off axis studios

Polyworks Low Poly Packs

User Guide

Version 6.0

The following pages explain the design and usage of the packs and their components.

You can always find the most updated support documentation at:
https://offaxisstudios.com/docs/

Thank you for your purchase and your support!

This is a generic user guide for all of our Polyworks Low Poly Packs.

All packs function the same, but their contents vary.
For example; the Free Pack contains a limited amount of extras, and the Boardgame Pack has no need for a water effects system.

A. Change Summary - 6.0 Release Cycle

As all of our major versions have done before, our 6.0 release cycle brings huge changes and benefits to the Polyworks Low Poly packs.

From version 6.0 onwards, the default render pipeline is built-in with the option to upgrade to URP.
To help facilitate this, the prefabs have been reduced down to standard shaders that are portable with additional shaders for advanced use and URP packages for URP specific use in the packages that use them (such as the Complete Collection).

Additionally, there are 1px color atlased versions of meshes for hyper-optimizing your projects.

For Complete Collection users, we have included builtin and URP versions of each of our shaders.
The same method has been used for any packs that include the water shader.

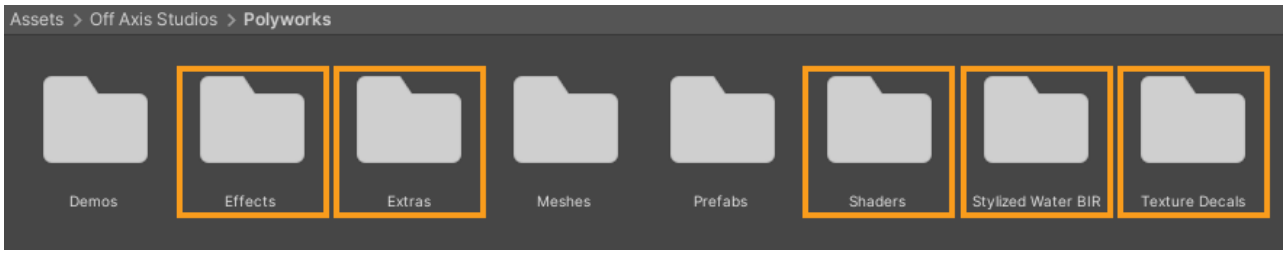
Due to this, the package structure has changed to accommodate the new format. Due to this, please take care if updating into a live project and remember, always keep project backups before upgrading any packages, from anywhere!

The hope with version 6.0 and onwards is that we can cover as many users and their preferences as possible, without causing friction for other users, with builtin vs URP being the biggest of these challenges now addressed - especially for users that are new to Unity.

We’re also looking forward to a massive change in package structure during the 6.0 release cycle by introducing new value into the larger packages, adding new tiers of packs and adjusting included items and price points, which will see some packages stay the same, some getting great free upgrades and adding a few packs at different prices to enable better expansion and tools inclusion as well as introduce new devs to packs with great value without having to buy the largest pack.
There will also be a dedicated free and paid prototyping pack aimed at testing, gray boxing, game jams, etc. that includes some vehicles, pickups and basic rigged characters.

B. Included Components

1. Folder Structure & Files



The folders outlined in orange are not in all packs and are specific to particular packs. If you don't see them, don't worry!
Within the pack folder there are several items (both core to the packs, and as helpers):

a. The "**Demos**" folder contains demonstration scenes like the ones shown in the individual packs marketing images on the store as well as a combined mesh of this demo scene.

b. The "**Effects**" folder contains effects such as the leaves particle system and some smaller 'helper' effect scripts such as flickering lights, floating sway and rotation for the demo scenes and your own use.

c. The "**Extras**" folder contains the documentation and additional Unity Package files for things like URP water and URP shaders that can be unpacked for use after converting the project and its materials to URP.

d. The "**Meshes**" folder contains all of the base meshes and materials for a pack. For the most part, you won't need to use anything from within here, unless you want to duplicate materials from the existing ones for customisation or for editing atlases. They are split into two folders, "**Atlased**" and "**MaterialsOnly**".

e. The "**Prefabs**" folder contains prefabs of the meshes in atlased and material only form for use in your level building.

f. The "**Shaders**" folder contains the custom shaders that are included in the ***Complete Collection***. If you are modifying these it is strongly recommended to make copies to do so. For conversion to URP, the "**Extras**" folder contains URP shaders to complement these builtin shaders.

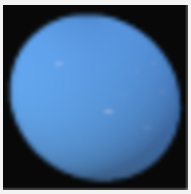
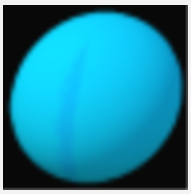
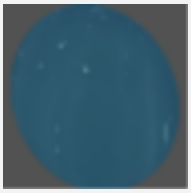
g. The "**Stylized Water BIR**" folder contains the builtin renderer stylized water shader system, water planes and demo meshes for packs that contain a water effect.

h. The "**Texture Decals**" folder has a selection of images for use as decals, such as graffiti, art, grass, etc. for the couple of packs that include these as a feature.

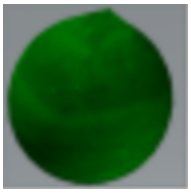
C.Shader Compatibility & Usage

Please note that shaders and effects are pack specific. Please check the pack's description.

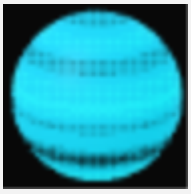
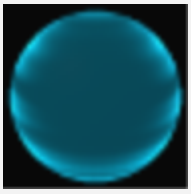
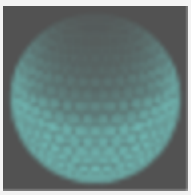
Water Effect Shaders:

		Render Pipeline		Supported Cameras			
Sphere Example	**Shader Name**	**Builtin**	**URP**	**Persp**	**Ortho**	**Script**	**Notes**
	Stylized Water Advanced		X	X	X		Advanced is the more feature focused of the URP water shaders.
	Stylized Water Basic		X	X	X		More stylized than simplistic compared to above.
	Stylized Waterfall		X	X	X		Suited for waterfalls and such, not bodies of water. Foam texture scrolling to simulate movement.
	Stylized Water	X		X	X	X	Builtin replacement for above. Similar to the shaders above but does things differently. Depth texture script needs attaching to camera.

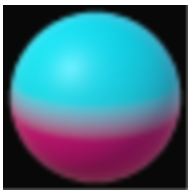
Leaf / Wind Effect Shaders:

		Render Pipeline		Supported Cameras			
Sphere Example	**Shader Name**	**Builtin**	**URP**	**Persp**	**Ortho**	**Script**	**Notes**
	Leaf Shake Wind		X	X	X		Will behave depending on your meshes vertices.
	Leaf Shake	X		X	X		Waveform is different to the URP version. Will behave depending on your meshes vertices.

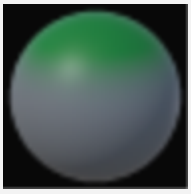
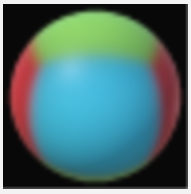
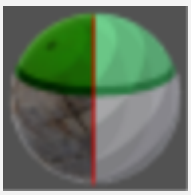
Hologram / Shield Effect Shaders:

		Render Pipeline		Supported Cameras			
Sphere Example	**Shader Name**	**Builtin**	**URP**	**Persp**	**Ortho**	**Script**	**Notes**
	Hologram Effect		X	X	X		Stylistically leans towards holograms. Unlit.
	Shield Effect		X	X	X		Stylistically leans towards energy shields. Unlit.
	Hologram	X		X	X	X	Builtin version that stylistically differs to above and can be used for both and supports a texture. Unlit. Requires script attached to object to drive glitching effect.

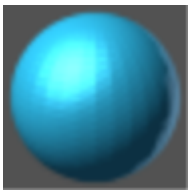
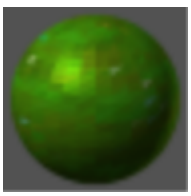
Gradient Effect Shaders:

		Render Pipeline		Supported Cameras			
Sphere Example	**Shader Name**	**Builtin**	**URP**	**Persp**	**Ortho**	**Script**	**Notes**
	Gradient Noise Highlight		X	X	X		Single color base and single color noise "highlight".
	Gradient Basic		X	X	X		Two color gradient top to bottom.
	Gradient Simple	X		X	X		Blend size differs from the URP version.

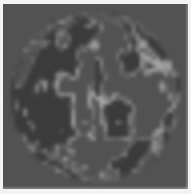
Planar Mapping Effect Shaders:

		Render Pipeline		Supported Cameras			
Sphere Example	**Shader Name**	**Builtin**	**URP**	**Persp**	**Ortho**	**Script**	**Notes**
	Monoplanar Blend		X	X	X		Base color/texture and top down color texture.
	Triplanar		X	X	X		XYZ color and texture support with blending.
	Triplanar Normal Light Ramped	X		X	X		Base color/texture and top down color/texture with light ramp support and rim lighting.

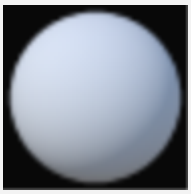
“Low Poly” Flat Shading Effect Shaders:

		Render Pipeline		Supported Cameras			
Sphere Example	**Shader Name**	**Builtin**	**URP**	**Persp**	**Ortho**	**Script**	**Notes**
	Flat Shading Basic		X	X	X		Color support and basic texture support.
	Low Poly Flat	X					Color support only.
	Low Poly Flat Textured	X					Color support and texture support that merges to single colors per tri.

Dissolve Effect Shaders:

		Render Pipeline		Supported Cameras			
Sphere Example	**Shader Name**	**Builtin**	**URP**	**Persp**	**Ortho**	**Script**	**Notes**
	2 Color Dissolve		X	X	X		Two tone dissolve noise shader. Unlit.
	2 Color Dissolve	X		X	X		Mathematically slightly different, but mostly the same outcome. Unlit.
	Camera Cull Dissolve		X	X	X	X	URP only. Allows subtractive or additive dissolve based on scripted object location. Requires script attached to each object to be dissolved.

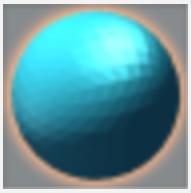
Single Material Vertex Color Shader:

		Render Pipeline		Supported Cameras			
Sphere Example	**Shader Name**	**Builtin**	**URP**	**Persp**	**Ortho**	**Script**	**Notes**
	Vertex Color Basic		X	X	X	X	URP only. Specialized use. Allows single texture vertex coloured batching. Requires script attached to the object the material/shader is to be used on.

URP Toon Shader:

		Render Pipeline		Supported Cameras			
Sphere Example	**Shader Name**	**Builtin**	**URP**	**Persp**	**Ortho**	**Script**	**Notes**
	Toon Shader		X	X	X		Basic URP toon shader. Can be compared to the Unity builtin toon shader. Directional lit, not point lit.

Camera Object Highlight Effect Shader:

		Render Pipeline		Supported Cameras			
Sphere Example	**Shader Name**	**Builtin**	**URP**	**Persp**	**Ortho**	**Script**	**Notes**
	Cam Object Highlighter	X		X	X	X	Allows the camera to highlight scripted objects. Needs your own code extension to utilize beyond static highlighting. Orthographic camera only supports Overlay mode, not depth mode. Requires script to be attached to the camera and an array of objects to be added for highlighting.

D. Pack Usage & Design Philosophies

Variants (Atlased & Materials Only)

There are two base options for the meshes included in the pack; “Atlased” and “Materials Only”.

Atlased:
The atlased meshes are packed into a 1px per color (rounded), per model, per pack texture.

As an example, some models with 3 colors will be packed into a square with an additional blank pixel, then packed next to the following model and same colors used by multiple meshes will be duplicated through the atlas texture because of a per model packing method.
Whilst this might sound a little wasteful at first, it allows some headroom for you to add and edit per model and keeps relevant colors grouped together on a per model basis, keeping things organized and not having to worry about changing a color and having it affect 50 other models - but it also has next to no impact on resource efficiency.
For instance, the close to 4,500 meshes from the ***Complete Collection*** 5.0 release cycle are packed into a 128x64px texture that is 17KB. Super helpful while being super efficient.

Each pack has its own atlas texture, even if one pack includes the same mesh as another.
The Complete Collection and larger combined packages have a single base atlas for everything from the 5.0 release cycle and lower, and then an additional atlas for meshes added with each pack update added to them over time.

Materials Only:
This is the classic and beginner friendly “every different color is a new material” method that is often used by beginners or when greyboxing a prototype level. It’s quick to change colors and use, but has obvious performance drawbacks. While you can counter these somewhat with batching etc. it will always be less efficient then the atlased versions from a performance standpoint.

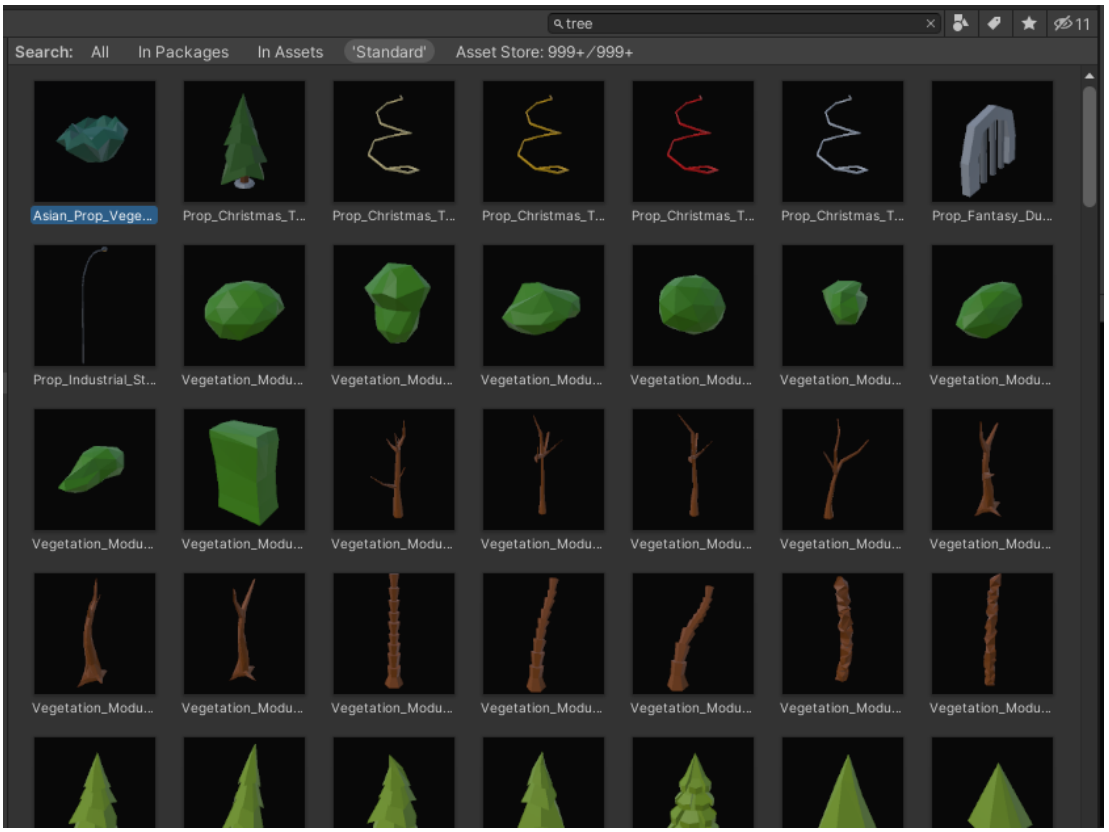
For ***Complete Collection*** users, this can be mitigated somewhat by changing to URP and using the single material vertex coloring shader to enable quick color selection per model while using a single material.

Please note: There are some “duplicated” meshes within packs that are included for atlas color mapping ease, but these are generally as minimal as is reasonable. Whilst the topology of the mesh is the same, the UV mapping or materials are not.

Model Usage

The usage of the pack is quite simple; navigate to the prefab folder with the variant you want to use, and drag and drop the model into your scene, positioning and combining it as needed.
Combining pieces and recolouring them is the key to getting some great looking, unique props into your scenes, as you will see in the demo scenes.
You can think of the pack as something similar to a model kitbashing kit, or a plastic building blocks kit. Combining your imagination with the provided shapes and combining them all can turn a few ordinary shapes into something very cool and unique.

All prefabs are sorted into categories or packs to attempt to best sort them for use. Each prefab is also named in a way that includes keywords for searching (the recommended way to surf through the thousands of models).
If you can't find what you're after by browsing, or you want to search via a keyword, you can use the project search within Unity to return results and find what you are after, like below:



E. Upgrading to URP

To upgrade any of the packs to URP, switch your project over to URP as you normally would (or import the package into a URP project), then run the Unity material upgrader.

Please note: ***These changes cannot be undone. As always, backup your project before you upgrade it to URP.***

To do this, navigate to **Edit > Render Pipeline > Universal Render Pipeline**.

According to your needs, select either **Upgrade Project Materials to URP Materials** or **Upgrade Selected Materials to URP Materials**.

If the pack includes any of our URP shader packages under the "**Extras**" folder, unpack them for your use.
Whilst these shaders are not identical to the builtin shaders, they offer similar functionality to serve a similar purpose in your projects.

If after the upgrade and unpacking, some of the preview thumbnails are incorrect or magenta/pink, try right-clicking anywhere in the Project View window and selecting **Reimport All**. This can take some time, but should update the Unity thumbnails.

We recommend cleaning up any builtin specific items in your project after this process to help keep things clean and reduce potential errors.

For the latest information and instruction on changing a project over to URP, please consult the online Unity documentation.

F. Feature Requests & Support

If you have any feedback or need support, please drop us an email at contact@offaxisstudios.com and include your invoice number and any screenshots or information you think might help us assist. Please remember to be as thorough as possible.

You can fire off a tweet to us @offaxisteam and show off what you've been using the packs for too, we'd love to see it! Please, no support requests via Twitter as they won't get lodged in our support system. Thanks!

Thanks again for your support!