
What is ProBuilder?

ProBuilder is a tool for building and editing 3D objects, directly in Unity. You can use it for visual things like buildings or custom vehicles and weapons, or to make custom collision geometry, trigger zones, nav meshes, etc. The choice is yours!

ProBuilder Basic vs Advanced

ProBuilder Basic is entirely free, and includes the core ProBuilder features for building and editing basic geometry :

[Download ProBuilder Basic](#)

ProBuilder Advanced is a paid extension that adds advanced features such as Edge Loop Modeling, UV Unwrapping, and specialized optimization : [Purchase ProBuilder Advanced](#)

This documentation encompasses *all* features, actions, and tools available in both ProBuilder Basic and Advanced. If you are using ProBuilder Basic, please check the full [Basic vs Advanced Comparison](#)

Source Files and Online Downloads

If you like, you may register for access to our online download site, the "User Toolbox". Downloading ProBuilder from this site will give you a single ZIP file with **all** the latest builds (ie, ProBuilder for Unity 5.3, 5.6, 2017.2, etc), and source files.

1. Forward your Unity Asset Store invoice to register@procore3d.com
2. Create an account on the [User Toolbox](#) (if you don't already have one)
3. Once we have verified the invoice, the latest downloads will always be available via your [User Toolbox](#) account

*Thanks for purchasing ProBuilder, your support allows us to continue updating and developing all the ProCore tools!
Also, we love to see and share what everyone creates with the tools, get in touch!*

Helpful Links and Info

- [ProCore3D Website](#)
- [Email](#)
- [Facebook](#)
- [Twitter](#)
- [Online Documentation](#)
- [Tutorial Videos](#)
- [Support and Troubleshooting](#)

Fundamentals

Getting Started with ProBuilder

First time using ProBuilder? Start here for an overview of creating your first mesh, editing geometry, applying materials, and UV editing.

The ProBuilder Toolbar

All of ProBuilder's specialized editing functions are available via the [ProBuilder Toolbar](#), which dynamically adapts to your Edit Mode and selection.



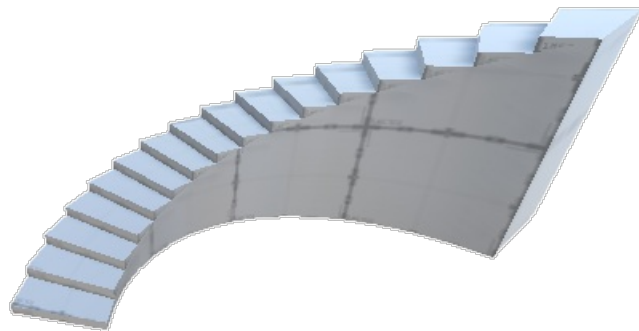
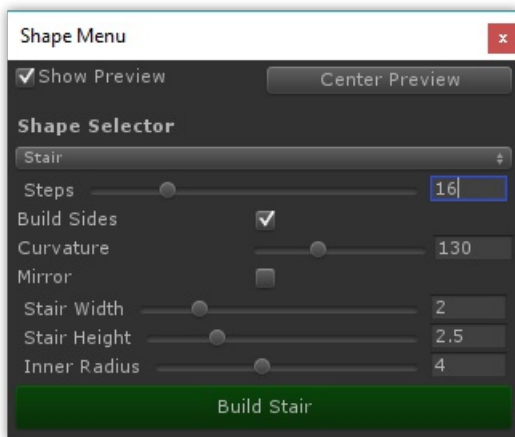
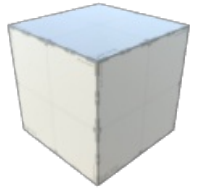
Each Toolbar button will display detailed information about its use, options, and keyboard shortcuts when hovered over. Viewing tooltips is a great way to start learning about ProBuilder's functionality.

More Info: [ProBuilder Toolbar](#)

Creating a New Mesh

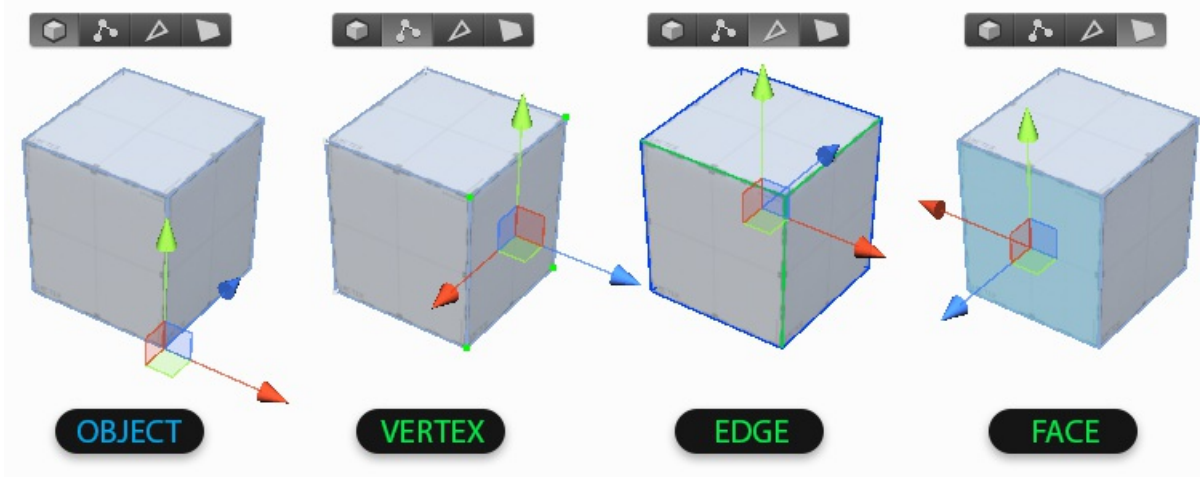
Press **CTRL K** on your keyboard to spawn in a new ProBuilder-editable cube.

To start with a more complex shape, ProBuilder also includes a library of shapes (cylinder, torus, stairs, etc), to begin modeling with. Which each of these shapes, you can customize both starting dimensions and unique parameters.



More Info: [Shape Tool](#)

Object vs Element



Object Mode is standard Unity mode, no surprises.

Elements are the individual parts that make up a mesh: **Vertices**, **Edges**, and **Faces**. If it helps, you can think of these like levels of detail on a map- for example, "city, state, country". Click in the [Edit Mode Toolbar](#) to change Mode, or use it's shortcut keys.

- **Vertex Editing:** Select and edit Vertices for detailed editing and functions like vertex splitting and connecting.
- **Edge Editing:** Select and edit Edges for semi-complex geometry editing, and Edge Loop Modeling techniques.
- **Face Editing:** Select and edit Faces on an object, performing basic tasks like deleting faces and extruding.

Element Selection and Manipulation

First, choose which Element type you'd like to edit by clicking it's button in the [Edit Mode Toolbar](#).

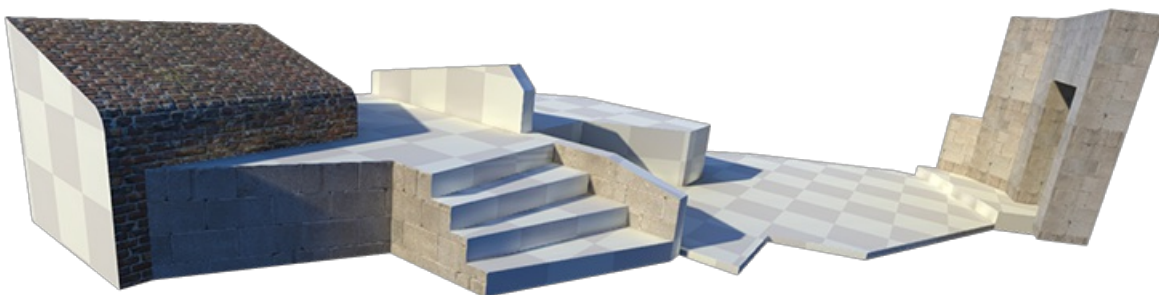
Then, use any of the standard Unity selection methods (click, drag, etc) and manipulation controls (move, rotate, scale), just as you would on any other object(s).

Building and Editing Complex Meshes

ProBuilder follows many of the same conventions as other 3D modeling applications, so experienced 3D artists will likely be able to jump right in after reading the [ProBuilder Toolbar](#) section.

If you are new to 3D modeling, ProBuilder is a great way to get your feet wet. Now would be a good time to check out the tutorial videos on the ProCore [Youtube playlist](#).

Texturing and UVs



Applying Materials

You can apply **any** material (including Substance) to ProBuilder meshes using the Unity drag and drop method or the [Material Palette](#).

Materials can also be applied to individual faces of a ProBuilder mesh, while in [Element Mode](#).

More Info: [Material Tools](#)

Editing UVs

ProBuilder includes both [Auto UVs](#) (default), and a complete [Manual UV Editing and Unwrapping](#) system.

Auto UV mode lets you tweak basics like Offset, Tiling, and Rotation, while ProBuilder handles the complex UV work automatically.

Manual UV mode enables complete control of the UVs, including Projection Mapping, UV Stitching, and more, similar to UV editors in major tools like 3DS Max, Blender, etc.

You may use whichever you prefer, or a mix of both, even on the same mesh.

More Info: [Texturing and UVs](#)

Toolbar Overview

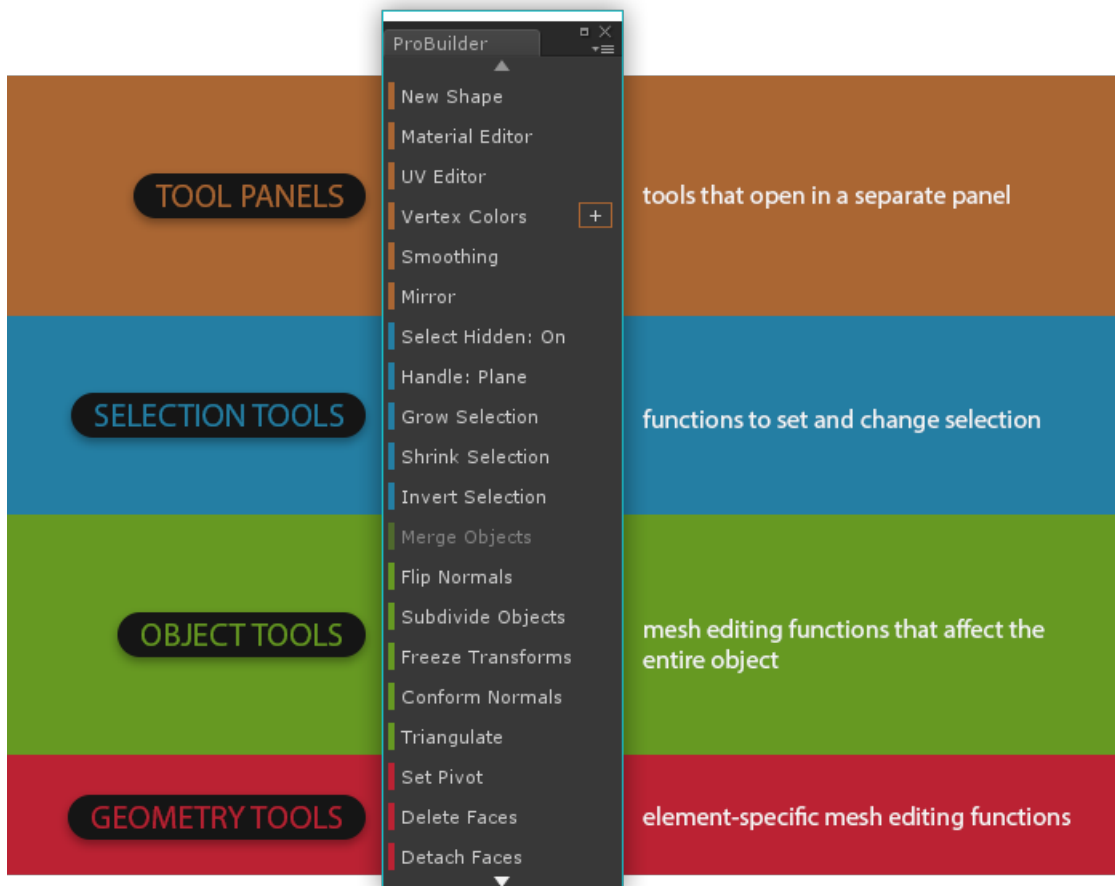
ProBuilder is controlled via the **Main Toolbar**, which contains all commonly used functions.

A second toolbar, the **Edit Mode Toolbar**, is available to quickly switch between editing modes. This toolbar can always be found floating at the top-middle of your currently active scene view.

Tool Categories

The Toolbar is color-coded to help you quickly choose tools by type:

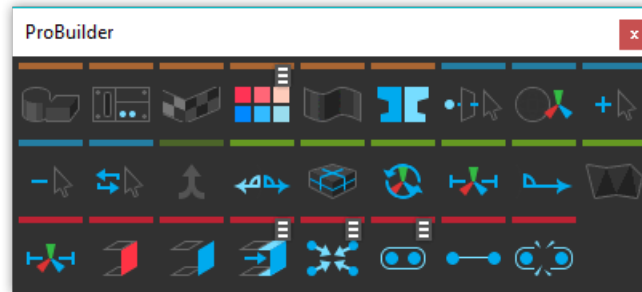
- **Orange** for [Tool Panels](#)
- **Blue** for [Selection Tools](#)
- **Green** for [Object Actions](#)
- **Red** for Geometry Actions ([Vertex](#), [Edge](#), [Face](#))



Resizing and Text vs Icon Mode

You can resize the Toolbar however you like; ProBuilder will re-order the icon or text contents to best fit the window size.

Prefer the good ol' Text Buttons? Right click on the toolbar in the empty space and choose "Use Text Mode". In this menu you can also change how this window is displayed (docking or floating).



Dynamic Layout

This is a "smart" toolbar, and dynamically changes to match your current editing method and selection.

- Buttons are only shown on the Toolbar if they are applicable in your current editing mode
- Buttons that cannot be used on the current selection are automatically grayed-out and disabled.

Custom Settings for Actions

Some of the most-used actions ([Extrude](#), [Collapse](#), [Grow Selection](#), etc) also include Custom Settings, which can significantly modify the action.

⚙️ This symbol is shown next to a button if there are Custom Settings available. To edit these settings, **ALT CLICK** on the button.

When using the text toolbar the options menu for actions is shown as a **+** icon to the right. Simply click the icon to open the options window.

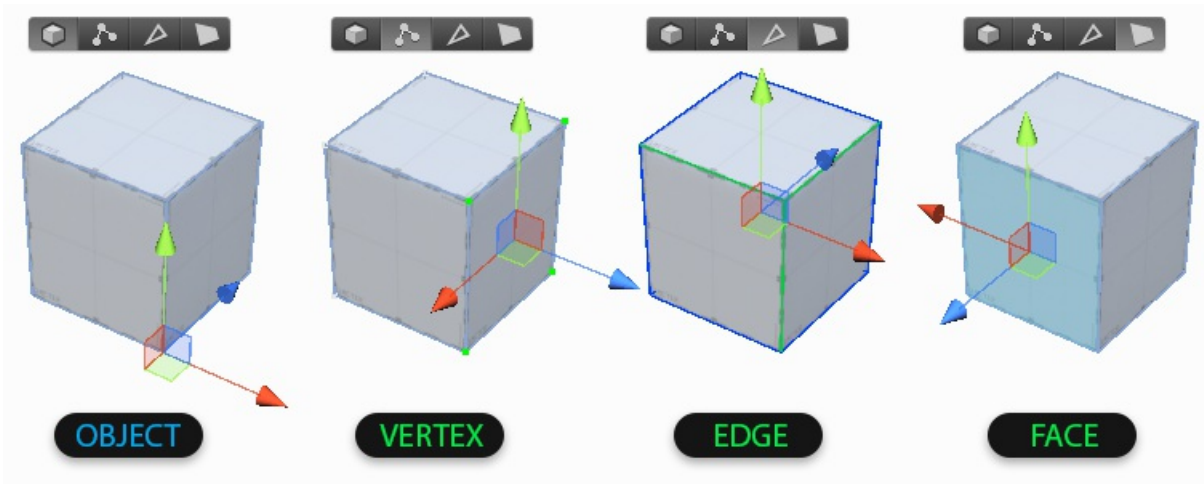
Edit Mode Toolbar

This toolbar switches ProBuilder between the available edit modes.

By default it is in the Top Middle of the Scene View, but you may change where this toolbar is positioned in the [Preferences > ProBuilder](#) panel.

Use this toolbar to choose your Edit Mode, or use keyboard shortcuts:

- **Escape** to exit back to Object mode
- **G** to toggle in/out of the Geometry editing modes
- **H** to toggle through the available Element modes (Vertex, Edge, and Face)



If you prefer to have dedicated keys for each mode (ex, **J** opens *Vertex Mode* , **K** opens *Face Mode* , etc) you can enable "Unique Mode Shortcuts" in the Preferences window.

Tool Windows

These **Tool Panels** contain important tools for [Shape Creation](#), [Materials](#), [Texturing and UVs](#), [Vertex Coloring](#), and [Smoothing Groups](#).

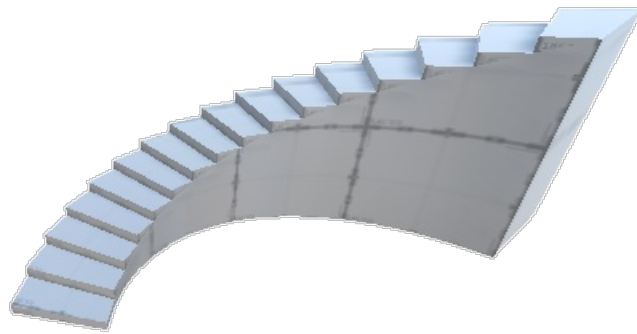
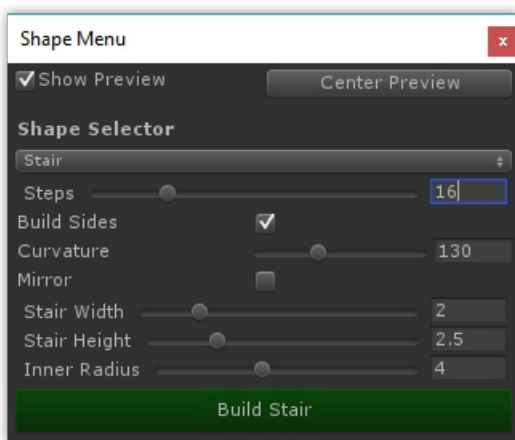
Note: Each panel can be docked, kept floating, or simply closed immediately after use.

Shape Tool

Keyboard Shortcut : CTRL SHIFT K

Purpose : Create new editable shapes such as Cylinder, Arch, and Stairs.

Each shape has specific properties which can be customized before creation- for example, the Stairs shape lets you choose items like Step Height, Arc, and which parts of the Stairway to build.

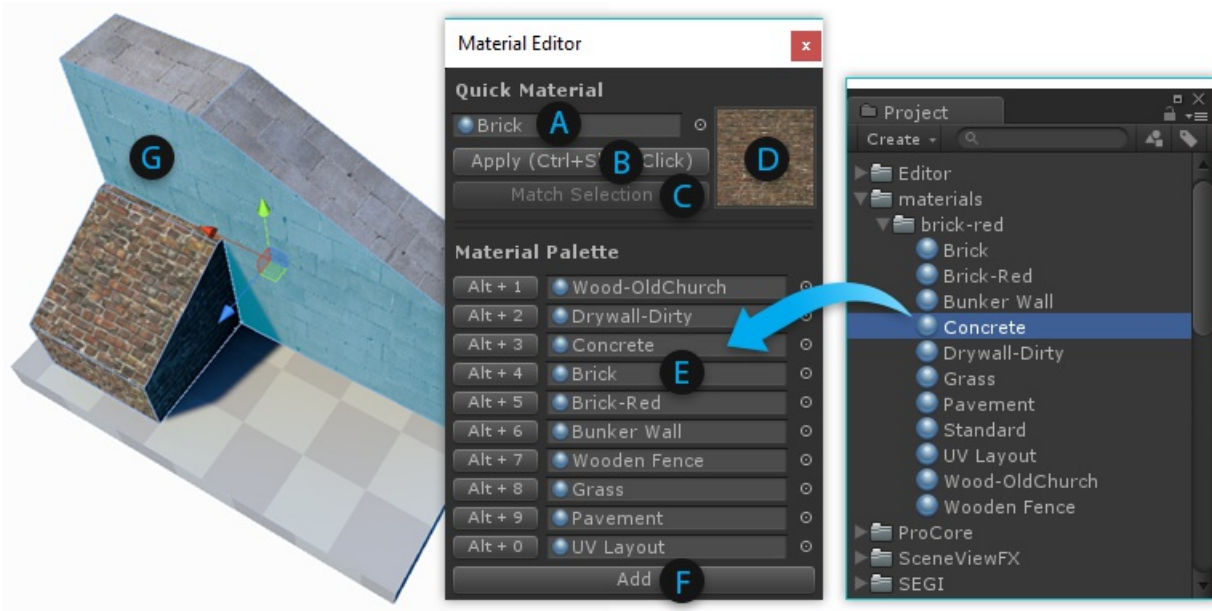


Usage : To create a new shape, do the following:

1. Open the New Shape Tool
2. If "Shape Preview" is enabled, you will see a blue Preview Object in the scene
3. Choose the Shape you'd like to create (ex, Cube, Cylinder, Torus, etc)
4. Set the options (ex, width, height, radius, number of stairs, etc)
5. You may Move or Rotate the Preview Object within your scene
6. Once ready, click "Build Shape" to create your final Shape

Material Tools

Purpose : Save and apply your most frequently used materials, using Quick Material one-click or Material Palette keyboard shortcuts.



Quick Material Usage:

- (A) The current "Quick Material"
- (B) Apply the Quick Material to the selected faces
- (C) Pick your Quick Material from the selected face
- (D) Preview of the current Quick Material

Hold **CTRL SHIFT** while clicking on a face to apply the Quick Material.

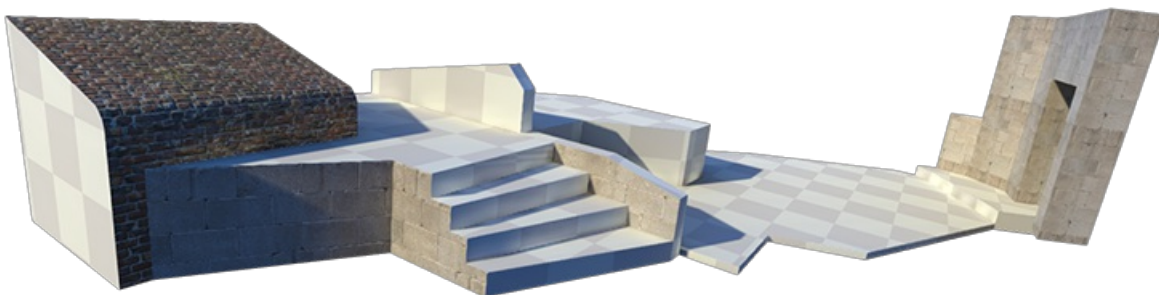
Material Palette Usage :

- (E) Drag-and-drop your often-used materials to these slots
- (F) Create additional Material Palette slots

You can also press **ALT (number key)** to apply materials from the Palette.

Texturing and UVs

Purpose : Opens the UV Editor Panel, for controlling how materials are displayed on your mesh (tiling, offset, unwrapping, etc).



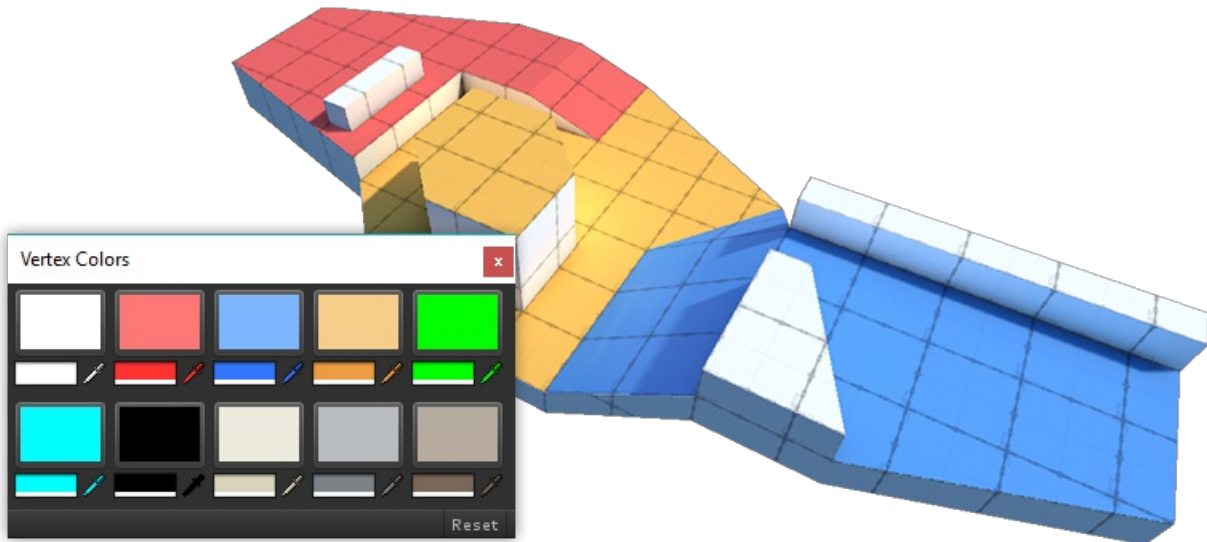
The UV Editor Panel includes both [Auto UV](#) tools, and a complete [Manual UV Editing and Unwrapping](#) system.

More Info: [Texturing and UVs](#)

Vertex Color Tools

Purpose : Opens the Vertex Coloring controls, for applying or painting vertex colors onto meshes.

Warning! Not all shaders will show vertex colors on a mesh.



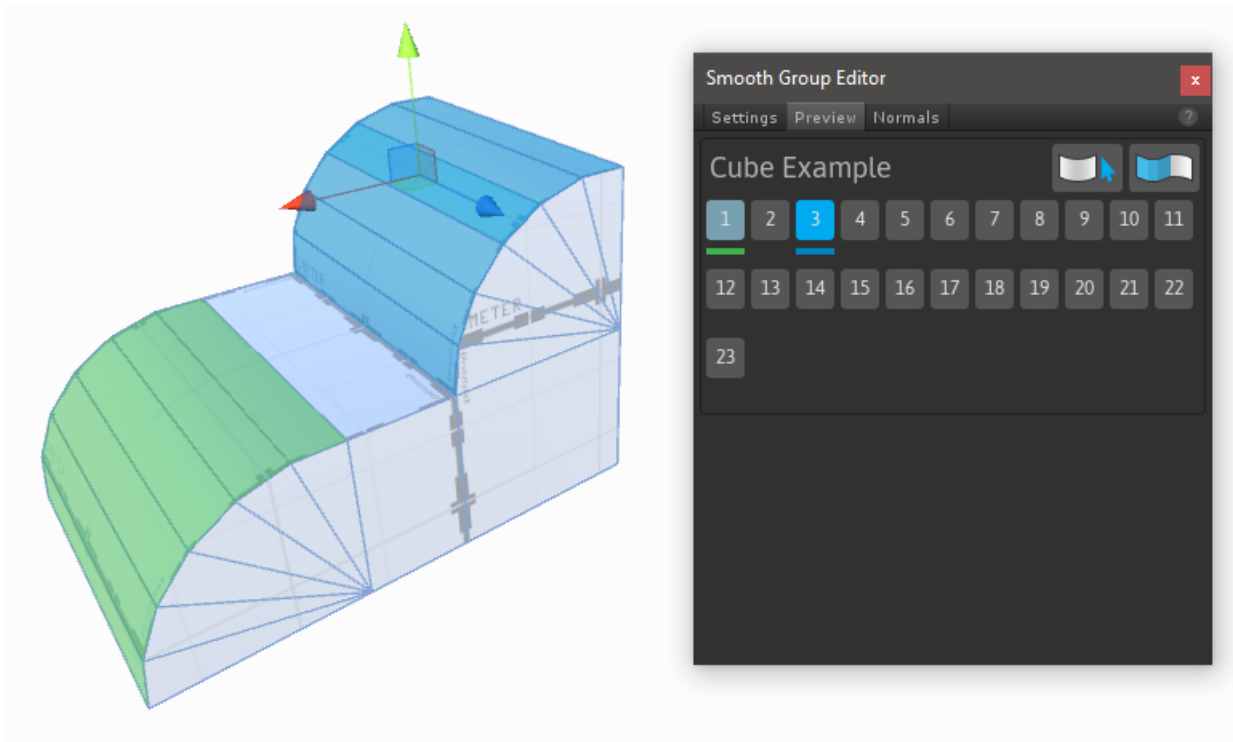
Applying Vertex Colors is a great way to colorize levels for prototyping, team layout, zones, etc.

Smoothing Groups



Section Video: [ProBuilder Toolbar: Smoothing Groups](#)

Purpose: Create a smooth and rounded look, or sharp and hard cornered.

Usage:



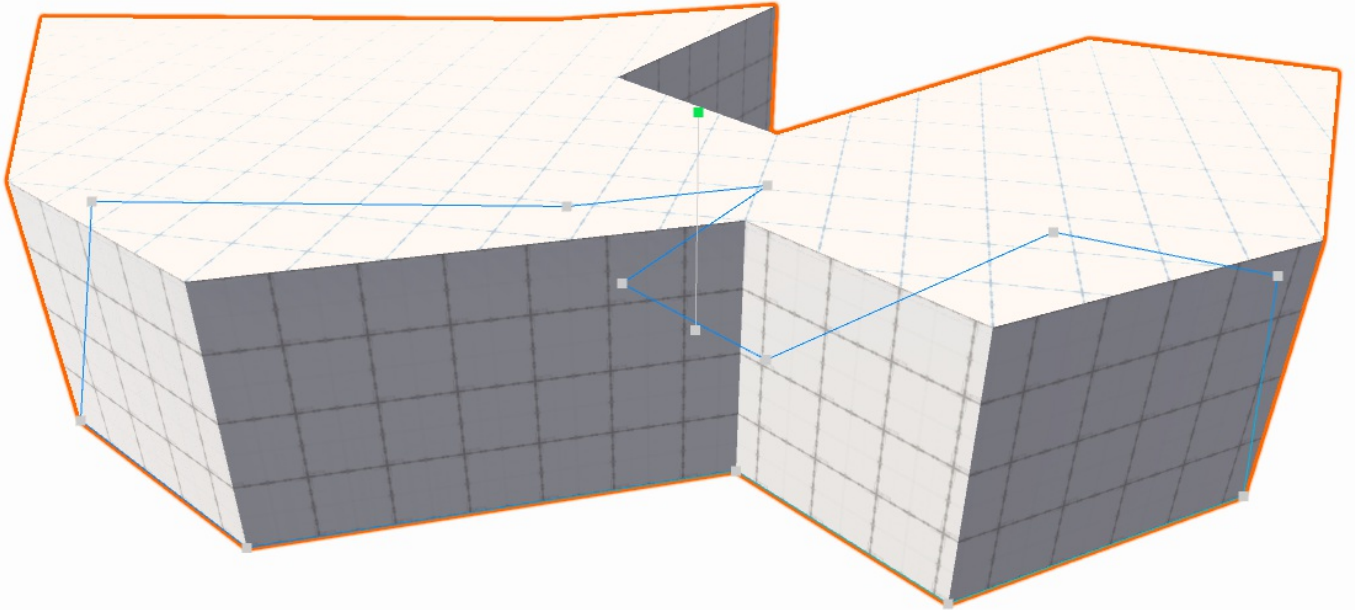
- Choose Face editing from the [Edit Mode Toolbar](#)
- Select a group of faces that you want to have smooth adjoining edges
- Click an unused smooth group number in the Smooth Group Editor

- *Note* Smooth groups already in use are shown with a light blue highlight
- To clear selected face smoothing groups, select the faces and click the  icon
- To select all faces matching with the current smooth group index, use the  icon

Poly Shape

Poly Shape

Section Video: [Creating and Editing a Poly Shape](#)

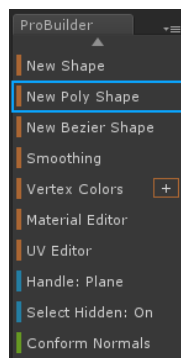


Poly Shape is unlike the usual ProBuilder shapes in that it is interactive and editable indefinitely. Once a **Poly Shape** has been created you may continue to edit its control points and other settings.

Important!

Modifying control points or settings will clear any mesh edits.

Quick Start



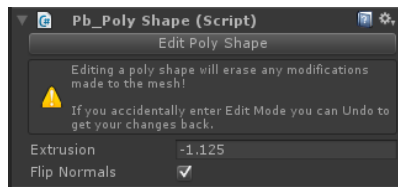
- In the [ProBuilder Toolbar](#) select **New Poly Shape**.
- In the Scene View click to add control points. These will form the outer bounds of your mesh.
- Once finished placing points, hit **Enter / Return** or **Space** to finalize the shape.
- Move the mouse up and down to set the mesh height, then **Left Click** to finalize.

After the initial path and height setting, the mesh enters **Editing Mode**.

Editing a Poly Shape

Even after the initial creation steps a **Poly Shape** can still be modified.

Select the **Edit Poly Shape** button in the **Unity Inspector**. To disable Poly Shape Editing simply click this button again.



- Move existing control points by clicking and dragging.
- Add new points by clicking along the perimeter line.
- Remove existing points by clicking to select, then press **Backspace** (**Delete** on Mac).
- Set the height by clicking and dragging the handle in the center of the mesh.
- Flip the normals by selecting **Flip Normals** in the Inspector.

Selection Actions


Select Hidden

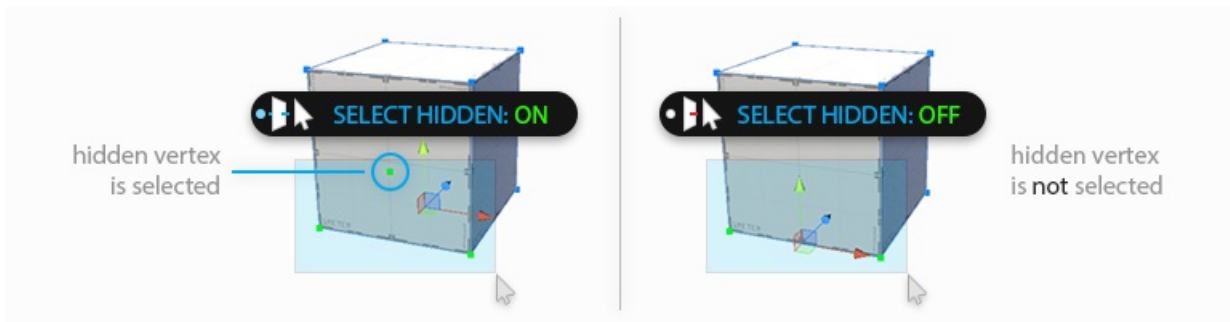
Section Video: [Selection Tools: Select Hidden](#)

Determines whether hidden elements are selected or ignored, when drag-selecting. This is a toggle button, click to change modes:

Toolbar Icon Description

 **On:** all **elements** are selectable, regardless of their visibility

 **Off:** drag selection will ignore any **elements** that cannot currently be seen



Handle Alignment

Section Video: [Selection Tools: Handle Alignment](#)

Keyboard Shortcut : P

Choose how the scene handles will be oriented when selecting **elements**. This is a toggle button; click to change modes:

Toolbar Icon Description

 **Global:** Similar to a compass, the handle orientation is always the same, regardless of local rotation.

 **Local:** Similar to "left vs right", handle orientation is relative the object's rotation.

 **Planar:** This special mode aligns the handles to exact normal direction of the selected face.



Grow Selection

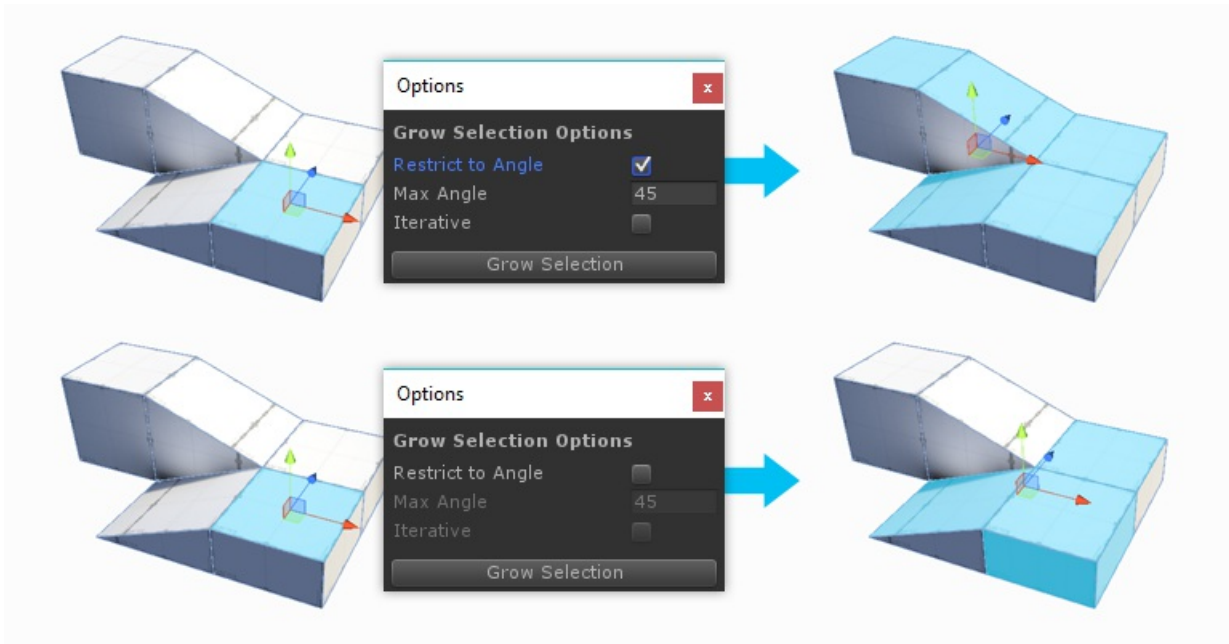
Section Video: [Selection Tools: Grow Selection](#)

Keyboard Shortcut: ALT G

Expands the selection outward to adjacent faces, edges, or vertices.

Options:

Setting	Description
Restrict To Angle	Only Grow Selection to faces within a specified angle
Max Angle	The angle to use when Restrict to Angle is On
Iterative	Only Grow Selection to adjacent faces, with each button press

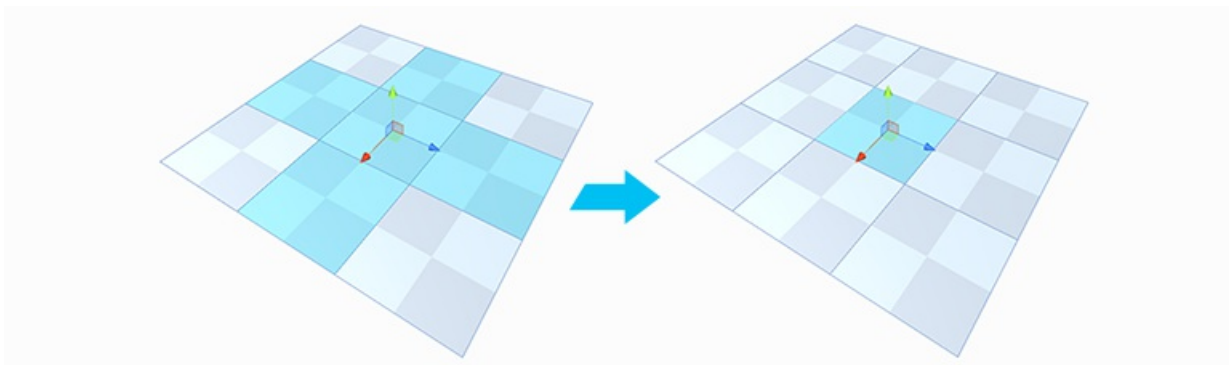


Shrink Selection

Section Video: [Selection Tools: Shrink Selection](#)

Keyboard Shortcut: ALT SHIFT G

Does the opposite of Grow Selection: removes the elements on the perimeter of the current selection.

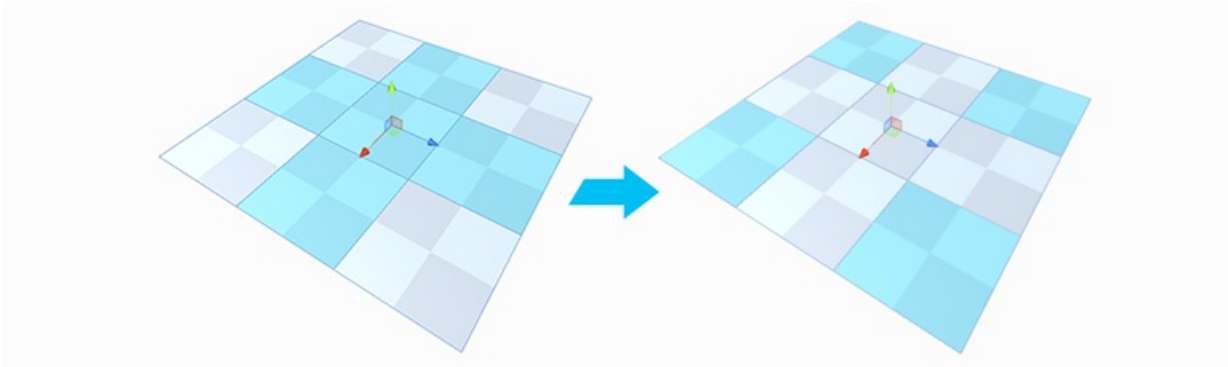


Invert Selection

Section Video: [Selection Tools: Invert Selection](#)

Keyboard Shortcut : CTRL SHIFT I

Selects the inverse of the current selection. All unselected elements will become selected, the current selection will be unselected.

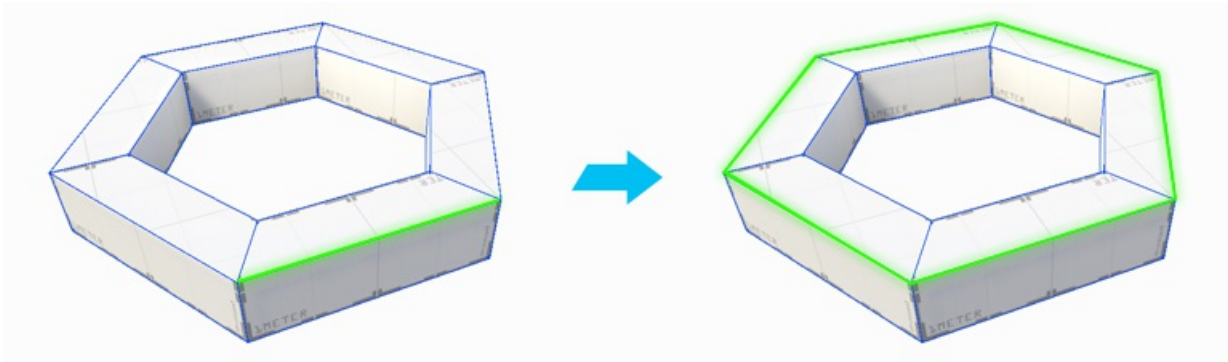


Select Edge Loop

Section Video: [Selection Tools: Select Edge Loop](#)

Keyboard Shortcut : ALT L

Selects an edge loop from each selected edge.

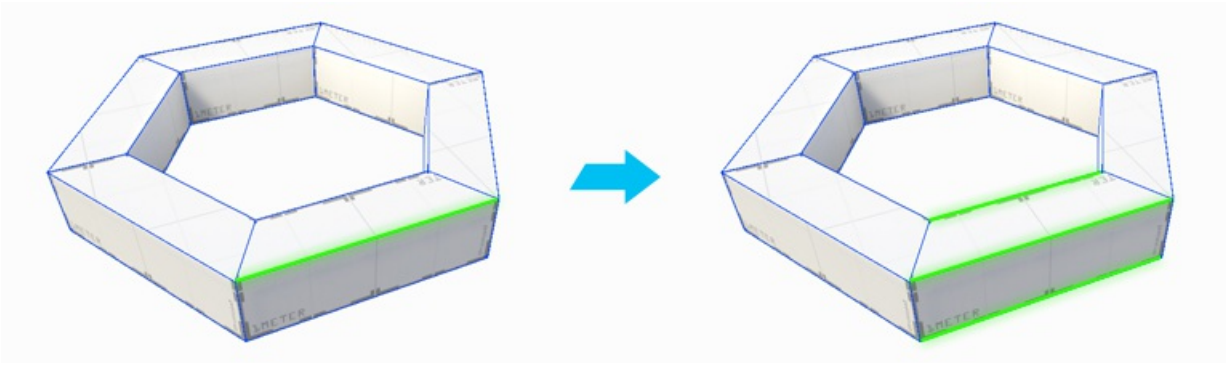


Select Edge Ring

Section Video: [Selection Tools: Select Edge Ring](#)

Keyboard Shortcut : ALT R

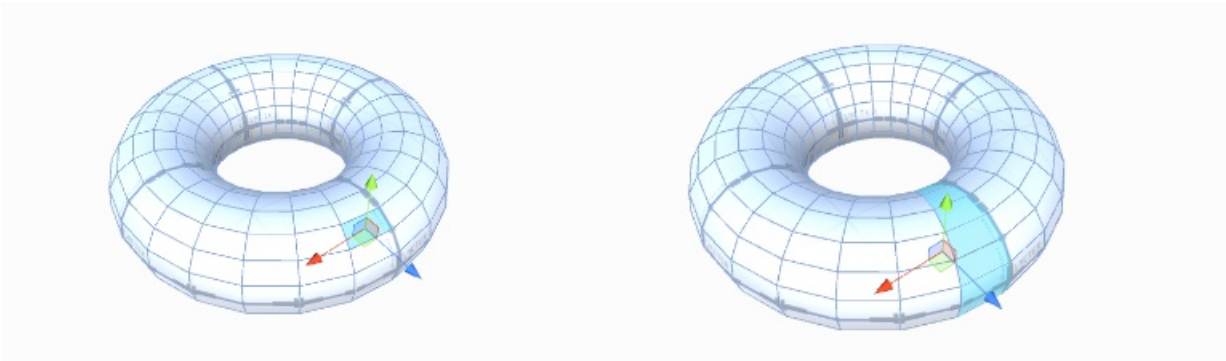
Selects a ring from each selected edge.



Select Face Loop

Keyboard Shortcut : ALT L Shift + Double Click

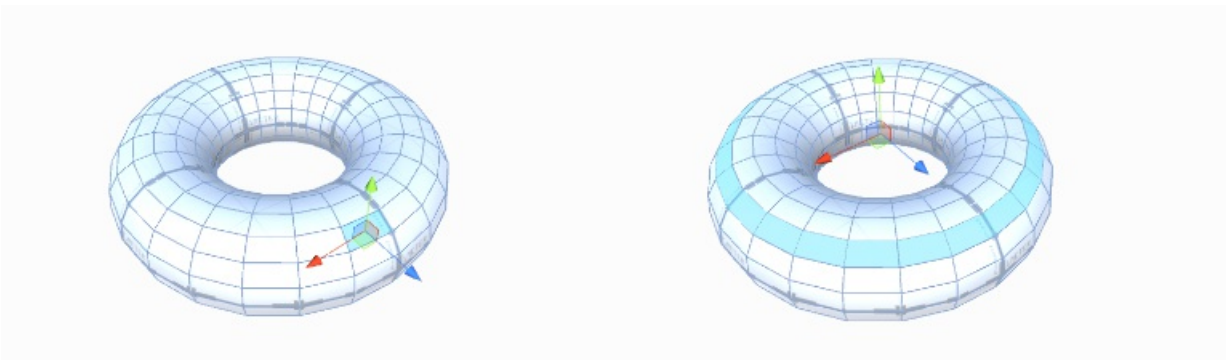
Selects a face loop from each selected face. Faces are only considered to be part of a loop if they contain exactly 4 sides.



Select Face Ring

Keyboard Shortcut : ALT R Control + Double Click

Selects a face ring from each selected face. Faces are only considered to be part of a ring if they contain exactly 4 sides.

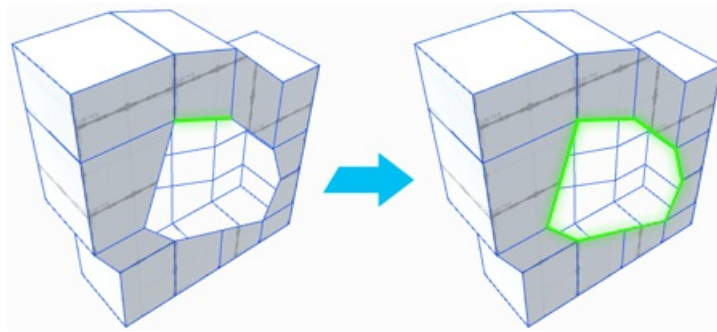


Select Hole

Section Video: [Selection Tools: Select Hole](#)

With an open vertex or edge selected, click **Select Hole** to select all elements along opening.

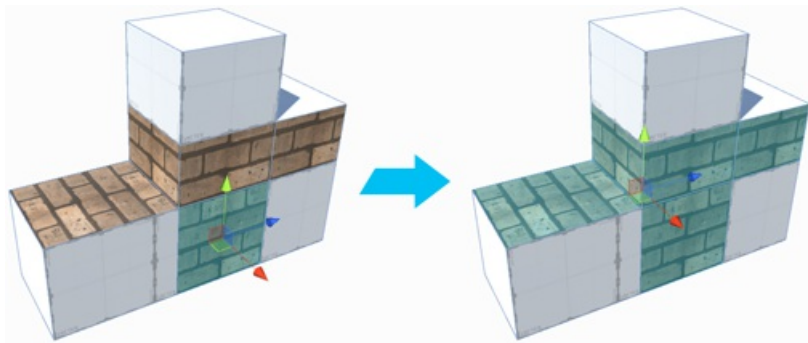
With no elements selected, clicking **Select Hole** will automatically select **all** holes in the selected object.



Select by Material

Section Video: [Selection Tools: Select byMaterial](#)

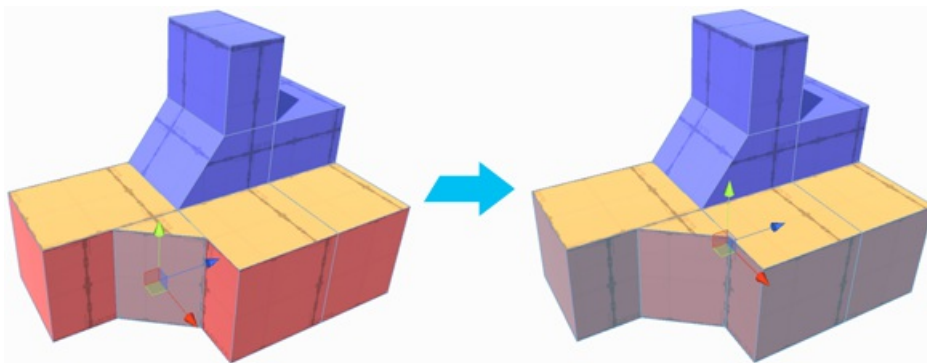
Click to select all faces on this object, which use the same material as the selected face.



Select by Vertex Color

Section Video: [Selection Tools: Select by Vertex Color](#)

Click to select all faces on this object, which have the same vertex color as the selected face.



Shift Modifier

Section Video: [Selection Tools: Shift Modifier](#)

Choose how holding the SHIFT key will affect selection, when clicking or drag-selecting:

Toolbar Icon Description



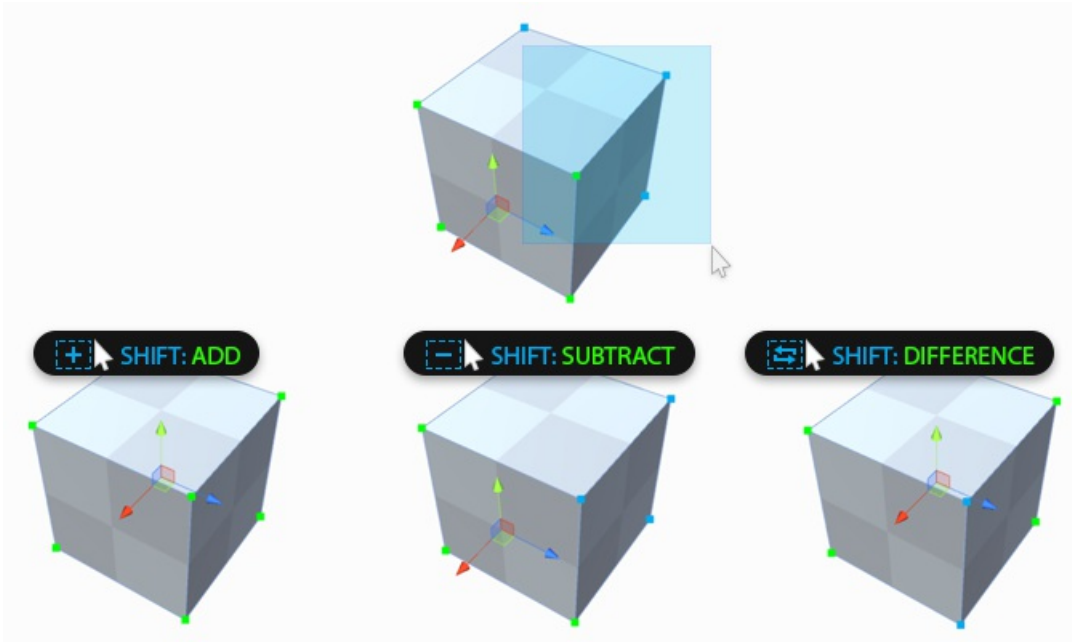
Add: always add to the selection



Subtract: always subtract from the selection



Difference: unselected elements are added, selected elements are subtracted



Selection Rect Mode

Choose whether drag selection should only select elements inside the drag-rect (Complete), or also elements intersected by the drag-rect.

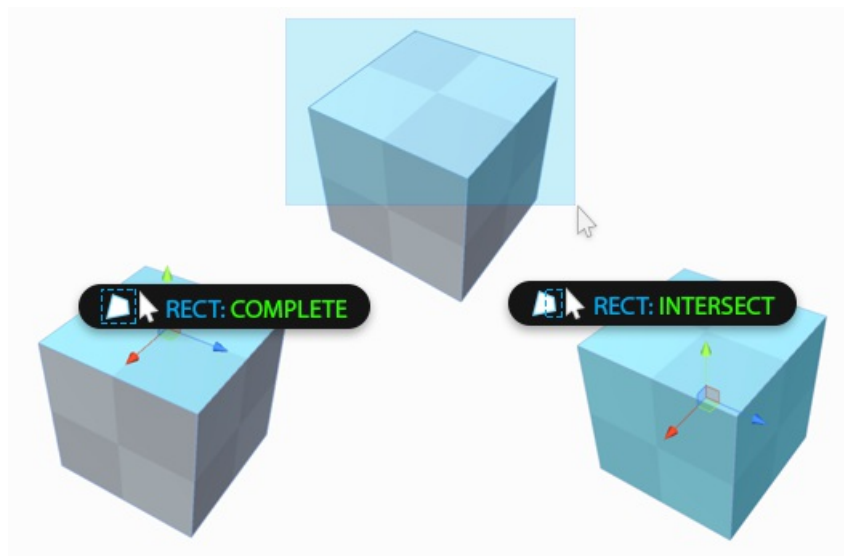
Toolbar Icon Description



Complete: Only select elements entirely within the drag-rect



Intersect: Select both occluded and intersected elements



Object Actions

Merge Objects

Section Video: [Object Actions: Merge Objects](#)

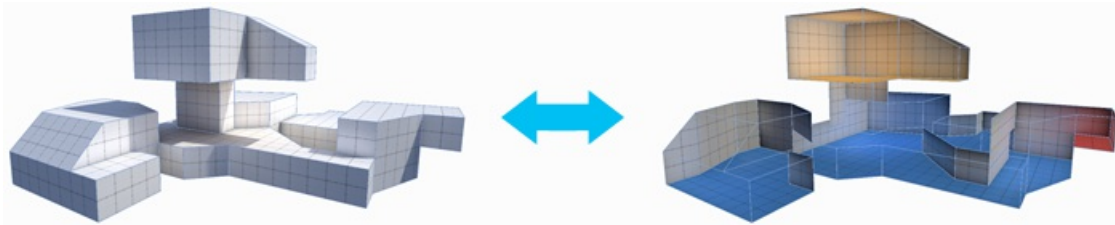
Merges the selected objects into a single object.

Flip Object Normals

Section Video: [Object Actions: Flip Object Normals](#)

Flips the normals of **all** faces on the selected object(s).

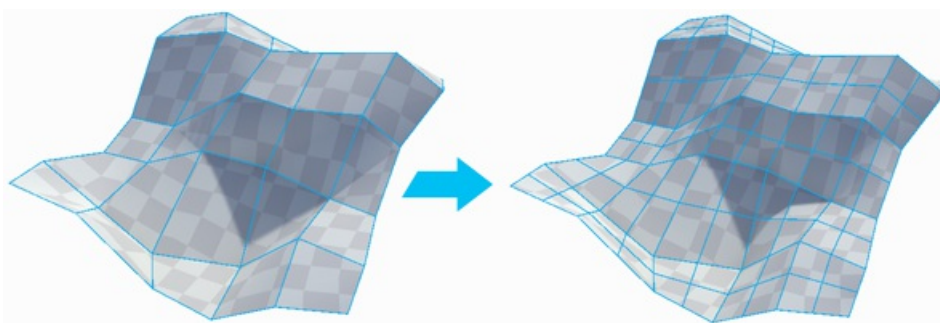
Especially useful for converting an exterior modeled shape into an interior space.



Subdivide Object

Section Video: [Object Actions: Subdivide Object](#)

Divides every face on selected objects, allowing for greater levels of detail when modeling.



Reset / Freeze Transform

Section Video: [Object Actions: Reset / Freeze Transform](#)

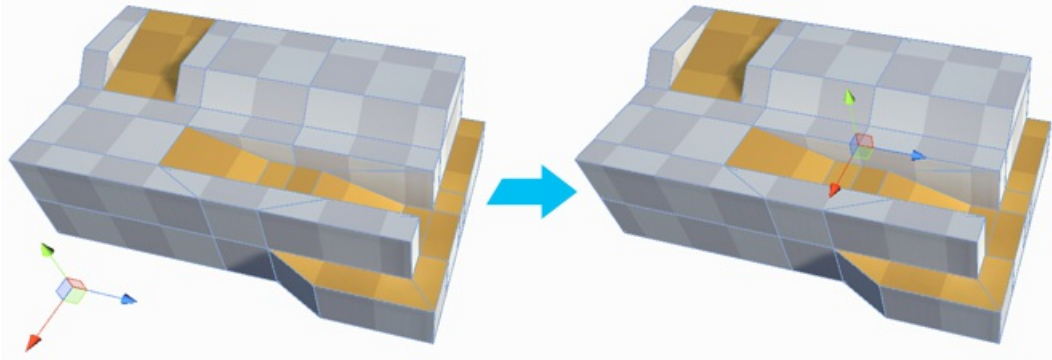
Sets the selected objects position, rotation, and scale to world-relative $\{0,0,0\}$ without changing any vertex positions.

Move Pivot to Center of Object

Section Video: [Object Actions: Center Pivot](#)

Keyboard Shortcut : CTRL J

Moves the mesh pivot to the center of the object's bounds.



Conform Normals

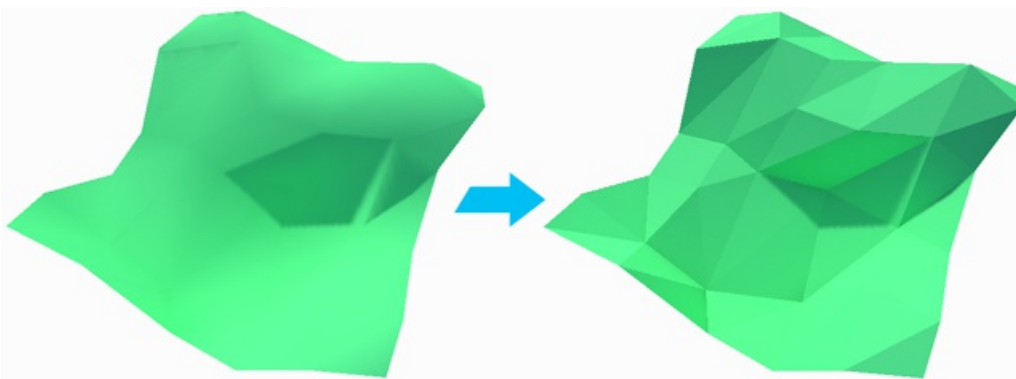
Section Video: [Object Actions: Conform Normals](#)

Sets all face normals on the selected object to the same relative direction.

Triangulate

Section Video: [Object Actions: Triangulate](#)

Reduces all polygons to their base triangles, creating a sharp, faceted appearance.

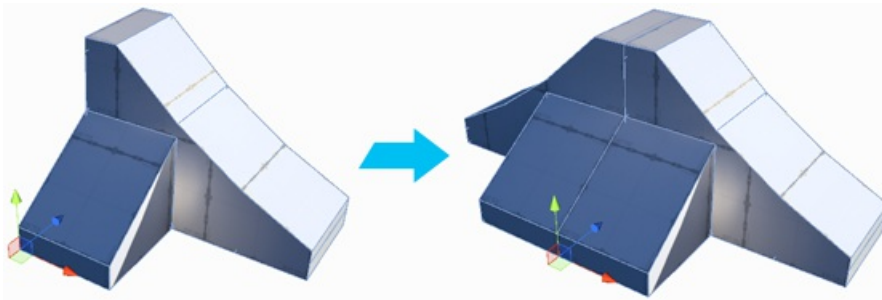


Mirror Tool

Section Video: [ProBuilder Toolbar: Mirror Tool](#)

Use the Mirror action to create mirrored copies of objects.

Mirror is especially useful when creating symmetrical items- build one half, mirror it, then weld the two together for a perfectly symmetrical result.



Custom Settings Available :

Setting Description

X, Y, Z Choose which axis (single or multiple) to mirror on

Duplicate When **On**, a duplicate object will be created and mirrored, leaving the original unchanged.

Generate UV2

Builds the UV2 channel for each selected mesh, or all meshes in the scene if the "Generate Scene UVs" option is toggled.

Custom Settings Available :

Setting Description

Generate Scene UV2s If **On**, will generate UV2s for all meshes in the scene. Otherwise, only UV2s on the selected object(s) will be generated.

Enable Auto UV2 If **On**, UV2s will be auto-generated as needed.

Export

Export the selected ProBuilder objects to a 3D model.

Format Description

OBJ Wavefront OBJ. Widely supported model format supports multiple textures and mesh groups.

STL A widely supported format generally used in CAD software or 3D printing. Only supports triangle geometry.

PLY Stanform PLY. Widely supported and very extensible. Supports quads and vertex colors, but not multiple materials.

Asset Unity's asset format, only readable in Unity.

Export options:

Option Formats Description

Include Children	All	If enabled ProBuilder will include not only selected meshes, but also the children of selected objects in the exported model.
Export as Group	OBJ, PLY	If enabled all selected objects will be combined and exported as a single model file. Otherwise each mesh will be exported separately.
Apply Transforms	OBJ, PLY	Should the GameObject transform be applied to the mesh attributes before export? With this option and Export as Group enabled you can export your whole scene, edit, then re-import with everything exactly where you left it.
Right Handed	OBJ, PLY	Unity's coordinate system is "Left Handed", where most other major 3D modeling packages operate in "Right Handed" coordinates.
Copy Textures	OBJ	If enabled the exporter will copy texture maps to the OBJ file destination and reference them from local paths in the material library. If unchecked the material library will reference an absolute path to the textures and not copy them. If you're exporting an OBJ to use in Unity leave this unchecked and set the Mesh Importer "Material Naming" to "From Model's Material" and "Material Search" to "Project-Wide."
Vertex Colors	OBJ	Some 3D modeling applications can import vertex colors from an unofficial extension to the OBJ format. Toggling this will write vertex colors using the MeshLab format. This can break import in some applications, please use with caution!
Texture		Some 3D modeling applications import texture scale and offset parameters (Blender, for example). Toggling this will write these

Scale	Format	Description
Offset	OBJ	The exported mtl file. This can break import in some applications, please use with caution!

STL Format	STL	The STL file specification supports both ASCII and Binary representations. This toggles between the two types.
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Quads	PLY	Where possible, ProBuilder will preserve quads when exporting to PLY.
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ProBuilderize Object

Converts the selected object(s) into ProBuilder-editable objects.

Custom Settings Available :

Setting	Description
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Preserve Faces	If On, ProBuilder will attempt to keep ngons. Otherwise, all the mesh will be converted to hard tris.
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Entity Type Tools

In ProBuilder, "Entity Types" can be very helpful in projects that make heavy use of Trigger Volumes and custom Collision Volumes. There are 4 Entity Types:

Trigger

- Configures a mesh for use as a Trigger Volume
- This object will only be visible in the editor, never in game
- On the object's Collider component, "Force Convex" and "Is Trigger" are enabled
- Static Flags: none

Collider

- Configures the mesh for use as a Collision Volume
- This object will only be visible in the editor, never in-game
- Static Flags: Navigation Static and Off-Link Mesh Navigation

Mover

- For meshes that will need to move and change in-game
- Static Flags: NONE

Detail

- For objects that will NOT move or change in-game
- Static Flags: ALL

Using the Entity Type Controls: To set an object's type, select it (or multiple) and click the "Set (type name)" button at the bottom of the ProBuilder GUI. Click the "eye" icon to instantly toggle the visibility of each Entity Type (for example, to quickly hide all Mover objects)

Tip: You can choose the default Entity Type in the [ProBuilder Preferences](#)

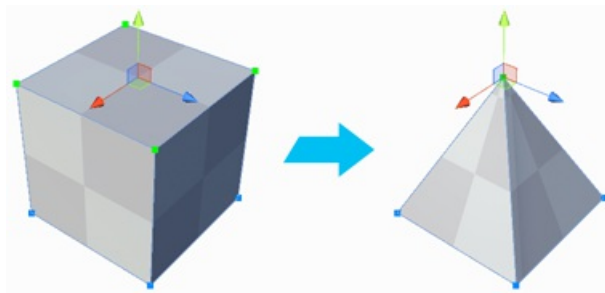
Vertex Actions

🔗 Collapse Vertices

Section Video: [Vertex Actions: Collapse Vertices](#)

Keyboard Shortcut : ALT C

Collapses all selected vertices to a single point, regardless of distance.



⚙️ **Custom Settings Available :**

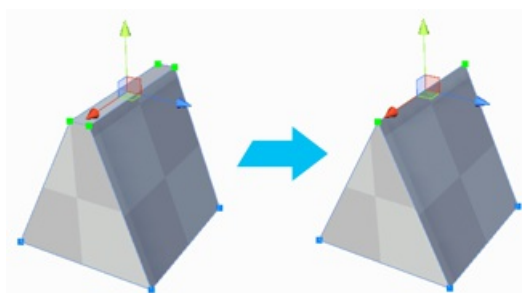
Setting	Description
Collapse To First	Collapse to first-selected vertex position, instead of selection center.

🔗 Weld Vertices

Section Video: [Vertex Actions: Weld Vertices](#)

Keyboard Shortcut : ALT V

Merge vertices within a set distance of one another.



⚙️ **Custom Settings Available :**

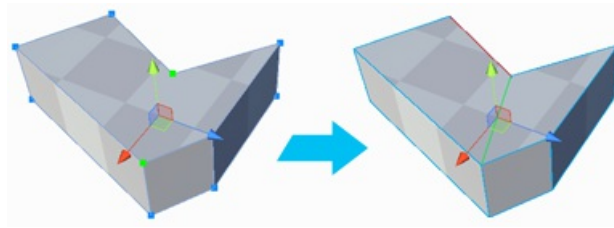
Setting	Description
Collapse To First	Collapse to first-selected vertex position, instead of selection center.

🔗 Connect Vertices

Section Video: [Vertex Actions: Connect Vertices](#)

Keyboard Shortcut : ALT E

Create a new edge connecting the selected vertices.

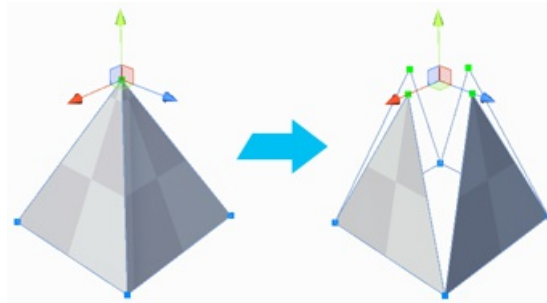


Split Vertices

Section Video: [Vertex Actions: Split Vertices](#)

Keyboard Shortcut : ALT X

Splits a vertex into it's individual vertices so that they may be moved independently of one another.



Note : When a vertex is **Split**, the newly separated vertices will not actually move apart on their own. This was done for the image, to better illustrate the effect of this action.

Edge Actions

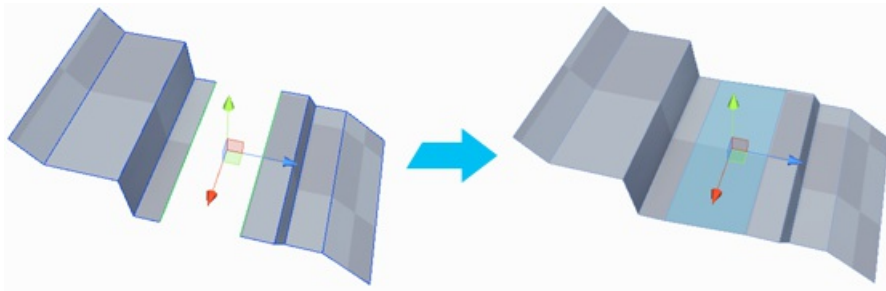
Bridge Edges

Section Video: [Edge Actions: Bridge Edges](#)

Keyboard Shortcut : ALT B

Create a new face between two selected edges. Each edge must have a free side.

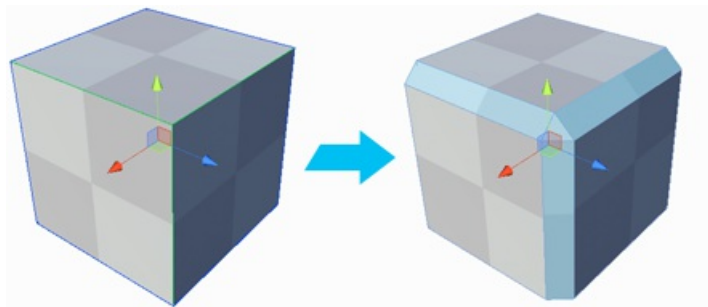
Note: By default, only open edges can be **Bridged**. You can change this in the [ProBuilder Preferences](#).



Bevel

Section Video: [Edge Actions: Bevel Edges](#)

Splits the selected edge(s) into two edges, with a new face between.



 **Custom Settings Available :**

Setting **Description**

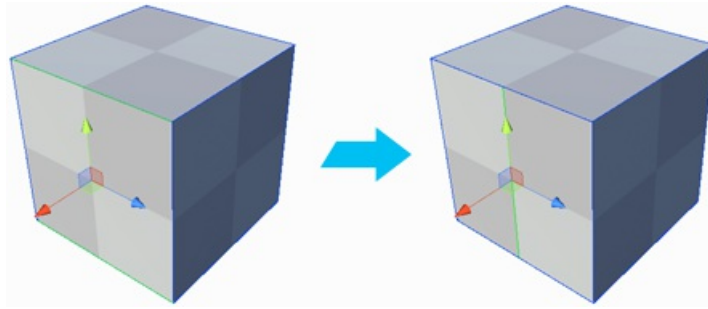
Distance Sets the distance each new edge is moved, from the position of the original.

Connect Edges

Section Video: [Edge Actions: Connect Edges](#)

Keyboard Shortcut : ALT E

Insert an edge connecting the centers of each selected edge.



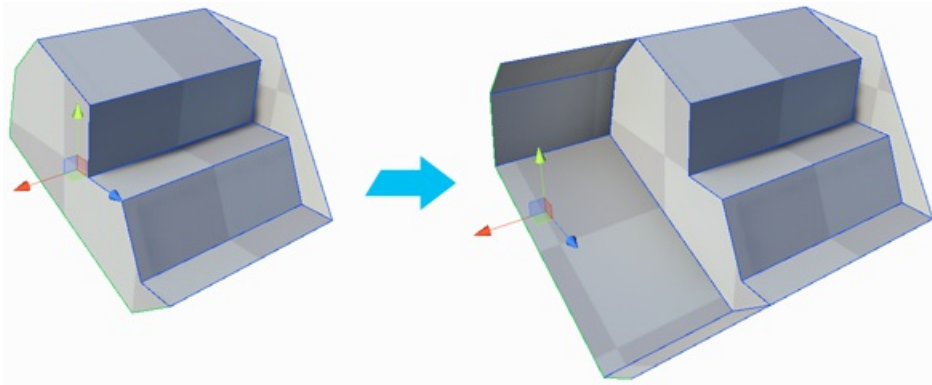
Extrude Edges

Section Video: [Edge Actions: Extrude Edges](#)

Keyboard Shortcut : **SHIFT DRAG** / **CONTROL E** (PC) / **COMMAND E** (Mac)

Pushes a new edge out from the selected edge, connected by a new face.

You can also extrude edges by holding **SHIFT** while moving, rotating, or scaling them.



 **Custom Settings Available :**

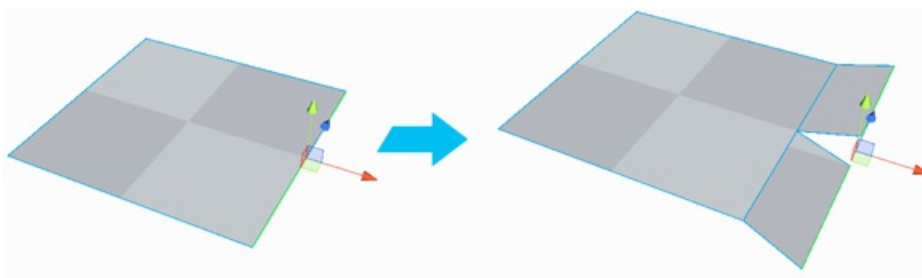
Setting	Description
Distance	Distance to extrude the edge(s).

Subdivide Edge

Section Video: [Edge Actions: Subdivide Edge](#)

Keyboard Shortcut : **ALT S**

Divides the selected edge(s) into multiple edges.



⚙️ **Custom Settings Available :**

Setting **Description**

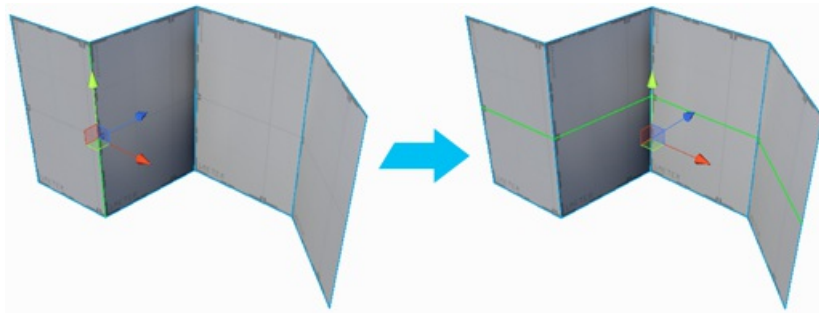
Subdivisions Number of divisions to make in the selected edge(s).

Insert Edge Loop

Section Video: [Edge Actions: Subdivide Edge](#)

Keyboard Shortcut : **ALT U**

Adds a new edge loop from the selected edge(s).



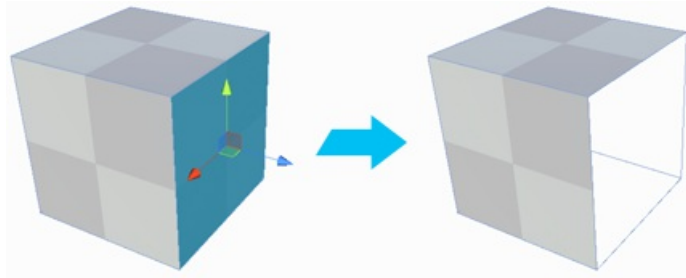
Face Actions

Delete Face

Section Video: [Face Actions: Delete Faces](#)

Keyboard Shortcut : BACKSPACE

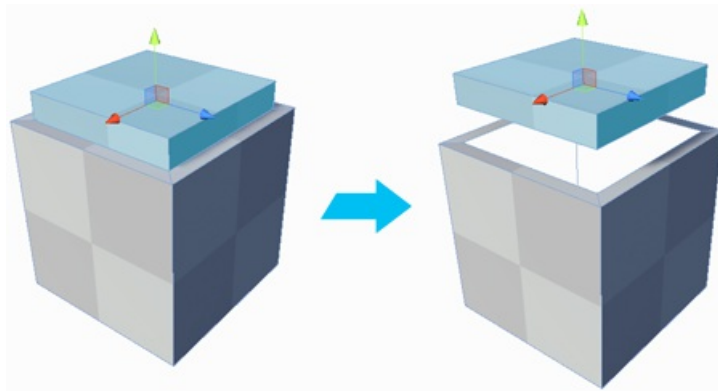
Deletes the selected face(s).



Detach Face

Section Video: [Face Actions: Detach Faces](#)

Detach the selected face(s) to a new sub-mesh, or separate object.



 **Custom Settings Available :**

Setting	Description
Detach To New Object	If On , the face(s) will be detached to a new, separate object. Otherwise, they will be detached to a sub-mesh within the original object.

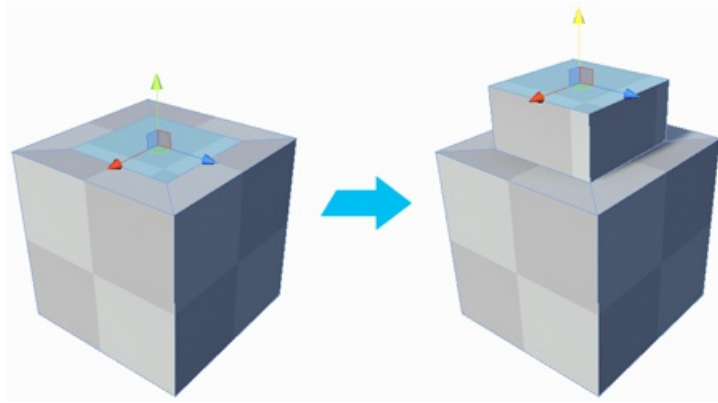
Extrude Face

Section Video: [Face Actions: Extrude Faces](#)




Keyboard Shortcut : SHIFT DRAG

Creates a new face by pulling out the currently selected face and attaching sides to each edge.

You can also extrude by holding **SHIFT** while moving, rotating, or scaling the faces.



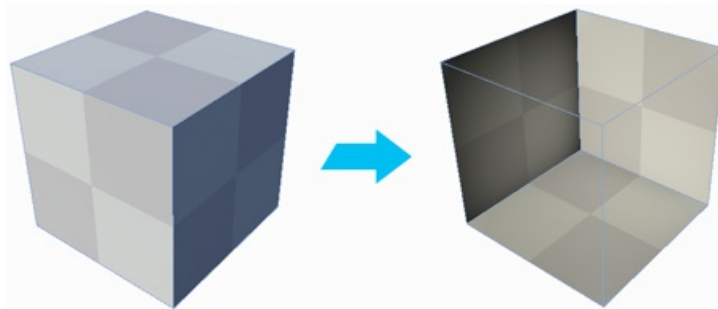
⚙️ Custom Settings Available :

Setting	Description
 Face Normals	Extrudes each selected Face according to its own surface direction, and adjacent faces remain connected.
 Vertex Normals	Extrudes selected Faces by Vertex normals. Adjacent Faces remain connected.
 Individual Faces	Extrudes each selected Face according to its own surface direction, however adjacent faces do not remain connected.
Distance	Distance to extrude the selected faces(s).

↔️ Flip Normals

Section Video: [Face Actions: Flip Normals](#)

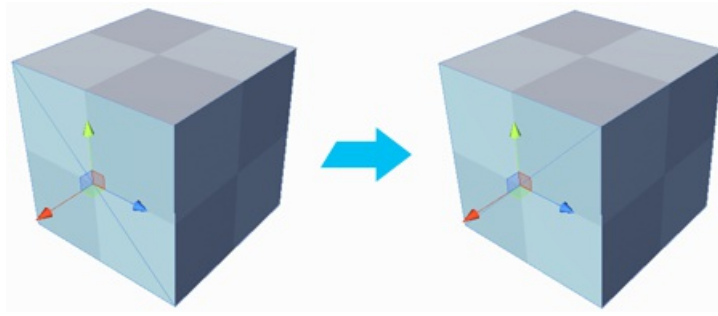
Flips the normals on the selected face(s).



↔️ Flip Face Edge

Section Video: [Face Actions: Flip Face Edge](#)

Swap the triangle orientation on the selected face(s). This will only work on quads (faces with 4 sides).



➡📐 Conform Normals

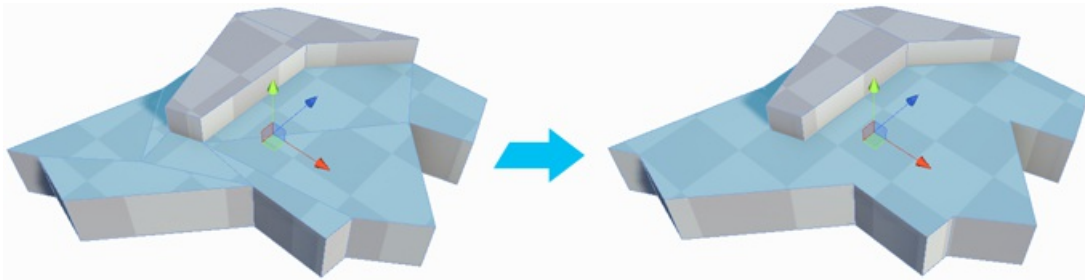
Section Video: [Face Actions: Conform Normals](#)

Sets all selected face normals to the same relative direction.

📐 Merge Faces

Section Video: [Face Actions: Merge Faces](#)

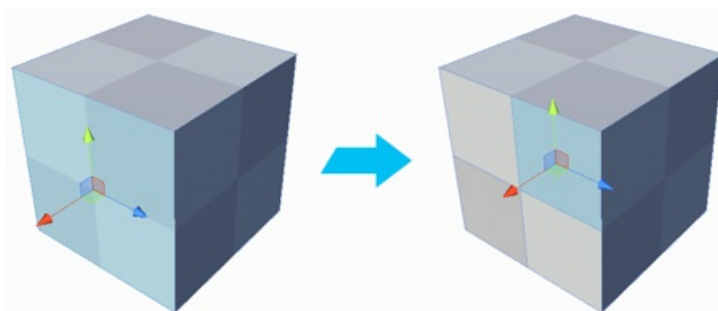
Merges selected faces into a single face, and removes any dividing edges.



📐 Subdivide Faces

Section Video: [Face Actions: Subdivide Face](#)

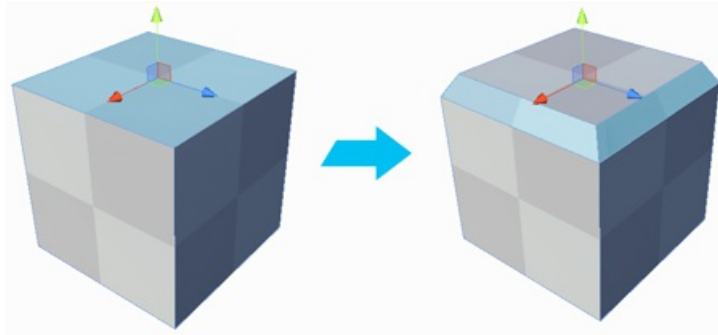
Split each selected face by adding a vertex at the center of each edge and connecting them in the center.



Bevel Faces

Section Video: [Face Actions: Bevel Face](#)

Performs the [Bevel Edge](#) action on all the edges of the selected face(s).



 **Custom Settings Available :**

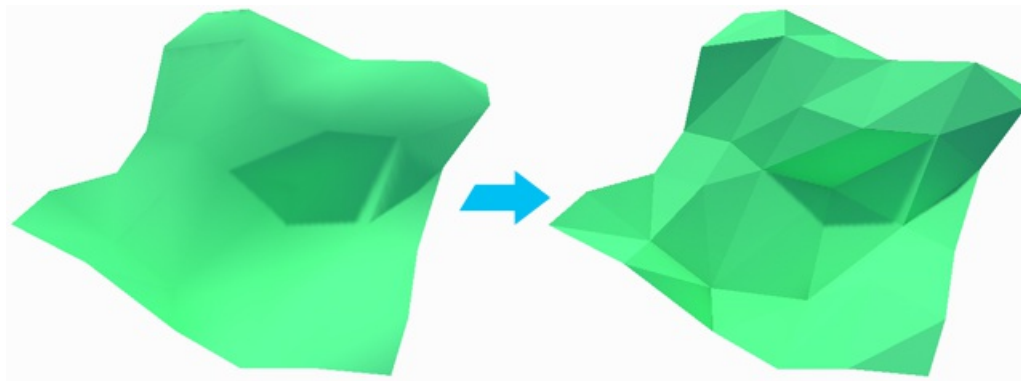
Setting **Description**

Distance Sets the distance each new edge is moved, from the position of the original.

Triangulate Faces

Section Video: [Face Actions: Triangulate Faces](#)

Reduces selected faces to their base triangles, creating a faceted, non-smooth appearance.



Element Actions

Move Pivot to Center of Selected Elements

Section Video: [Element Actions: Set Pivot](#)

Keyboard Shortcut : ALT J

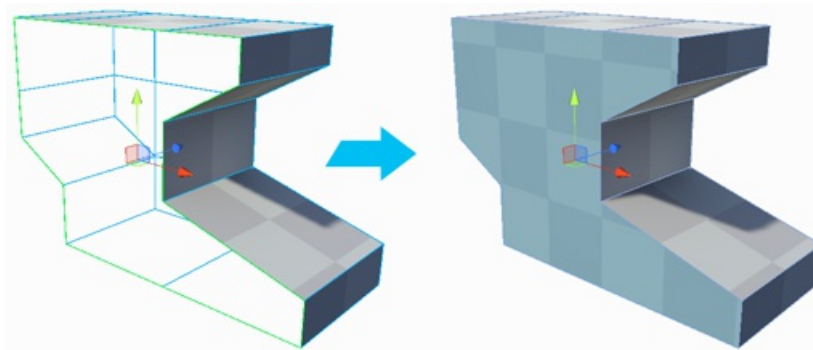
Move the pivot point of this mesh to the average center of the selected elements.

This action is available in all Element modes (Vertex, Edge, Face).

Fill Hole

Section Video: [Element Actions: Fill Hole](#)

Creates a new face filling any holes that touch the selected edges/vertices.



 **Custom Settings Available :**

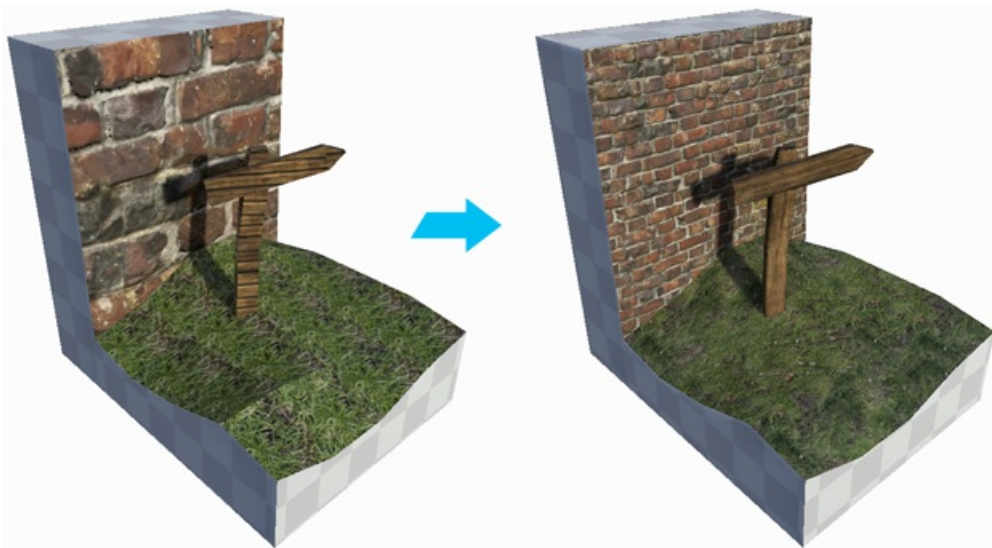
Setting	Description
---------	-------------

Fill Entire Hole	If On , the entire mesh opening will be filled. Otherwise, only the selected open edges/vertices will be capped.
-------------------------	---

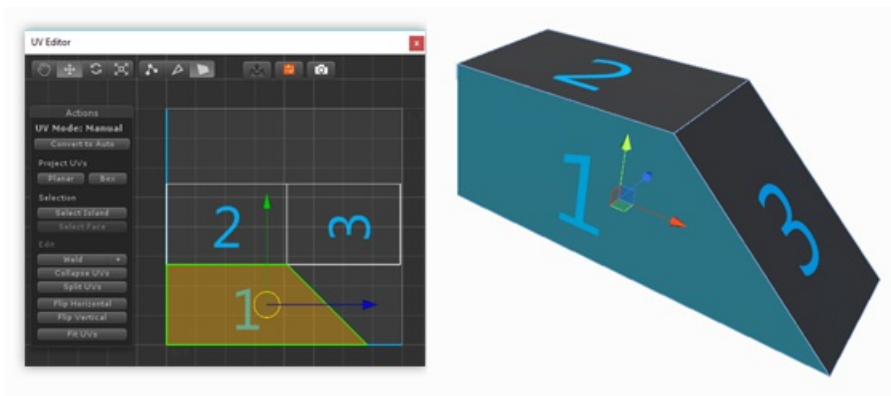
Texturing Overview

Texture Mapping 101

Texture Mapping is the process of applying materials ("textures") to an object, and adjusting the Offset, Rotation, and Tiling of the object's UVs.



UVs are how the mesh stores this data. These are basically 2D "fold-outs" of the actual 3D mesh, like the image below.



Auto vs Manual UVs

ProBuilder provides both "Automatic" and "Manual" Texturing methods:

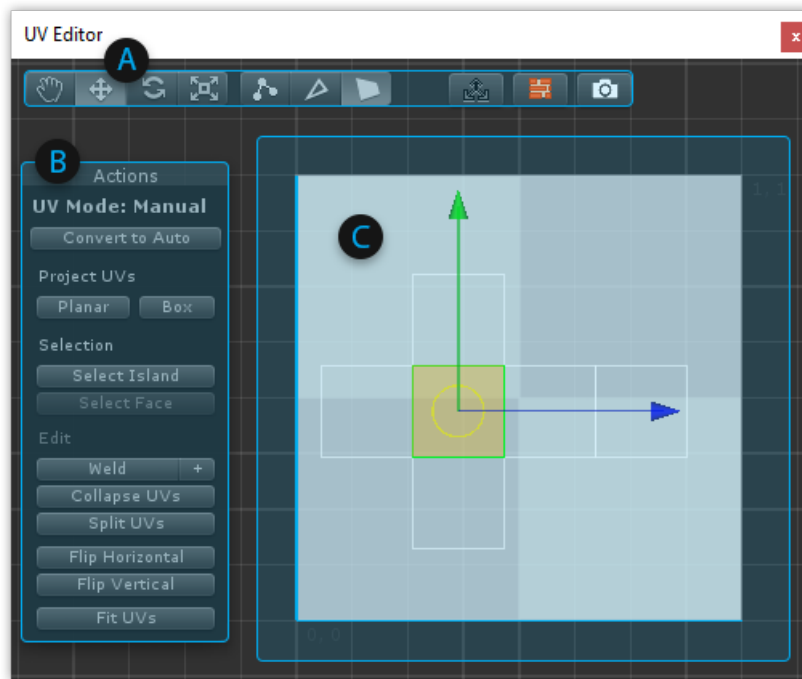
- **Auto UVs** : Use this for simple Texturing work, especially architectural or hard-surface items. Tiling, Offset, Rotation, and other controls are available, while ProBuilder automatically handles projection and updates as you work.
- **Manual UV Editing** : Use a full UV Editor to precisely unwrap and edit UVs, render UV Templates, project UVs, and more.

You can use a mix of Auto and Manual UVs, even on the same object. This is especially useful when some parts of a model need to have tiling textures, while others are unwrapped.

The UV Editor Window

Both **Auto-Texturing** and **Manual UV Editing** controls are located in UV Editor Window.

To open this window, click it's button ( or "UV Editor") in the [Main Toolbar](#).



A UV Editor Toolbar

General tools and shortcuts for working with UVs- see the [UV Editor Toolbar](#) section for details.

B Actions Panel

This is a dynamic Panel, similar to the [Main Toolbar](#)- only actions available for the selected UV Element(s) type will be shown.

For full info, see the [Auto UVs Actions](#) and [Manual UVs Actions](#) sections.

C UV Viewer

Here you can view and edit the selected object's UV Elements directly- see the [Manual UVs](#) section for full details.

UV Editor Toolbar



Select, Move, Rotate, Scale

This first group of buttons contains shortcuts to the standard Unity manipulation modes. Clicking these will have the exact same effect as clicking on the main Unity toolbar buttons.

Vertex, Edge Face



The second button group contains shortcuts to ProBuilder's [Element Editing Modes](#). When using [Manual UV Editing](#), this allows you to select and manipulate UVs by Vertex, Edge, or Face.

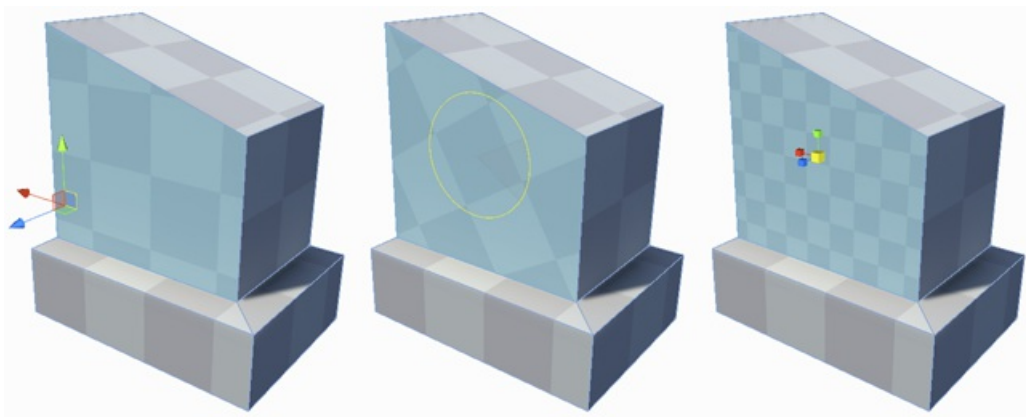
Note: When using [Auto UVs](#) you may only edit UVs by face. Editing an Edge or Vertex will convert the selected UVs to [Manual UVs](#).

In-Scene Controls

When **On**, you can use Unity's standard Move, Rotate, and Scale tools to directly manipulate UVs in the scene, without affecting geometry.

Toolbar Icon Description

-  **On**: Move, Rotate, and Scale tools will affect UVs, geometry will not be affected
-  **Off**: Move, Rotate, and Scale tools will return to normal geometry actions





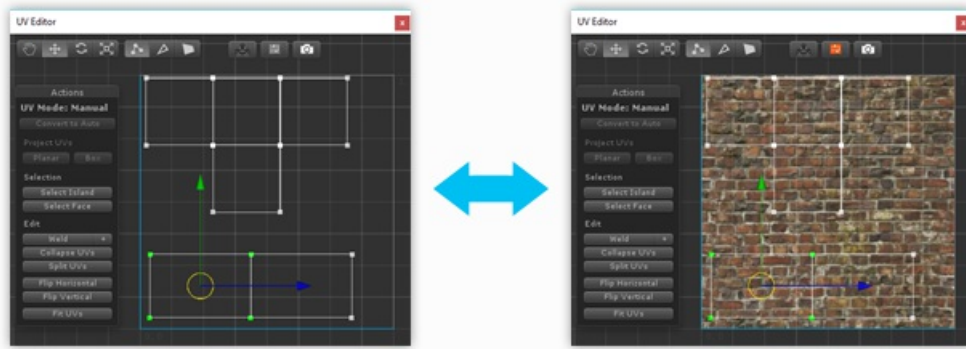
Snap to increments by holding **CTRL**. You can customize these increment values via the [ProBuilder Preferences](#)

Texture Preview

When **On**, the selected face's main texture will be displayed in the UV Viewer.

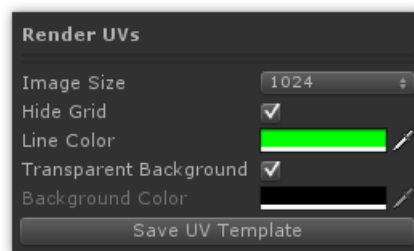
Toolbar Icon Description

-  **On**: Selected element's Texture will be displayed in the UV Viewer
-  **Off**: No texture will be displayed in the UV Viewer



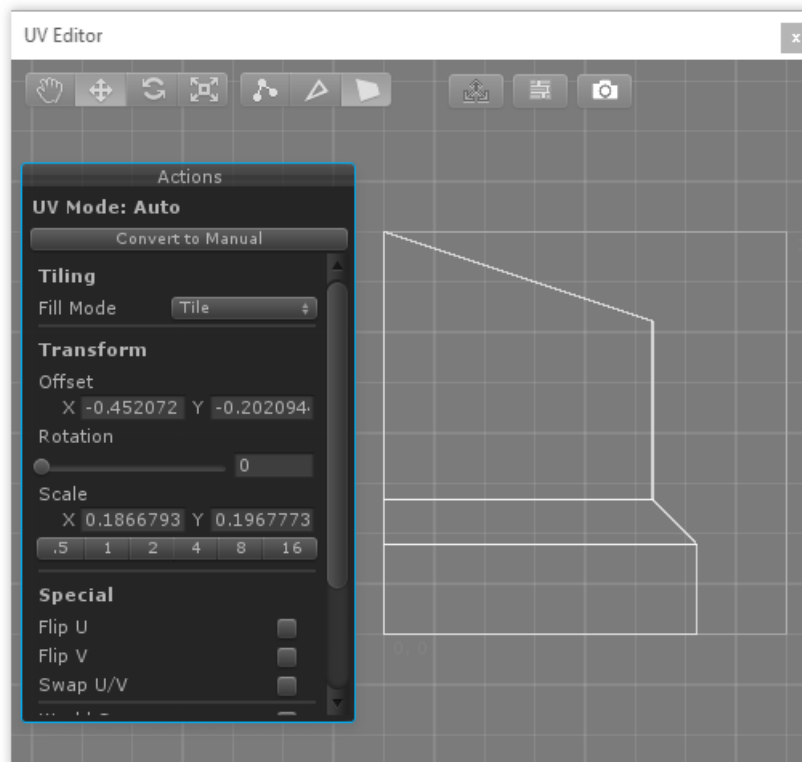
Render UV Template

Opens the Render UVs tool panel, for rendering UV Templates to be used with texture map painting, atlasing, sprite sheets, etc.



- **Image Size** : Total size of the rendered template (always square)
- **Hide Grid** : Should the grid be hidden in the render?
- **Line Color** : What color should UV lines be rendered as?
- **Transparent Background** : Should the background be rendered transparent?
- **Background Color** : If you want a non-transparent background, set the color here
- **Save UV Template** : Click to render the UV Template - a file dialog will be opened to save the file.

Auto UV Actions



Convert to Manual

Converts the selected Face(s) to using Manual UVs.

When converting from Auto UVs to Manual there will be no loss of resolution, but if you modify vertices or edges individually in Manual Mode those changes will not be transferable to Auto Mode.

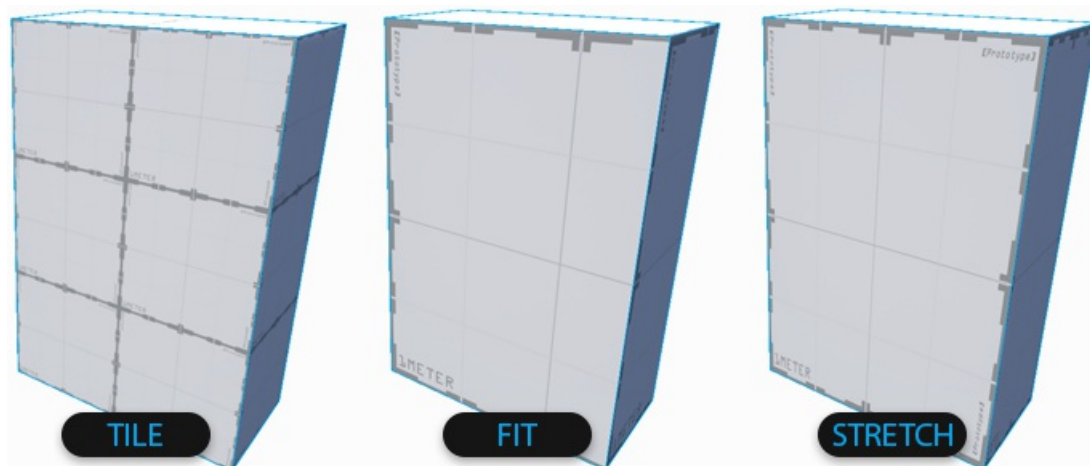
Fill Mode

Option Description

Tile Continuously tiles (repeats) the UVs across the object

Fit Uniformly scales UVs to size

Stretch Expands the selection on all sides to fill space



Offset

Enter exact offset values here, or drag the input field to adjust.

Rotation

Enter exact rotation values here, or drag the slider to adjust.

Scale

Enter exact Scale values here, or click the preset buttons.

Flip U

Flip the UVs horizontally.

Flip V

Flip the UVs vertically.

Swap U/V

Invert the horizontal and vertical UVs.

World Space

UVs are aligned to the World - this ensures textures on same-angle faces will always line up, but UVs will not stay put when moving the object.

Texture Group Number

Shows the Texture Group ID of the currently selected face, if applicable.

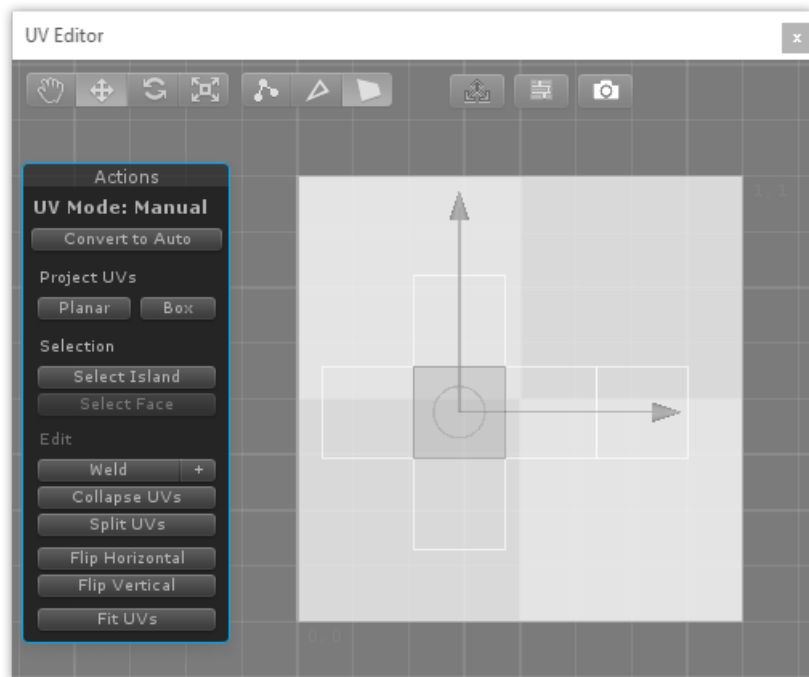
Group Selected Faces

Create a new Texture Group from the selected faces.

Select Texture Group

Select all faces in the the Texture Group.

Manual UV Actions

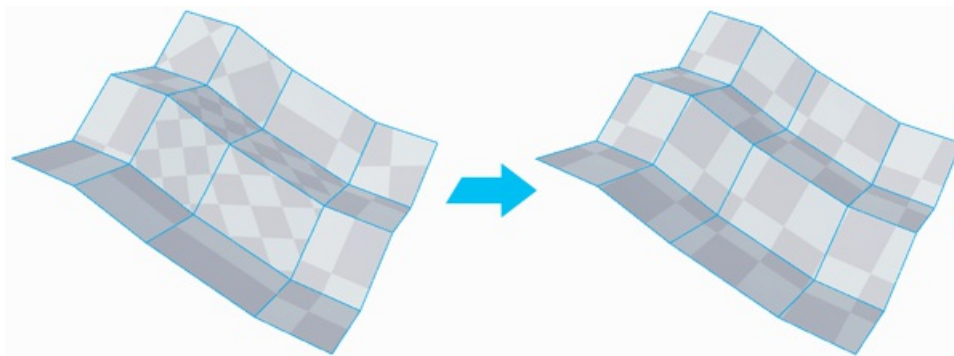


Convert to Auto

Converts all selected faces to [Auto UVs](#).

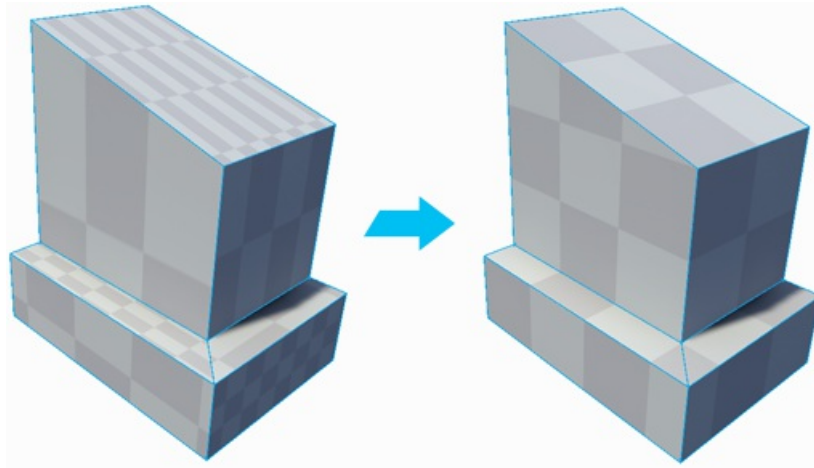
Project UVs: Planar

Unwraps the selected face(s) using a Planar Projection method.



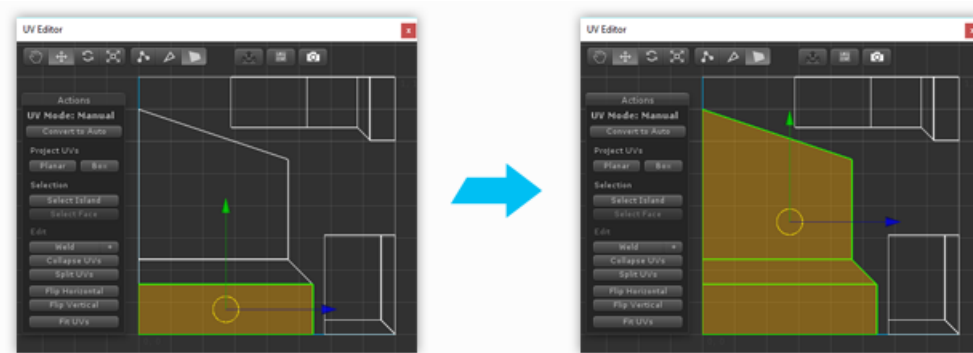
Project UVs: Box

Unwraps the selected face(s) using a Box Projection method.



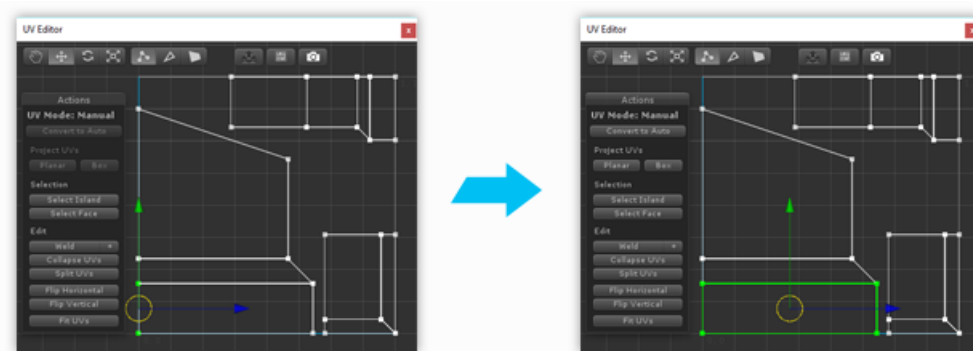
Select Island

With a UV element selected, clicking this will expand the selection to include all other connected UV elements.



Select Face

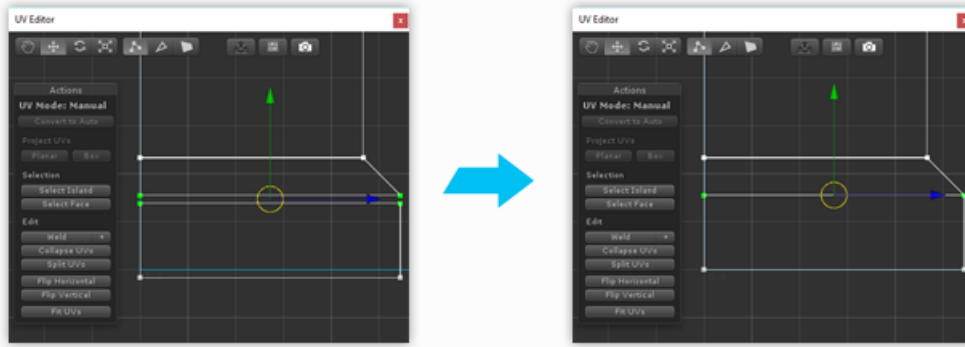
With a Vertex or Edge selected, click to select all elements on the same face.



Weld

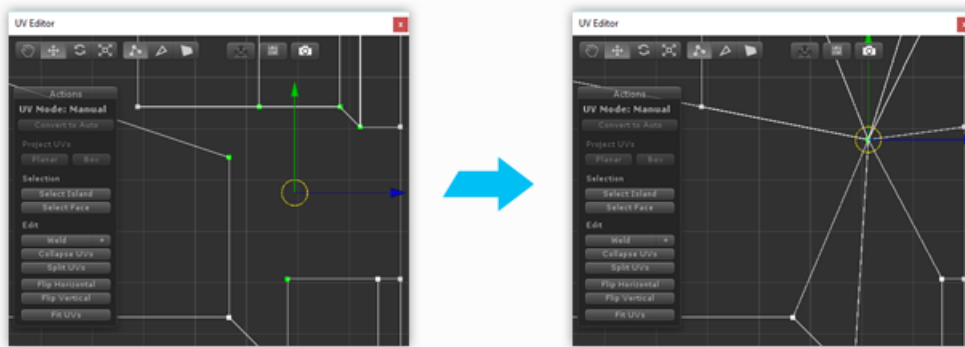
Collapses selected vertices together, but only if they are within a set distance.

To adjust the distance modifier, click the "+" button on the right side of the Weld button.



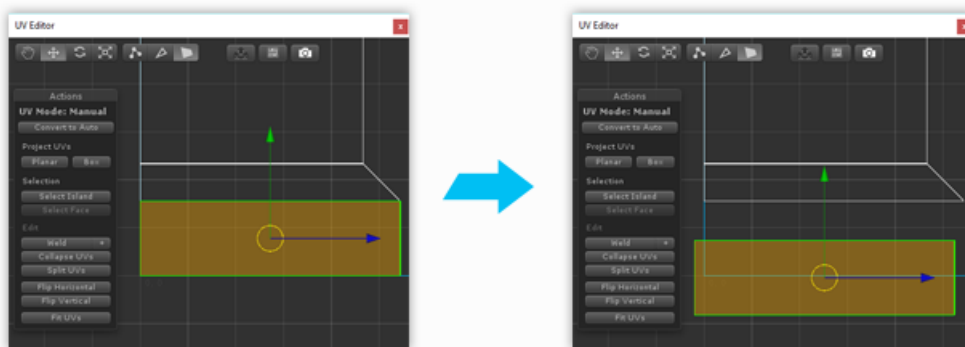
Collapse UVs

Collapses all selected vertices to a single vertex, regardless of distance.



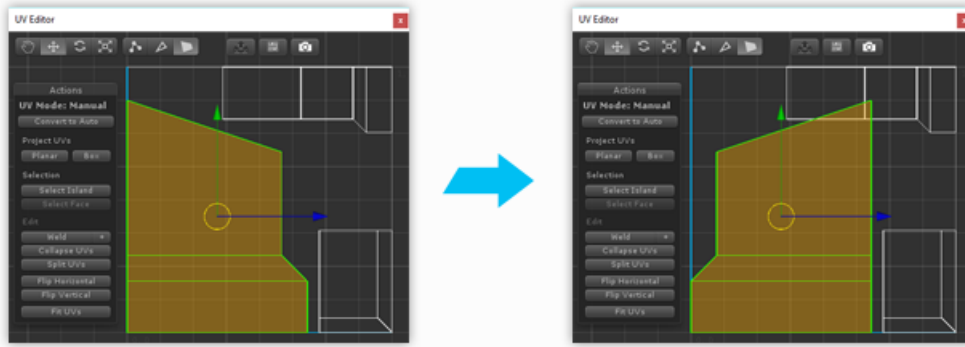
Split UVs

Breaks off the selected UV element(s) from any UV element(s), allowing them to be manipulated independently.



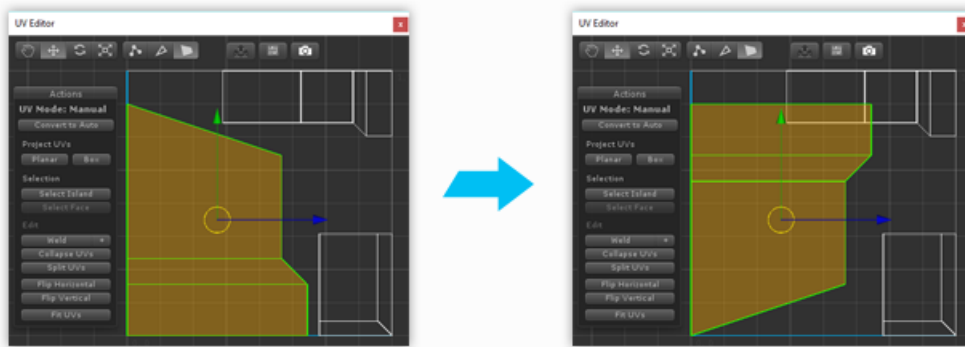
Flip Horizontal

Flip the selected UV element(s) in the horizontal direction.



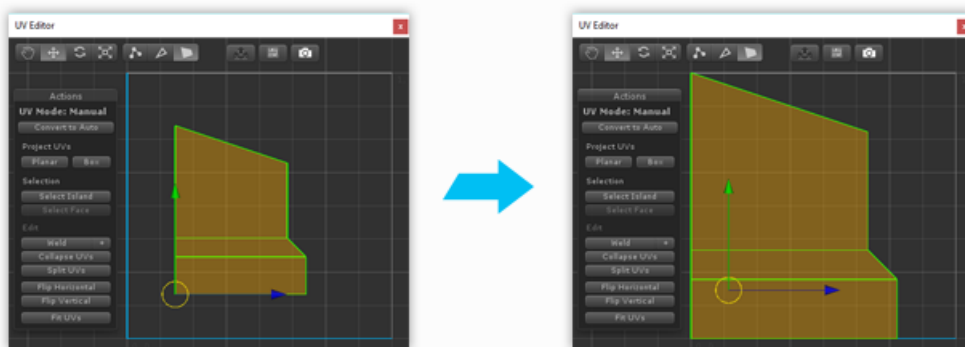
Flip Vertical

Flip the selected UV element(s) in the vertical direction.



Fit

Scale and move the selected UV element(s) to fit exactly within the UV space.



Continue UVs

Control + Click to align an adjacent face UV coordinates to the current selection.

To use:

- Open the UV Editor
- Select a face in the Scene View
- **Control + Click** a face that shares an edge with the current selection

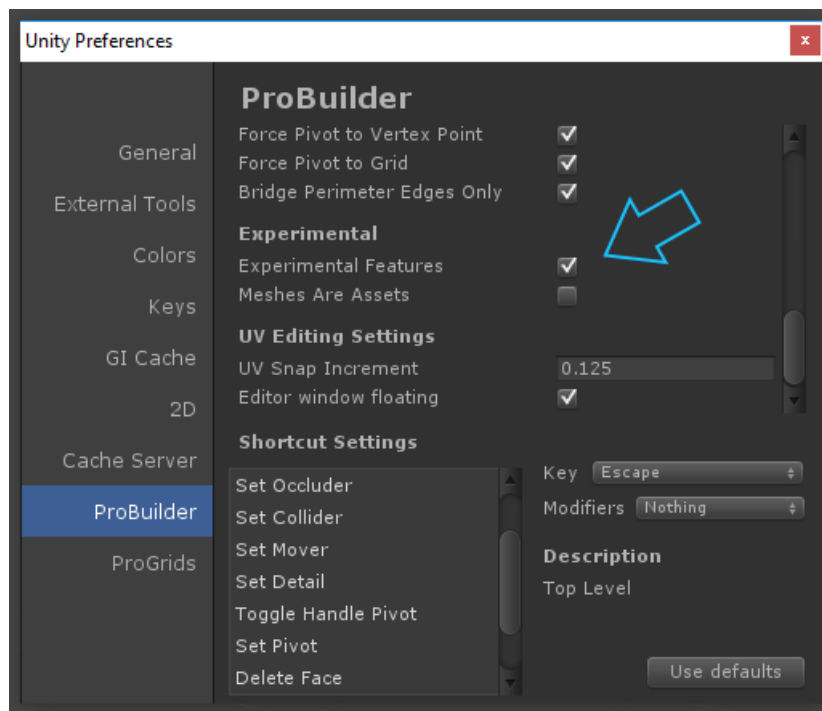
Overview

ProBuilder has some additional features that are considered "experimental."

These are features that are either close to being complete, or complete with some caveats.

By default **Experimental Features** are disabled. To enable experimental features:

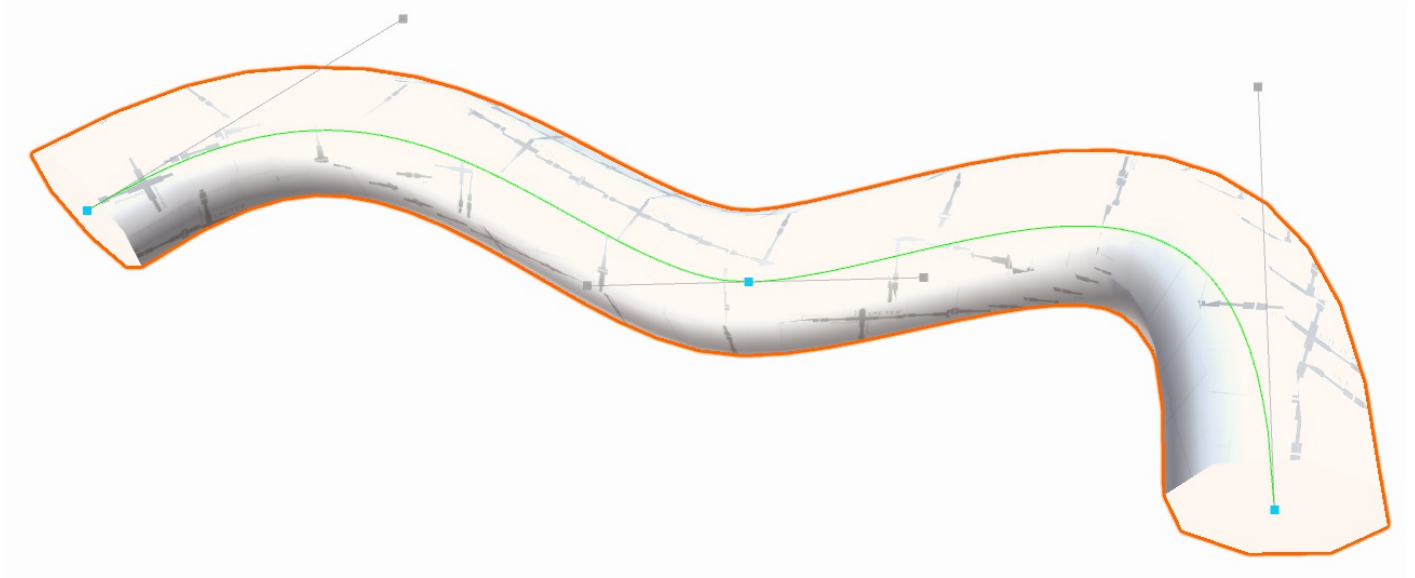
- Open Unity Preferences ([Edit / Preferences](#) on Windows, [Unity / Preferences](#) Mac)
- Under the **Experimental** header, enable **Experimental Features**



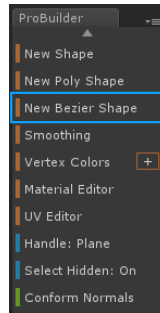
Bezier Shape

Bezier Shape

Section Video: [Creating and Editing Bezier Shapes](#)



Quick Start

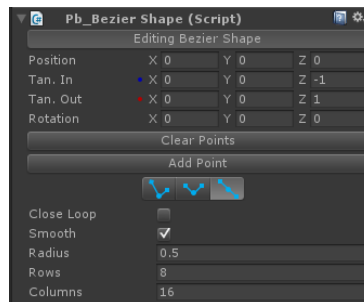


- In the [ProBuilder Toolbar](#) select **New Bezier Shape**.
- Move control & tangent points by dragging.
- For precise controls, click a control point to select it (selected control points have a translate and rotation handle).
- To add a point click on the bezier path line.
- To remove a point, select it and press **Backspace** (**Delete** on Mac).
- To finish editing, click the "Editing Bezier Shape" button.
- To re-enter editing, click the "Edit Bezier Shape" button.

Important!

Modifying bezier control points or settings will clear any mesh edits.

Bezier Shape Inspector



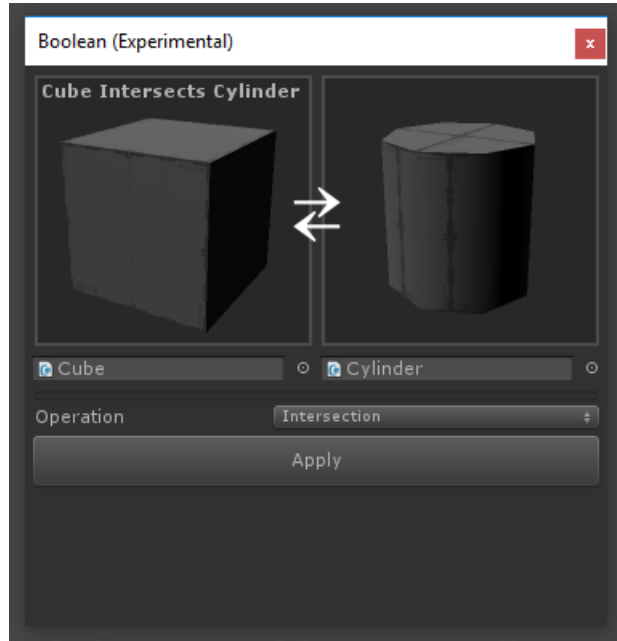
Inspector	Description
Edit Bezier Shape	Toggle in and out of shape editing mode.
Position	The local position of the selected control point.
Tan. In	The local position of the selected control tangent in handle.
Tan. Out	The local position of the selected control tangent out handle.
Rotation	An additional rotation to be applied to the vertices of the extruded tube.
Tangent Mode	Allows you to modify how interacting with tangent handles works.

Icon	Tangent Mode	Description
	Close Points	Close all control points on this mesh.
	Add Point	Add a new control point at the end of the bezier path.
	Close Loop	Should the extruded path loop back around to the start point.
	Smooth	Determines if the extruded pipe faces have hard or soft normals.
	Radius	The radius of the extruded pipe.
	Rows	How many segments to insert between control points when extruding the pipe.
	Columns	How many vertices make up the ring around the radius of the pipe.

Tangent Modes

Icon	Tangent Mode	Description
<input type="checkbox"/>	Free	Adjusting one tangent does not affect the other.
<input type="checkbox"/>	Aligned	Adjusting a tangent will set the other tangent to match it's magnitude.
<input type="checkbox"/>	Mirrored	Tangent handles are locked in a straight line.

Boolean Ops

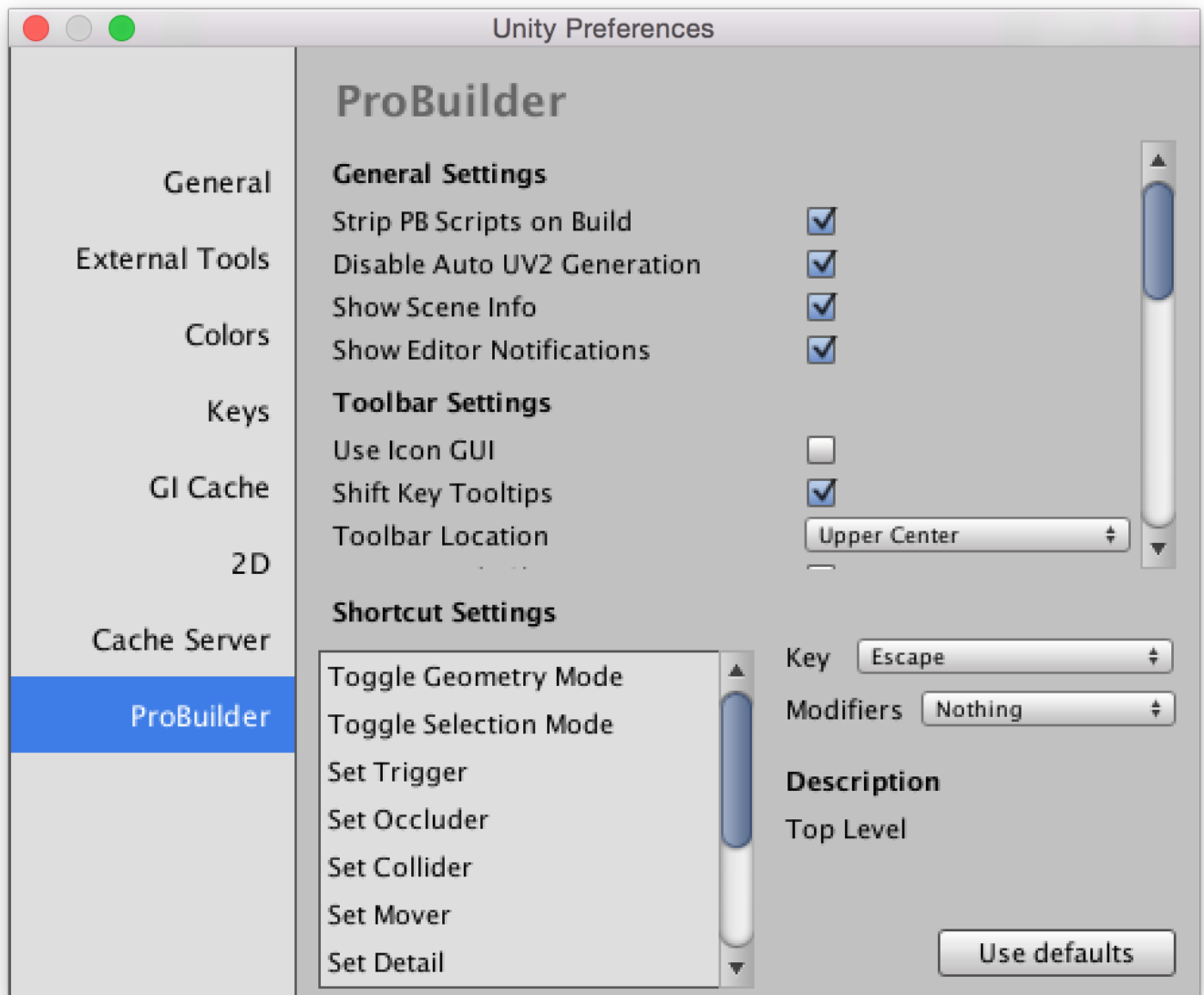


The Boolean Tool provides an interface for creating new meshes from boolean operations.

Each function (Union, Subtract, Intersect) accepts 2 gameObjects: the left and right side. A new mesh is created.

Preferences

ProBuilder contains many settings that can be customized to suit your needs.



General Settings

Strip PB Scripts on Build

If enabled ProBuilder will automatically remove the extra data ProBuilder stores in a scene. This includes all ProBuilder scripts, so if you are making use of the runtime API you will need to disable this feature.

Disable Auto UV2 Generation

Generating a UV2 channel for meshes is necessary for lighting, but can be a time consuming operation. If you are editing objects with large vertex counts it is beneficial to skip generating the UV2 channel after every geometry edit and do it manually (using the [Generate UV2](#) toolbar item).

Show Scene Info

Show or hide the mesh information overlay in the top left of the Scene View.

Show Editor Notifications

This preference enables or disables notification popups when performing actions.

Toolbar Settings

Use Icon GUI

Toggles the toolbar between using Icons or Text.

Shift Key Tooltips

If enabled the ProBuilder toolbar will only show tooltips when the mouse is hovering an item and the **Shift** key is held.

By default tooltips are shown when the mouse hovers an action for more than a second.

Toolbar Location

Controls where the [Element Mode Toolbar](#) is shown in the Scene View.

Unique Mode Shortcuts

If Unique Mode Shortcuts is enabled ProBuilder assigns the **G, H, J, K** keys to **Object**, **Vertex**, **Edge**, and **Face** modes respectively. You can change which keys are mapped to these actions in the Shortcut Settings section.

By default ProBuilder assigns the **G** key to toggle between **Object** mode and **Vertex/Edge/Face** modes. **H** toggles between the different element modes **Vertex/Edge/Face**.

*More Info on Modes: [Object and Element Modes](#);

Open in Dockable Window

If enabled the ProBuilder toolbar will be opened as a dockable window. If disabled the window will be floating and always on top.

Resource Defaults

Default Material

What material new shapes will be instantiated with.

Default Entity

What [Entity Type](#) new shapes will be instantiated as.

Default Collider

The type of collider new shapes will be instantiated with.

Force Convex Mesh Collider

If the default collider is **Mesh Collider**, this setting controls the **Is Convex** setting of the collider.

Miscellaneous Settings

Limit Drag Check to Selection

When enabled ProBuilder will restrict drag selection of elements to the current selection. If disabled drag selecting in a scene will test every ProBuilder object, which may be slow in larger scenes.

Only PBO are Selectable

If enabled while ProBuilder is open only ProBuilder created GameObjects may be selected.

Close Shape Window After Building

If enabled the [Shape Tool](#) will automatically close itself after a new object is created.

Dimension Overlay Lines

Hide or show the bounding lines in the Dimensions Overlay.

Geometry Editing Settings

Precise Element Selection

This controls how close to an element the cursor must be to register for selection. By default this is disabled, meaning that vertex and edge selection are very forgiving when clicking.

If enabled, the selectable area for vertices and edges is smaller, but you may also select faces by clicking outside of vertices.

Colors

ProBuilder allows users to set the colors for element selections.

Vertex Handle Size

Determines how large vertex points are rendered in the scene. This setting does not affect selection.

Force Pivot to Vertex Point

When instantiating new shapes ProBuilder will guarantee that the pivot point of the object coincides with a vertex position.

Force Pivot to Grid

When instantiating a new object ProBuilder will snap the object to the nearest grid point (as determined by ProGrids).

Bridge Perimeter Edges Only

When enabled ProBuilder will not allow users to bridge closed edges. Disable to remove this restriction.

Experimental

Warning! Enabling experimental features may break your project! Please exercise caution.

Meshes Are Assets

ProBuilder will store mesh information in the Project instead of per-scene.

UV Editing Settings

UV Snap Increment

Set the snap increment in the UV Editor window.

Editor Window Floating

Make the UV Editor window floating or dock-able.

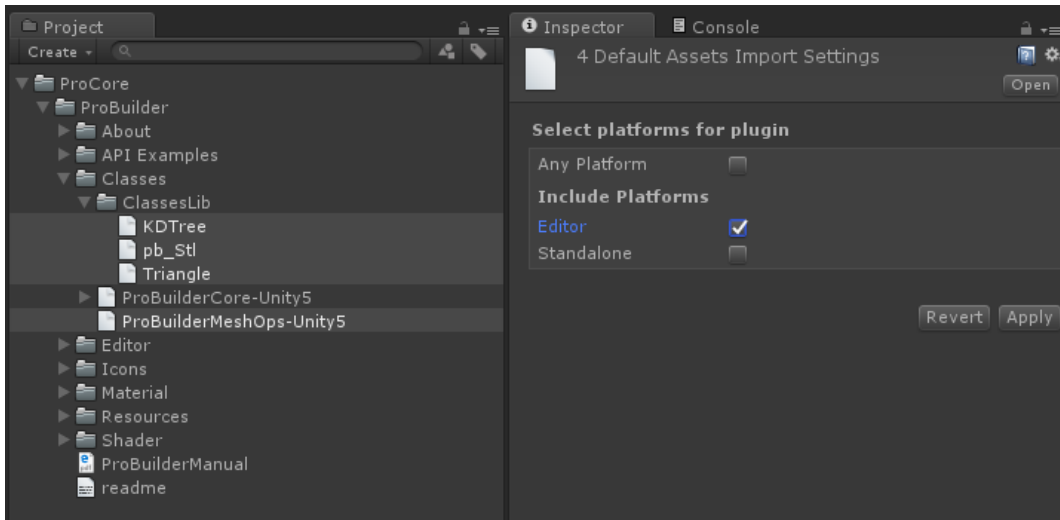
Troubleshooting

Error building Player (Windows Store, iOS, Android, WebGL)

Usually seen with console errors:

- **Error building Player: UnityException: Failed to run serialization weaver with command**
- **Reference Rewriter found some errors with command**

To get things compiling again, you need to mark the ProBuilder Mesh Operations DLLs as Editor only.

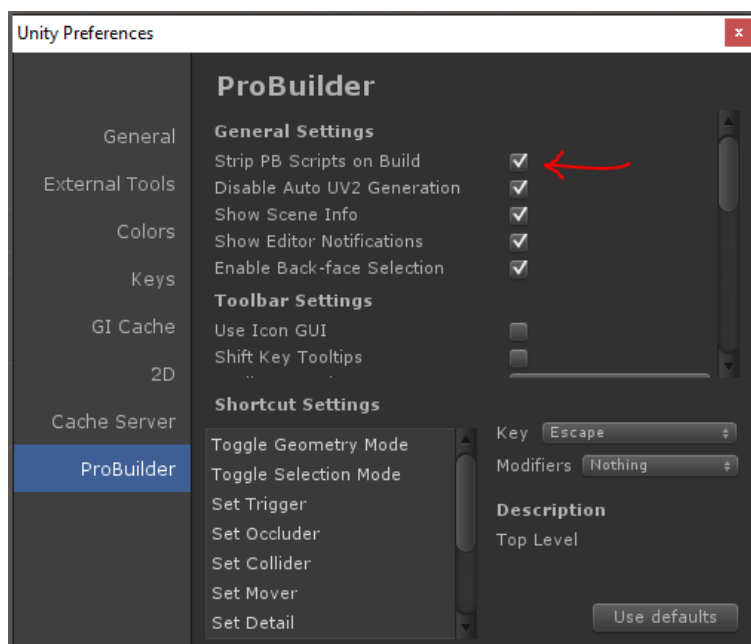


The caveat is that this means you won't be able to access any of the ProBuilder mesh operations API at runtime.

If this step does not address the build issues, it may be necessary to strip ProBuilder scripts entirely before compile. Fortunately this is also trivial:

Steps to Strip ProBuilder Scripts at Build Time

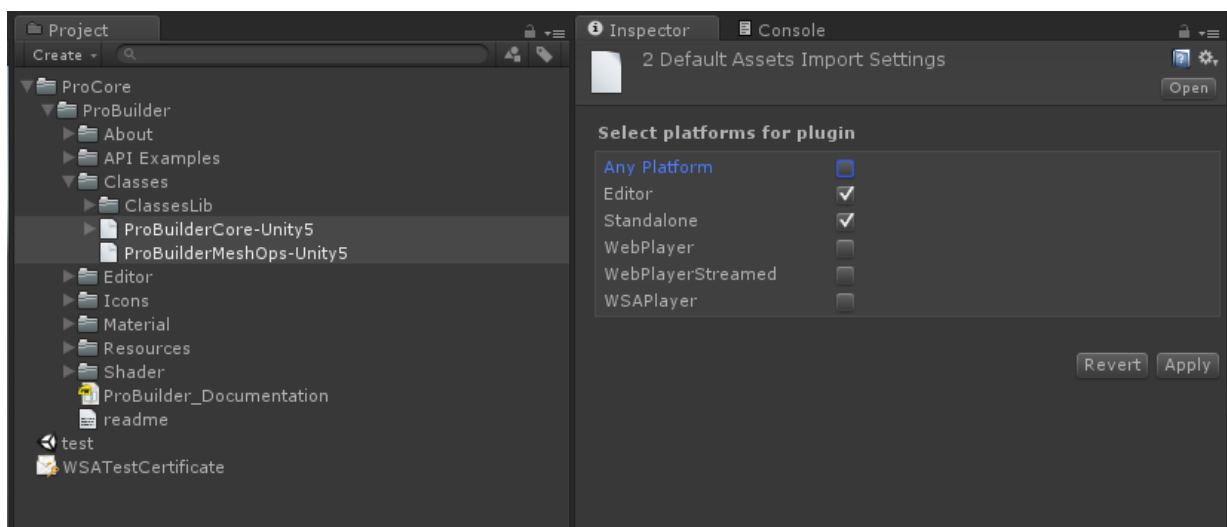
1. First make sure that **Strip PB Scripts on Build** is checked in the Preferences/ProBuilder panel.



2. Next, locate **ProBuilderCore-Unity5.dll** and **ProBuilderMeshOps-Unity5.dll** in your project.



- With both **ProBuilderCore-Unity5** and **ProBuilderMeshOps-Unity5** selected, in the Inspector window un-check "Any Platform." Then toggle both "Editor" and "Standalone."



If you're using ProBuilder 2.5 or lower, some errors will appear when scripts reload. Open the following files (in ProBuilder/API Examples):

- `IcoBumpin.cs`
- `HueCube.cs`
- `RuntimeEdit.cs`

In each of these files, place this line at the very beginning:

```
#if UNITY_EDITOR || UNITY_STANDALONE
```

and this line at the very end:

```
#endif
```

For example, here's what `RuntimeEdit.cs` looks like:

```
#if UNITY_STANDALONE || UNITY_EDITOR
using UnityEngine;
using System.Collections;
using ProBuilder2.Common;

namespace ProBuilder2.Examples
{
```

```
/**
 * \brief This class allows the user to select a single face at a time and move it forwards or backwards.
 * More advanced usage of the ProBuilder API should make use of the pb_Object->SelectedFaces list to keep
 * track of the selected faces.
 */
public class RuntimeEdit : MonoBehaviour
{
    // ... etc
}
}
#endif
```

Now compile your project and run!

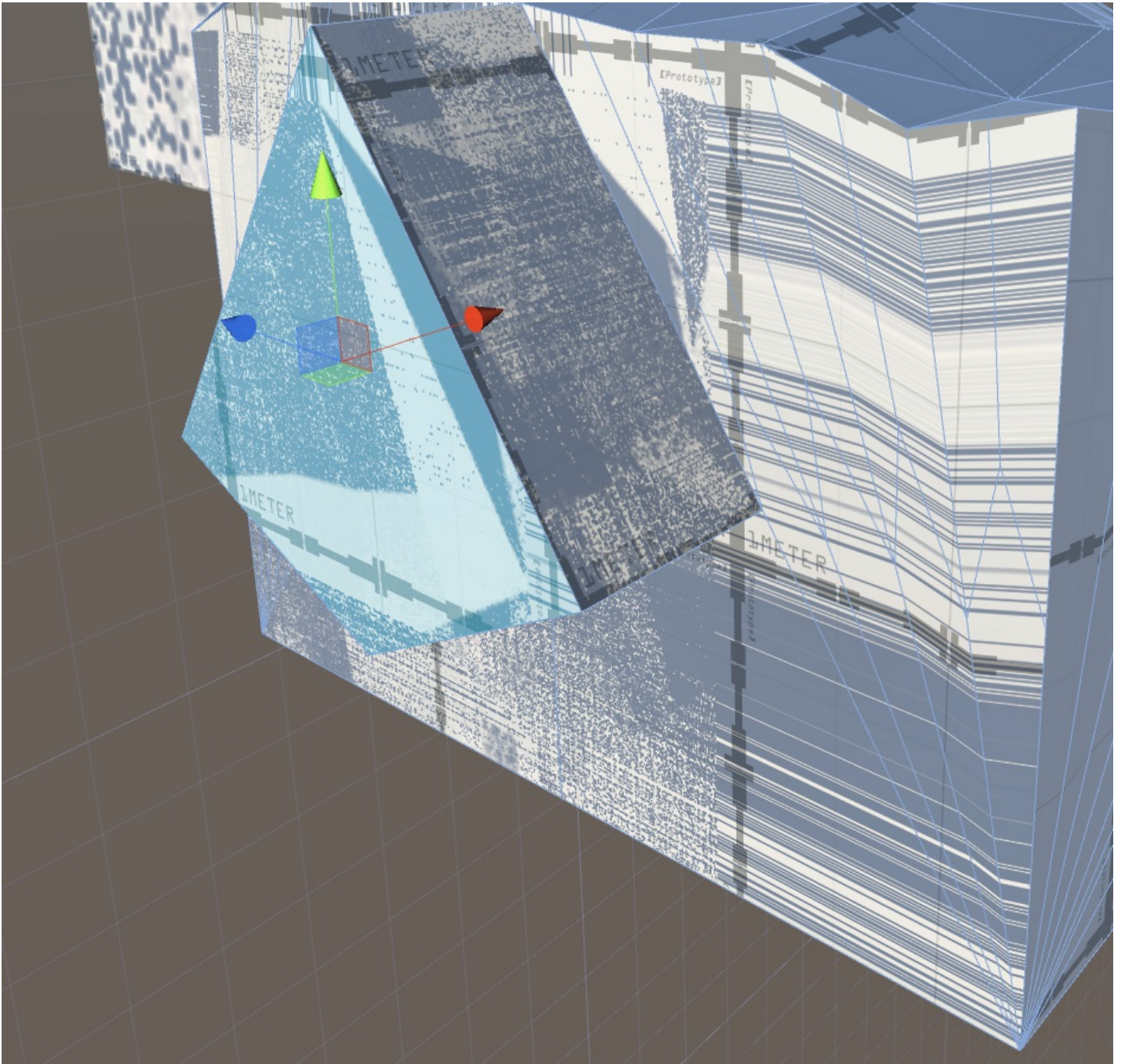
Missing Icons

If you upgraded ProBuilder and are now missing icons in the toolbar, first try restarting Unity.

If that does not work,

1. Delete this folder: [ProCore/ProBuilder/Resources/GUI](#)
2. Re-import ProBuilder from Asset Store / ProCore Downloads

Spotty Textures on Lightmapped Objects



The object does not have a UV2 channel built.

- Select the affected objects
- Click **Generate UV2** in the ProBuilder Toolbar

FbxPrefab could not be found. Are you missing an assembly reference?

```
Assets/ProCore/ProBuilder/Editor/Addons/pb_Fbx.cs(62,35): error CS0246: The type or namespace name `FbxPrefab' could not be found. Are you missing an assembly reference?
```

This error may occur if you have imported the **FbxExporters** Unity package, then later removed it. To fix this error, you can either:

- Re-import the **FbxExporter** package
- Open **Edit > Project Settings > Player** and in the **Scripting Define Symbols** field delete **PROBUILDER_FBX_ENABLED**.

Third-Party Licenses

Third-party code and licenses used in ProBuilder.

Where applicable links to ports & forks are also listed (original project is always listed first).

Poly2Tri

- <https://github.com/greenm01/poly2tri>
- <https://github.com/MaulingMonkey/poly2tri-cs>
- <https://github.com/procore3d/poly2tri-cs>

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csg.js

- <https://github.com/evanw/csg.js>
- https://github.com/karl-pb_CSG

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KdTree

- <https://github.com/codeandcats/KdTree>
- <https://github.com/procore3d/KdTree>

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Cinder

- <https://github.com/chrisimpkins/cinder>
- <https://github.com/procore3d/cinder>

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pb_Stl

- https://github.com/karl-/pb_Stl

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