# 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 Advanced vs. ProBuilder Basic

**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

> ## Important!
>
> This documentation encompasses *all* features, actions, and tools available in both ProBuilder Basic and Advanced. If you are using ProBuilder Basic, please view the full Advanced vs Basic Comparision.

## Optional: Register for access to Source Files and Online Downloads

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!*

## Helpful Links and Info

- ProCore3D Website
- Email
- Facebook
- Twitter
- Online Documentation
- Tutorial Videos
- Support and Troubleshooting

**Video Tutorials:** Take a short break to watch the video tutorials before using ProBuilder. You'll be an expert in no time!

# Fundamentals

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.

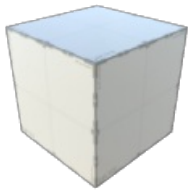
Each Toolbar button will display detailed information about it's use, options, and keyboard shortcuts when hovered over. Viewing tooltips is a great way to start learning about ProBuilder's functionality.

*More Info:* ***ProBuilder Toolbar***

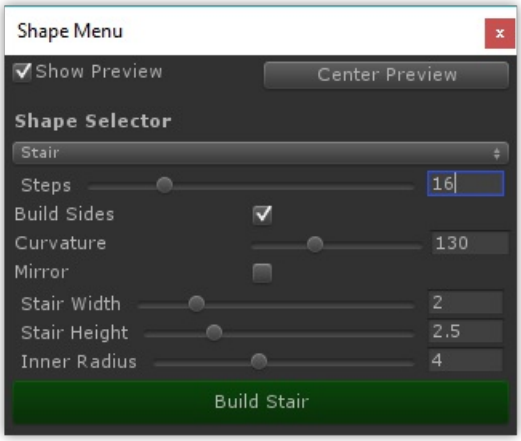
---

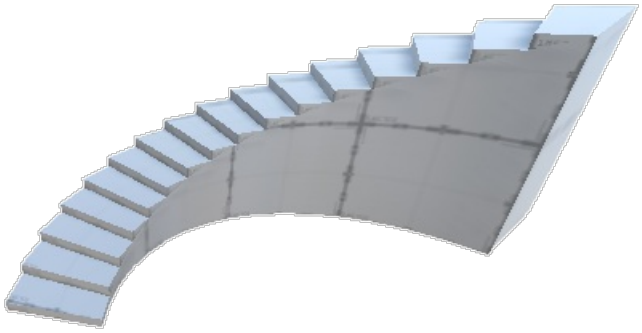
## Creating a New Mesh

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.



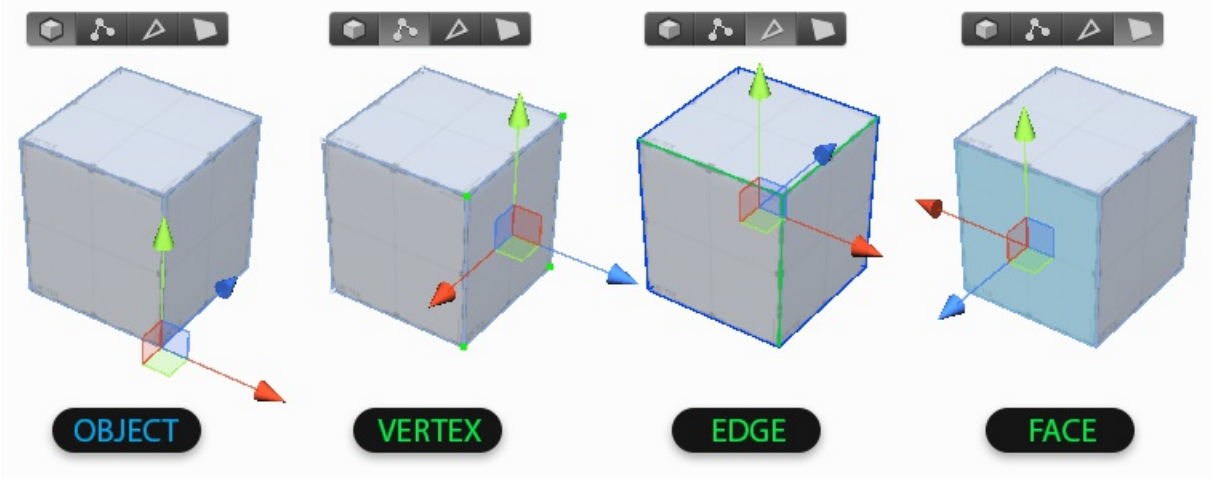



*More Info:* ***Shape Tool***

---

## Editing Meshes

### 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).

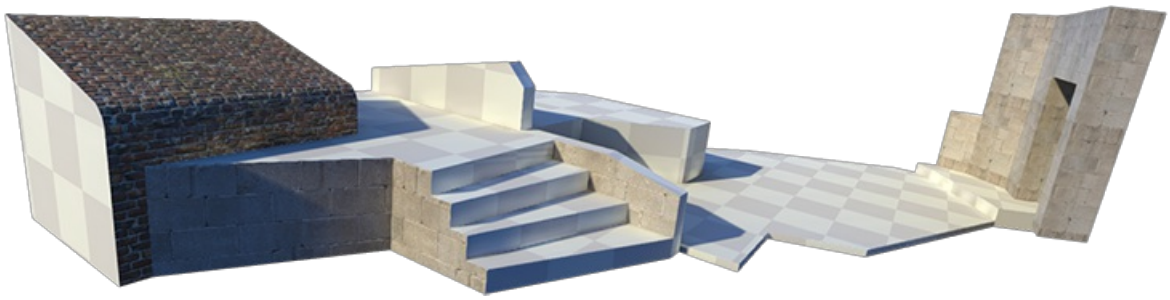
## Building and Editing Complex Meshes

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.

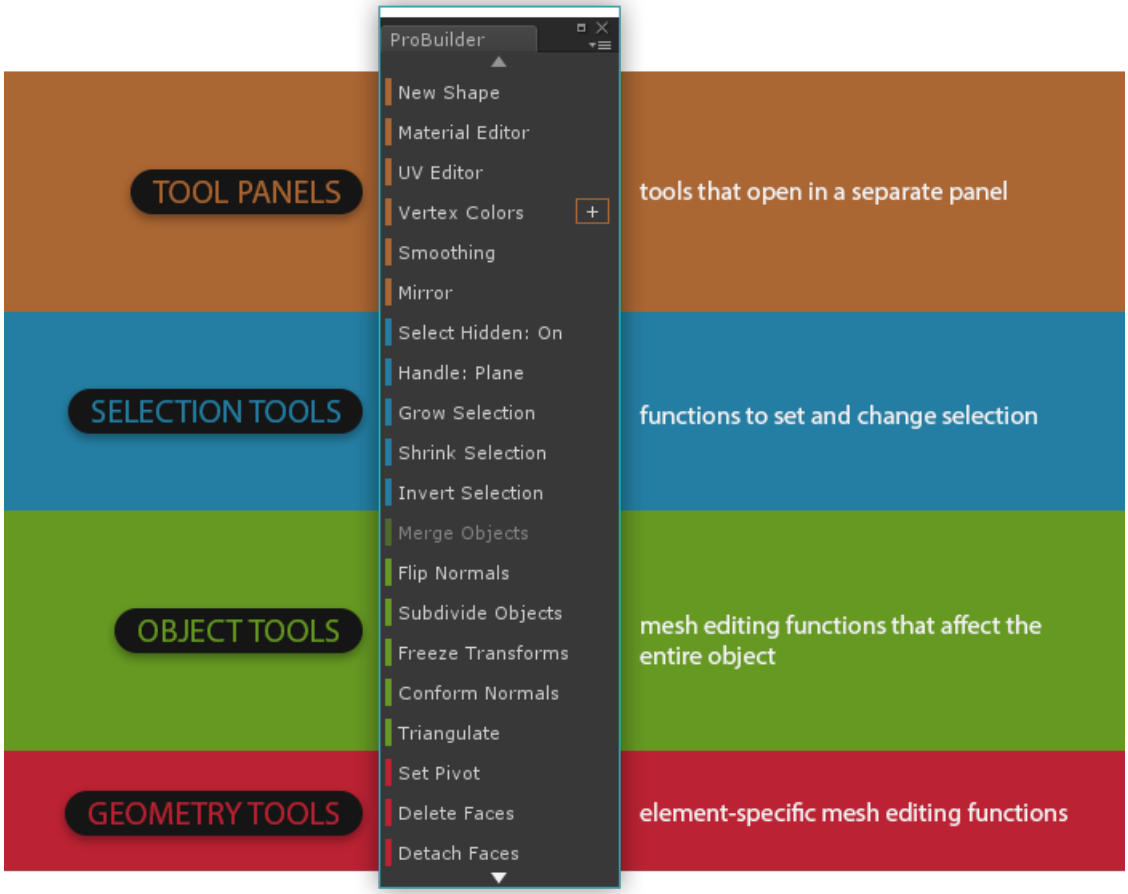
A second toolbar, the **Edit Mode Toolbar**, is available to quickly switch between editing modes. This toolbar can always be found floating at the top-middle of your currently active scene view.

---

## 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)

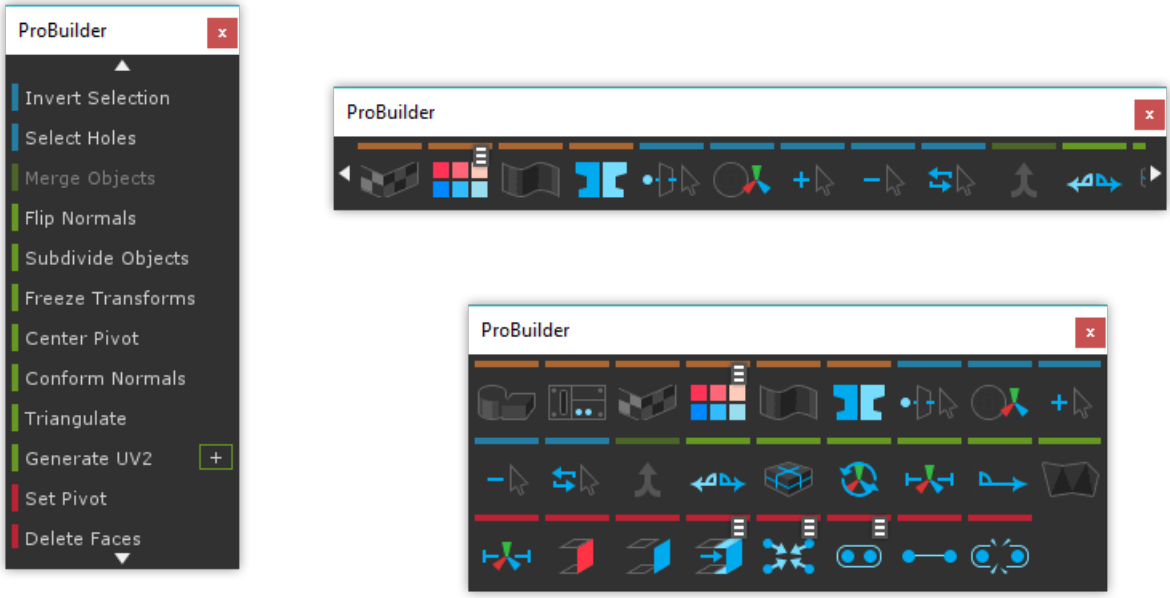



---

## 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.

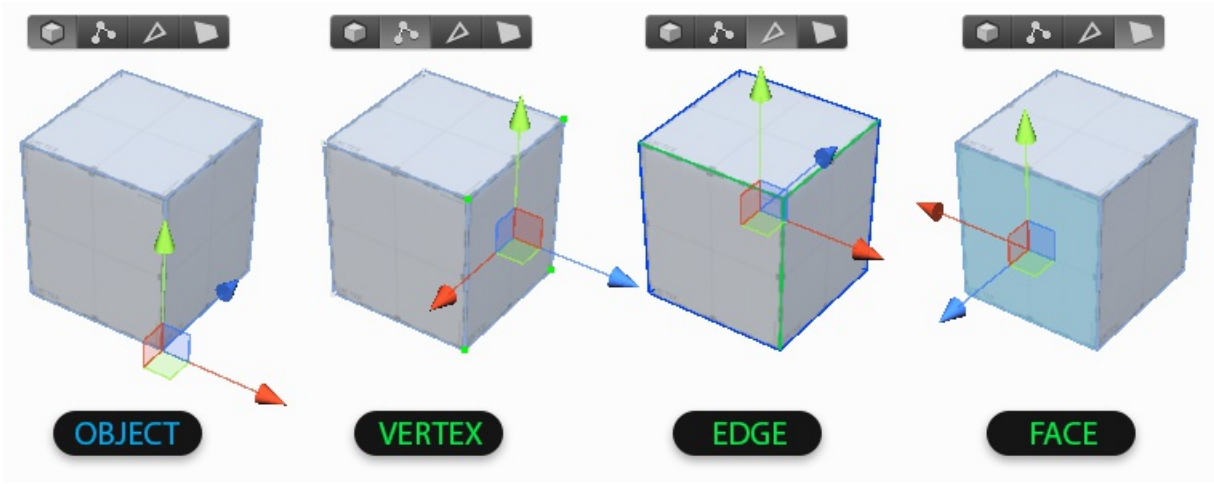
## Edit Mode Toolbar

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.

---

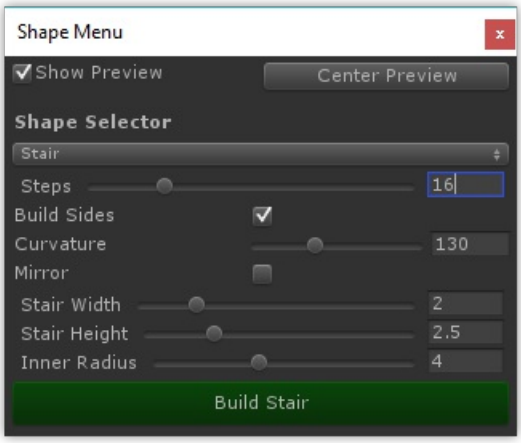
---

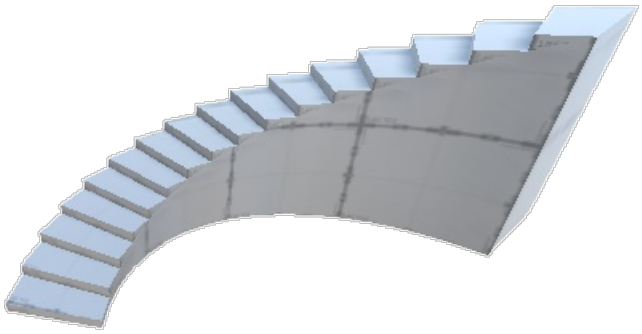
## Shape Tool

**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.



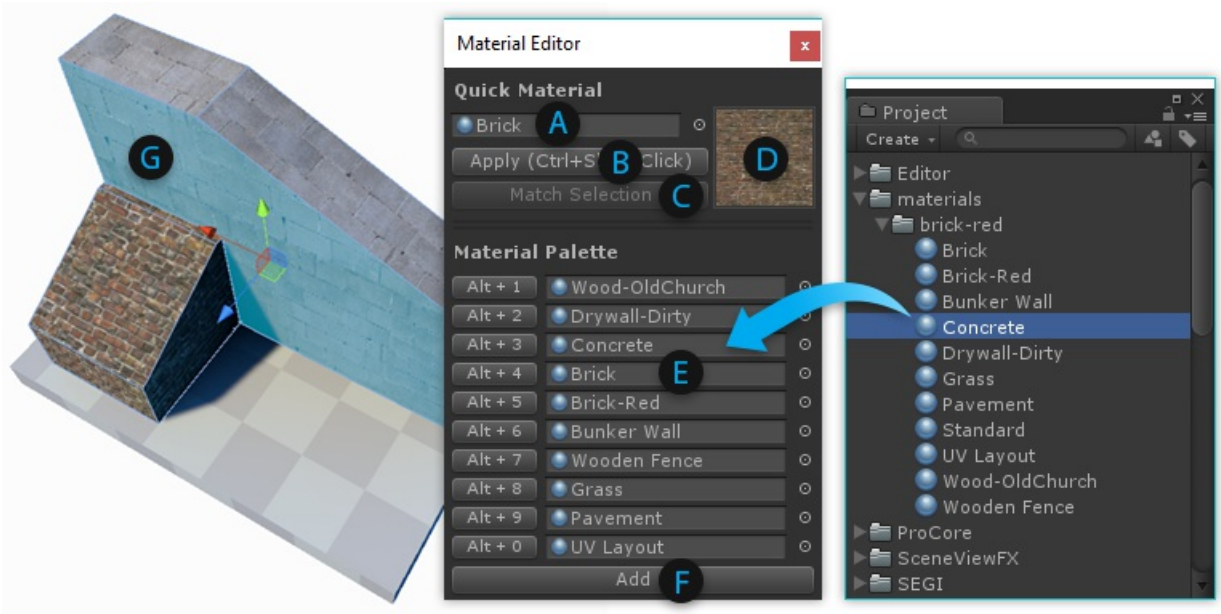
**Usage** : To create a new shape, do the following:

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** :

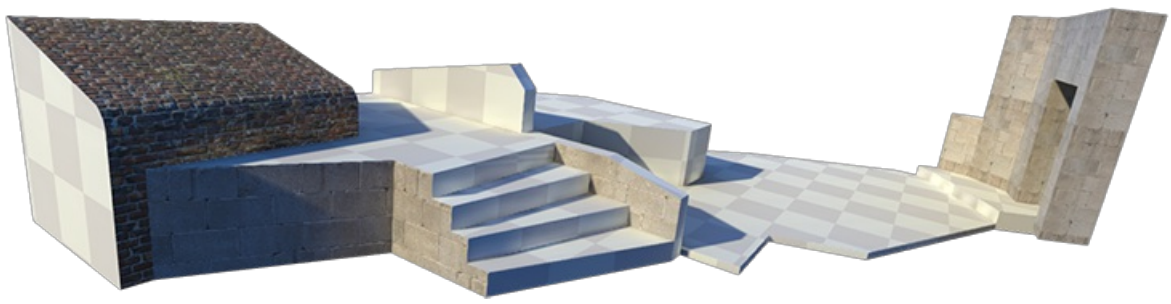
- **(E)** Drag-and-drop your often-used materials to these slots
- **(F)** Create additional Material Palette slots

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.

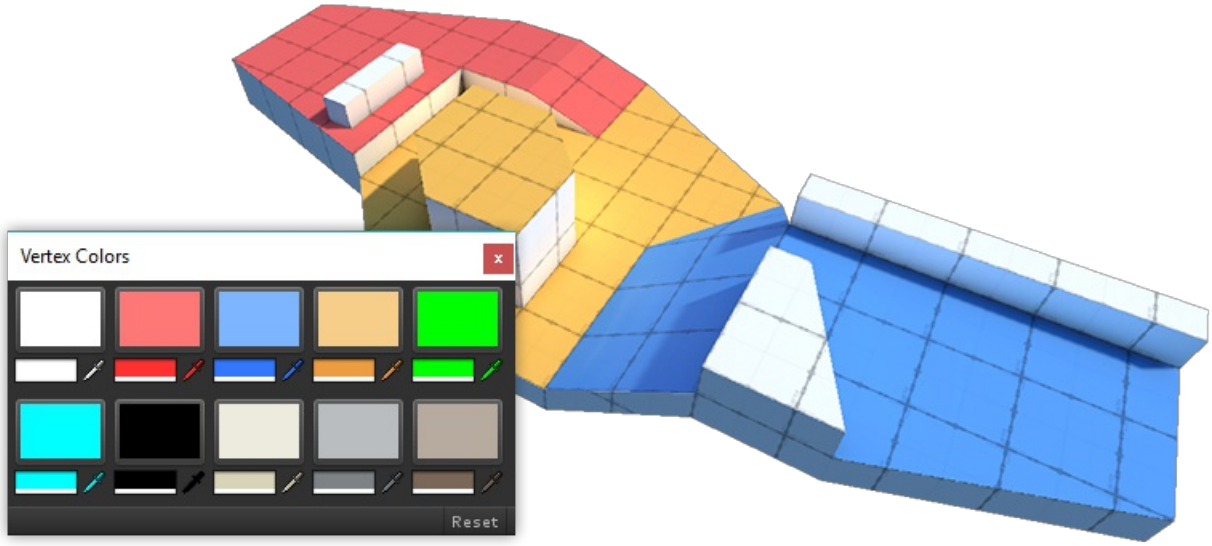
*More Info:* ***Texturing and UVs***

---

# 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.



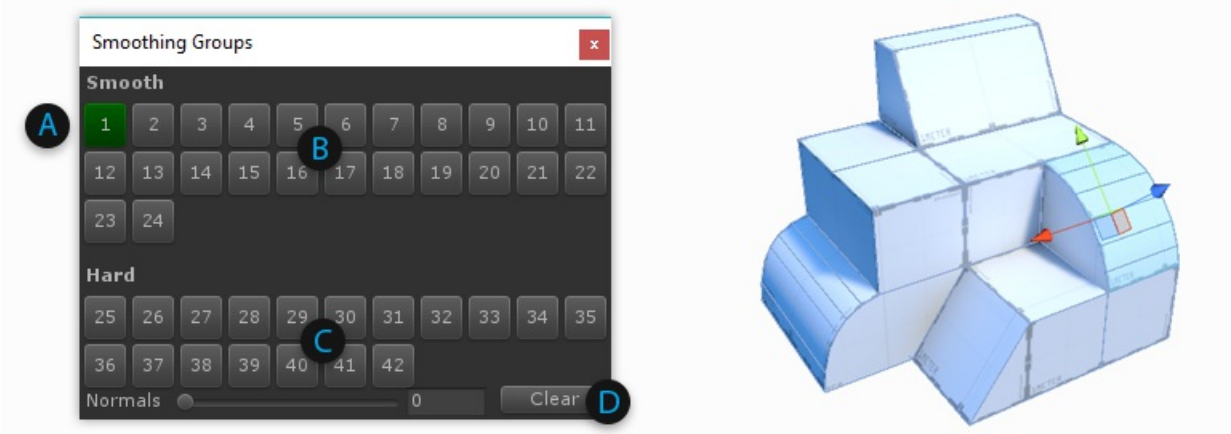

Applying Vertex Colors is a great way to colorize levels for prototyping, team layout, zones, etc.

---

# Smoothing Groups

**Purpose**: Create a smooth and rounded look, or sharp-edged and faceted.

**Usage**:

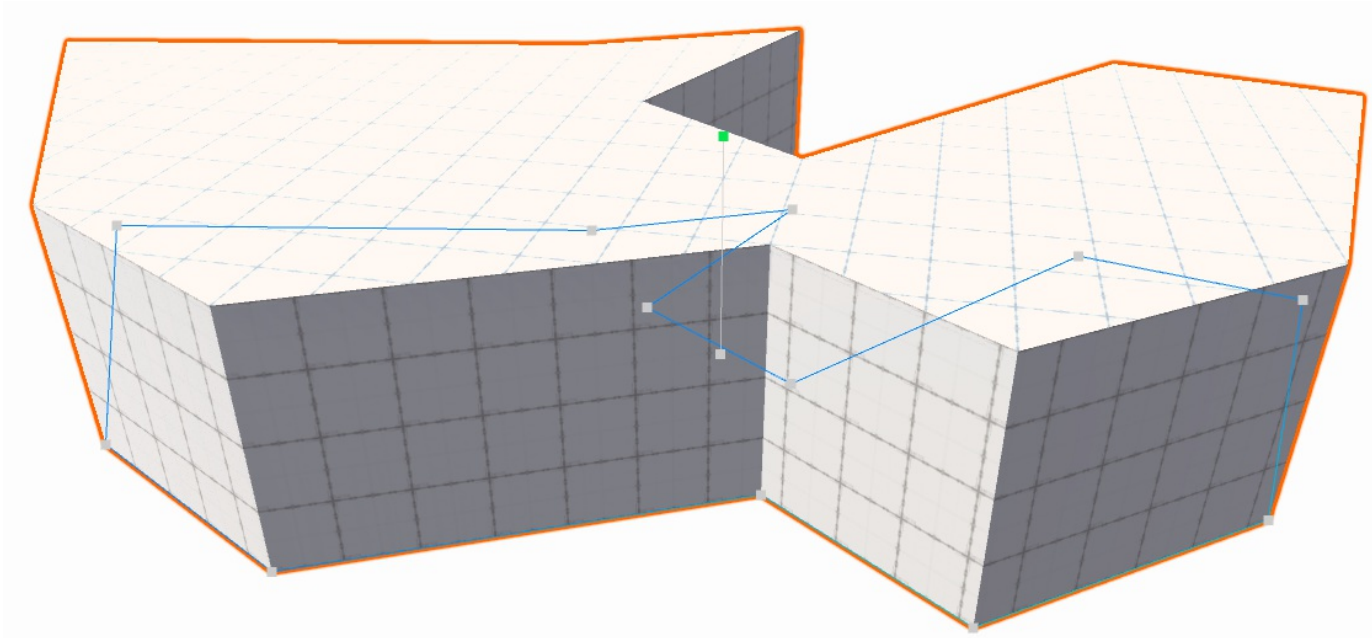



- Choose Face editing from the Edit Mode Toolbar
- Select a group of faces that you want to be smooth
    - *If no faces are selected, or you are in Object Mode, any Smoothing actions will be applied to the entire object*
- **(A)** If any selected faces already have Smoothing Groups assigned, they will be highlighted. Clicking on a highlighted group will un-assign it.
- **(B)** To assign the selected faces to a new Smoothing Group, click any available group button
- **(C)** You can also assign Hard groups
- **(D)** Press the "Clear" button to clear all Smoothing from the selected faces

# Poly Shape

## Poly Shape

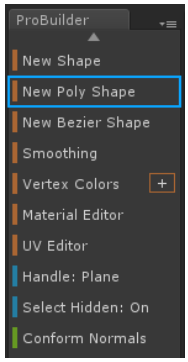
> Section Video: Creating and Editing a Poly Shape



**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 it's control points and other settings.

> **Important!**
> Modifying control points or settings will clear any mesh edits.

## Quick Start



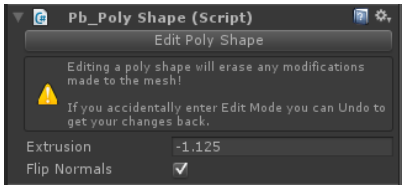

- In the ProBuilder Toolbar select **New Poly Shape**.
- In the Scene View click to add control points. These will form the outer bounds of your mesh.
- Once finished placing points, hit Enter / Return or Space to finalize the shape.
- Move the mouse up and down to set the mesh height, then Left Click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

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

## Editing a Poly Shape

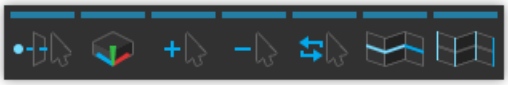
Even after the initial creation steps a **Poly Shape** can still be modified.

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

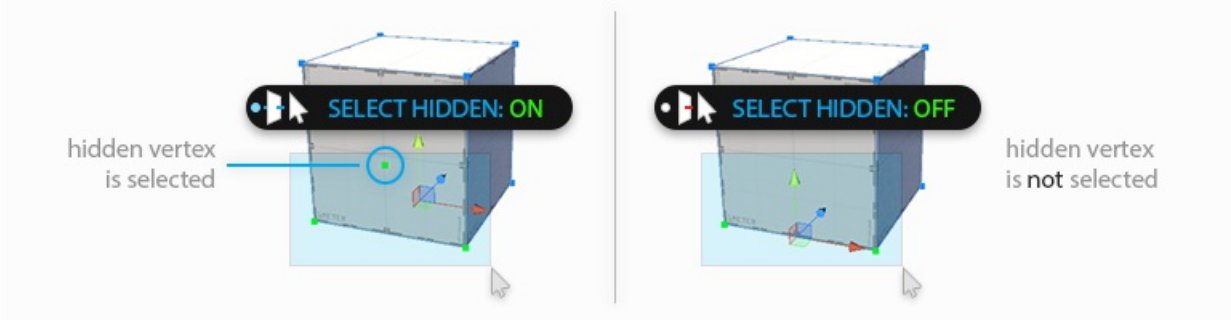
> Section Video: Selection Tools: Select Hidden

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

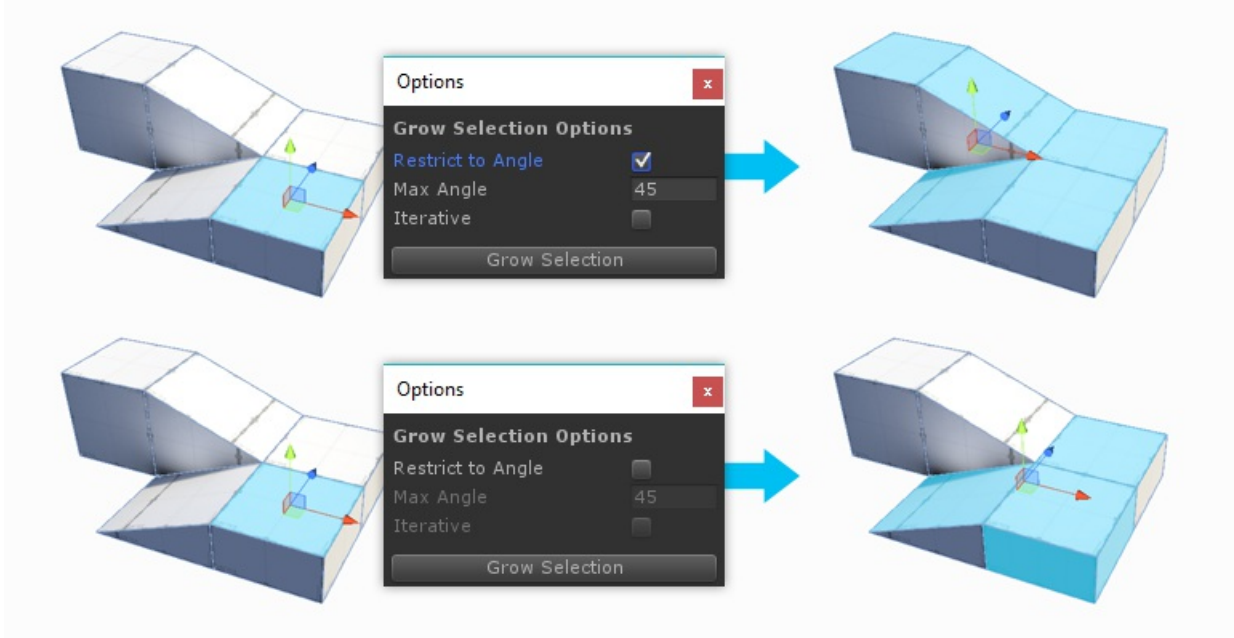
> Section Video: Selection Tools: Grow Selection

**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.

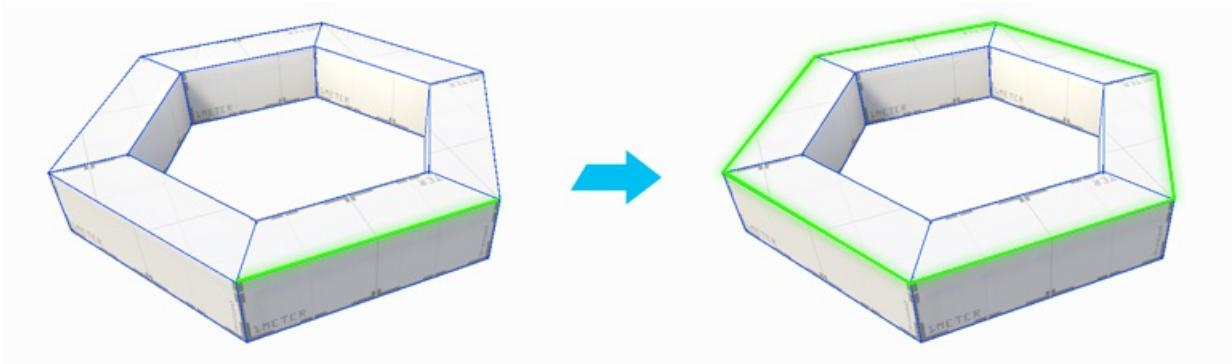
---

# Select Edge Loop

> Section Video: Selection Tools: Select Edge Loop

**Keyboard Shortcut** : ALT L

Selects an edge loop from each selected edge.



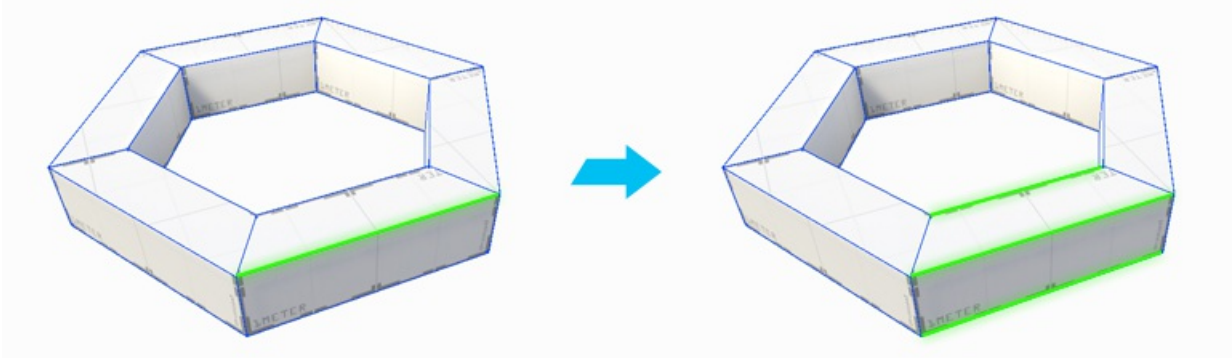
---

# Select Edge Ring

> Section Video: Selection Tools: Select Edge Ring

**Keyboard Shortcut** : ALT R

Selects an edge ring from each selected edge.

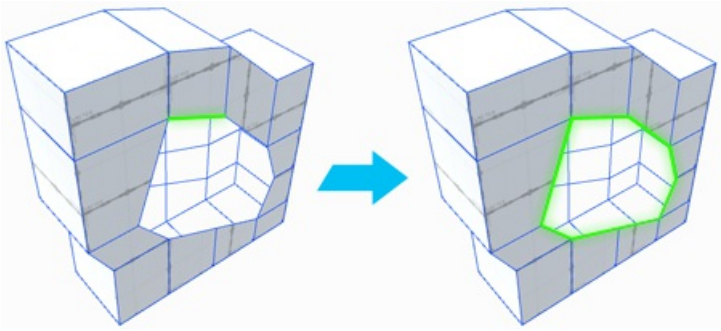


---

# Select Hole

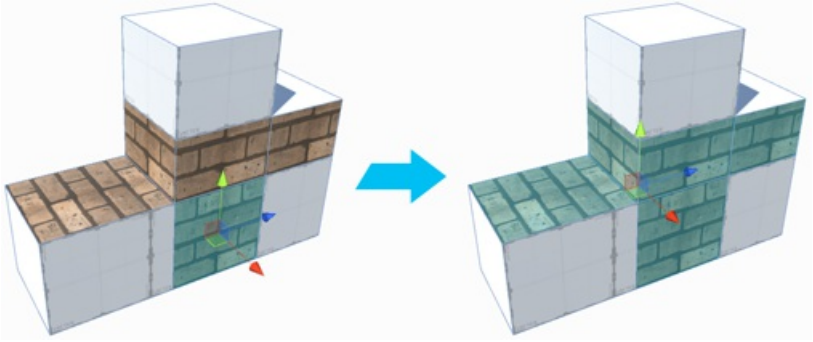
With an open vertex or edge selected, click **Select Hole** to select all elements along opening.

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



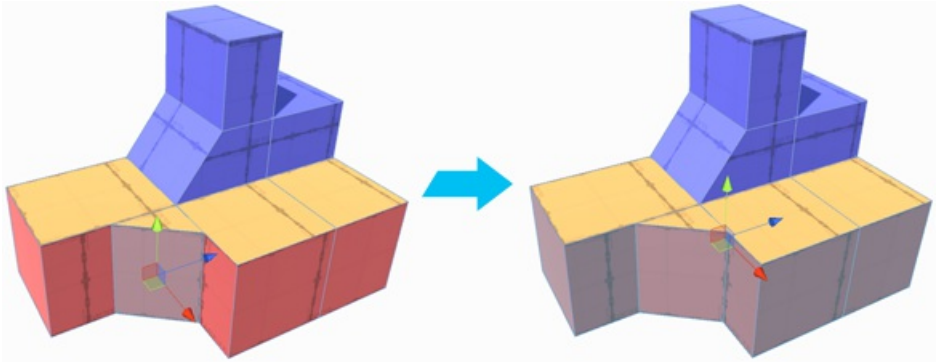
## Select by Material

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



## Select by Vertex Color

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



# Object Actions

## Merge Objects

> Section Video: Object Actions: Merge Objects

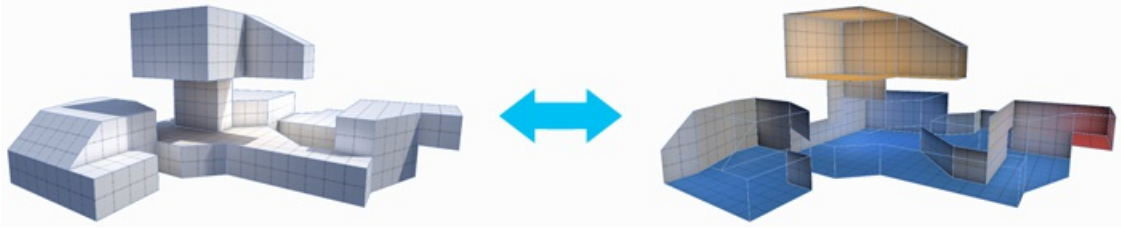
Merges the selected objects into a single object.

## Flip Object Normals

> Section Video: Object Actions: Flip Object Normals

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

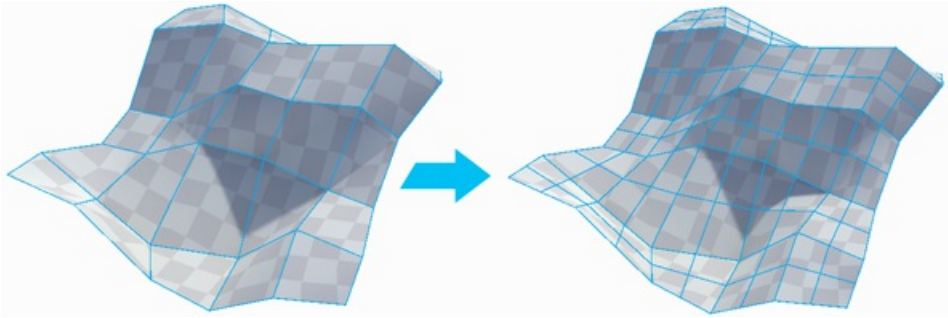
> Especially useful for converting an exterior modeled shape into an interior space.



## 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.

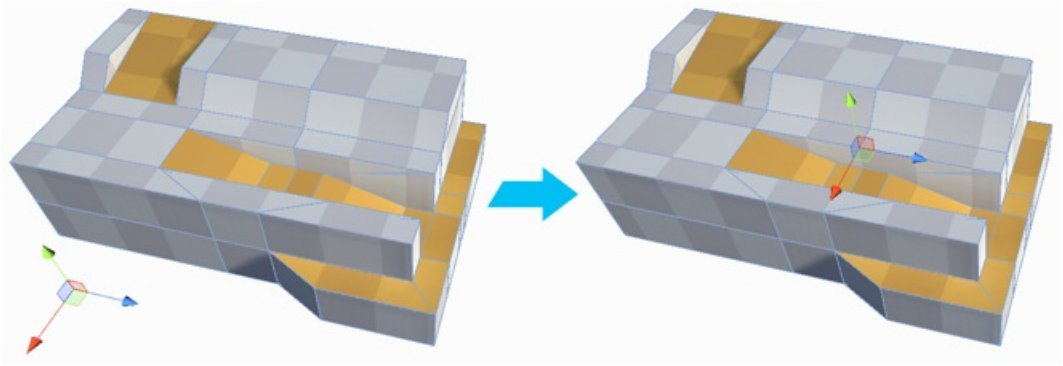
---

# 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

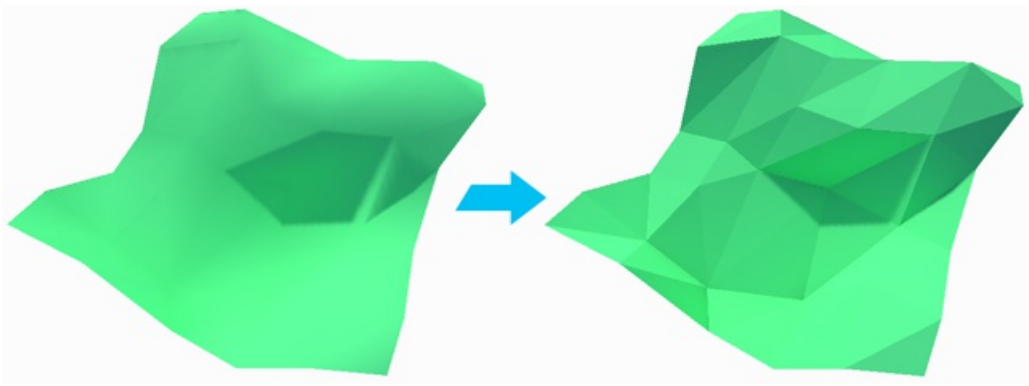
Sets all face normals on the selected object to the same relative direction.

---

# Triangulate

> Section Video: Object Actions: Triangulate

Reduces all polygons to their base triangles, creating a "Polyworld-like" effect.



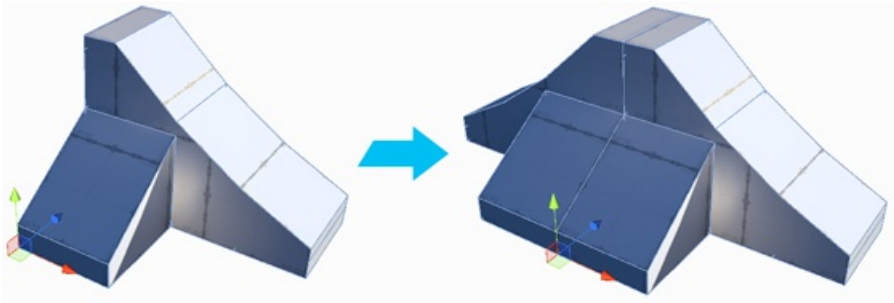
---

# 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 | | 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 |

| Option | Formats | Description |
| --- | --- | --- |
| Textures | OBJ | Unity users: 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 Scale, Offset | OBJ | Some 3D modeling applications import texture scale and offset paramters (Blender, for example). Toggling this will write these values to the exported mtlib 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. |
| Quads | PLY | Where possible, ProBuilder will preserve quads when exporting to PLY. |

---

# ProBuilderize Object

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

### Custom Settings Available :

| Setting | Description |
| --- | --- |
| **Preserve Faces** | If **On**, ProBuilder will attempt to keep ngons. Otherwise, all the mesh will be converted to hard tris. |

---

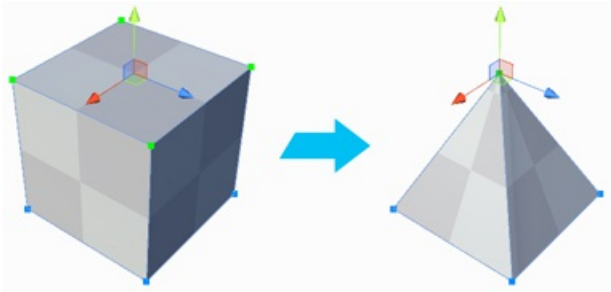
# Vertex Actions

## 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** :

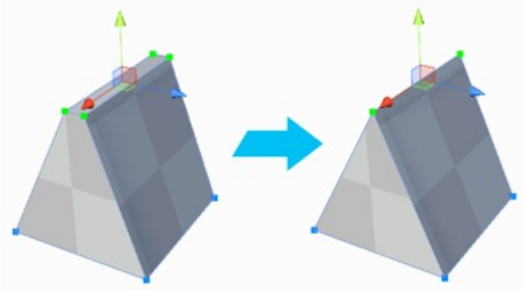
| Setting | Description |
| --- | --- |
| **Collapse To First** | Collapse to first-selected vertex position, instead of selection center. |

## Weld Vertices

> Section Video: Vertex Actions: Weld Vertices

**Keyboard Shortcut** : ALT V

Merge vertices within a set distance of one another.



**Custom Settings Available** :

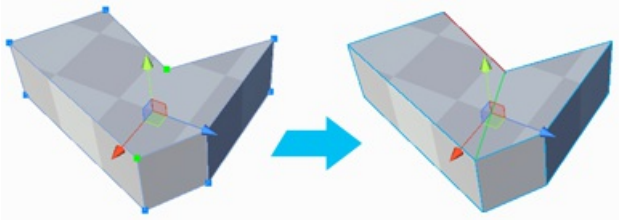
| Setting | Description |
| --- | --- |
| **Collapse To First** | Collapse to first-selected vertex position, instead of selection center. |

## Connect Vertices

> Section Video: Vertex Actions: Connect Vertices

**Keyboard Shortcut** : ALT E

Create a new edge connecting the selected vertices.



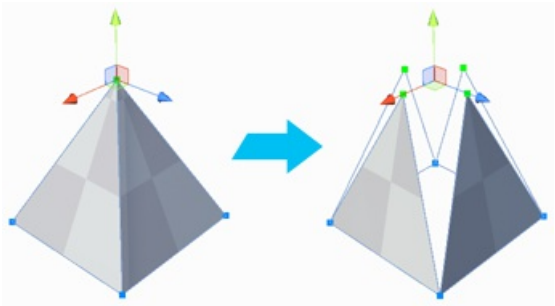
---

# 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.

---

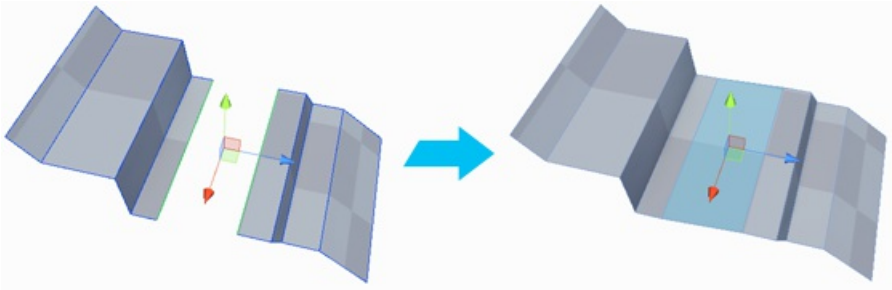
# Edge Actions

## Bridge Edges

> Section Video: Edge Actions: Bridge Edges

**Keyboard Shortcut** : ALT B

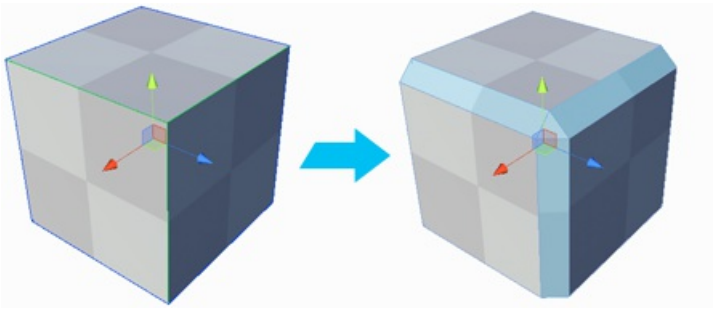
Create a new face between two selected edges. Each edge must have a free side.



## Bevel

> Section Video: Edge Actions: Bevel Edges

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



**Custom Settings Available** :

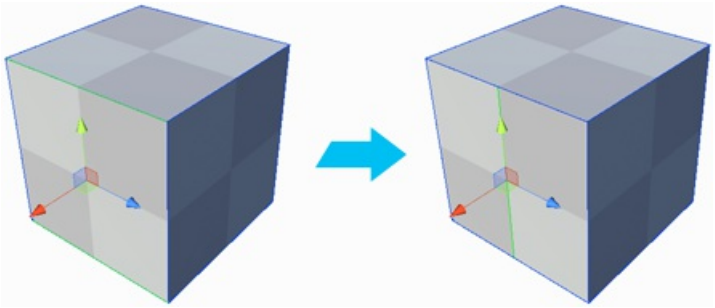
| Setting | Description |
| --- | --- |
| **Distance** | Sets the distance each new edge is moved, from the position of the original. |

## Connect Edges

> Section Video: Edge Actions: Connect Edges

**Keyboard Shortcut** : ALT E

Insert an edge connecting the centers of each selected edge.



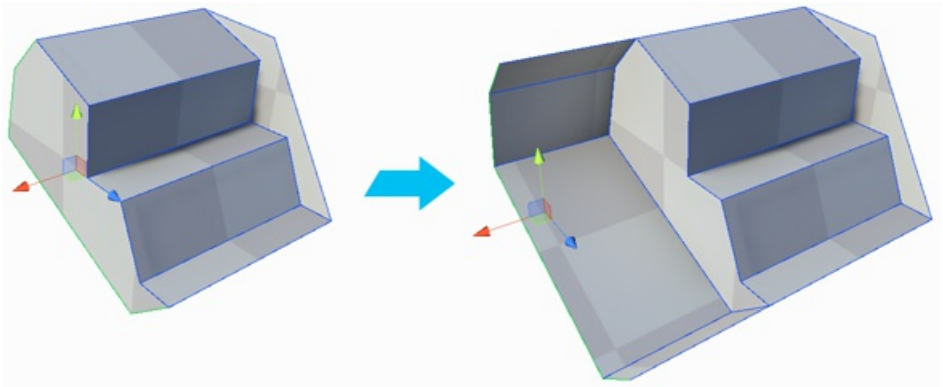
## Extrude Edges

> 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.



> Note: By default, only open edges can be **Extruded**. You can change this in the ProBuilder Preferences.

**Custom Settings Available** :

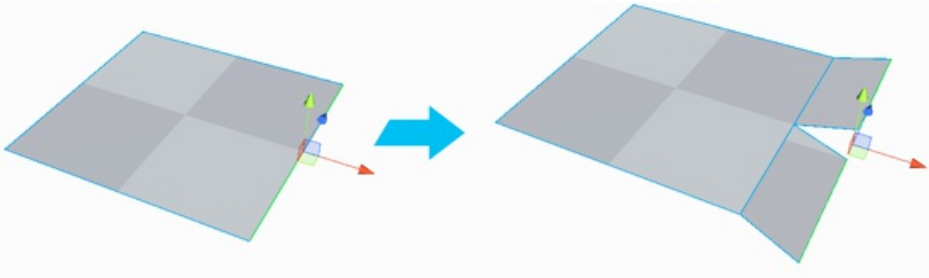
| Setting | Description |
| --- | --- |
| **Distance** | Distance to extrude the edge(s). |

## 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). |

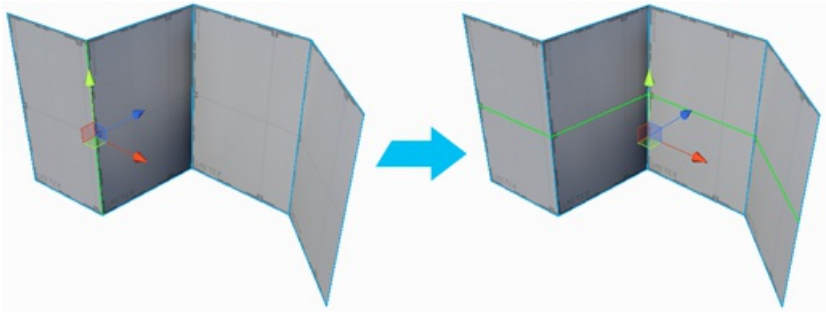
---

# Insert Edge Loop

> Section Video: Edge Actions: Subdivide Edge

**Keyboard Shortcut** : ALT U

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



---

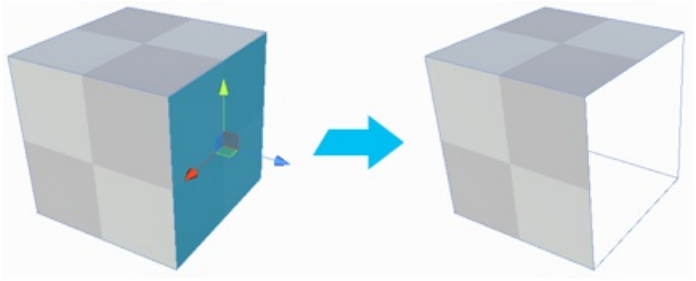
# Face Actions

## Delete Face

> Section Video: Face Actions: Delete Faces

**Keyboard Shortcut** : BACKSPACE

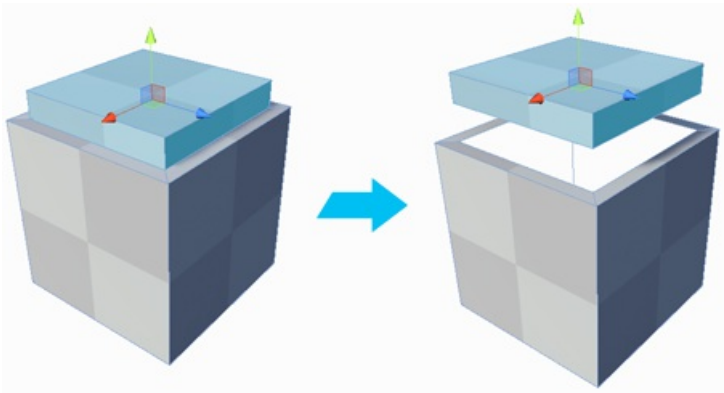
Deletes the selected face(s).



## 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. |

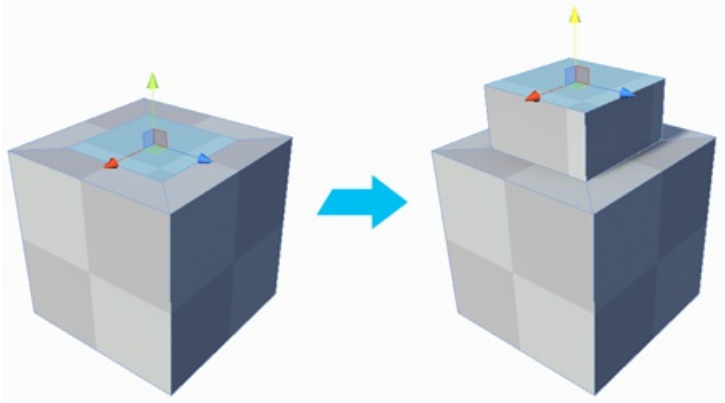
## Extrude Face

> 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** :

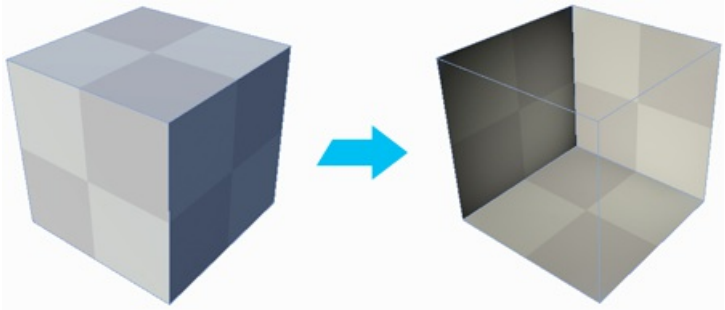
| Setting | Description |
| --- | --- |
| **As Group** | If **On**, adjacent faces in the selection will be extruded together, along an averaged normal direction. Otherwise, all faces will be extruded individually, along their own normal direction. |
| **Distance** | Distance to extrude the selected faces(s). |

---

# Flip Normals

> Section Video: Face Actions: Flip Normals

Flips the normals on the selected face(s).

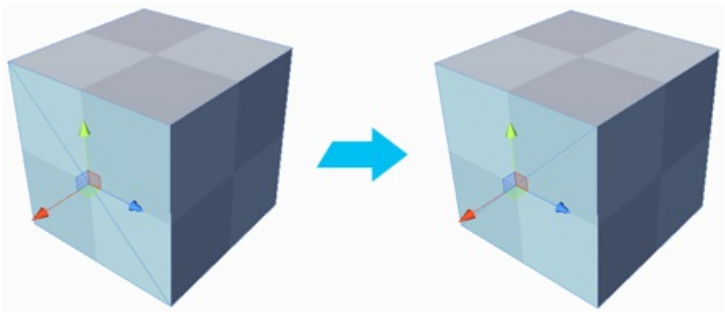


---

# 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

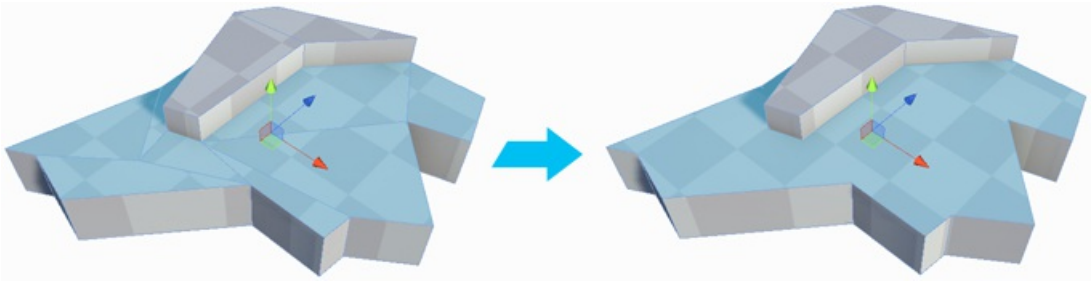
> Section Video: Face Actions: Conform Normals

Sets all selected face normals to the same relative direction.

## Merge Faces

> Section Video: Face Actions: Merge Faces

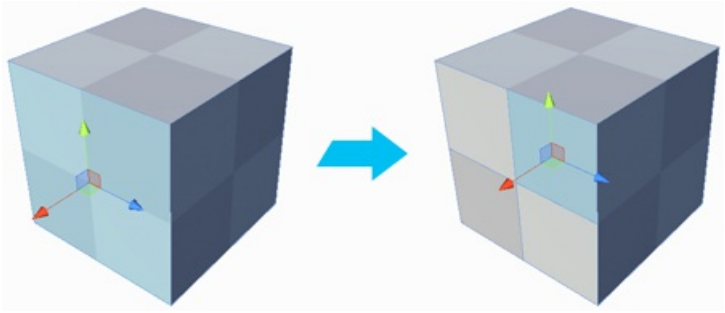
Merges selected faces into a single face, and removes any dividing edges.



## Subdivide Face

> Section Video: Face Actions: Subdivide Face

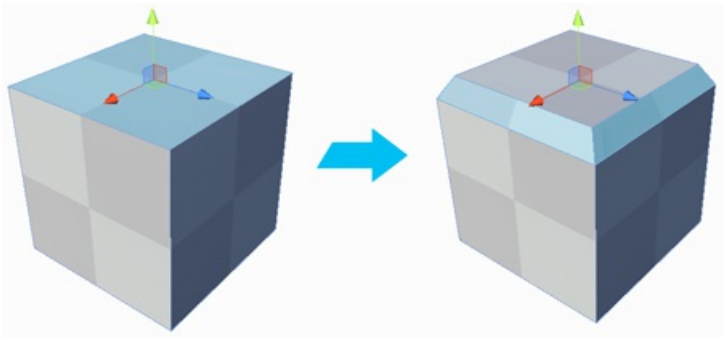
Split each selected face by adding a vertex at the center of each edge and connecting them in the center.



# Bevel

> 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. |

# Element Actions

## Move Pivot to Center of Selected Elements

> Section Video: Element Actions: Set Pivot

**Keyboard Shortcut** : ALT J

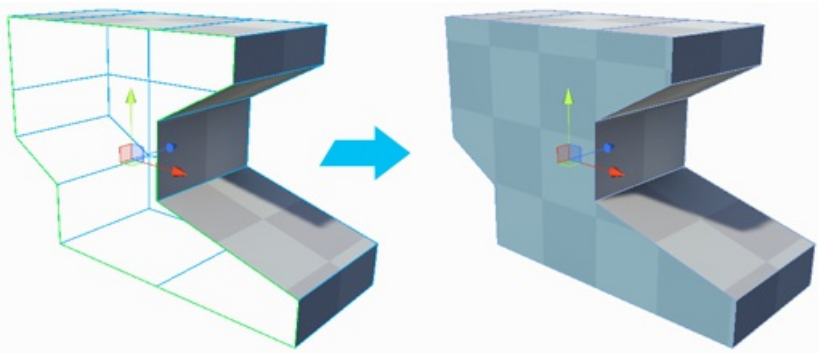
Move the pivot point of this mesh to the average center of the selected elements.

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.



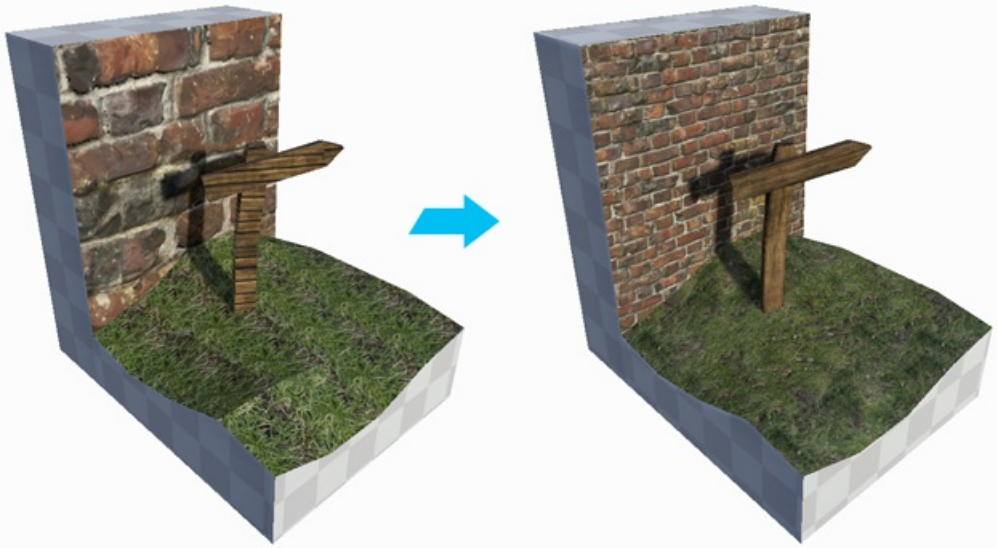
**Custom Settings Available** :

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

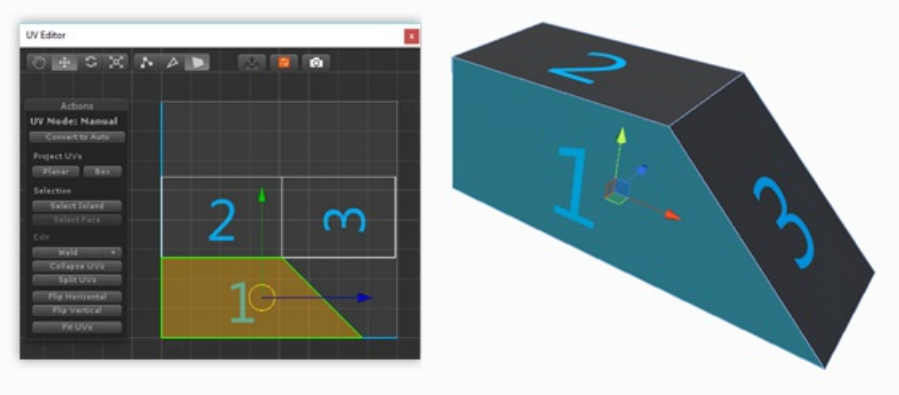
# Texturing Overview

## 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.

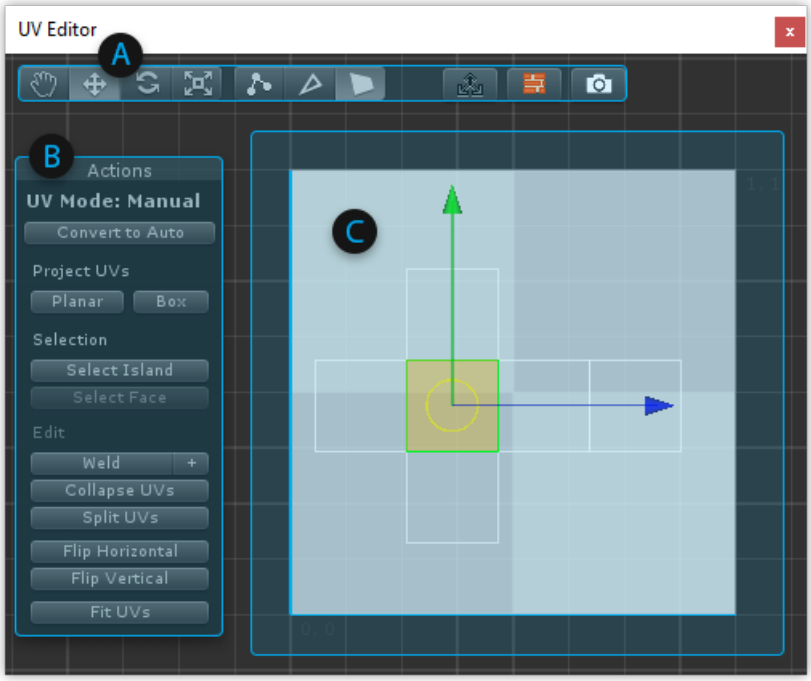
You can use a mix of Auto and Manual UVs, even on the same object. This is especially useful when some parts of a model need to have tiling textures, while others are unwrapped.

## 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 in the Main Toolbar.

- In Text Mode, this will be the button labeled **UV Editor**
- In Icon Mode, use the button with this icon:




## 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. When using Auto UVs you may only edit UVs per-face.

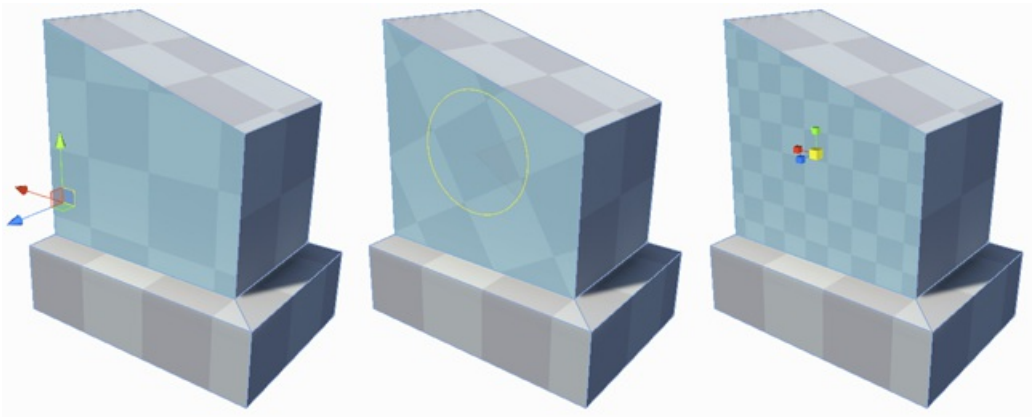
## In-Scene Controls

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

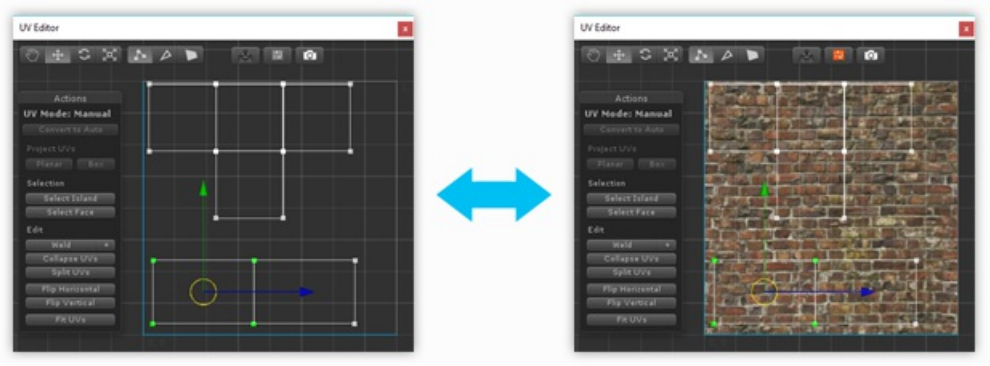
## Texture Preview

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

**Toolbar Icon Description**

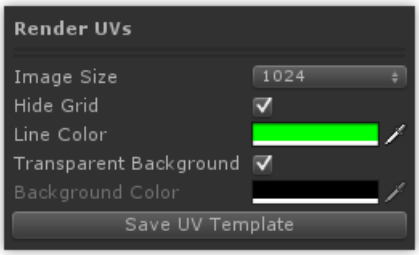
**On** : Selected element's Texture will be displayed in the UV Viewer

**Off** : No texture will be displayed in the UV Viewer



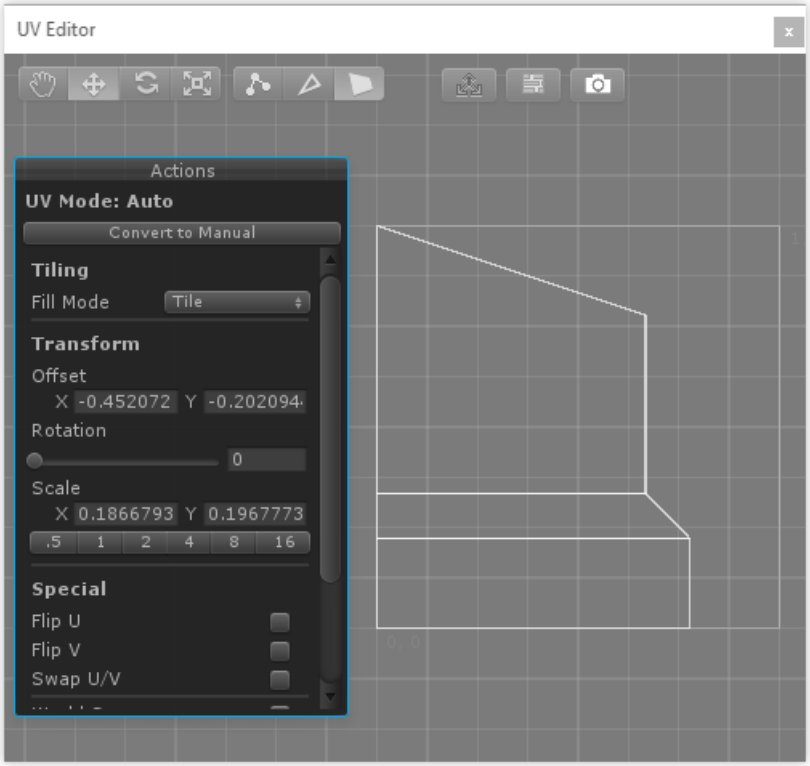
## Render UV Template

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



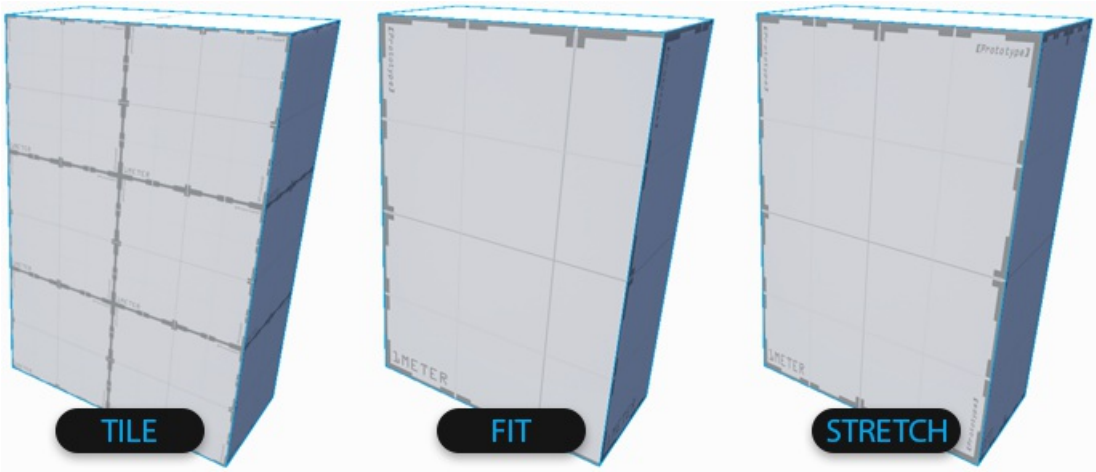

## Convert to Manual

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** | Continously 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.

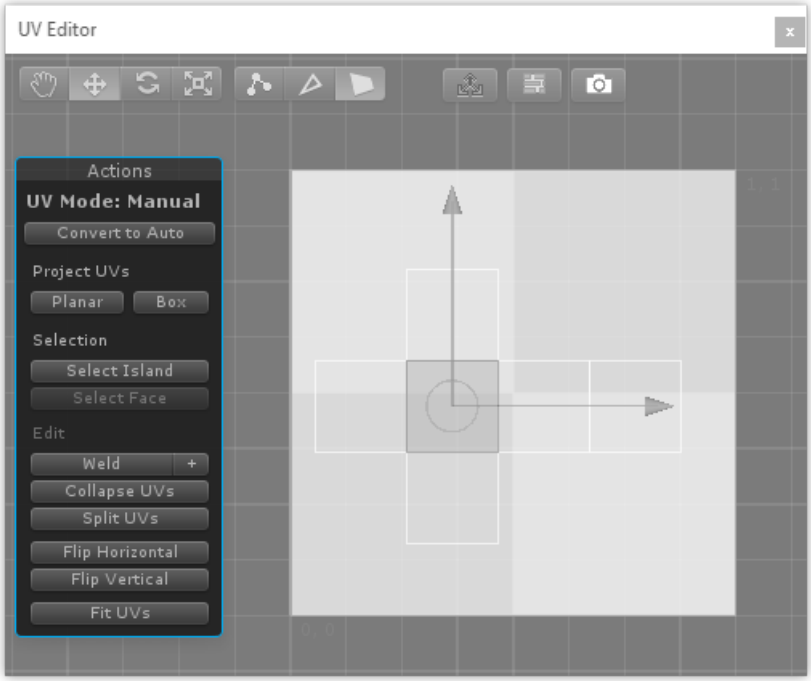
# Group Selected Faces

Create a new Texture Group from the selected faces.

# Select Texture Group

Select all faces in the the Texture Group.

# Manual UV Actions

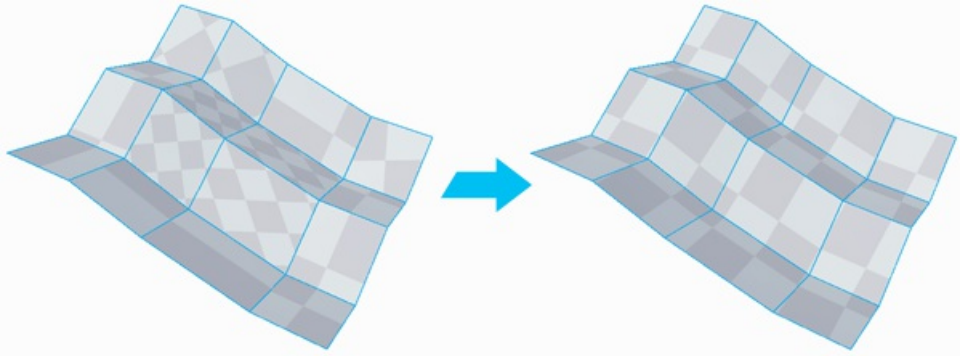



## Convert to Auto

Converts all selected faces to Auto UVs.

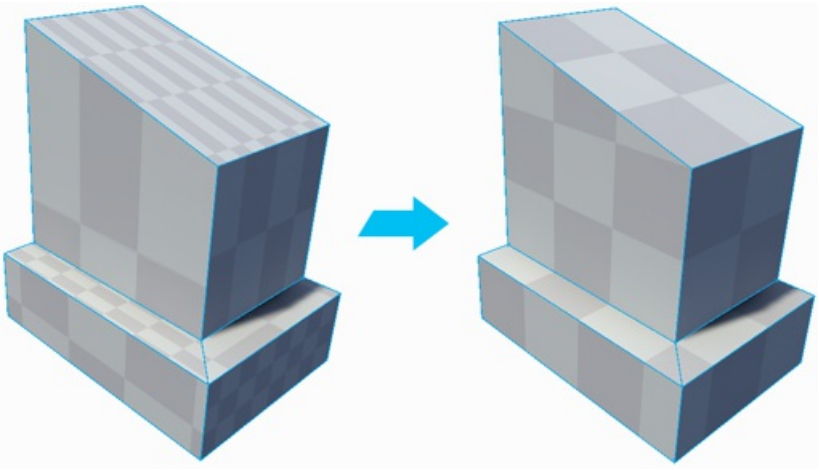
## Project UVs: Planar

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



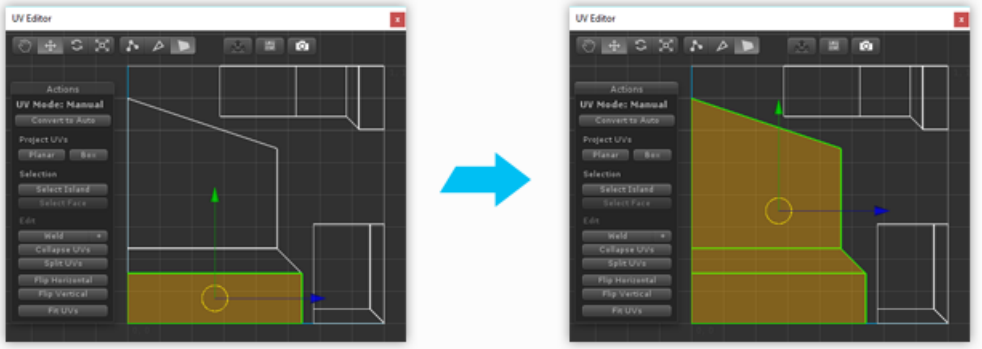
## Project UVs: Box

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



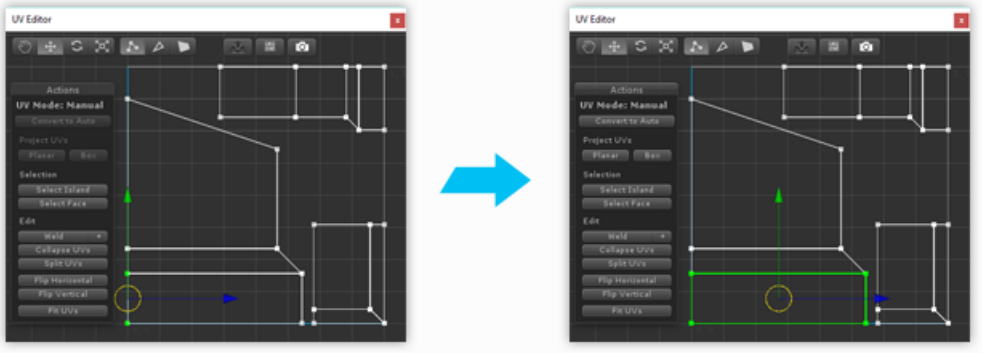
## Select Island

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




## Select Face

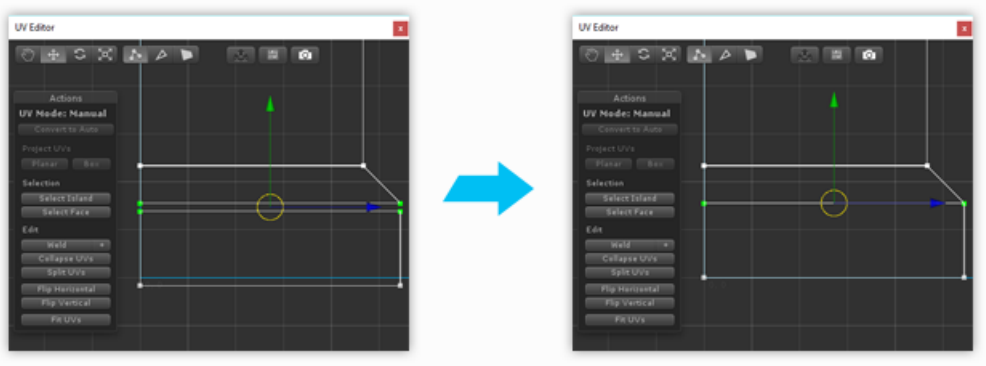
With a Vertex or Edge selected, click to select all elements on the same face.




## Weld

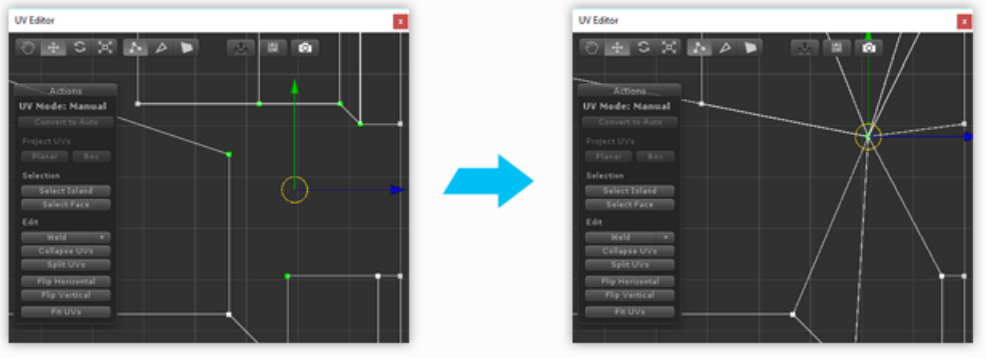
Collapses selected vertices together, but only if they are within a set distance.

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



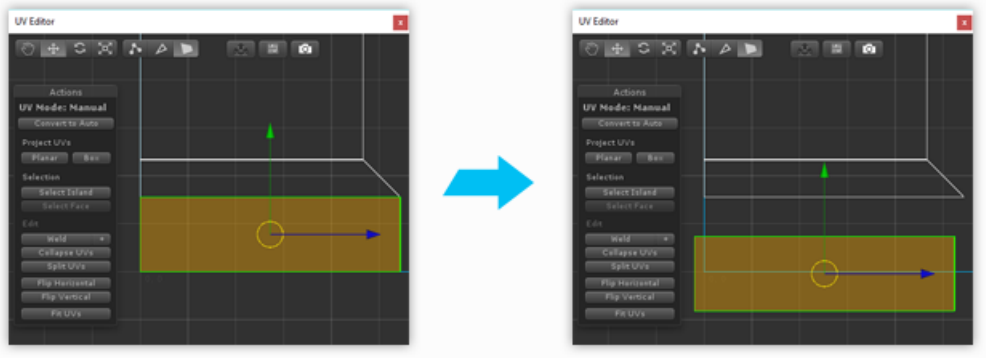

## Collapse UVs

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 independantly.

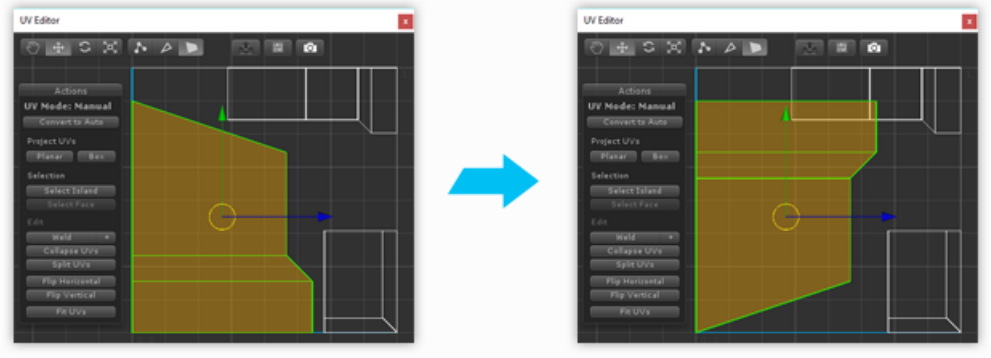



## Flip Horizontal

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

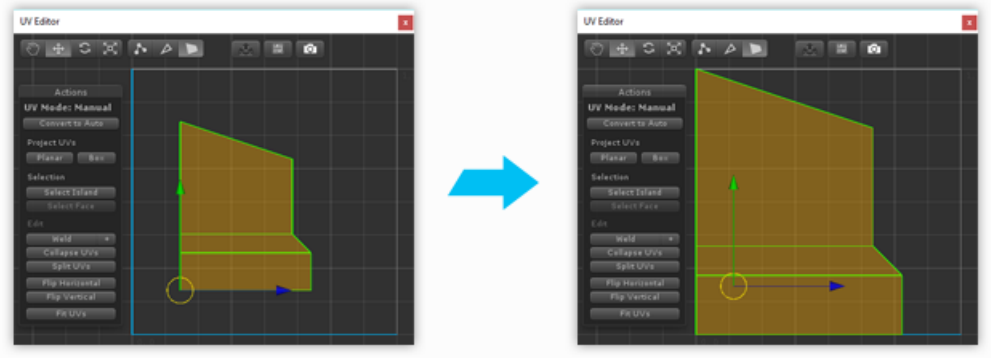
# Flip Vertical

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

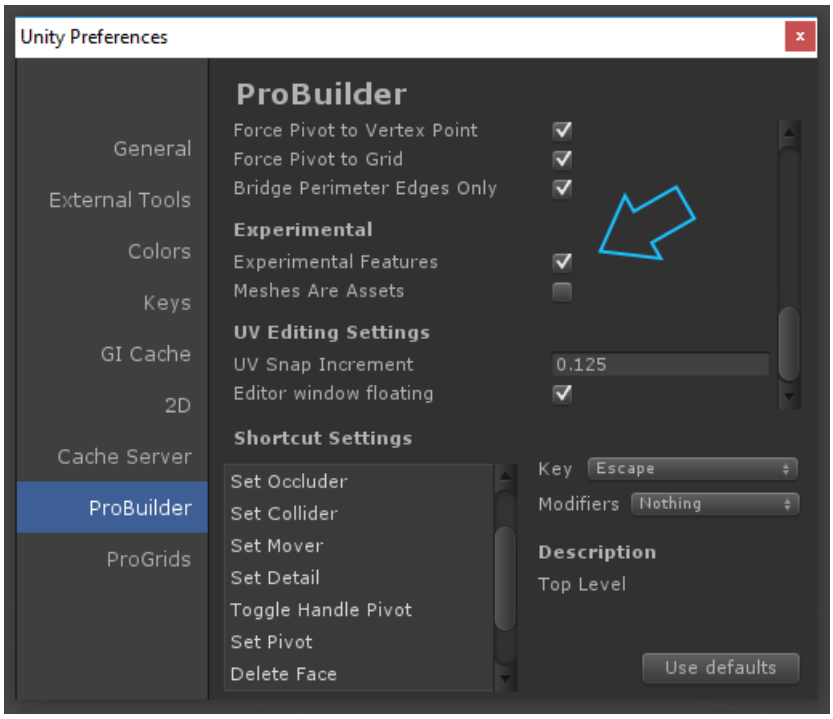
# Overview

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:

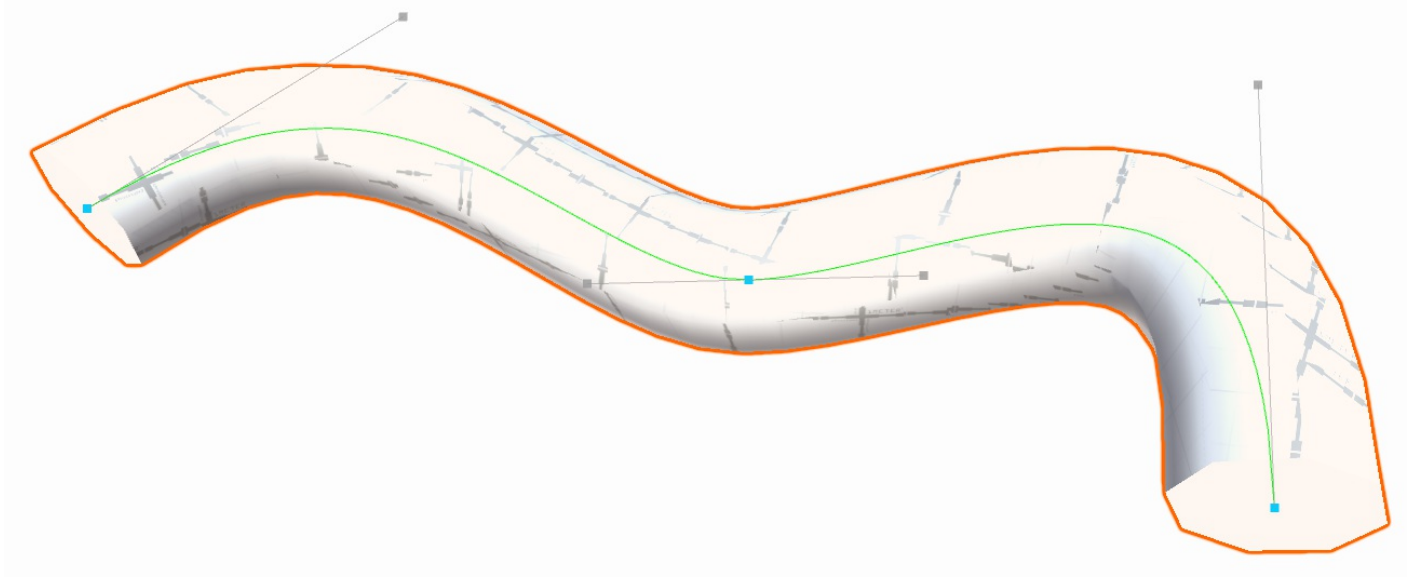
- Open Unity Preferences ( Edit / Preferences on Windows, Unity / Preferences Mac)
- Under the **Experimental** header, enable **Experimental Features**



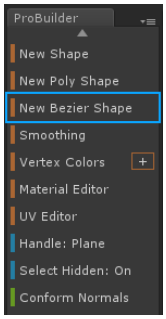
# Bezier Shape

## Bezier Shape

> Section Video: Creating and Editing Bezier Shapes



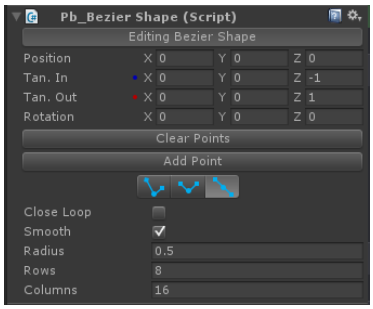
## Quick Start




- 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 tranlate 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



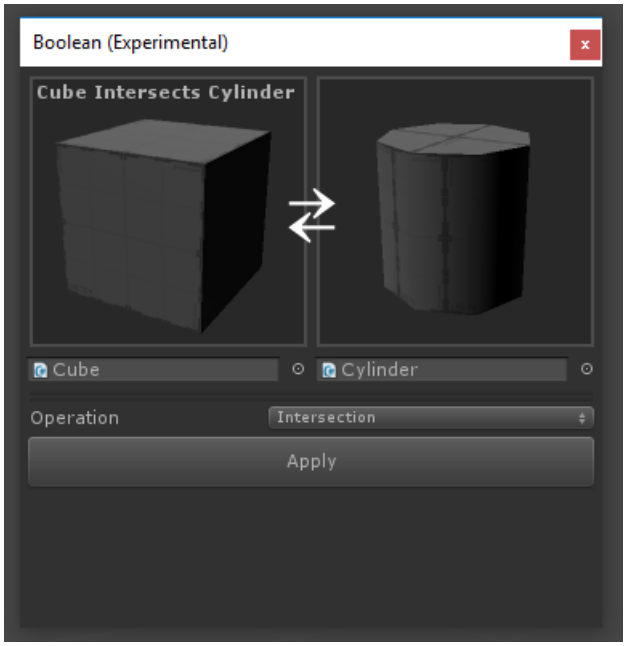

| Inspector | Description |
|---|---|
| Edit Bezier Shape | Toggle in and out of shape editing mode. |
| Position | The local position of the selected control point. |
| Tan. In | The local position of the selected control tangent in handle. |
| Tan. Out | The local position of the selected control tangent 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. |
| Clear Points | Clear all control points on this mesh. |

| Inspector | Description |
| --- | --- |
| Add Point | Add a new control point at the end of the bezier path. |
| CloseLoop | 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 |
| --- | --- | --- |
| | Free | Adjusting one tangent does not affect the other. |
| | Aligned | Adjusting a tangent will set the other tangent to match it's magnitude. |
| | Mirrored | Tangent handles are locked in a straight line. |

# Boolean Ops

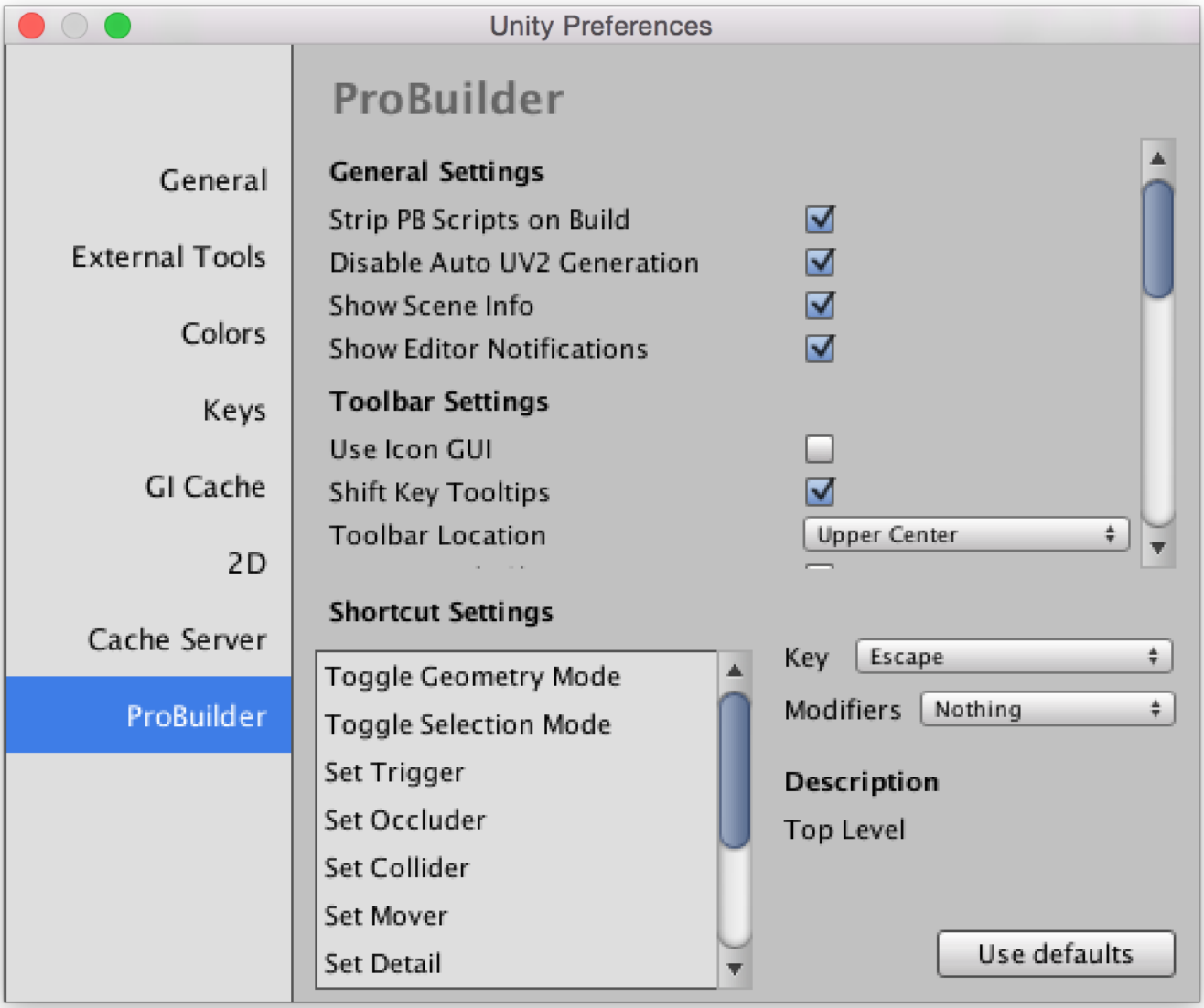



The Boolean Tool provides an interface for creating new meshes from boolean operations.

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 Shorcuts 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 extrude edges from manifold 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.

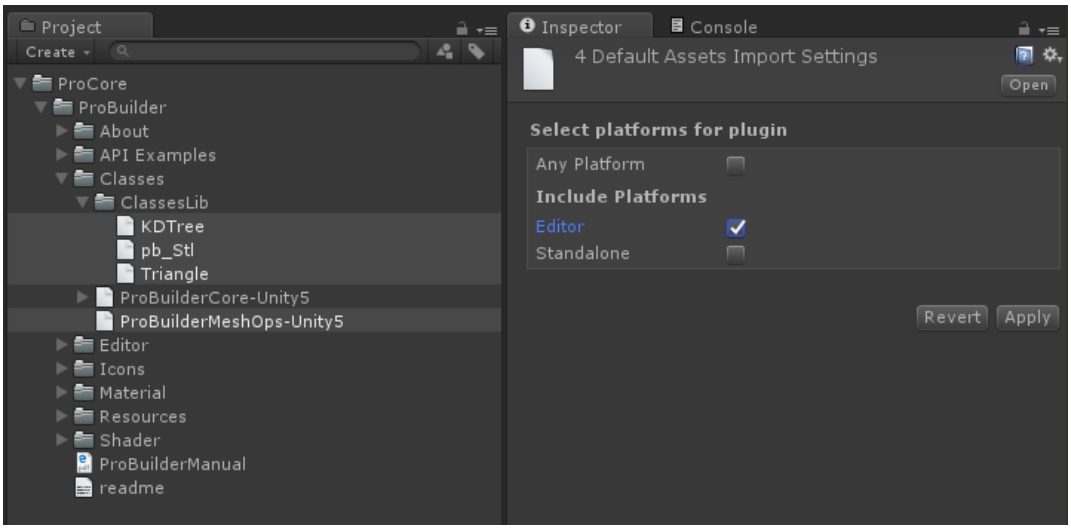
# Troubleshooting

## 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.

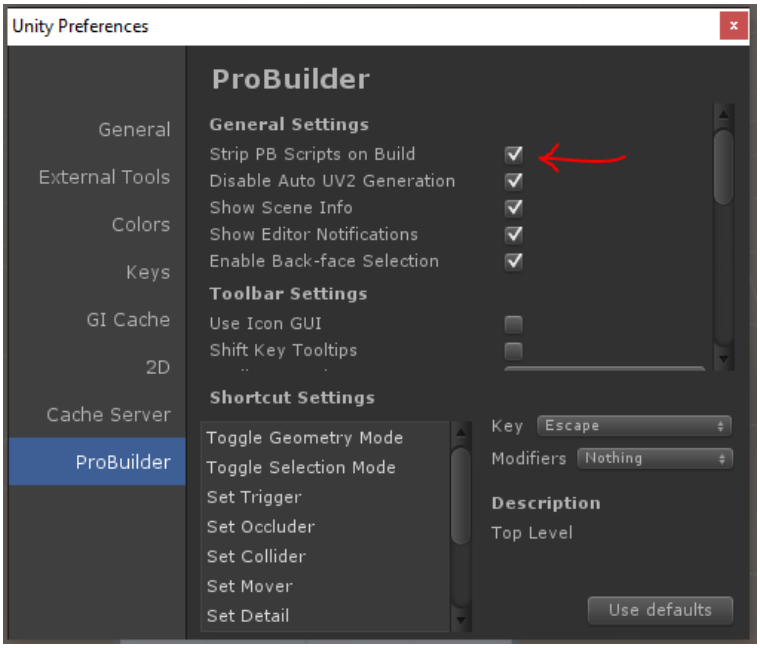



The caveat is that this means you won't be able to access any of the ProBuilder mesh operations API at runtime.

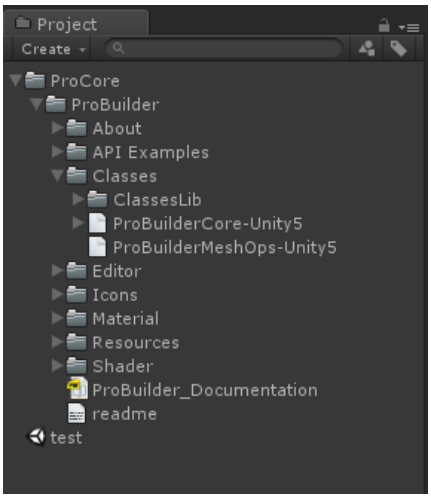
If this step does not address the build issues, it may be necessary to strip ProBuilder scripts entirely before compile. Fortunetely this is also trivial:

Steps to Strip ProBuilder Scripts at Build Time

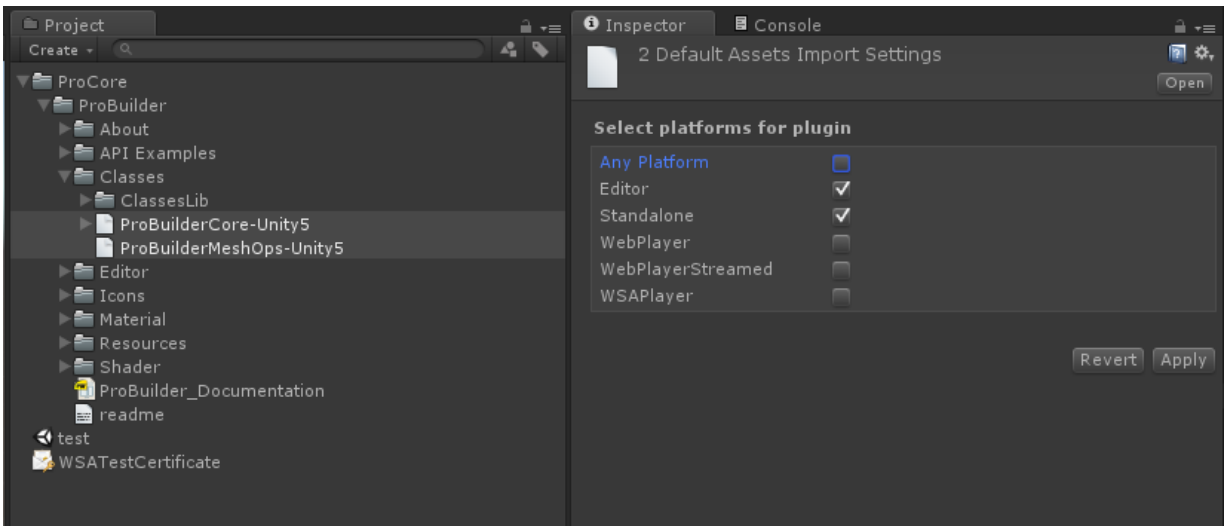
1. First make sure that Strip PB Scripts on Build is checked in the Preferences/ProBuilder panel.




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




3. 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!

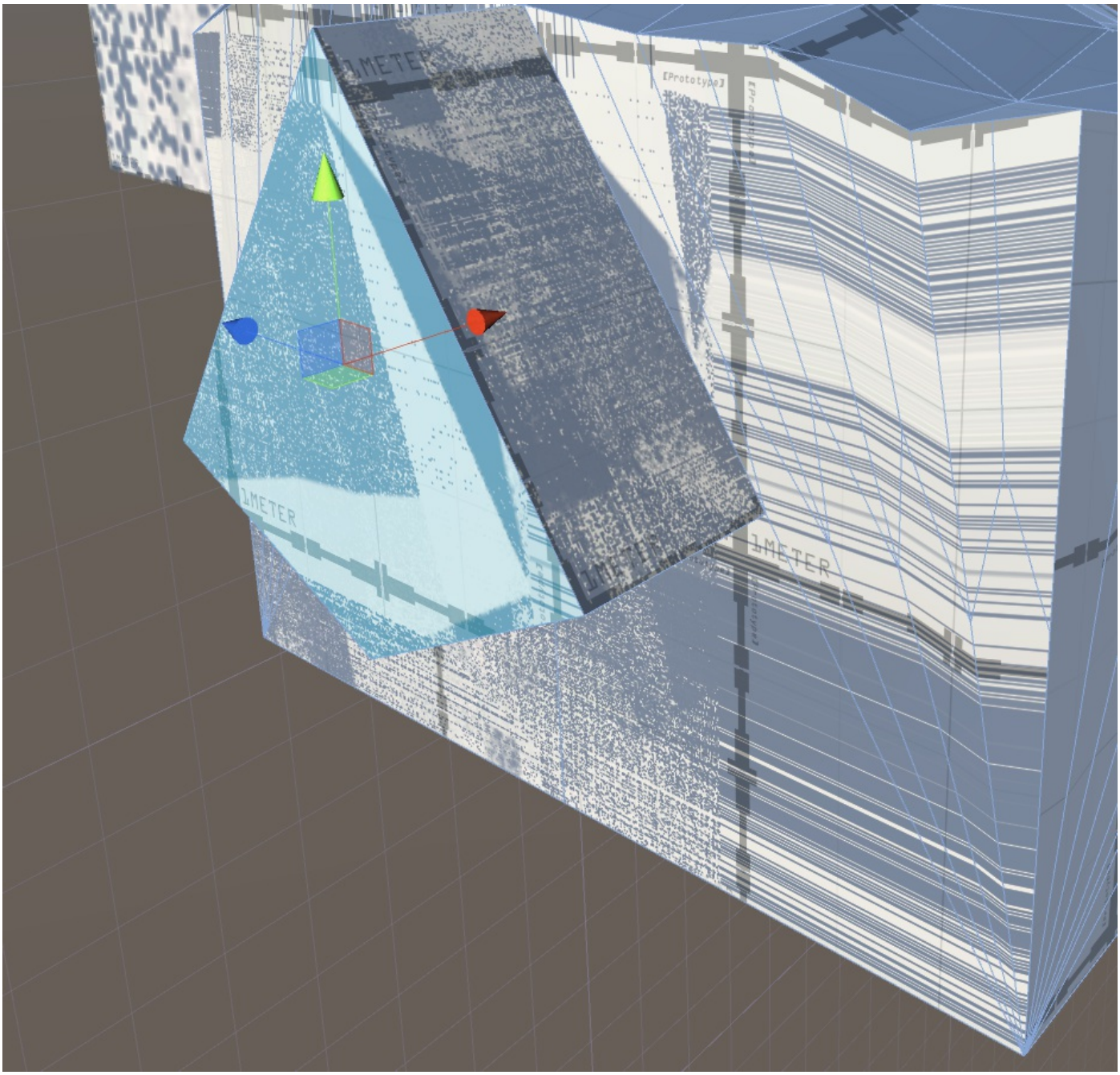
# Missing Icons

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

# 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

Poly2Tri Copyright (c) 2009-2010, Poly2Tri Contributors http://code.google.com/p/poly2tri/

All rights reserved. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- Neither the name of Poly2Tri nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

## csg.js

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

Copyright (c) 2011 Evan Wallace (http://madebyevan.com/)

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY

CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

---

# KdTree

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

The MIT License (MIT)

Copyright (c) 2013 codeandcats

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

---

# MkDocs

- http://www.mkdocs.org/

BSD 2-clause "Simplified" License

Copyright © 2014, Tom Christie. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

---

# Cinder

- https://github.com/chrissimpkins/cinder
- https://github.com/procore3d/cinder

The MIT License (MIT)

Copyright (c) 2016 Chris Simpkins

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

---

# pb_Stl

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

The MIT License (MIT)

Copyright (c) 2016 Karl Henkel

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.