



MARI

GETTING STARTED GUIDE
VERSION 1.4V2

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Rev: December 7, 2011



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PREFACE

Mari is a creative texture-painting tool that can handle extremely complex or texture heavy projects. It was developed at Weta Digital and has been used on films such as District 9, The Day the Earth Stood Still, The Lovely Bones and Avatar.

The name Mari comes from the Swahili 'Maridadi', meaning 'beautiful' and carrying connotations of 'usefulness'.

About this manual

This manual provides you with the basic information you need to start painting with Mari.

The first part of the manual, [Installation and Licensing](#) describes how to install, license, and launch Mari.

The rest of the manual consists of five [tutorials](#) which teach you the basics of creating a Mari project and painting textures. The tutorials provide a series of comprehensive walk-throughs, complete with geometries and associated textures. As you follow the steps in these tutorials, you'll gain a good feel for Mari's user interface and workflow. This, in turn, will provide a good working knowledge for creating more complex production projects.

For more detailed information on Mari and its functions, see the accompanying Mari *User Guide* and Mari *Reference Guide*.

Contact customer support

Should questions arise that this manual fails to address, you can contact Customer Support directly via e-mail at support@thefoundry.co.uk or via telephone to our London office on +44 (0)20 7968 6828 or to our Los Angeles office on (310) 399 4555 during office hours.

INSTALLATION AND LICENSING

Steps for running Mari

To run Mari, follow these steps:

1. Check the [System requirements](#)
2. [Install Mari](#)
3. [Launch Mari](#)
4. [License Mari](#)

System requirements

System requirements

- Quad-core processor
- Windows 7 64-bit or Linux 64-bit operating system (Fedora 12 or Red Hat Enterprise Linux 5.4)
- 250GB disk space available for caching and temporary files (or a minimum of 50GB if you're working on a small project)
- 4GB RAM
- display with 1680 x 1050 pixel resolution
- an NVIDIA graphics card with at least 1GB of RAM and OpenGL 3.0 support (see Recommended graphics cards below)

Supported graphics cards

- NVIDIA GeForce GTX 480*
- NVIDIA GeForce GTX 580*
- NVIDIA Quadro FX 3800
- NVIDIA Quadro FX 3800M
- NVIDIA Quadro FX 4800
- NVIDIA Quadro FX 5800
- NVIDIA Quadro (Fermi Series) 600*
- NVIDIA Quadro (Fermi Series) 4000*
- NVIDIA Quadro (Fermi Series) 5000*
- NVIDIA Quadro (Fermi Series) 6000*

Please download and install the latest graphics driver for your card from the NVIDIA website.

Note **The displacement preview feature in Mari is currently only supported by these cards.*

Install Mari

Mari 1.4 is available to download from our web site at www.thefoundry.co.uk/mari. The downloads are in a compressed format (.run or .exe).

On Linux

1. Download the .run installation file from our web site at www.thefoundry.co.uk/mari.
2. Extract Mari from the .run archive with the following terminal command, replacing [version number] with the current version:
sudo ./Mari[version number]-linux-x86-release-64.run
The installer displays the End User Licensing Agreement (EULA) and prompts you to accept it.
3. If you agree with the EULA, enter **y** and press **Return** to accept the EULA. (If you don't agree with the EULA and press **n** instead, the installation is cancelled.)
By default, Mari is installed in an appropriately named folder in the current working directory.
4. That's it! Proceed to [Launch Mari](#).

Tip *You can also use the following options after the terminal command when installing Mari:*

- **--info**
This lets you see what the default installation directory is.
- **--target MyMariDirectory**
This lets you specify a different directory to install Mari to (in this case, MyMariDirectory).
- **--accept-eula**
This lets you automate the installation so that you are not prompted to accept the EULA. Note that if you use this option, you agree to the terms of the EULA. To see the EULA, please refer to Appendix C in the Mari User Guide.
- **--help**
This lets you see additional help and installer options.

Here's an example of the syntax using the --accept-eula option:
sudo ./Mari[version number]-linux-x86-release-64.run --accept-eula

Note *If you leave out **sudo** from the terminal command, you need to ensure that you have sufficient permissions to install Mari under your current working directory or selected target directory.*

After the Mari application files have been installed, the installer also runs a post-installation script that creates the following directory:

/usr/local/foundry/RLM

If you don't have sufficient permissions on the /usr/local folder for this directory to be created, the post-installation script prompts you for your sudo password as necessary.

On Windows

1. Download the .exe installation file from our web site at www.the-foundry.co.uk/mari.
2. Double-click on the installation file to start the installation. Follow the on-screen instructions. By default, Mari is installed to drive letter:\Program Files\Mari [version number].
3. That's it! Proceed to [Launch Mari](#).

Launch Mari

On Linux

1. Open a terminal.
2. Navigate to the directory you installed Mari to.
3. Enter `./mari`.
4. If you haven't installed a license for Mari, you need to [License Mari](#). Once you've done so, click **Launch** in the **Mari Licensing** dialog.
*Mari checks for [Supported graphics cards](#), and if an unsupported graphics card configuration is detected, a dialog appears warning you about it. Depending on the configuration detected, you have the option to **Quit**, **Ignore** or **Ignore Permanently**. Note that if you ignore the warning and run Mari anyway, you may experience instability or performance issues. If a supported graphics card configuration is detected, Mari will run as normal.*
5. If you are launching Mari for the first time, you are prompted to choose a directory for its cache files. In the **Please Pick Cache Directory** dialog, navigate to the directory you want to use and click **Choose**.
Note that the cache directory should be:
 - empty
 - local to the machine (not a network mount)
 - as fast as possible
 - a location that's not temporary (to avoid the data disappearing)

- a directory that the user has read and write permissions to.
- The Mari graphical interface appears.

Note *If the `MARI_CACHE` environment variable has been set, its value is used to determine the location of the cache files. In this case, Mari does not prompt you to choose the cache directory. For more information on environment variables that Mari understands, please refer to the Mari User Guide.*

Tip *You can also launch Mari in verbose mode by using the following command:*
`./mari --verbose`

This way, Mari provides a running log of each action that it performs. You can see this log in a terminal window.

On Windows

1. Click **Start > All Programs > The Foundry > Mari 1.4v2 > Mari 1.4v2**.
2. If you haven't installed a license for Mari, you need to [License Mari](#). Once you've done so, click **Launch** in the **Mari Licensing** dialog.

*Mari checks for [Supported graphics cards](#), and if an unsupported graphics card configuration is detected, a dialog appears warning you about it. Depending on the configuration detected, you have the option to **Quit**, **Ignore** or **Ignore Permanently**. Note that if you ignore the warning and run Mari anyway, you may experience instability or performance issues. If a supported graphics card configuration is detected, Mari will run as normal.*

3. If you are launching Mari for the first time, you are prompted to choose a directory for its cache files. In the **Please Pick Cache Directory** dialog, navigate to the directory you want to use and click **Choose**.

Note that the cache directory should be:

- empty
- local to the machine (not a network mount)
- as fast as possible
- a location that's not temporary (to avoid the data disappearing)
- a directory that the user has read and write permissions to.

The Mari graphical interface appears.

Note *If the `MARI_CACHE` environment variable has been set, its value is used to determine the location of the cache files. In this case, Mari does not prompt you to choose the cache directory. For more information on environment variables that Mari understands, please refer to the Mari User Guide.*

Tip *You can also launch Mari in verbose mode by selecting **Start > All Programs > Mari 1.4v2 > Mari 1.4v2 (Verbose Output)**. This way, Mari provides a running log of each action that it performs. You can see this log in a command line window.*

License Mari

About licenses

If you simply want to try out Mari, you can obtain a trial license, which allows you to run Mari for free for 15 days. See [Install the license](#) on page 12.

To use Mari after this trial period, you need either a valid **activation key** or a **floating license** and server running the Foundry Licensing Tools (FLT):

- **Activation Keys**—These can be used to easily install and activate **node locked** (also known as **uncounted**) licenses. Node locked licenses allow you to use Mari on a single machine. This license will not work on a different machine and if you need it to, you'll have to transfer your license. Node locked licenses do not require additional licensing software to be installed. See [Licensing Mari on a single machine](#) for more information.
- **Floating Licenses**—also known as **counted** licenses, enable one of our products to work on any networked client machine. The floating license should be put on the server and is locked to a unique number on that server. Floating licenses on a server require additional software to be installed. This software manages those licenses on the server, giving licenses out to client stations that want them. The software you need to manage these licenses is called the Foundry License Tools (FLT) which can be freely downloaded from our web site. Floating licenses often declare a port number on the server line and a port number on the vendor line. See [Licensing Mari over a network](#) for more information.

The instructions below run through both licensing methods and you can find a more detailed description in the Foundry Licensing Tools User Guide available on our website:

<http://www.thefoundry.co.uk/support/licensing/tools/>

Licensing Mari on a single machine

Obtain an activation key

You can purchase activation keys over the Internet by clicking **Purchase License** in the Mari licensing dialog that displays when you launch Mari without a license, or by contacting The Foundry Sales Department at sales@thefoundry.co.uk.

Install the license

You are prompted to enter your activation key when you start Mari without a license. Mari skips this step if you've already activated the application.

Select an activation option from the **Mari Licensing** dialog:

- **Purchase License**—click to open a web browser directly to The Foundry website to purchase an activation key.
- **Activate Key or Use Server**—click to enter a previously obtained activation key. When you enter the activation key, Mari automatically obtains a license from the web and installs it on your machine. You're good to go.
- **Obtain Trial License**—click to automatically install a trial license valid for 15 days. Whenever you then launch Mari, the **Mari Licensing** dialog displays how many days remain before your trial license expires. Note that you can only obtain a trial license for a major Mari release once on each machine (for example, if you had a trial license for Mari 1.1v1, you can't get another one for Mari 1.1v2 on the same machine).

Tip *If you later want to change your license (for example, from a node locked license to a floating license), you can select **Tools** > **License** in Mari to display the **Mari Licensing** dialog.*

Note *If you access the Internet through a proxy server and Mari cannot connect to the activation server, you may get an error dialog prompting you to either:*

- *Click **Use Proxy** to enter the proxy server name, port number, username, and password. This enables Mari to connect to the activation server and obtain a license. Mari then installs the license automatically.*
- *Click on the web link in the dialog and use the System ID (also known as hostid) provided to manually activate and install a license. For more information on how to install a license manually, see the Foundry Licensing Tools (FLT) User Guide available on our website at <http://www.thefoundry.co.uk/support/licensing/>.*

Licensing Mari over a network

Obtain floating licenses

Alternatively, you can purchase a floating license key from our website. To generate you a license key, we need to know your System ID. The System ID (sometimes called Host ID or rlmhostid) returns a unique number for your computer. We lock our license keys to the System ID. See [Install floating licenses](#).

To display your System ID, do any of the following:

- Download the Foundry License Installer for Mari (FLI) utility from www.thefoundry.co.uk/licensing and run it. Your System ID is displayed.
- Download the Foundry Licensing Tools (FLT) free of charge from our web site and then:
 - On Windows, run C:/Program Files/TheFoundry/LicensingTools6.0/Foundry License Installer.exe
 - On Linux, run the following command in a terminal shell:
`/usr/local/foundry/LicensingTools6.0/bin/systemid`

Just so you know what a System ID number looks like, here's an example: 000ea641d7a1.

Once you have provided us with your System ID number and a license key has been generated for you, you will receive the license key in an e-mail or Internet download. The license key is contained in a text file called `foundry.lic`. For information on what to do with the `foundry.lic` file, see [Install floating licenses](#) below.

Install floating licenses

If you requested a floating license from The Foundry, you will receive your license key (`foundry.lic`) in an e-mail or Internet download. You should also receive the Foundry License Installer (FLI) application to help you install the license key. The FLI is also available to download from www.thefoundry.co.uk/licensing. The instructions below tell you what to do with these.

1. Make sure you have saved both the license key (`foundry.lic`) and the Foundry License Installer application in the same directory.
2. Run the Foundry License Installer application. The license key should automatically appear in the FLI window if the FLI and `foundry.lic` are in the same directory. If they are not, you can either copy and paste the contents of the license key or drag and drop the file into the FLI window.
3. Click **Install**.

This checks the license file and, provided that the license is valid, installs it into the correct directory.

In order for the floating license to work, you will need to install the Foundry Licensing Tools (FLT) on the license server machine. For more information on how to install floating licenses, refer to the FLT user guide, which you can download from our web site:

<http://www.thefoundry.co.uk/support/licensing/tools/>.

4. Once your license server is up and running, launch Mari (if it isn't already running).
5. Click **Activate Key or Use Server** and enter the server address in the field provided. The format for the server name is <port>@<servername>, for example, 30001@red.

Note *You must perform steps 4 and 5 on each client machine that requires a Mari license from the server.*

Tip *If you later need to display the **Mari Licensing** dialog again, you can select **Tools > License** in Mari.*

Further reading

For more information on licensing Mari, displaying the System ID number, setting up a floating license server, adding new license keys and managing license usage across a network, you should read the Foundry Licensing Tools User Guide available on our web site.

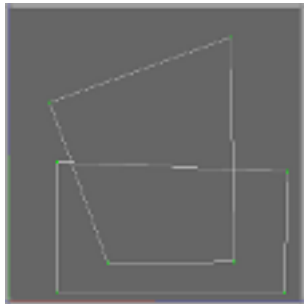
MARI MODEL REQUIREMENTS

Model Requirements

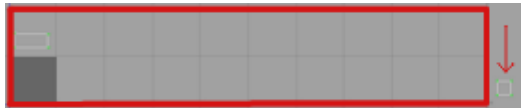
Mari requires your model files to be configured in a particular way.

Models to paint in Mari *should not* have:

- **Overlapping UVs** — these can cause paint artifacts, as Mari calculates which UV to project the paint onto. If you are sure that the overlaps are only on hidden areas (for example, areas on the model that will never face camera), you can work with models with overlapping UVs.



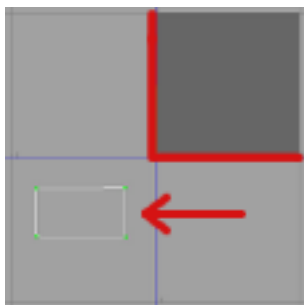
- **UVs that go over 10 on the U axis** — these are ignored.



- **Stacked UVs** — these cannot be individually selected in UV view. If you do have stacked UVs and want to select an individual UV, you need to select it in either Ortho or Perspective view first, and then switch back to UV view.

Models to paint in Mari *cannot* have:

- **Negative UVs** — painting on these is not possible.



ABOUT THE TUTORIALS

The tutorials included in this manual are:

- [Tutorial 1: Setting up a Mari Project](#)
- [Tutorial 2: Setting the View and Lighting](#)
- [Tutorial 3: Painting!](#)
- [Tutorial 4: Painting Through and Clone Stamping](#)
- [Tutorial 5: Exporting and Importing](#)

The tutorials are self-paced but designed to take roughly 10 to 45 minutes each. You might find yourself breezing through one while spending a lot of time on another to soak up details you're not quite sure about.

Download sample files


Sample files are provided for use with all of the tutorials. You can download these files from our web site at www.thefoundry.co.uk/mari and try Mari out on them. From the Mari product page, click on the **Demo Assets** link.

Tutorial format

Mari tutorials include the following conventions:

Steps

Steps are the specific instructions for you to perform. Steps are organized into major actions. For example, all the steps involved in loading the geometry when creating a project are grouped on a page with the title "Load geometry". The individual steps are numbered, and describe what you should do and what happens in Mari. For example:

1. Next, to bring in the geometry, click .

The **Pick Mesh** dialog box displays.

Note that the response to each step (what happens when you do it) is in *italics*, and the name of any dialog box that displays as part of that response is **bold**.

Tips

Throughout the tutorials, you'll notice tips in italics. These are extra bits of information, not necessarily critical to the procedure you're performing but worth knowing. For example, here's a tip about following the tutorials generally:

Tip *When reading through the steps, don't worry too much about memorizing details or performing it in Mari. The tutorials are designed for you to familiarize yourself with the instructions, and then get some hands-on experience with the Sandbox items — referring back to the instructions as needed.*

Sandbox

Throughout the tutorial, you'll also see sandbox items. These are instructions for you to have a play, using the sample files set up for the tutorial. For example:

Sandbox *Try opening an exported .tif file from this project in another program (such as Photoshop), changing it in some obvious way, saving it, then re-importing the changed texture into your Mari project.*

Playing is an important part of learning! You can see how the procedures in the tutorial might work for you in the real world.

TUTORIAL 1: SETTING UP A MARI PROJECT

About this lesson

What this lesson teaches you

This lesson teaches you what Mari projects are, and how to create them.

What you should know before starting this lesson

This lesson assumes:

- a basic knowledge of computers and graphics applications
- that you have read through the *Mari Quick Start Guide*
- that you know how to start Mari (see [Launch Mari](#)).

Resources you need to complete this lesson

To complete this lesson, you need access to a computer that can run Mari, and the following sample file:

- `blacksmith_body.obj`

How long should it take?

Plan on spending about 20 minutes to complete this lesson.

About Mari projects

A **Mari project** holds your work on geometries and associated textures. Once you've created a Mari project, you can work on it, save and close — and then re-open it to continue working on the same textures later.

Projects also hold other items, such as projectors, shaders, and so on. Mari saves some settings at the project level. For instance, each project has:

- a project **shelf**, to hold brushes, colors, and images for you to use specifically in that project
- contents of the various palettes — **Image Manager**, **Brush Editor**, and so on.

When you first create a project, you can specify its parameters, including:

- the details (such as resolution and color depth) of the initial channel in the project
- the range of animation frames to import.

Steps for creating Mari projects

To create a Mari project, follow these steps:


1. [Open a new project](#)
2. [Specify project options](#)
3. [Load geometry](#)
4. [Save your project](#)

Open a new project

1. Start Mari (see [Launch Mari](#)).

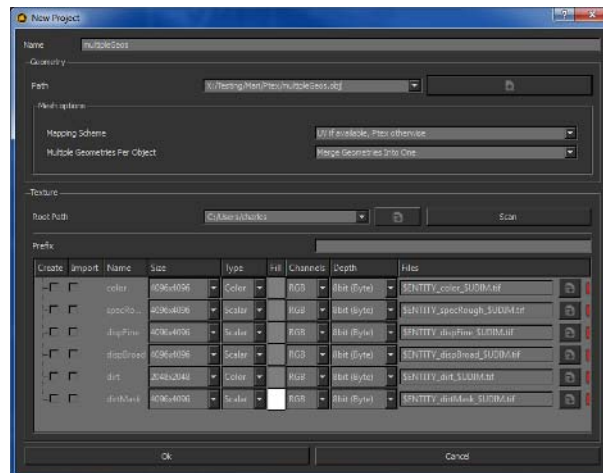
The Mari workspace displays, showing the **Projects** tab. This holds all the projects you have been working on.

2. As with most commands in Mari, you can select the **New Project** option a few different ways:

- from the **File** menu, select **New**, or
- click  on the toolbar, or
- click the **New** button, or
- press the **Ctrl+N** shortcut key.

Pick any one of the options above.

The **New Project** dialog box displays.



The **New Project** dialog box has three parts:

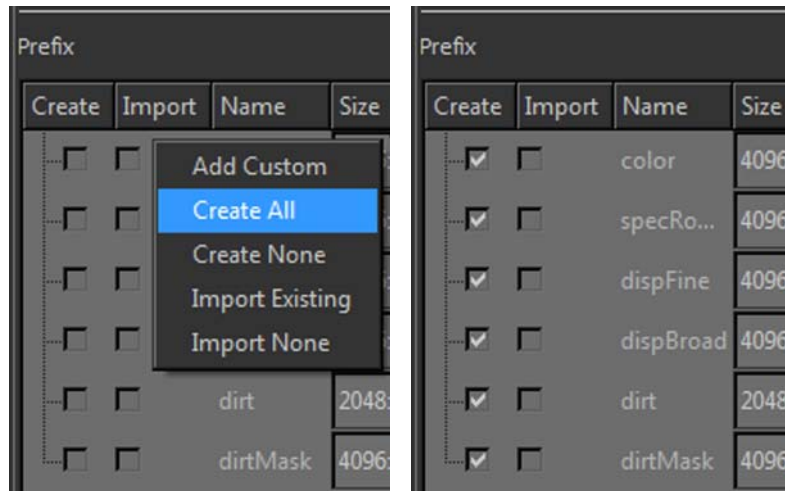
- **Name** — a name for your project.
- **Geometry** — the model you'll be painting on.
- **Texture** — parameters for the textures you'll be creating.

Next we'll specify the name and texture options, and then select the geometry.


Tip For more on the different options in the **New Project** dialog box — and other dialog boxes illustrated in this tutorial, see the *Mari Quick Start and Reference Guides*.

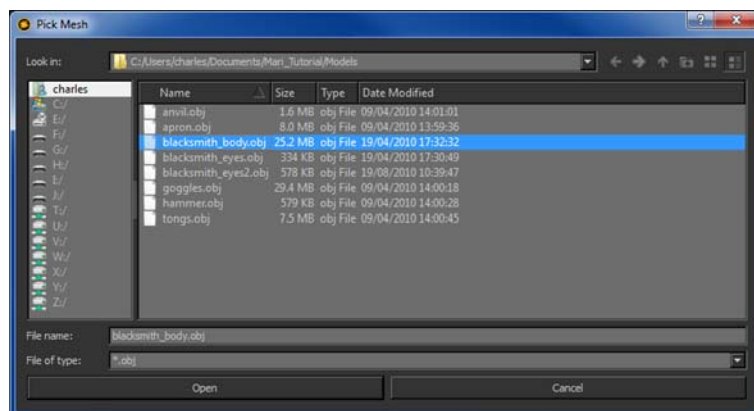
Specify project options

1. For the project **Name**, type **1-Blacksmith**.
2. For the Texture options, right-click on the list of channels and select to **Create All**.



Load geometry

1. Next, to bring in the Geometry, click . The **Pick Mesh** dialog box displays.

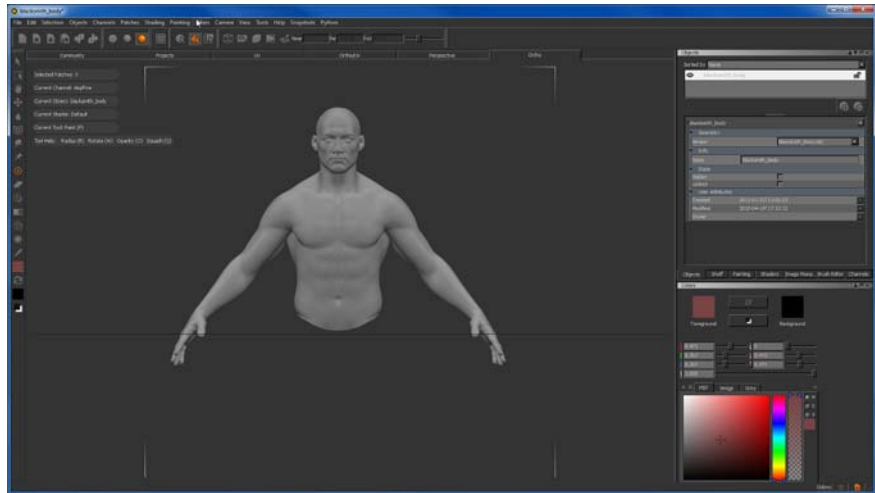


2. Navigate to your tutorial folder, click to highlight **blacksmith_body.obj**, and click **Open**.

3. Click Ok.

Mari conducts a quick “sanity check” on the model to make sure there are no obvious problems. If there are any problems, it displays **warnings** or **errors**. If there are warnings, you can continue. If there are errors, you must stop and fix them.


For more information on what kind of models Mari expects, see [Mari Model Requirements](#). This model displays with no errors. Mari loads the geometry and displays it in your workspace.



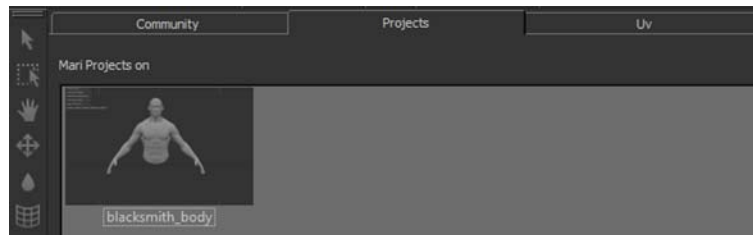
Tip *Depending on the size and complexity of a model, it can take several minutes the first time you load it into a Mari project. Once saved, however, the project should open quickly in future.*

Save your project

Save your project — again you can do this a few ways:

- from the **File** menu, select **Save**, or
- click  on the toolbar, or
- press the shortcut key **Ctrl+S**.

Mari saves the project into its cache directory. Now, if you click on the **Projects** tab at the top of the screen, you see your new project in the list.



Where do you go from here?

At this point, you should have a basic idea of what a Mari project is and how to create one. You learned how to:

- name the project
- set texture options
- load geometry
- save the project.

Next, you'll use this project to practice some basics about setting the camera and lighting on the geometry in your project, before you begin to paint on it. When you're ready, proceed to [Tutorial 2: Setting the View and Lighting](#).

TUTORIAL 2: SETTING THE VIEW AND LIGHTING

About this lesson

What this lesson teaches you

This lesson teaches you how to open a Mari project, and then set the view and lighting on your geometry (before painting on it).

Setting the **view** includes:

- rotating
- zooming in or out
- panning
- viewing from six basic directions
- displaying a split view showing a 3D view plus UV patches.

Setting the **lighting** includes:

- picking “flat”, “basic”, or “full” lighting
- moving lights around and adjusting their properties.

What you should know before starting this lesson

This lesson assumes:

- a basic knowledge of computers and graphics applications
- that you have read through the *Mari Quick Start Guide*
- that you know how to start Mari (see [Launch Mari](#))
- that you have completed [Tutorial 1: Setting up a Mari Project](#).

Resources you need to complete this lesson

To complete this lesson, you need access to a computer that can run Mari, and the following sample file:

- **1-Blacksmith** — the Mari project file you created in Tutorial 1.

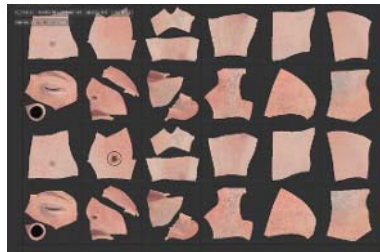
How long should it take?

Plan on spending about 25 minutes to complete this lesson.

About Mari view and lighting

The **view** in Mari is a view on the object you are painting. By default, Mari has four types of view:

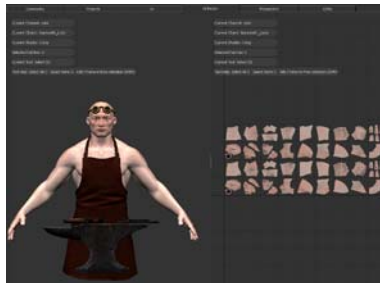
- **Uv** — this gives you a “flat” view of the patches in the model.
- **Perspective** — this show the model as a whole in 3D space, through a perspective camera.
- **Ortho** — this shows the model as a whole in 3D space, through an orthographic camera.
- **Ortho/Uv** — this is a split screen, showing both the Uv patches and the orthographic view.



Uv View






Ortho View



Ortho/Uv View

You can move each view separately.

Tip You can also use the , , and  toolbar buttons or the **F10**, **F11**, and **F12** keyboard shortcuts to activate a particular view on any tab.

Within the views, you can:

- **Spin** or **rotate** the model (3D views only). Spinning turns the model on one axis, while rotating lets you turn the model in all three axes. Think of spinning as like turning the model on a turntable, while rotate is turning it around in midair.
- **Pan** to move the view across the model.
- **Zoom** in or out.

- **Focus** on a selected patch.

You separately configure the **lighting** on the object, by choosing pre- set settings for “flat”, “basic”, or “full”, or specifying fine details such as shading parameters and separate lighting for each of the four configurable lights.

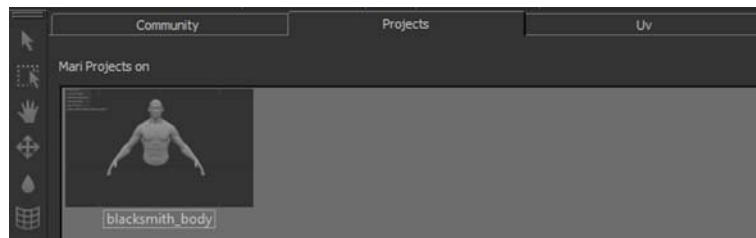
Steps for setting the camera and lighting

To set the camera and lighting, follow these steps:

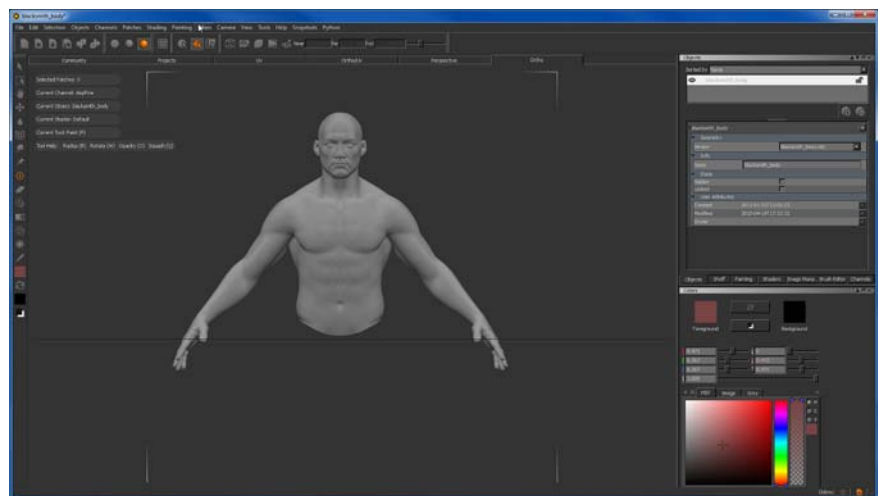
1. [Open your project](#)
2. [Adjust the view](#)
3. [Adjust the lighting](#)

Open your project

1. Start Mari (see [Launch Mari](#)).
The Mari workspace displays.
2. On the **Projects** tab, double-click on your **1-Blacksmith** project to open it.



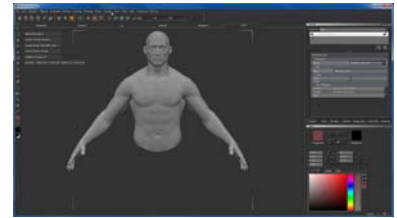
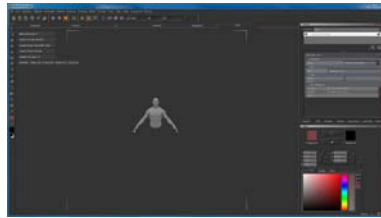
*Your project opens and switches to the **Ortho** view.*



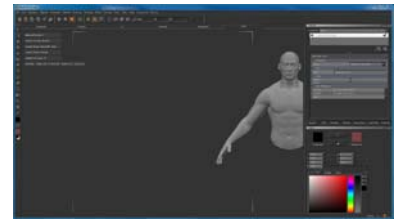
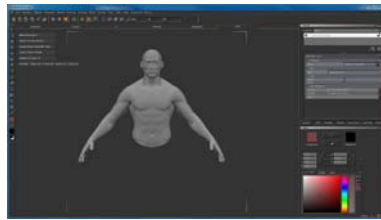
Adjust the view

To adjust the view on your project, you can zoom, pan, rotate, choose one of six pre-set views, display your model and patches in a split screen, or use perspective and orthographic views.

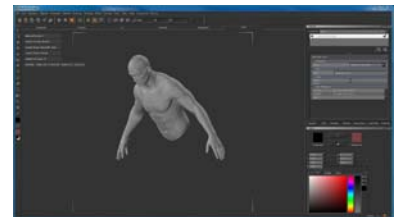
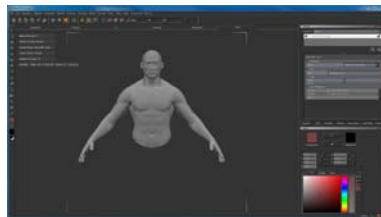
1. To **zoom out** and **in**, hold down the **Alt** key, right-click and drag the cursor to the left and right.



2. To **pan**, hold down the **Alt** key and middle-click (or hold **Alt** and **Shift** and left-click and drag).



3. To **rotate**, hold down the **Alt** key and left-click and drag.

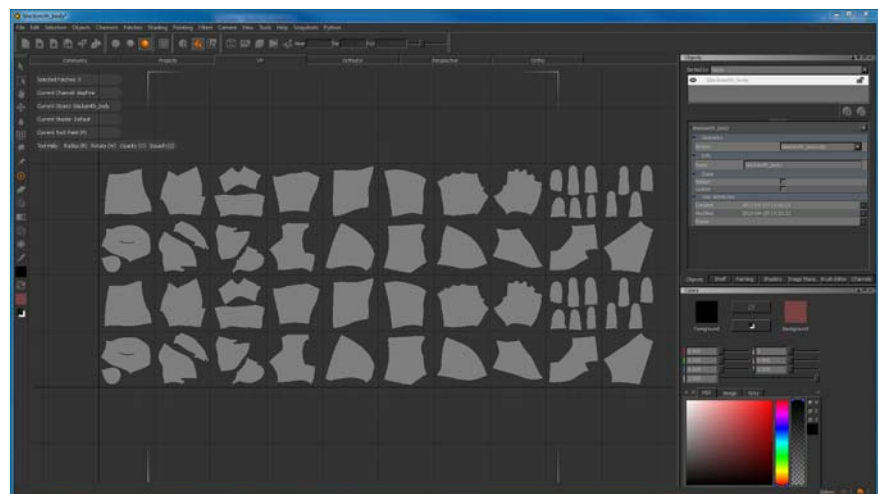


- Tip**
- You can also "spin" around a fixed point by pressing **Ctrl+R**, left-clicking, and dragging.
 - When you rotate or spin, the pivot point is located in the center of the current view.

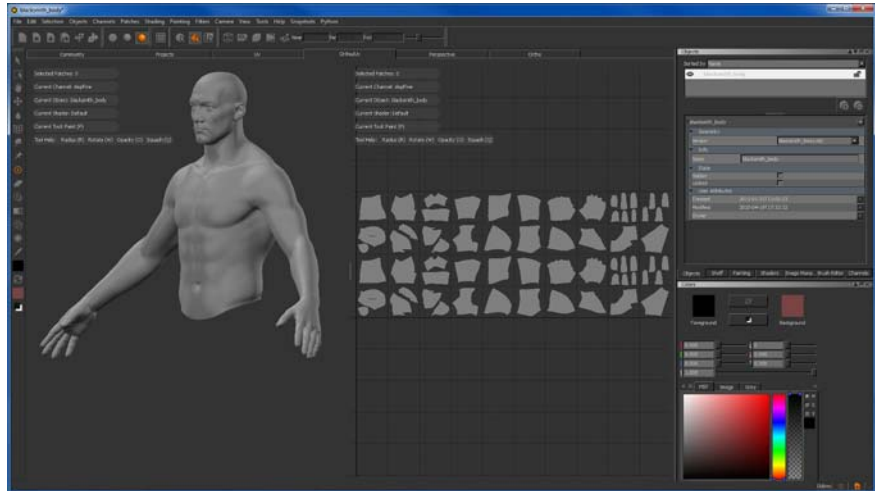
- To view from six basic preset angles (camera “left”, “right”, “top”, “bottom”, “front”, and “rear”), press **1**, **2**, **3**, **4**, **5**, or **6**, or select the angle from the **Camera** menu.



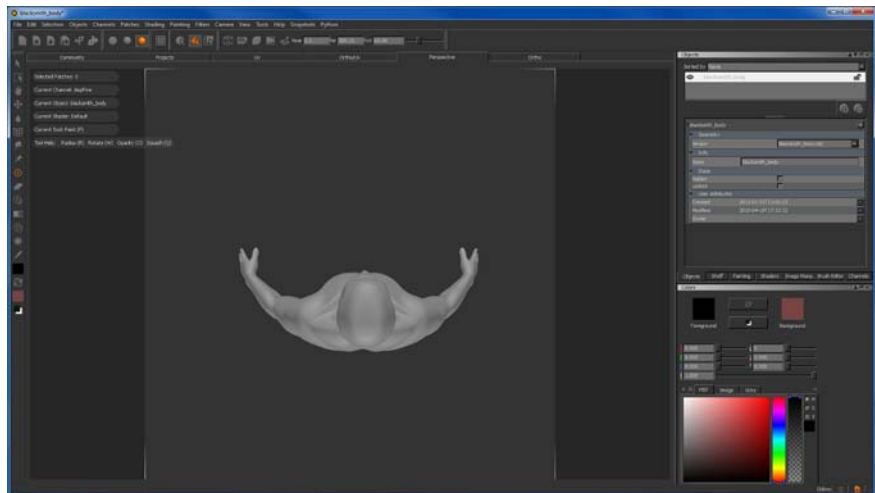
- To see a flat view of the UV patches on the model, click the **UV** tab.



- To see a split screen showing both the Ortho and Uv views, click the **Ortho/Uv** tab.

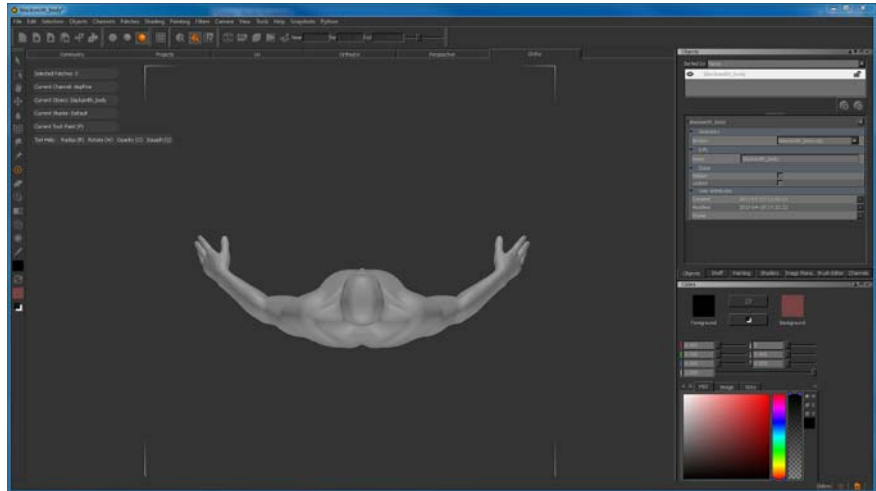


- To see a perspective view of your model, click the **Perspective** tab (or press **F11**).



In the **Perspective** view, you can alter your model's appearance in the viewer by entering **Near**, **Far**, and **FoV** values in the **Canvas** toolbar. See chapter 2 in the *Mari User Guide: Set the perspective camera details* for more information.

- To see an orthographic view of your model, click the **Ortho** tab (or press **F10**). This is the default view mode, that is, the view you see when you start Mari.



Note *The model is in the same position in steps 7 and 8; only the view mode has changed. Notice that the model's arms appear closer to the body due to the application of perspective.*

Tip *You can paint in any of the views.*

- To switch the view to display all selected patches, press **A**.
If you don't have any patches selected, the view focuses on the model as a whole (changing to show the whole model).

Tip *If you find that the view starts cutting through the front clipping plane, try pressing **A**.*

- To center the view at a particular place, move the cursor there and press **F**.
At the current size and angle, the view changes to center on the selected point.




Tip *Moving the view bakes the current paint if **Bake Behavior** is set to **AutoBakeAndClear**. You can set this on the **Projection** palette, under **Projection** (if you can't see the **Projection** palette, select **View > Palettes > Projection** to display it).*

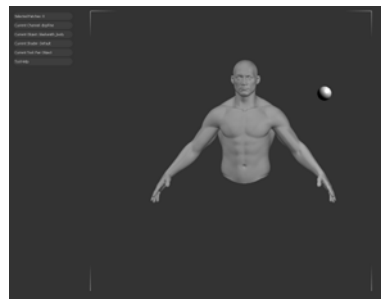
- Sandbox**
- *Play around with zooming, panning, and rotating the camera.*
 - *Try changing between **Ortho** and **Perspective** modes. Notice that objects closer to the camera distort far more than objects further away?*


Adjust the lighting

Mari comes with three lighting presets: flat, basic, or full. In basic and full modes, you can move the lights around the model.


1. To change the lighting:

- from the **Shading** menu, select **Flat**, **Basic**, or **Full**, or
- click , , or  on the toolbar.



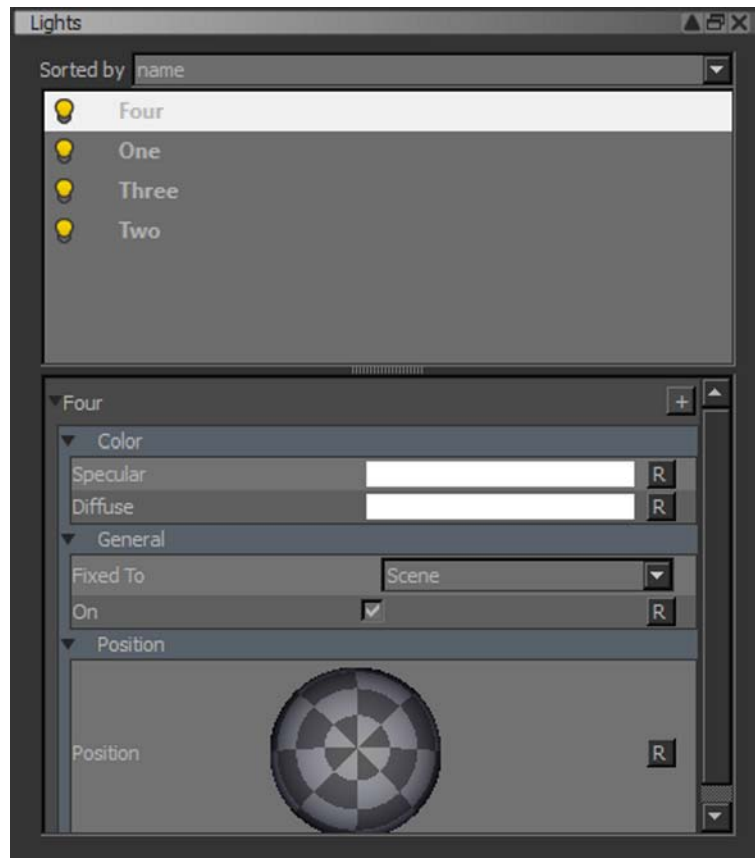
2. Notice the four lights in the viewport (you may need to select the **Pan Object** tool  to see them).

By default, the lights appear as gray spheres .

3. To move a light around, select the **Pan Object** tool  (if you didn't already). Click on a light and drag it around the viewport.

As you move the light, you can see the effect on the model.

4. You can also make fine adjustments to lighting using the **Lights** palette. If it's already open, click the **Lights** tab to give it focus; or if it's closed, right-click in the toolbar area on top of the Mari workspace and select **Lights** to open it.



The **Lights** palette displays details of four lights, which you can enable or disable, and customize by adjusting their **Color** and **Fixed To** information — for details, see Chapter 2, “Customizing the view” in the *Mari* User Guide.

- Tip**
- **Lighting can be relative to the *Scene* or a *Camera*:**
 - **Scene** (default) — the light is fixed to the model, for example if a light is set at the model’s back, it will always point at the model’s back, no matter how you move the view.
 - **Camera** — the light is fixed to a camera view, for example you can have a light always shining from above the camera, allowing you to move the model around and cast light on different areas.
 - *Mari* saves custom lighting with the project. If you need the same lights in another project, you will need to set them up separately.

Sandbox Experiment with the different options for lighting.

Where do you go from here?

At this point, you should have a basic idea of the different options for adjusting the view and lighting on your model. You learned how to:

- zoom, pan, and rotate
- choose one of six preset angles
- toggle split view
- change to flat, basic, or full lighting
- move and configure lights.

Now that you know how to create a project, load geometry, and adjust the position of the view and lighting, you can (finally) begin to paint! When you're ready, proceed to [Tutorial 3: Painting!](#).



TUTORIAL 3: PAINTING!

About this lesson

What this lesson teaches you

This lesson teaches you the basic steps to painting on a model in Mari. This includes:

- selecting a brush
- selecting a color
- painting with that brush and color.

What you should know before starting this lesson

This lesson assumes:

- a basic knowledge of computers and graphics applications
- that you have read through the Mari *Quick Start Guide*
- that you know how to start Mari (see [Launch Mari](#))
- that you have completed [Tutorial 1: Setting up a Mari Project](#) and [Tutorial 2: Setting the View and Lighting](#).

Resources you need to complete this lesson

To complete this lesson, you need access to a computer that can run Mari, and the following sample file:

- **1-Blacksmith** — the Mari project file you created in Tutorial 1 and configured in Tutorial 2.

How long should it take?

Plan on spending about 25 minutes to complete this lesson.

About painting in Mari

Painting in Mari is similar to painting in other standard paint programs — you can choose and configure both brushes and colors, and then use them to paint an object. In Mari, you configure brushes through the **Brush Editor** and colors through the **Color Palette**. You also have the option of saving colors and brushes to your **Shelf** for easy access. The Mari **Shelf** comes with lots of presets, as well as any items you have created or customized for yourself (and saved there).

After you paint (also as with other programs), in Mari you need to **bake** the paint buffer into the object. Mari includes various ways of baking onto selected patches, including an **Autobake** option that bakes by default every time you move the camera.

Steps for painting in Mari

To paint in Mari, follow these steps:

1. [Open your project](#)
2. [Open the Colors and Shelf palettes](#)
3. [Select a color](#)
4. [Select a brush](#)
5. [Paint!](#)
6. [Bake your painting](#)

Open your project

1. Start Mari (see [Launch Mari](#)).
The Mari workspace displays.
2. On the **Projects** tab, double-click on your **1-Blacksmith** project to open it.
*Your project opens and switches to the **Ortho** view.*

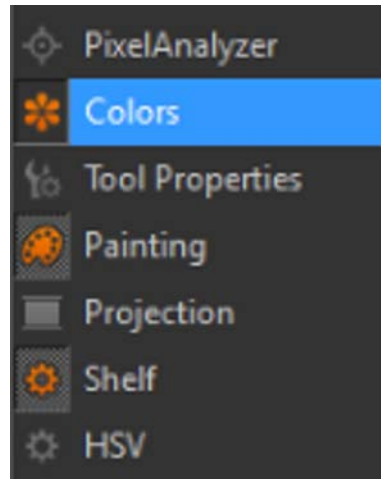
Open the Colors and Shelf palettes

Basic painting on your model involves selecting a brush, selecting a color, and using them to paint. In the steps below, you'll select a color from the **Colors** palette and a brush from your **Shelf**. To begin, let's open and arrange those palettes.

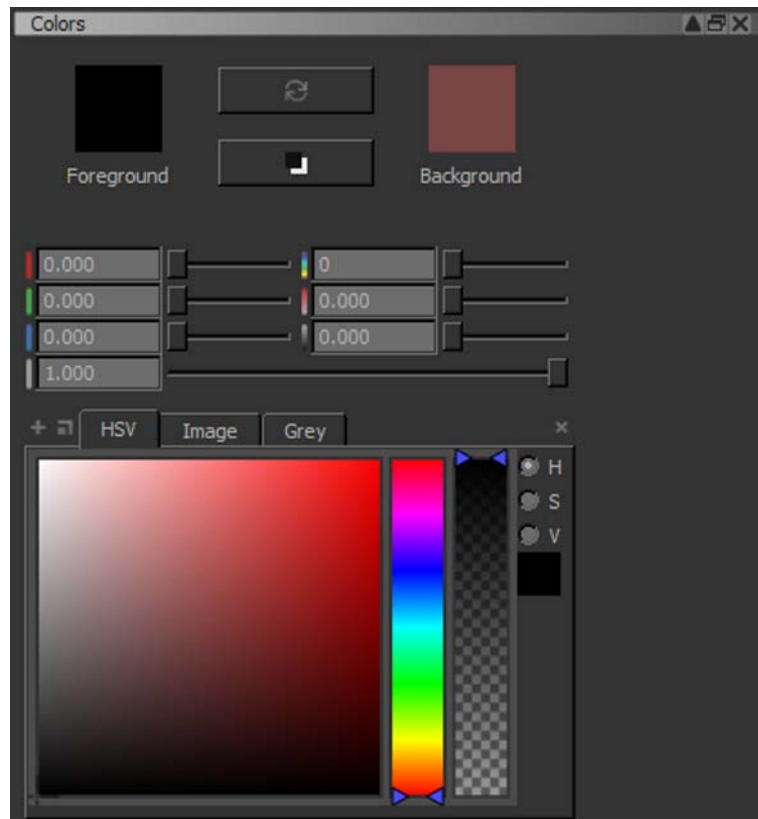
Tip *By default, the **Colors** and **Shelf** palettes are already open when you start Mari (but follow the instructions below to see how to open and close palettes).*

1. To open the **Colors** palette:
 - from the **View** menu, select **Palettes > Colors**, or

- right-click in the toolbar area and select **Colors** from the popup menu.

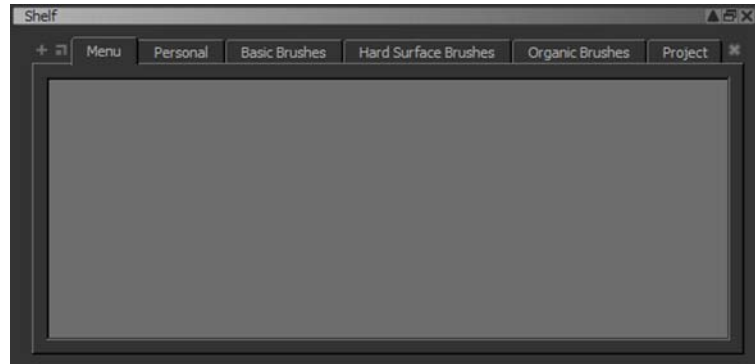


The Colors palette displays.



2. To open the **Shelf** palette:
 - from the **View** menu, select **Palettes > Shelf**, or
 - right-click in the toolbar area and select **Shelf** from the popup menu.

*The **Shelf** palette displays.*

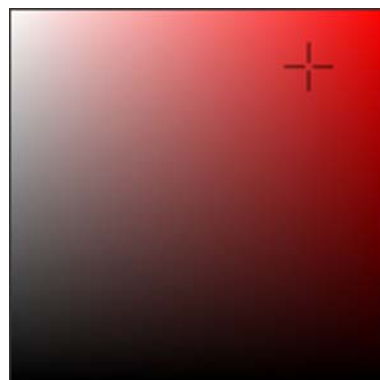


As described in the Mari Quick Start Guide, the shelf can hold your customized sets of colors and brushes — but when you first start Mari, the shelf will be empty.

Sandbox *The Mari Quick Start Guide outlines the different options for arranging palettes. Take a few minutes to experiment with docking, undocking, sizing, moving, collapsing, and stacking palettes (including the **Colors** palette and **Shelf**). Over time, you'll find a configuration that works best for you. And when you exit Mari, it will remember that configuration for the next time you re-start the program.*

Select a color

1. You can select a color from the **Colors** palette a few different ways:
 - click in the color field

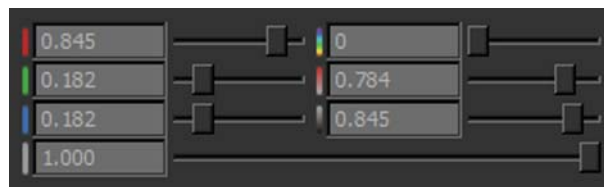


- click to select the **H**, **S**, or **V** next to the vertical sliders (to the right of the color field), then click and drag the sliders up or down to select color and alpha



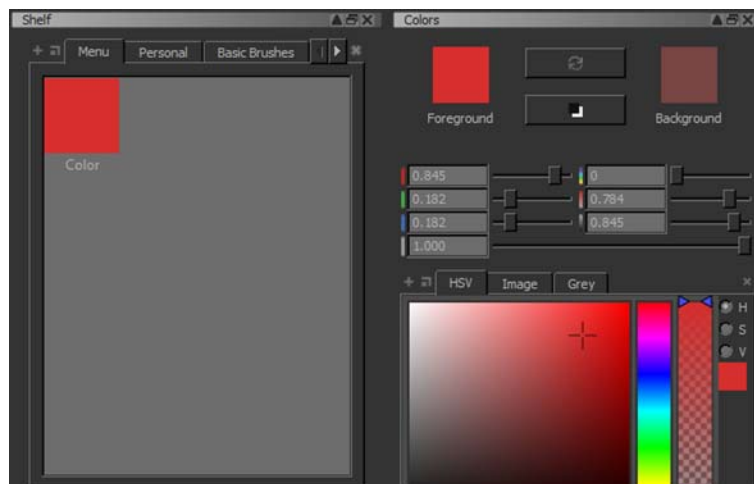
- drag the horizontal sliders left or right, or type specific values in the boxes, to specify:

RGB() or HSV(), and Alpha()



*The selected color displays in the **Foreground** swatch (and in the swatch to the right of the vertical sliders).*

2. When the color you want is selected in the **Colors** palette, drag the swatch to the **Shelf**.

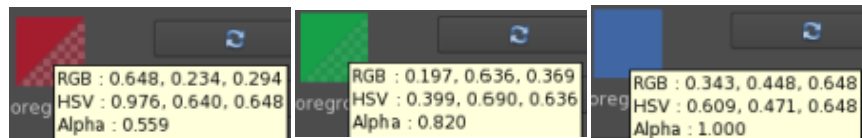


You don't have to drag the color to the shelf to use it, but it's useful for storing colors you use regularly.

Sandbox *Play around with all the different options for selecting colors. See if you can get these:*



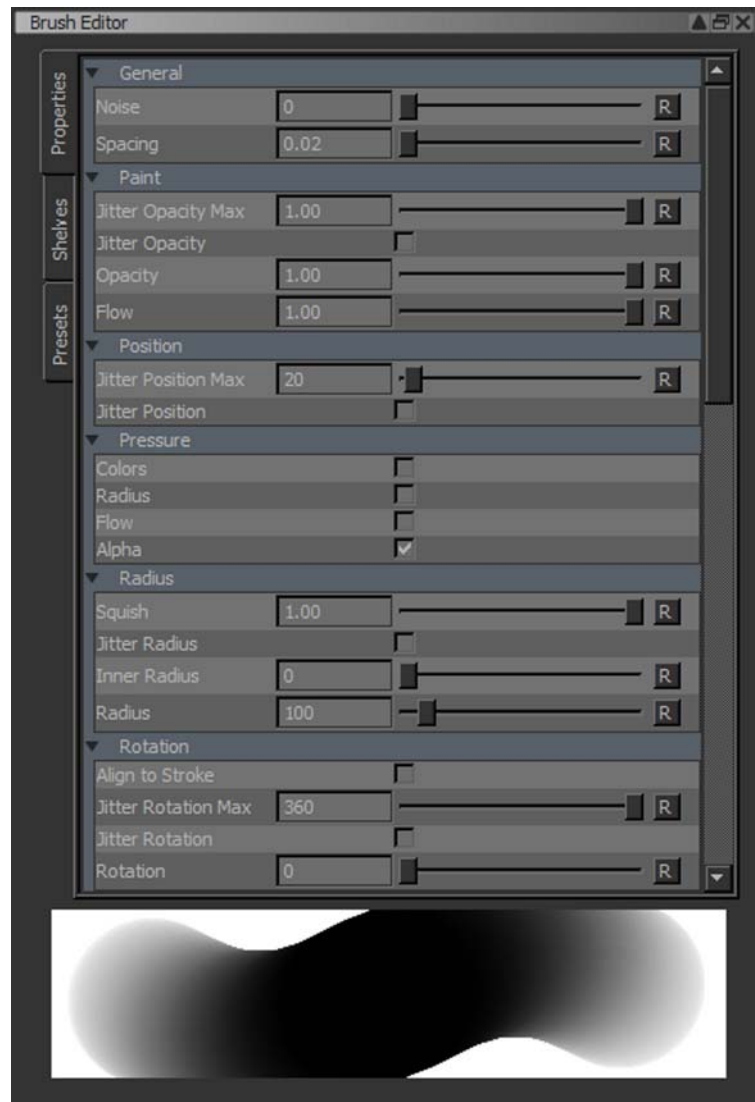
Tip *If you hover the mouse over a swatch, it displays RGB, HSV, and Alpha values:*



Select a brush

1. To select a brush, open the **Brush Editor** palette:
 - from the **View** menu, select **Palettes > Brush Editor**, or
 - right-click in the toolbar area and select **Brush Editor** from the popup menu.

*The **Brush Editor** palette displays.*

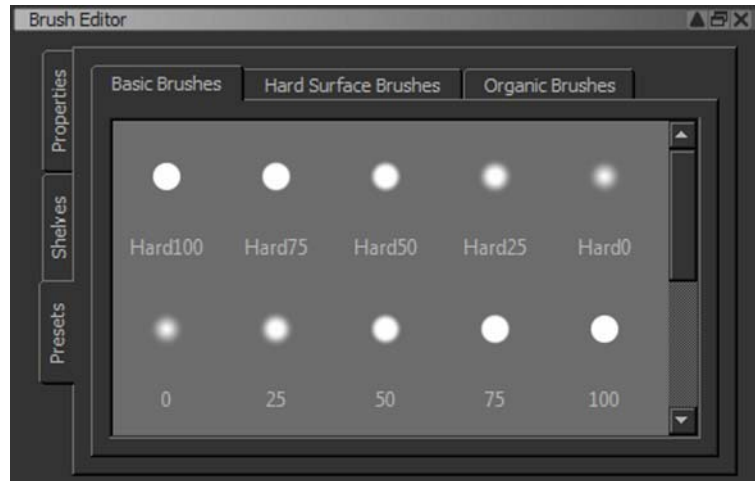


*The **Brush Editor** has three tabs:*

- **Properties** — configurable properties of the selected brush (see the *Mari Reference Guide* for details)
- **Shelves** — the same shelves that appear in your **Shelf** palette
- **Presets** — an array of predefined brushes that come with *Mari*.

2. Click the **Presets** tab.

Three tabs display along the top for different sets of predefined brushes.




Tip *At the bottom of the **Brush Editor** is a scratch area for you to test out the selected brush.*

3. Click a brush to select it.

Tip *You can press **N** to swap back to the last brush tip you used. This lets you quickly swap back and forth between two brush tips.*


Sandbox *Browse through the different preset brushes that are available. Try them in the scratch area. Try changing some of the properties on the **Properties** tab.*

Tip *You can also customize brushes from the **Brush Editor**, and save them to the **Shelf**. This is covered in the *Mari* User Guide, but basically involves:*

- *selecting a preset brush from the **Presets** tab*
- *custom-configuring that brush by selecting options on the **Properties** tab*
- *saving it by clicking the  button on the **Shelves** tab.*

Redoing an action in Mari only reverses a previously undone action. You cannot use the Redo command in Mari to repeat a command — it's reversing an Undo (not a "do that again").

Bake your painting

1. As with other paint programs, what you paint stays in a paint buffer until you "bake" it onto the model. To bake in Mari, make sure all patches with unbaked painting are selected, and then:
 - from the **Painting** menu, select **Bake**, or
 - click  on the status bar, or
 - press **B**.

Tip *The **Projection** palette also includes a **Bake Behavior** option, which by default (**AutoBakeAndClear**), automatically bakes every time you adjust the view.*

2. When you exit Mari, **do not save** the project. (We'll start the next lesson with the unpainted blacksmith you imported in Tutorial 1...)

Where do you go from here?

This lesson covered the most basic options for painting in Mari:

- selecting a color in various ways, and dragging it to the **Shelf**
- selecting a brush from the **Brush Editor**
- painting on the model and baking.

The next tutorial, [Tutorial 4: Painting Through and Clone Stamping](#), covers two main options for using images to create textures in Mari.

TUTORIAL 4: PAINTING THROUGH AND CLONE STAMPING

About this lesson

What this lesson teaches you

This lesson introduces using images to create textures in Mari. This includes:

- “painting through” an image onto your model
- “clone stamping” part of an image onto your model.

What you should know before starting this lesson

This lesson assumes:

- a basic knowledge of computers and graphics applications
- that you have read through the Mari *Quick Start Guide*
- that you know how to start Mari (see [Launch Mari](#))
- that you have completed [Tutorial 1: Setting up a Mari Project](#), [Tutorial 2: Setting the View and Lighting](#), and [Tutorial 3: Painting!](#)

Resources you need to complete this lesson

To complete this lesson, you need access to a computer that can run Mari, and the following sample files:



- **1-Blacksmith** — the Mari project file you created in Tutorial 1 and used in Tutorial 2 and Tutorial 3
- **Tattoo.png** — an image of a tattoo, in your Mari tutorial directory.

How long should it take?

Plan on spending about 25 minutes to complete this lesson.

About painting from images in Mari

Like with other paint programs, Mari lets you superimpose image files onto the surface of an object. To manage image files, Mari includes the **Image Manager** palette. To paint with images you've loaded into the **Image Manager** palette, Mari has two main tools: **Paint through** and **Clone stamp**:

- The **Paint through** tool () lets you position an image *over* an object, and then as you paint, copy from the image directly onto what's under the brush.
- The **Clone stamp** tool () lets you position an image *alongside* an object, with a source point on the image relative to where the brush is on the object. Then as you paint, the source point on the image moves in sync with the brush on the object, and Mari copies from the image onto the corresponding spot under the brush on the object. (You can also clone stamp from painting already on an object, in the paint buffer, or in another channel.)

Steps for painting through and clone stamping

To paint through and clone stamp in Mari, follow these steps:

1. [Open your project](#)
2. [Load an image](#)
3. [Paint through](#)
4. [Clone stamp](#)

Open your project

1. Start Mari (see [Launch Mari](#)).
The Mari workspace displays.
2. On the **Projects** tab, double-click on your **1-Blacksmith** project to open it.
*Your project opens and switches to the **Ortho** view.*

Load an image

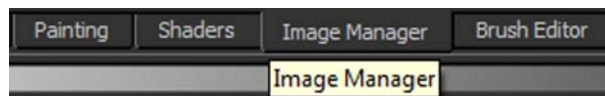
For both painting through and clone stamping, we'll use an image of a tattoo that looks like this:



We'll start by loading that image in Mari's **Image Manager** palette.

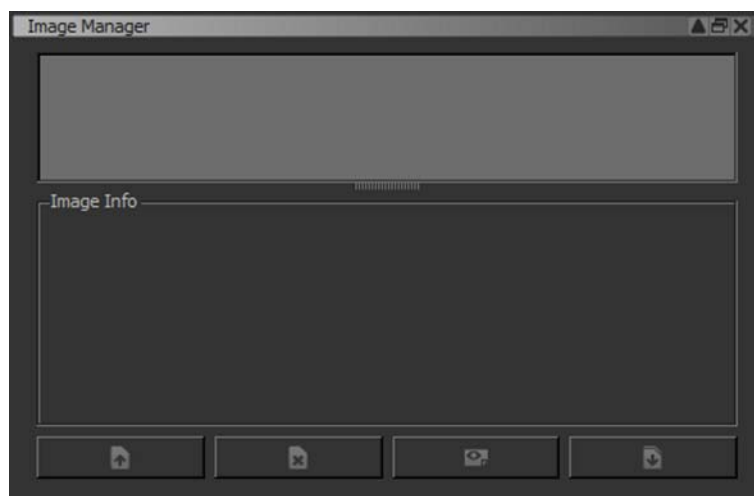
1. To open the **Image Manager**:


- click the **Image Manager** tab if it is already open but hidden (as in the default Mari layout), or



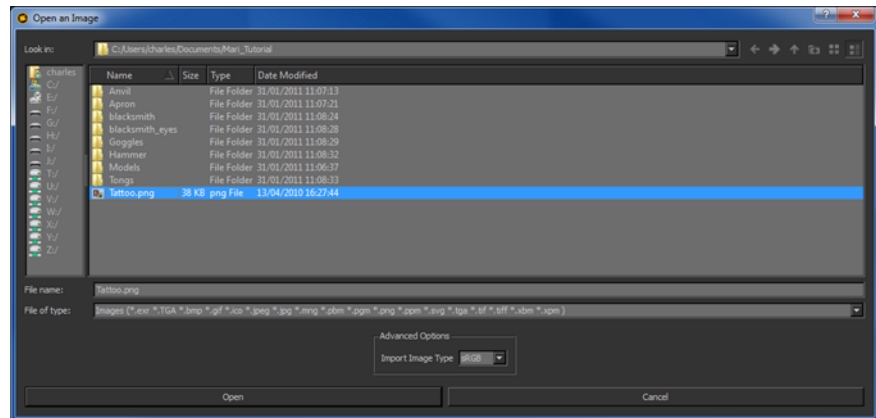
- from the **View** menu, select **Palettes > Image Manager**, or
- right-click in the toolbar area and select **Image Manager** from the popup menu.

*The **Image Manager** palette displays.*



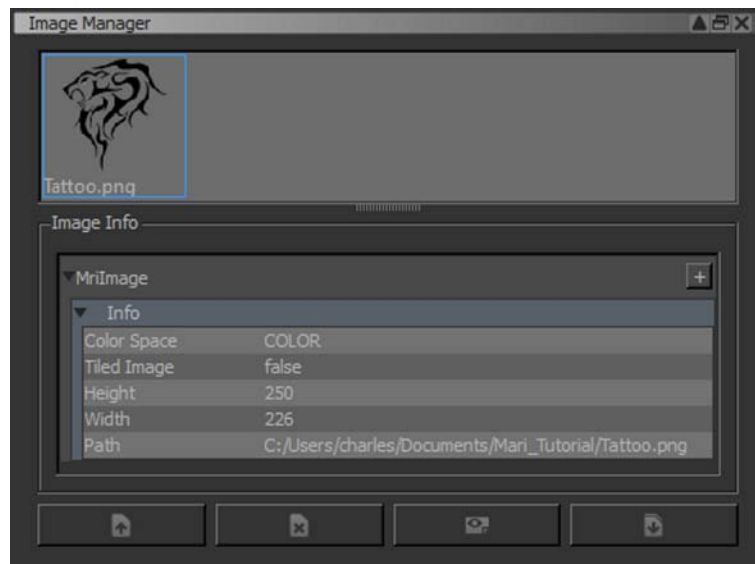
- To load an image, click .

*The **Open an Image** dialog box displays.*



- Navigate to your tutorial folder, and select **Tattoo.png**.

*That image displays in the **Image Manager**.*



Paint through

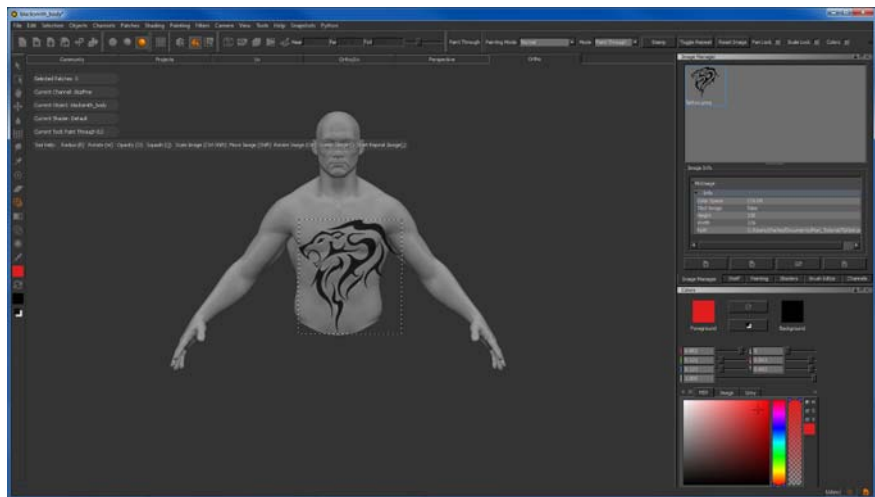
Painting through an image basically involves:

- selecting the **Paint Through** tool
- dragging an image onto the canvas
- painting.

1. Select the **Paint Through** tool:

- click  on the toolbar or
- press **U**.

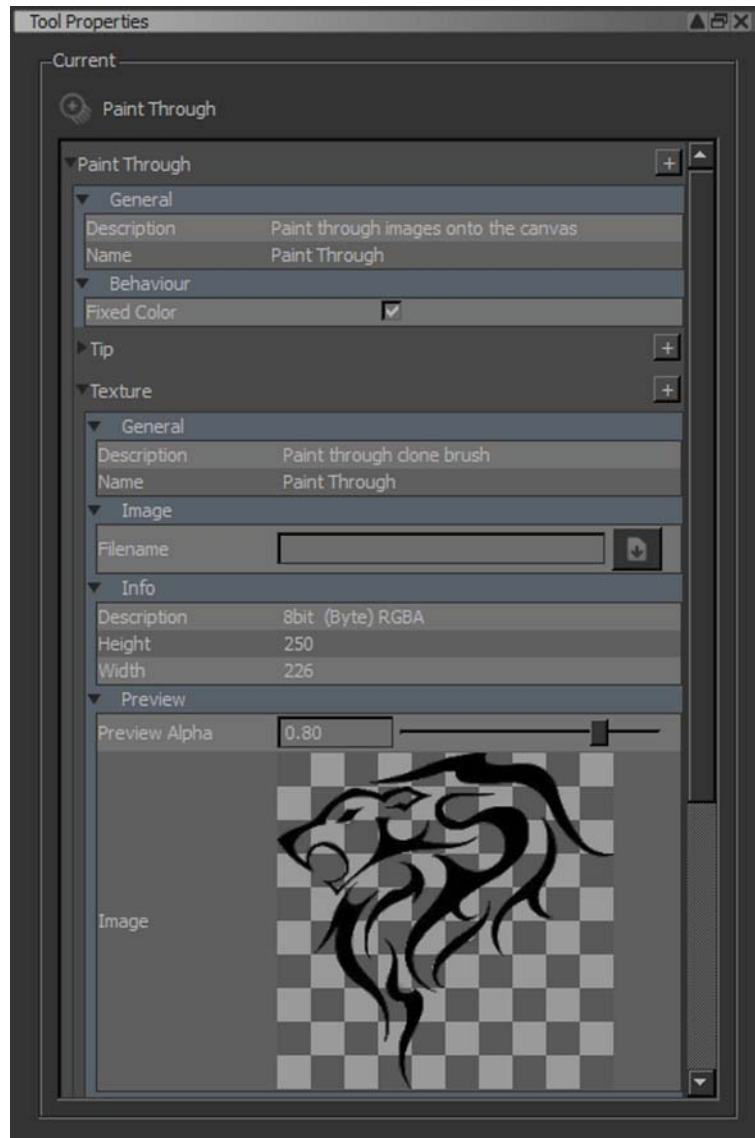
2. Drag the image from the **Image Manager** and drop it onto the model.



3. Move and resize the image:

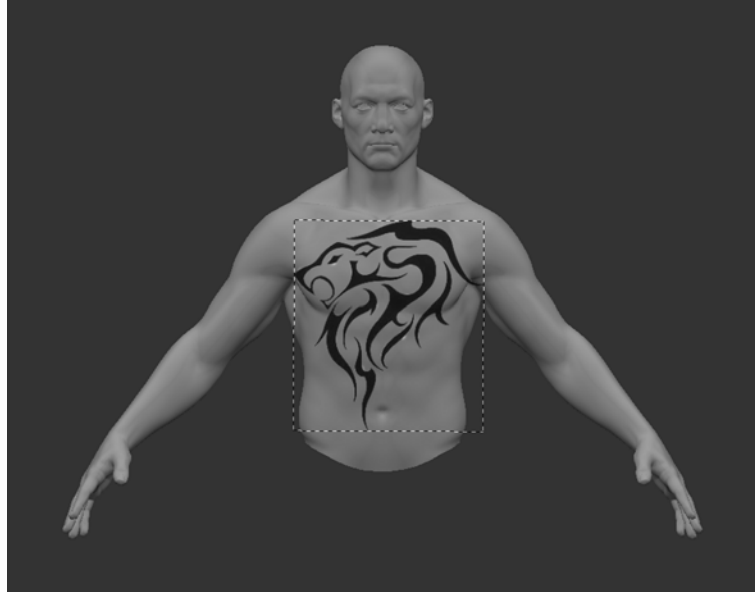
- To resize the image, hold down **Ctrl+Shift**, click and drag.
- To move the image around the canvas, hold down **Shift**, click and drag.
- To rotate the image, hold down **Ctrl**, click and drag.

Tip *The **Tool Properties** palette includes many options for manipulating paint-through images.*



*You can also double-click the image in the **Image Manager**, and crop a smaller portion to use for painting through and clone stamping (see the *Mari Quick Start Guide*).*

Sandbox *Try sizing, moving and rotating the image. See if you can get it to look like this:*



4. Paint through the image onto the model (hold down the left mouse button and move, as you do in any standard paint program).
5. When you're done painting through, press **P** to see just the painted-on object.




- Tip**
- To hide the overlying image, press the *?* (question mark) key.
 - To paint the whole image onto the model in one step, press the *'* (apostrophe) key.
 - To repeat the source image (so you can paint past the edges and have the source image repeat), press the *;* (semicolon) key.


Clone stamp

Clone stamping is like painting through, but the image does not have to sit directly on top of the model.

1. First, clear the painted-through textures:

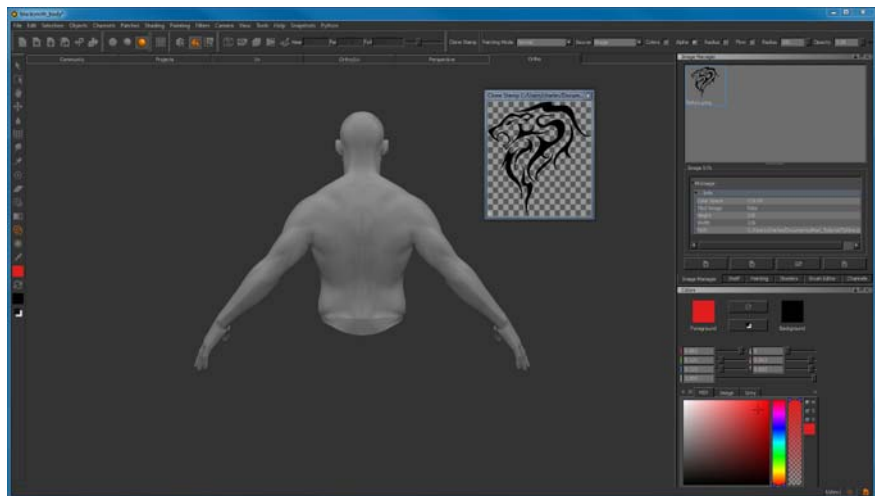
- from the **Painting** menu, select **Clear Painting**, or
- click  on the toolbar.

This removes any un-baked painting on the model. In this case, the model re-displays as imported.

2. Select the **Clone Stamp** tool: click  on the toolbar.

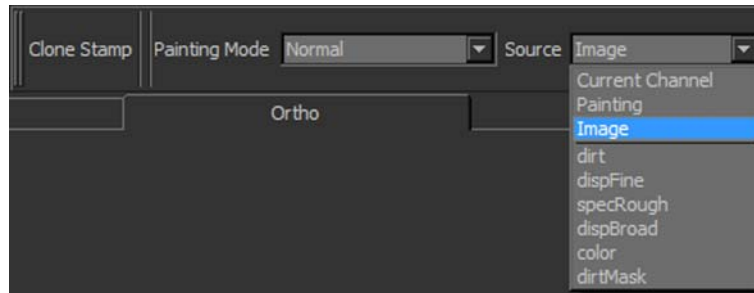
3. Drag the image from the **Image Manager** and drop it onto the canvas. *The image displays in a separate window.*

4. Re-size and position the image window alongside your model. To scale the image within the window, hold down **Alt**, right-click and drag. To pan the image, hold down **Alt**, left-click and drag.

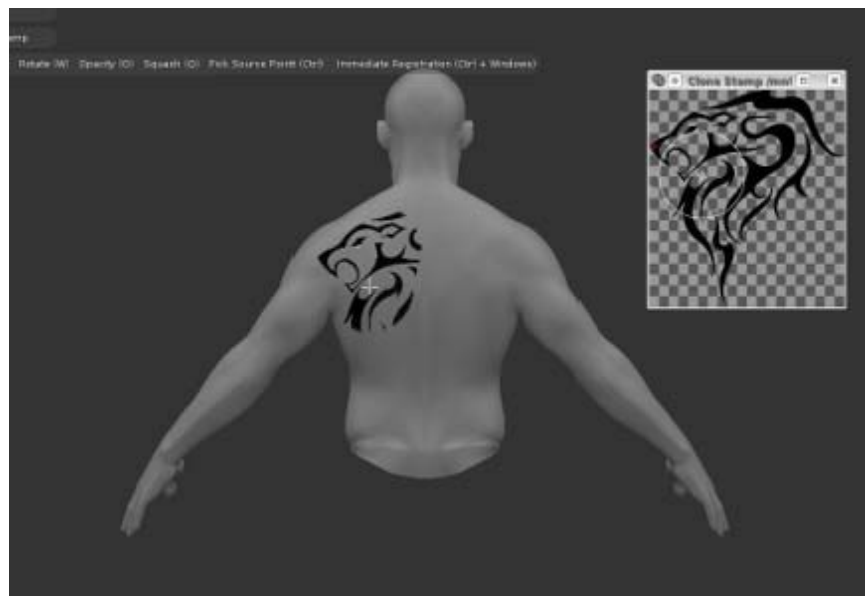


5. To select the source point for cloning on the image, press **Ctrl** and click. *Once you start painting, a magenta + displays the source point on the image.*

Tip You can also clone stamp from existing textures — painting on the surface of the object, in the paint buffer, or painted in another channel. To select a clone source, use the **Source** menu in the **Project** toolbar and select from the origins available.



6. Once you've selected the source, then paint. The cursor will move on the image in sync with the cursor on the model as it clone stamps from the image onto the model.



Sandbox Change the view (as covered in [Tutorial 2: Setting the View and Lighting](#)), and try both painting through and clone stamping the image onto another side of the object. Do you like one method of using images to paint more than the other?

Where do you go from here?

This lesson covered the two main options for painting images onto a model:

- dragging an image and positioning it on top of an object, then **Painting through** the image onto the surface of the object
- dragging an image and positioning it on the canvas next to an object, then **Clone stamping** from a part of the image to the surface of the object.

The next tutorial, [Tutorial 5: Exporting and Importing](#), covers procedures for saving and re-importing your work.



TUTORIAL 5: EXPORTING AND IMPORTING

About this lesson

What this lesson teaches you

This lesson explains how you can **export** channels you've painted in Mari as a set of image files, work on those files in another program, and then re-**import** them into your Mari project.

What you should know before starting this lesson

This lesson assumes:

- a basic knowledge of computers and graphics applications
- that you have read through the *Mari Quick Start Guide*
- that you know how to start Mari (see [Launch Mari](#))
- that you have completed tutorials 1 through 4 — so you know the basics of creating a Mari project, setting up the camera and lighting, and painting textures.

Resources you need to complete this lesson

To complete this lesson, you need access to a computer that can run Mari, and the following sample files:

- **1-Blacksmith** — the Mari project file you created in tutorial 1 and used in tutorial 2, tutorial 3, and tutorial 4.

How long should it take?

Plan on spending about 25 minutes to complete this lesson.

About Mari exports

Mari includes the facility to **export** the painting in a project to a series of image files. You might use this, for example, to modify part of your work in an external program (such as Photoshop) and then re-**import** those modifications into the project. Mari lets you select a format and naming conventions for the export. Each export contains the painting baked in a selected channel, one image file per patch. When you import a series of previously exported files, Mari lets you know whether it's a complete set.

Steps for exporting and importing

To export and import Mari painting, follow these steps:

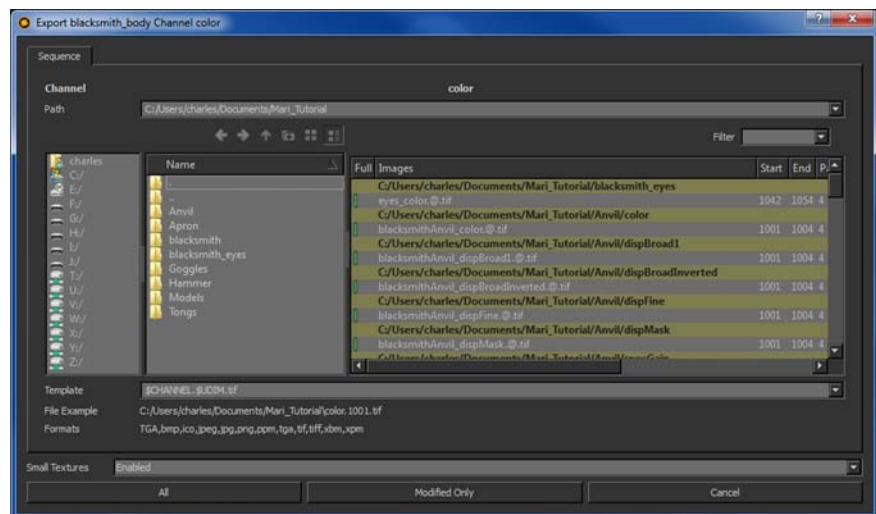
1. [Open your project](#)
2. [Export a channel](#)
3. [Import a channel](#)

Open your project

1. Start Mari (see [Launch Mari](#)).
The Mari workspace displays.
2. On the **Projects** tab, double-click on your **1-Blacksmith** project to open it.
*Your project opens and switches to the **Ortho** view.*

Export a channel

1. To export the current channel, from the **Channels** menu, select **Export**.
*This exports the currently selected channel (in this case, **Color**). To export any channel, right-click the channel you want to export in the **Channels** palette, and select **Export** from the popup menu.*
*The **Export <channel name> Channel** dialog box displays (in this case, **Export color Channel**).*



2. If necessary, use the two left-hand navigation boxes to navigate to your tutorial folder.
3. Note the **Template** field. Mari will name each image file in the export, one per patch, based on this template. The default is **\$CHANNEL.\$UDIM.tif**.

Note also the **File Example** below it, which displays what a filename will look like with that template. In the illustration, it's: **color.1001.tif**
So each filename will include the following (with examples from the illustration):

- **\$CHANNEL** — the name of the channel you're exporting: **Color**.
- **\$UDIM** — an incremental number identifying each patch: **1001** (followed by **1002**, **1003**, and so on).
- **tif** — the extension for the selected file format. You can set the format for the exported files by changing this extension. Mari supports standard image formats (such as TIFF, EXR, PNG, JPG, or TGA).

Tip *The formats available to export depend on the color depth of the channel. Channels with color of Half or Full can only export to EXR format.*

4. Click **All**.

*This exports all patches. To only export the patches that have been modified since the project was last exported, select **Modified Only**.*

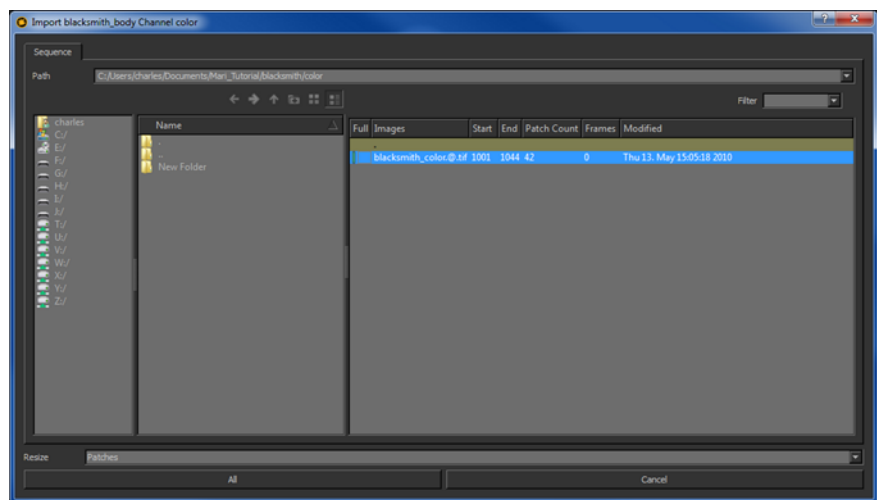
You may be prompted that the selected directory does not exist, and asked whether you want to create the channel. Select to create it.

Tip *For a complete explanation of export fields, see the Mari Reference Guide.*

Import a channel

1. To import a channel (for example if you've tweaked some exported image files in another application and now want them back in your texture):
 - from the **Channels** menu, select **Import** for the currently selected channel, or
 - right-click on the channel where you want to import the textures (in this case, **Color**) in the **Channels** palette, and select **Import** from the popup menu.

*The **Import <channel name> Channel** dialog box displays (in this case, **Import color Channel**).*



2. Select the path for the imported images, by either:
 - typing it in the **Path** field at the top of the dialog, or
 - clicking on it in your directory bookmarks (to the left), or
 - browsing to it in the middle pane.

If you are using the middle pane to browse to the directory, you can use the buttons above the view to navigate back, forward, up one directory level, create a new directory, or switch between icon only and full details directory view.

3. Select the texture set to import.

Mari shows all the texture sets available under the selected directory, arranged by subdirectory.

For each texture set, the **Import <channel name> Channel** dialog box includes:

- **Full** — shows a green bar if the selected image sequence has a full set of images for the current model, a yellow bar if the selected image sequence has a partial set of images for the current model, or a red

bar if the selected image sequence has no images for the current model.

- **Images** — the name of each image to import, with the udim number represented as @ (in this case, **color.@.tf**).
 - **Start** and **End** — the first and last UDIM numbers in the image set (in this case, **1001** to **1055**).
 - **Count** — the number of images in the set (in this case, **50**).
4. From the **Resize** drop-down, select how Mari should act when importing a texture at a different resolution to the patch:
 - **Patches** — Mari will resize the patch to match the size of the imported image.
 - **Images** — Mari will resize the imported image to match the size of the patch.
 5. Click the buttons at the bottom of the dialog to import onto either **All** patches in the project, or **Selected only**.

Mari imports the textures from the selected files.

Sandbox *Experiment with your options for importing textures.*

Where do you go from here?

This lesson showed you how to:

- **export** a channel in a Mari project to a series of image files
- **import** an exported channel, for example after having manipulated the exported textures in another program.

Congratulations! You have now completed all modules in the Mari Tutorials. To better familiarize yourself with the features you are particularly interested in or to get answers to specific problems that arise during painting, please refer to the accompanying Mari User Guide and Mari Reference Guide.