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Getting Started with Medium

What is Medium?

Medium is a freeform 3D sculpting tool built for artists. Some of the most notable features include:

- **Organic and geometric modeling** - use Medium to craft both organic and geometric sculpts using a variety of customizable tools:
  - **Layers** - create different parts of your sculpt in discrete layers that can be modified and managed independently (or merged together).
  - **Stamps** - select from a library of custom shapes (or create your own) to add pre-defined, repeatable forms to your sculpt, or to define a custom “tool” through which to add clay.
  - **Mirror** - build models that are completely symmetrical.
  - **Color** - select a clay color as you work, or paint with different brushes.
  - **Materials** - define surface attributes for individual layers.

- **Shared sculpt sessions** - make sculpting a social activity! Invite fellow artists to join a sculpting session when you want to share your work. Talk with each other and view the same content simultaneously to get immediate feedback.

- **Pipeline friendly** - Medium supports industry standard formats for both importing and exporting:
  - **Import** - load 3D meshes from other packages directly into Medium, either as reference meshes to guide your work or to serve as the basis for your sculpting.
  - **Export** - save your sculpts for use with other applications or to generate 3D output.

- **Share your content** - share your sculpts, videos, photos and more on Oculus.com.

- **Reference material** - place reference images, meshes, and videos into your workspace to help guide you.

- **Customizable workspace** - set preferences for lighting, background color, and other environmental preferences.

- **Record your work** - take photos, record videos, or capture entire VR sessions that can be shared or replayed.

- **Learning resources** - select from a variety of tutorials to help you learn Medium.
Launching Medium

Starting from Your PC

To get started with Medium from your PC:

1. Start Oculus on your PC.
2. Select Medium from your library.
3. Put on your Oculus headset.

Starting from the Oculus Home Screen

To get started with Medium from the Oculus Home screen:

1. Put on your headset and start Oculus when prompted.
2. After your Oculus Home screen loads, select the Library icon to see your currently installed games and apps.
3. Select Medium.

Note: Once you’ve used Medium, you may also see it listed under the recently used games and apps category on the left side of the Oculus Home screen.

Your Medium Workspace

When Medium opens, you’ll see a brief introductory sequence letting you know you’re in Medium.

The first time you use Medium, you’re asked whether you’re right handed or left handed. Select the hand that you would use to hold a sculpting tool as your dominant hand.

Once you’ve chosen, you can start sculpting right away or check out the tutorials (recommended for first timers).

- If you choose to start sculpting, you’ll see a white sphere of clay in front of you, along with your Tool hand and Support hand.
If you choose the tutorials route, the first tutorial loads automatically...follow along! (You can always re-watch the tutorials later.)

With either selection, you’ll see the same basic environment. Below the sphere, you’ll see a grid called the ground plane, and a surrounding cloud-covered half-dome called the skybox. (Later, you can customize your scene settings to turn off some of these visual elements, adjust your lighting, and so forth.)

Tool Hand and Support Hand

You sculpt in Medium using your controllers. Each Oculus controller is represented in Medium as one of your virtual hands, and each hand has a different function.

If you’re right handed:

- Your right hand is your Tool hand. You use your Tool hand to add clay to your sculpt or modify it using any of Medium’s tools, to select options from a menu, or select a layer in your scene.
- Your left hand is your Support hand. You use your Support hand to help do things like move your model, select tools, change settings for your scene, and manipulate layers of your sculpt.

If you’re left-handed (or if it just feels more natural), you can swap the function of your hands. Your preference for right or left-handedness is preserved between sessions. See Selecting a Hand if you want to change your preference for which hand is dominant.
Moving and Rotating Your Sculpt

As you work in Medium, you’ll get used to “picking up” your model and adjusting its position and orientation relative to the camera. This makes it easier to:

- Better see your sculpt’s silhouette and edge contours. As you work, it’s a good idea to constantly move your sculpt to better see its shape.
- Use a more natural stroke direction (that is, going from left to right or right to left) when you’re sculpting. In the same way an artist moves his sketch pad while sketching in 2D, moving your sculpt makes it possible to use a consistent, comfortable stroke.
- Orient your model so that the current tool has the effect you want. Some tools (like Smooth) need a direct “line of sight” to the surface of the sculpt. You may need to reposition your sculpt if the “line of sight” for the current tool is obscured by an intervening volume of clay.
- Move your sculpt in and out of the area of effect of the current tool (as you might move a marshmallow in and out of the flames of a campfire).

To adjust the position or orientation of your sculpt:

1. Squeeze and hold the grip button on your Support hand.
2. Move or rotate your Support hand in any direction.
3. Release the Support hand grip button when the sculpt is where you want it.

**Note:** You can also use the grip button on your Tool hand to move or rotate the sculpt; however, if you are actively working, you’ll probably find it easier to move your sculpt with your Support hand, and sculpt with your Tool hand.

Pinch and Zoom

You can also “pinch and zoom” to move the camera closer or further from your sculpt. You might zoom out to get a broader view of your model, or zoom in on an area where you need to add detail. Get used to climbing right into your dragon’s mouth to work on its teeth!

- Squeeze both of the grip buttons and move the controllers away from each other to zoom in on your sculpt.
- Squeeze both of the grip buttons and move the controllers toward each other to zoom out from your sculpt.
Note: Tool size changes relative to your pinch and zoom actions, so you don’t need to resize tools every time you adjust your point of view.
Using Medium: The Basics

Adding Clay

Let's start by adding some clay to your scene. The Clay tool is selected by default when you start Medium, so you should be good to go:

1. Squeeze the Tool hand trigger and move your hand.

   As you move your Tool hand, a “trail” of clay flows from the tool.

2. Release the trigger to stop the flow.

3. Squeeze your Support hand grip button to move or rotate your sculpt and see it from different angles.

Undo and Redo

As you add clay, you’ll inevitably make some mistakes. To step backward and forward through your actions:

- **Undo** - press left on the Support hand thumbstick to undo the previous action.
- **Redo** - press right on the Support hand thumbstick to reverse the previous undo action.
Selecting Your Tool

As mentioned above, each session starts with the Clay tool pre-selected. To select a different tool:

1. Press up on your Support hand thumbstick to open the Tool Tray.

2. Aim the Tool hand at the tool you want to use.
3. Squeeze the trigger on your Tool hand to select the tool.

The tool preview changes to let you know that you’ve selected the new tool. Each tool has a different tool preview. You’ll get familiar with what each tool looks like the more you use Medium.

Left, Clay tool; center, Smooth tool; right, Paint tool

Switching Tool Modes

Some sculpting tools have multiple modes. For example, if you select the Clay tool, you can quickly switch between modes that let you either add or subtract clay.

To switch between modes for the current tool:

- Double tap the Gear button on your Tool hand.
If there are multiple modes, the Tool preview changes for each mode. For example, if you are adding clay, the preview is green, while if you are removing clay, it is red:

1. Select the Clay tool.
2. Add some clay to your scene.
3. Tap the Gear button on the Tool hand to switch modes. The Tool preview changes to a red color:
4. Squeeze the trigger on the Tool hand and move the tool over part of your sculpt to remove it.

**Note:** Not all tools have multiple modes. If there is only one mode for a tool, the double tap gesture has no effect.

**Resizing Your Tool**

You can change the size of your tool to better fit the scale of the sculpt or the action you want to perform. For example, you might want to increase the size of the Clay tool when you’re blocking in the volume of a sculpt, and decrease its size when adding finer detail.

There are two gestures for resizing the current tool:

- **Resize by Pressing the Tool Hand Thumbstick Up or Down**

  After selecting your tool:

  1. Press the thumbstick on the Tool hand up and down. A green scale appears over your tool hand, indicating the tool’s relative size. The tool preview changes size as you move the thumbstick.
2. Release the thumbstick to set the new tool size.

Resize by Depressing the Tool Hand Thumbstick Straight Down Along its Axis

You can also resize the tool by setting an anchor point and then moving your Tool hand:

1. Depress the Tool hand thumbstick, straight down along its axis, and keep it depressed, to set the anchor point. The tool preview (which is different for each tool) changes to yellow:

2. Move your Tool hand in any direction away from the anchor point to set the new tool diameter.
3. Release the thumbstick to set the new tool size.
The Bounding Box

As you move your sculpt around, you may notice the thin outlines of a “bounding box” around it:

The bounding box defines the area in which you can sculpt; think of it as your 3D canvas. If your stroke runs into one of the sides of the bounding box, it will stop and you’ll see something like this:

The bounding box helps you visualize your sculpt’s resolution. Keep the size of the bounding box in mind when you start your sculpt, to make sure you don’t start too big.

Tool Settings

For most tools, you can set additional parameters that define how the tool works. For example, if you have the Clay tool selected:
- Tap the Gear button on the Tool hand to open the Clay settings menu.

A menu appears in your scene, with a number of options related to how the current tool works:

The Clay settings menu lets you set things like the shape and size of the tool, its mode, feathering and constraint preferences, and so forth. The settings menu for every tool is described in the **Tools** section.
Tooltip Previews

Whenever you’re on a menu in Medium, you have the option to display short tooltips that describe what each setting does. In addition, the tooltip shows a brief animation of the effect of the setting or tool in question:

When you stop pointing at the option, the tooltip (and the video) both disappear.

Defining an Alternate Tool

Once you start sculpting, you may get into a groove where you find yourself switching back and forth between two tools (for example, using Clay to build out your volume and Smooth to refine its surface). In Medium, you can define a primary and an “alternate tool” (or “alt-tool”) and switch between the two tools with a simple gesture:

1. Press up on your Support hand thumbstick to open the Tool Tray.
2. While the Tool Tray is open, point to a tool, and squeeze the Support hand trigger to select it as the alt-tool. A white triangle appears on the Tool Tray next to the selected tool:
Smooth tool selected as alt-tool

To use the alternate tool while sculpting:

1. Squeeze and hold the Support hand trigger. (Note that the tool preview on the Tool hand changes to that of the selected alt-tool)
2. Use the Tool hand as you normally would.
3. Release the Support hand trigger to return to using the primary tool.

Saving Your Work

After you’ve done some sculpting, you can save your work.

1. Tap the yellow Control Panel button on your Support hand.
2. Select Quick Save.

Quick Save re-saves your work under the last specified filename. If you haven’t yet saved your sculpt, you’re prompted to enter a filename on a virtual keyboard:
Medium inserts your username and a timestamp in the filename to get you started, but you can modify the filename as you see fit:

1. Use either hand to point at keys on the keyboard.
2. Squeeze the trigger on either hand to select (“press”) a key.

You can position the cursor by pointing and squeezing at a location inside the filename.

- **Arrow** - delete a character.
- **Clear** - clears the entire name.
- **Enter** - saves your sculpt with the specified filename.
- **Upward arrows** - increments the last digit in the filename. If the filename does not end in a number, one is added (and incremented by repeating the gesture).

**Saving Under a Different Filename**

Once you’ve saved your work (or if you’re working on a sculpt you’ve loaded into Medium), the Quick Save option saves the sculpt with the previously specified filename. If you want to save your work under a different filename:

1. Select Save As. The virtual keyboard appears and Medium inserts your username and a timestamp into the filename.
2. Enter a new filename.
3. Select Enter.

The sculpt is saved with the new name.

**Where Your Work is Saved**

Sculpts are saved in the following folder:

```
C:/Users/<username>/Documents/Medium/Sculpts/<user>
```

**Notes:**

You can also:

- **Export your sculpt** in various industry-standard formats.
- **Share your sculpt** with others on Oculus.com or directly in Facebook.
Starting a New Sculpt

As you work, you may want to discard your current sculpt and begin working on a new one. To start a new sculpt:

1. Tap the yellow Control Panel button on your Support hand.
2. Select New.

CAUTION: Starting a new sculpt wipes out your current sculpt, so Medium always asks you to confirm this action before you proceed. If you don’t want to lose your work, make sure to save your current sculpt before starting a new one (using either Quick Save or Save As).

Loading a Saved Sculpt

If you previously saved a sculpt, and want to reload it:

1. Tap the red Home button on your Support hand.
2. Select Library on the Home screen.
3. Select the sculpt icon (the first icon in the row across the top of the panel).

CAUTION: Loading a previously saved sculpt wipes out your current sculpt, so Medium warns you if you have current unsaved changes. You’ll be asked if you want to:

- Ignore - ignore the warning and continue loading the previously saved sculpt.
- Save - save your work in progress before loading.
- Cancel - cancel the load.

Make sure to save your current sculpt before loading a new one.

That’s it! You now know how to:

- Start Medium.
- Add or remove clay.
- Select a tool.
- Resize your tool.
- Change tool modes.
- Change tool settings.
- Save your work.
- Start a new sculpt.
- Load a previously saved sculpt.
Using Medium: Customizing Your Sculpts and Your Workspace

Using the Color Menu

You can use Medium’s Color menu to select colors for elements such as the clay, paint, lights and so forth in your scene.

For example, to set the color of the clay you add with the Clay tool:

1. Select the Clay tool.
2. Tap the Color button on the Tool hand.
3. Aim at the color wheel with the Tool hand and squeeze the Tool hand trigger to select a color:
4. Add some clay to your sculpt:

You can select different clay colors for different parts of your sculpt.

**Note:** You can tweak additional material attributes for your sculpt (for example, bumping its specular component) to give better lighting information about the surface.

Parts of the Color Menu

There are four parts to the Color menu:

**Eyedropper**

Use the eyedropper to select a color from the surface of your sculpt:

1. Select the eyedropper with your Tool hand.
2. Aim the eyedropper at your sculpt and squeeze the Tool hand trigger to select a color from the sculpt’s surface.
Grayscale Bar

The rectangular palette above the color wheel that includes black, middle gray, and white swatches. Aim at the swatch and squeeze the Tool hand trigger to quickly select black, gray or white as your current color.

Color Wheel

The circular area of the color menu that shows all currently selectable colors. Aim at the color wheel and squeeze the Tool hand trigger to select a color.

Saturation Slider

After selecting a color, drag the handle left and right to adjust the selected color’s saturation.

- Dragging the handle to the left goes to middle gray.
- Dragging the handle to the right goes to full saturation for the selected color.

Lighting Your Workspace

Medium lets you set up both ambient and directional lighting for your workspace. You can also modify material attributes, including the material type and attributes like Diffuse Light to define how it’s affected by lights in the scene.
Setting Up Ambient Lighting for Your Scene

The characteristics of the ambient light (the “Sun”) in your scene is determined by the Sun brightness and Sun color. To set the brightness and color of the ambient light in your scene:

1. Press down on the Support hand thumbstick.
2. Select the Scene Settings icon.
3. Adjust the Sun brightness value (default value is 1.0).
4. Select Sun color; select a color from the Color menu that appears.

Manipulating the Spotlight

Medium has a single spotlight which you can position wherever you like in your scene. Changing the position of the spotlight can dramatically affect the visual characteristics of your sculpt:

![Spotlight Images]

Changing the Spotlight’s Position

To change the spotlight’s position:

1. Press down on the Support hand thumbstick and select the Scene Settings icon.
2. Look up until you see the spotlight object.
3. Select the spotlight object with your Tool hand.
4. Squeeze the Grip button on your support hand and move the spotlight (or select the Transform icon and select which transform operation you want to use to modify the position and/or rotation of the spotlight).
5. Release the Grip button when the spotlight is in the position you want.

**Changing the Spotlight’s Attributes**

To modify the characteristics of the spotlight:

1. Press down on the Support hand thumbstick and select the Scene Settings icon.
2. Look up until you see the spotlight object.
3. Select the spotlight object with your Tool hand.
4. Select the Settings icon to open the Spotlight settings menu:

   ![Spotlight Settings Menu]

   **Options**
   The Move with Sculpt option keeps the orientation of the spotlight relative to the sculpt. When you move the sculpt, the spotlight moves in the same way. If not selected, the spotlight remains fixed.

   **Brightness**
   Set the relative brightness of the spotlight.

   **Color**
   Select this field with the Tool hand to open the Color menu and select a color for the spotlight.

   **Cone Width**
   Adjust the angle of the spotlight; higher values give the spotlight a larger angle.

**Defining Materials for Your Sculpt**

**What are Materials?**

Materials define the inherent surface attributes for your sculpt. They determine, for example, how rough or shiny your sculpt looks, how prominent the shadows appear, and how lights in the scene interact with it. Material attributes are set for each layer in your sculpt.
Defining Materials for a Layer

To select material attributes for a layer:

1. Press down on the thumbstick of your Support hand.
2. Select the Layers icon.
3. Select the layer you want to work with (either from the menu or aim at it in your scene and squeeze your Tool hand trigger).
4. Tap the Gear button on your Tool hand.
5. Select the Settings icon.

Across the top of the menu, you’ll see the three basic material categories:

- **Default** - basic attributes that would be used to describe a “clay” or “plastic” surface.
- **Metal** - assign attributes that give the surface a more metallic appearance.
- **Emissive** - assign attributes that give the surface a glowing appearance.
Default Material Attributes

Diffuse Light
Sets how strongly the lighting in the scene affects the layer’s surface. Setting the value all the way to zero negates any impact diffuse light might have on the clay’s color, so the “base” paint color is shown at 100%.

Diffuse Light: Left, 1.0, right, 0.0.

Diffuse Color
Changes how strongly the diffuse color of the layer is rendered. You can use this option, for example, to set the Diffuse Color to zero, to temporarily “hide” any surface color detail (paint) and shows the underlying sculpt.

Diffuse color: Left = 0.0, right = 1.0
Specular

Changes how intensely directional lights (including the Medium spotlight) reflect off the surface of the layer. A higher value creates a more visible specular effect, and generally gives a more “metallic” or “shiny” appearance (depending on other attributes).

Specular: Left = 1.0, right = 0.0.

Roughness

Changes the overall surface quality of the layer. Lower values give a shinier appearance to the layer, while higher values give it a more matte finish. This attribute goes hand-in-hand with the Specular setting, and is more apparent if you have at least some specular component in your surface attributes or when using the metal material.

Roughness: Left = 1.0, right = 0.0.
Occlusion

Changes the relative darkness of the areas of your sculpt with surface direction change (crevices, bumps, creases, etc.). Higher values make occluded surface areas darker. Note that if your surface area is regular (such as a sphere) this attribute’s effect is not visible.

*Occlusion: Left, low occlusion, right, high occlusion.*

Metal Material Attributes

Selecting the Metal material gives the layer a baseline metallic appearance. The Metal material is great for metal details (think armor, swords, or nuts and bolts).

Metal Roughness

Set the sculpt’s surface appearance to vary from very smooth (think “chrome”) to very rough (think “oxidized iron”).

*Metal Roughness: Left, low metal roughness, right, high metal roughness.*
Diffuse Light

See Diffuse Light above.

Occlusion

See Occlusion above.

Emissive Material Attributes

The Emissive material gives the layer a glowing appearance. It’s useful for creating elements such as light bulbs, neon signs, and the like.

Emissive Strength

Sets how strongly the layer appears to glow. Objects using the Emissive material will appear completely black when emissive strength is turned down, while high values create a glow:

![Emissive Strength: Left, low emissive strength, right, high emissive strength.](image)

Using Mirror Mode

Medium’s Mirror feature lets you sculpt on one “side” of your model and see those changes “reflected” or “mirrored” across a plane to the other half, resulting in a perfectly symmetrical sculpt with only half the work. You can start your session with Mirror mode enabled (to get the basic form down in a symmetrical fashion) and then turn Mirror mode off to apply changes to one side (such as repositioning a limb or adding asymmetrical surface detail).

To enable Mirror mode:

1. Tap the Control Panel button on your Support hand.
2. Select Mirror.

When you enable Mirror mode, the position of the mirror plane is indicated by four corners with a set of crosshairs at its center.

![Mirror Mode Illustration]

**Note:** The mirror effect is applied *regardless* of the tool you select, or the tool’s current *mode* (for example, you can either add or remove clay in a mirrored fashion, or paint both the near and far sides of your model simultaneously). When you aim a tool at the sculpt, you’ll see a counterpart “ghost” image of the tool aimed at the corresponding location on the other side of the mirror plane.

Try it out:

1. Select the Clay tool.
2. Add some clay to one side of the mirror plane. Note that it’s automatically “reflected” onto the other side:
3. Double tap the Gear button on your Tool hand to change modes for the Clay tool, and remove some clay from one side (noting the corresponding removal on the other side):

4. Select the Smooth tool and aim it at one side of your sculpt. The corresponding “ghost” tool preview appears at the corresponding location of the model on the other side of the mirror plane; when you smooth one side, the other side is smoothed in the same way:

Medium’s Mirror plane can be used with any tool selected from the Tool tray.
5. Select the Paint tool and paint some detail onto one side of the model. Medium simultaneously applies the same paint stroke to the mirrored half of the sculpt:

Mirror Settings

You can use the Mirror settings menu to turn the mirror plane on or off, save or restore the mirror plane’s position, or align your sculpt’s origin to the mirror plane.

To open the Mirror settings menu:

1. Press down on the Support hand thumbstick and select the Settings icon.
2. Aim the Tool hand at the mirror plane and squeeze the trigger to select it.
3. Tap the Gear button on your Tool hand.

Select any of the following options:
**Active**

Turn the mirror plane on or off.

**Position**

Save or restore the position of the mirror plane:

- **Set to saved** - restores the mirror plane to your previously saved position.
- **Save** - save the mirror plane’s current position as your preferred position.
- **Reset** - restores the mirror plane to the factory default position.

**Center Sculpt Origin**

Moves your sculpt’s origin to the center of the mirror plane. The origin is aligned such that +Z axis is pointing “up” toward the top of the mirror plane (with the ZY plane of the sculpt aligned to the mirror plane).
Using the Lathe

The lathe feature rotates your sculpt as if it were sitting on a potter’s wheel. Just like the potter’s wheel, you can use the lathe to:

- Review your work in progress from different angles.
- Use any of Medium’s tools on the sculpt while it’s spinning (such as painting your sculpt)
- Add “spiral” features while sculpting.
- Capture short video previews of your work to share with friends, clients, or on social media.

Using the Lathe to Review Your Work

The simplest use of the lathe is as a simple way to review your work.

To start the lathe:

1. Tap the Control Panel button on your Support hand.
2. Select Lathe.

Your sculpt begins to rotate, giving you a 360-degree view of your work.

To stop the lathe:

3. Tap the Control Panel button on your Support hand.
4. Select Lathe again.

Adding Rotational Shapes with the Lathe

You can also take advantage of the lathe’s rotation to add circular or spiral shapes with the Clay tool.

1. Start the lathe as described above.
2. Select the Clay tool.
3. Squeeze and hold the Tool hand trigger in place while the lathe spins to create a ‘donut’ shape (a torus):

Using a Tool While Turning Your Sculpt

Your tools still remain in effect when the lathe is spinning, so you can take advantage of the rotation to apply their effects, like paint, to the entire model.

1. Start the lathe as described above.
2. Select the Inflated tool.
3. Aim the Inflated tool at the model and squeeze the Tool hand trigger.

In this scenario, the sculpt rotates under the Inflated tool, creating a ridge in the surface as it moves under the tool.

You can use any tool while the lathe is rotating (for example, you might use the Smooth tool as your sculpt rotates to smooth all sides of your sculpt equally).

Repositioning the Lathe Freehand

You can move the position of the lathe (as if you were moving the potter’s wheel to a different location in your studio):

1. Press down on the thumbstick on your Support hand.
2. Select the Scene Settings menu.
3. Aim your Tool hand at the lathe and squeeze the Tool hand trigger to select the Lathe (which pauses while you are in Scene Settings mode):

![Lathe selection](image1)

4. Squeeze either of the Grip buttons and move the lathe to a new position on the ground plane:

![Lathe movement](image2)

When you close the Scene Settings menu, the lathe reactivates

Repositioning the Lathe Using the Transform Menu

You can also position the lathe explicitly using the transform menu:

1. Press down on the thumbstick on your Support hand.
2. Select the Scene Settings menu.
3. Aim your Tool hand at the lathe and squeeze the Tool hand trigger to select the Lathe (which pauses while you are in Scene Settings mode):

4. Select the transform button. The lathe transform menu opens:

**Translation Axes**

Click on the value next to either the X or Y to move the lathe to a new position along that axis.

**Coordinate Space**

Specify whether the move should be relative to the world origin or object origin.

**Snap**

If enabled, select an increment by which to translate the lathe when it is move.
Lathe Settings

You can change the speed and direction of the lathe on the Lathe Settings menu:

1. Tap the Control Panel button on your Support hand.
2. Select Lathe.
3. In your scene, look “down” at the lathe object.
4. Select the lathe with your Tool hand and tap the Gear button on your Tool hand.

The Lathe settings menu opens:

*Active*
Indicates whether the lathe is on or off.

*Speed*
The speed at which the lathe rotates. Higher values rotate faster.

*Direction*
The direction (clockwise or counterclockwise) in which the lathe turns.

*Center Sculpt Origin*
Aligns the sculpt (object) origin over the lathe (along its Z axis). For more information on transforms like this, see Applying Transforms to Your Sculpt.
Using Medium: Advanced Topics

Understanding Your Sculpt’s Resolution

When you sculpt, each layer has a given resolution. The layer’s resolution determines the level of detail you can add to that layer; the higher the resolution, the more detail supported. If one part of your sculpt does not require fine detail, you can sculpt at a lower resolution, and increase resolution only for those layers where you need more detail.

**Note:** Increasing the resolution of a layer requires more RAM on your PC. Medium notifies you if increasing the resolution of a layer would require more memory than your have.

When to Increase Your Sculpt’s Resolution

You may find that your sculpt starts to break apart when you’re trying to add detail, particularly when you use tools such as Move or Swirl, which can increase the resolution for the layer. Consider what might happen if you were to rotate the end of a tendril on a dragon’s face:

If you were to zoom in, you might see debris from where the surface broke up:
Sculpting fine detail at default resolution

To prevent this from happening, you can increase the resolution for the layer you’re working on:

1. Press down on your Support hand thumbstick.
2. On the Layers menu, select the layer which includes the part of the sculpt you are working on.
3. Select Increase Resolution.

After a brief pause (while the layer’s resolution is increased), you can begin sculpting again. Doing the same gesture can now be supported and results in a continuous surface:

Sculpting detail after increasing the layer’s resolution
When to Decrease Your Sculpt’s Resolution

While *increasing* a layer’s resolution happens for artistic reasons, *decreasing* its resolution is usually done only when your computer is running low on memory. As mentioned above, each time you increase the resolution for your sculpt, it uses more of your machine’s available RAM.

If you run into the situation where Medium warns you that it is running out of memory, you can try decreasing the resolution for a layer, evaluating whether the loss in resolution affects its surface fidelity. In many cases, reducing the resolution one time may be acceptable:

![Dragon head, high resolution](image1) ![Dragon head, low resolution](image2)

In the sample images above, note the loss of some fine detail and surface texture. Depending on the surface characteristics of your model, decreasing a layer’s resolution may be an acceptable option when you run into memory limits.

**Note:** The decrease resolution operation can be undone if the reduction removes too much detail.

Applying Transforms to Your Sculpt

Transforms are a way to mathematically describe the position, scale (size) and rotation of all or part of your sculpt. Changing any of these values doesn’t change the inherent shape or detail of your sculpt, but rather changes its relationship to the space around it.

Transforms also have a *frame of reference*; the frame of reference defines the space in which the transform is applied, and the transform is applied relative to a specific *origin*.

Medium supports the following frames of reference:
• **World space** - transforms are applied relative to the global origin (the point at which the dark lines drawn on the ground plane meet).

• **Sculpt space** - transforms are applied relative to the sculpt origin (the parent level for all layers in your sculpt).

• **Object space** - transforms are applied relative to the object origin (for individual layers).

Setting the Sculpt Origin

To set your sculpt’s origin:

1. Press down on the Support hand thumbstick and open the Layers menu.
2. Aim the tool hand at the small white box where the three axes meet. A note appears in your scene, telling you that you are changing the origin for your entire sculpt.

![](image)

From here, you can:

- Squeeze the grip button to manually change the position and rotation for the sculpt origin.
- Tap the Gear button on the Tool hand and select to either move or rotate the origin using the transform menus (you can also scale the origin, but this has no effect).

Transforming Individual Layers (Objects)

In addition to setting the sculpt origin, you can transform the content of individual layers. You can transform the object freehand or using a specific transform operation (move, scale, or rotate).

**Note:** The content on a given layer can also be referred to as an *object*, and you will see that terminology on some of Medium’s transform menus.
Transforming a Layer Freehand

To transform a layer freehand:

1. Select the layer you want to transform using either of the following methods:
   ○ Aim the Tool hand at the layer on the menu and squeeze the Tool hand trigger.
   ○ Aim the Tool hand at the part of your sculpt that corresponds to the layer and squeeze
     the Tool hand trigger.

2. Squeeze the Grip button on either hand and move or rotate the object (by default, the object
   moves relative to the displayed sculpt origin, which remains stationary):

Selecting a Transform Operation

To select a specific transform operation to perform on a layer (object):

1. Select the layer you want to transform using either of the following methods:
   ○ Aim the Tool hand at the layer on the menu and squeeze the Tool hand trigger.
   ○ Aim the Tool hand at the part of your sculpt that corresponds to the layer and squeeze
     the Tool hand trigger.
2. Select the transform button.

3. Select the transform operation you want to apply to the object:

Select from any of the following operations:

- Freehand transform (selected by default; see the previous section)
- Move
- Rotate
- Scale
- Set Pivot
Moving a Layer Freehand

To move a layer along any of the X, Y, or Z axes:

1. Select the Move transform operation (the white sphere with six arrows pointing away from it).
   Two things happen:
   - Move manipulators appear around your object (red, blue and green cones).
   - The Move Transform Settings menu opens.
2. Aim the Tool hand at any of the manipulators and drag it to a new location; the object moves (by default) relative to the sculpt's origin:

   ![Left, original object at sculpt origin, right, object translated along the Z axis by dragging the move manipulator.](image)

*Left, original object at sculpt origin, right, object translated along the Z axis by dragging the move manipulator.*
Move Transform Settings Menu

When you select the move transform operation, the Move Transform Settings menu opens:

![Transform Menu]

**Move Axis**

Shows the current values for the object’s X, Y and Z axes.

- Click on any number to enter a new value.
- Click on the “X” to zero out that transform.

**Coordinate space**

Selects the frame of reference for the transform. Moves are executed relative to the world, sculpt, or object origin.

**Snap**

If enabled, you can enter a snap increment. The object moves only in the specified increment.

Rotating a Layer Freehand

To rotate a layer around any of the X, Y, or Z axes:

1. Select the Rotate transform operation (the white sphere with three rings around it). Two things happen:
   - Rotate manipulators appear around your object (red, blue and green rings).
   - The Rotate Transform Settings menu opens.

2. Aim the Tool hand at any of the rings and rotate it to a new orientation; the object rotates (by default) around the axes for the sculpt’s origin:
Left, original object at sculpt origin, right, object rotated about the Y axis by dragging the rotate manipulator.

Rotate Transform Settings Menu

When you select the rotate transform operation, the Rotate Transform Settings menu opens:

Rotation Axis
Shows the current values for the object’s rotation around the X, Y and Z axes.

- Click on any number to enter a new value.
- Click on the “X” to zero out that transform.

Coordinate space
Selects the frame of reference for the transform. Rotations are executed relative to the world, sculpt, or object origin.

Snap
If enabled, you can enter a snap increment. The object rotates only in the specified increment.
Scaling a Layer Freehand

To scale a layer:

1. Select the Scale transform operation (the white sphere with three arrows pointing away from it, surrounded by a white dotted line). Two things happen:
   - Scale manipulators appear (six yellow rectangles).
   - The Scale Transform Settings menu opens.

2. Aim the Tool hand at any of the manipulators and drag it to a new location; the object moves (by default) relative to the sculpt’s origin:

![Left, original object at sculpt origin, right, object scaled up by dragging a scale manipulator.](image)

**Note:** For the Scale operation, you can select any rectangle to scale the object relative to the specified origin.
**Scale Transform Settings Menu**

When you select the scale transform operation, the Scale Transform Settings menu opens:

![Scale Transform Settings Menu](image)

- **Move Axis**
  - Shows the current scaling factor.

- **Coordinate space**
  - Selects the frame of reference for the transform.
  - Scales are executed relative to the world, sculpt, or object origin.

- **Snap**
  - If enabled, you can enter a snap increment. The object is scaled only in the specified increment.

**Setting the Pivot Point (Object Origin) for a Layer**

In the same way that you can set the sculpt origin, you can set the pivot point for a layer. You can think of the pivot point as the object’s origin. To manipulate the object’s origin:

To set the pivot point’s new position:

1. After selecting the move, rotate or scale operation, also select the Pivot Point icon (the red, green, and blue axes at the far right). A small set of red, green and blue axes appears at the object origin.
2. Use the manipulators to transforms the position or orientation of the object origin.

After moving the pivot point (object origin), transformations made in the object frame of reference will be based on this new location:
Left, original object with object origin coincident to sculpt origin; right, object origin translated along the Z axis by dragging the move manipulator.
Getting to Know Medium’s Menus

Menu Basics

In some cases, you’ll need to tell Medium what you want to do, or change the settings for a tool. Menus are panels that appear in your workspace when you tap certain buttons on your controllers. For example, if you tap the Gear icon on your Tool hand, the Settings menu for that tool appears:

![Settings menu for Move tool]

Interacting with Menus

To interact with a menu aim your Tool hand at the option on the menu you want to change.

- For sliders, aim at the handle, squeeze and hold the Tool hand trigger, and drag it left and right.
- Select the “-” and “+” symbols to uniformly increment the displayed value.
- Select the value itself to bring up a numeric keypad (for specifying exact values).
- To enable/disable an option, aim at the option and squeeze the Tool hand trigger.
Moving Menus

Many of Medium’s menus can be moved. If you’re sculpting and you find that your view is obscured by a menu:

1. Aim the Tool hand at the menu.
2. Squeeze and hold the Grip button on the Tool hand.
3. Move the menu to its new position and release the Grip button.

Moving a menu: left, menu obscuring the sculpt, and right, after moving with Tool hand Grip button

Closing a Menu

There are a number of ways to close a menu in Medium, depending on its type:

- For most menus, you can simply aim the tool hand away from the menu and it will disappear. This is also called “waving off” the menu.
- For menus with an “X” in the upper left corner, aim at the “X” with your Tool hand and squeeze the Tool hand trigger. (You cannot wave off a “menu” with an “X” in the upper left corner
Closing a menu

Some special menus have specific “closing” behaviors:

- The Control Panel stays visible only as long as you press and hold the yellow Control Panel button on the Support hand. Releasing the button dismisses the menu.
- The Home screen stays visible until you press the Home button on the Support hand a second time.
The Control Panel

The Control Panel includes options that you want to quickly access during a sculpting session. Use the Control Panel to:

- Load, save, export and share your work.
- Turn sculpting features such as Mirror and Lathe on or off.
- Set up capture of photos, video, or full VR sessions.

To open the Control Panel, press the yellow Control Panel button on the Support hand. Each of the options on the Control Panel menu are described below:

New

Creates a new scene.

**Note:** Creating a new scene deletes your current scene. When you select this option, Medium asks you to confirm before proceeding.

Save As

Saves your current scene, prompting for a filename before saving.

Load Last

Reloads the most recently saved sculpt. Contents of the current scene are lost.

Quick Save

Saves the contents of your current scene to the your local file system.

- If this is the first time you are saving, Medium prompts you to enter a filename.
- If you have saved the scene at least one time (or loaded the current scene from your local file system), Medium saves the file with the same name.
**Note:** The Quick Save option overwrites your previous work; earlier versions are not preserved. If you want to save a new version, use the Save As command.

**Export**

Exports the current scene to your local file system in a non-Medium format (such as .obj or .fbx).

**Share Sculpt**

Use the Share Sculpt option in the Control Panel to connect your Facebook to your Medium account, and share creations to your Facebook newsfeed.

On Facebook and in your Artist Gallery, your Medium sculpt is displayed as a 3D model that can be manipulated like a gyroscope and viewed in all its glory.

When sharing sculpts to the Medium sharing site, you can edit the description and select a Creative Commons license completely in VR (as long as you’ve already signed in to your Oculus account).

- Selecting Share to Facebook shares your current sculpt to your Facebook feed; selecting Share to Public Gallery shares your sculpt to your Artist Gallery as well. These two options enable you to share to Facebook without sharing to your Gallery, and vice versa.

- Turning off your skybox in Medium renders your background with the solid color of your choosing; keeping the skybox on in Medium renders a gray gradient background.

- Only default material works are supported for sharing to Facebook (emissive or metal material will appear as default).

- The orientation of your sculpt can be found in your 2D preview image.

- There is currently an upload limit of 400 MB.

- You are still unable to share sculpts from the Home Screen - You must load them into your scene first.

- Sharing recordings, photos, and videos from your Home screen will bring up the Edit Asset page on the web browser.
• Sharing to Facebook from an asset page in the Gallery will post a 2D preview image to your Feed; to share a 3D model to your newsfeed, you must share from inside Medium.

The Home Screen

Open the Home screen to do any of the following:

• Load and play tutorials
• Load assets from your library
• See important notifications
• Change your user settings
• See credits for Medium
• Exit Medium
• View a news feed containing new information of interest to Medium artists.

Tutorials

One of the best ways to get a good basic understanding of Medium is to load and follow the tutorials. The tutorials are a special set of videos that load and play right in your Medium workspace. (New tutorials of all levels are added frequently, so you may want to check in every once in awhile for new content.)

Watching a Video Tutorial

Video tutorials load right into your scene; they appear in a floating rectangle above the ground plane so you can watch them while (or before) you work.

To load and watch a video tutorial:

1. Tap the Home button on your Support hand.
2. Select Tutorials.
3. Aim at the tutorial you want to watch with your Tool hand and squeeze the Tool hand trigger. A larger screenshot of the tutorial appears, with some information about the author, a brief description of the tutorial, and when the tutorial was last changed. If this is the one you want to
watch, select Play:

4. The video appears on a floating screen in your workspace, and a set of playback controls appears over your Support hand:

The playback controls do the following:

- Go to Previous Tutorial
- Pause
- Stop
- Replay
- Manipulator (lets you reposition the screen in your workspace)
- Go to the Next Tutorial (the next tutorial is the next downloaded tutorial in your library, depending on the sort order you’ve specified).
In addition to viewing the tutorials, you can learn about Medium by watching other videos and VR sessions from your library.

Library

Medium keeps all of its related assets in a library. Your library includes the following:

- Sculpts
- Stamps
- Videos
- Photos
- VR Sessions
- Reference Material (images and meshes)

Library: Sculpts

Your sculptures library includes both your own work and sculptures provided by the Medium team. Sculptures in your library are grouped by user so it's easier to find what you are looking for. To select a sculpture from your library:

1. Tap the Home button on the Support hand.
2. Select Library.
3. Select the Sculpts icon.
4. Select a user from the list at the left. A gallery view of all the sculptures in the selected folder opens. Point at a sculpture with your Tool hand to see more information about it; while you're
pointing at the sculpt, it rotates to give you a better view.

5. Select a sculpt by squeezing the trigger on your Tool hand. (Use the sort buttons at the bottom of the screen to sort by date or by name, and use the elevator bar to the right of the sculpt previews if you need to scroll up or down through the gallery.)

When you select a sculpt, a larger view appears; from here, you can do any of the following:

- **Load** - load the sculpt.
- **Share** - get directions on how to share your sculpt on the Oculus.com
- **Rename** - give the sculpt a new name.
- **Delete** - delete the sculpt.

**Library: VR Sessions**

VR sessions are recordings of sessions made by Medium users that can be played back and watched by another user. You can load VR sessions into your world and see them right alongside your current work and view them from any angle. To load a VR session:

1. Tap the Home button on the Support hand.
2. Select Library.
3. Select the VR Sessions icon.
4. Select a user. A gallery view of all the VR sessions in the selected folder opens. Point at a session to see more information about it.

5. Select a VR session by squeezing the trigger on your Tool hand. (Use the sort buttons at the bottom of the screen to sort by date or by name, and use the elevator bar to the right of the sculpt previews if you need to scroll up or down through the gallery. When you select a VR session, a larger view appears with additional information including the author, duration, license and creation date:

From here, you can do any of the following:

○ **Play** - start the VR session playback.

○ **Delete** - delete the VR session.
6. Select Play to start the VR Session playback. The user’s avatar appears in your workspace, along with a set of playback controls on your Support hand:

The playback controls do the following:

- Pause the session
- Stop
- Replay
- Manipulator (lets you reposition the screen in your workspace)

To reposition the VR tutorial content:

1. Select the manipulator icon (the rightmost playback menu).
2. Squeeze the grip button on the Support hand and reposition the avatar and associated content so you have a better view.

Notes:

- If you are working in a standing position, you can also move around in your scene for a better view.
- The VR session pauses if you remove your headset, so you can take a break and then pick up where you left off.

Library: Stamps

Your stamps library contains any stamps that you have previously saved (as well as factory default stamps supplied by Oculus). Stamps are custom shapes that can be used for any of the following:
● Repeating shapes consistently on a sculpt (such as bolts on a robot).
● As an interesting shape through which to add clay
● As custom sculpting tools for removing clay

Note: Select a stamp from this menu to rename, delete, or move it to a different collection. To select a stamp for sculpting, see Stamps.

To see the stamps in your library:

1. Tap the Home button on the Support hand.
2. Select Library.
3. Select the Stamp icon.
4. Select a user (first column) and collection (second column). Stamps you created previously appear in the Personal category, and by default are added to the Custom collection. A gallery view of all the stamps in the selected collection opens. Point at a stamp to see more information about it; while you point at the sculpt, it rotates to give you a better view.
5. Select a stamp by squeezing the trigger on your Tool hand. (Use the sort buttons at the bottom of the screen to sort by date or by name, and use the elevator bar to the right of the stamp previews if you need to scroll up or down through the gallery.)

Importing Stamps

You can import shapes that you’ve created in other applications and use them as stamps in Medium. Shapes for import must be in either .fbx or .obj format, and placed in the following folder:

C:/Users/<username>/Documents/Medium_Import/Stamps

To import a stamp (or stamps):

1. Tap the Home button on the Support hand.
2. Select Library.
3. Select the Stamps icon.
4. Select a user (first column) and collection (second column).
5. Select Import (at the bottom of the screen).

Any stamps in the directory The stamps are now available as part of the specified collection.

Renaming a Stamp

Give the selected stamp a different name.
Changing the Collection to Which a Stamp Belongs

Stamps are organized into collections so you can keep related shapes together. When you select a stamp with the Clay tool, for example, stamps appear in the collection to which you’ve assigned them.

Deleting a Stamp

Delete the selected stamp.

Library: Photos

Your photo library contains any photos that you have taken of your work. Photos are similar to screenshots that you might take in a 2D application, and are useful for sharing progress on your work with a client or sharing on social media.

To select a photo from your library:

1. Tap the Home button on the Support hand.
2. Select Library.
3. Select the Photo icon.
4. Select a photo by squeezing the trigger on your Tool hand. (Use the sort buttons at the bottom of the screen to sort by date or by name, and use the elevator bar to the right of the thumbnails if you need to scroll up or down through the gallery.)

When you select a photo, a larger version appears; from here, you can do any of the following:

- **Share** - share the image on the Oculus.com site.
- **Rename** - give the photo a new name.
- **Delete** - delete the photo.

Return to the gallery by selecting the asset name at the top of the panel, or to the Home screen by selecting the Home icon.

Library: Videos

Your video library contains any videos that you have taken of your work. Videos are useful for sharing tips or techniques that you want to share with other artists on social media.

To select a video from your library:

1. Tap the Home button on the Support hand.

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2. Select Library.

3. Select the Video icon.

4. Select a video by squeezing the trigger on your Tool hand. (Use the sort buttons at the bottom of the screen to sort by date or by name, and use the elevator bar to the right of the thumbnails if you need to scroll up or down through the gallery.)

When you select a video, a larger version appears; from here, you can do any of the following:

- **Load** - load the video.
- **Share** - share the video on the Oculus.com site.
- **Rename** - give the video a new name.
- **Delete** - delete the video.

Return to the gallery by selecting the asset name at the top of the panel, or to the Home screen by selecting the Home icon.

**Note:** The VR session pauses if you remove your headset, so you can take a break and then pick up where you left off.

**Reference Material** *(Images and Meshes)*

Review reference images and meshes that you can load into your scene. For more information, see [Working with Reference Images](#) and [Working with Reference Meshes](#).

**Note:** If you look in the Medium user folder, you’ll see .asset files associated with each item you have saved (such as sculptures, videos, or photos). Don’t erase these files; Medium uses them to keep track of your content.

**Notifications**

Opens the Notifications panel, where you can read important messages from the Medium team.

**User Preferences**

Opens the User Preferences menu. User Preferences are persistent across sessions and define some basic behaviors of Medium:

**First Time User**

Automatically starts an introduction and tutorials for the user.
**Note:** This is automatically turned off after your first session.

**Double Tap Speed**

Some shortcuts (such as the Settings menu) are enabled with the double tap of a button. This sets the maximum time in which two quick taps are recognized as a double tap gesture. If you’re double tapping on a button but not seeing the expected menu, you may want to increase this value:

- Use a lower value if you’re quick on the draw.
- Use a higher value if you work at a more relaxed pace.

**Tooltips**

Show tooltips when you hover over a menu option in Medium.

**Start with Blank Scene**

Start Medium without the default sphere shape. Once you’re proficient in Medium, you can deselect this option to avoid having to erase the default sphere each time you start.

**Application Sounds**

Enable sounds for actions in Medium.

**Controller Vibration**

Vibrate the controllers to alert the artist to certain events (such as a successful save).

**Avatar Hands**

Display your Oculus Avatar hands in the scene. If not selected, only the tools are displayed.

**Show Menu on Object Selection**

Show the object menu when the object is selected. If you deselect this option, tap the Gear button on the Tool hand controller to open the object menu.

**Selecting a Hand**

Define which hand is your Tool hand. Most users select their dominant hand (so if you’re right handed, select the right hand).
Credits
See who worked on Medium!

Exit
Select Exit to end your sculpting session in Medium. Confirm when you’re prompted, or tap the Home button again if the Confirm prompt appears and you change your mind.

News Feed
Your Medium News Feed keeps you up to date with new material that you may find useful. Things you may find in your News Feed include:

- Tutorials and associated assets
- Recorded VR Sessions
- Tips and suggestions on using Medium

Use the arrows at the bottom of the feed (or the elevator bar on the right) to scroll up and down through your News Feed.

Loading a News Feed Item
To load a News Feed item, select the item from the “What’s New” column.

- If the content includes a VR session, select the play button to start the playback.
- If the content includes downloadable content, select Download. Your Support hand vibrates and a notification appears, telling you when the download has started and finished.

The Support Modes Menu
Use the Support Modes menu to manage the following:

- **Layers** - how you organize the parts of your sculpt.
- **Scene Settings** - how you set up the environment.
- **References** (images and meshes) - guides that assist you in your sculpting.
- **Studio Share** - working with other Medium users in the same session.
To open the Support Modes menu, press down on the Support hand thumbstick. Each of these support menus is described below.

**The Layers Menu: Managing the Structure of Your Sculpt**

*What is a Layer?*

When you’re working on a sculpt, you may want to work on one feature (such as your creature’s teeth) without affecting another feature (such as the creature’s jaw). In Medium, you can define “Layers” to contain discrete areas of your sculpt and work on them independently of one another.

**Note:** In general, the current tool affects only the active layer. Some tools, however, are intended to affect more than one layer (such as Move). In those cases, you can use the settings menu for the tool to specify whether all layers or just the active layer are affected.

*The Layers menu*

Most of the menu-related commands in Medium appear on the Layers menu, where you can do things like add, delete, merge, and rename layers. To open the Layers menu:

1. Press down on the Support hand thumbstick.
2. Select the Layers icon.
Adding Layers

To understand how layers work, start by adding some clay to your current scene with the Clay tool, or loading a sculpt from your library.

Next, add a new layer:

1. Press down on the Support hand thumbnail.
2. Select the Layers icon.
3. Select New. The new layer appears on the left side of the Layers menu (as Layer 2, Layer 3, and so on).
4. Press the Support hand thumbnail up hide the Support modes menu and start sculpting in the new layer.

When you create the layer, it automatically becomes the active layer, and any changes you make take place in that layer:

5. Use the Clay tool to add some more detail to your scene. The clay you add on one layer doesn’t blend with clay on other layers, even if it intersects:

In the image above, note the hard intersection between the top horn and the head. (If you later merge these two layers, Medium tries to preserve that hard edge.)

6. Select the Smooth tool and aim at your sculpt. Note that only the clay in the active layer is affected by the tool.
Selecting the Active Layer

As you add layers, you will invariably want to switch between one layer and another. There are two ways to select the layer you want to work on.

Select the Active Layer from the Layers Menu

To select the active layer from the Layers menu:

1. Press down on the Support hand stick.
2. Select the Layers icon; a list of layers is displayed on the left side of the Layers menu.
3. Aim the Tool hand at the layer you want to work on and squeeze the Tool hand trigger.

Selecting a layer makes it the active layer. Changes you make (such as adding or removing clay) are now made in that layer.

Select the Active Layer Interactively

You can also make a layer the active layer by pointing at it in your scene. This might be handy if you’ve created several layers but haven’t given them descriptive names yet:

1. Press down on the Support hand stick.
2. Select the Layers icon.
3. Aim your Tool hand at your sculpt. As you aim at different parts of your sculpt, the content of each layer is highlighted.
4. Squeeze the Tool hand trigger to make the currently highlighted layer the active layer.

Hiding and Showing Layers

Once you have more than one layer in your scene, you may want to hide some layers while you’re working on others. To hide a layer:

1. Press down on the Support hand stick.
2. Select the Layers icon.
3. Aim the Tool hand at the “eye” icon next to the layer and squeeze the Tool hand trigger.

When the eye icon is crossed out, the layer is hidden; toggle the icon on or off to hide or show the selected layer.
Deleting Layers

If you change your mind about changes you’ve made to a layer and want to completely remove it:

1. Press down on the Support hand thumbstick.
2. Select the Layers icon.
3. Aim the Tool hand at the layer you want to delete and squeeze the Tool hand trigger to select it.
4. Select Delete.

Duplicating Layers

You can make an exact duplicate of an existing layer; the duplicate will have the same name as the original but will have a higher numeric extension (e.g., the duplicate of Layer 1 will be Layer 2 or Layer 3). You might want to make a duplicate to try out some specific techniques and compare the two versions, or to make a copy of an element you want to flip across the mirror axis when sculpting a symmetrical model.

To make an exact duplicate of a layer:

1. Press down on the Support hand thumbstick.
2. Select the Layers icon.
3. Aim the Tool hand at the layer you want to duplicate and squeeze the Tool hand trigger to select it.
4. Select Duplicate.

Renaming Layers
As you add layers, you may need to clarify what each layer in the scene represents. To give a layer a new name:

1. Press down on the Support hand thumbstick.
2. Select the Layers icon.
3. Aim the Tool hand at the layer you want to rename and squeeze the Tool hand trigger to select it.
4. Enter the new name for the layer using the keyboard that appears.

Merging Layers
If you've made changes to more than one layer and decide that they should be combined:

1. Press down on the Support hand thumbstick.
2. Select the Layers icon.
3. Use the Tool hand to select the checkboxes next to the layers you want to merge.
4. Select Merge to combine the layers into one layer.

Notes:

- If the merged layers have different resolutions, they are combined at the highest resolution (to avoid any loss of detail).
- If the layers have different materials, the merged layer uses the material of the highest layer on the layers list (for example, if Layer 1 were ‘red’ and Layer 2 were ‘blue’, the merged layer would be ‘red’).

Flipping the Contents of a Layer Across the Mirror Plane
You may find that you want to “mirror” the content of a particular layer across the mirror plane. Flipping a layer moves the clay across the mirror plane as if it were a reflection of the original. (You can Duplicate a layer and then Flip the copy across the mirror plane if you want to reproduce the same details on both sides of your sculpt.)
Flipping a layer: Left, original arm, right, arm duplicated and flipped across the mirror plane.

To flip a layer:

1. Press down on the Support hand thumbstick.
2. Select the Layers icon.
3. Aim the Tool hand at the layer you want to flip and squeeze the Tool hand trigger to select it.
4. Select Flip.

The clay in the layer “jumps” across the mirror plane.

Making a Stamp from a Layer

If you've created a unique, reusable element in a layer, you can save it as a *stamp*. Stamps are custom shapes you can use with the Clay tool to add clay to (or remove clay from) your sculpt. You can use stamps, for example, to create teeth, rivets, nuts and bolts, surface textures, and so forth...things that you might use over and over in different sculpts.

To create a stamp from a layer:

1. Press down on the Support hand thumbstick.
2. Select the Layers icon.
3. Aim the Tool hand at the layer you want to rename and squeeze the Tool hand trigger to select it.
4. Select Stamp.
The stamp is automatically saved in your personal stamps directory. See the Stamps section for more information.

Centering the Content of a Layer

Centers the contents of the layer within the bounding box. This feature is useful if you are butting up against one side of the bounding box and need a little more elbow room.

Increasing the Resolution of a Layer

While sculpting, you may find that certain fine details start to “break up.” The Increase Resolution option enables you to sculpt with a higher level of detail for the selected layer.

Notes:

- Resolution can be different for each layer.
- Increasing resolution uses additional RAM in your machine. If increasing the resolution for a detailed sculpt would exceed the available RAM, Medium gives you a warning.
- Increase resolution only for the layers where you need the additional detail; increasing the resolution for a relatively smooth layer can use up your computer’s RAM unnecessarily.

To increase the resolution for a layer:

1. Press down on the Support hand thumbstick.
2. Select the Layers icon.
3. Aim the Tool hand at the layer for which you want to increase the resolution and squeeze the Tool hand trigger to select it.
4. Select Increase Resolution.

In general, you won’t see much of a visual effect immediately after using Increase Resolution on a layer; however, after using the command you should be able to add more fine detail to the sculpt’s surface. For more information, see When to Increase Your Sculpt’s Resolution.

Decreasing the Resolution of a Layer

The Decrease Resolution option intelligently reduces the resolution of the selected layers, discarding unnecessary information (e.g., along regular surfaces) while trying to maintain the sculpt’s form. While you may have to initially increase the resolution of a layer in order to sculpt the fine detail you want, you
may also find that you can later decrease the layer’s resolution after you’ve done so in order to reduce the memory footprint of your sculpt.

Notes:

- Resolution can be different for each layer.
- If decreasing resolution removes too much detail, use Undo to restore the higher resolution version.

To decrease the resolution for a layer:

1. Press down on the Support hand thumbstick.
2. Select the Layers icon.
3. Aim the Tool hand at the layer for which you want to decrease the resolution and squeeze the Tool hand trigger to select it.
4. Select Increase Resolution.

Review your sculpt after decreasing its resolution; after using the command you may see that certain areas have lost too much detail, and you can Undo the action. For more information, see When to Decrease Your Sculpt’s Resolution.

Tools that Affect Multiple Layers

Some tools affect more than one layer by default:

- **Move tool** - by default, the Move tool affects all layers. To change this setting, select the Move tool and tap the Gear button on your Tool hand to open the Move tool Settings menu.
- **Cut tool** - the Cut tool slices your sculpt apart into multiple pieces; each of those pieces becomes a new layer.

To make these tools affect only the active layer:

1. Select the tool.
2. Tap the Gear button on your Tool hand.
3. Select whether the tool should affect only the active layer or all layers.
The Scene Settings Menu: Customizing Your Workspace

Use the Scene Settings menu to customize your working environment.

To open the Scene Settings menu:

1. Press down on your Support hand thumbstick.
2. Select the Scene Settings icon with your Tool hand.

As you make changes, they are reflected in your environment. For example, try turning the Skybox or Ground plane on and off, or change the brightness of the sun (which defines the brightness of the ambient light in your scene).

Sun Brightness

Sets the brightness of the sunlight (ambient light in the scene).

Sun Color

Sets the color of the sunlight (ambient light in the scene).

Background Color

Set the background color for the scene (visible only if the Skybox is turned off).
Skybox

The three-dimensional cloud-covered hemisphere that surrounds your workspace. If you prefer to work with a solid background color, turn this option off.

Ground Plane

The two-dimensional grid that appears in your workspace. The global origin is located where the two thick black lines meet (with +Z pointing up).

Bloom

The weak “glow” effect of sunlight that surrounds any objects (even menus). This effect simulates the similar real-world effect seen when viewing objects through a camera.

Set as Default

Make the currently selected scene settings your default settings.

- Any new scenes you create will use these defaults.
- These settings are persistent between sessions.

Reset to Default

Restores your last saved scene settings.

- If you have previously used the Set as default option above, those options are restored.
- If you have never saved your own defaults, factory settings are restored.

The References Menu: Using Images and Meshes as Guides

The Reference menu lets you bring meshes and images created in other applications into your scene. You can use assets provided by the Medium team or follow the guidelines below to use your own assets.

For clarity’s sake:

- **Importing** a mesh or image means that you’re adding it to your Medium library.
- **Loading** a mesh or image means you’re bringing the an item from the library into your current scene.
Working with Reference Images

You can import images from other 3D packages into Medium to use as references in your sculpting.

To import an image, drag it into the Medium Import folder:

   C:\Users\<USERNAME>\Documents\Medium\_Import\Reference Images\n
You can import reference images in any of the following file formats:

- .png
- .jpg
- .jpeg
- .jpe
- .tga
- .bmp
- .gif

Importing the Reference Image

Once the image file is inside the import folder:

1. Press down on the Support hand thumbstick.
2. Select the Reference icon.
3. Select the Images tab.
4. Select Import Images at the bottom of the panel.

Loading and Placing Reference Images

To load and position an imported image in your scene:

1. Press down on the Support hand thumbstick.
2. Select the References icon.
3. Select the Images tab.
4. Select a category. (Images that you have Imported appear in the Custom category.)
5. Aim at the image you want to load with the Tool hand and squeeze the Tool hand trigger to select it.
6. Squeeze the Support hand trigger to “grab” and position the image.
Transforming a Loaded Reference Image

To transform an image, you must first make sure it’s selected. (If you’ve just loaded the image, it’s selected by default.) To select a previously loaded image:

1. Press down on the Support hand thumbstick.
2. Select the Reference icon.
3. Aim your Tool hand at the image you want to transform and squeeze the Tool hand trigger to select it.

Once you’ve selected the image you want to transform:

4. Tap the Gear button on your Tool hand.
5. Select the transform button.

On the menu that appears, select the type of transform you want to perform on the image:

- Free transform
- Move
- Rotate
- Scale

For more on specific transform operations, see Applying Transforms to Your Sculpt.

Reference Image Settings

To open the Image Settings menu for a given image, you must first make sure it’s selected. (If you’ve just loaded the image, it’s selected by default.) To select a previously loaded image:

1. Press down on the Support hand thumbstick.
2. Select the Reference icon.
3. Aim your Tool hand at the image you want to transform and squeeze the Tool hand trigger to select it.

Once you’ve selected the image whose settings you want to modify:

4. Tap the Gear button on your tool hand.
5. Select the Settings button.
Move with Sculpt

If selected, the reference image moves in unison with your sculpt.

Visible

Set the visibility of the image.

Deleting a Reference Image

To remove a reference image from your scene:

1. Press down on the Support hand thumbstick.
2. Select the Reference icon.
3. Aim your Tool hand at the image you want to delete and squeeze the Tool hand trigger to select it.

Once you’ve selected the image you want to delete:

4. Tap the Gear button on your Tool hand.
5. Select the Delete button.

Working with Reference Meshes

You can import meshes from other 3D packages into Medium to use as references in your sculpting. With Medium’s Copy to Clay feature, you can also convert reference meshes into sculptable material, preserving color information from your original mesh.

To import a mesh, drag it into the Medium Import folder:

   C:\Users\<USERNAME>\Documents\Medium\_Import\Reference Meshes\

You can import reference meshes in either of the following file formats:

- .fbx
- .obj

Meshes from both formats can be brought into Medium with vertex color and texture information. Each format has slightly different requirements:

- **OBJ** - Medium uses a non-standard extension to the OBJ file format to support vertex colors inside the OBJ file. For textures, we require a .obj file, accompanying .mtl file, and all image files.
We support one diffuse texture per subset. All files should be included in the Medium Import folder.

- **FBX** - Medium’s FBX importer supports one diffuse texture per mesh node inside the .fbx file. Each image file, as well as the .fbx file itself, should be included in the Medium import folder. Normal maps, multiple blended textures, and other special usage of textures are not supported and are not brought into Medium. If you are having issues with import, make sure that you have included all textures files with correct pathing in of the import folder, and make sure that each mesh node contains only one diffuse texture.

**Mesh Requirements**

Meshes you plan to import should have vertex normals and be watertight. (While watertightness isn’t required for the reference mesh in general, it is strongly recommended for meshes you plan to use with the Copy to Clay feature.) Non-watertight meshes may fail to copy or show errors in the final sculpt. While minor errors in the geometry may not cause problems with Copy to Clay, it’s best for the mesh to be completely watertight. It is not necessary to triangulate meshes, as they are automatically triangulated upon import. As for vertex normals, they aren’t strictly required either, though meshes without normals show up unlit inside of Medium, giving them a uniformly flat gray appearance.

**Importing the Reference Mesh**

Once all required files are inside the import folder:

1. Press down on the Support hand thumbstick.
2. Select the Reference icon.
3. Select the Meshes tab.
4. Select Import Meshes at the bottom of the panel.

**Loading and Placing Reference Meshes**

To load and position an imported mesh in your scene:

1. Press down on the Support hand thumbstick.
2. Select the Reference icon.
3. Select the Meshes tab.
4. Select a Category. (Meshes that you have Imported appear in the Custom category.)
5. Aim at the mesh you want to load with the Tool hand and squeeze the Tool hand trigger to select it.
6. Squeeze the Support hand trigger to “grab” and move the mesh.

**Transforming a Loaded Reference Mesh**

To transform a mesh, you must first make sure it’s selected. If you’ve just loaded the mesh, it’s selected by default. To select a previously loaded mesh:

1. Press down on the Support hand thumbstick.
2. Select the Reference icon.
3. Aim your Tool hand at the mesh you want to transform and squeeze the Tool hand trigger to select it.

Once you’ve selected the mesh you want to transform:

4. Tap the Gear button on your Tool hand.
5. Select the transform button.

On the menu that appears, select the type of transform you want to perform on the mesh:

- Free transform
- Move
- Rotate
- Scale

For more on specific transform operations, see *Applying Transforms to Your Sculpt*.

**Reference Mesh Settings**

To open the Mesh Settings menu for a given mesh, you must first make sure it’s selected. If you’ve just loaded the mesh, it’s selected by default. To select a previously loaded mesh:

1. Press down on the Support hand thumbstick.
2. Select the Reference icon.
3. Aim your Tool hand at the mesh you want to transform and squeeze the Tool hand trigger to select it.

Once you’ve selected the mesh whose settings you want to modify:

4. Tap the Gear button on your Tool hand.
5. Select the Settings button.
Move with Sculpt
If selected, the reference mesh moves in unison with your sculpt.

Visible
Set the visibility of the mesh.

Wireframe
Displays the mesh in wireframe mode.

Copy to Clay
Converts the mesh into the most active layer of clay (and takes on that layer’s resolution).

Deleting a Reference Mesh
To remove a reference mesh from your scene:

1. Press down on the Support hand thumbstick.
2. Select the Reference icon.
3. Aim your Tool hand at the mesh you want to delete and squeeze the Tool hand trigger to select it.

Once you’ve selected the mesh you want to delete:

4. Tap the Gear button on your Tool hand.
5. Select the Delete button.
The Studio Share Menu: Working with Other Medium Artists

With Medium’s Studio Share, you can join another user in a shared workspace. In the Studio Share session, you can:

- Share advice and comments over the headset.
- See each other's avatar.
- See each other’s current sculpt.

Inviting Another User to Studio Share

To initiate a Studio Share session:

1. Press down on the Support hand thumbstick.
2. Select the Studio Share icon to see a list of your friends who are currently online with Oculus.
3. Select one of your friends to start a Studio Share session.

After you select a friend, an invitation is sent:
Accepting a Studio Share Invitation

If you are online with Oculus, and a friend sends you an invitation to Studio Share, you’ll first hear a tone on your headset.

- **Accept the invitation** - if you want to enter a Studio Share session.
- **Ignore the invitation** - if you’re busy and don’t want to Studio Share at the moment.

Once you accept the invitation, you can begin working together.

Working Together in a Studio Share Session

Once you have sent an invitation and your friend has accepted, you’ll see both avatars in your scene. You can talk to each other, move around each other’s sculptures, and work in a highly communal fashion.

**Note:** While you can sculpt simultaneously, you can’t sculpt on the each other’s work.
Tools

Clay

Use the Clay tool to add clay to your sculpt. The Clay tool is your default tool when you first start a Medium session, and can be used to build out the basic volume of your sculpt or to add different levels of detail.

By default, the Clay tool has a spherical shape; you can select from other pre-defined shapes (see Clay Settings) or create and use your own custom stamps. You can add clay with continuous strokes or place a single instance of the current stamp with each squeeze of the trigger (see Single vs. Continuous Mode).

To select the Clay tool from the Tool Tray:

1. Push up on the thumbstick on your Support hand to open the Tool Tray.
2. Point to Clay with your Tool hand and squeeze the Tool hand trigger.

Adding Clay

With the Clay tool selected:

1. Squeeze and hold the trigger on your Tool hand. The trigger is pressure sensitive, so the harder you squeeze, the faster the clay “comes out” of the tool, just like a tube of toothpaste.
2. Move your Tool hand while holding the trigger to add clay just where you want it.

Removing Clay

You can also use the Clay tool to remove clay from your scene. With the Clay tool selected, double-tap the Settings button on your Tool hand to switch modes. The tool preview changes color from green to red; when in this mode, the tool removes clay instead of adding it.
To remove clay from your sculpt:

1. Press and hold the trigger on your hand. Just as when adding clay, the trigger is pressure sensitive, so the harder you squeeze, the more clay you remove.
2. Move your Tool hand while holding the trigger. The area where the tool preview intersects with your sculpt is removed.

Double-tap the Settings button on your Tool hand again to switch back to adding clay.

Setting the Clay Tool’s Size

You can change the Clay tool’s size to add more or less clay to your sculpt with each squeeze of the trigger...imagine a larger or smaller tube of toothpaste. You might use a larger size for adding primary volume to your sculpt, then reduce the size for adding secondary and tertiary levels of detail:

- Press up on the Tool hand thumbstick to increase the Clay tool size.
- Press down on the Tool hand thumbstick to decrease the Clay tool size.

As you press and hold the thumbstick up or down, the tool preview changes, and a green scale appears over the tool hand to indicate the relative size of the tool.

Selecting a Clay Color

You can select the color of the clay you add to your sculpt. With the Clay tool selected:

4. Tap the Color button on the Tool hand.
5. Select a color from the color wheel.

You can select the clay color from either the Color wheel or directly from your model (see The Color Menu).

**Note:** If you use more than one color in a single layer, many sculpting operations (such as Smooth or Inflate) will cause those colors to blend. If you are working on a complex sculpt where you want to give different parts *their own* colors (for example, make an alien’s head green, and its teeth white), you may want to consider breaking your work into layers.
Clay Settings Menu

With the Clay tool selected, press the Gear button on your Tool hand to open the Clay settings menu. Use the options on the Clay settings menu to define the size, shape, and behavior of the Clay tool as you sculpt.

Selecting the Clay Tool’s Shape

At the top of the menu, you can select from three default Clay tool shapes:

- Sphere
- Cube
- Capsule

In addition to these default shapes, you can select from Medium’s library of stamps to define the Clay tool’s shape (or create your own).

Single vs. Continuous Mode

Use the Single setting to determine how clay is added to your scene:

- **Not selected** (default) - add clay continuously as you squeeze the trigger, following the path of your stroke.
- **Selected** - add a discrete instance of the shape with each squeeze of the trigger. You must release the trigger after each stamp to add a new one.

Single mode is useful for:

- Adding repetitive detail to your sculpt (teeth, warts, etc.)
- Building inorganic shapes with hard surfaces (buildings, robots, etc.)

For more information, see [Stamps](#) below.
**Size**

Set the overall size of the Clay tool.

**Steady Stroke**

If enabled, removes any hand jitter effect as long as the tool stays within the specified radius.

*Steady Stroke: Left, steady stroke off, right, compared to steady stroke on.*

**Apply**

Select the tool mode:

- **Add** - add clay when the trigger is pressed.
- **Erase** - remove clay when the trigger is pressed.

**Feather**

Defines how each stroke updates your sculpt:

- **No selection** - each stroke adds clay using the full diameter of the Clay tool, and no special end treatment is applied to the stroke when the trigger is released.
- **Trigger** - the amount of clay added or removed with each stroke is based on the pressure applied to the trigger of the Tool hand.
- **Taper** - tapers the end of each stroke, at a rate defined by the slider.

**Constrain**

Constrains the clay tool to move in a straight line or along the surface of your sculpt:
- Line - add or remove clay along a straight line. When you select Line, a broken line tool preview appears at the tip of your tool. When you squeeze the Tool hand trigger, the orientation of the line is “locked” and you add or remove clay only along that line. Release the trigger to re-orient the line. The Line constraint is useful, for example, when you need to add hard line shapes (rails, streets, etc.), or remove a channel along a flat surface.

- Surface - add or remove clay along the surface of your sculpt. When you select Surface, aim the tool at the surface of your sculpt. When you squeeze the Tool hand trigger, clay is added or removed along the surface. The Surface constraint is useful, for example, to add surface detail (veins, warts, or other textural details) to organic sculptures.

Stamps

Stamps are previously saved sculpts that can in turn be used as the shape through which you add clay to your current sculpt. The three shapes at the top of the Clay settings menu (sphere, cube and capsule) are stamps as well.

Medium features several categories of stamps, including:

- 3d Print Joints
- 3d Print Stands
- Bones
- Cloth
- Custom
- Expressions
- Houseware
- Human Anatomy
- Letters
- Mechanical
- Numbers

Selecting a Stamp

You can select a stamp to use from either the Clay Settings menu.
You can manage your stamps (renaming, deleting and moving them between collections) from Home screen > Library > Stamps.

Selecting a Stamp from the Clay Settings Menu

1. With the Clay tool selected, tap on the Gear button on your Tool hand.
2. Select Stamps to see the categories of available stamps.
3. Select a category to see the stamps it contains (or select All to preview all available stamps). Stamps you created previously appear in the Custom category.
4. If needed, scroll up and down through the list by dragging the handle on the elevator bar on the right of the menu, or select the left facing arrow on the left side of the menu to return to the category list.
5. Point at the stamp you want to use and squeeze the Tool hand trigger to select it.

After you select a stamp, the tool preview changes to the shape of that stamp.

Using Stamps

Once you’ve selected a stamp, you can add or remove clay using that shape. For example, you might use stamps to:

- Add repetitive detail on the surface of an object (such as rivets on the surface of a tank, or boulders in an environment).
- Make the Clay tool behave more like traditional modeling tools used for cutting, scraping, shaping and smoothing your sculpt. (This is particularly effective when removing clay from a sculpt.)
Changing the Orientation of the Current Stamp

If the orientation of the stamp is awkward for the sculpt you’re doing, you can reposition it with respect to the Clay tool’s tip:

1. Press and hold the Tool hand thumbstick to the right.
2. A banner appears in your scene:

![Banner appears in scene](image1.png)

3. Reposition the tool with respect to the stamp preview:

![Reposition tool](image2.png)

4. Release the Tool hand trigger to set the new orientation for the stamp.

![Release trigger](image3.png)
Creating Your Own Stamps

To create your own stamp:

1. Open the Layers menu and create a new layer.
2. In that layer, create a sculpt that you might want to use across multiple sessions (for example, a feather or horn, which you might want to use again and again on multiple creatures).
3. Open the Layers menu again and select Stamp.
4. Enter a descriptive name for the stamp.

Stamps you create appear in the Custom category when selecting a stamp from the Clay Settings menu.

Stamps are saved in:

C:\Users\<username>\Documents\Medium\Stamps\<user>

Once saved, you can re-use the stamp in any session.

What’s Saved with a Stamp

Stamps are stored as a high-resolution versions of the selected layer. (This ensures that the shape retains its fidelity the next time you load the stamp.)

Note: Color information is not saved with stamps; clay applied through a stamp uses the current color for the Clay tool.
Move

Use the Move tool to change the shape of clay that you have already added to your sculpt. You can use the Move tool to tweak the form of your sculpt by squashing, stretching, and rotating all or part of your sculpt.

The Move tool consists of two concentric spheres centered around the Tool hand. Within the inner sphere, the move will have 100% effect; that effect falls off gradually to the boundary of the outer sphere. You can find more options for the tool on the Move Settings Menu.

Selecting the Move Tool

To select the Move tool from the Tool Tray:

1. Push up on the thumbstick on your Support hand to open the Tool Tray.
2. Point to Move with your Tool hand and squeeze the Tool hand trigger.

Setting the Move Tool’s Size

You can change the Move tool’s size so that it affects more or less of your sculpt as you work.

- Press up on the Tool hand thumbstick to increase the Move tool size.
- Press down on the Tool hand thumbstick to decrease the Move tool size.

As you press and hold the thumbstick up or down, the tool preview changes, and a green scale appears over the tool hand to indicate the relative size of the tool.

Unlike other tools, the Move tool has both an inner and an outer radius. When you resize the tool as described above, you scale the overall size of the tool (both spheres). If you want to adjust the ratio of the inner sphere to the outer sphere, you’ll need to use the Move settings menu.
Move Settings Menu

With the Move tool selected, press the Gear button on your Tool hand to open the Move settings menu. Use the options on the Move settings menu to define the size, shape, and behavior of the Move tool as you sculpt.

Size
The overall radius of the Move tool.

Inner Radius
The ratio of the inner sphere to the outer sphere.

- The area inside the inner sphere moves 100%.
- For the area between the inner sphere and outer sphere, there is a smoothed falloff of effect; areas further from the inner sphere move less than those closer to it.

If you want to move a discrete part of your sculpt intact (for example, repositioning the contents of a layer relative to another), make sure the inner radius is large enough to surround the entire part you want to move.

Strength
The Strength option affects the overall behavior of the tool:

- A higher number causes the tool to have a “harder” effect (think “spike”).
- A lower number causes the tool to have a “softer” effect (think “bump”).

Layers
By default, the Move tool affects all layers of your sculpt. Select Active Layer Only if you want the move to affect only the layer you are currently sculpting.
Swirl

Use the Swirl tool to rotate an area of your sculpt either clockwise or counter-clockwise and pull it away from the surface. The Swirl tool behaves a lot like one of the beaters on an electric mixer dipped into a bowl of dough.

Selecting the Swirl Tool

To select the Swirl tool from the Tool Tray:

1. Push up on the thumbstick on your Support hand to open the Tool Tray.
2. Point to Swirl with your Tool hand and squeeze the Tool hand trigger.

Setting the Swirl Tool’s Size

You can change the Swirl tool’s size to affect more or less of your sculpt:

- Press up on the Tool hand thumbstick to increase the Swirl tool size.
- Press down on the Tool hand thumbstick to decrease the Swirl tool size.

Swirl Settings Menu

With the Swirl tool selected, press the Gear button on your Tool hand to open the Swirl settings menu:

Size

Set the size of the Swirl tool.

Direction

Set the direction in which the clay is swirled. The arrow on the tool preview changes to show the selected direction.
Flatten

The Flatten tool behaves much like a “sanding disk” that can grind down part of your sculpt. You can adjust the size of the disk, make it orient itself to your sculpt’s surface, and even set the hardness of the edges.

Selecting the Flatten Tool

To select the Flatten tool from the Tool Tray:

1. Push up on the thumbstick on your Support hand to open the Tool Tray.
2. Point to Flatten with your Tool hand and squeeze the Tool hand trigger.

Setting the Flatten Tool’s Size

You can change the Flatten tool’s size to affect more or less of your sculpt:

- Press up on the Tool hand thumbstick to *increase* the Flatten tool size.
- Press down on the Tool hand thumbstick to *decrease* the Flatten tool size.

Flatten Settings Menu

With the Flatten tool selected, press the Gear button on your Tool hand to open the Flatten settings menu:
**Size**

Set the diameter of the disk.

**Hardness**

Set the resulting edge hardness on the flattened area of your sculpt.

- Use a higher value to create a harder edge.
- Use a lower value to create a softer, more beveled edge.

**Constrain**

Orients the sanding disk to the surface normals of the area at which it’s pointing. You could use this setting, for example, to “grind down” areas of detail you want to remove.
Cut

Splits your model into different parts. The cut does not have to be flat, but you can constrain it to a plane if needed (see Constrain below).

The tool is shaped like a wand; to make a cut, you must pass the wand entirely through a part of your sculpt, separating it from the rest of the model. After a short delay, the separated volumes are cut and placed on unique layers (for more information, see Layers).

Note: If the cutting tool does not entirely separate part of an object (for example, if the wand does not extend all the way through the back of the sculpt when trying to cut), nothing occurs.

Selecting the Cut Tool

To select the Cut tool from the Tool Tray:

1. Push up on the thumbstick on your Support hand to open the Tool Tray.
2. Point to Cut with your Tool hand and squeeze the Tool hand trigger.

Setting the Cut Tool’s Size (Length)

You can change the Cut tool’s length to slice through more or less of your sculpt:

- Press up on the Tool hand thumbstick to lengthen the Cut tool.
- Press down on the Tool hand thumbstick to shorten the Cut tool.

Cut Settings Menu

With the Cut tool selected, press the Gear button on your Tool hand to open the Cut settings menu:
Apply To

Specify which layers are affected by the cut tool.

- **All Layers** - cuts all layers in your sculpt.
- **Active Layer Only** - cuts only the current layer.

Constrain

Select Line to constrain the cut along a plane. If selected, the tool preview changes to a projected broken line which you can use to define the plane.
Inflate

The Inflate tool lets you expand a portion of your sculpt’s surface relative to its surrounding area, creating additional volume in your sculpt. This makes it ideal for tasks like accentuating bone ridges or muscles, or creating surface detail like bumps.

Double tap the Gear button on your Tool hand to make this a Deflate tool. In Deflate mode, the tool can be used to create valleys, crevices or even holes in the surface of your sculpt. Flipping between modes (and adjusting the strength of the tool) is a great way to create surface contrast on your sculpt.

Note: The Inflate tool can also be used to expand the clay surrounding an area of negative space to “fill in” holes that you might want to plug if you’re exporting your model for 3D printing.

Selecting the Inflate Tool

To select the Inflate tool from the Tool Tray:

1. Push up on the thumbstick on your Support hand to open the Tool Tray.
2. Point to Inflate with your Tool hand and squeeze the Tool hand trigger.

Setting the Inflate Tool’s Size

You can change the Inflate tool’s size to affect more or less of your sculpt:

- Press up on the Tool hand thumbstick to increase the Inflate tool size.
- Press down on the Tool hand thumbstick to decrease the Inflate tool size.
Inflate Settings Menu

With the Inflate tool selected, press the Gear button on your Tool hand to open the Inflate settings menu:

![Inflate settings menu](image)

**Size**

Set the diameter of the Inflate tool.

**Apply**

Select the mode for the tool:

- **Inflate** - expands the surface area under the tool.
- **Deflate** - contracts the surface area under the tool

**Constrain**

Constrain the inflate or deflate action to a straight line.

- When you select Line, a broken line tool preview appears at the tip of your tool. When you squeeze the Tool hand trigger, the orientation of the line is “locked” and the inflate or deflate actions are constrained to movement along that line. Release the trigger to re-orient the line.
Smooth

Use the Smooth tool to smooth out rough areas of surface topology on your sculpt, either by filling in valleys, flattening bumps, or both (selectable on the Settings menu). You can also adjust the size and strength of the Smooth tool.

Selecting the Smooth Tool

To select the Smooth tool from the Tool Tray:

1. Push up on the thumbstick on your Support hand to open the Tool Tray.
2. Point to Smooth with your Tool hand and squeeze the Tool hand trigger.

Setting the Smooth Tool’s Size

You can change the Smooth tool’s size to affect more or less of your sculpt:

- Press up on the Tool hand thumbstick to *increase* the Smooth tool size.
- Press down on the Tool hand thumbstick to *decrease* the Smooth tool size.
Smooth Settings Menu

With the Smooth tool selected, press the Gear button on your Tool hand to open the Smooth settings menu:

- **Size**
  Set the size of the Smooth tool.

- **Intensity**
  Set the strength of the Smooth tool.

- **Mode**
  - **Fill** - smooth the sculpt’s surface by filling in valleys.
  - **Average** - smooth the sculpt’s surface using a combination of filling and flattening (essentially working toward the surface midpoint of the area under the tool).
  - **Flatten** - smooth the sculpt’s surface by flattening bumps or other protrusions.

- **Constrain**
  Constrain smoothing to a straight line.
  - When you select Line, a broken line tool preview appears at the tip of your tool. When you squeeze the Tool hand trigger, the orientation of the line is “locked” and the Smooth tool is constrained to movement along that line. Release the trigger to re-orient the line.
**Paint**

Apply color to the surface of your sculpt, either spraying the paint (like an airbrush) or directly to it surface (like a paintbrush).

**Selecting the Paint Tool**

To select the Paint tool from the Tool Tray:

1. Push up on the thumbstick on your Support hand to open the Tool Tray.
2. Point to Paint with your Tool hand and squeeze the Tool hand trigger.

**Setting the Paint Tool’s Size**

You can change the Paint tool’s size so that it colors more or less of your sculpt’s surface:

- Press *up* on the Tool hand thumbstick to *increase* the Paint tool size.
- Press *down* on the Tool hand thumbstick to *decrease* the Paint tool size.

**Selecting a Paint Mode**

By default, the paint tool starts out in airbrush mode. With the paint tool selected, double tap the Settings button to switch modes.

**Spray Mode**

In spray mode, the paint tool works like an airbrush. When you aim the tool at your sculpt, a green circle shows you where the paint will be applied.

1. Tap the color button to select a paint color.
2. Point the brush at the surface of your sculpt.
3. Squeeze the trigger on your Tool hand to paint the model’s surface. The tool is pressure sensitive, so squeezing the trigger harder applies more paint.

**Note:** Use the Paint settings menu to make further refinements to the tool.
**Brush Mode**

In brush mode, the paint tool works more like a paintbrush. The brush applies the selected color to the surface without the “falloff” effect of the airbrush mode.

**Paint Settings Menu**

With the Paint tool selected, press the Gear button on your Tool hand to open the Paint settings menu:

![Paint Settings Menu]

- **Size**
  - Set the diameter of the tool.

- **Opacity**
  - Set the opacity for the color being applied to the sculpt's surface.
  - A higher value will make the color appear more vibrant.

- **Hardness**
  - Set the edge treatment for the paint tool. A higher value creates a shaper line at the edge of the area being painted.

- **Apply**
  - Select the mode for the Paint tool:
    - **Spray** - sprays the color onto the sculpt, like an airbrush.
    - **Brush** - applies the color directly to the surface of the sculpt, like a paintbrush.

- **Steady Stroke**
  - Reduce jitter by setting a diameter within which the paint stroke is smoothed.

- **Constrain**
  - Constrain painting to a straight line.

  - When you select Line, a broken line tool preview appears at the tip of your tool. When you squeeze the Tool hand trigger, the orientation of the line is “locked” and your paintbrush or
airbrush are constrained to movement along that line. Release the trigger to re-orient the line. The Line constraint is useful, for example, when you need to paint stripes or other lines on your sculpt.
How To’s

How to Export Your Sculpt

This article teaches you:

- How to export your sculpt
- How the settings on the export menu affect your output
- What gets exported
- Where files are saved

After you’ve created your perfect sculpt, you may want to export it, either to move it along in your production pipeline, or perhaps for 3D printing.

Exporting Your Sculpt

To export your sculpt:

1. Tap the Control Panel button on your Support hand.
2. Select Export to open the Export menu.

You’ll use the Export menu to specify details about what’s included with your export.

Triangles

Initially, this shows the number of triangles for the current sculpt. You can optionally reduce the number of triangles to export:
• Select one of the presets (0.1, 1.0, 10.0 or 100.0) to perform a shortcut percentage decimation.
• Drag the handle on the slider left and right to select a specific number of triangles.

You can use either option (or a combination of both) to set the target number of triangles for export.

**Paint**

If you painted your model, or if you used different colors of clay when sculpting, you can include color information along with your exported sculpt in one of two ways:

• **Vertex color** - a color value is assigned to each vertex on the exported mesh. No image files are needed to export vertex color.
• **Texture maps** - the mesh is “unfolded” onto a 2D image; the color information for each triangle on the sculpt is represented by a small piece of a texture map (image file).

**Texture size**

If you include textures as part of your export, you can optionally set the size of the exported image. Keep in mind that you’ll need to use a large enough image to support the number of triangles in your mesh. Using a texture map that is too small can cause a loss of texture detail in your export.

However, if your production pipeline dictates that a given object can only carry texture data of a certain size, you can use the presets (256, 512, 1024, 2048, 4096, and 8192) to export a map of that size. For example, selecting 1024 exports a texture map 1024 pixels wide x 1024 pixels tall.

To export full texture data, deselect any of the presets.

**Normal map space**

Select the normal mapping option needed for your pipeline:

• Object
• Tangent

**Texture File Format**

Select the file format option needed for your pipeline:

• .tga
• .png
**Note:** PNG files save normal maps at a higher fidelity than TGA files. (PNG normal maps use 16 bits / channel, which avoids banding. We support TGA normal maps for broad compatibility, but they use only 8 bits / channel.)

**Mesh File Format**

Select the mesh format option needed for your pipeline:

- .obj
- .fbx

**What's Exported and Where is it Saved?**

All files, include meshes and textures, are saved in the following folder:

`C:/Users/<username>/Documents/Medium/Sculpts/<username>`
How to Take Photos of Your Work

This article teaches you how to take photos of your sculpt while you’re working. You can take photos to share your progress with someone who’s reviewing your work, or to post for your friends on social media. You’ll need to select the point of view for the camera, and you’ll be able to preview what your picture will look like in a rectangular viewfinder.

Starting the Camera

To start your camera:

1. Tap the Control Panel button on your Support hand.
2. Select Capture > Photo.

The Capture menu opens over your Support hand and stays there as long as you’re capturing.

A viewfinder also opens, attached to your Support hand by default. (You can also attach the camera to your avatar’s head or position it at a specific place in the scene, as described below).

There are two ways to take a photo:

- Press the trigger on your Support hand to take a photo.

-or-

- Point your Tool hand at the camera icon at the bottom of the photo menu and squeeze the trigger.

FOV

Drag the handle on the Field of Vision slider to adjust the focal length of your camera’s lens. This is similar to zooming in and out with an adjustable camera lens.

**Note:** Extreme settings can add curvature to your photos (just like a real camera lens).

Positioning the Camera

Select one of the following POVs:

- **Hand** - attaches the camera to your Support hand. The viewfinder follows the position of your Support hand and you can preview the photo in the viewfinder.
- **Head** - attaches the camera to your head, and shows a preview of the photo in a small rectangle attached to the upper right corner of the photo menu. You take photos from your avatar’s point of view.

- **World** - positions the camera at a specific static location in your scene (a good option if you want to take photos of several consecutive steps from the same angle).
  - **Transform Manipulator** - to change the location of the camera in World mode, select the manipulator tool (next to the world icon). With this option selected, squeeze the Support hand trigger to move the viewfinder instead of your sculpt.

What’s Saved and Where?

Photos are saved as .png files in the following directory:

```
C:/Users/<username>/Documents/Medium/Photos/<username>
```

**Note:** Both a .png file and an .asset file are saved with each photo taken. The .asset file lets Medium keep track of which photos to display through the Library.

Sharing Your Photos

For more information on sharing your photos, see [Library: Photos](#).
How to Record a Video of Your Work

This article teaches you how to take videos of your sculpt while you’re working. You can take videos to show how a specific sculpting technique, or to post for your friends on social media. You’ll need to select the point of view for the camera, and you’ll be able to preview what your picture will look like in a rectangular viewfinder.

Starting the Camera

To start your camera:

1. Tap the Control Panel button on your Support hand.
2. Select Capture > Video.

The Capture menu opens over your Support hand and stays there as long as you’re capturing.

A viewfinder also opens, attached to your Support hand by default. (You can also attach the camera to your avatar’s head or position it at a specific place in the scene, as described below).

To take a video:

1. Point your Tool hand at the start icon at the bottom of the Capture menu and squeeze to start recording.

FOV (Field of View)

Drag the handle on the Field of View slider to adjust the focal length of your camera’s lens. This is similar to zooming in and out with an adjustable camera lens.

Note: Extreme settings can add curvature to your photos (just like a real camera lens).

Positioning the Camera

Select one of the following points of view (POVs):

- **Hand** - attaches the camera to your Support hand. The viewfinder follows the position of your Support hand and you can preview the photo in the viewfinder.
- **Head** - attaches the camera to your head, and shows a preview of the photo in a small rectangle attached to the upper right corner of the photo menu. You take photos from your avatar’s point of view.
- World - positions the camera at a specific static location in your scene (a good option if you want to take photos of several consecutive steps from the same angle).
  - Transform Manipulator - to change the location of the camera in World mode, select the manipulator tool (next to the world icon). With this option selected, squeeze the Support hand grip button to reposition the viewfinder (instead of moving your sculpt).

Stop Recording and Exit

- To stop recording, select the stop icon at the bottom of the capture menu.
- To exit from capture mode, select the “X” on the upper left corner of the capture menu.

What’s Saved and Where?

Videos are saved as .mp4 files in the following folder:

C:/Users/<username>/Documents/Medium/Videos/<user>

Note: Both an .mp4 file and an .asset file are saved with each photo taken. (The .asset file lets Medium keep track of which photos to display through its Library.)

Sharing Your Videos

For more information on sharing your photos, see Library: Videos.