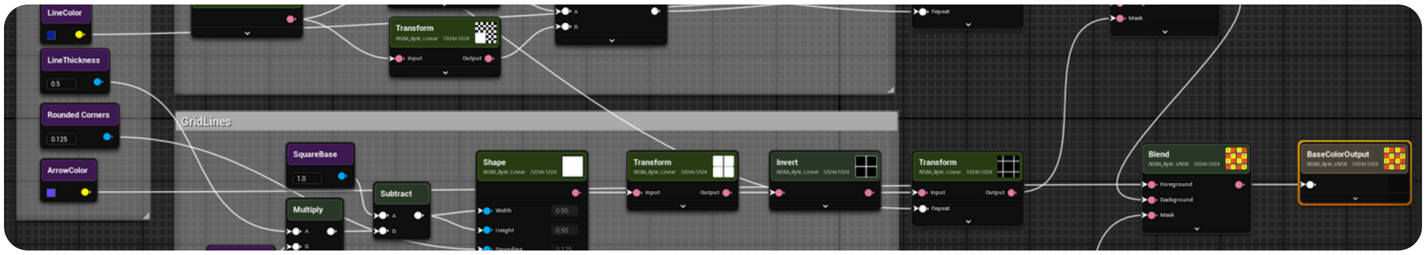
Getting started with Texture Graph

Fundamentals of the Texture Graph Editor and asset to procedurally create textures.



Learn to use this **Experimental** feature, but use caution when shipping with it.

The **Texture Graph Editor** provides artists with a node-based interface to procedurally create and edit textures in Unreal Engine. With a node graph similar to the Material Editor, you arrange nodes in the editor to build a texture graph that represents an image. From the graph, you output textures. The network of nodes saves as a **texture graph asset**.

Using the Texture Graph

Textures are image assets and part of the core process for creating experiences in Unreal Engine. Textures are primarily used in materials and user interfaces (UI). You can apply textures directly as an input (like base color), use them as a mask, or use the RGBA values in other calculations. Textures can be unique to an asset or tiled.

Materials define the surface properties of meshes and may sample several textures for different purposes. For instance, a simple material may have a Base Color, Specular and Normal Map textures. In addition, there may be a map for Emissive and Roughness stored in the alpha channels of one or more of these same textures. The process of packing multiple values in a single texture makes them readily available while saving draw calls for performance and reducing disk space.

You can combine texture graphs with Blueprints, materials, and material functions for unique workflows only possible within Unreal Engine. The editor works with the Texture Asset Editor, which provides additional controls for managing the texture asset.

Loading the Plugin

The Texture Graph Editor is an experimental plugin that is not loaded by default when starting the engine.

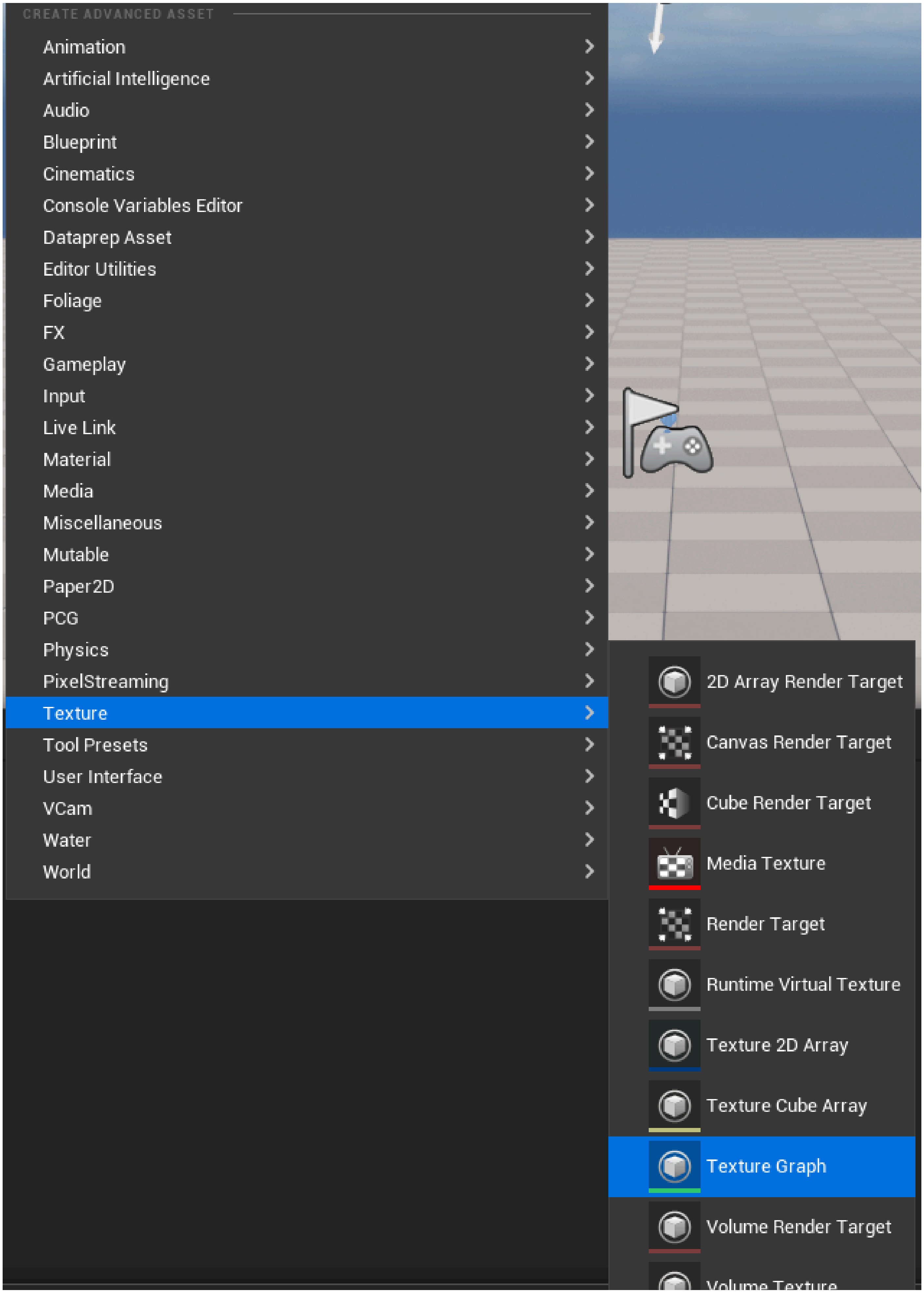
To enable the plugin, follow these steps:

1. In the **menu bar**, select **Edit > Plugins**.
2. In the search bar, type "texture graph".
3. Enable the **TextureGraph** plugin, and select **Yes** in the dialog popup.
4. Restart the engine.

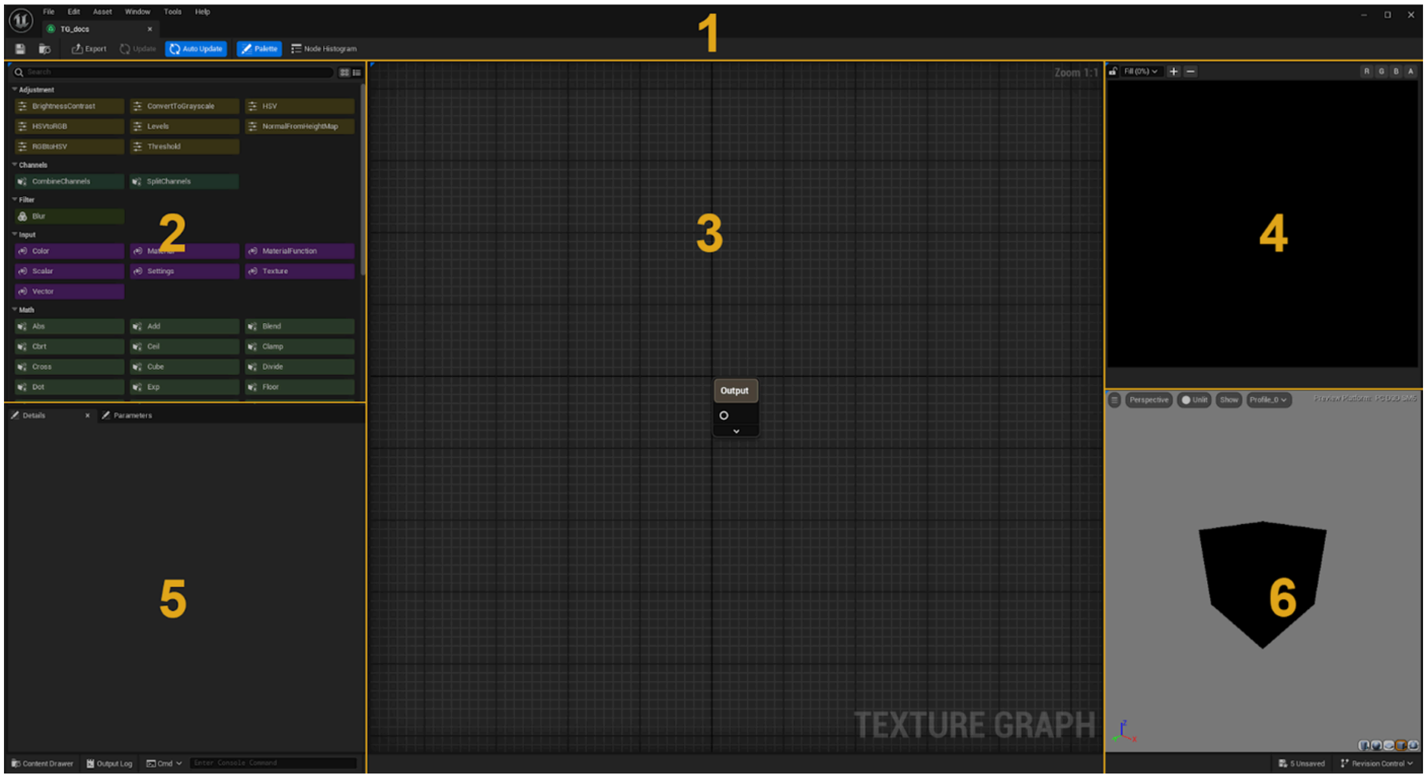
Creating a New Graph

To create a new texture graph, open the **Content Drawer** and do one of the following:

- Click **Add > Texture > Texture Graph**.
- Right-click an empty space in the content browser and select **Texture > Texture Graph**. This option creates a texture graph asset in the current folder.


CREATE ADVANCED ASSET
Animation
Artificial Intelligence
Audio
Blueprint
Cinematics
Console Variables Editor
Dataprep Asset
Editor Utilities
Foliage
FX
Gameplay
Input
Live Link
Material
Media
Miscellaneous
Mutable
Paper2D
PCG
Physics
PixelStreaming
Texture
Tool Presets
User Interface
VCam
Water
World
2D Array Render Target
Canvas Render Target
Cube Render Target
Media Texture
Render Target
Runtime Virtual Texture
Texture 2D Array
Texture Cube Array
Texture Graph
Volume Render Target
Volume Texture

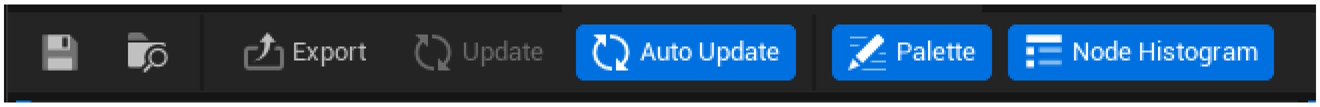
Texture Graph UI



The Texture Graph UI

Main Menu - 1

The main menu bar contains quick access to important graph management items like save, and open. The tool bar also has several graph specific tools.



Texture Graph Main Menu Bar

Action	Description
Save	Saves the current graph.
Open	Opens a graph from your content folder.

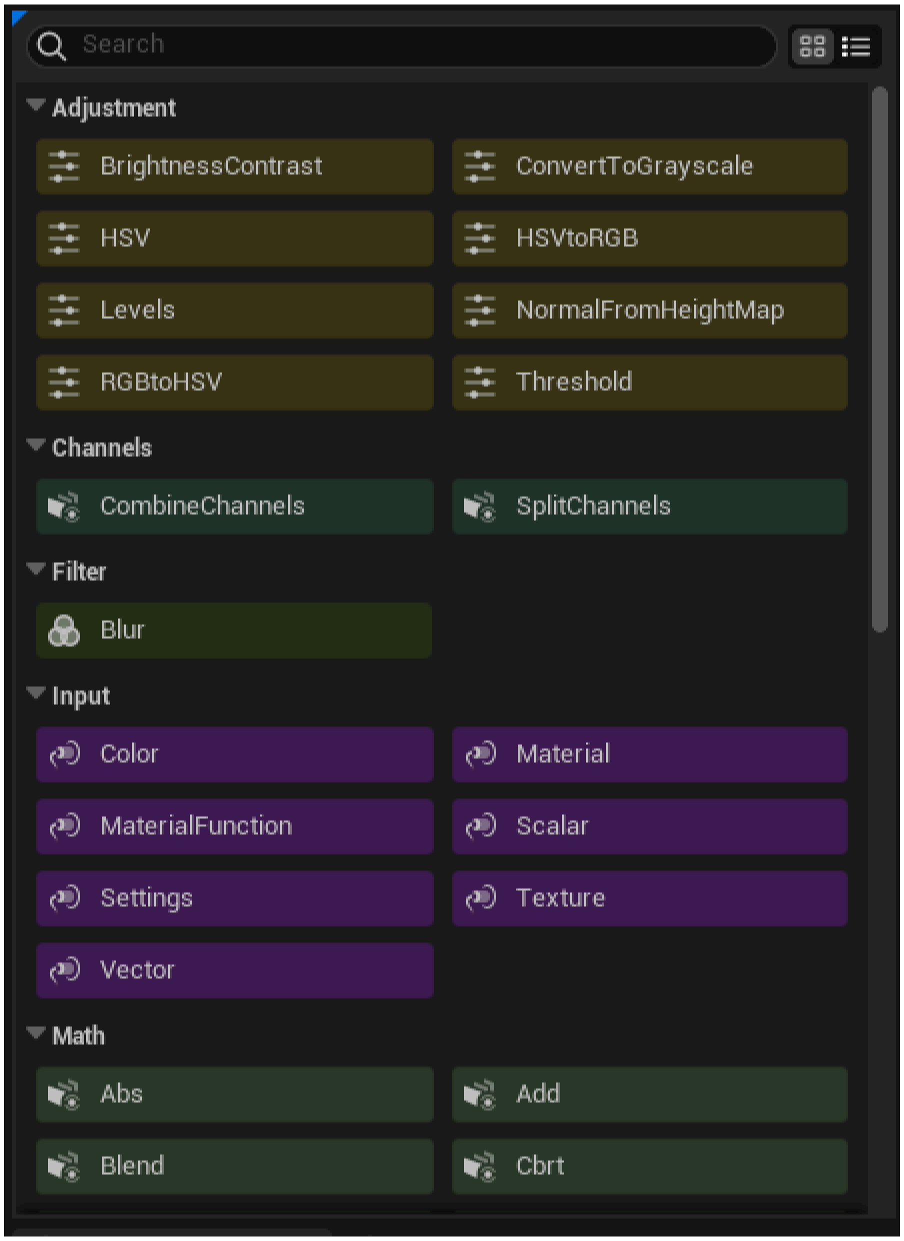
Action	Description
Export	Opens the export window which controls the graphs final texture export. This window provides control to which of the outputs in the graph get exported. You can choose to export just a single output or multiple textures if they exist.
Update	When Auto Update is not toggled on, the tool updates the graph thumbnails and output previews. This can be useful for complex graphs where the auto updating can be slow.
Auto Update	Turns the graph auto update on or off. Depending on the complexity of the graph you may decide to toggle this option off.
Palette	Displays the palette of nodes.
Node Histogram	Displays the node histogram, the histogram provides valuable information about the texture distribution of values.

Node Palette - 2

The **Node Palette** contains all of the available nodes for use inside your texture graph. You can scroll through the library of nodes or use the search bar to find a specific node.

To add a node to the graph window, do one of the following:

- Drag a node from the library to the main graph window.
- Right-click in the graph window.
- Drag a connection from an existing node's pins. This workflow has the advantage of creating the node connection once the node is placed. The node's connections are made from the initial pin to the first open input pin on the new node.

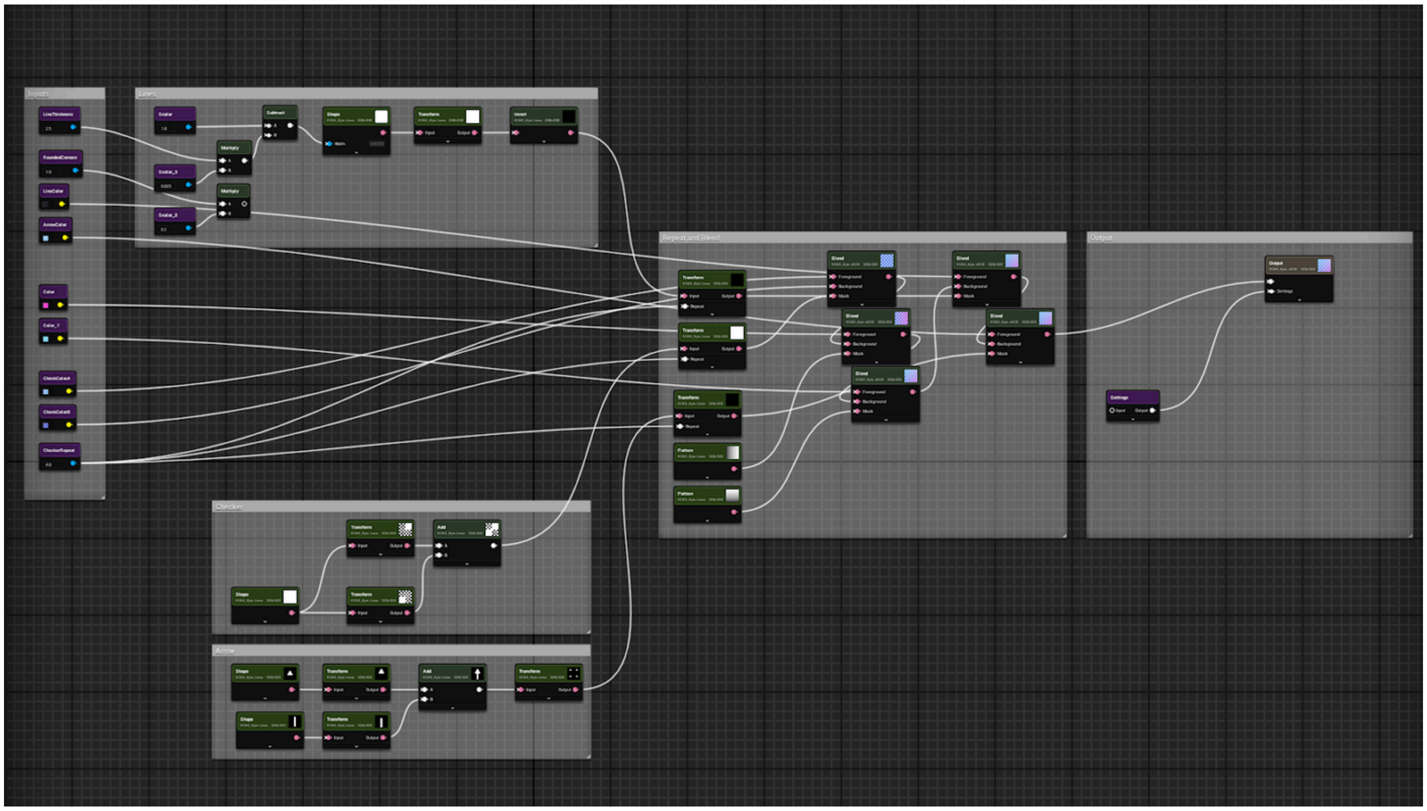


Node Palette

Main Graph - 3

The main graph window is the primary view for assembling your graph. You can position nodes anywhere on the graph. In general, input and creation nodes are placed on the left, and the flow of the graph proceeds to the right, ending with output nodes that control what textures get written.

You can have a single or multiple outputs from a graph.

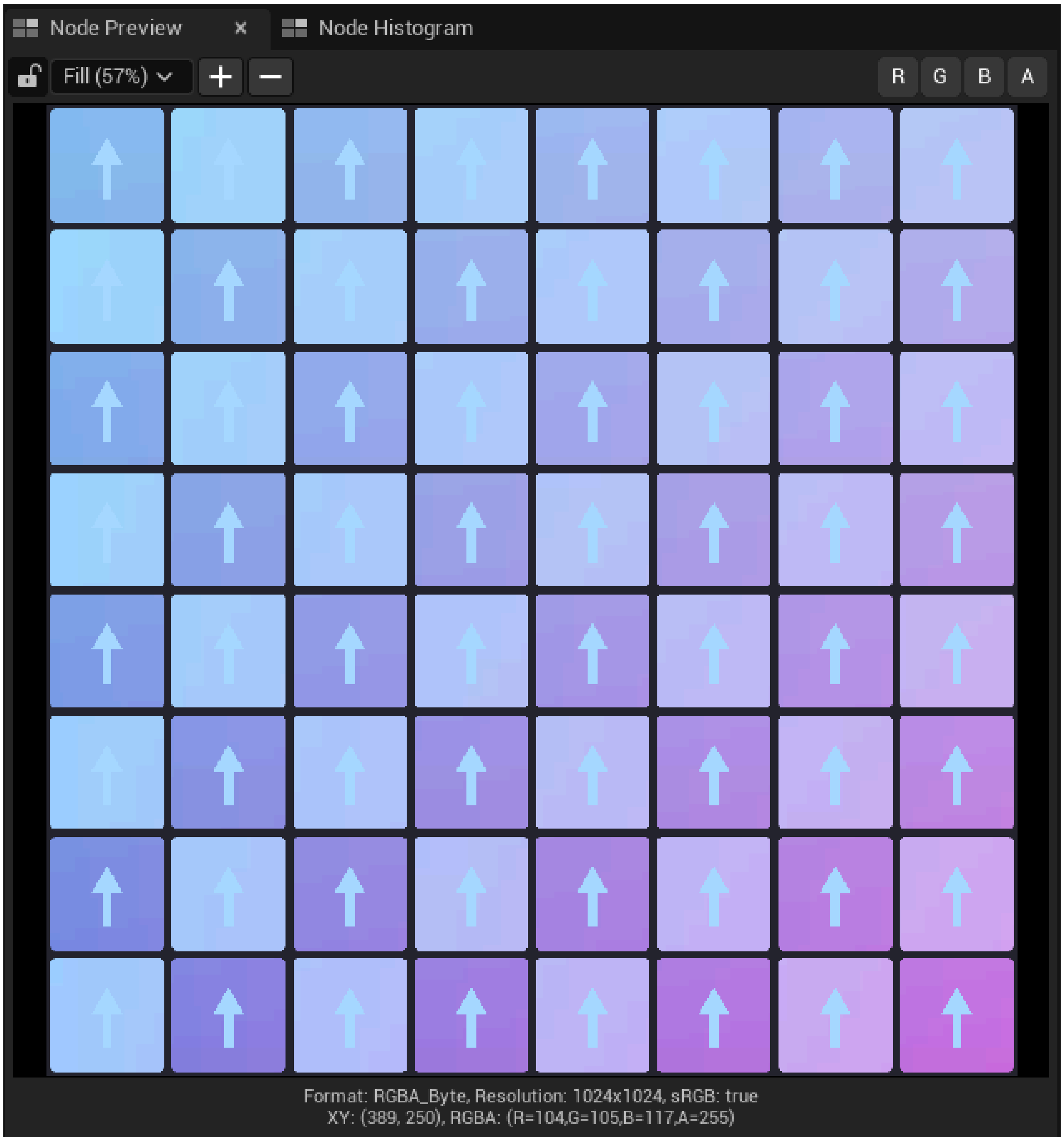


Primary Graph View

Node Preview - 4

The **Node Preview** displays the texture of the selected node. The preview has options for viewing specific channels and adjusting the zoom level of the texture.

You can lock the preview to view a specific node while other nodes are adjusted. For example, locking the view to the final output but adjusting a blend parameter earlier in the graph.



Format: RGBA_Byte, Resolution: 1024x1024, sRGB: true
XY: (389, 250), RGBA: (R=104,G=105,B=117,A=255)

2D Preview

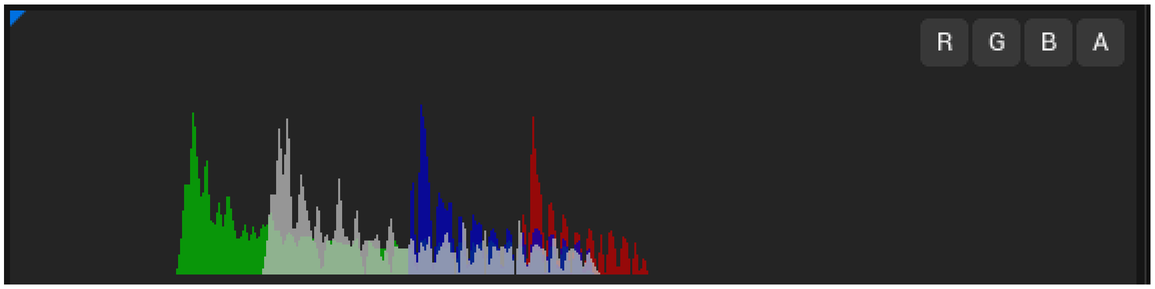
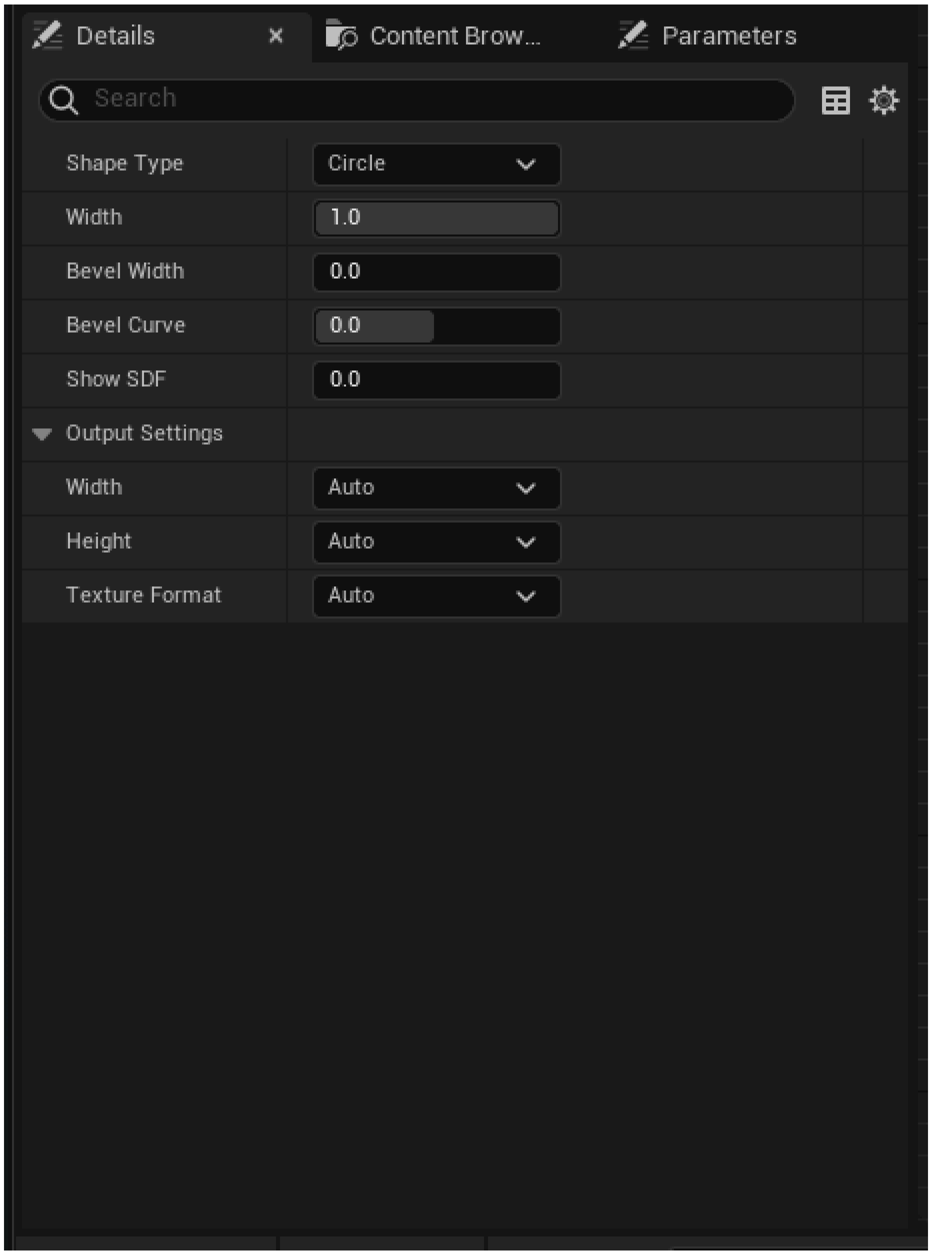


Image Histogram

Details Panel - 5

The **Details** panel contains the properties for the currently selected node.



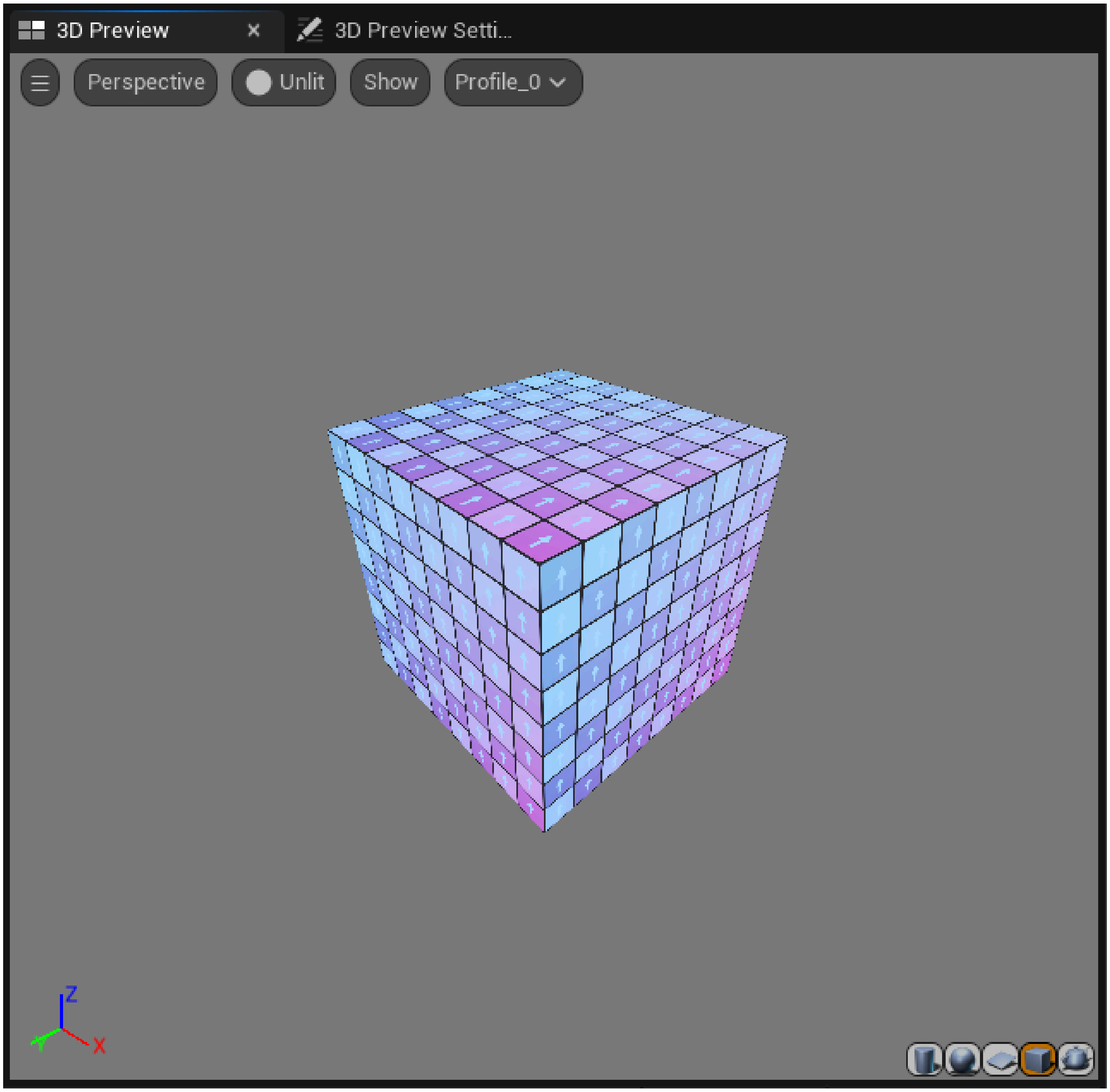
Shape Type	Circle
Width	1.0
Bevel Width	0.0
Bevel Curve	0.0
Show SDF	0.0
Output Settings	
Width	Auto
Height	Auto
Texture Format	Auto

Details Panel

3D Viewport - 6

The **3D Preview** viewport displays the selected output map on a standard or user defined 3d mesh. You can define the mesh by dragging the asset directly into the view or by selecting the mesh and applying it with the custom mesh icon (teapot).

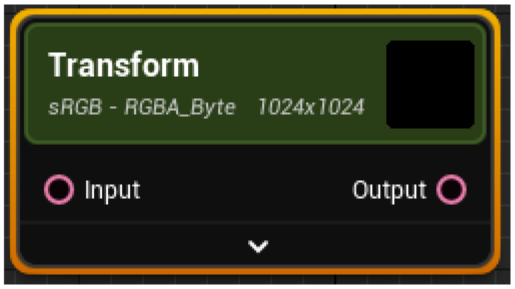
The visible map can be selected from the viewport Details panel.



D Viewport

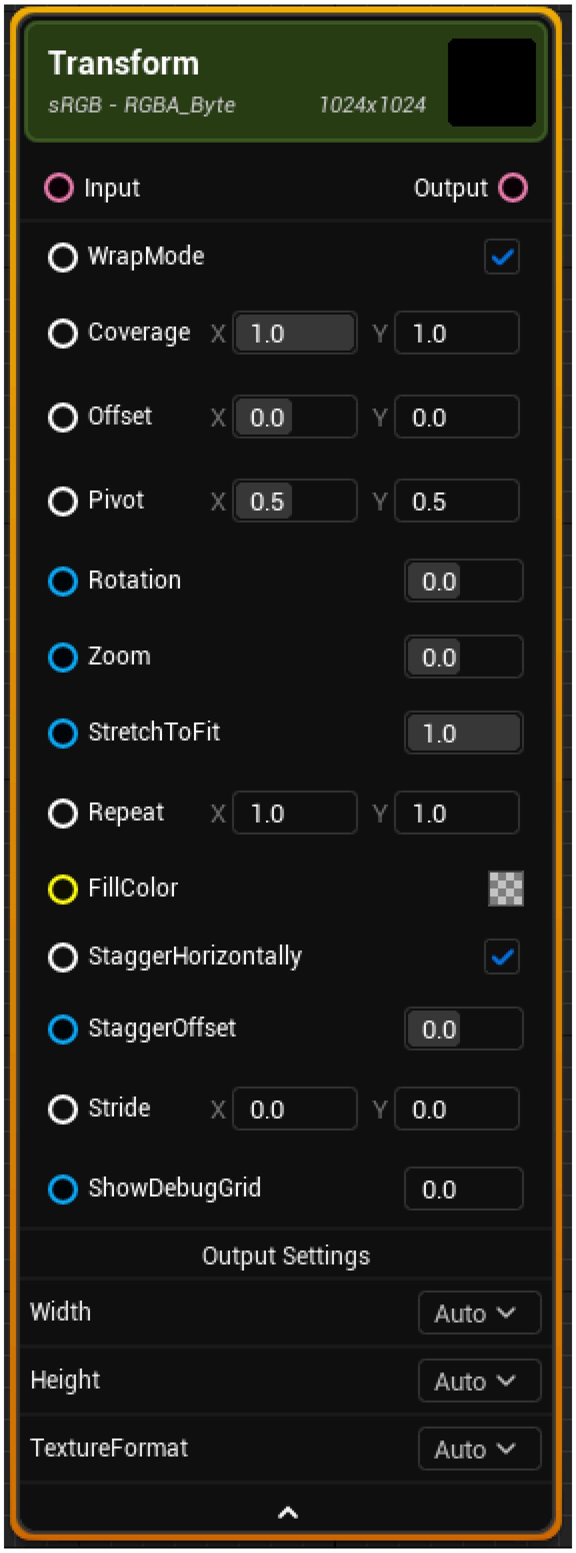
Nodes

The node design for texture graph provides relevant information in a compact layout. With this layout artists can traverse the graph quickly and evaluate the flow of data easily. The node header shows the name or type of node. Nodes are colored based on type of operation. Below the name, is information about the image format of the node and the current resolution. The node header also contains a thumbnail preview.



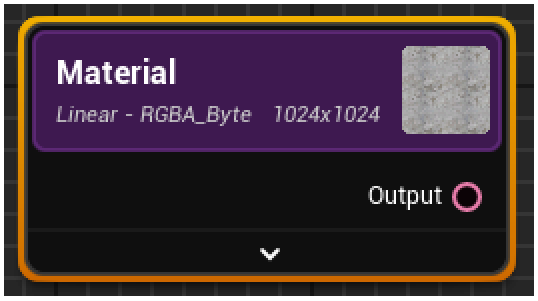
Basic Node

When expanded, all of the attributes of a node are exposed. This may include node specific attributes or only output settings for the node. In general these values are automatically set based on the evaluation of the graph. In some cases you may want to define custom settings instead of the values.


Transform
sRGB - RGBA_Byte 1024x1024
Input Output
WrapMode ✓
Coverage X 1.0 Y 1.0
Offset X 0.0 Y 0.0
Pivot X 0.5 Y 0.5
Rotation 0.0
Zoom 0.0
StretchToFit 1.0
Repeat X 1.0 Y 1.0
FillColor ▨
StaggerHorizontally ✓
StaggerOffset 0.0
Stride X 0.0 Y 0.0
ShowDebugGrid 0.0
Output Settings
Width Auto
Height Auto
TextureFormat Auto

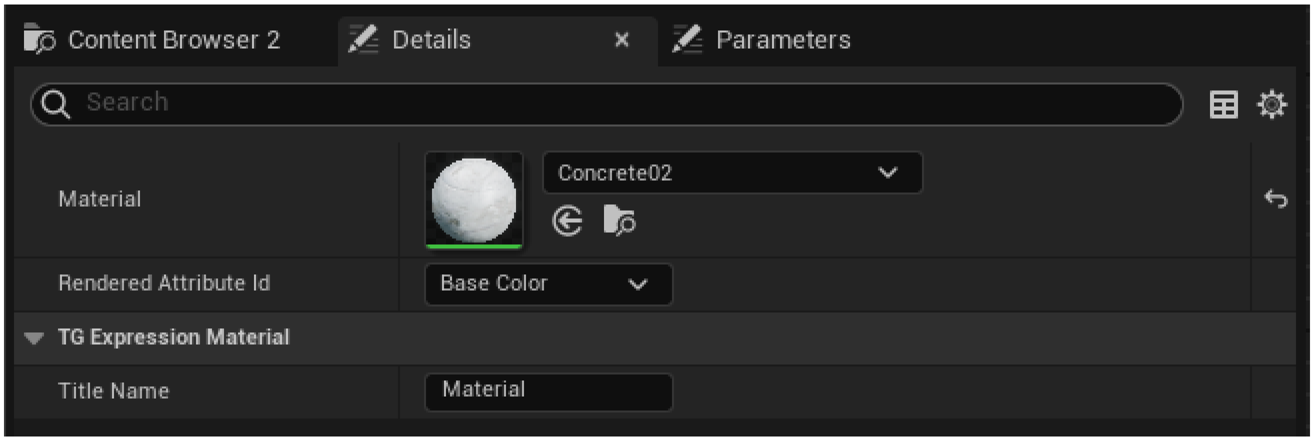
Advanced Node

Materials



Material Node

Unreal Engine has a powerful material system. The texture graph can leverage the material system by evaluating materials to create textures that can be utilized in the graph. A material, such as the standard concrete material can be loaded into a material node. You can then define the rendered attribute.



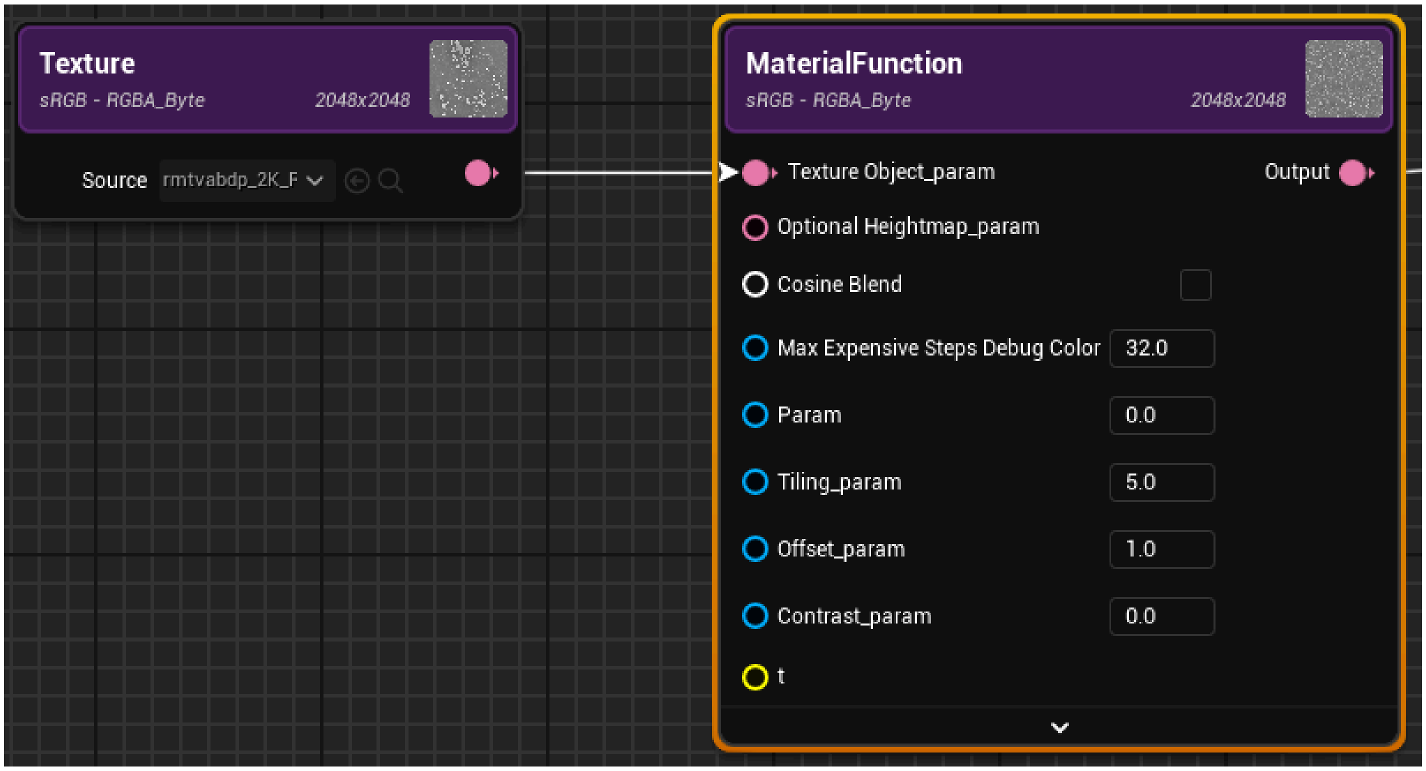
Material: Concrete02
Rendered Attribute Id: Base Color
TG Expression Material
Title Name: Material

Material Node Details

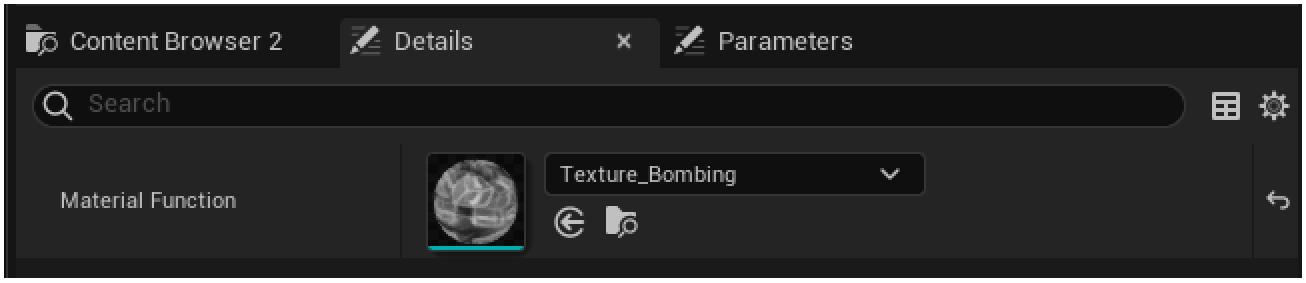
Material Functions

The Texture Graph Editor can use some material functions directly. The **MaterialFunction** node exposes the input pins and attributes available from the material function. This can be extremely useful, allowing for the development of a graph without the need to recreate complex functions that may already exist. With this functionality, the texture graph leverages the robust material function library and toolset.

For example, the texture bombing material function can quickly be integrated to give more random repeating of a texture when compared to a simple repeat available in transform.



Material Function Node

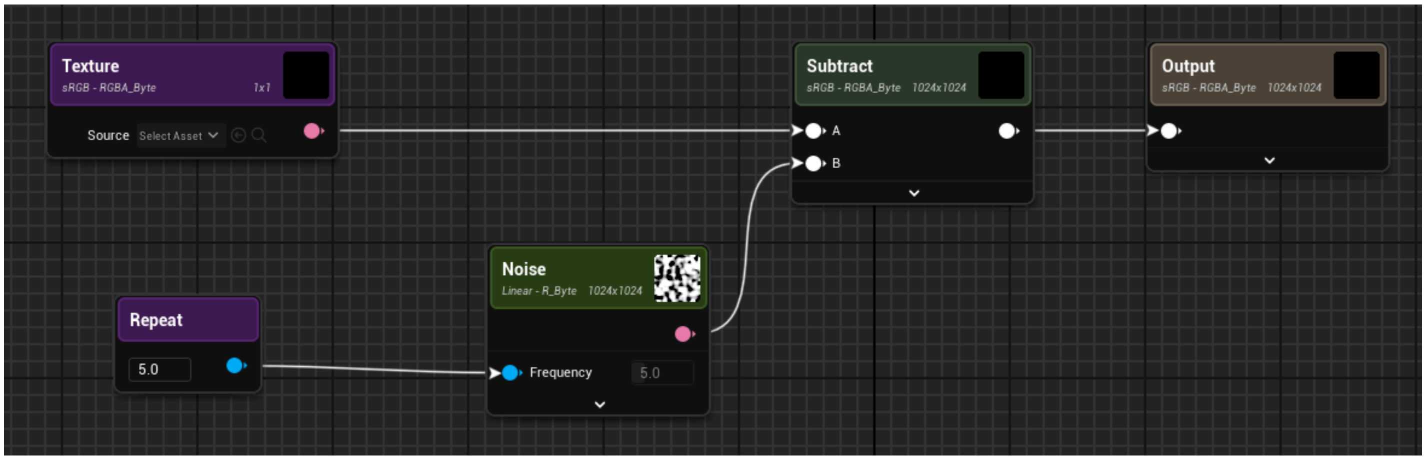


Material Function Details

Texture Graph Subgraphs

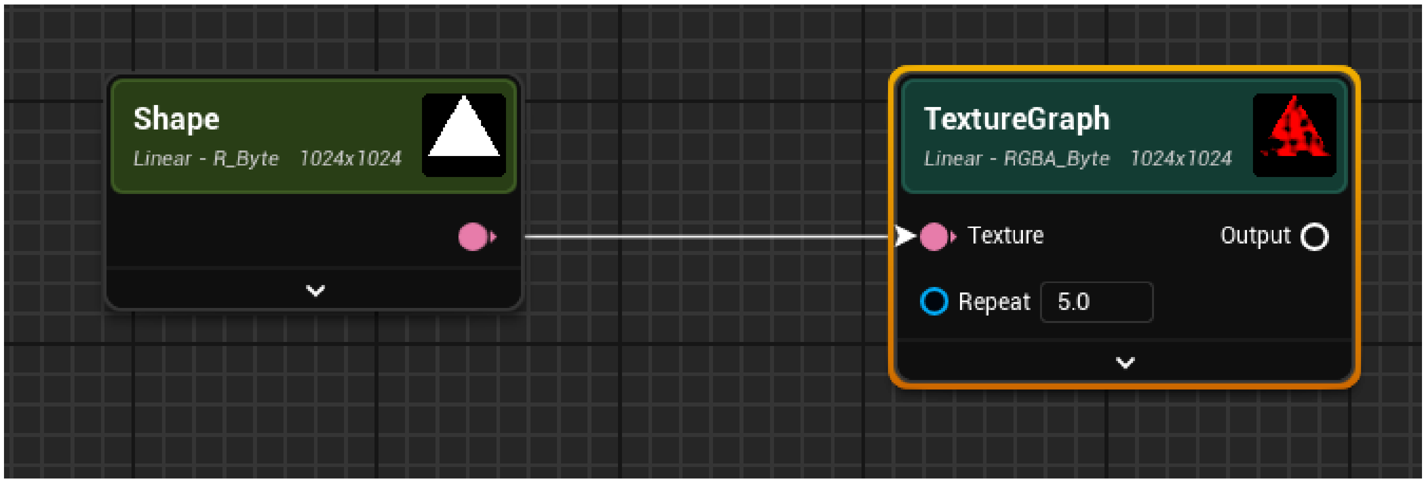
You can reuse texture graphs as a subgraph through the **TextureGraph** node. This is useful for custom repeated operations. For example, adding some noise to a mask.

The subgraph can contain a series of nodes to create a complex noise pattern with some specific variables controllable through scalar values.



Texture Graph Subgraph

When you use a **TextureGraph** node, the specified inputs are exposed along with any outputs defined in the subgraph. This provides the means for development and reuse of common operations.



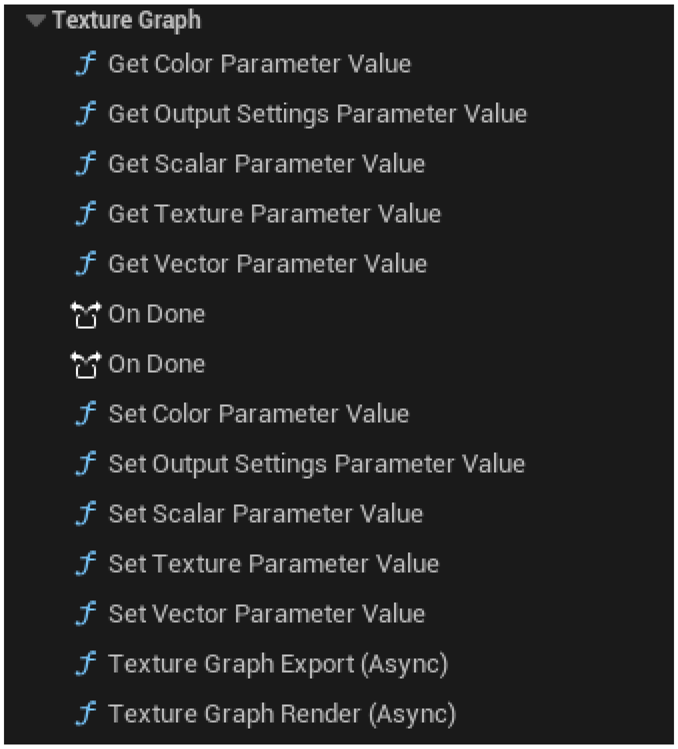
Texture Graph Node

Texture Graph and Blueprints

You can combine a texture graph with Blueprints for a wide range of pipeline related functions to streamline common tasks.

When you load the Texture Graph plugin, you get additional functions in the [palette] of the Blueprint Editor. To learn more about Blueprints, see Blueprints Visual Scripting and Blueprint Editor Palette.

With these functions an existing graph can be controlled easily. For example, you can have a basic texture graph that creates a common UV checker pattern.



Texture Graph

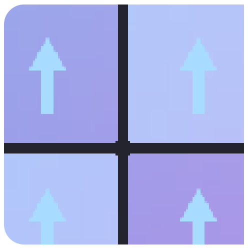
- Get Color Parameter Value
- Get Output Settings Parameter Value
- Get Scalar Parameter Value
- Get Texture Parameter Value
- Get Vector Parameter Value
- On Done
- On Done
- Set Color Parameter Value
- Set Output Settings Parameter Value
- Set Scalar Parameter Value
- Set Texture Parameter Value
- Set Vector Parameter Value
- Texture Graph Export (Async)
- Texture Graph Render (Async)

Blueprint Functions for Texture Graph

For a full list of functions and descriptions, see the Blueprint API.

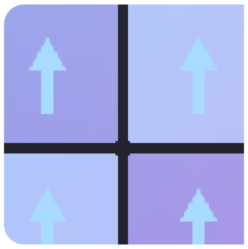
Next Steps

With the fundamentals of texture graph, use the following resources to learn more about the nodes and to get started creating textures.



Making your First Texture Graph

Procedurally create a UV checker pattern texture with the Texture Graph Editor.



Texture Graph Node Reference

Texture Graph node reference for procedurally creating and editing textures.