality. It defines Features within a Texture for use in extracting Sub-Meshes or Mapping UVs to another Texture.

- **TextureFeature.cs**: The description of a Feature: position, size, name etc.
- **TextureFeatureSet.cs**: The ScriptableObject.
- **TextureFeatureSetTools.cs**: Additional tools for TFSs. Create from Selection of Sprites.

H3B7/Recipes/Script/Visualiser

This folder contains the Node Visualisation functionality.

- **VisualiserWindow.cs**: The node view window.

H3B7/Recipes/Tests

This folder contains the test Recipes. They are mainly intended to test functionality but may be useful in understanding an Instruction.

H3B7/TextureInspector

- **Settings.asset**: The stored settings for this tool.

- **Texture2DExtensions.cs**: C# Extension methods for Texture2Ds
- **TextureInspectorSettings.cs**: ScriptableObject that holds the settings for the tool.
- **TextureInspectorWindow.cs**: Texture Inspector Tool. See section below.

How to Use This Package

How Does It Work?

Recipes revolve around a Recipe Object. When you build a Recipe, a Blackboard is created which is then passed to the Recipe’s Instructions. These Instructions can Instantiate Prefabs, make modifications to the GameObjects, Meshes, Materials etc and then save as files separate from the original.

How to Get Started?

Start by building the demo recipes. Then follow the Simple Recipe instructions.

Examples

Demo 01 – Separate Colors Using TFS

Separate colors into sub meshes with corresponding materials using a Texture Feature Set (TFS).

Demo 2: Separate Colors Using UV Spatial Separation

Separate colors using spatial separation on the UV channel. Then merging and renaming the sub meshes.

Demo 3: Character FPS

Separate a mesh based on its bone weights to provide distinct meshes for the Head, Body and Arms.

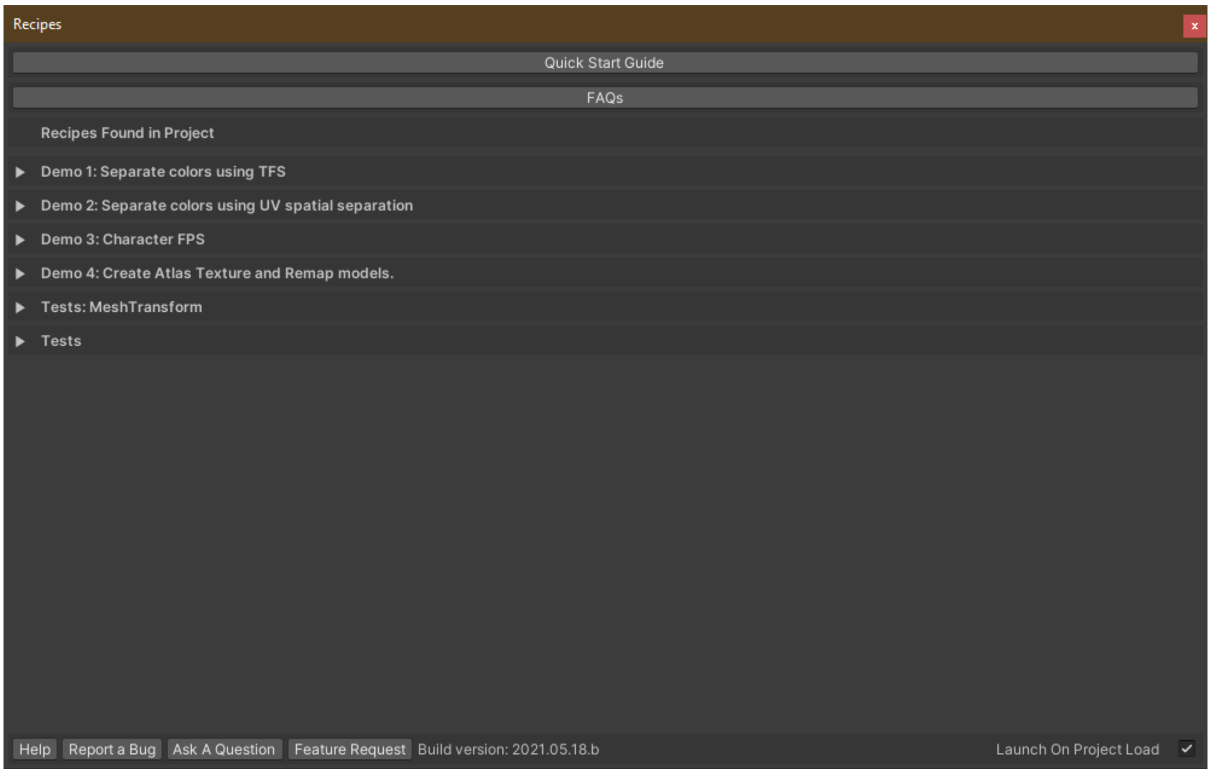
Demo 4: Create Atlas Texture and Remap Models

Create a new atlas texture and remap models’ UV to use the new texture.

Tools

Launcher

The recipe Launcher list all Recipes within the current Project.


Recipes

Quick Start Guide

FAQs

Recipes Found in Project

▶ Demo 1: Separate colors using TFS

▶ Demo 2: Separate colors using UV spatial separation

▶ Demo 3: Character FPS

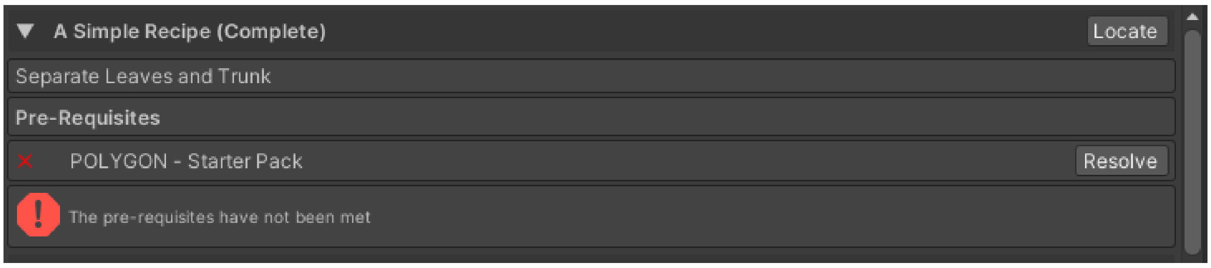
▶ Demo 4: Create Atlas Texture and Remap models.

▶ Tests: MeshTransform

▶ Tests

Help | Report a Bug | Ask A Question | Feature Request | Build version: 2021.05.18.b | Launch On Project Load ✓

Left click on an entry to expand its details:


▼ A Simple Recipe (Complete) Locate

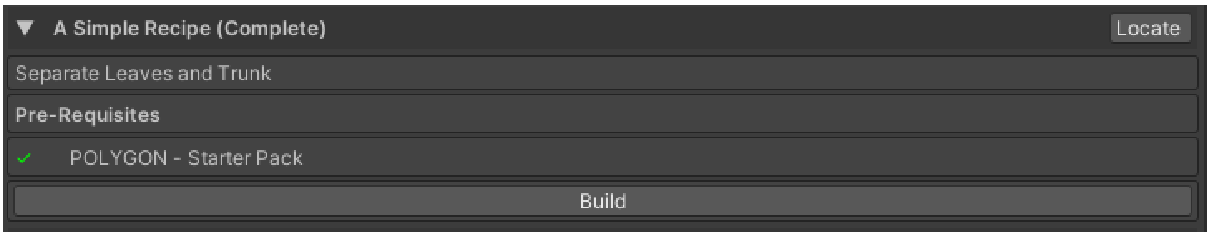
Separate Leaves and Trunk

Pre-Requisites

✗ POLYGON - Starter Pack Resolve

The pre-requisites have not been met

If a Pre-Requisite (Requirement) of the Recipe has not been met, then the build option will not be available. Click the Resolve button to fix the issue. In this case a required Asset is not present and needs importing.


▼ A Simple Recipe (Complete) Locate

Separate Leaves and Trunk

Pre-Requisites

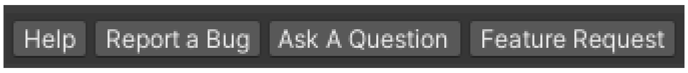
✓ POLYGON - Starter Pack

Build

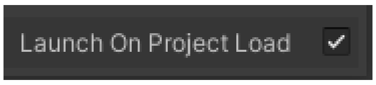
After all Pre-Requisites have been met, the Build option becomes available. This will Build the Recipe.

Note. You can also build the Recipe from a Tool on Recipe's Inspector GUI.

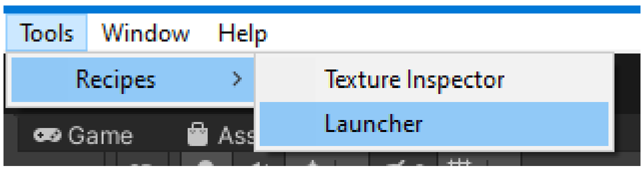
The Locate button in the top right will ping the Recipe in the Project window.



The Help buttons at the bottom link to the online help and issue reporting. When reporting an issue please add the Build version (to the right of the buttons).

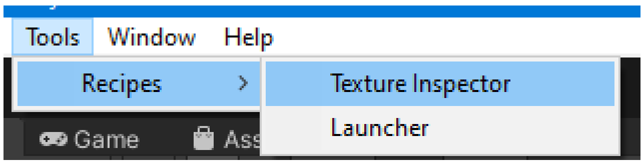


In the bottom right is an option to disable launching on load. If disabled, you can manually launch via the Tools menu:

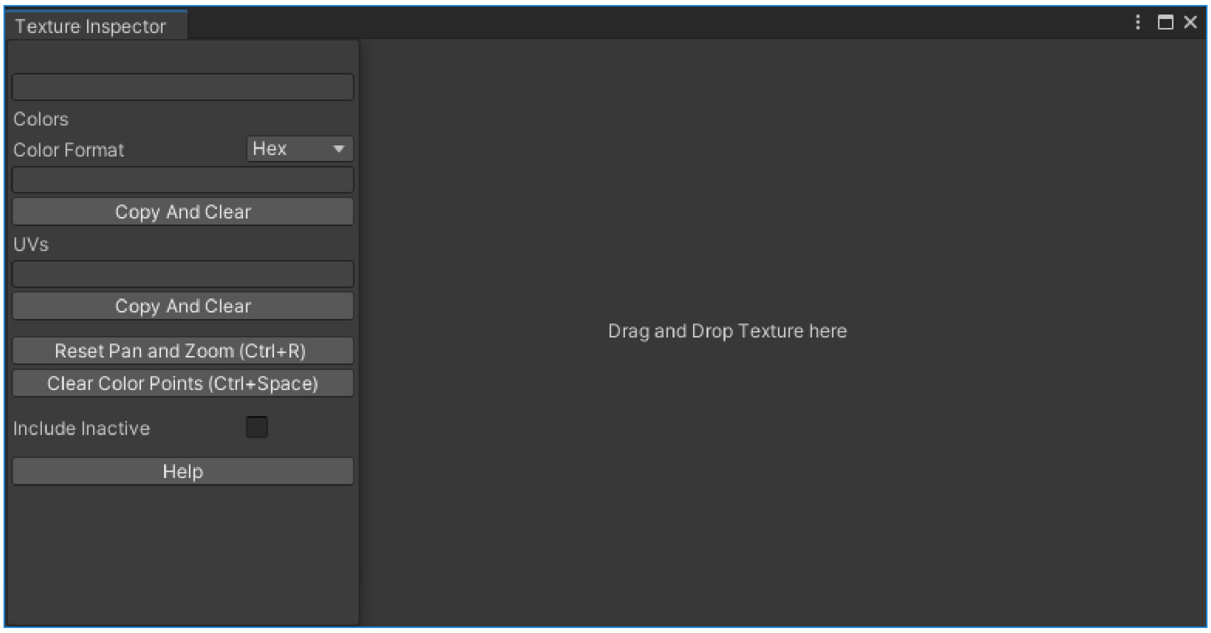


Texture Inspector

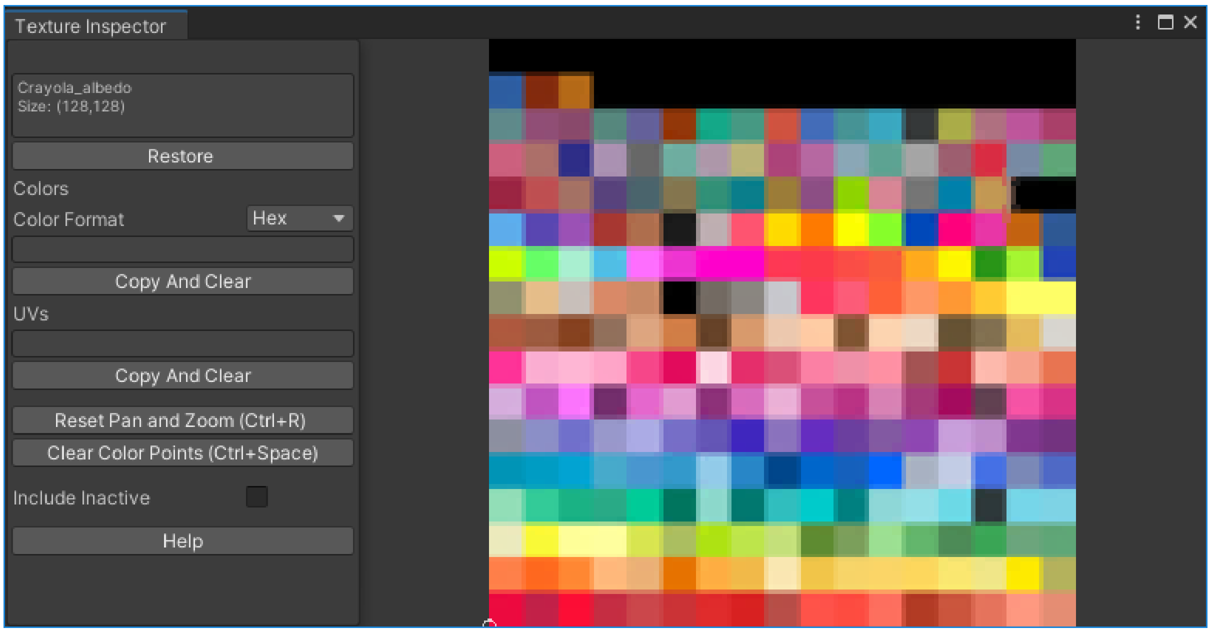
The Texture Inspector tool is used to quickly visualise a texture and see how a Model's UV channel maps onto the Texture. Also provides tools for inspecting color and UV coordinates.



Launch the Texture Inspector via the Tools menu.



To start Drag and Drop a texture onto the window.

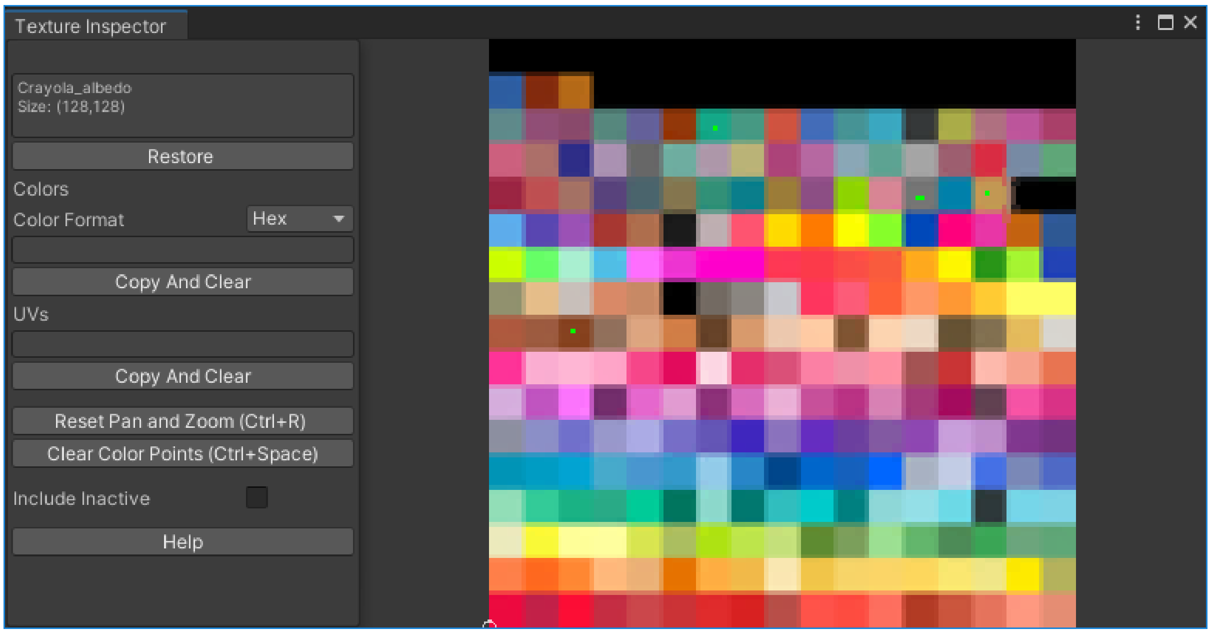


The Texture will now be displayed.

Note. The texture will be affected by any Import settings you may have, such as Filter Mode and Compression.

Controls: Centre Click & Drag the mouse to Pan the texture. Scroll Wheel to Zoom.

Now Drag and Drop a Mesh, Prefab or GameObject onto the Window

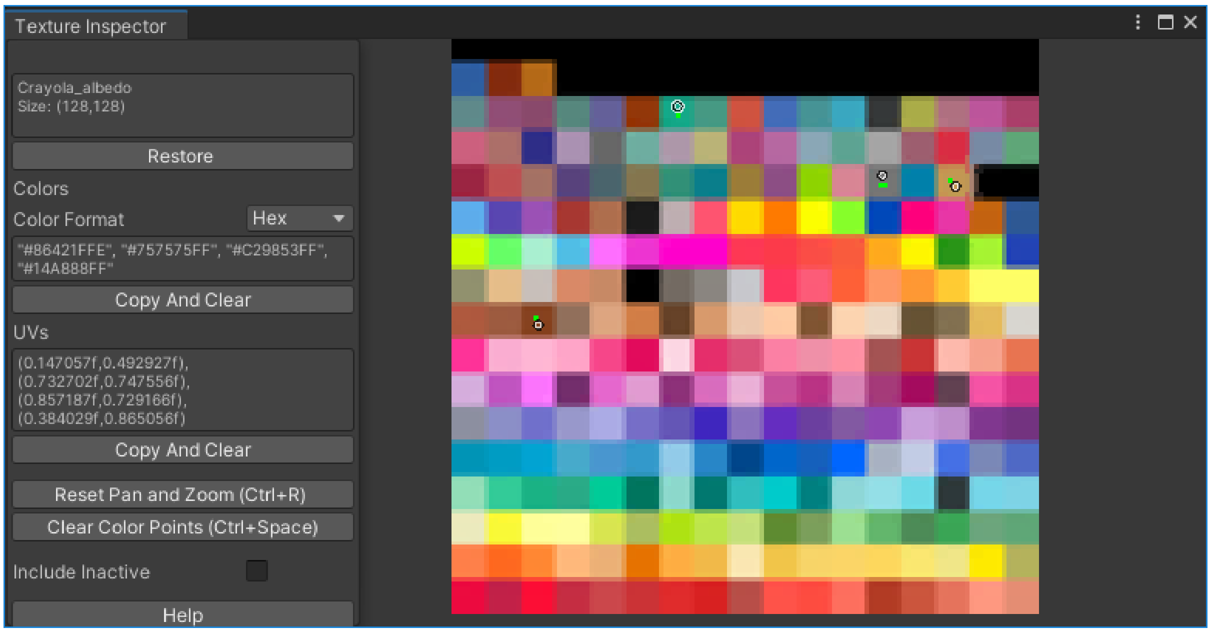


The UVs will be mapped out in green. The Restore button will reset the display, removing the green UVs.

Note. The colors are stored in the Settings file:
`Assets/H3B7/TextureInspector/Settings.asset`

Left click to add Selection Points. Selection points let you inspect colors and UV coordinates.

Note. The last point selected will be a larger symbol and will remain after clearing. This is to allow you to keep track when copying points.



Crayola_albedo
Size: (128,128)

Colors

Color Format: Hex

```
"#86421FFE", "#757575FF", "#C29853FF",
"#14A888FF"
```

UVs

```
(0.147057f,0.492927f),
(0.732702f,0.747556f),
(0.857187f,0.729166f),
(0.384029f,0.865056f)
```

Include Inactive: ☐

GUI Layout:

- **Texture Info**: The current texture and its size
- **Restore**: Button to restore the current texture (remove UV overlays)
- **Color Format**: Output format for the 'Copy and Clear' button. Hex: "#707C84FF" Float: (0.3529412f, 0.3764706f, 0.4f,1f)
- **Color Data**: Displays the color for the selected points
- **Copy And Clear**: Copies the content of the Color Data to the clipboard and clears the points.
- **UV Data**: Displays the UV coordinates for the selected points
- **Copy And Clear**: Copies the content of the UV Data to the clipboard and clears the points.
- **Reset Pan and Zoom**: Restores Pan and Zoom settings.
- **Clear Color Points**: clears the selected points.
- **Help**: Opens the online help page.