ZBrush 4R7 What's New Guide

Pixologic™
makers of ZBRUSH®

Welcome

Welcome to the What's New documentation for ZBrush® 4R7. While much of ZBrush® 4R7 is very similar to other releases in the version 4 series, there are quite a few new features to help make your ZBrushing even more productive and creative. We hope that the information you find here helps you understand the differences between this release and previous versions of ZBrush®.

This document only covers what's new in version 4R7. To learn more about the features introduced in previous releases of ZBrush® 4, we invite you to read the other ZBrush® 4 What's New Guides, located in your ZBrush installation's Documentation folder.

You're invited to visit our ZClassroom for a huge database of free high quality movies explaining all the main features of ZBrush®. Here you will also find the Artists Spotlight, where famous 3D Artists explain how they use ZBrush®, helping inspire you to create like the pros.

Don't forget to subscribe for free to our ZBrushCentral community with over 250,000 members to discover tips, view artists' creations, locate useful help for all things related to ZBrush® or post your works-in-progress!

We encourage you to regularly visit our ZBrush® Blog as well as our social media outlets where you will find all the news related to the ZBrush® universe, from the most recent Interview to new plugins or gallery additions.

ZClassRoom Portal: http://www.pixologic.com/zclassroom/

Artist Spotlight: http://www.pixologic.com/zclassroom/artistspotlight/

ZBrushCentral: http://www.zbrushcentral.com/

ZBlog: http://www.pixologic.com/blog/

Pixologic.com: http://www.pixologic.com

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The Pixologic Team

Mac OS X & Windows version of ZBrush®

Instead of the Windows Ctrl key, the Macintosh uses the Command (Apple) Key. This documentation will always refer to using the Ctrl key name, although it may sometimes list both as Ctrl/Command. When the Ctrl key is mentioned anywhere in the documentation a Macintosh user will want to use the Command key instead.

The same is true for the Windows Enter key, which the Macintosh calls Return. When seeing the Enter key mentioned anywhere in this documentation, a Mac user will want to use the Return key instead.

The Close/Quit, Hide, Minimize and Maximize buttons are located on the top right in Windows and at the top left on Mac OS X.

ZBrush Documentation Guide - version 1.00

This documentation has been written by Thomas Roussel, Paul Gaboury, Joseph Drust and Matthew Yetter

For all documentation questions and inquiries, please contact us at documentation@pixologic.com.

About ZBrush® 4R7

ZBrush 4R7 is the final iteration within the ZBrush 4 series before we move to ZBrush 5.0. As with our previous point releases, it doesn't simply make a few minor changes but rather is packed with major additions. In fact, 4R7 is one of the most extensive releases since ZBrush 4 came out.

With ZBrush 4R7, you will add another set of tools to your arsenal, expanding your artistic freedom and creativity. In particular: Array Mesh, NanoMesh and ZModeler with QMesh. All of these features are useful throughout the creative process, from initial creation of your model to beautifying your artwork. They allow you to stay within ZBrush for more of your workflow, doing things that were either impractical or even outright impossible to accomplish before now.

Beyond its feature set, the core of ZBrush is being reworked and 4R7 will be the first version of ZBrush that is released with optional 64-bit support. This will allow you to fully harness your machine's computing power, not only allowing for higher polygon counts but also making it possible for you the artist to create more art in less time!*

1. ZModeler

With ZBrush 4R7 comes the ZModeler brush. This smart polygonal modeling system is designed to simplify your creation process. Quickly and dynamically create new shapes, doing so more easily than ever before possible: fuse polygons, delete full blocks of geometry, connect parts with advanced paths, and repeat your actions with a single click!

With the ZModeler brush, ZBrush takes a quantum leap beyond the organics that it is already relied upon for. You can refine the shape of your model in real-time to revolutionize how you create hard surface models, architectural structures or highly detailed environments. The possibilities are endless.

2. Instances and Details

With the new NanoMesh and Array Mesh features, you as the artist can bring more complexity and detail to your work while still maintaining a low polygon count. Both NanoMesh and ArrayMmesh will allow for multiple instances of any object to be created and then adjusted in a matter of seconds.

3. Render with Complete Details - Surface Noise

With ZBrush 4R7 the BPR Render system will now render all Surface Noise as displacement, deforming the mesh to match the attributes of any procedurally created noise. It is like having a displacement map without needing to actually create the map. See extremely detailed results at render time regardless of polygon count.

4. ZBrush To KeyShot

With the ZBrush to Keyshot Bridge you can seamlessly connect ZBrush with KeyShot 5 to produce hyper-realistic and high quality images. If you don't already own KeyShot 5 or if its price is simply out of your reach, a "special edition" KeyShot for ZBrush is also available*.

The KeyShot to ZBrush Bridge changes your Best Preview Render (BPR) button to instead send your models to KeyShot with a single click. All associated data transfers automatically, including materials, displaced geometries, procedural noise, PolyPaint or textures -- and of course the new NanoMesh and Array Mesh. If ZBrush can display it, KeyShot can render it!

** The KeyShot for ZBrush edition is based on KeyShot HD functionality except for two points: It can only communicate with ZBrush (no importing from other packages) and there are no restrictions on rendering size. Luxion normally sells KeyShot HD for USD 995 but the introductory price to bundle of the ZBrush to KeyShot Bridge together with Keyshot for ZBrush is only USD 249. After the introductory period, the regular price will still be a terrific value at USD 349.*

5. 64-Bit Support

Push the boundaries of your imagination with the ZBrush 4R7 64-bit Preview Edition*. ZBrush can now tap all available computer memory and processing power for more details, even more complex models and faster operations.

**The official release of ZBrush 4R7 is a native 32-bit application. We are also providing a native 64-bit build as a Developer Preview. This 64-bit application has been tested and should work flawlessly, but since the 64-bit conversion is a major overhaul of the core programming, official 64-bit support will not be available until the release of ZBrush 5. Version 4R7 will be the final 32-bit release of ZBrush.*

6. ZRemesher 2.0

Retopologizing has never been as artist-friendly as with ZRemesher 2.0. With a single click, you can automatically produce organic or hard surface topology without spirals. If one-click topology isn't the right answer for every situation, you can intuitively take control of the re-topology process with curves to assist in determining polygon flow.

7. FBX Import/Export

To continue improving its integration with the artist's pipeline, ZBrush 4R7 introduces a new free plugin: FBX Import Export. This supports texture, normal and displacement maps, blendshapes, smoothing based on normals and much more!

8. Other Enhancements and Additions

As with past updates, ZBrush 4R7 doesn't stop at major features. It also includes numerous other additions which will improve your productivity and creativity. A few are:

- Replay Last can now be reapplied to any portion of the model.
- Background images applied with the Grid system can now be projected onto your model for a painted guide in your newest creations.
- Start any sculpt with the new polygonal Cube, Sphere and Cylinder primitives.
- Automatically center the TransPose line on any unmasked, partially visible or symmetrical piece of geometry with one click.
- Copy and Paste between Tools, SubTools and even Projects.
- And whole lot more!

We look forward to seeing your ZBrush® 4R7 creations and comments on our user forum: ZBrushCentral.com!

TABLE OF CONTENT

INSTALLATION UPGRADING & ACTIVATION

All the steps you need to install or upgrade ZBrush, as well as to leverage its activation system.

This is the useful information that you will need to know when installing and upgrading ZBrush® on your computer. This chapter also describes the activation and deactivation process. Understanding how the activation system works will help you avoid difficulties should you upgrade your computer, reinstall your operating system, etc.

1 System Requirements

Recommended:

- Operating System: Windows Vista or newer. Mac OS X 10.7 or newer. (32-bits or 64-bits for either platform.)
- CPU: Pentium D or newer (or equivalent such as AMD Athlon 64 X2 or newer) with optional multithreading or hyperthreading capabilities.
- 6 GB recommended.
- Disk Space: 750 MB for ZBrush, plus 16 GB for the scratch disk.
- Pen tablet: Wacom or Wacom compatible.

Notes:

The scratch disk may be a different drive from where ZBrush is installed.

Having ZBrush and its scratch disk running on an SSD drive will result in improved performance.

Minimum System Requirements:

- • Operating System: Windows Vista or newer. Mac OS X 10.7 or newer. (32-bits or 64-bits for either platform.)
- • CPU: P4 or AMD Opteron or Athlon64 Processor. (Must have SSE2 -- Streaming SIMD Extensions 2. All CPU's from 2006 or later support SSE2.)
- • RAM: 1024 MB (2048 MB required for working with multi-million-poly models).
- • Disk Space: 750 MB for ZBrush, plus 8 GB for the scratch disk.
- • Monitor: 1280x1024 monitor resolution set to 32-bits or Millions of Colors.

II Installation and Activation

ZBrush installation is based on an installer application, which is similar on both Windows and Mac OSX operating systems.

After downloading the ZBrush installer you can run it to be guided through the activation process.

For all the information about the process of the installation and activation, please read the "**Install_and_activate_ZBrush.pdf**" located in the ZBrush documentation folder or available to download at our Download Center: http://zbru.sh/docs or visit our online documentation website; http://zbru.sh/onlinedocs

It is **HIGHLY RECOMMENDED** that you make a backup copy of the installer after you have downloaded it. Download links are valid for two downloads or seven days, whichever comes first. Our Support staff is happy to renew your download link at any time but we also know from experience that people often need to reinstall on an evening or weekend when there is nobody available to assist you.

Special notes for Mac users:

1. The download is a Disk Image (DMG) file which mounts to be like any other disk on your computer. In some cases, a Finder window does not automatically open after mounting the DMG. If that happens, you will find it within your Devices list. Opening that will then allow you to run the installer itself.
2. Upon running the installer you may receive a message to the effect that it is from an unknown publisher. In this case you will need to disable Gatekeeper before you will be able to run the installer. Apple explains how to do this here: http://support.apple.com/en-us/HT202491

III Upgrading

Depending on your current ZBrush version and what you need to upgrade to, there are two upgrade paths available:

- Using a full installer to perform a “clean” install of a fresh new copy of ZBrush. This does not require any earlier version to already be on your computer.
- Using an upgrader (downloaded from our Download Center or through the Auto Upgrader system) which will duplicate your current ZBrush folder and then upgrade the copy without affecting your current installation.

The full installer takes longer to download, but is greatly preferred. Using it avoids any possible permissions issues. Also, if there are any problems with your current ZBrush installation (even those you might not be aware of), an update will copy those problems to the new installation! The full installer avoids that possibility. You will still be able to manually copy any desired files from the old installation to the new one.

If you do wish to use the update process instead of the full installer, please read the Auto Update chapter of this section.

IV Auto Update

ZBrush includes an Auto Update system which can check with the Pixologic® servers at your request to see if a new update is available.

This will support a variety of updates: Any upgrades ZBrush itself, the release of a new plugin, changes to existing plugins, GoZ upgrades, documentation changes, etc.

This process is initiated manually and is voluntary. It is recommended that you run it from time to time to see if a new update is available.

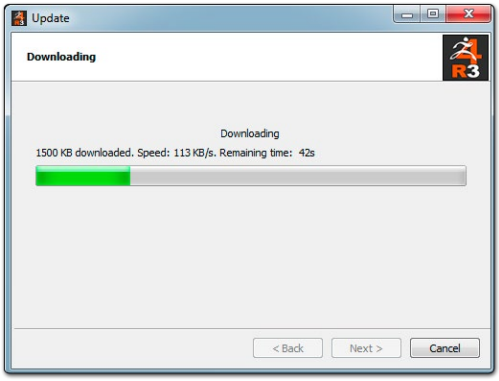
1. Auto Update In Action

The Auto Update is a separate application named ZUpgrader.exe (.app for Mac users), located at the root of your ZBrush folder.

This program can be executed by itself and when you wish to check for a new update or upgrade. Make sure that ZBrush is closed, then simply double-click ZUpgrader to run it.

An installer-like window will open. From there, simply follow the steps to check for any available updates. The application will tell you whether or not something is available for download.

- If no update is available, the software will automatically quit.
- If an update is available, the software will start the download. When the update has finished downloading, it will be launched automatically and guide you through the installation.



Auto Update in action.

The update installer is similar to the ZBrush full install process. Just follow the steps to install the new components. The Auto Updater will automatically place all files in their proper locations. When installation is finished the updater will close and you can launch ZBrush to enjoy the new features or changes.

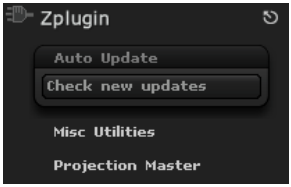
You will also find the update's installer as a new program in the root of your ZBrush folder. You can keep it for future use or simply delete it. We recommend that you keep the most recent update and delete any older ones.

Note:

Each new update will include all items since the most recent ZBrush version release. This means that if you've just installed ZBrush you will not need to download multiple updates – a single download will be all that's necessary to bring your installation up to date.

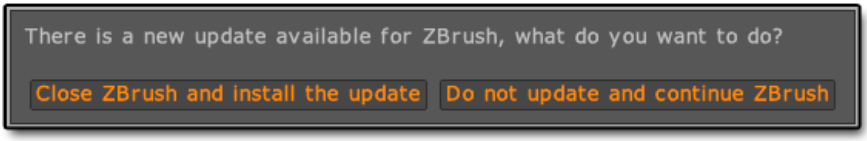
2. Auto Update Within ZBrush

The Auto Update process can be executed from within ZBrush via the Auto Update plugin located in the ZPlugin palette.



The Auto Update button in the ZPlugin palette.

When checking for an update, ZBrush will notify you whether or not a new update is available. You will then have the choice of continuing to use ZBrush or quitting ZBrush to run the Auto Update as described in the section above.



An update is available. Continue working and update later or quit ZBrush to install immediately.

Notes:

It is not possible to run ZBrush while updating.

In some cases, the Auto Update button will not launch the check. In that case, simply exit ZBrush and run ZUpgrader as explained in the previous section.

V Summary of the Activation Process

For new installations of ZBrush (and some upgrades) this step must be completed in order to run ZBrush successfully.

The single-user ZBrush license allows you to have ZBrush activated on two of your computers, provided that both copies are not actually used at the same time. For example it may be activated on a workstation and a laptop. Please keep in mind that only one copy of ZBrush should be run at any given time.

Volume licenses allow only the number of activations for which seats have been purchased.

Floating licenses do not use activation and can ignore this section.

For all information about the activation process, please read the “Install_and_activate_ZBrush.pdf” located in the ZBrush documentation folder. It is also available for download at our Download Center: http://zbru.sh/docs or by visiting our online documentation website; http://zbru.sh/onlinedocs

ZBrush activation window.

- Launch ZBrush.
- From the splash screen, select your desired activation method.
- **If your computer is connected to the internet** (or can be temporarily connect-

ed), use Web Activation. This activation method is faster and more accurate.

- After ZBrush has displayed the End User License Agreement window, your web browser will be opened to a page that requests your serial number, the email address associated with your account, and a description that you can use to identify this computer (should you ever need to see a list of your activations.)
- Upon submitting this form you will be given an activation code.
- Click the button to select the code, then press Ctrl+C (Windows) or Cmd+C (Mac) to copy it.
- Switch back to ZBrush and click the button to “Enter Activation Code”.
- A new window will open with a red text line.
- Click in that line and press Ctrl+V (Windows) or Cmd+V (Mac) to paste the activation code.
- Now press Enter/Return to complete activation.

The Web activation form

Or

- If your computer cannot be connected to the internet, use Phone Activation. PLEASE NOTE THAT DURING THE WEEK FOLLOWING THE RELEASE OF A NEW VERSION OF ZBRURH, HIGH CALL VOLUME MAY MAKE IT VERY DIFFICULT TO REACH SUPPORT FOR PHONE ACTIVATION.
- After ZBrush has displayed the End User License Agreement window, a new screen will open with your request code and a phone number to call. Please have your serial number ready before calling!
- When you call you will be asked for your serial number, request code, email address and desired computer description.
- An activation code will be created and sent to the email address on record for your account. If you cannot conveniently check your email, the phone representative will be able to read the 32-letter activation code to you.
- To enter your activation code into ZBrush, click the option to “Enter Activation Code”.
- Click in the red text line within the window that will open, type your activation

code and press Enter/Return to complete your activation.

Or

- Instead of calling, you may follow the steps above but write down the request code that ZBrush gives you.
- You may then shut down ZBrush.
- From any computer that has internet access you can submit a Support ticket at https://support.pixologic.com.
- In your ticket, provide the following information: The request code from ZBrush, your serial number, your email address, and your desired computer description.
- You should receive a response to your Support ticket within one business day (often within one or two hours) containing your activation code.
- At that point, launch ZBrush and choose the option to “Enter Activation Code”.

Note:

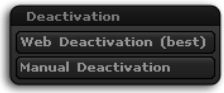
Do not start a new Phone Activation

- Click in the red text line within the window that will open, type your activation code and press Enter/Return to complete your activation.
- Once activated, ZBrush will start immediately.

VI Deactivation

If you plan to move ZBrush to a new computer or if you are going to reinstall your operating system, you can make everything easier by first deactivating your current installation of the software.

To do this, launch ZBrush and go to the Zplugin >> Deactivation menu. There are two options: Web Deactivation and Manual Deactivation



The Deactivation plugin in the ZPlugin menu.

Deactivation process:

If your computer has internet connection, use Web Deactivation. This will launch your browser to a page that asks for the email address associated with your account. Submit that form and then click the confirmation button to instantly complete your deactivation of ZBrush.

or

If your computer cannot be connected to the internet, you will need to use Manual Deactivation. In this case you will be given a deactivation code. HAVE SOMETHING HANDY TO WRITE THIS CODE DOWN – it can't be copied and pasted, and attempting to do so will cause its window to permanently close. You may either call the number on the screen to deactivate by phone (only available during normal business hours of 9:00 am to 5:00 pm Pacific Time, Monday through Friday) or you may submit a Support ticket at https://support.pixologic.com. Please note that by either method you will also be required to provide the email address that is associated with the account.

Note:

Once deactivation has been started, it is not possible to stop it. The moment you confirm your desired deactivation method, ZBrush will shut itself down and will not be able to be restarted without a new activation. However, the deactivation will not be credited back to your serial number until you have submitted the Web Deactivation form or contacted Support with your manual deactivation code.

VII Activation Troubleshooting

"Activation Failed" after entering activation code:

- **Disable antivirus software**. Such programs can prevent ZBrush from writing its license information successfully. If they were perfect and never made mistakes, they wouldn't give you a way to disable them!
- Make sure **you are not trying to use your serial number as an activation code**. Serial numbers are 16 characters in length, with both letters and numbers. Activation codes are longer and have all letters. You will never enter your serial number directly into ZBrush. It is always used via Web or Phone activation to create an activation code.
- Make sure you are not trying to use an outdated activation code. Any time you install ZBrush you must begin with a new Web or Phone activation to create a new activation code. Codes from previous activations cannot be reused.
- Make sure that your system clock is set to the correct date, including year. If the date is wrong, activation will fail. After correcting the date you will need to start the activation process over from the beginning.
- Make sure that you are logged into the computer as an administrator when installing and activating ZBrush. After it has been activated it may be run by any user on that computer, but the initial installation and activation must be done under an admin account.
- (Windows Users) Right-click the desktop shortcut for ZBrush (or the ZBrush.exe in your ZBrush folder) and choose "Run as Administrator" from the context menu. This launches ZBrush with elevated permissions which help resolve most activation issues. Simply being logged into the computer under an administrator account does not automatically elevate the programs you run to administrator-level permission. After choosing "Run as Administrator" you should see a pop-up message from Windows asking if it is okay to proceed. If you do not see this message, go to the Windows Control Panel's "User Account Control Settings" section to ensure that its slider is set to the default setting of "Always Notify". Without the user account control pop-up, Windows doesn't actually give administrator-level permission to the desired program, even though you specifically chose the "Run as Administrator" option!
- (Mac Users) If you launch ZBrush and immediately receive an error message (such as a virtual memory error) that must be resolved before activation can be done successfully. This error is typically caused by permissions. For most environments, simply get info on the ZBrush folder. Unlock permissions and then assign Read & Write permission to the "Everyone" user group. Next, click the gear icon underneath the users list and choose the option to "Apply to Enclosed Items". When the process completes you should be able to launch ZBrush without an error message and may then proceed to activation.

If the above troubleshooting items do not resolve your issue, please contact Pixologic Support for assistance. Make sure to state from the beginning that you have already

tried activation and it failed. Phone activation uses the same system as Web activation, so if Web activation failed you will have the same problem with Phone. We need to resolve the issue rather than just trying under a different method.

VIII Un-installation

This process completely removes ZBrush from your computer.

Un-installation process:

1. In the ZPlugin menu, choose Web Deactivation and proceed with license deactivation as explained above. If you do not deactivate prior to un-installation, the un-installed machine will continue to count against your serial number and potentially prevent you from reactivating!
2. On Windows, use the Windows Control Panel uninstall utility and follow the steps. On Mac OS X, simply move the Applications/ZBrush folder and the Users/Public/Pixologic folder to the Trash.
3. During the un-install process, depending on the Version of ZBrush you are using, the Uninstaller may ask you if you want to keep your GoZ files. Always answer “Yes” if you are removing an older version of ZBrush after having upgraded. If you answer “No”, GoZ won’t work anymore because most of its components will be deleted by the un-install process.
4. After the un-installer has finished, check the location where ZBrush had been installed. There will often be extra files which remain. You can delete those folders if you do not intend to use ZBrush on this computer again.

Note:

With the exception of GoZ and the various files in the ZBrushData shared/public folder, ZBrush doesn’t write files outside its own directory.

IX Support Registration

It is required to have a current Support account at http://support.pixologic.com in order to receive technical support for ZBrush. This account is free.

If your purchase was of ZBrush 4R5 or earlier, you won't have a Support account unless you specifically created one yourself! Having activated an earlier version of ZBrush is not the same as having a registered Support account. The Support system is an independent platform. It does not use any existing log-ins that you might have for ZBrushCentral, Cleverbridge or any other ZBrush-related sites.

Note:

Purchases of ZBrush 4R6 and later required having a Support account to be able to complete the purchase or get your serial number. If your first version was ZBrush 4R6 or later, you will have a Support account already and can skip this section.

If you have not already registered on the Support site:

1. Go to https://support.pixologic.com.
2. Click the Register icon.
3. Enter your email address and whatever password you would like to use for the Support site. These will become your login info for the future.
4. Fill in your system information. We need this info in order to respond to your support requests more efficiently.
5. Also provide your ZBrush 4x serial number for your copy of ZBrush. This information identifies you as someone who has actually purchased a ZBrush license. (If you have upgraded from an earlier version of ZBrush 4, your serial number will remain unchanged. All versions of ZBrush 4x use the same serial number.)
6. After you submit the form you will receive a confirmation email at the address you used to register. Follow the instructions in that email to complete your registration.

If you have already registered on the Support site:

You do not need to change any information.

At any time, you can go to https://support.pixologic.com to view your past tickets or create a new one.

X Backward Compatibility of ZBrush Files

ZBrush files are not backward compatible, which means that your files created with the most recent version of ZBrush won't be compatible with any older version.

For example, if you have a file that you'd been working on with ZBrush 4R3 and then save it using ZBrush 4R7, you will no longer be able to open it in version 4R3.

Different versions of ZBrush can be used together with GoZ due to the fact that its main components have remained the same, but it's not possible to work on the same project between multiple versions of ZBrush at the same time. Once a file has been created or saved in a newer version of ZBrush, it will not be able to be opened by any earlier version.

GoZ cannot get around this restriction. It can be used to open files from earlier versions of ZBrush but it cannot be used to send files to an earlier version. The only way to get a file into an earlier version of ZBrush than it was last saved in is through the OBJ format.

ZMODELER

Subdivision Surface Modeling in ZBrush

The ZModeler is a new brush containing a set of polygonal modeling functions that will allow you to quickly generate a wide variety of shapes -- from environmental assets to parts for your next IMM brush. This new brush is for extremely low resolution modeling and will give you the control to build just about any base mesh or object with as few polygons as possible. With its unique snapping ability you will also now find it even easier than ever to create holes, add edge loops, or maybe even create your very own robot.

The workflow is quite simple and is based on two main principles: Targets and Actions.

The ZModeler brush has a set of Smart Targets, such as a "Single Polygon", "PolyGroup," or "PolyGroup Border." These Targets remove the need to manually perform selections before performing a modeling Action.

The ZModeler Brush contains most of the common functions found in 3D-modeling packages but also has a few smarter ones like the QMesh Action. Not only does this offer you the ability to extrude but also to fuse the extrusion with any adjacent or crossed polygons. The QMesh Action also allows you to quickly remove blocks of polygons, move pieces of geometry or extract parts of your mesh to create new polygonal islands. You will find that QMesh will become your primary poly Action.

The ZModeler brush contains thousands of Action and Target combinations, putting astonishing power behind something that is so easy to learn and use. With just a little practice, ZModeler and QMesh will undoubtedly become a new favorite in your arsenal for creating low res geometry assets in ZBrush.

I Introduction to the ZModeler

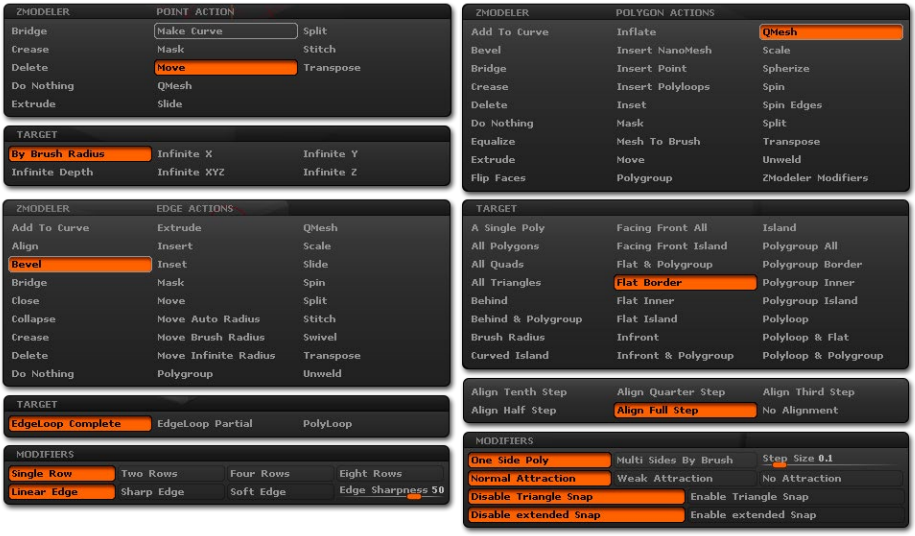
To access the ZModeler toolset, you need to first select the ZModeler brush in the Brush palette (or pop-up). You can do this quickly by typing the letter B on your keyboard, followed then Z then M. (You can also assign a hotkey to the ZModeler brush.)

The ZModeler functions are controlled via a dedicated pop-up window. You can access this menu in two different ways. Hover over the 3D model before:

- Pressing the space bar (advised)i
- Right-clicking

Note:

Right-clicking or pressing the space bar while the cursor is over empty canvas or a non-selected SubTool will trigger the default pop-up menu with its sliders/selectors.



The Point, Edge and Polygon pop-up windows of the ZModeler. Notice the differents sections, especially for the Polygon, with on top the Actions, then the Targets, followed by the Options and then the Modifiers.

The ZModeler popup is composed of 4 areas. Some of these are only visible when specific items are selected.

- **Action**: This is where you select the function to be performed on the 3D Model.
- **Target**: This tells ZModeler how to interpret your click on the model when applying an Action. For example, do you wish to affect a single polygon or an entire flat surface?

- **Options**: Parameters which change how the Target or Action behaves. Not all the Targets or Actions have options.
- **Modifiers**: Operators which alter interaction while doing the operation. Not all the Targets or Actions have modifiers.

Note:

Options and Modifiers are very similar. They have been split mainly to make the operations easier to understand. An example is the Bridge Action which has different presets of curves for the options (like circle, curve or small rounded corners). Modifiers then refine this to define if the shape creation is interactive or predefined with parameters (which can be set).

Select an Action and a Target, then adjust any options or modifiers as necessary. Now click on the model to perform the Action.

Each Action is performed by clicking on a point, edge or polygon to begin the Action and then dragging continue it. Depending on the Action, you will get different results by dragging the mouse left/right or up/down.

The ZModeler brush also has a Replay function allows you to apply a duplicate Action with a single click. Please refer to the Replay the Action chapter for more information.

Because ZModeler is a brush rather than a special mode you at any time switch between it and other sculpting features. As a polygon-based brush, it is compatible with all the PolyMesh3D compatible features.

1. Context-Based Actions: Points, Edges, Polygons and Curves

The ZModeler set of Actions are context-sensitive. When positioning your cursor over a point, edge, polygon or compatible curve, specific ZModeler Actions will be accessible. The content of the ZModeler menu will also differ depending on what your cursor is hovering over.

It is very important to highlight specific topology elements to have access to the Actions that can be performed on it. Some Actions may have similar functions for points, edges and polygons but their behavior can be totally different. As an example, the Edge Bridge Action can create very powerful connections between two openings while the Point Bridge will create an edge between two clicked points. Please refer to the chapters explaining Actions to learn these various functions.

2. Restrictions

ZModeler only works with PolyMesh3D objects. You need to convert your primitives (via Make Polymesh3D) or ZSpheres (via Unified Skin or Adaptive Skin) to PolyMesh3D before using the ZModeler.

If you are using ZModeler on an existing model, you also need to consider its polygon count. ZModeler works in a different way from other brushes in that it's not designed for models with millions of polygons. It is designed specifically for direct editing down to the individual polygon.

ZModeler is mean to work on models which have no subdivision levels. It is possible to work on a model with subdivisions, but you will need to use the Tool >> Geometry >> Freeze Subdivision Levels first or delete the other levels.

To allow you to see how your model will appear with more subdivision levels, use the Dynamic Subdivision system. This system was specifically designed to work with the ZModeler brush, providing real-time high resolution display while you work directly on the base level. Please refer to the Dynamic Subdivision chapter for more information.

ZModeler only functions with quadrangles and triangles; it does not support n-gons. When an Action would create topology with possible n-gons, ZBrush automatically creates extra edges to produce topology with only quads and tris.

II The ZModeler Brush: Actions and Targets

The ZModeler brush is a whole modeling universe by itself. It contains a vast array of functions that can be applied to multiple Targets, resulting in hundreds of combinations of modeling possibilities within ZBrush.

To make the process easier to understand and not create a restricted set of tools, the ZModeler functions are split into two different elements: the Action and the Target.

- The **Action** is the function itself, such as Extrude Move, Bridge or Split.
- The **Target** is the element to which the Action will be applied. This can be individual points, edges or polygon as well as smart compound selections such as borders, PolyGroups, edge loops and more.

Taking the Poly Move Action as an example: The Action contains Targets such as Move Poly, Move All Mesh, Move Brush Radius, Move Curved Island, Move Flat Island, Move Island, Move PolyGroup All, Move PolyGroup Island, etc. (More may also be added in the future.) The same Move Action when applied to points or edges is associated with different Targets, offering even more tools for your modeling process.

It is up to you to define the tool you need for your modeling at the moment by combining the desired Action with the best Target.

To display the list of Actions and Targets, you must have the ZModeler brush selected and hover over a point, edge, or polygon of a Polymesh 3D model. By right-clicking or pressing the space bar, the ZModeler context pop-up menu will appear, displaying Actions with Targets beneath them.

The displayed Actions and Target will depend upon exactly what the cursor is hovering over, with different items being show for points, edges or polygons. If you are looking for a function that you can't find, it may be because you were not hovering over the correct part of the mesh before opening the ZModeler pop-up menu.

III Options and Modifiers

In association with the Actions and Targets there are additional options and modifiers able to be applied to the selected Action. Not all Actions have options and/or modifiers. Also, the selection of a specific Target can enable or disable what is available.

A good example is the Bridge Action for polygons. It has two Targets: Connected Polys and Two Polys.

- When selecting Connected Polys, the ZModeler context menu displays two new sections just below the Target. The first of these is a list of options and below that, a list of modifiers.
- Now if you switch the Target to Two Polys, the previous options and modifiers for Connected Polys disappear and the area where they had been will be blank. This is because Two Polys is very straightforward and has no need for additional settings.

For each Action, the corresponding options and modifiers will be explained in their dedicated sections of this documentation.

The default settings for the options and modifiers are always displayed first. If you need to reset the options and/or modifiers, simply select the left-most one in each line.

IV Edge Selector Widget

Some Actions require directional information to guide ZBrush to results you are looking for. When hovering over the polygons or points of your model you will notice visual widgets that represent directional information.

ZBrush's selection system has a priority order: Each time that an element is highlighted, ZBrush considers its position relative to the surrounding geometry. When highlighting a vertex, ZBrush also looks at the adjacent edges and faces while doing any calculations. Some Targets (like Polyloop when used for a Poly Action) rely detection of the adjacent edges to determine in which direction the Action will function. The Edge Selector Widget simply makes this "sub-element detection" visible.

1. Highlighting a Point:

An orange line extending from the point indicates the direction of the Action operation. Along with this point, some Actions will also look at the face that is highlighted when hovering over the point. If the selected Action needs directional information it will refer to these two widgets. Simply move the cursor around the point to change the direction of the widget and thus, the Action.

2. Highlighting an Edge:

There is no indication of direction needed when working with edges as the edge by itself gives the direction. However, hovering over an edge will highlight faces as well. Some Actions also use the edge's midpoint to determine their direction.

3. Highlighting a Polygon:

An orange line located between the highlighted polygon's center and edge closest to the cursor indicates the direction of the Action operation. Moving around the poly will change which edge this line points to.

V The Do Nothing Action

Each point, edge, polygon and curve menu has a Do Nothing Action. This Action prevents use of its associated element when hovering over the mesh. This is helpful if you want to only preform certain Actions by blocking mis-clicks.

For example, if you enable the Do Nothing action for points then clicking on a point will result in the Action being applied to the associated edges instead. If you also enable Do Nothing for edges then you will only be able to affect polygons even if you click on a point or edge by mistake.

VI Working With PolyGroups

PolyGroups (which are groups of polygons identified by a specific color) are an essential part of the creation process with ZModeler.

ZModeler has an extended toolset of functions to create and manipulate PolyGroups, such as using them as a Target so that an Action will affect all polygons belonging to the same PolyGroup, no matter where they appear in the mesh. PolyGroups can also be modified in the in the Tool >> Polygroups sub-palette.

1. Propagation of PolyGroups

The current PolyGroup remain the same until you decide to assign a new PolyGroup after an Action. Several Targets specifically use the PolyGroups while most Actions will either create or propagate PolyGroups. Depending on your needs, you can use the PolyGroup Action to create new PolyGroups before applying another Action.

An example of this: Using the Extrusion Action will maintain the existing PolyGroup for the top part of the extrusion while creating a new PolyGroup for the sides. Continuing this Action elsewhere on the model will continue produce identical PolyGroups unless you instruct ZBrush otherwise.

2. Temporary PolyGroup

When modeling there may be times when no specific Target fits the selection you are looking for. Or perhaps you may simply want to extend an existing Target with extra polygons from another location. For this purpose, ZModeler has an integrated Temporary PolyGroup which is always displayed as white.

To apply the Temporary PolyGroup, you must be working with a polygon Action. If so, simply Alt+click the desired polygons. These polygons will turn white to indicate that they are part of the Temporary PolyGroup. You can also click and drag to paint this Temporary PolyGroup.

Alt+clicking a white polygon will remove it from the Temporary PolyGroup selection.

You are free to continue editing this Temporary PolyGroup until you execute an Action.

The Temporary PolyGroup always adds to the current Target. As an example, if you

are selecting an Extrude Action with a Polyloop Target and create a Temporary PolyGroup out of polygons not belonging to the poly loop you are looking for, the Action will extrude both the poly loop itself and any polygons belonging to the Temporary PolyGroup.

3. Changing of PolyGroups During an Action

While editing your model, it may happen that you would need a different PolyGroup from what is being created by the Action. While still applying the Action, simply tap the Alt key once to change the PolyGroup to another one.

The actual color of a PolyGroup is irrelevant to any Actions or Targets but sometimes PolyGroup colors might be too similar for you to be able to easily tell the groups apart. If you don't like the color that ZBrush gives you, tap Alt again and repeat until you find something that you're satisfied with.

Not all Actions permit you to use Alt to change the PolyGroup color. This is because they use the Alt key as a modifier.

Note:

Be careful to not tap the Alt key until after you have started executing the Action. Otherwise you could end up changing the Target instead or even add polygons to the Temporary PolyGroup.

4. Copying an Existing PolyGroup

The Temporary PolyGroup is useful for one-off selections but you will sometimes want to keep coming back to the same Targeted polygons. In this case, you can apply an existing PolyGroup to another location. With the PolyGroup Action, it is possible to pick a PolyGroup identifier and color, then copy and store it for the next Action.

To do this, follow these steps:

1. Select the PolyGroup Action
2. Select the A Single Poly Target
3. Hover over a polygon belonging to the desired PolyGroup.
4. While clicking and holding on this polygon, press (or tap) the Shift key. ZBrush will copy the clicked polygon's PolyGroup. Release the click.
5. Now click on another polygon to paste the PolyGroup.

You can do this on multiple locations. Try it also with other Targets, like Polyloop to apply the same strips of PolyGroups on multiple polygons.

VII Replay the Action

Because some polygonal modeling Actions are repetitive by nature, the ZModeler brush stores all settings and values used in your last Action. You can then simply click once on another part of the model or choose another Target to instantly reproduce that last operation.

During the modeling session, each Action stores all the parameters or settings, elevation and values. You can perform an Action, switch to another Action to perform its operation, then switch back to the previous one and with a single click replay the same operation. The Replay Last Action feature works for all ZModeler Actions.

To demonstrate:

1. On a simple plane, use the Polygon Extrude on a single face to extrude a column.
2. Click other polygons on the grid to create additional columns at those locations. They will all have the same elevation.
3. Now choose the Polygon Delete Action and delete the top polygon from each column.
4. Select the Edge Bridge Action with the Two Holes modifier. Click on a first hole, then click and drag on a second hole to produce a bride with a specific elevation and tessellation.
5. To reproduce this same bridge with the same settings, just click the holes at the top of another couple of columns.
6. Select Polygon Extrude again and click another polygon on the grid. You will get a column that is identical to the first ones you created, even though you used different Actions and adjusted their settings since creating the first columns.

VIII ZModeler and Masking

Like all other ZBrush functions, the ZModeler brush is affected by any masks on your model. Additionally, you can temporarily change to the current Mask brush by using the standard hotkey. (Ctrl)

The default masking behavior will prevent Actions from affecting the masked points, edges and/or polygons.

A Masking Action is available in the ZModeler brush to produce quick masks based on Targeted points, edges and/or polygons. Once masked using these Actions, the model can be manipulated with TransPose for accurate transformation.

There is also a TransPose Action that masks the entire model except where Targeted, then automatically switches to TransPose mode.

When working with a mask, keep in mind that its representation is based on the points of the topology (just like Colorize PolyPainting). With very low resolution models it can be difficult to visualize the mask.

All the masking functions found in the Tool >> Masking sub-palette work with ZModeler.

IX Point Actions

In this section we will cover the different Actions that can be applied to the points of a model. To access the point menu when using the ZModeler brush, hover over a point and right-click the mouse or press space bar.

Some Actions operate in a specific direction. In this case, pay attention to the Edge Indicator so that you can control how the Action will be applied.

Targets are described in later sections of this documentation.

Bridge

The Bridge Action connects two selected points and establishes an edge between them. To perform this operation, the two points must share the same polygon. Since ZBrush is based on triangles and quads the Point Bridge function cannot be used to create an edge or set of edges which connect two distant points.

The different Targets associated with the Bridge Action define how this point Action will be applied to the model. The Ring Target connects the clicked point to all the points of the shared polygons it is attached to, while the Two Points Target connects two points by clicking them in succession.

Modifiers (only with Ring Target)

- Crease Ring, Do Not Crease: Opt to apply creasing to the edges created by the Bridge Action.
- Regroup Ring, Do Not Regroup: Opt to change the created edges to a new PolyGroup.

Crease

The Crease Action applies edge creasing to the edges connected to the clicked point

Alternative Operations

- Alt+click: Uncrease an already creased edge and vice versa.

Delete

The Delete Action removes the clicked point, creating a hole in the model. By default, ZBrush creates triangles around the deleted point, deleting half of them.

Do Nothing

The Do Nothing Action is an empty Action. When this is active it will prevent the possibility of accidentally performing a Point Action while using the ZModeler Brush. If you know that you only want to use Poly or Edge Actions, having this active and hovering over a point will instead result in a Poly Action.

Extrude

The Extrude Action creates an extrusion from the targeted point by clicking and dragging. This Action will create a pyramidal shape perpendicular to the extruded point.

The position of the cursor around the point defines which of the connected edges will be transformed during the extrude Action. To see this, move your cursor slightly around the point; you should notice the highlighted connected polys change to show the direction of the extrusion.

The extruded polygons will receive two PolyGroups: One for the extruded face and another for the polygons connected to the extrusion. Performing additional extrusions will keep the same PolyGroups until another type of Action is performed.

Alternative Operations

- Ctrl: Stop the extrusion process and switch to a Move Action.
- Shift: Move the point along its normal.
- Alt: Change the PolyGroup of the extruded part.

Make Curve

The Make Curve Action creates a curve point-by-point, corresponding to the points clicked on the 3D mesh. This created curve can be used by other Brushes, such as the Curve Tube brush or ZRemesher Guides brush. It can also be used by ZModeler's Curve Actions.

Mask

The Mask Action applies a mask to the clicked point (or corresponding auto-masking), preventing that point from being manipulated until the mask has been cleared.

Clicking on multiple points is possible and will let you protect multiple points as needed.

Move

The Move Action lets you freely move the selected point relative to the screen's working plane.

Alternative Operations

- Shift: Constrains the Move Action along the closest X, Y or Z working plane. It is important to move your camera to an aligned angle before using the Shift modifier with a Move Action.

QMesh

The QMesh Action creates an extrusion of targeted point by clicking and dragging. This Action will produce a pyramidal shape perpendicular to the extruded point.

The position of the cursor around the point will define which of the connected edges are to be transformed during the QMesh Action. To see this, move your cursor slightly around the point; you should notice the highlighted connected polys change to show the direction of the QMesh extrusion.

By default, the QMesh operation is exactly the same as the Extrude Point Action, except that:

- The created mesh will attempt to fuse with the adjacent polygons, including merging with any polygons that are crossed during the operation.
- The created mesh can be completely deleted when performing an extrusion that crosses an existing polygon that is connected to the extruded polygons.

Draw Size impacts the detection of the fusing operation: A small Draw Size generates a stronger fusion attraction while a larger Draw Size generates a lower fusion attraction.

Options

- Full, Half, Quarter Step: Define the number of steps that the QMesh extrusion

will have between the clicked points and the maximum height, when it's connected to an adjacent polygon. These modifiers have no effect when the extruded point is not able to fuse with adjacent polygons.

Alternative Operations

- Ctrl: Stop the extrusion process and switch to a Move Action.
- Alt: Change the PolyGroup of the extruded part.

Slide

The Slide Action shifts the clicked point along the path of its connected edges.

Note:

The Edge Selector widget indications have no impact on a Slide operation. The point will freely move along all connected edges.

Split

The Split Action creates a circle shape with its center on the clicked point position. This Action is very handy when creating tube-like shapes starting from existing geometry.

Point Target Modifiers

- Keep Quad Center, Triangulate Center: This modifier toggles whether to allow the generation of triangles when creating the split shape.
- Crease Ring, Do Not Crease: Toggles whether to apply creasing to the created edges.
- Regroup Ring, Do Not Regroup: Toggles whether to generate a new PolyGroup for the created polygons.

Ring Target Modifiers

- Crease Ring, Do Not Crease: Toggles whether to crease the created edges.
- Regroup Ring, Do Not Regroup: Toggles whether to generate a new PolyGroup for the created polygons.
- Equalize Radius, Do Not Equalize: Toggles whether to modify the created points so that they fit a circle.

Stitch

The Stitch Action allows you to weld adjacent points on your model together. You must first click one point, then the one to be welded to it.

Point Target Modifier

- To End Point, To Mid Point, To Start point: Define in which direction the points will be welded together: at the second point's position, at a location exactly between both points, or at first point's position.

TransPose

The TransPose Action automatically masks all points except the clicked one and switches to TransPose mode. You are then able to perform all the usual TransPose operations on the clicked point.

Please keep in mind that while using TransPose, you are no longer in Edit >> Draw mode. This means that the ZModeler brush will be deselected. To continue using ZModeler, return to Draw mode.

Note:

Don't forget to remove your mask before attempting other operations.

X Edge Actions

This section explains the different ZModeler Actions that can be applied to the edges of a model. To access the Edge menu, simply hover over an edge and either right-click or press the space bar.

Edge Actions may generate different results depending on which Target option is chosen. The descriptions of the Targets are available in later chapters of this document.

Add to Curve

The Add to Curve Action will generate a curve corresponding to the selected Target. The created curves can later be used with Curve Actions or other Curve brushes.

Note:

Curve Actions are only available when a Curve exists on the model.

Align

The Align Action will take a series of edges in continuous order and unifies their positions based on the selected modifier.

Before using the Action you must establish the first and last edges of the poly loop you want to affect. After clicking the last edge you will be able to align the edges in various ways such as a straight line or a partial circle.

Modifiers

- Bezier Curve, Spline, Circle, Arcs, Arcs and Line, Round Corners, Small Round Corners, Tight Round Corners: Define the shape of the edges aligned between the two clicked one.
- One Line: Produces a flattened strip of polygons between the two clicked edges.

Options

- Interactive, Specified Curvature: Defines the curvature of the alignment, either interactively or through a numerical value.
- Align to Normal, Tangent: Defines how the alignment will initially be calculated, based on surface normal. This option is not used when the One Line modifier is selected.
- Overwrite, Additive Position: Defines if the curvature that is generated by the

alignment is replacing the existing edge position or is added to the existing position, creating an offset in the alignment.

- Variable, Constant Width:

Bevel

The Bevel Action generates a new planar surface along the edges corresponding to the selected Target. The width of the bevel is determined by clicking and dragging.

Modifiers

- Single, Two, Four, Eight Row(s): Define the number of edges inserted in the bevel topology.
- Linear, Sharp, Soft Edge: Define the shape of the bevel. Not only is the visible roundness of the bevel affected but also the distance between the edges. This allows the bevel to look correct when using Dynamic Subdivision.

Bridge

The Bridge Action connects one or more edges with polygons. This Action makes it possible for you to connect two edges or two edge borders together.

With Edges Target, the Bridge Action connects two edges together with a single polygon. When hovering over and edge with this Action selected, a widget with “Click first edge” and “Click second edge” will be visible. Upon clicking the second edge, the polygon will be created.

When using the Bridge Two Edges function, use caution. It can be easy to create invalid topology by clicking two edges which are not connected.

Note:

Because polygons are single-sided, it can be hard to see their edges from certain angles. Enabling Tool >> Display Properties >> Double makes the borders of polygons more visible.

With Two Holes Target, the Bridge Action connects the edge borders of two holes together to create a tube-like shape between them. The shape of the Bridge can be drastically impacted by the different options and modifiers explained below.

When hovering over and edge with this Action selected, a widget with “Click first edge” and “Click second edge” will be visible. It is important to continue holding the second click to enable the interactive part of this Action. This allows you to reshape the bridge in accordance with the selected modifiers.

Note:

Because polygons are single-sided, it can be hard to see their edges from certain angles. Enabling Tool >> Display Properties >> Double makes the borders of polygons more visible.

Modifiers (Two Holes Only)

While continuing to hold the second click, dragging the mouse vertically and horizontally will reshape the bridge. Horizontal movement increases or decreases the curvature while vertical movement controls tessellation of the spans.

Pressing the Shift Key will snap to the optimal curvature depending on the modifier that is selected.

- Interactive Curvature, Optimal Curvature, Half Curvature: Define the curvature of the bridge, allowing it to be interactive or automatically optimized.
- Interactive Resolution, Optimal Resolution, Minimum Resolution: Define the resolution (tessellation) of the bridge, either interactively or automatically.
- PolyGroup Columns, PolyGroup Rows, PolyGroup Flat: defines how the PolyGroups are created along the bridge.
- Pivot on Hole Center, Pivot on Clicked Edge: Defines the pivot point to define how the curvature of the tube will be created. Clicking two edges of a larger distance will generate a longer curve, while clicking two edges of shorter distance will generate a shorter curve.
- Auto Align Edges, Align Clicked Edges: These are similar to the Pivot modifiers and define which edges will be used when aligning the edges.

Options (Two Holes Only)

- Circle, The Spline, Arcs, Arcs and Line, Round Corners, Small Round Corners, Tight Round Corners and Straight Lines: Define the shape of the tube between the two holes, based upon any Action modifiers.
- One Line: Produces a straight bridge between the two clicked holes.

Alternative Operations (Two Holes Only)

- Shift: Press this modifier while doing a click and drag to automatically create the shape selected in the Bridge options. (For example, the Circle type of bridge produce a clean partial circle.)

Close Hole

The Close Hole Action fills openings in the model. This process contains two Targets.

Close Concave Hole fills the hole using the same algorithm used in the Tool >>

Geometry >> Modify Topology >> Close Hole function. It simply closes the hole of the clicked open edge loop.

Note:

A hole can be filled only if the topology allows it.

When associated with the Convex Target, the Close Hole Action uses a different algorithm to fills the space. The shape of this fill can be drastically impacted by the options and modifiers described below.

It is important to continue holding the click after selecting the edge of the hole. This enables interaction for you to reshape the created surface.

Modifiers (Convex Hole Only)

While continuing to hold your click open edge loop, moving the cursor horizontally or vertically modifies the shape of the surface being created. Horizontal movement changes the curvature and elevation. Vertical movment affects the amount of tessellation that is applied.

- Converge to Center, Converge to Edge, Converge to Point: Define how the shape of the structure is created and which direction the center point moves in during creation. The direction of your stroke also determines where the new topology converges to.
- Interactive Curvature, Optimal Curvature, Curvature Value: Define the curvature of the created geometry to be either interactive or automatically optimized.
- Interactive Resolution, Optimal Resolution, Resolution Value: Define the resolution (tessellation) of the geometry, with it either being interactive or automatically controlled by ZBrush.
- No Twist, 360 Degrees Twist, Twist Value: Define the behavior of the generated geometry. This function can be used to generate helix-shaped surfaces.
- PolyGroup columns, PolyGroup Rows, PolyGroup Flat: Define how the PolyGroups are created along the bridge.

Options (Convex Hole Only)

- Circle, The Spline, Arcs, Arcs and Line, Round Corners, Small Round Corners, Tight Round Corners and Straight Lines: Define the shape of the geometry closing the hole.
- One Line: Produces a flat hole with no elevation. With this option selected, only tessellation can be changed.

Alternative Operation (Convex Hole Only)

- Shift: Press this modifier during the click and drag to let ZBrush use the optimal shape.

Collapse

The Collapse Action will remove the selected edge, fusing the connected vertices together.

When used with:

- Edge Target: The edge point closest to the cursor is fused with the second edge point.
- Hole Target: All the vertices along the boundary of the hole merge together at the center of the hole.
- PolyLoop: All the vertices of the loop closest to the clicked edge are fused with the polyloop that is opposite the clicked edge.

Crease

The Crease Action applies edge creasing to the Targeted edges.

Alternative Operation

- Alt: Uncrease an already creased edge and vice versa.

Delete

The Delete Action deletes the edge(s) corresponding to the selected Target.

Do Nothing

The Do Nothing Action is an empty Action. When this is active it will prevent the possibility of accidentally performing an Edge Action by mistake while using the ZModeler brush. If you know that you only want to use Poly or Point Actions, having this active and hovering over a point will default to a Poly Action instead.

Extrude

The Extrude Action will extrude a selected edge on a model. The extrude edge Action creates a polygon between the clicked edge and the opposite edge. When using this Action, triangles will be created on the extruded part.

The position of the cursor when clicking on the Target edge defines the direction of the extrusion.

Alternative Operations

- Ctrl: Stop the extrusion process and switch to an Edge Move Action.
- Shift: Disconnect the polygons adjacent to the extrusion.
- Alt: Change the PolyGroup of the extruded part.

Modifiers

- Straight, Rotate to 15 Degrees, Custom Rotation: Define the steps the extruded edge. Straight provides no constraints while 15 Degrees add steps of 15 degrees. Custom rotation allows you to add a custom constraint by the value set in this slider.

Insert

The Insert Action creates an edge loop along the clicked ring of edges. The insert Action will continue across the entire edge loop.

If you want the Inserted edge to only be generated through part of an edge loop, you can use a mask to protect the portions of the model where you do not want the Inserted edge to be generated.

The Insert Action uses two Targets: Multiple EdgeLoops and Single EdgeLoop. If using the Multiple EdgeLoops Target you will have access to modifiers that help generate advanced shapes.

Modifiers

- Interactive Resolution, Specified Resolution: Define the number of inserted edges. You can move the cursor up and down interactively or enter a numerical value.
- Specified Resolution, Interactive Elevation: Defines the elevation of the inserted edge(s). When set to Interactive Elevation, moving the cursor left and right will change the elevation.
- Spline, Radial, Linear, Flat: Define the shape of the elevation.
- Per Polygon Normal, Clicked Normal, Average Normals: Define the direction of the Elevation modifier.

Alternative Operations

- Alt: Remove the clicked edge loop.
- Shift: When used with the Single EdgeLoop Target, this will move the inserted edge proportionally to the cursor.

Inset

The Inset Action inserts a new polygon within the selected face or group of faces.

The different modifiers not only change the shape of the inserted polygon(s) but also allow for control over how these new polys are connected to the original surface.

Modifiers

- Center and Border, Border Only, Center Only: Define how the new polygons are created. Center and Border will create all the polygons. Border Only will not create the center polygon. Center Only will create the center polygon(s) without any border polygons.
- Inset Each Poly, Inset Region: Define whether the inserted polygons are created individually or connected all together as a region.

Alternative Operations

- Alt: Change the PolyGroup of the inserted part.
- Shift: Change the shape of the inserted polygon(s) to be square rather than matching the original polygon.

Mask

The Mask Action applies a protective mask to the clicked edge, preserving it from manipulation until the mask has been cleared.

It is possible to click on multiple items, masking all of them if needed.

Alternative Operation

- Alt: Unmask the clicked Target. Like the Mask Action; click unprotect as many edges as needed.

Move

The Move Action lets you freely relocate the selected edge relative to the screen's working plane.

Alternative Operation

- Shift: Constrains the Move Action along the closest X, Y, or Z working (canvas) plane. It is important to adjust your camera angle before using this modifier with the Move Action.

Move Auto Radius

Move Infinite Radius shifts the whole edgeloop by slowing decreasing the strength of the move.

Alternative Operations

- Alt: Moves the edges like they were inflated.
- Shift: Slides all Targeted edges along the adjacent polygons.

Move Brush Radius

Move Brush Radius moves the edges based on the Draw Size.

Alternative Operations

- Alt: Moves the edges like they were inflated.
- Shift: Slides all Targeted edges along the adjacent polygons.

Move Infinite Radius

Move Infinite Radius shifts the whole edgeloop based on depth of the camera view.

Alternative Operations

- Alt: Moves the edges like they were inflated.
- Shift: Slides all Targeted edges along the adjacent polygons.

PolyGroup

The PolyGroup Action sets a new PolyGroup for the Targeted edge. The modifiers below define how these PolyGroups are created.

Modifiers

- Overwrite, Additive: Define how the new PolyGroups are created. Overwrite will apply a new PolyGroup with the first click and reuses it for each subsequent click while the Additive modifier will create a different PolyGroup with each click.

Note:

Unlike other Actions where the Alt key can change the PolyGroup, this operation isn't possible for the PolyGroup Action when Overwrite is active. You need to switch to the Additive modifier instead.

QMesh

The QMesh Action creates an extrusion of the edges corresponding to the selected Target. This extruded edge creates a polygon between the clicked edge and the opposite edge, creating a triangle shape on the side of the extruded part.

By default, the QMesh operation is exactly the same as Extrude Edge, except that:

- The created mesh will fuse to the adjacent polygons when possible.
- The created mesh can be completely deleted when performing a negative extrusion.

The Draw Size has impacts the attraction of the fusing operation: a small Draw Size will trigger a strong fuse operation while a larger Draw Size will apply weaker fusing.

The position of the cursor when clicking on the Target edge affects the direction of the extrusion. It is important to carefully position your cursor before executing the Action.

Options

- Full, Half, Quarter Step: Define the number of steps that the QMesh extrusion will have between the clicked edges and its maximum height. These options have no effect when the extruded edge isn't in contact with adjacent polygons.

Modifiers

- Straight, Rotate to 15 Degrees, Custom Rotate Angle: Define the value of the steps when extruding the edge. Straight provides no constraints while 15 Degrees add steps of 15 degrees. The custom rotation adds a custom constraint

determined by the slider value.

- Normal Attraction, Weak Attraction, No Attraction: Define the sensitivity of the fusing detection.

Alternative Operations

- Ctrl: Stops the extrusion process and switches to a Move Action.
- Shift: Disconnects the extrusion's adjacent polygons.
- Alt: Changes the PolyGroup of the extrusion.

Scale

The Scale Action resizes the Targeted edges. When scaling a single edge its two points will be affected. While scaling a polyloop, a larger part of the model may be scaled depending its path.

Slide

The Slide Action shifts the Targeted edges along their connected polygons.

Spin

The Spin Action rotates the clicked edge counter-clockwise around the two adjacent polygons. This Action is very convenient when you wish to change the model's topology.

Alternative Operation

- Alt: Produces a clockwise spin.

Split

The Split Action inserts a point on the clicked edge and connects it to all adjacent edges. Dragging the point during the Split Action allows you to move it along the edge.

Alternative Operation

- Alt: Collapse the edge by welding its two points together at the location of the one closest to the click.

Stitch (Hole)

The Stitch Action closes the edges of a hole, welding them together. Since the two clicked edges are welded together, the alignment of the clicked edges will define the resulting topology.

The Stitch Action produces better results when the hole has constant and uniform topology, such as with a poly loop shape.

Swivel

The Swivel Action rotates the clicked edge or edge loop around the polygon's opposite edge. The Action is performed by clicking the edge and dragging.

TransPose

The TransPose Action automatically masks all edges except the clicked edge and switches to TransPose Move mode. At this stage, you can perform all the usual TransPose operations.

Please keep in mind that while you are in TransPose, you are no longer in Draw mode and so the ZModeler brush will no longer be active. To switch back to it, return to Draw mode.

Note:

Don't forget to clear your mask before performing other operations.

Unweld

The Unweld Action disconnects the clicked edges corresponding to the Target and creates creasing on the border edges. Extruded polygons are created to keep the original shape visually separate when Dynamic Subdivision is enabled.

The Unweld Action doesn't split the model in multiple SubTools; it just disconnects the topology.

XI Polygon Actions

You will find below the different Actions that can be applied to the polygons of a model using the ZModeler brush. The ZModeler brush is context sensitive. To access its Poly menu you need to hover over a polygon before right-clicking or pressing the space bar.

Some Actions have behaviors that will be totally different depending on the selected Target. Also take note of the Edge Indicator widget when hovering over a polygon. This widget provides important directional information that may be used by the selected Action.

The descriptions of the available Targets are found after the Actions sections of this document.

Add to Curve

The Add to Curve Action generates curves along the edges of the Targeted polygons. The created curves can be used in later stages with the Curve Actions or various Curve brushes.

Note:

The Curve actions are only available when a Curve exists on the model.

Bevel

The Bevel Action slices off the edges of the corresponding Target, creating new edges with angled planes between them. The dimension of the generated bevel is determined interactively by dragging your stroke following the initial click.

Modifiers

- Single, Two, Four, Eight Row(s): Define the number of edges inserted in the bevel topology.
- Linear, Sharp, Soft Edge, Edge Sharpness: Define the shape of the bevel. Not only is the visible roundness of the bevel affected but also the distance between the edges, allowing for the bevel to look correct when using Dynamic Subdivision.

Bridge

The Bridge Action creates geometry between two polygons. The Bridge function can generated rounded surfaces when used with connected polys.

With the Two Polys Target, the Bridge Action connects the clicked polygons via a tube-like bridge. When using this Action a widget will prompt you to 'Click 1st Poly' then 'Click 2nd Poly.' With the 2nd click, the bridge will be created. When using this Action and Target; it can be easy to create a bridge that crosses existing polygons, resulting in irregular undesired topology.

With the Connected Polys Target, the Bridge Action connects two adjacent polygons and creates a new shape. The shape of the Bridge is drastically impacted by the different options and modifiers. To use the Target, hover over a poly and take note of the edge indicator. The edge indicator will point to the direction in which the Bridge will be created.

Modifiers (Connected Polys)

Dragging vertically and horizontally while clicking and dragging will allow you to dynamically reshape the bridge. Horizontal movement adjusts the curvature that is applied to the bridge. Vertical movement changes the amount of tessellation that is applied. Only the Interactive modifiers can by dynamically updated.

Pressing the Shift key while clicking and dragging will instruct ZBrush to automatically generate the optimal shape as specified by the modifier

- Interactive Curvature, Specified Curvature: Define the curvature of the bridge. This can be interactively controlled or set with a predefined value.
- Interactive Resolution, Specified Resolution: Define the resolution (number of tessellations) of the bridge. This can be interactively controlled or set with a predefined value.
- Align to Tangent, Normal: Define the direction in which the bridge is computed. Using Normal alignment is generally preferred when the adjacent polygons have a low angle between them.
- Variable, Constant Width: Allows the rows of the geometry being created to have a variation in width. This is most noticeable when one polygon's edge width not shared by both polygon faces is wider compared to the adjacent polygon being bridged.
- Non Symmetrical, Symmetrical: Maintains an average width to the rows of geometry being created when bridging between two polygon faces with variable edge lengths on the none shared edge between the two polygons.
- Polygroup Rows, Flat: Determine what PolyGroups will be created for the new topology.
- Triangle & Quadrangles Sides Loop, Triangle Sides, Quad Sides: Define the topology of the side of the bridge. Extra edge loops can be created around the pivot edge and the topology can a mix of triangles and/or quadrangles.

Options (Connected Polys)

- The Bezier, Spline, Circle, Arcs, Arcs and Line, Round Corners, Small Rond Corners, Tight Round Corners, and Straight Lines: Define the shape of the geometry generated between the two polygons, based upon the selected modifiers.
- One Line: Produces a straight tube between the two clicked holes.

Alternative Operations (Connected Polys)

- Shift: Pressing this modifier while performing the click and drag allows ZBrush create the optimal shape based on the selected modifier.

Crease

The Crease Action applies edge creasing to the Targeted edges.

Modifiers

- All Sides, Long, Short Sides: Define which edges of the polygons will have edge creasing applied.
- All Faces, Polygroup Border, Polygroup Inner: Define the behavior of the creased edge, based on the existing PolyGroups for the selected Target.
- All transitions, Shallow, Sharp Transition: Define the behavior of the creased edge based on the topology of the model in the Targeted region. Shallow Transition will apply creasing where there are low angles between each polygon. Sharp Transition will apply creasing only on edges which form a sharp angle between polygons.
- All, Outer, Inner Targets: Specify whether to apply creases to all edges within the Target area, to boundaries only or to all edges except boundaries.
- All, Outer, Inner Edges: Specify whether to apply creases to all edges within the Target area or only to those at the boundaries of an opening.

Alternative Operations

- Alt: Uncrease already creased edges and vice-versa. Important: you must press the Alt key after clicking on the Target, without releasing the click. Pressing the Alt key before clicking will switch to the Temporary PolyGroup selection mode.

Delete

The Delete Action removes the Targeted polygons, creating a hole in the model.

Do Nothing

The Do Nothing Action is an empty action. When active, prevents performing any Poly Actions. This is useful when you know that you only want to use Point or Edge Actions, letting you work faster by eliminating the need to be as precise in your clicks. While active, any click on a polygon will be treated as an Edge click instead.

Equalize

The Equalize Action tries to slide the Target edges to unify their lengths, changing the effected polygons to squares. The results greatly depend on the existing topology and the complexity of the Target. This process may need to be applied multiple times to achieve the desired effect.

Extrude

With the Extrude Action, click and drag to create an extrusion of the Targeted polygons.

Alternative Operations

- Ctrl: Stops the extrusion process and switches to a Move Action.
- Shift: Disconnects the extrusion from its adjacent polygons.
- Alt: Changes the PolyGroup of the extruded part.
- Modifiers
- One Side Poly, No Sides Polys: Determine whether sides will be created to connect the extruded polygons with adjacent polygons.
- Step by Brush, Step Size: Edge loops generated along the length of the extrusion are based either on the Draw Size or a defined value.

Flip Faces

The Flip Faces Action changes the surface normal orientation of the Target polygons. Be careful when using this option because flipped faces can generate the appearance of holes in the mesh.

Note:

You may wish to turn Tool >> Display Properties >> Double on to ensure that you don't mistake flipped faces for holes.

Inflate

The Inflate Action applies a spherical effect to the Target polygons, like they're the surface of a balloon as it's being blown up. Modifiers define the direction of the deformation and its shape.

Modifiers

- By Face, Edge, Point Normal: Define the direction of the Inflate deformation, based on the normal direction of the specified element. If the Target polygons are a flat surface, the Face Normal modifier will produces perpendicular movement of the polygons because all the normals are going the same direction.

Insert NanoMesh

Use the Insert NanoMesh Action to insert meshes on the Targeted polygons. This is done using a NanoMesh brush – a special brush that is an Insert Mesh or IMM brush which has then been converted specifically for this Action.

After the action has been applied to the surface, the NanoMeshes can be further edited through the Tool >> NanoMesh parameters and settings.

To create an Insert NanoMesh brush for this purpose, you must first load or create an InsertMesh or Insert MultiMesh Brush (IMM) and then click Brush >> Convert to NanoMesh Brush.

Please refer to the NanoMesh documentation for more information.

Insert Point

The InsertPoint Action creates a single point in the middle of the clicked polygon and then connects it to the points of the polygon that it's being inserted into. This Action is handy when wanting to quickly divide faces or find the exact middle of a polygon.

Insert Polyloops

The Insert Polyloops Action creates single or multiple edge loops following the topology of the Target region. The topology along the edge of the Target region may be altered to connect the existing points to the inserted edge loops.

If you want extra control over propagation of the inserted edge loop, use a mask to protect an area of the model. The edge loop will not cross masked polygons.

Modifiers

- Interactive Split, Even Splits, Specified Splits Count: Define the number of inserted edges, either by interactively moving the cursor up and down or by entering a numerical value.
- Loops mode, Grid Mode, SunBurst Mode: Define the pattern of the inserted edge loops. Some patterns will work only on specific Targets. For example, Grid Mode requires a flat island with no poly loops.
- Alternate Polygroup, Same Polygroup: Control whether to create new PolyGroups for the edge loops.

Inset

The Inset Action inserts one or more polygons within the Target polygons and connected to them.

The modifiers can change the shape of the inserted polygons as well as whether or not they are connected to the original polygons.

Modifiers

- Center and Border, Border Only, Center Only: Define how the new polygons are created. Center and Border will generate the inset polygons plus any polygons that are needed to connect them to the original edges. Border Only will not create the center polygon, while Center Only will not create border polygons.
- Inset Each Poly, Inset Region: Define whether every polygon within the Target receives its own inset or if the Target polygons are treated as an entire region with a shared inset. (This latter option effectively results in an edge loop.)

Alternative Operations

- Alt: Change the PolyGroup of the inserted part.
- Shift: Change the shape of the inserted polygon(s) to be square rather than proportional to the original polygon/region.

Mask

The Mask Action simply masks the clicked polygon or selected Target, preserving it from manipulation until the mask is cleared.

Clicking on multiple items is possible, letting you protect as many polys as needed.

Mesh to Brush

The Mesh to Brush Action converts the Target geometry to a NanoMesh brush, ready for applying later as a NanoMesh.

Note:

This Action can only create NanoMesh brushes. To create an Insert Mesh or IMM brush you would instead need to use Tool >> Geometry >> Modify Topology >> Mesh from Brush and then create your desired brush.

Modifiers

- Align to Mesh Orientation, Align to Clicked Face Normal: Define the orientation of the mesh when it is stored within the brush. When working with the Align to Clicked Face Normal modifier, it is advised to switch to orthogonal view and carefully select the camera position.

Move

The Move Action lets you manipulate the Targeted polygons as specified by the two modifiers. All polygons are moved the same distance, without any falloff effect, deformation,or snapping.

Note:

TransPose can be also used with the Mask Action to do a similar operation.

Modifiers

- Align to Normal: Sets the Target to move along the normal of the clicked polygon (perpendicular to the surface).
- Align to Axis: Sets the Target to move based on the nearest world axis with the screen working plane (user point of view).

Polygroup

The Polygroup Action generates new PolyGroups for the Targeted polygons. Because ZModeler makes extensive use of PolyGroups for Targets, this Action can quickly becoming one of go-to items for creating a faster workflow.

This Action has no impact on your mesh's topology; it only changes the existing PolyGroup(s).

Don't forget to refer to the Working with PolyGroups chapter of the ZModeler documentation for more information about how to use PolyGroups, including how to work with ZModeler's Temporary PolyGroup feature.

Options

- One GroupID: Creates a unique PolyGroup.
- Three Sides: Creates different PolyGroups for each world working plane. (X, Y, Z)
- Six Sides: Creates different PolyGroups corresponding to each side of the world's working planes. (+X, -X, +Y, -Y, +Z, -Z)
- Topological: Creates gradient PolyGroups that follow the mesh topology, based on the initial click location.
- Poly Order: Creates PolyGroups based on the polygon order.
- Point Order: Creates PolyGroups based on the point order.
- Relative Plus, Minus One: Replace the existing PolyGroup with a slightly different hue.
- Checker: Create two PolyGroups with a checker pattern.

Modifiers

- Overwrite, Additive: Define how new PolyGroups are created. Overwrite applies a new PolyGroup and uses it for each subsequent click while the Additive modifier creates a different PolyGroup with each click.
- Pick Existing: Copies the PolyGroup of the clicked face and stores it for use with the next PolyGroup creation process.
- Full, Random Coverage: Apply the PolyGroup to either the entire Target region to a fraction of it.

QMesh

The QMesh Action lets you click and drag to extrude the Target polygons.

By default, the QMesh operation is exactly the same as the Extrude Edge Action,

except that:

- The created mesh will attempt to fuse to the adjacent polygons.
- The created mesh can be completely deleted by performing a negative extrusion.

The attraction of the fusing operation depends upon the Draw Size: a small brush size will trigger a strong fuse operation while a larger brush size will apply weaker fusing.

The position of the cursor when clicking on the Target edge will define the direction of the extrusion. It is important to carefully position your cursor before executing the Action.

Options

- Align tenth, Quarter, Third, Half, Full Step, No Alignment: Define the number of steps that the QMesh extrusion will have between the clicked polygon and its maximum height. These Modifiers have no effect when the extruded polygon doesn't come in contact with adjacent polygons.

Modifiers

- One Side Poly, Multi Sides By Brush, Step Size: One Side Poly is the default fuse function of QMesh. The Step Size Modifier will allow you to perform a continuous Qmesh of the clicked polygons, generating edge loops along the length equal to the Draw Size or a defined value.
- Normal Attraction, Weak Attraction, No Attraction: Define the sensitivity of the fusing detection.
- Disable and Enable Triangle Snap: When enabled, QMesh will allow the fusing operation to create triangles.
- Disable and Enable Extended Snap: When enabled, snapping continues beyond the full step of the extrusion. If the Step is set to quarter, then it will continue to add a step equal to a quarter of the distance beyond a full step. When disabled, ZBrush will snap to the maximum distance of the surrounding polygons without needing to evaluate height.

Alternative Operations

- Ctrl: Stops the extrusion process and switches to a Move Action.
- Shift: Disconnects the polygons adjacent to the extrusion.
- Alt: Changes the PolyGroup of the extruded part.

Scale

The Scale Action scales the Target polygons. When scaling a single polygon, ZBrush will simply move its points in or out relative to the anchor point defined by the options. When scaling a poly loop, ZBrush may scale a larger part of the model as determined by the path of the poly loop.

Options

- Mesh Center, Axis Center, Local Symmetry, Click Center, Polygon Center: Define the location of the anchor point for the scaling operation, with all affected points moving relative to it.

Spherize

The Spherize Action forces the Target polygons toward a spherical shape. Moving the stroke in different directions while clicking and dragging generates different results.

Alternative Operations

- Shift: Spherize by moving all affected vertices at the same time.

Spin

The Spin Action rotates the Target polygons around a point defined by the selected option.

Options

- Mesh, Axis, Polygon, Clicked Center, Local Symmetry, Clicked Polygon Corner: Define which point the polygon(s) will spin around. Some rotation centers are defined by the topology while others are determined by the click position.

Modifiers

- No Alignment, Align to 15 Degrees, Custom Alignment: Set a constraint value that affects the rotation of the spin Action.
- Align Rotation to Axis: The rotation is done along the closest world axis.

Spin Edges

The Spin Edges Action changes the point order within the clicked Target. The usage is specific to those functions in ZBrush which make use of point order, such as MicroMesh and NanoMesh.

Because this only affects point order rather than position, you won't see any apparent effect unless you have applied a NanoMesh or MicroMesh to the surface. With one of these functions applied, performing the Action will change the orientation of the NanoMesh or MicroMesh.

Options

- Clockwise, Counter Clockwise: Define the rotation direction.

Split

The Split Action inserts a point in the clicked polygon and connects it to middle of each surrounding edge. This Action is similar to Insert Point but maintains a quad surface.

TransPose

The Transpose Action automatically masks everything except the selected Target and then switches to TransPose Move mode to manipulate the surface standard TransPose operations.

Please keep in mind that while using TransPose, you are no longer in Draw mode. You have to switch back to Draw mode if you want to continue using ZModeler.

Note:

Don't forget to remove your mask before performing other operations.

Unweld

The Unweld Action disconnects the Target polygons creases the border edges so that they maintain their shape when smoothed. Extruded polygons are created to keep the original shape visually unwelded when using Dynamic Subdivision mode.

The Unweld Action doesn't split the model in multiple SubTools; it just disconnects

the topology.

ZModeler Modifiers

There are a few settings which are universal ZModeler's Actions and Targets. Modifying these are only necessary for very specific purposes.

- Default Flatness and Flat Targets Tolerance: Define the accuracy of flat surface detection performed by some targets. Increasing the value can allow Actions to affect slightly irregular areas and larger surfaces.

XII CURVE ACTIONS

Listed here are Actions that affect curves which have been created on a model. The ZModeler brush is context sensitive: Hovering over a curve and either pressing the space bar or right-clicking will bring up the ZModeler Curve menu.

Curve Actions are of course only available when a curve or set of curves has been generated on a model. Curves can be created using point, edge, and/or polygon actions.

The descriptions of the Targets are available after the Actions sections of this document.

Bevel

The Bevel Action creates beveled topology on the edges corresponding to the selected Curves. The distance dragged while clicking defines the radius of the bevel.

Modifiers

- Single, Two, Four, Eight Row(s): Define the number of edges inserted in the bevel topology.
- Linear, Sharp, Soft Edge: Define the shape of the bevel when Dynamic Subdivision is applied to the model. Not only is the visible roundness of the bevel affected but also the distance between the edges, allowing for the bevel to look correct when using Dynamic Subdivision.

Delete

The Delete Action suppresses the Target curve(s).

XIII ZModeler Brush Targets

The ZModeler brush operates by performing Actions on Target polygons, points, edges or curves in a PolyMesh3D such object. In other words, the Action tells ZBrush what to do but the Target specifies exactly what part of the mesh to perform the Action on.

The most basic Targets such as a single vertex, edge or polygon will affect small areas of your mesh. However when working on your models you may need to affect a larger area such as groups of polygons or multiple edges.

As an example, by selecting the “Extrude” Action and setting the “PolyGroup” Target you can click and drag on a single polygon in your mesh to affect all polygons sharing the same PolyGroup – even if those polygons are scattered throughout your model. Now change the Target from “PolyGroup” to “A Single Poly.” If you click and drag that same polygon, it will now be the only part of the model that is altered.

With this system it is important not only to specify which Action that you want to use but also the Target area you want to effect. Of course, some actions only have one Target due to the nature of their effect. For example, the Point Stitch Action only has the Two Points Target since stitching can only generate an effect across this specific area.

Because the Target system is so versatile the ZModeler brush seamlessly adapts to virtually any of your low resolution sculpting needs. The better you understand the various Targets available to you, the more you will get from ZModeler. This section of the documentation will give you that knowledge.

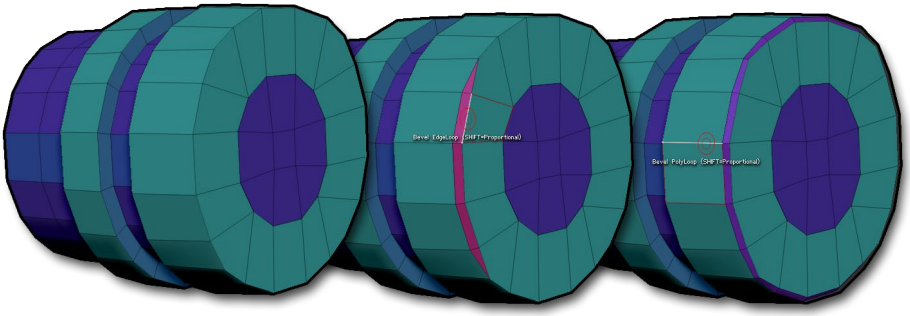
Below is the list of the different targets. Depending of the Action selected some of these targets may not be available.

1. EdgeLoop Versus PolyLoop

This documentation will often refer to poly loops and edgeloops. While the descriptions of these structures are similar, they are not exactly the same and as a result you can get very different topology results depending upon which Target type you have selected.

An edgeloop ends when it reaches a vertex that connects and odd number of edges. A polyloop continues no matter how many edges connect to the vertex.

See the illustration below to understand how this distinction can affect your topology.



This is an example of the difference between an EdgeLoop Target and a PolyLoop Target, combined with the Bevel Action. On the left, the original mesh. In the center, the Bevel EdgeLoop is stopped when it reaches an extraordinary point (point with three connected edges). On the right, the Bevel PolyLoop uses the boundary of the polygonal loop and so isn't affected by the extraordinary point. It creates a bevel around the whole model.

2. Point Targets

Below is a list of Targets which are specifically available to Actions that affect the points of your model.

By Brush Radius

The By Brush Radius Target simply uses the Draw Size setting to define the influence area of the Action. As an example, selecting this Target with the Point Move Action will generate an effect similar to that of the Move brush.

Point(s)

The Point (or Points) Target looks at the edges of your model and zeroes in on their endpoints. The Action applied to this Target will affect only the clicked point.

Note:

Some Actions depend upon the edges connected to this point, which means that if you chose the Extrude Action with Point Target, the exact position of your cursor will determine which of the polygons attached to this point will be extruded.

Two Points

The Two Points Target is specific to an Action that needs two points to be performed, such as Stitch which will move and weld the two clicked points.

The Two Points Target is done in two steps; clicking a first point, followed by a second point. With each click, the ZModeler brush widget will instruct you to 'Click 1st point' or 'Click 2nd point.'

Note:

You can change your point of view while selecting the two points. This Target only evaluates clicks on points and ignores all others, such as to rotate the model.

Infinite Depth

The Infinite Depth Target automatically selects all points in line with your click, no matter how deep they might be relative to the camera. Only the vertices that are perfectly aligned will received the Action.

In less technical words, all the points that are visually overlapped by the clicked one will be manipulated by the Action. This is very convenient when working in orthographic views with models composed of simple extruded elements where you need to move all the aligned points. With this Target you will have the freedom to refine your shape without resorting to TransPose and/or masks.

The infinite Depth Target only affects points that are perfectly aligned or almost perfectly aligned.

Infinite X, Y or Z

The Infinite X, Y or Z Target is automatically selecting the points which are aligned with the cursor and located on the working plane of the selected axis (X, Y, or Z).

The infinite X, Y, or Z Target is only affecting the points that are perfectly aligned or almost perfectly aligned.

Infinite XYZ

The Infinite XYZ Target is similar to the Infinite X, Y or Z Action except that it automatically selects the working plane that is closest to the current camera point of view. Once the plane is determined, the Target then automatically selects the points on that plane that are aligned with the cursor.

The infinite XYZ Target only affects points which are perfectly aligned or almost perfectly aligned.

Ring

The Ring Target selects the surrounding points which are connected to the clicked point by edges.

3. Edge Targets

Below is a list of Targets which are specifically available to Actions that affect the edges of your model. An edge is the line between two connected points on your model's surface.

Edge

The Edge Target will only ever select the single clicked edge.

EdgeLoop Complete

The EdgeLoop Target identifies a ring of edges which connect end to end, returning to the start point. The points passed through cannot have an odd number of connected edges.

EdgeLoop Partial

The EdgeLoop Target is similar to EdgeLoop Complete except that the selection will stop at the first extraordinary point that it encounters. (A point with an odd number of edges connected to it.)

Multiple EdgeLoop

The Multiple EdgeLoop Target is associated with advanced modifiers that produce multiple edge loops across the surface of the model.

Single EdgeLoop

This Single EdgeLoop Target is an alternative to the Multiple EdgeLoop Target and will only select a single edge loop as the Target.

Edge Strip

The Edge Strip Target corresponds to a set of edges that are located in the same poly loop (meaning that extraordinary points with an odd number of edges are permitted). The first click defines the beginning of the strip and a second click defines its end.

PolyLoop

The PolyLoop Target identifies a ring of edges which connect end to end, returning to the start point. The points passed through can have an odd number of connected edges.

The PolyLoop Target applies the Action to the entire set of polygons within the loop or (for some Actions) it may affect the poly loop's border edges. For example, the TransPose Action with PolyLoop Target will modify all polygons within the loop while the Bevel Action with PolyLoop Target will apply a bevel only to the edges that make up the poly loop border.

Note:

For edge Actions, the affected edges of the Targeted poly loop will be the perpendicular ones since they correspond to the boundary of the poly loop.

Two Edges

The Two Edges Target is specific to any Action that needs to have two edges selected in order to be performed. As an example, the Edge Bridge Action will create a polygon between two clicked edges.

The Two Edges Target is done in two steps by clicking a first edge, then a second edge. For each click, the ZModeler brush widget will instruct you to 'Click 1st Edge' or 'Click 2nd Edge.'

Note:

You can change your point of view while selecting the two edges. This Target only evaluates clicks on edges and ignores all others, such as to rotate the model.

PolyGroup Island

The PolyGroup Island Target selects all polygons connected to the clicked edge which share the same PolyGroup and continues to expand the selection until encountering edges of a different PolyGroup.

For example, if your model is a face and the two eyes share the same PolyGroup, using this Target would let you select only one eye. Even though the other eye has the same group it is not contiguously connected to the clicked eye and so will not be affected by the Action.

Hole

The Hole Target corresponds to an area within your model with no polygons on. This area is defined by a loop of edges that surround the border of the hole. The selection is done by clicking on one of these bordering edges.

Note:

The hole must be completely surrounded by connected polygons.

Concave Hole

The Concave Hole Target is equivalent to the Hole Target except that it is designed to work on holes that have a concave angle in their outline. A concave hole with at least one internal angle with a value higher than 180°.

The selection is done by clicking on one of the edges of the hole.

Convex Hole

The Convex Hole Target is equivalent to the Hole Target except that it is designed to work on holes which have a convex angle in its outline. A convex hole only has internal angles between each edge which are less than 180°.

The selection is done by clicking on one of the edges of the hole.

Two Holes

The Two Holes Target is specific to an Action that needs to have two holes selected to be performed. For example, the Edge Bridge Action will generate bridging topology across the distance between two clicked holes.

The Two Holes Target is done in two steps by clicking an edge of the first hole, then an edge of the second hole. For each click, the ZModeler brush widget will instruct you to

‘Click 1st Edge’ or ‘Click 2nd Edge.’

Note:

You can change your point of view while selecting the two holes. This Target only evaluates clicks on hole edges and ignores all others, such as to rotate the model.

4. Polygon Targets

Below is a list of Targets which are specifically available to Actions that affect the polygons of your model. Polygons are the planes between points which are connected by edges.

A Single Poly (Polygon)

The A Single Poly Target selects only the clicked polygon, which must be composed of 3 of 4 points (either a triangle or quadrangle.)

Note:

N-gons are not supported.

All Polygons

The All Polygons Target selects the entire clicked mesh. It will ignore PolyGroups, geometry islands and specific quadrangle or triangle areas on the mesh.

All Quads (Quadrangles)

The All Quads Target selects all quadrangle (four-sided) polygons that are contained within the clicked mesh, ignoring triangles and n-gons.

All Triangles

The All Triangles Target selects all the triangles within the clicked mesh, ignoring all polygons with more than three sides.

When used with the PolyGroup Action, this lets you quickly isolate all triangles within your model to make topology clean up easier.

Behind

The Behind Target corresponds to all the polygons which are located behind the clicked polygon, as determined by its surface normal.

Note:

Viewing angle is irrelevant to this Target.

Behind & Polygroup

The Behind & Polygroup Target is similar to Behind except that it will only select polygons which are both behind the clicked polygon and sharing the same PolyGroup as the clicked polygon.

Brush Radius

The Brush Radius Target uses the current Draw Size to select polygons to be affected by the Action. Focal Shift is not taken into consideration, meaning that all polygons will be uniformly affected by the Action, wherever they are located within the brush radius.

Connected Polys (Polygons)

The Connected Polygons Target identifies two polygons that are connected to each other.

The position of the cursor over the polygons determines the direction in which the Action will be applied. For this reason, the edge selector widget informs you of the location of the edge that is sharing the connected polygon.

Curved Island

The Curved Island Target selects polygons which are adjacent to the clicked polygon but not forming a flat surface. The selection will expand until encountering adjacent polygons that are at a 0° angle relative to the previous one.

For more information about the concept of islands, please refer to the Island Target.

Facing Front All

The Facing Front Target allows you to apply Actions to Polys that are directly facing the camera plane. By switching to Orthographic view and rotating your model to a certain angle you can control which polygons will be affected by the Action.

Facing Front Island

The Facing Front Island Target allows you to apply Actions to polygons that are both directly facing the camera plane and part of the same geometry island. By switching to Orthographic view and rotating your model to a certain angle you can control which polygons will be affected by the Action. Unlike with Facing Front All, polygons that face the camera plane will be ignored if they are part of a different geometry island from that of the clicked polygon.

For more information about the concept of islands, please refer to the Island Target.

Flat & PolyGroup

The Flat & PolyGroup Target selects an island of connected polygons which have no angle differentiation between them and are part of the same PolyGroup.

See the Island Target for more information about the concept of islands.

Flat Border

The Flat Border Target looks for a flat island and then selects the polygons that make up its border. The flat detection threshold can be modified by changing the Flat Targets Tolerance value in the universal ZModeler modifiers.

Flat Border is gives results which are opposite that of the Flat Inner Target

Flat Inner

The Flat Inner Target looks for a flat island and then discards its border polygons, causing the Action to only affect the center region.

Flat Inner gives results which are the opposed of the Flat Border Target.

Flat Island

The Flat Island Target selects a group of connected polygons which make up a totally flat surface. These polygons do not need to all share the same PolyGroup.

For more information about the concept of islands, please refer to the Island Target.

Infront

The Infront Target corresponds to all the polygons which are located in front of the click polygon as determined by its surface normal.

Note:

Viewing angle is irrelevant to this Target.

Infront & Polygroup

The Infront & Polygroup Target is similar to the Infront Target except that polygons which are in front of the clicked polygon's normal will be ignored unless they share the same PolyGroup as the clicked polygon.

Island

The Island Target selects a single geometry island within your model. Islands are created when SubTools are merged together into a single SubTool, such as in the DemoHead.ztl where the "eyes" SubTool has both eyes, the teeth and the tongue to create four separate islands. Each Island has its topology which is totally independent from the others.

Islands can intersect with each other, but so long as they aren't welded together they are considered separate entities for Target purposes.

Poly (Polygon)

Similar to the A Single Poly Target, the Poly Target selects a clicked three or four-sided polygon. (A triangle or quadrangle.)

Poly Corners (Polygon Corners)

The Poly Corners Target selects the points which make up the clicked polygon.
PolyCenter (Polygon Center)
The PolyCenter Target aims the associated Action at the center of the clicked polygon.

PolyGroup All

The PolyGroup All Target selects all polygons that share the same PolyGroup as the clicked polygon, no matter where those polygons might be within the model. This Target ignores geometry islands.

Polygroup Border

The PolyGroup Border Target is similar to PolyGroup All except that after selecting the polygons which share the same PolyGroup it then refines that selection to include only those polygons which connect (share an edge) with other PolyGroups.

Put another way, the refinement is opposite that of Polygroup Inner.

Polygroup Inner

The PolyGroup Inner Target is similar to PolyGroup All except that after selecting the polygons which share the same PolyGroup it then refines that selection to include those polygons which DO NOT connect (share an edge) with other PolyGroups.

Put another way, the refinement is opposite that of Polygroup Border.

Polygroup Island

If your model has a PolyGroup that is found on multiple islands, the PolyGroup Island Target will select all polygons belonging to the clicked polygon's group and then refine that selection by discarding those polygons which are part of the same island.

For more information about the concept of islands, please refer to the Island Target.

Polyloop

The Polyloop Target selects a loop of polygons. This is a group of polygons that are connected to each other as a strip of geometry. A poly loop can be closed or open, depending on the topology.

When hovering over a polygon, the edge selector widget informs you of the direction in which the poly loop Action will be applied.

Polyloop & Flat

The Polyloop & Flat Target selects a poly loop as defined above but detection ends as soon as ZBrush detects an angle between polygons.

For more information about the poly loop concept, please refer to the Polyloop Target.

Polyloop & Polygroup

The Polyloop & Polygroup Target selects a poly loop as defined above but detection ends as soon as another PolyGroup is encountered.

For more information about the poly loop concept, please refer to the Polyloop Target.

Two Polys (Two Polygons)

The Two Polys Target is specific to Actions that need to have two polygons to be performed. For example, the Poly Bridge Action creates bridged geometry between two clicked polygons.

The Two Polys Target is done in two steps by clicking a first Poly and then a second Poly. For each click, the ZModeler brush widget will instruct you to ‘Click 1st Poly’ or ‘Click 2nd Poly.’

Note:

This Target only considers clicks on polygons. This allows you to rotate your model as necessary while making the selection.

5. Curve Targets

Below is a list of Targets which are specifically available to Actions that affect the curves of your model..

All Curves

The All Curves Target directs the Action to affect all curves drawn on the model.

Curves

The Curves Target selects a single segment of the clicked curve. A segment is the section between any two circles along the length of the curve.

All other segments of the curve, if existing, will be ignored.

QUICKMESH

Polygonal Primitives for the ZModeler.

To more readily jump right into your creation process, ZBrush offers the Tool >> Initialize sub-palette, with settings that can be applied to any PolyMesh3D object.

Named Quick Meshes, these primitives convert the currently selected Tool or SubTool to a PolyMesh3D cube, Sphere or Cylinder which is optimized for usage with the ZModeler brush. The topology generated is composed only of quadrangles (four sided polygons) and comes with a predefined set of PolyGroups to make your initial modeling steps easier.

Each polygonal primitive is bound to X, Y and Z values that set the number of polygons for each axis. This value must be set prior to creation of the mesh.

These Quick Meshes do not have UV's. Also, no matter what values are set in the X, Y and Z axis, the mesh will always fit in a 1x1x1 QCube size.

The Quick Mesh primitive has primarily been designed to provide optimized primitives for the ZModeler brush but because it generates a Polymesh3D object it can also be used in association with nearly all other ZBrush sculpting features.

Note:

The active object must not have subdivision levels in order for Quick Mesh to function. If your selected model has subdivision levels, you must either delete them before using Quick Mesh or select a different model such as the PolyMesh3D primitive.

I Quick Mesh Functions

Quick Mesh primitives are based on the selected X, Y and Z values. Changing these settings will have an impact on the shape. The settings are described below to help you create these primitives quickly.

QCube

The Tool >> Initialize >> QCube button creates a cube-based shape, using the values defined by the X, Y and Z resolution sliders.

Performing this action will replace the current mesh with a QCube mesh.

QSphere

The Tool >> Initialize >> QSphere button creates a spherical shape as defined by the X, Y and Z resolution sliders.

To create a perfect sphere, you need to have the same value for all three sliders.

Performing this action will replace the current mesh with a QSphere mesh.

QCyl X, Y and Z (Quick Cylinder)

The Tool >> Initialize >> QCyl X, Y and Z buttons create a cylindrical shape as defined by the X, Y and Z resolution sliders. The primary axis of the cylinder is determined by which QCyl X, Y or Z button you click.

By modifying the X, Y and Z resolution sliders, it is possible to create a variety of shapes. For example, to create a circle-based cylinder, you can start with the same value for the X, Y, and Z resolution sliders and then increase or decrease the resolution of the slider corresponding to the axis of creation, generating the shape's length.

Performing this action will replace the current mesh with a QCyl mesh.

X, Y and Z Res (Resolution)

The Tool >> Initialize >> X, Y and Z Resolution sliders define the number of subdivisions along the corresponding axis of the mesh. This value must be set before pressing the Quick Mesh button of your choice.

DYNAMIC SUBDIVISION

Subdivision Surfaces for Low Polygon Models

The Dynamic Subdivision system contains alternative functions to ZBrush's Classic Subdivision Surface mode, allowing you to apply dynamic smoothing to your models without actually dividing the polygons. This feature is mainly designed to work in association with the ZModeler brush and low polygonal models.

The default Dynamic Subdivision mode is similar to the classic subdivision surfaces previously used by ZBrush. Applying a single subdivision level with Dynamic Smooth Subdivision mode active gives the same result as simply subdividing the model once in previous ZBrush versions.

The main difference between the two systems is simple: Dynamic Subdivision mode is used to represent the result of a smoothing your base mesh, letting you see what the divided model would look like even while you actually edit and sculpt the lower resolution mesh.

While working with Dynamic Subdivision active, you see the higher resolution surface while your brushes operate on the lower resolution base mesh.

As wtih the classic Subdivision system, Dynamic Subdivision surfaces can be altered with creased edges. However, this new mode also offers a wide range of other options that drastically change the visual results of smoothing: chamfered edges, non-smoothed subdivisions and more.

Dynamic Subdivision is applied to the model in real-time. While the function is active, any changes in the base mesh topology will show an immediate result in the displayed smooth surface. Using functions like QGrid and its options (Bevel or Chamfer) will allow you to model objects while having real-time dynamic chamfers or bevels applied to them.

I Dynamic Subdivision Blended with Classic Subdivision

Using Dynamic Smooth Subdivision mode will generate a visual result that is exactly the same as a classically subdivided mesh, except that only the base mesh is editable. You can't sculpt the displayed higher resolution surface.

Also, options like chamfering require angles in your surface to achieve the best results. Since Classic Subdivision smooths the surface, those angles will be lost and features that depend upon them won't work as well.

While it is possible to combine Dynamic Subdivision with Classic Subdivision smoothing, it is generally advised not to. If you must combine modes, only do so at low levels.

Put another way, use Dynamic Subdivision while building your base mesh, prior to detailing. Once you have completed base mesh modeling, turn Dynamic Subdivision off and subdivide like normal for the rest of your sculpting. (Or use the Apply feature explained below.)

Note:

Because Dynamic Subdivision operates in real-time, it will max out when reaching high polygon counts. If ZBrush determines that real-time feedback will be compromised it will no longer allow additional polygons.

II Dynamic Subdivision Workflow

To enable Dynamic Subdivision on a model, you need to press the Tool >> Geometry >> Dynamic Subdiv >> Dynamic button. You will not immediately see a visual change on your model. Next, specify which type of subdivision you wish to use: QGrid (QuickGrid), Flat Subdivision or Smooth Subdivision. ZBrush will now display that type of Dynamic Subdivision on your mesh.

Each option smooths the model using its own algorithms and so will generate a different appearance in the smoothed surface. It is possible to mix the three sliders' values, creating your own smoothing style. When doing this, keep in mind that the values in each slider individually multiply the displayed polygon count by 4, so mixing all three Dynamic Subdivision types with a value of 1 is the same as subdividing the model three times: 64 times as many polygons!

The polygon count of the working/editable topology remains exactly the same but you need to keep in mind that ZBrush is still processing the visual quality of these subdivisions. Using multiple Dynamic Subdivision types could slow down your computer.

III Dynamic Subdivision HotKeys

Dynamic Subdivision and Classic Subdivision share some common hotkeys. These can be a huge time saver when disabling and enabling Subdivisions. Remember that ZBrush Hotkeys can also be customized to your liking.

By default, ZBrush uses “D” and “Shift+D” for these hotkeys.

When working with Classic Subdivision, these hotkeys will navigate up and down between any existing subdivision levels.

With the Dynamic Subdivision (and only when the model has Dynamic Subdivision with no Classic Subdivision levels) the same hotkeys are used to enable or disable the display mode. They becomes a simple on/off toggle.

If Classic Subdivision is used in addition to Dynamic Subdivision, the hotkeys stop toggling Dynamic Subdivision and instead revert to navigating between the Classic Subdivision levels.

There are no default hotkeys for the three separate Dynamic Subdivision modes. You must navigate to those sliders, although you can certainly assign hotkeys of your choice if you prefer.

IV Dynamic Subdivision and Saved Projects/Tools

Any Dynamic Subdivision settings applied to the current Tool or SubTool will be saved within either Project (ZPR) or Tool (ZTL) files. After saving and reopening a file, the current Dynamic Subdivision settings will remain the same.

Unlike Classic Subdivision which actually changes the model's geometry, Dynamic Subdivision is a render effect being performed in real-time. As such, Dynamic Subdivision has no effect upon file size. ZBrush is simply storing a few settings rather than extra polygons.

V Priority Order of the different Dynamic Subdivision sliders

Because it is possible to combine Dynamic Subdivision modes, it is important to keep in mind that ZBrush has a specific order in which it stacks them, regardless of the order in which they were enabled by you.

The first subdivision applied is always QGrid, followed by Flat Subdivision and finally, Smooth Subdivision.

If you turned Smooth Subdivision on first then added Flat Subdivision, the visual result would be the same as if they'd been turned on in the reverse order.

VI Dynamic Subdivision Functions

Changing the different parameters for Dynamic Subdivision can drastically change both the visual appearance of your model and the performance of ZBrush itself. The settings below will help you fine tune your use of Dynamic Subdivision to get the most out of the feature.

All of these functions are found in Tool >> Geometry >> Dynamic Subdivision.

Dynamic

The Tool >> Geometry >> Dynamic Subdivision >> Dynamic mode enables Dynamic Subdivision mode for the current Tool or SubTool.

Remember that when first enabling this mode for a model it will not have any apparent effect until you adjust the QGrid, Flat Subdiv and/or Smooth Subdiv sliders to tell ZBrush which mode(s) you wish to use and how strongly.

Hotkey: D or Shift+D as a toggle.

Note:

As specified above, any Classic Subdivision levels override the use of these hotkeys for Dynamic Subdivision.

Apply

The Tool >> Geometry >> Dynamic Subdivision >> Apply function converts the model's Dynamic Subdivision to Classic Subdivision.

This only generates multiple subdivision levels with Flat and/or Smooth modes, due to the fact that those algorithms are based on quadrangle. With QGrid (Quick Grid), using Apply will generate the appropriate geometry as Subdivision Level 1 with no additional levels.

These modes do work together, however, with QGrid being applied first and then followed by the other two. So if your model has settings of 1 QGrid, 1 Flat Subdivision and 3 Smooth Subdivision, using the Apply function will create a model with 5 subdivision levels. QGrid is created as the first subdivision level, followed by a level of Flat Subdivision and three more levels of Smooth Subdivision.

After clicking the Apply function, your model will appear to be unchanged due to the

fact that Dynamic Subdivision is a WYSIWYG system. However, you will now have real high-resolution polygons with which to further refine and detail your mesh.

Note:

The values of the Dynamic Subdivision mode sliders are not reset by pressing the Apply button.

QGrid (Quick Grid)

The Tool >> Geometry >> Dynamic Subdivision >> QGrid (QuickGrid) slider defines the number of grid-style subdivisions applied to the model. By default, it applies a uniform grid over the entire model. Each increment in the slider's value quadruples the number of displayed polygons.

The QGrid function works in collaboration with the Coverage, Constant, Bevel and Chamfer options.

When Transform >> PolyFrame is enabled, the QGrid topology is visible but with less intensity than the base mesh topology.

Flat Subdivision and the QGrid Subdivision are based on the same algorithm except that QGrid can use extra options:

QGrid Coverage

The Tool >> Geometry >> Dynamic Subdivision >> Coverage slider defines how the grid pattern subdivision is distributed across the surface:

- With a value of 1, the distribution is uniform across the surface.
- Lower values slide the highest subdivision toward the edges of your mesh.

While QGrid is active you can see the effect of the Coverage slider in real-time.

To observe an example of this, simply load a Tool >> Initialize >> QuickCube mesh, then set the QGrid slider to 1, the SmoothSubdivision slider to one and change the Coverage slider values. At 1, you will have a very rounded cube because the entire surface is being divided uniformly. As the value approaches 0 you will get sharper edges due to the fact that most of the polygons will be pushed to those areas. (The main surfaces of the cube will have fewer polygons, resulting in less smoothing and flatter sides.)

QGrid Constant

The Tool >> Geometry >> Dynamic Subdivision >> Constant mode, when enabled, keeps the QGrid subdivision at a constant distance from the base mesh edges, providing uniform topology along these edges.

This setting is enabled by default as it is important to keep a constant radius along the edges when the QGrid Bevel and/or Chamfer modes are active.

QGrid Bevel

The Tool >> Geometry >> Dynamic Subdivision >> Bevel mode moves the edges of the QGrid subdivision to produce a flat angle along the mesh's edges.

The Coverage slider as well as the QGrid slider values impact the size and accuracy of this bevel.

QGrid Chamfer

The Tool >> Geometry >> Dynamic Subdivision >> Chamfer is similar to Bevel in that it operates along the mesh's edges. However, the edges will be more rounded.

The Coverage slider as well as the QGrid slider values will have an impact on the size and accuracy of the Chamfer.

Flat Subdivision

The Tool >> Geometry >> Dynamic Subdivision >> Flat Subdivision slider defines the number of grid-style subdivisions applied to the model. It creates a uniform grid across the model's surface. Each increment in the slider value multiplies the number of rendered polygons by four but no actual smoothing is applied to the surface.

(This is similar to turning off Smt before using Divide with Classic Subdivision.)

Because Flat subdivision does not smooth the surface, it doesn't make use of the QGrid options described above. The subdivided shape is almost identical to using QGrid with Constant, Bevel and Chamfer all set to 0, except that the polygons will be distributed uniformly.

Smooth Subdivision

The Tool >> Geometry >> Dynamic Subdivision >> Smooth Subdivision slider defines the number of standard subdivisions being dynamically applied to the model. It applies the same Catmull-Clark subdivision smoothing over the model that you would get using Tool >> Geometry >> Divide. However, these subdivisions are dynamic and display virtual geometry rather than actually creating new sculptable polygons. Each increment in the slider's value by one will divide the number of polygons by four.

For tech buffs, Catmull-Clark Subdivision splits each quadrangle into four new polygons and uniformly smooths the resulting surface. Triangles are split into three quads and the surface is not smoothed. A model with both tris and quads will be partially smoothed with the first subdivision (wherever the original quads are to be found) and fully smoothed with the second subdivision.

NANOMESH

Real Geometry Details Through Instancing

A feature of the ZModeler brush, the NanoMesh system takes the process of using ZBrush's InsertMesh and MicroMesh features to a whole new level. The NanoMesh system allows you to populate areas of a model with instanced geometry. These instances can then be modified in real-time to generate different scale, offset and angle for each instance.

If the default variations are not enough; the NanoMesh system has a random distribution mode that will allow you to create purely random surfaces across a model.

Since the NanoMesh system generates instanced geometry based on an original mesh, you can edit the original mesh at any time to make changes that instantly update across all its instances. These edits can be done using any of the ZBrush sculpting tools, including the ZModeler Brush. During editing you can also apply UV mapping and texture maps.

NanoMesh also gives you the ability to layer multiple NanoMeshes across the same surface to give even greater variety and creative freedom!

With NanoMesh, you can quickly experiment with shape and form as well as add tremendous detail in a few clicks!

I NanoMesh Components

The NanoMesh system is devised from instanced geometry (called “Nanos”) that are linked to placement polygons. In order for a NanoMesh to be applied to a mesh it must be Targeted to the desired polygon(s) by using the dedicated ZModeler Action.

1. The Placement Mesh

The placement mesh can be composed of anything from a single polygon (triangle or quadrangle) to the entire 3D model. Any of a model’s polygons can be Targeted as the placement polygons.

Because ZModeler can Target PolyGroups, a NanoMesh can have its instance placement determined by the model’s PolyGroups. This will allow different Nanos to be placed on different parts of the model’s surface.

Editing the placement polygons and/or PolyGroups will have a direct impact on the instanced NanoMeshes. If you have a NanoMesh applied to one PolyGroup then you change or remove that PolyGroup the Nanos that were linked to that PolyGroup will be removed.

Placement polygons can be also edited without applied NanoMesh instances getting in the way. Simply enable the Edit Placement option, which temporarily hides the Nanos while you freely modify the placement polys.

2. The Instanced Geometry (Nanos)

The instanced geometry (Nanos) created by NanoMesh are PolyMesh 3D geometry that has been linked to placement polygons with the ZModeler brush’s Insert NanoMesh Action. The NanoMesh process takes this single original Nano and applies it to the model as instanced geometry across whatever placement polygons have been set by the Target. This Nano index can then be manipulated through multiple options to give random size, rotation and offset variations.

At any time you can edit the original NanoMesh model using ZBrush’s standard Edit mode features. You can use any of the ZBrush modeling and sculpting tools, even creating UV’s and applying textures. When done, your changes will be applied to all the instances.

Please refer to the ZModeler documentation for more information about the Insert

NanoMesh Action.

3. The NanoMesh Brush

The NanoMesh brush is a special brush type that is similar to an Insert MultiMesh brush except that it is created specifically to store various Nanos for use with ZModeler brush.

The default ZModeler Brush contains a Nano that is a single cube. To use other types of 3D models as NanoMeshes, you need to create your own NanoMesh brush. The NanoMesh brush is simply a ZModeler Brush with custom 3D models stored in it. This brush will have all standard ZModeler functions with the exception of the stored Nanos.

To create this NanoMesh brush, you need to:

1. Select an Insert Mesh or Insert Multi Mesh Brush of your choice.
2. Click Brush >> Create NanoMesh Brush.
3. The NanoMesh brush will be created and automatically selected.
4. If the NanoMesh Brush has been created from an IMM brush, press the “M” key at any time to display the 3D models to use as a NanoMesh. The next time you use Insert NanoMesh polygon Action, this model which will be selected. (If you converted an InsertMesh then only the one Nano will be available.)
5. Optionally, save your brush for later use.

Please refer to the ZModeler documentation for more information about the Insert NanoMesh Action.

II NanoMesh Demonstration

With your NanoMesh brush created, the workflow is quite simple:

1. Load a PolyMesh 3D. Meshes with classic subdivision levels will use the currently selected level.
2. Select the ZModeler or NanoMesh brush of your choice and select the “Insert NanoMesh” Action. (Access the ZModeler pop-up menu hovering over a polygon in your model and either pressing the space bar or right-clicking.)
3. If the NanoMesh brush has been built from an IMM brush, press the “M” key to display the list of available models and select the one of your choice.
4. Still in the ZModeler pop-up, select the Target of your choice. For an initial test use “All Polygons” to populate the whole model.
5. While a polygon is highlighted, click and drag. The placement polys as determined by your Target will be covered by NanoMesh Nanos. The movement of the mouse or pen while you drag the stroke will define the size of the inserted model.
6. You can now edit the various Tool >> NanoMesh settings to fine tune the instances. You can change the size, width, length and offset as well using the Variance sliders to apply variations to the instances.
7. Use the Random Distribution slider to change the way that the NanoMesh populates the model.
8. Now select another NanoMesh brush or press the “M” key to select a different Nano to insert. Click and drag on a polygon of the model which already has a Nano on it. This replaces the previous Nano with your new one.
9. If you want to replace the instances without losing the current settings applied to it, simply select change Nanos and then instead of a new click-and-drag, use the Tool >> NanoMesh >> Inventory >> Replace NanoMesh from Brush feature.
10. Finally, if you want to convert all the instances to real geometry, press Tool >> NanoMesh >> Inventory >> One To Mesh. This change the Nanos from instances to regular geometry just as if they’d been placed using a normal InsertMesh.

III Working with Multuiple NanoMeshes

To produce even more variation in your creations, you can combine multiple Nanos on the same placement polygons.

1. Multiple NanoMeshes

Each time you add a Nano to a placement polygon that doesn't already have one, you are simply linking the new NanoMesh to this area. Repeating this operation will create even more NanoMesh indexes across your model.

Each NanoMesh index that is created is totally independent from those that have come before except that it may share the same placement polygons. If you want to edit the settings for a previous NanoMesh index, simply use the Tool >> NanoMesh >> Index slider or the "<<" and ">>" functions.

An alternative is to click on the NanoMesh thumbnail in the NanoMesh sub-palette to display a pop-up of your current NanoMesh indexes and choose the one you wish. Once selected, you can then edit its settings.

2. Polygons with Multiple NanoMeshes

Creating a NanoMesh on a placement polygon that already has one or more Nanos applied to it will typically replace the Nano. (See the example, above.) If you want to apply multiple Nanos to the same placement polygon(s), you need to follow this process:

1. Create a first NanoMesh and modify its settings as needed.
2. Select a different Nano and start to draw it.
3. Without ending the click, press and hold the Shift key. You will see the previous Nano reappear, with the new one added as well.
4. Release your click to finalize the insertion.
5. This new NanoMesh will have a unique index and can be now edited in the Tool >> NanoMesh settings.

IV NanoMesh Functions

Even though a single NanoMesh index results in repeating the same piece of geometry multiple times across the surface of the model, there are an abundance of settings that can be applied to give great visual variation to each Nano, hiding the repetition. All the settings below are dynamic so you can edit them and see the results in real-time.

1. Main settings

The Main settings control the aspect, orientation and duplication of the Nanos.

NanoMesh Selector

The small preview in the Tool >> NanoMesh menu is a selector. Not only does it display the existing NanoMesh Index that is applied to the current model, clicking on one of the preview icons will select the corresponding NanoMesh index.

NanoMesh On

Tool >> NanoMesh >> NanoMesh On mode enables or disables all NanoMeshes applied to the model.

Hide Others

Tool >> NanoMesh >> Hide Others hides all the NanoMeshes applied on the model except for the currently selected one.

If you keep this mode on while switching to another NanoMesh, their visibility on the model will be swapped. This mode is similar to Solo Mode when working with SubTools.

<< and >>

The Tools >> NanoMesh >> “>>”and “<<” buttons let you cycle through the various

existing NanoMesh indexes. These buttons are greyed out when you only have one NanoMesh applied to the model.

Index

The Tool >> NanoMesh >> Index slider lets you select a specific NanoMesh index from those currently applied to the model. As with the “>>” and “<<” buttons, the slider is greyed out when you only have one NanoMesh applied to the model.

Copy and Paste

The Tool >> NanoMesh >> Copy and Paste functions let you copy the settings from one NanoMesh index and duplicate them on another.

Edit Mesh

The Tool >> NanoMesh >> Edit Mesh button switches to isolate the current NanoMesh index’s source model, letting you modify it. It operates similarly to Solo mode when working with SubTools, hiding the placement polygons.

While in this mode, you can edit the model with the various ZBrush sculpting and modeling tools. When you are satisfied with the changes, simply press the Edit Mesh button again to return to NanoMesh mode. All instances will be updated with the changes you did while in Edit Mesh mode.

As mentioned previously, another interesting thing that you can do with the Edit Mesh function is to create UV’s on the Nano mesh and apply textures. If you add a displacement map, this will be used during the BPR render or by an external render.

When editing a Nano, keep in mind that there can be thousands of instances of it depending on the various duplication settings. Increasing the polygon count of the original model can exponentially increase the total polygon count of your scene.

Edit Placement

The Tool >> NanoMesh >> Edit Placement mode is the reverse of Edit Mesh because it temporarily isolates the NanoMesh placement polygons. All Nanos will be hidden and you can freely edit the placement polygons themselves, similar to how Solo mode works with SubTools.

While in this mode, you can edit the NanoMesh placement polygons using the various ZBrush sculpting and modeling tools. Changing the shape of the placement polygons determines how the Nano are distributed over the model.

When satisfied with the changes, simply press the Edit Placement button again to quit the mode. The NanoMeshes applied to the placement polygons will have their positions updated to reflect the changes made to the placement polygons.

Proportional

The Tool >> NanoMesh >> Proportional mode keeps the shape of the inserted meshes proportional rather than being dependant on the shape of the underlying placement polygons.

To determine the reference size, ZBrush uses the bottom part of the Nano as seen in the mesh selector preview.

Fit

The Tool >> NanoMesh >> Fit mode keeps the size of the inserted mesh proportional with the placement polygons. The shape of the Nano is not changed and so will not be distorted.

Note:

The NanoMesh fits the polygon source when the Size slider value is set to 1

Fill

The Tool >> NanoMesh >> Fill mode resizes the inserted Nano in such a way as to completely fill the placement polygons. This result in non-uniform scaling and will distort the shape of the Nano.

Note:

Fill mode and the Fit mode can be identical if the bounding box of the inserted model is cubical in shape.

Constant

The Tool >> NanoMesh >> Constant mode, when enabled, keeps a constant height for the NanoMesh, regardless of the size of the placement polygons.

Clip

The Tool >> NanoMesh >> Clip mode prevents the topology of the insert mesh from going outside the placement polygons. It does this by trimming off any parts that would extend past the edges.

Note:

Clip mode may result in topology issues if the Nano has a low polygon count or a shape which may result in flat parts. This is similar to what can happen with the Clip brushes.

Size

The Tool >> NanoMesh >> Size slider changes the size of the NanoMesh. The original value is set by your drag motion when inserting the NanoMesh on the placement polygons through the ZModeler brush.

Width, Length and Height

The Tool >> NanoMesh >> Width, Length and Height sliders change the proportions of the NanoMesh. A value of 1 represents 100% of the original size.

These slider values are affected by the Wvar, Lvar and Hvar variation sliders.

XOffset, YOffset and ZOffset

The Tool >> NanoMesh >> XOffset, YOffset and ZOffset sliders change the default positions of the Nano by adjusting how it sits relative to its usual centered position on the placement polygon.

The default value for the X and YOffsets is 0 while the ZOffset value defaults to 1. This is simply because the Nano's default position is to lay on top of the surface rather than being embedded within it.

These slider values are affected by the XOvar, YOvar and ZOvar variation sliders.

XRotation, YRotation and ZRotation

The Tool >> NanoMesh >> XRotation, YRotation and ZRotation sliders apply a rotation value to the Nano's default orientation.

These slider values are affected by the XRvar, YRvar and ZYvar variation sliders.

xVar - Variation (W, L, H, I R Var, etc)

The Tool >> NanoMesh >> "Var" sliders (located to the right of the size, offset and rotation sliders) apply a random variation to their corresponding attributes. Each variation can be from -100% up to 100%.

As an example, the WVar slider adds a variation to the Width slider, with a result that the associated Nanos will no longer be uniform in width.

Flip H and Flip V (Flip Horizontal and Flip Vertical)

Tool >> NanoMesh >> Flip H and Flip V mirror the inserted NanoMesh either horizontally or vertically.

H Tile and V Tile (Horizontal Tile and Vertical Tile)

The Tool >> NanoMesh >> HTile and VTile sliders duplicate the inserted NanoMesh within the boundaries of each placement polygon.

By default, this is done in a grid pattern. The replication pattern can be changed with the Tool >> NanoMesh >> Pattern setting (see below).

When applying tiling to the NanoMesh, its orientation may be different from one polygon to another. ZBrush uses the vertex order of each placement polygon to define Nano orientation. Unfortunately, the point order may be different between two adjacent polygons or multiple polygons, resulting in NanoMeshes not tiling in the same direction. To change a single polygon's orientation (or that of multiple polygons) you can use the polygon Spin Edge Action associated with the A Single Poly Target of the ZModeler brush. With this Action and Target selected, simply clicking on the problem polygons will rotate the tiling.

Pattern (and Pattern Selector Pop-up)

The Tool >> NanoMesh >> Pattern slider and its associated pop-up selector alters the distribution of the NanoMesh inside the placement polygons when a pattern is created by the H Tile and V Tile sliders.

The default pattern is a grid. To change the distribution pattern, simple change the Pattern slider value. You can also click the Pattern Selector pop-up to select a new one by name.

Some pattern types may produce the same result as others, depending upon the value of the H and V Tile sliders. If you are not noticing a difference, attempt to increase the Tile values.

IMAGE

An example showing the impact of the H and V Tile values on the different pattern types: on the left are Grid Inset and Border Inset with a value of 4 for the H and V Tile sliders, producing the exact same result. On the right, H and V Tile have been set to 8. Notice the difference between the two types of insets.

The Pattern and the Pattern Selector pop-up only work the H and/or V Tile slider has a value other than 1.

Random Distribution

When enabled, the Tool >> NanoMesh >> Random Distribution slider overwrites the existing NanoMesh distribution with random placement across all placement polygons. By increasing the slider value, you will increase Naon density as well as changing the distribution.

The Random Distribution slider is the perfect function to create a natural look for duplicated objects because instantly hides the fact that the Nanos are all the same object. Each NanoMesh can have the orientation, size and scale of its Nanos modified by the variation sliders.

Random Distribution is also applied to the H and V Tile values and its Pattern distribution, creating clusters of random meshes.

Random Seed

The Tool >> NanoMesh >> Random Seed slider modifies the Random Distribution slider's result without affecting the distribution of the NanoMesh. To put in simple words;

it changes the base randomization variables, resulting in different randomization values.

This function is useful when low values for the Random Distribution slider produce placement which may not fit your design. By changing the Random Seed value, you may generate a more appropriate result.

2. Alignment

NanoMesh uses an Insert Mesh to populate the regions of the model in which it is applied, with the orientation of each Nano being determined by the point order of the placement polygons. Depending on how the model has been constructed, this order may not be uniform across the polygons. As a result, the initial appearance of your NanoMesh can be disorganized and seemingly random.

One solution to align the NanoMeshes is to edit all the placement polygons one by one to change the vertex order. This would be time consuming, however. To resolve this, you will find the following alignment functions in the Tool >> NanoMesh sub-palette. These alignments make use of topology information to change the direction of the Nanos.

To define the orientation of each instance, ZBrush uses the base (bottom) of the master model when it was created. All alignments refer to this original orientation.

Align to Normal

Tool >> NanoMesh >> Alignment >> Align to Normal aligns each Nano based on the model's surface normals.

This alignment produces the best results in most cases.

Align to Short Edge

Tool >> NanoMesh >> Alignment >> Align to Short Edge aligns each Nano to the shortest edge of the placement polygon.

If a polygon has two or more edges of equal length, the point order will still be used to select the "shortest" one. It also uses the point order to determine the direction of alignment along the shortest edge.

Align to Long Edge

Tool >> NanoMesh >> Alignment >> Align to Long Edge aligns each Nano with the longest edge of the placement polygon.

If a polygon has two or more edges of equal length, the point order will still be used to select the “longest” one. It also uses the point order to determine the direction of alignment along the longest edge.

Align to Near Edge

Tool >> NanoMesh >> Alignment >> Align to Near Edge is a modifier for the Align to Long Edge option.

Align to Point Order

Tool >> NanoMesh >> Alignment >> Align to Point Order orients the Nano based on the position of the first vertex position in the placement polygon.

Note:

The vertex order is a structural information within the polygon, with no visual influence on the polygon’s appearance. It is not possible to visualize the order of the vertices.

Align to Random Edge

Tool >> NanoMesh >> Alignment >> Align to Random Edge aligns the Nano randomly.

No Alignment

Tool >> NanoMesh >> Alignment >> No Alignment uses the default alignment based on the placement polygon’s point order.

3. Colorize

As with all 3D models in ZBrush, you can apply colors to a NanoMesh. These functions let you manipulate how the coloring is applied.

This is color being added to the Nanos rather than the master mesh. For instructions on texture manipulation, please refer to the UV section below.

Restore NanoMesh MRGB

Tool >> NanoMesh >> Colorize >> Restore NanoMesh MRGB reverts the Nanos to the color and material of the original master mesh. This only has any effect if that information has been changed using the other functions within the Colorize menu. (See below.)

Mesh MRGB

Tool >> NanoMesh >> Colorize >> Mesh MRGB matches the color and material of each Nano to that of its placement polygon's PolyPaint.

Mesh Color

Tool >> NanoMesh >> Colorize >> Mesh Color matches the color of each Nano to that of its placement polygon's PolyPaint.

Mesh Material

The Tool >> NanoMesh >> Colorize >> Mesh Material matches the material of each Nano to that of its placement polygon's PolyPaint.

UI MRGB

Tool >> NanoMesh >> Colorize >> UI MRGB sets the color and material of each Nano using the Color >> Main Color setting and the currently selected material from the

ZBrush interface.

UI Color

Tool >> NanoMesh >> Colorize >> UI Color sets the color of each Nano using the Color >> Main Color setting in the ZBrush interface.

UI Material

Tool >> NanoMesh >> Colorize >> UI Material sets the material of each Nano using the currently selected material from the ZBrush interface.

Adjust Hue, Saturation and Intensity

The Tool >> NanoMesh >> Colorize >> Adjust Hue, Saturation and Intensity sliders modify the colors currently being displayed on each Nano.

These sliders will have no effect if the Nanos have no color applied to them.

Adjust Variations

Tool >> NanoMesh >> Colorize >> Adjust Variations apply a variation factor to the Hue, Saturation and Intensity values, assuming that any have been set.

This function is very useful when wanting to add some slight differences in the color of each Nano so that they look less like instances of the same object.

4. UV

Not only can Nanos receive color and material from the placement polygons, the master copy of the mesh can also have a texture applied. This texture will then appear on all instances of the mesh.

To have a texture applied, it is of course important to have UV's. ZBrush includes functions to automatically produce UV's for each Nano based on the placement poly-

gons. This means that the applied texture will look different for every instance!

Note:

It is possible to create custom UV's for a NanoMesh through its Edit mode. This applies the UV's and texture to the master model, so all instances of it will then have the same UV's.

Use Base Mesh UVs

Tool >> NanoMesh >> Use Base Mesh UVs mode tells ZBrush to match the UV's of each Nano with that of its placement polygons. This is accomplished by projecting from the placement.

Use Base Mesh Texture

Tool >> NanoMesh >> Use Base Mesh Texture mode projects the texture of the placement polygons onto the Nanos.

Note:

As with other places in ZBrush, texture always has priority over the NanoMesh colors, overriding any settings in the Colorize menu.

5. Inventory

The Inventory functions are dedicated to manipulation and conversion of the NanoMesh itself, such as the conversion from instances to real geometry or replacement of one NanoMesh with another.

One to Mesh

Tool >> NanoMesh >> One to Mesh converts the current NanoMesh index to real geometry. This result can then be further edited with the various ZBrush sculpting and modeling tools.

If your model has multiple NanoMeshes applied, use the Index slider or "<<" ">>" buttons to first select the specific NanoMesh that you wish to convert.

6. All to Brush

Tool >> NanoMesh >> All to Brush creates a new ZModeler brush from all current NanoMeshes applied to your model.

By pressing the M key, you should see all of these meshes as available objects for use with other models.

Note:

The All to Brush function is available only if the model has a NanoMesh on it. It is not possible to perform this action on a model which only has inserted meshes.

Replace NanoMesh from Current Brush

Tool >> NanoMesh >> Replace NanoMesh from Current Brush replaces the current NanoMesh index with a different mesh, using your currently selected ZModeler, InsertMesh or IMM brush.

This function simply replaces the inserted mesh. It won't affect the various settings currently applied to the NanoMesh index.

Note:

If your currently selected brush is an IMM brush or ZModeler brush with multiple meshes, you can choose the InsertMesh of your choice by pressing the M hotkey or by clicking the Brush >> Modifiers MeshInsert Preview button.

This function is really convenient to replace a placeholder Nano with another model or simply to try out different NanoMeshes on a model.

Delete One

Tool >> NanoMesh >> Delete One removes the currently selected NanoMesh by deleting its index. If your model has multiple NanoMeshes applied, you must of course first use the Index slider or "<<" ">>" buttons to select the NanoMesh that you wish to delete.

Delete All

Tool >> NanoMesh >> Delete All function removes all NanoMeshes applied to the current model, deleting every NanoMesh index.

ARRAY MESH

Dynamically Instanced Array Generation

Array Mesh is an advanced array system in ZBrush that will allow you to create duplicate instances of geometry in varying patterns and shapes. This feature operates in real-time as you edit the structure of the original mesh or adjust the modifiers of the array. Using the sliders located in the Array Mesh sub-palette or simply using Array Mesh with TransPose can quickly generate complex instanced geometry.

The Array Mesh system also incorporates a multi-stage approach that allows you to nest multiple arrays within each other. With this system you can easily create Instanced shapes such as tank treads or full buildings!

Because the Array Mesh is instanced geometry you can at any time modify the original model and see all changes propagate across the entire Array. If you created an Array of windows for a building façade and you now want to add curtains to all the windows, simply modify the original model and the curtains will be applied to all the instances.

I Array Mesh Stages

An Array Mesh can be generated as a single operation or as multiple operations combined together. Each stage that is applied to the array can either reuse the content of the previous stage or just the location of the last copy as a start of a new stage.

Each Array Mesh stage is independent. This provides a way to have different parameters for each stage. An example is tank track treads where:

- The first stage defines the top flat part.
- The second stage defines one of the rounded parts.
- The third stage defines the bottom flat part.
- The fourth stage defines the other rounded part and connects it to the beginning of the first stage copy.
- The fifth stage defines a mirrored version of the whole track to generate two full treads.

Now by editing the original source mesh, the tracks can be automatically updated in real-time!

II Working with TransPose

Array Mesh is a function that relies heavily on parameters and sliders to generate the desired results. This process is not always artist-friendly, so ZBrush also allows control over these parameters using the TransPose line.

- Location of the Pivot Point: the little yellow circle defines the center of the transformations.
- Offset between the source model and its duplicates, with Move.
- Scale factor between the source model and its duplicates, with Scale.
- Rotation between the source model and its duplicates, with Rotate.
- Number of instanced copies.
- Selection of the current stage.

Any changes that you generate with TransPose are automatically applied to the Array Mesh modifiers in the Array Mesh sub-palette.

To use TransPose with Array Mesh, you need to first enable the Tool >> Array Mesh >> TransPose mode switch. After enabling this feature you can freely manipulate TransPose as usual and switch to the different TransPose modes to affect the Offset, Scale, Rotate and Pivot of the Array. The behaviors of TransPose are exactly the same as the ones that are used when manipulating 3D models.

III Pivot Point

The Pivot Point is a key item in Array Mesh creation because it sets the center of the operation, thus impacting how the rotation and offset values work to place the instances.

You can define the position of the pivot point by using the X, Y and Z Amount sliders while in Pivot mode. For more interactive manipulation, use TransPose. In this latter case, a little yellow circle will appear at the TransPose line's starting point. This is the pivot point.

The pivot point is manipulated by clicking and dragging the circle. Because its position is set in the camera working plane, it is advised to switch to an orthographic view and carefully select your point of view before manipulating.

The pivot point is only visible when TransPose mode is enabled. When disabled, the yellow circle will not be seen.

IV Array Mesh and NanoMesh

Array Mesh and NanoMesh are two functions that can work together in two different ways: Duplicating a NanoMesh with an Array Mesh or using an Array Mesh as placement polygons for Nanos.

1. Duplicating a NanoMesh with an Array Mesh

A NanoMesh is considered by ZBrush to be true geometry. This means that it can become the source of an Array Mesh, without the need to first convert the NanoMesh instances to geometry.

Because both NanoMesh and Array Mesh are based on the principle of instanced geometry, editing the source object of the NanoMesh will modify the result of the NanoMesh and then copy that result across the Array Mesh.

2. Converting an Array Mesh to a NanoMesh

An Array Mesh is a fantastic tool when it comes to generating parametric shapes based on instanced copies of the initial object. However since an Array Mesh generates exact copies of the source object, the resulting figure will look very uniform. By converting each copy of the Array Mesh to a NanoMesh, you can capitalize on the variation parameters within the NanoMesh system to break the design up and make it look more natural.

When converting an Array Mesh to a NanoMesh, each array instance is isolated and applied to a single placement polygon. Once the Array Mesh is converted to a NanoMesh it can use any of the NanoMesh features -- from replacing it with another NanoMesh to editing the original model or applying randomizations.

A simple workflow could be:

- Create an Array Mesh, in either single or multiple stages.
- Convert it to NanoMesh. After conversion you will not be able to change the number of instances or use any other Array Mesh modifiers.
- Select an Insert brush, Insert Multi Mesh brush (IMM) or NanoMesh brush. (When using an IMM brush or a NanoMesh created from an IMM brush.) Press the M key to select the 3D model of your choice.
- Click Tool >> NanoMesh >> Inventory >> Replace NanoMesh from Brush. The 3D model associated with the placement polygons will be replaced.

- Use all the NanoMesh settings to interactively refine the results.

Please refer to the NanoMesh documentation for more information about NanoMesh creation and manipulation.

V Working with Presets

The Array Mesh settings can be saved as a file on your computer to reuse at a later date or share with other artists. You can also save these files in the dedicated ZArray Mesh folder. Storing the Array Meshes in this folder (found in the main ZBrush directory, in the same folder as the ZBrush application itself) will make them available through the Array tab in LightBox.

To apply an Array Mesh preset from LightBox, simply double-click its thumbnail. ZBrush will automatically take your currently selected Tool (model), enable the Array Mesh function and apply the Array Mesh settings from the preset.

VI Array Mesh Functions

Below is a list of the Array Mesh settings that can be modified for greater control over the duplication process.

Most of these settings are fully interactive, letting you freely experiment with advanced multiple stage creations.

LightBox > Array Mesh Presets

The Tool >> Array Mesh >> Array Mesh Presets button opens LightBox to the Array Mesh tab. You can then double-click on a saved Array Mesh preset file to apply the settings to your current mesh.

Open and Save

Tool >> Array Mesh >> Save allows you to save the current Array Mesh settings in a file.

Tool >> Array Mesh >> Open command of course loads any previously saved Array Mesh file and applies the corresponding settings to the current model.

Note:

An Array Mesh file does not contain the geometry that is being instanced, but rather the settings for the array itself.

Array Mesh

Tool >> Array Mesh >> Array Mesh enables or disables Array Mesh mode for the current Tool or SubTool.

When Array Mesh mode is first enabled, it creates a copy of the current model. This copy is positioned in the same location as the original model.

If an Array Mesh already exists, disabling and enabling Array Mesh mode will simply hide/unhide any transformations that have been applied without changing any settings. This function allows you to temporally turn off the array so as to make isolated modifications to the original Mesh.

TransPose

The Tool >> Array Mesh >> TransPose switch allows you to use the TransPose system to manipulate your Array Mesh interactively.

When TransPose is enabled, switching to Move, Scale or Rotate will turn on the TransPose Action Line and let you use it to modify the Offset, Scale and Rotate values for the Array Mesh. (The X, Y, and Z Amount sliders.)

TransPose mode with an Array Mesh also lets you interactively set the pivot point for the transformations. To change the pivot, simply click and drag the yellow circle located at the start of the TransPose line. The pivot is always freely manipulated relative to the camera working plane. For accurate placement, it is advised to switch to an orthographic view and carefully choose the desired point of view before moving the pivot indicator.

Upon changing the pivot point, the Action Line will automatically be repositioned to fit the new pivot location.

Lock Position, Lock Size

Tool >> Array Mesh >> Lock Position and Tool >> Array Mesh >> Lock Size prevent the position and/or size of the existing Array Mesh instances from being changed.

By default, transformations are applied to the initial model and the instances then move or scale accordingly. By activating these locks, the size and position of the existing instances won't change.

These locks affect all stages associated with the array.

Switch XY, Switch XZ, Switch YZ

Tool >> Array Mesh >> Switch XY, Switch XZ and Switch YZ transform the current axis orientation, based upon the current working plane from which you are viewing the model.

These functions are useful when you want to apply transformations that may not be in the desired direction relative to the world axis.

Transform Stage

The Tool >> Array Mesh >> Transform Stage slider lets you navigate between the

different Array Mesh stages. To create a new stage, use the Append New or Insert New functions.

When an Array Mesh is first created, this slider will be greyed out because there are no additional stages to choose from.

Please refer to the Array Mesh Stages section below for more information about stages.

Append New

Tool >> Array Mesh >> Append New creates a new stage after all existing stages in the list. So if you have four stages and are currently at the first, this button will create a 5th stage.

Insert New

Tool >> Array Mesh >> Insert New creates a new stage immediately after the currently selected stage. So if you have four stages and are currently at the first, this button will create a new stage 2 with the remaining stages each incrementing by one number. With this function, you can insert a new stage in between two existing stages.

Reset

Tool >> Array Mesh >> Reset sets all parameters for the currently selected stage back to their default values.

Delete

Tool >> Array Mesh >> Delete removes the currently selected stage. If that is the only existing stage then the Array Mesh is deleted and all the settings are returned to their default values.

Copy, Past

The Tool >> Array Mesh >> Copy and Paste functions let you copy the settings from

the current Array Mesh stage and paste them into another stage or even to another Array Mesh.

Repeat

The Tool >> Array Mesh >> Repeat slider defines the number of instance that will be created from the current model. This value always includes the original model, so to create a single copy the slider must be set to 2.

Chain

Tool >> Array Mesh >> Chain makes the next stage start at the end of the previous one. This allows you to generate advanced curve structures using a single instanced mesh across multiple stages.

When enabled, the Chain function turns off the Alignment and Pattern functions.

Smooth

The Tool >> Array Mesh >> Smooth slider applies a smooth transition between each stage.

Align to Path

Tool >> Array Mesh >> Align to Path changes the orientation of all instances to follow the array path.

To change the orientation of each instanced mesh along the path, you can change the axis orientation modifier in the Align to Path button.

Align to Axis

Tool >> Array Mesh >> Align to Axis orients each instance with the world axis rather than along the array path.

To change the orientation of the instanced meshes to use another axis, click the

desired modifier in the Align to Axis button

Pattern Start, Pattern Length, Pattern On, Pattern Off

The Tool >> Array Mesh >> Pattern Start, Pattern Length, Pattern On and Pattern Off sliders define when each instance of the Array Mesh starts and how many are visible (On) or invisible (Off).

The first object is always visible, even if you set Pattern Start to a value other than 1. However, in this case selecting another SubTool will cause the first instance of the previous SubTool to disappear since it's no longer the active instance. This is similar to how SubTool visibility works, where the selected SubTool must always be displayed even if it is set to "Off".

X Mirror, Y Mirror, Z Mirror

Tool >> Array Mesh >> X Mirror, Y Mirror and Z Mirror apply a mirror transformation to the Array Mesh, based on the chosen axis.

Mirroring can be individually set for each Stage.
X Align, Y Align, Z Align
Tool >> Array Mesh >> X Align, Y Align and Z Align apply a positive or negative offset to the axis of transformation, making the various alignments easier.

Offset

The Tool >> Array Mesh >> Offset mode works in association with the X, Y and Z Amount sliders and curves. When enabled, modifying the sliders will increase the distance of the copies from the source. The Offset value is the distance between the source and the final instance generated by the current stage.

Modifying the curve will affect the acceleration or deceleration of distance between copies along the length of the array. The curve is interactive and any manipulation will provide real-time visual feedback.

When the Tool >> Array Mesh >> TransPose mode is enabled, manipulating the TransPose line in Move mode will interactively change the Offset values.

Scale

The Tool >> Array Mesh >> Scale mode works in association with the X, Y and Z Amount sliders and curves. When enabled, modifying the sliders will increase the scale of the copies relative to the source. The Scale value is the size of the source relative to the final copy being generated by the current stage.

Modifying the curve will affect the acceleration or deceleration of the scale between copies along the length of the array. The curve is interactive and any manipulation will provide real-time visual feedback.

When the Tool >> Array Mesh >> TransPose mode is enabled, manipulating the TransPose line in Scale mode will interactively change the Scale values.

Rotate

The Tool >> Array Mesh >> Rotate mode works in association with the X, Y, and Z Amount slider and curves. When enabled, modifying the sliders will adjust the orientation of the copies relative to the source. The Rotate value is the angle of the source relative to the final copy being generated by the current stage.

Modifying the curve will affect the acceleration or deceleration of the rotation between copies along the length of the array. The curve is interactive and any manipulation will provide real-time visual feedback.

When the Tool >> Array Mesh >> TransPose mode is enabled, manipulating the TransPose line in Rotate mode will interactively change the Scale values.

Pivot

Tool >> Array Mesh >> Pivot mode works in association with the X, Y and Z Amount slider and curves. When enabled, modifying the sliders will change the position of the pivot point used by the different transformations (Offset, Scale, Rotate).

Modifying the curve has no impact on the pivot location.

When the Tool >> Array Mesh >> TransPose mode is enabled, being in TransPose Move mode and dragging the yellow circle found at the source position will interactively change the Pivot values.

Please refer to the TransPose and Pivot section of the documentation (above) for more information about the pivot.

X, Y, Z Amount and X, Y, Z Profile

These sliders and profile curves work in conjunction with the Offset, Rotate, Scale and Pivot modes. Please refer to these sections just above for more information.

Convert to NanoMesh

Tool >> Array Mesh >> Convert to NanoMesh transforms each Array Mesh to a NanoMesh structure, creating a separate placement polygon for each instance.

Please refer to the Array Mesh with NanoMesh section above and to the NanoMesh documentation for more information about NanoMesh manipulation and creation.

Make Mesh

Tool >> Array Mesh >> Make Mesh converts the Array Mesh into real (non-instanced) geometry. After conversion, the resulting model can be freely edited with any ZBrush sculpting and modeling tools.

Extrude

Tool >> Array Mesh >> Extrude converts the actual Array Mesh results to a new mesh and generates between each former instance, based upon its PolyGroups.

In order to perform this function, the Array Mesh objects must share PolyGrouping on their opposite sides. When Extrude is turned on, the Make Mesh function will look at this PolyGrouping and create bridges between the same PolyGrouped areas. This function is useful when creating environment items like stairs or organic models like snakes where you want the gaps generated in between the repeats to be filled.

If your instance repeats are close to each other, ZBrush will fuse them. If this is an undesired result, change the Repeat Value of the array to add more space between each instance and then click Make Mesh again.

Close

When using cylindrical arrays, the Close function will attempt to fuse the final instance of the array to the start, creating a contiguous circle.

Angle

The Angle slider works with Extrude when it generates bridging geometry on the Array. This slider will look at the surface normal of the corresponding PolyGrouped faces. Changing the Angle slider may fix bridging problems but can also generate undesirable results. Adjust this setting only if the default values don't work well.

KEYSHOT FOR ZBRUSH

Interactive raytracing and global illumination render for ZBrush.

KeyShot® is a rendering software created by the company Luxion. They have expert knowledge in areas related to daylighting (atmospheric scattering), light scattering by materials (BRDF and BSSRDF models), light transport algorithms such as photon mapping, and real-time rendering technology. KeyShot is an interactive raytracing and global illumination program developed by Luxion for both PC and Mac that breaks down the complexity of creating photographic images from 3D models. KeyShot is easy to use and gives anybody involved with 3D data the ability to create photographic-quality images in a matter of minutes, independent of the size of the digital model. KeyShot features Scientifically Accurate Materials, Multi-Core Photon Mapping, Adaptive Material Sampling and a Dynamic Light Core. These features allow users to see results as changes are being made. In addition to the above, KeyShot also allows you to create your own lights as well as materials in order to have full control over your rendering.

KeyShot for ZBrush consists of two parts: KeyShot itself and a ZBrush to KeyShot Bridge based on the LiveLinking™ function which connects ZBrush to KeyShot 5. For ZBrush users who do not already own a copy of KeyShot 5, there is a special edition of the renderer, named KeyShot for ZBrush. With the Bridge active, KeyShot becomes an alternative renderer for BPR inside of ZBrush.

If you are already an owner of KeyShot, you will only need the ZBrush to KeyShot plugin to enable the Bridge. All versions of KeyShot 5 and beyond are compatible with this plugin.

With the combination of ZBrush and KeyShot, you will have another option to almost instantly produce high quality images from your ZBrush models. At any time you can send your models to KeyShot which will then display what you have in ZBrush, including primitives, ZSpheres, ZSketches, geometry and more. This will include the corresponding material or MatCap already applied to them. In a way, KeyShot can become your second ZBrush "monitor".

We invite you to visit the KeyShot website for further information and documentation on the application. The ZBrush to KeyShot Bridge plugin can be purchased from the Pixologic web store. Also available is a bundle containing both KeyShot for ZBrush and the ZBrush to KeyShot Plugin. All versions of KeyShot itself (including special licensing options for KeyShot for ZBrush) are available from the Luxion website.

I About the KeyShot for ZBrush Software

The KeyShot for ZBrush edition is a dedicated version of KeyShot that works only with ZBrush. This version is equivalent to KeyShot HD in terms of features except that it can only open KeyShot's native .bip files and of course, connect to ZBrush. It is not possible to use other file formats to import data, although one could load such models into ZBrush and then use KeyShot to render via the Bridge.

This edition has no restrictions on render resolution..

All versions of KeyShot starting with KeyShot 5 natively support the Bridge, which mean that if you are already an owner of a KeyShot license you will be able to use it without needing to buy the special edition of KeyShot for ZBrush. In that case you will only need to purchase the Bridge plugin, adding it to ZBrush to enable connection between both applications.

The purpose of the KeyShot for ZBrush version is to make KeyShot more readily priced for hobbyists. To that end, a bundle is also available with special pricing when you buy both KeyShot for ZBrush and the KeyShot Bridge together. You of course are not required to purchase the KeyShot for ZBrush edition and could instead opt to buy one of the other editions in order to have expanded import capabilities or larger renders.

II Installing and Activating

The KeyShot for ZBrush Bridge plugin is already installed with ZBrush and doesn't need any additional files to be added by you after your purchase. All that is necessary is to activate the plugin after purchasing a license for it.

The activation process is simple and will be triggered the first time you use the ZBrush to KeyShot Bridge.

1. First, install and activate KeyShot.
2. Click Render >> External Render >> KeyShot to set it as the default BPR renderer.
3. Load a model and click Render >> BPR RenderPass >> BPR or use the Shift + R hotkey.
4. A dialog box will open, notifying you that you need a license to run the ZBrush to KeyShot Bridge. Click the "Install my License" button. If you don't own a license, you will need to purchase one at the Pixologic Store (http://store.pixologic.com/) or download a trial license. Internet links in the dialog box can take you directly to the appropriate pages for these choices.
5. Upon clicking the "Install my License" button, a window will open so that you can browse your computer hard drive to locate and load the license file that you saved after your purchase. (If you haven't download your license you will need to do so before you can proceed. Please refer to the email you received from the Pixologic store which includes all the information needed to download your license file.)
6. When your license has been located, select it and click the "Open" button.
7. A new dialog box will appear notifying you that the license has been successfully installed on your computer.
8. The final step is to activate your license on this computer. To do this, click the "Activate My License" button.
9. If your computer is connected to the internet, activation will be immediate. If you do not have an internet connection, see the paragraph immediately following these steps.
10. Upon activation, KeyShot should now launch and your ZBrush model should appear in its document window. If you have a connection error in ZBrush after performing the activation, click the BPR button again. (You should not have to go through steps 4-9 again).

If your computer does not have internet access, an offline activation process is available. After loading your license file you will be given the opportunity to save an activation request file to your computer. Simple put it on a USB stick and visit https://register.pixologic.com/activate/ from any computer that does have internet access. Following the instructions on that web page will create an activation file. Download the file and save it to your USB stick. The ZBrush to KeyShot Bridge activation window will allow you to load that file from the USB stick and complete the activation.

Notes:

Activation of the KeyShot to ZBrush Bridge is separate from your ZBrush activation.

III Deactivating the ZBrush to KeyShot Bridge Plugin

To deactivate the ZBrush to KeyShot Bridge, follow these steps:

1. Browse your hard drive to locate the ZBrush installation. By default, it is located at:
2. On Windows: C:\Program Files (x86)\Pixologic\ZBrushXX
3. On Mac OSX: Applications/Pixologic/ZBrushXX
4. Within the ZBrush folder, locate the Pixologic Deactivation Manager application and launch it.
5. The application lists your currently activated plugins. You should have the ZBrush to KeyShot Bridge listed.
6. Select it.
7. Click the Deactivate button. The bridge will now be deactivated and the activation credited back to your license for use elsewhere.

If your computer does not have internet access, an offline activation process is available. After loading your license file you will be given the opportunity to save an activation request file to your computer. Simple put it on a USB stick and visit https://register.pixologic.com/deactivate/ from any computer that does have internet access. Following the instructions on that web page will create a deactivation file. Download the file and save it to your USB stick. The Pixologic Deactivation Manager will allow you to load that file from the USB stick and complete the activation.

Note:

Deactivating the ZBrush to KeyShot Bridge does not deactivate ZBrush or KeyShot. You will need to deactivate them separately if you intend to remove them from your computer or reinstall your operating system.

KeyShot Hardware Specifications

KeyShot will run on both Windows and Mac OSX operating systems. Like ZBrush, it is a CPU driven software which means that it doesn't need an expensive high end graphic card to give great renders. KeyShot will work on most computers, from laptops to high end workstations. If your computer can execute ZBrush, then it will be able to execute KeyShot

Because KeyShot performs real-time renders, the model render is constantly updated to refine and optimize the quality of the image. For this reason, the processor is always used at its maximum potential. Both processor speed and number of cores have an impact on performance. As a rule, more cores will be of greater benefit than faster individual core speed. (This holds true for ZBrush as well.) An easy – if generic – way to compare CPU's for both ZBrush and KeyShot is to multiply each CPU's speed by the number of cores that it has. Doing this for each CPU will give you values that you can compare, with the higher number being the better choice. In this way, a dual core processor at 4 GHz (comparison value of 8) is inferior to a quad core processor at 3 GHz (comparison value of 12) even though the dual core CPU is the faster chip.

Both ZBrush and KeyShot also rely heavily on memory. If your computer has a limited amount of memory, running both applications at the same time will produce degraded performance due to the memory that is needed. It is advised to have at least 8 GB of memory to be able to run both programs at the same time. To give you an estimation of the memory needed, with 16 GB of RAM you can manipulate between 100 and 200 million polygons. Of course, to push that many polygons in ZBrush you would need to be using the 64-bit version of ZBrush.)

IV Supported and Non-Supported ZBrush Data Types

The KeyShot for ZBrush Bridge allows you to produce high quality renders in a single click without the need for converting your models to a specific type of file. KeyShot will not only render your geometry, but also many of ZBrush's proprietary functions like ZSpheres and ZSketch.

This list gives a quick rundown of the information types that are supported and not supported, along with various notes:

1. Geometry and Meshes

- **Geometry with or without UV's**: All of your 3D models displayed in ZBrush in Edit mode can be sent to KeyShot without restriction.
- **Geometry HD**: This specific sculpting mode isn't supported by the Bridge. Geometry HD supports up to 1 billion polygons, which is well beyond the capabilities of KeyShot.
- **ZSphere, ZSketch, Primitives**: These procedural geometries (i.e., non-PolyMesh3D) can be sent to KeyShot and will appear as they do in ZBrush without the need to convert them to PolyMesh3D objects via Adaptive or Unified Skinning.
- **Partial visibility** (hiding part of a mesh): Partially visible meshes are sent to KeyShot as they are displayed within ZBrush.
- **SubTools**: All visible SubTools are sent to KeyShot. The selected SubTool will also always be sent, even if it is flagged as invisible.
- **FiberMesh**: The FiberMesh feature is fully supported, from preview mode to generated FiberMesh.
- **MicroMesh**: If MicroMesh mode is enabled in the Render properties of ZBrush, instances are sent to KeyShot as geometry.
- **NanoMesh**: The different NanoMesh layers applied to a model will be exported to KeyShot as separate geometry.
- **Surface Noise**: This feature is fully supported in KeyShot and is equivalent to what you would have with the traditional BPR render. Noise is converted to real geometry without any action being required from you.

2. Color, Textures and Materials

- **PolyPainting**: KeyShot supports ZBrush PolyPaint. Models will keep their

PolyPaint when applying different KeyShot materials as long as those materials support vertex shading.

- **Color Textures**: KeyShot supports the color texture applied on a mesh via its UVW coordinates. The user can keep the texture when applying different KeyShot materials as long as those materials support textures.
- **Normal Maps, Displacement Maps and Vector Displacement Maps**: None of these maps are currently supported. KeyShot can easily handle the high resolution geometry generated by ZBrush, so using such maps would only increase render time while actually reducing render quality. In effect, these maps are useless for KeyShot renders.
- **Materials and MatCap**: ZBrush materials -- whether they are classic materials or MatCaps -- are fully interpolated to KeyShot. Most of this information is transferred via a texture, which means that you won't be able to tweak the material in KeyShot like you could do in ZBrush. However, what you see in ZBrush will be what you can expect to see in KeyShot.

3. Environmental Data

- **ZBrush Lights**: The lights set in the Light palette are not supported in KeyShot.
- **LightCap**: This is not directly supported. The effect of any LightCap is converted to be a part of the the ZBrush Material in KeyShot. This means that your material will look the same there, but if you change materials in KeyShot the LightCap "result" will be lost.
- **Background color**: The ZBrush background color defined in the Document >> Back color is supported by setting Environment >> Background in KeyShot to "Color."
- **Background image**: Background images loaded in ZBrush are not transferred to KeyShot.

4. Settings

- ZBrush camera: ZBrush uses a 2.5D camera while KeyShot uses a fully 3D camera. As a result, when going to KeyShot it is not possible to preserve the model's position relative to the ZBrush camera.
- References images and Grids: Neither feature is supported by KeyShot.
- Grid level: The grid level (defined by Draw >> Elv (Elevation Grid)) isn't supported in KeyShot.

V Basic Workflow from ZBrush to KeyShot

The process of rendering your ZBrush models or scenes in KeyShot is easy and mainly relies on the materials applied in ZBrush.

1. Changing the Rendering Engine

The first step to use KeyShot instead of the ZBrush BPR is to go to Render >> External Renderer and click the KeyShot button to enable it as the default rendering engine for ZBrush.

2. Setting the Bridge Options

Before sending your data to KeyShot, you can change the various options found in the External Renderer sub-palette.

The most important setting to consider is the Auto Merge mode which we recommend be left enabled. Please refer to the AutoMerge function description at the end of this chapter.

3. Sending Data from ZBrush to KeyShot

With the above settings in place, clicking the BPR button (located in the Render >> BPR Render Pass menu or on the right Shelf in main ZBrush interface) or using the Shift+R hotkey will automatically send your current model to KeyShot, launching it if necessary. If KeyShot is already running, the current instance of KeyShot will be used.

Depending on what you have in ZBrush, you can have these scenarios inside of KeyShot:

- If you have an empty scene in KeyShot, the Bridge will build the scene by using the information from ZBrush.
- If you already have a model loaded in KeyShot composed of one or more SubTools and you have the same model in ZBrush, the KeyShot scene will update according to the current ZBrush state. For example, modified SubTools or even added/removed SubTools will be updated appropriately in KeyShot.

Note:

All visible SubTools are always sent to KeyShot even if they have not been edited.

- If you selected a different Tool or Project in ZBrush, then whatever is in the KeyShot scene will be replaced by what is now in ZBrush. This is similar to creating a new scene.

It is important to consider that the Bridge itself won't automatically save your KeyShot renders. If you like a render, save it before doing a new render! Otherwise the new render will replace the previous one. The Bridge actions are not undoable.

Note:

It is not possible to update your KeyShot scene from ZBrush if KeyShot is in Pause mode. You must disable Pause mode before pressing BPR to try again.

4. Going Back from KeyShot to ZBrush

The Bridge is strictly a one-way action, from ZBrush to KeyShot. While you can send materials from ZBrush to KeyShot it is not possible to bring KeyShot materials back into ZBrush. Additionally, if you used the copy/instance functions of KeyShot you would not be able to reflect that in ZBrush.

To go from KeyShot to ZBrush you can use your operating system commands (such as Alt/Cmd+Tab) or you can click the small ZBrush logo located at the right of the KeyShot toolbar. All that this will do is change your focus application from KeyShot back to ZBrush, without any data being transferred.

Of course, if you are working on a dual monitor configuration with ZBrush and KeyShot located on different monitors, you won't need to use this function.

VI Working with ZBrush Data

The workflow to produce nice models in KeyShot is partly based on the background environment image which will produce the light, as well as the materials applied to you model.

In KeyShot, you have complete freedom to change the lighting, use ZBrush materials already applied to your model and also use anything from the rich material library provided within KeyShot.

Applying materials to a model in KeyShot is done in two different ways:

- Drag a material from the library and drop it onto the model. The ZBrush material applied to the model will be replaced by the selected one and this change will also be applied to all other SubTools which have the same ZBrush material.
- Drag a material from the library and drop it onto the model of your choice in the KeyShot scene tree. In this case, the material change will only be applied to that specific SubTool.

This way of working gives you great flexibility. If you are working with a single model which only needs one material, you can simply do a quick drag and drop from the library onto the model, no matter how many SubTools it might be comprised of. On the other hand, if you want to keep the ZBrush materials for some SubTools while using KeyShot materials for others, you can drag materials onto the scene tree. Alternatively, you can define different Materials/MatCaps in ZBrush before sending it to KeyShot.

1. Material Priority

When working with materials in either ZBrush or KeyShot, the last material applied in either program will have the priority when doing an update of the scene from ZBrush to KeyShot.

In other words, if you sent a scene to KeyShot and changed the materials there, those materials would remain even if you do some edits in ZBrush and perform a new render. However, if you then changed a material in ZBrush that would be reflected in your next KeyShot render. KeyShot will always use the most recently applied material for any SubTool, regardless of whether that material was applied in ZBrush or in KeyShot.

2. Multiple Materials in Action

If you wish to apply different KeyShot materials to different parts of your model, you will generally first want to assign separate ZBrush materials to each part. Applying a material in ZBrush always means being able to apply a KeyShot material to the same location.

If you want separate KeyShot materials on different parts of the same SubTool you would have to:

1. Select your SubTool.
2. Select the first ZBrush Material/MatCap.
3. Select Draw >> M or MRGB.
4. Click Color >> Fill Object to attribute the material to all the SubTool's polygons.
5. Use the Marquee or Lasso selection brush (Ctrl+Shift+click drag) to hide the parts of the model that you want to continue using the first material.
6. Select another material.
7. Color >> Fill Object to attribute the material only to the visible polygons of the model.
8. Repeat the last few steps for any other materials.
9. Show all the polygons of the model with by Ctrl+Shift+click on the document or by clicking Tool >> Visibility >> ShowPt.
10. Now send your model to KeyShot.
11. If you select a material and drag it over your model without releasing the mouse button, portions of the model should become highlighted based upon which ZBrush material was assigned to that portion.
12. Now you can define which KeyShot material to apply to each section simply by dropping it on the desired highlighted area.

3. Working with Texture and PolyPaint

The KeyShot for ZBrush Bridge fully supports both textures applied to your model and ZBrush PolyPaint. If your SubTool has both an applied texture and PolyPaint, the Bridge will transfer whichever is currently visible in the ZBrush document. (Texture takes priority unless it is turned off in Tool >> Texture Map.)

You can also apply KeyShot materials to your model to replace the ZBrush materials. By default, doing this will completely replace the material and its information of color/texture. To preserve the texture or PolyPaint information you need to hold the Alt key while dragging and dropping the KeyShot material to its destination.

Keep in mind that not all KeyShot materials support vertex shading or texture mapping! If you choose to use such a material it will be impossible to preserve the incompatible data in that part of the model. In those cases it is not possible to add the Color/Texture information in KeyShot except by changing the type of material but this may make some physical properties of the material disappear.

4. Working with Surface Noise

Any Surface Noise applied to your model is fully transferable to KeyShot. During the rendering process, ZBrush applies a tessellation to the whole model before then displacing the geometry to correspond with the procedural noise. This automatic operation means that you don't need to apply your surface noise to the mesh for rendering purposes.

The quality of the tessellation and as a result the quality of the produced noise is defined by the Tool >> Display Properties >> BPR Settings >> 3D Noise Max Resolution slider. This sets (in millions) the maximum number of polygons that ZBrush can add to your model during the rendering process.

Please refer to the Surface Noise documentation for more information.

VII ZBrush to KeyShot Bridge Options

The ZBrush to KeyShot Bridge is simple and easy to use but there are a few options can have great impact on the way you work. This is particularly true of the Auto Merge mode.

KeyShot

Render >> External Render >> KeyShot enables the Bridge between ZBrush and KeyShot. When enabled, any time you tell ZBrush to do a BPR render it will automatically send your model to KeyShot.

If disabled, ZBrush will use its own BPR renderer.

Max Faces

The Render >> External Render >> Max Faces mode splits the current model into smaller parts. The size of each part will be no larger (in millions of polygons) than what has been set by this slider. Increasing the slider's value sends your work to KeyShot in larger chunks. Depending upon your computer configuration, this may produce slow-downs or cause the Bridge to hang entirely.

Imagine crossing a foot bridge. If you tried to drive a tank across, it would most likely collapse. But if you disassemble the tank and carry it across one piece at a time you'll be able to reassemble it on the other side. The actual capacity of your bridge depends upon your system specs. But even with a powerful computer, keeping a low value will produce smaller chunks of data when sending to KeyShot and usually speed up the process.

If the Auto Merge option is active, these smaller chucks will be merged together inside of KeyShot.

Auto Merge Mode

Because ZBrush can send large amounts of data to KeyShot, the information usually needs to be split into smaller chunks to speed up the Bridge process. (See the Max Faces section above.) The Render >> External Renderer >> Auto Merge mode then tells KeyShot to weld all these parts to rebuild the models as they originally were in ZBrush.

Of course, you can increase the Max Faces Slider value to send the data in larger chunks, thus avoiding splitting of the model. However, since the maximum value is 10

million polygons you will most likely need to merge parts of your model sooner or later.

If you don't enable Auto Merge mode, your KeyShot scene may contain hundreds of parts. For this reason, it is strongly advised to leave Auto Merge enabled.

So why would you ever want to turn Auto Merge off? There may be times when you want to do quick renders of your models while working and are not going to be applying KeyShot-specific materials through the Scene tree. In that case, turning Auto Merge off will make the Bridge operation much faster because KeyShot won't need to spend time welding the model back together again.

Group By Materials

The Render >> External Render >> Group by Material mode creates a separate group for each ZBrush material applied to the model's SubTools. This means that having multiple materials applied to your model in ZBrush will produce the same number of material groups in KeyShot.

These groups are simply defined by the materials in ZBrush; no other visual representation exist.

When the model is sent to KeyShot, dragging a material from the KeyShot library onto any part of the model which is part of a material group will apply that material to parts that share this material group.

When this Group by Materials options is disabled, each model is independent and dragging a material from the KeyShot library onto the model will affect only that model.

Send Document Color

When enabled, the Render >> External Render >> Send Document Color mode instructs KeyShot to set its own document background color to match your ZBrush document.

This function doesn't send any background image to KeyShot; it only sends the color values found in the Document palette.

ZREMESHER 2.0

Automatic retopology taken to a new level.

ZBrush's automatic retopology tool has evolved. In this second version, ZRemesher now generates better automatic retopology results with only limited spirals or none at all. The updated version generates improved surface quality, has an automatic helix removal system and has far better support for hard surfaces. In addition to these improvements it is now also a 64-bit process

This Chapter covers only the latest additions to ZRemesher. The full ZRemesher documentation **can be found in the ZBrush User Guide***.*

I ZREMESHER AND HARD SURFACES

ZRemesher is optimized to work on all kinds of model structures and shapes but will by default produce better results with organic shapes. However, with some extra effort on your part retopology of hard surfaces and mechanical models can be greatly improved.

1. Mesh Density

Unlike organic shapes, hard surface models generally have drastic changes in direction along their surfaces and multiple topology variations in small areas. All these topology changes put a lot of stress on the algorithms. With this in mind, requesting a low value for the target polygon count can decrease the quality of the results.

To help ZRemesher, the first step to do is to avoid using a low polygon count and allow a higher value. This gives ZRemesher the necessary freedom to manage these topological changes.

2. Work with PolyGroups

ZRemesher has two different options dedicated to PolyGroups. One of them strictly keeps the PolyGroup borders (using them as edge loops) while the other uses them as references during the retopology. If your hard surface model is defined by PolyGroups, turning these options on will improve the results. Depending on the model, it is advised to test both options.

If your model doesn't have PolyGroups, it is benifical to create them to assist ZRemesher. When working with hard surface objects, Tool >> PolyGroups >> Group By Normal will quickly produce PolyGroups based on angles between edges.

3. Use curves

At a value of 100, the Curve Strength setting forces ZRemesher to put partial or complete edge loops at the curve positions. Making extensive use of this for hard surface models can therefore increase the quality of edge surface topology. Unfortunately, it can be difficult to accurately place a curve exactly along an edge.

There is, however, an easy way to produce an accurate set of curves based on the

angles and edges of your surface:

1. First create PolyGroups based on the model's normals by using Tool >> PolyGroups >> Group By Normal and adjusting its Max Angle Tolerance slider as needed.
2. Use those PolyGroup borders to create curves via the Stoke >> Curve Functions >> Frame Mesh feature. Don't overlook the usefulness of the Border and Creased edges modes.
3. Set Tool >> Geometry >> ZRemesher >> Curve Strength to 100, along with any other ZRemesher options that you need. (Like the Keep Groups option.)
4. Run ZRemesher.

II Spirals in the Retopology

Because ZRemesher is a 100% automatic algorithm, it can in some cases produce a topology without edge loops in some places with tubular shapes such as legs, arms, fingers. Instead, in rare cases it can create sprials. ZRemesher's smart algorithms watch for and do their best to avoid this topology issue because it can be problematic when trying to break the model into clean PolyGroups.

If ZRemesher creates spiral topology in a place that you would like to avoid, then use the ZRemesher Guide brush to create a curve at that location. It should be a closed curve corresponding to a desired edge loop direction. Next, set Tool >> Geometry >> ZRemesher >> Curve Strength to 100, forcing ZRemesher place an edge loop at that location rather than a spiral.

It is important to consider that depending for some models it may be impossible to have topology that is 100% free of spirals. This is because sometimes, avoiding a spiral in one position may result in a spiral at another location that hadn't had one previously.

III ZREMESHER FUNCTIONS

What follows is a list of the ZRemesher latest settings which can modified to more precisely control the results of your retopology. All settings are found in the Tool >> Geometry >> ZRemesher UI group.

ZRemesher can of course produce very high quality results with its default settings. However, depending on the needs of your specific model, you may find that changing these parameters can improve the results.

Keep Groups

Tool >> Geometry >> ZRemesher >> Keep Group mode retains the existing boundaries of each of the model's PolyGroups to reproduce those groups in the retopologized model.

Unlike Freeze Groups option (which retains the same topology along the PolyGroup borders), the Keep Groups option alters the topology while keeping the boundary shape. This results in a better topology flow.

FBX EXPORT IMPORT PLUGIN

Seamless communication

The FBX ExportImport plugin, located in the Zplugin palette, provides export and import of the FBX file format. This is a 3D interchange format developed by Autodesk and is commonly used by many 3D software applications and game engines.

FBX is a complex format that can include animation and different cameras as well as 3D meshes. The ZBrush implementation only includes a subset of these features.

I General

The plugin is installed automatically with the default installation of ZBrush. If you need to reinstall the plugin, please execute the ZBrush full installer.

1. Features supported for export

Listed below are the features supported when exporting an FBX file from ZBrush.

- Export of selected, visible or all SubTools.
- Embedding/non-embedding of texture, displacement and normal maps.
- Export of PolyPaint as vertex coloring.
- Polygroups.
- Smooth or hard normals.
- Triangulation of meshes on export.
- 3D layers exported as Blendshapes.
- Axis system selection.

2. Features supported for import

Listed below are the features supported when importing an FBX file into ZBrush.

- Import of separate meshes as SubTools.
- Texture, normal and displacement maps imported and assigned.
- Import of vertex coloring as PolyPaint.
- Polygroups.
- Blendshapes applied as percentage mesh deformation.

3. FBX versions supported

In order to ensure compatibilty with as many different applications as possible, the FBX plugin supports many FBX versions as listed below.

- FBX 2009, 2010, 2011, 2012, 2013 and 2014.
- Binary or ascii.

4. Texture map file formats supported

For ease of use, the FBX plugin supports the image file formats below.

- TGA
- PSD
- PNG
- BMP
- TIF
- JPG

5. Step By Step - Exporting

Exporting an FBX file using the plugin is very straightforward. Here's a step-by-step guide to exporting your model.

Before you start, your model must be in Edit mode.

1. The first step is to decide if you wish to export the currently selected SubTool, the visible SubTools or all SubTools. Press the relevant button.
2. Choose the FBX version you wish to export by clicking the FBX 2014 button repeatedly. When exporting from ZBrush choose an FBX version that is suitable for your other software. For example, if exporting to Maya 2012 use FBX 2012 or earlier. Using a later version may mean that the model doesn't display correctly.
3. Select between a binary or ascii file. In general, binary will be the best choice and the file size will be smaller. Note that ascii format for 2010 and earlier does not allow embedded maps.
4. If your model has 3D layers and you want these included as Blendshapes then turn on this option. The layer names will be used as the Blendshape names and intensity values carried over.
5. Turn on the Tris option if you want meshes exported as triangular polygons. With this option turned on, each quad will be divided into two tris. When this option is turned off, quadrangular polygons are preserved.
6. The plugin can export with the model oriented for a particular axis system. Select

which you want to use by clicking the MayaYUp button repeatedly. Choose between MayaYUp, MayaZUP, 3dsmax, Marmoset Toolbag, Unity, Motion Builder, OpenGL, DirectX and LightWave. If in doubt then MayaYUp is a good choice.

7. Turn the SNormal option on for Smoothed Normals or turn it off for Hard Normals. Smoothed Normals is generally the preferred option. Smoothing is automatically calculated based on the normals.
8. If you wish to include maps then these must be assigned in the Tool palette for each SubTool. For example, there must be a texture map selected in the Tool>Texture Map sub-palette for it to be included with the FBX file.
9. Choose if you want to embed maps with the FBX file. Maps that are embedded will be included as part of a single FBX file whereas non-embedded maps are saved as separate files in the same location. Maps are named with the SubTool name followed by a suffix: _TXTR for texture (diffuse) maps, _NM for normal maps and _DM for displacement maps.
10. The map file format can be selected for both 8bit and 16bit. Click the relevant button repeatedly to select which you want.
11. If you wish to export PolyPaint make sure the Colorize button is on. You can turn this on quickly for all SubTools by Shift+clicking the paintbrush icon in the SubTool list.
12. Press the Export button to export your model.

6. Step By Step - Importing

Importing an FBX file into ZBrush is very easy. Here's a step-by-step guide.

1. Press the Import button to select a file to import. The imported file will create a new ZTool in the Tool palette. If there was a model in Edit mode then this will be swapped on the canvas with the new ZTool.
2. During import you may be asked to select map image files if the plugin cannot automatically find them. These will then be assigned to the relevant SubTools.
3. Embedded maps are extracted to a separate folder during import. This folder will have the same name as the FBX you import, with a ".fbm" suffix.

II FBX Import Export Functions

What follows is a full list of the FBX ExportImport plugin funcitions. The plugin settings are found in the Zplugin>> FBX ExportImport sub-palette. Click the sub-palette title to reveal the buttons.

Selected, Visible, All

The Selected, Visible and All buttons let you choose how you want your model to be exported.

- Selected will export just the currently selected SubTool.
- Visible will export the visible SubTools.
- All will export all SubTools.

FBX 2014

To select between different FBX versions, click the FBX 2014 button repeatedly.You can choose between 2014, 2013, 2012, 2011, 2010 and 2009.

bin (Binary), ascii

The bin and ascii switch buttons let you choose between binary and ascii FBX format. Binary will usually be the best choice and has smaller file size.

Layers

The Layers mode lets you export 3D layers as Blendshapes if you wish to.

Tris

The Tris modeTurn on this option for meshes to be exported as triangular polygons. Leave off if you want polygons to remain as quads.

MayaYUp – Axis systems selector

To select an axis system, click the MayaYUp button repeatedly . Choose between MayaYUp, MayaZUP, 3DS Max, Marmoset Toolbag, Unity, Motion Builder, OpenGL, DirectX and LightWave. If in doubt then MayaYUp is a good choice.

Embed Maps

The Embed Maps mode lets you embed maps into the FBX file. If turned off then all maps will be exported as separate files to the same location as the FBX file.

SNormals (Smooth Normals)

The SNormal mode, when activated, exports smoothed normals. Turn it off to export hard normals. Smoothing is automatically calculated based on these normals.

TGA – Image format selector

Click the TGA button repeatedly to choose between different 8bit image formats for texture and normal maps. The choice is between TGA, PSD, PNG, BMP, TIF, JPG low, JPG med, JPG high.

16Bit TIF – Displacement maps image format selector

Click the 16 Bit Tiff button repeatedly to choose between different 16bit formats for displacement maps. You can choose between TIF and PSD.

Export

The Export button exports your model as an FBX file. Enter a file name in the file dialog.

Import

The Import button imports an FBX file into ZBrush. Select a file through the file dialog. A new ztool will be created in the Tool palette.

?

The “?”button displays the Autodesk FBX license information.

OTHER ADDITIONS

Because ZBrush has such a rich feature set.

Complementing all of the major 4R7 features, there are a number of improvements and functions requested by our users, as well as various smaller additions and new functions.

I 64-bit Support

ZBrush 4R7 is available as two separate applications:

- The official release 4R7 application, which is a 32-bit program.
- A second executable: the 4R7 64-bit Preview.

The official 64-bit release of ZBrush will not be available until ZBrush 5. Due to the complex nature of migrating the code to 64-bit architecture, we are providing the 64-bit version of 4R7 as a “developer preview.” This preview edition has the exact same features as the official 32-bit release and has been tested on a wide variety of systems. However there still may be unknown bugs that can’t be spotted until it has been “in the wild” on a wide variety of hardware. We cannot guarantee that no problems will arise as part of the transition to 64-bit coding. For those of you who are using ZBrush for mission-critical and production projects we will continue to treat the 32-bit version as the official release until ZBrush 5. At that point ZBrush will exclusively be available as a 64-bit application. This means that 4R7 will be the final 32-bit release of ZBrush.

As a licensed user of ZBrush, feel free to start using the 64-bit Preview today! It is already faster than the 32-bit version and will use all of your computer’s RAM and processing capabilities to push ZBrush to its full potential!

II Surface Noise

The ZBrush Surface Noise capabilities have been improved to allow blending between noise sources. Now the surface noise function will allow for a Noisemaker or Imported Greyscale noise to be mixed with the default noise. This functionality makes it possible for you to blend these two types of noise together, extending the possibilities for your surface detailing.

Build your own library of presets and reuse them in future projects to create rich and subtle surface details. It will be impossible for viewers to spot repeating patterns that are inherent in noise generation systems, making your creations look more real than ever before.

Please visit the ZBrush Guide folder of the documentation for complete Surface Noise documentation, including these latest additions.

III Displacement Rendering

Whether you are using BPR or the ZBrush to KeyShot Bridge, you can now see procedural and texture-created surface noise rendered as displaced geometry. This process is automatic; after designing your noise you no longer need to worry about applying it before you can view the result on your geometry. All you need to do is render!

This feature can also be applied to NanoMeshes. With this new technology, it becomes easy to render scenes composed of billions of polygons!

IV Replay Last / All Relative

Repeating your most recent stroke on another part of your model is now possible by using the Replay Last Relative function. For example, a lightning bolt alpha that is drawn in one location can be identically reproduced at another location as long as the point of view remains the same.

To replay the last stroke in this manner, you must use the Shift+1 hotkey. Because the repeated stroke begins at the cursor location it is not possible to have an interface button for this function.

If you want to replay a set of strokes, you need to use the Stroke >> Inventory >> Record function to save your actions. Once done, use Shift+2 hotkey to replay all of the stored strokes.

Because the strokes are recorded, it is possible to change the point of view before replaying them.

Note:

For technical reasons, this feature requires a mouse and does not work with tablets.

V Projection of Grid Background Images

Background images applied to your scene's floor and wall grids can now be projected onto the surface of your models. This adds an extra layer of help when using reference images to accurately produce specific designs.

To enable the projection of the background image, first load one or more background images in the Draw palette Front-Back, Up-Down and/or Left-Right sub-palettes. Then simply change the value of the Project on Mesh slider.

A low value will generate a translucent version of the projected background image while a high value will generate a fully opaque effect.

Enabling projection of the background image will disable the visibility of the images on the grids themselves. (Otherwise you would have a bad case of double vision!) To return to displaying the images on the grid, set the value of the Project on Grid slider back to 0.

If you have favorite settings you can of course record macros for each and assign hotkeys so that you can switch between projection and grid view with all the ease of a key press.

VI FBX Import/Export

A new plugin has joined the library of free ZBrush plugins: FBX Import-Export!

You can now import and export FBX files using the FBX v6.1 and v7.1 standards. This FBX plugin will support embedded maps (Displacement, Normal, and Texture), blend shapes based on layers, smoothing based on normals and more!

Please visit the ZBrush Guide folder of the documentation for complete instructions on the use of this plugin.

VII Copy and Paste

With the Copy and Paste functions, you can now easily copy mesh data over different projects or functions.

These features work like the traditional Copy/Paste functions found in most software. The only exception is that the Paste function may create a new entity or geometry, depending on what is being pasted. An example is if you Copy and Paste within the Tool palette, Pasting will create a new Tool (and all its SubTools), similar to the “Duplicate” function.

The copied mesh data is not stored in the operating system’s scrapbook. Quitting ZBrush will erase remove the copied data from memory.

Note:

The usual Ctrl+c and Ctrl+V commands (or Cmd+C/Cmd+V for Mac users) can’t be use in ZBrush.

1. Copy/Paste Functions

The Copy and Paste functions are found in different locations throughout ZBrush, with each being dedicated to is location. Their behaviors may vary depending upon the data that they are meant to work with. What follows is a full list of these locations and their functions.

Copy Tool, Paste Tool

Tool >> Copy Tool and Tool >> Paste Tool copy the currently selected Tool and all its SubTools, including mesh data. Once stored, this data can then be pasted inside of the same project as a new Tool. Alternatively, you can load a different project and paste the Tool into that.

The Copy Tool and Paste Tool functions are the most convenient solution for transferring a model between separate projects.

SubTool Copy, Paste

The Tool >> SubTool Copy and Tool >> SubTool >> Paste functions are similar to

the Tool >> SubTool >> Duplicate function. The difference is that this feature allows you to copy the selected SubTool to another model's SubTool list without needing to Clone and then Append it.

Geometry Copy, Paste Append, Paste Replace

The Tool >> Geometry >> Modify Topology >> Copy, Paste Append and Paste Replace functions operate on the topology of the current 3D model. This function will copy all visible polygons from the mesh. Parts of the model that are hidden will not be copied.

The Pasting functions replace the existing model (Paste Replace) with the copied topology or adds the copied topology to the existing mesh (Paste Append).

Functions Copy, Paste (NanoMesh, ArrayMesh)

These Copy and Paste functions can be found in several locations that use multiple settings and parameters. These features let you copy them to another model that has the same function applied.

As an example the Copy and Paste functions located under the NanoMesh subpalette lets you copy the settings from one model to any other models that has an active NanoMesh.

VIII InsertMesh and UV's

The Make Insert Brush function now stores UV mapping. If converting a mesh directly to a ZModeler "Insert NanoMesh" brush, textures and displacement maps will also be included.

InsertMesh Brushes now hold UV's. When using InsertMesh brushes that have UV's stored the receiving mesh must have UV mapping applied to it as well or the UV's will not transfer. If the mesh receiving the InserMesh objects does not have UV's, the UV mapping of the inserted mesh will be deleted.

IX Beveling Creased Edges

Any creased edges on the model can be converted to bevels, offering an alternative to ZModeler's own Bevel function. The new Bevel function is located in Tool >> Geometry >> Crease >> Bevel.

When executing this function, all the edges (including masked edges) that have creasing are beveled. Several parameters are associated with the bevel to change the radius and tessellation. These can be dynamically changed immediately following the initial bevel creation.

X Polygon Draw Size

The polygons on the model can now have their size visually reduced, giving them an appearance similar to PolyFrame mode. The benefit is to drastically improve the display of the mesh and navigation on models that have high polygon counts. Having ZBrush only draw the Polys of the model and not the connecting edges will speed up performance.

To make use of this feature, simply change the Tool >> Display Properties >> Polygon Draw Size slider value.

Note:

This setting doesn't affect the real geometry. Exporting a model which has the Polygon Draw size set to a lower value than 1 will export the original geometry and not shrink polygons.

XI Grid Divide

Tool >> Geometry >> Modify Topology >> Grid Divide is an alternate subdivision routine which uniformly tessellates/divides a model based on a grid pattern.

It is associated with the Grid Divide slider. The value of the slider defines the number of segments to add in each edge, defining the density of the tessellation/division. This process is useful when wanting to generate uneven divisions across surfaces because you are no longer limited to only dividing by 4.

This algorithm is also applied internally when ZBrush converts procedural functions like Surface Noise to real geometry at render time.

XII Misc Additions

- TransPose now has a “Center on Selection” mode. This places the Action Line at the center of the unmasked region, visible mesh or current PolyGroup. Please see the ZBrush Guide folder of the documentation for complete TransPose documentation, including the latest additions.
- The technical information of a model (its PolyFrame or PolyGroup coloring) can be enabled or disabled individually. This offers alternate ways to display the model’s topology.
- The Mask Adjust function allows you to alter an existing mask beyond what can be accomplished with the regular sharpen/blur functions.
- Texture transparency now has a Tolerance slider to bring a higher quality of transparency by supporting more than just pure black.
- At creation, 3D Primitives can be oriented along the three different axes, avoiding an extra rotation step after the fact.
- All radial-based primitives (like the Sphere3D and Cylinder3D) now have the center points welded. They also align the segments to the world axis when possible.
- The UV Tiling function is now interactive.
- All Curves now have a Tile parameter to duplicate the curve value multiple times.
- The Weld Point function associated with the Modify Topology feature now has a maximum distance.

THANK YOU!

Yes, to you!

Thank You

Pixologic® would like to thank everyone who has participated as a beta tester for ZBrush® since its beginning. We also thank all the ZBrush users who are making such wonderful artwork, inspiring us to push our limits and offer you new, innovative, artistic and production tools!

Happy ZBrushing, and thank you again!

The Pixologic Team

Notes