## What is LW Brush

LW Brush is a powerful modeling toolset that consists of 14 Modeling Tool plug-ins for mesh editing, such as translating, rotating, grabbing, sliding, smoothing, pushing in, pulling out, drawing, cutting, extending, and so on. This toolset frees artists from mechanical and hard routine work, which allows you to edit your models by intuitively handling and feeling just like doing handicraft work in real life. An ornament is placed at the location you expect. A rubber band is stretched when you drag it. You can cut off unnecessary parts of wooden models. You should experience so natural behavior of polygon meshes in your viewport.

For Comfortable Modeling

To get more comfortable with the LW Brush tools, choose **Edit > Display Options**, and then minimize **Perspective Amount** (is set to **0**) on the Layout Tab. Before editing, first select the parts of the geometry you would like to edit, and then fit only the selected parts into all viewports using the **Fit Selected** command (the default keyboard shortcut **Shift + A**).
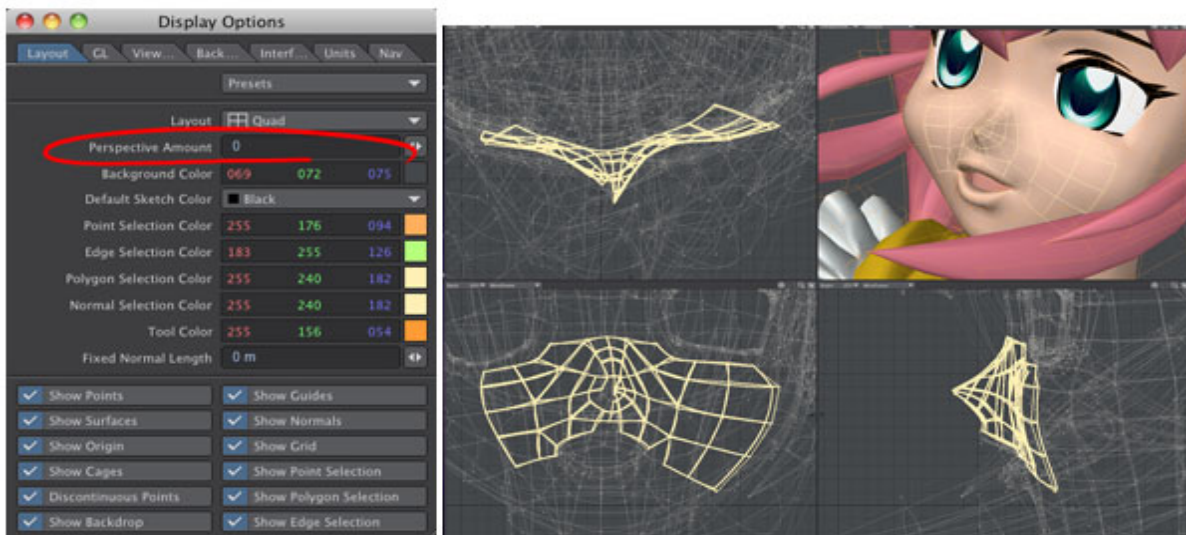
LWB Grab

Left-clicking and dragging on the surface of an object will grab the surface to adjust the shape and also roughly bend and stretch the part of the object within the brush's influence area. You can graphically adjust the size of the influence area by dragging out a circle by right-clicking.

> LWB Grab works in **Symmetry** mode. `Version 1.05`
> Since LightWave 11.5, you can also smooth out the part of the mesh within the brush's influence area by holding the Shift key down and left-clicking, instead of switching to **LWB Smooth**, and holding the Shift key and right-clicking will adjust the **Strength** of the smoothing effect.
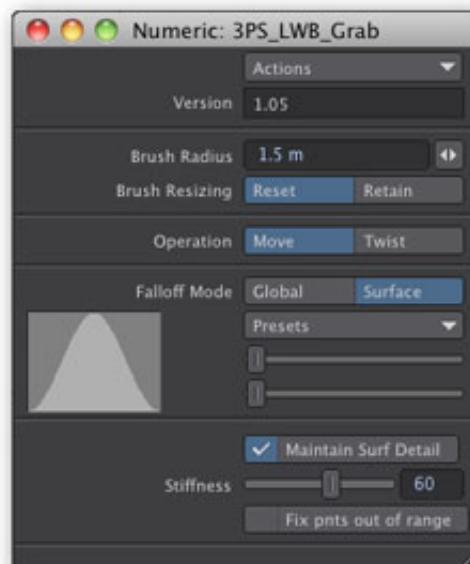

Brush Radius - shows and specifies the radius of the brush. In other words, this is the distance between the position of the mouse pointer (the center of the effect) and the boundary of the brush's influence area.

Brush Resizing - has the following two options for brush resizing:

> **Reset** - The **Brush Radius** is reset to zero by right-clicking.

> **Retain** - The **Brush Radius** starts from the current **Brush Radius**.

Operation - has the following two options:

>**Move** - just moves the points in the direction of dragging.
>
>**Twist** - twists (rotates with falloff) the meshes. The center of twisting is the point of clicking on the surface.
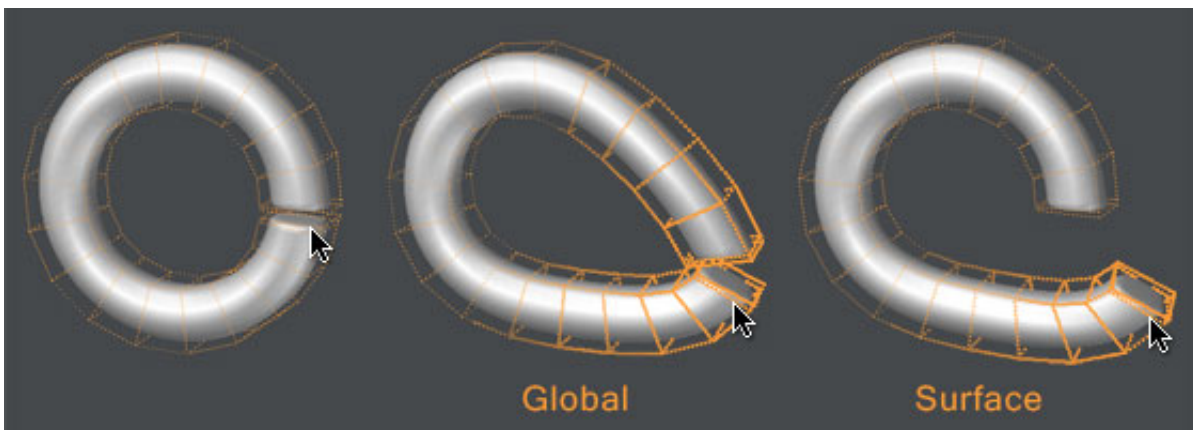>
>Instead of clicking on the option button, you may temporarily switch between the above two operations, **Move** and **Twist**, by holding the **Ctrl** key.
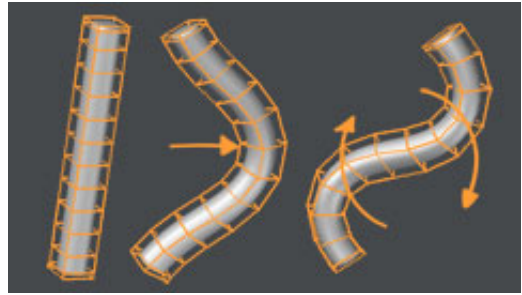
Falloff Mode - has the following two options:

>**Global** - The whole object in the active layer will be affected by editing. The center of the effect is the point of clicking on the surface. The effect will fall off with the distance from the center of the effect in 3D space.
>
>**Surface** - Only the geometry connected to the polygon you clicked on will be affected by editing. The center of the effect is the initial point of dragging on the surface. The effect will fall off with the distance from the initial point along the surface of the object.

Falloff Slider - This is the LightWave-style falloff setting. How the effect falls off is determined by the two sliders. You can use the **Presets** pop-up menu to quickly set up common falloff curves.

Maintain Surf Detail - When checked, you can deform your model while maintaining the surface detail of the original model. Checking this with dense models can considerably slow down the processing speed.
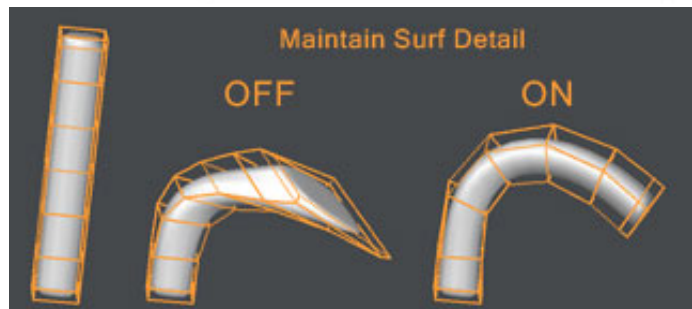
Stiffness - causes the model to roughly maintain its own volume. The larger the value, the stiffer the model is. However, too stiff models may be broken when you bend them.

Fix pnts out of range - If checked, the points out of the influence area will be considered not selected, that is, they will be fixed.

LWB Slide

Left-clicking and dragging on the surface of an object will slide points along its surface. This tool is very useful to adjust the positions of points while preserving the shape of the original object. You can graphically adjust the size of the brush's influence area by dragging out a circle by right-clicking (holding down the Command key and clicking the mouse button for Mac users loving a legacy single button mouse). You can also create wrinkles in your models using the additional effect.

> Since LightWave 11.5, you can also smooth out the part of the mesh within the brush's influence area by holding the Shift key down and left-clicking, instead of switching to **LWB Smooth**, and holding the Shift key and right-clicking will adjust the **Strength** of the smoothing effect. `Version 1.05`
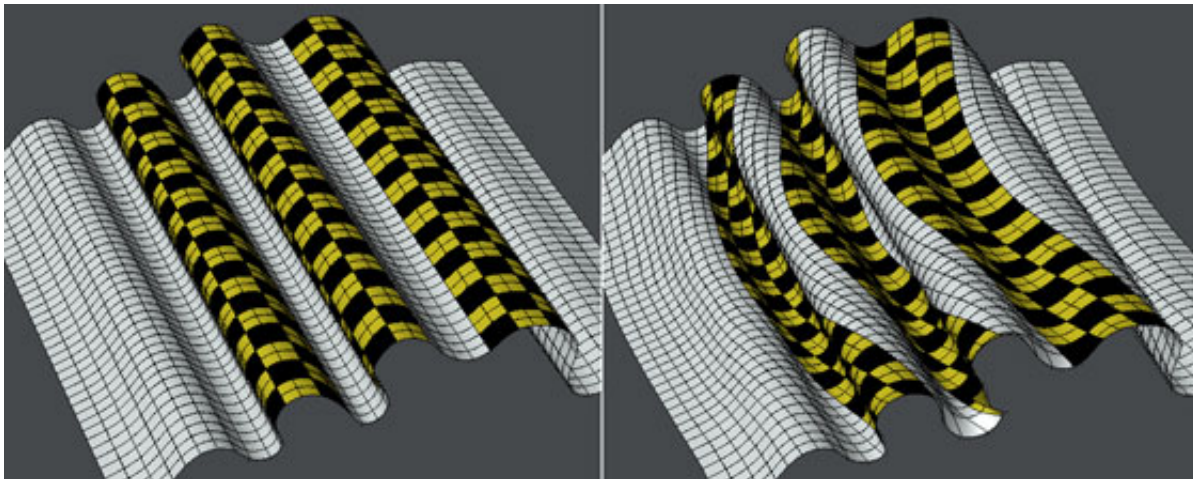
Brush Radius - shows and specifies the radius of the brush. In other words, this is the distance between the position of the mouse pointer (the center of the effect) and the boundary of the brush's influence area.

Brush Resizing - has the following two options for brush resizing:

> **Reset** - The **Brush Radius** is reset to zero by right-clicking.
> **Retain** - The **Brush Radius** starts from the current **Brush Radius**.

Sliding Mode - has the following two options:

> **Projection** - Each point is projected onto the surface with its own 2D plane. If you don't get the results you expect, try using **Surface** mode.

> **Surface** - The points slide exactly along the surface of the mesh. Choosing this option with dense models could cause the performance of this tool to degrade.


Falloff Slider - This is the LightWave-style falloff setting. How the effect falls off is determined by the two sliders. You can use the **Presets** pop-up menu to quickly set up common falloff curves.
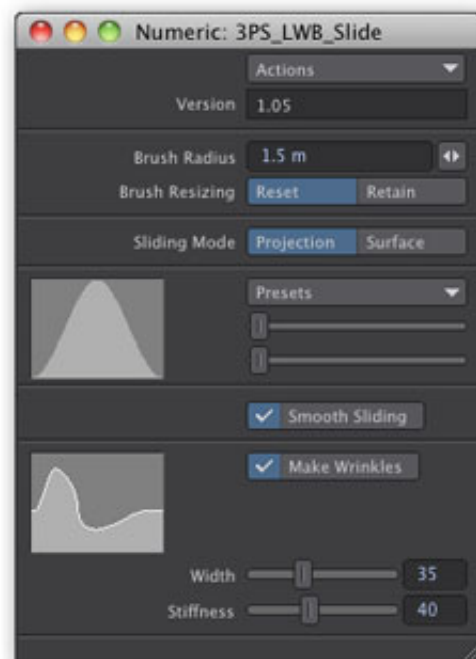
Smooth Sliding - If checked, the points will smoothly slide along the curved surface. If unchecked, they will just slide along the actual faces of polygons.

Make Wrinkles - If checked, the wrinkles will be created while sliding the mesh. This function will produce the best results with subpatch (or CC patch) meshes.
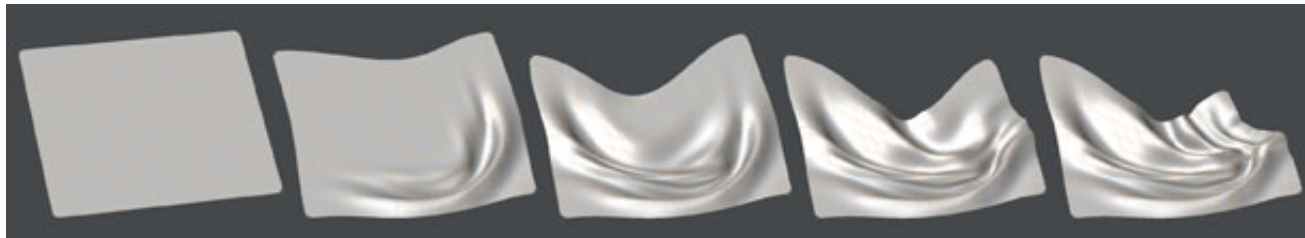
Width - roughly determines the width of wrinkles.

Stiffness - causes the mesh to roughly maintain its own surface area. The larger the value, the stiffer the mesh is. In other words, that will try to maintain the surface area of the mesh much more strongly.

LWB Smooth

Left-clicking and dragging on a mesh will smooth out the part of the mesh within the brush's influence area. You can graphically adjust the size of the influence area by dragging out a circle by right-clicking.

> LWB Smooth works in **Symmetry** mode. `Version 1.05`
> Since LightWave 11.5, you can also adjust the **Strength** value by holding the Shift key down and right-clicking.
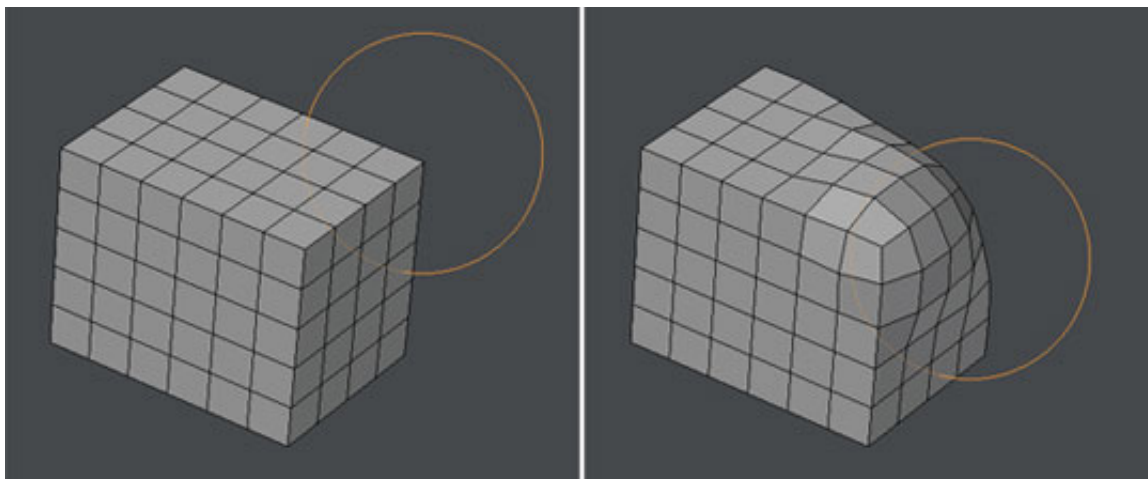
Brush Radius - shows and specifies the radius of the brush. In other words, this is the distance between the position of the mouse pointer (the center of the effect) and the boundary of the brush's influence area.

Brush Resizing - has the following two options for brush resizing:

> **Reset** - The **Brush Radius** is reset to zero by right-clicking.
> **Retain** - The **Brush Radius** starts from the current **Brush Radius**.

Falloff Mode - has the following two options:

> **Global** - The whole object in the active layer will be affected by editing. The center of the effect is the point of clicking on the surface. The effect will fall off with the distance from the center of the effect in 3D space.
> **Surface** - Only the geometry connected to the polygon you clicked on will be affected by editing. The center of the effect is the initial point of dragging on the surface. The effect will fall off with the distance from the initial point along the surface of the object.

Strength - determines the amount of smoothing. The larger the **Strength** value, the faster the meshes will be smoothed. In particular, Values greater than 100 will allow you to smooth out the mesh at high speeds (but it may be affected by the situation). Those high values are effective for dense meshes but too much for low-poly meshes. Usually, values less than or equal to 100 would be adequate for low-polygon-count objects, including SubPatch character models.

Fix Open Edges - If checked, the points of open edges (one unshared by multiple polygons) will be considered not selected, and those points will not be affected at all by editing.

Relax Polygons - Checking this will relax polygon's tight angles while smoothing.

If you need to smooth the open edges of meshes like cloths, make sure the **Fix Open Edges** option is unchecked and that the **Relax Polygons** option is checked.
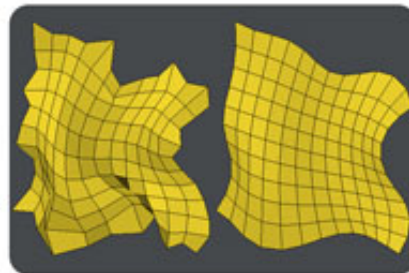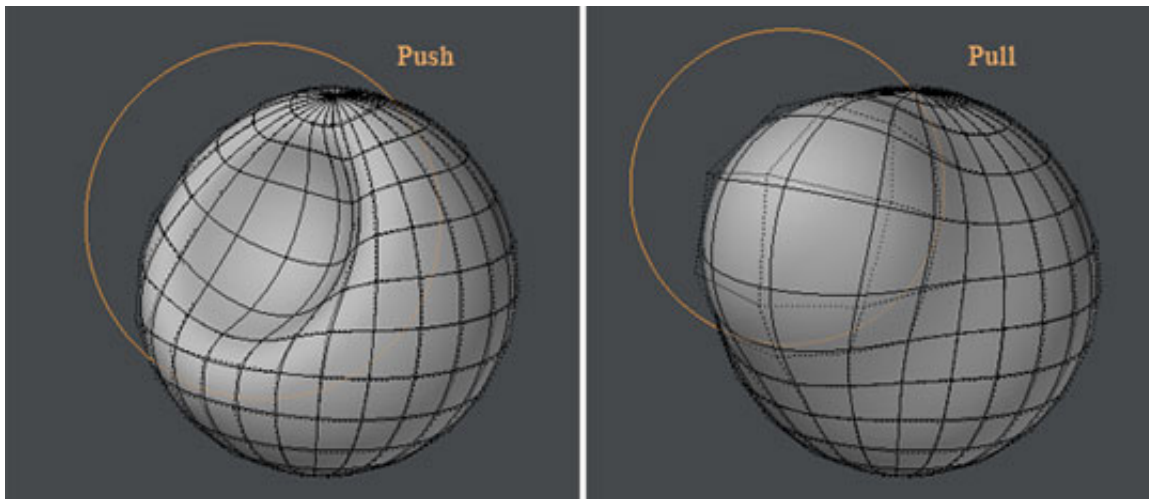
LWB Push/Pull

Left-clicking and dragging on a mesh will push in or pull out the points within the brush's influence area along their normals. You can graphically adjust the size of the influence area and the direction of the effect by dragging out a circle by right-clicking. Right-dragging right will set the operation to **Pull**, and right-dragging left will set the operation to **Push**.

> LWB Push/Pull works in **Symmetry** mode.
> `Version 1.05`
> Since LightWave 11.5, you can also smooth out the part of the mesh within the brush's influence area by holding the Shift key down and left-clicking, instead of switching to **LWB Smooth**, and holding the Shift key and right-clicking will adjust the **Strength** of the smoothing effect.

Brush Radius - shows and specifies the radius of the brush. In other words, this is the distance between the position of the mouse pointer (the center of the effect) and the boundary of the brush's influence area.

Brush Resizing - has the following two options for brush resizing:

> **Reset** - The **Brush Radius** is reset to zero by right-clicking.

> **Retain** - The **Brush Radius** starts from the current **Brush Radius**.

Operation - has the following two options to which you may manually switch without changing the brush size.

> **Push** - moves each point within the brush's influence area in the opposite direction of its normal.

> **Pull** - similar to **Push**, but each point moves in the direction of its normal.

> Instead of clicking on the option button, you may temporarily switch between the above two operations, **Push** and **Pull**, by holding the **Ctrl** key.

**Falloff Mode** - has the following two options:

> **Global** - The whole object in the active layer will be affected by editing. The center of the effect is the point of clicking on the surface. The effect will fall off with the distance from the center of the effect in 3D space.

> **Surface** - Only the geometry connected to the polygon you clicked on will be affected by editing. The center of the effect is the initial point of dragging on the surface. The effect will fall off with the distance from the initial point along the surface of the object.

Strength - determines the intensity of the effect. Larger values of **Strength** cause points to move faster.

LWB Translate

LWB Translate allows you to quickly handle a polygon island (a group of interconnected polygons, in the rest of this section, called "Part") with one-click operation. This tool has the six options, Move, Rotate, Size, Stretch, Clone and Delete, that determine which kind of change will be made to the part you clicked on. In Move mode, left-clicking and dragging will move the part, and you can also rotate it by right-clicking.
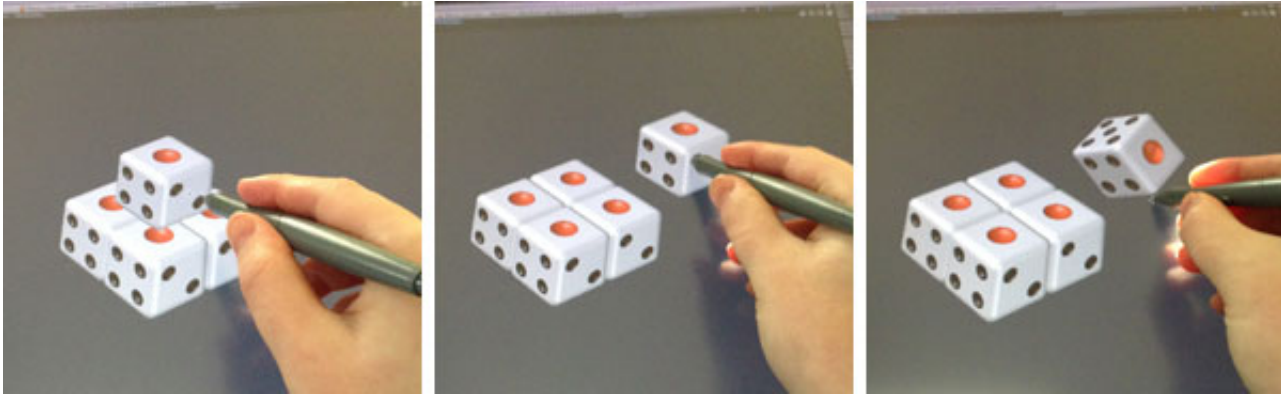
Operation - chooses which kind of change will be made to the part you clicked on.

Move - moves the part on which you clicked in the direction of your mouse movement.

Rotate - rotates the clicked part around its center point in the direction of your mouse movement.

Size - scales the clicked part proportionately along all axes. The center of the scaling is taken from the surface point you clicked on.

Stretch - similar to **Size** but allows you to scale the clicked part independently along each axis in screen space.

Clone - creates a clone of the left-clicked part and then moves the newly created clone in the direction of your mouse movement. You can also delete the clicked part by right-clicking.

Delete - displays the clicked part only in wireframe, then it will be deleted immediately after you release the mouse button.
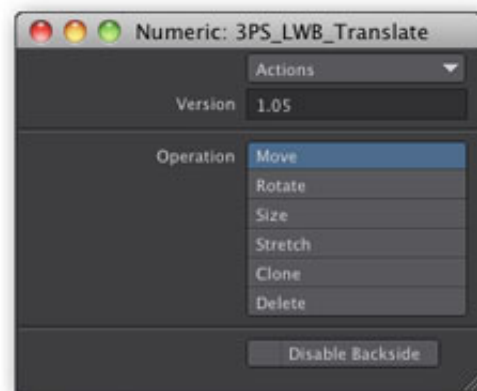
In any of the orthogonal viewports, holding the **Ctrl** key will constrain movement along the initial dragging axis or one of the axes. When **Rotate** is chosen, it will constrain the rotation angle to 15-degree increments. Since LightWave 11.5, you can also create a clone of the clicked part by holding the **Shift** key down and dragging it.

Disable Backside - If checked, you will be unable to click the backside of the polygon.

LWB AddPoints

A new point can be added along an edge by clicking and dragging on the edge of a polygon. If desired, the polygons can be divided along a line between the previous and current added points.
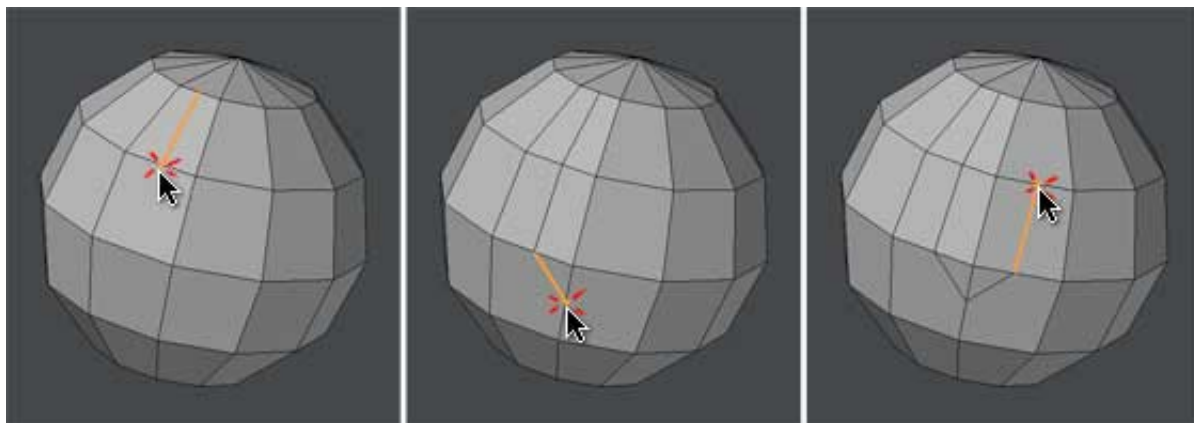
Mode - has the following two options:

> **Add** - just adds a new point along an edge.
> **Split** - adds a new point along an edge. In addition, if there are any polygons splitable with the current and previous added points, those polygons will be automatically divided.
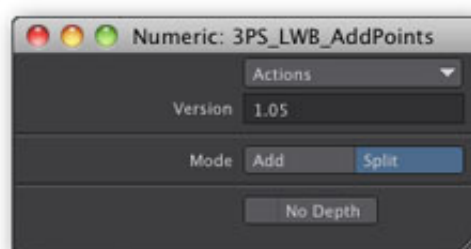
No Depth - Checking this will make the elements hidden behind other meshes clickable in a perspective viewport.

LWB Split

On the polygon you want to split, drag the first point into the second point, and the polygon will be divided along a line between those two points if splitable.
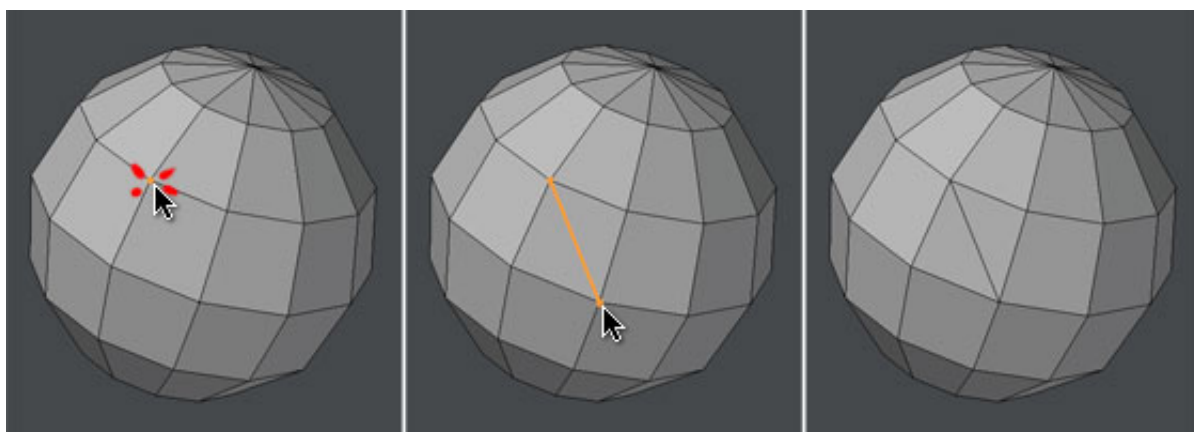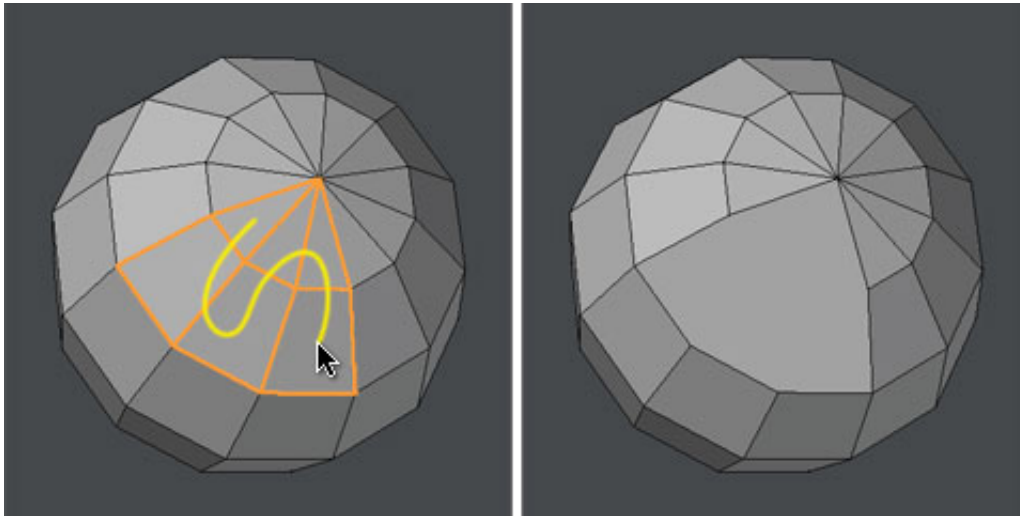

Safety - This option will avoid undesirable polygon splitting.

No Depth - Checking this will make the elements hidden behind other meshes clickable in a perspective viewport.
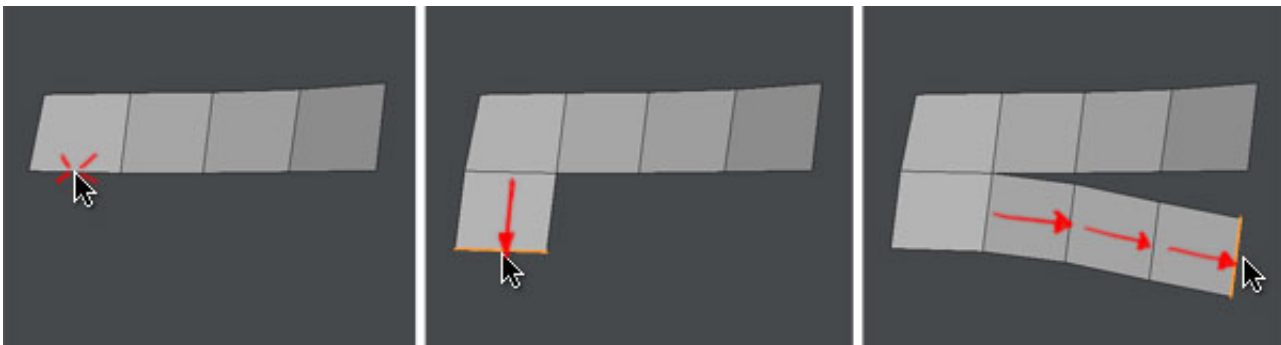
LWB Merge

With the tool active, select polygons by dragging, and then as soon as you release the mouse button, the selected polygons that share at least one edge will be merged into one polygon.
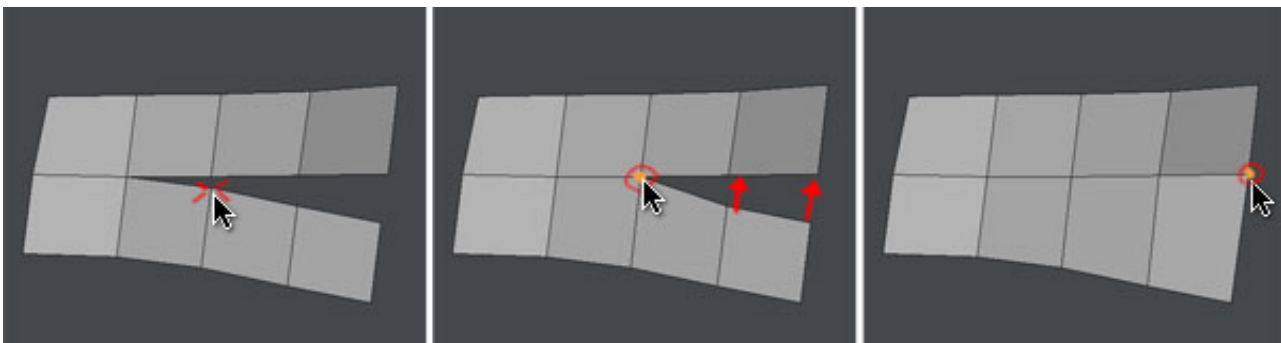

LWB Extend

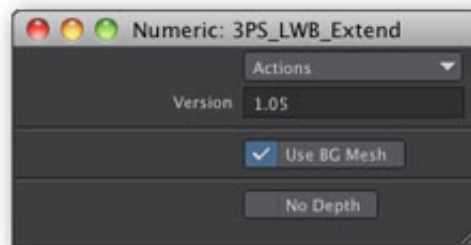Right-clicking and dragging on an open edge will create a new quadrangle (a four-point polygon) sharing the original edge.

You can also move an existing point by left-clicking. If you drag the point of the open edge, it can be snapped to and merged with another one of the points of open edges.
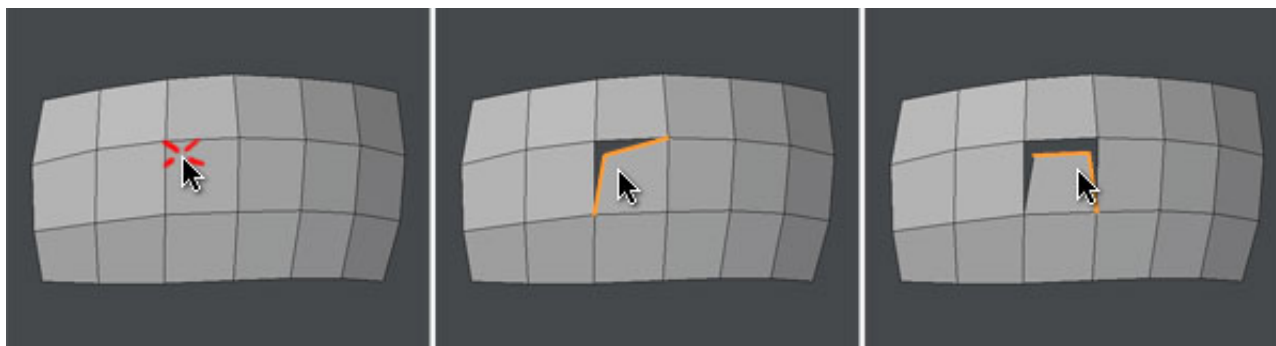
Use BG Mesh - If checked, the elements you are editing will slide along the background surface. This option is especially useful to use this tool in combination with the **LWB Topology** tool.

No Depth - Checking this will make the elements hidden behind other meshes clickable in a perspective viewport.


LWB Unweld

Right-clicking and dragging in the corner of a polygon will unweld its corner point, that is, the clicked corner point will be copied so that it is not shared by other polygons, and the two edges that share the newly created point become two open edges.


Just like the **LWB Extend** tool, you can move an existing point and also merge the points of open edges by left-clicking.
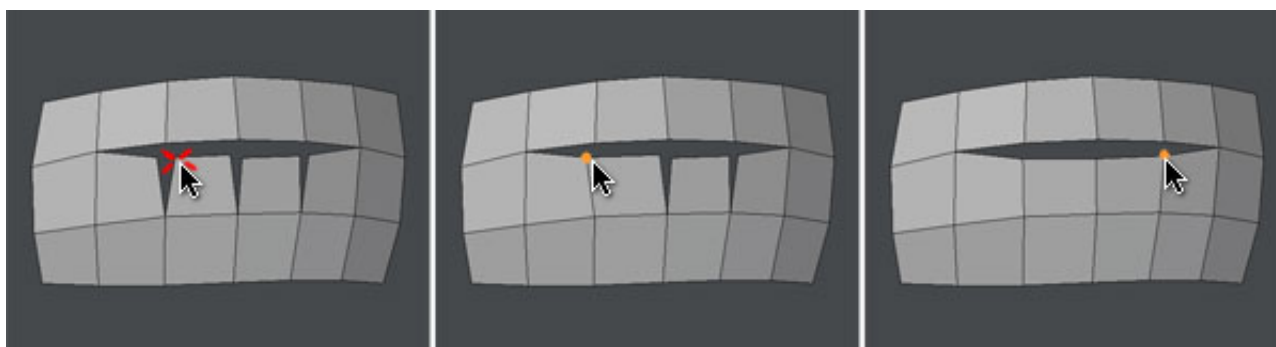
Use BG Mesh - If checked, the elements you are editing will slide along the background surface. This option is especially useful to use this tool in combination with the **LWB Topology** tool.

No Depth - Checking this will make the elements hidden behind other meshes clickable in a perspective viewport.
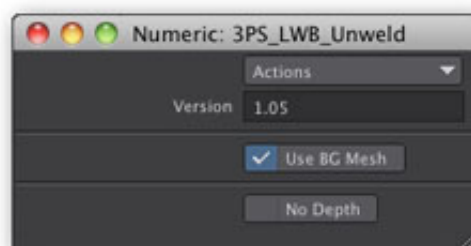
LWB BandSaw

LWB BandSaw is an improved version of **BandSaw** (It's a familiar tool to LightWave 3D users). Clicking on the edge of a polygon will slice through a contiguous band of four-point polygons, and you can adjust the cutting width by dragging on the edge until you release the mouse button. If there are any selected polygons, those polygons will work as blockers, and the polygons beyond them will not be cut.

> Since LightWave 11.5, you can also smooth out the part of the mesh within the brush's influence area by holding the Shift key down and left-clicking, instead of switching to **LWB Smooth**, and holding the Shift key and right-clicking will adjust the brush size.   `Version 1.05`

Type - has the following two options:

> **Percent** - The cutting width is determined by the percentage of each edge length. This can be useful for subdividing polygon meshes.
> **Uniform** - equalizes the cutting width of each edge. This is suitable for sharpening edges on a SubPatch object.

Percent   Uniform
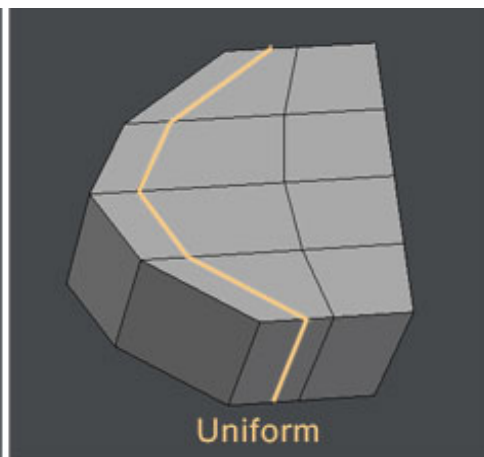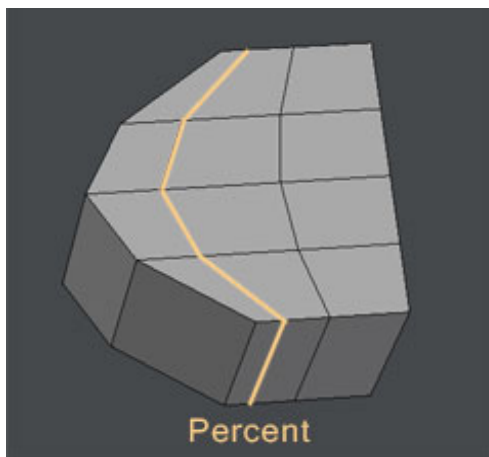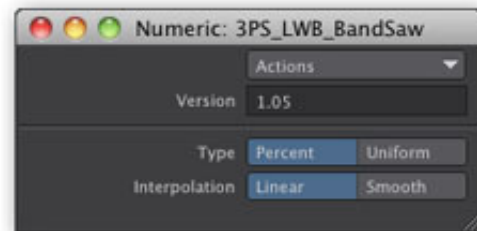
Interpolation - has the following two options:

> **Linear** - All the split edges are interpolated linearly.
> **Smooth** - All the split edges are smoothly interpolated along the curved surface. This is suitable for subdividing SubPatch objects.
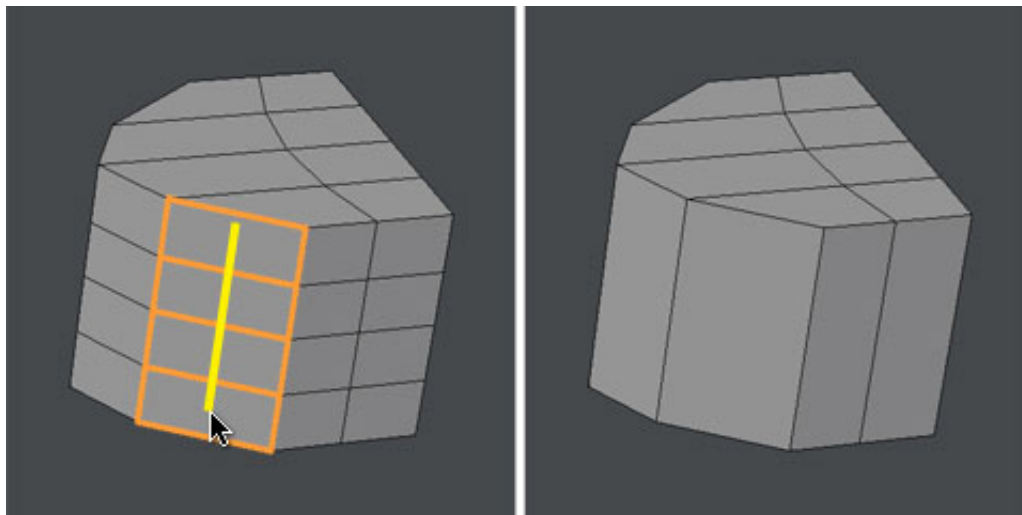

Linear   Smooth
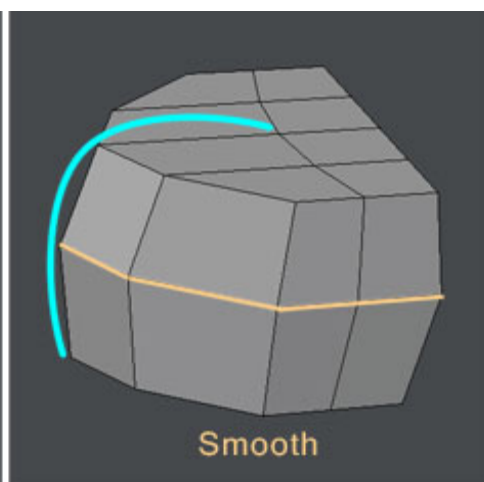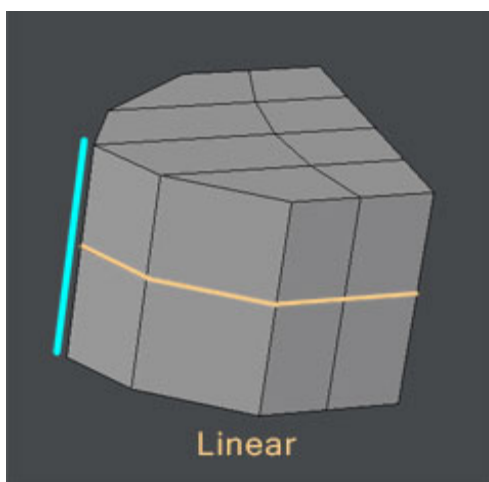
LWB BandGlue

LWB BandGlue is an improved version of **BandGlue** (It's a familiar tool to LightWave 3D users). This tool merges two or more contiguous bands of three- or four-point polygons into one contiguous band. With the tool active, click and drag on the polygons to select a contiguous row of two or more polygons, and then the bands will be merged as soon as you release the mouse button. This is a very handy polygon reducing tool.

> Since LightWave 11.5, you can also smooth out the part of the mesh within the brush's `Version 1.05` influence area by holding the Shift key down and left-clicking, instead of switching to **LWB Smooth**, and holding the Shift key and right-clicking will adjust the brush size.

LWB Knife

You can cut your objects with the cutting stroke you draw in any viewport. Left-clicking and dragging will draw a stroke curve. When the stroke's starting point and ending point are very close, the stroke curve is closed automatically. If the stroke curve intersects itself, it will be invalidated. You can also remove the clicked polygon island by right-clicking.
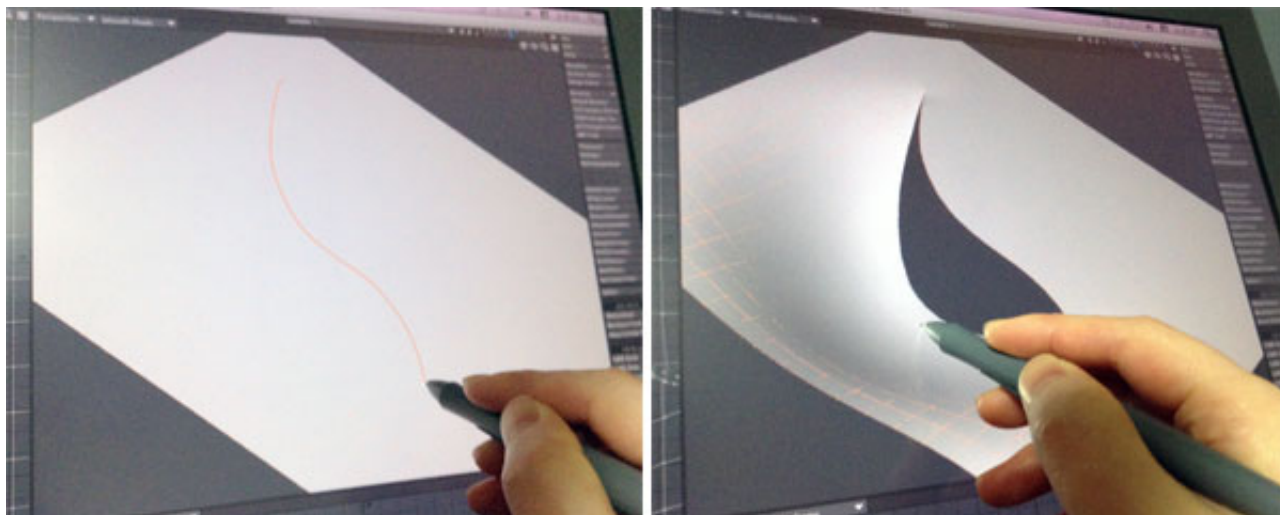
Mode - has the following three options:

> **Split** - just adds new closed edges onto your geometry with the cutting stroke. The original geometry is not divided into separate parts.
>
> **Skin** - adds new open edges onto your geometry with the cutting stroke. If the stroke curve completely crosses the geometry, the original geometry will be divided into separate parts.
>
> **Solid** - cuts off your geometry as closed 3D solids with the cutting stroke. The stroke curve must completely cross the geometry or be closed.

Split   Skin   Solid
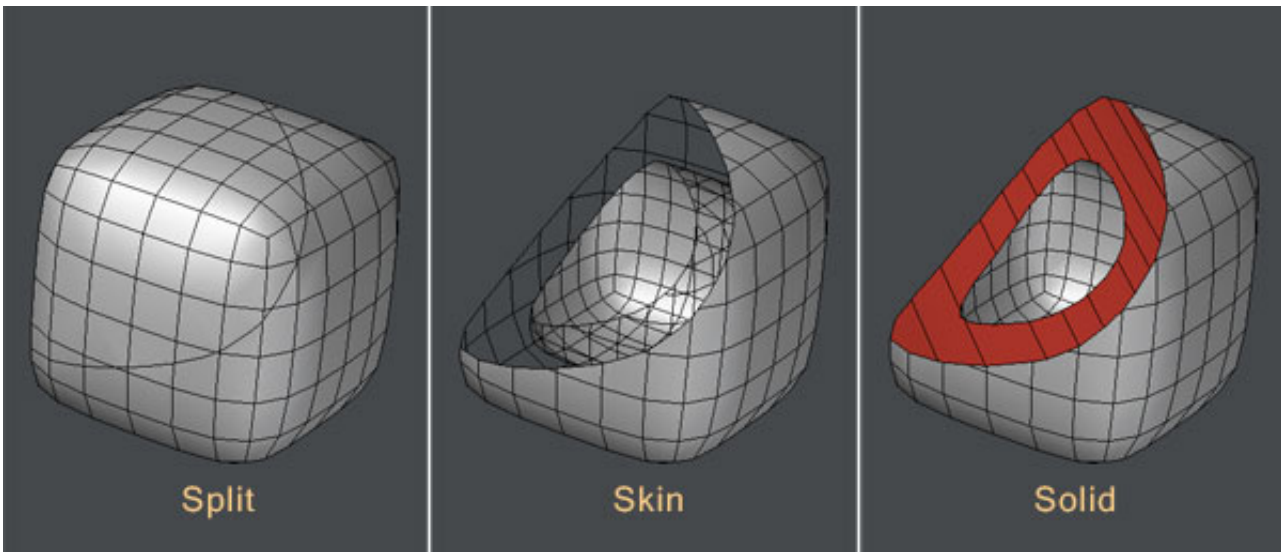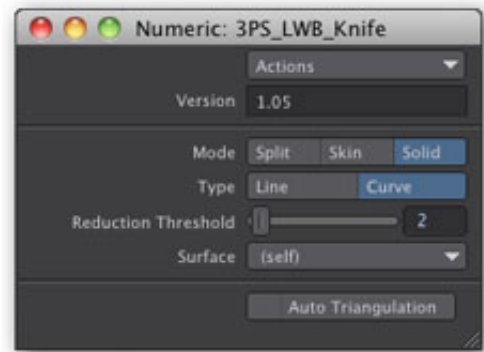
Type - chooses which type of stroke that you are going to draw, from the following two options:

> **Line** - makes a straight cut with a line segment connecting the starting point (where the mouse button is pressed) with the ending point (where the mouse button is released).
>
> **Curve** - cuts the geometry with a freehand curve.
>
> When **Line** is chosen, holding the **Ctrl** key will constrain the angle of a straight line to 15-degree increments.

Reduction Threshold - determines how largely the segments of the cutting stroke curve you are going to draw should be reduced. The larger the value, the fewer segments the stroke curve consists of.

Surface - specifies what surface name is going to be given to the cut polygons newly created in **Solid** mode.

Auto Triangulation - If checked, the polygons created by the edit will be automatically triangulated.

LWB Topology

A new mesh can be created with the topology curves you draw on the background surface. This tool is useful for retopology (rebuilding of the mesh), drafting meshes. Left-clicking and dragging will draw a topology curve on the background surface, and the polygon (or patch) will be interactively created in each of the enclosed areas surrounded by the topology curves. You can also remove the curves by right-clicking while editing. When you get the results you expect, you can accept them and exit the tool by tapping the spacebar. It is recommended to use this tool in combination with the **LWB Extend** and **LWB Unweld** tools. Those tools work well together.
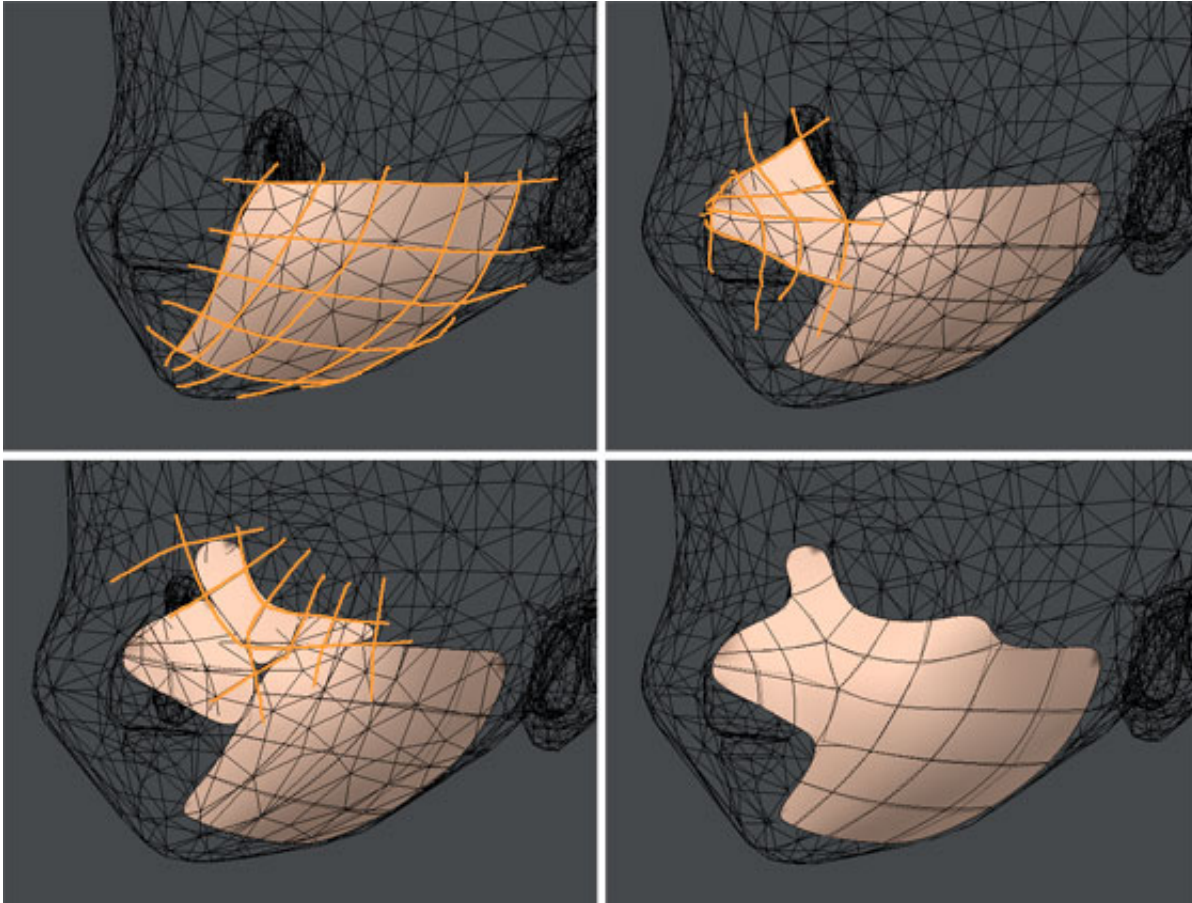
Type - determines the type of the newly created polygons. This has the following three options:

> **Faces** - creates a polygon mesh.
>
> **SubPatches** - creates a subpatch mesh.
>
> **CC Patches** - creates a CC(Catmull-Clark) patch mesh.

Surface - specifies what surface name is going to be given to the polygons created by the edit.