User Guide

for Macintosh® and Windows®

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Notice
Before using this software or reading this user guide, make sure you have read, understood and agreed to the license contained in the back of the Painter 3D User Guide.

Credits
Fractal Design Detailer was originally created by Mark Zimmer, Tom Hedges, Glenn Reid, Vahé Avedissian, Seath Ahrens, and John Derry. From the Painter team: Priscilla Shih, Christina Hall, Erik Johnson and Scott Cooper.

Quality Assurance testing by Michael Cinque, Adam Croston, Caitlyn Meeks, Stanley Vealé and Rob Thorne.

Painter 3D was created by Pascal Belloncle, Vahé Avedissian, Nicolas Barry, Pascal Fonté, Damien Saint-Macary, Thierry Buffenoir, and Emil Valkov and Mark Yang.

Product Management: Jerry Granucci.

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The Painter 3D User Guide was written by Beth Chargin and Lionel Kirsher; edited by Beth Chargin; project management by Stephanie Workman, Rafael Rodriguez, Erick Vera, and Beth Chargin; art directed by Brian Moose; illustrated by Heather Chargin, Brent Houston, Mojdeh Marashi, and Aaron Begley; production by Laureen Ferguson and Kimberley Ness; prepress production by Rich O'Reilly and Rafael Rodriguez.

Cover artwork by Aaron Begley.

Thanks to our friends at Zygote Media Group, Viewpoint Datalabs and Vivid Details for providing us with great 3D models and beautiful photographic images and patterns.

Welcome to Painter 3D™

MetaCreations Painter 3D is the latest development in the MetaCreations Painter family. Painter 3D is the best way to create realistic or artistic looks for 3D models. It contains hundreds of Natural-Media® tools and effects, which let you create surface maps that control the appearance of your 3D objects. With Painter 3D, you can interactively create texture, bump, reflection, highlight, glow, and environment maps, with all the control and flexibility MetaCreations products are known for.

Painter 3D is a new product from MetaCreations, but its roots are strong. A natural evolution from Fractal Design Detailer™, Painter 3D marries the proven technology from its predecessor with the richness of Painter 5 to create an exciting new application for 3D artists.

Your Painter 3D package includes:

- The Painter 3D CD-ROM
- The Painter 3D User Guide
- The Painter 3D Quick Reference Card
- A software registration card
- A set of Painter 3D serial number stickers. *Do not lose these stickers!* You'll need the serial number when you launch Painter 3D for the first time. Adhere the stickers to easy-to-remember spots, such as the CD-ROM case or the title page of this manual.

If you're missing any of these items, contact your Painter 3D dealer, or contact MetaCreations using the e-mail form at the MetaCreations Web site (www.metacreations.com).

What Is Painter 3D?

Painter 3D is a paint program abundantly filled with artistic tools and effects for 3D models. With Painter 3D, you can express your artistic vision by painting directly on 3D models with Natural-Media tools. You can easily transform your models from the ordinary to the spectacular by adding color, texture, shine, reflection, glow, and environment effects. It's the closest thing to actually holding an object in your hand and painting on it.

Maps

Painter 3D's primary function is to help you create 2D image maps that wrap around 3D models to create various surface effects. You can work in 3D or 2D to create the maps wherever is convenient for you. Paint directly on the model or work in the 2D view of the map image.

Painter 3D automatically updates the brush stroke in the other window. This means if you paint on the model, the stroke also appears in the 2D map Image window, and vice versa.

If you prefer, you can turn off updating in the 3D view (by clicking shut the Eye icon in the Maps Manager palette) to increase performance and drawing speed in the 2D window. Or, you can hide all 2D windows and work exclusively in the 3D view by clicking the Show Maps option in the expanded Maps Manager palette.

Painter 3D lets you have up to six maps for each object in a model. Each map represents a different map channel: texture, bump, highlight, reflection, glow, and environment. These six maps combine to create just the effect you want.

You control maps with the Maps Manager palette, a palette that gives you detailed information about each of the maps you're creating. The Maps Manager palette lets you select and edit maps

simultaneously, which means that you can precisely mimic brush strokes between maps. For example, a brush stroke that adds color to a texture map can also carve out a channel in a bump map.

Objects

Painter 3D lets you create primitive, single-object models—such as cubes, cones, and spheres—right within the application, but its true power lies in importing 3D models you've created in other applications like Ray Dream Studio™.

In Painter 3D, a model can be comprised of up to hundreds of objects, each of which can have its own set of surface maps and properties. Yet managing the maps associated with complex models is easy because you can share maps across objects. For example, if you have a model that contains repetitive objects, such as the legs of a spider, you can create one set of maps for one leg and then share those maps with the other legs. This simplifies and streamlines your workflow.

The Objects 3D palette contains a Hierarchy list, which also simplifies working with models. The Hierarchy list is as its name implies: a listing of the objects that make up a 3D model. From the list you can quickly select the object you want to work with, or you can turn off the display of multiple objects so you can isolate the piece you want to work on. (This can also save on screen redraw time.)

Once your model is detailed with the maps you've created, just save your maps and use your original 3D application to apply them to your model in the scene. Or if you like, you can export the models with the maps attached to your 3D modeling application (depending on your application and the file formats it accepts). Choose whichever method best suits your workflow.

If you're working with either Ray Dream Studio or 3D Studio MAX®, you can streamline your work by using the plug-ins (included on the Painter 3D CD-ROM). The plug-ins act as a direct link between either of these 3D applications and Painter 3D. The plug-ins provide a tight connection between the two programs and eliminates the need to actively save or import/export files between the two.

Efficient Workflow

Painter 3D is set up to streamline your work. Palettes and tools are organized to put controls at your fingertips. The Objects 3D palette not only contains the Hierarchy list (which shows you all the objects that make up a model), but also an Images list and an Objects list.

The Images list shows you all open images, whether they are associated with open models or not. Beneath each image name is a list of all the objects associated with that image. This lets you see the maps that are attached and shared across objects.

The Object list is similar. It lists all open objects and shows you which maps are associated with them.

The Image windows for each object use a layers analogy. If you have multiple maps for a single object, you use the Maps Manager palette to bring the map you want to edit to the front view in the Image window. This prevents multiple Image windows for the same object from cluttering your desktop. Of course, if you want to view two individual maps at once (such as texture and bump), you can easily open a new view to see both of them.

Also, you can edit two or more maps at once. Shift-click the Pencil icons in the Maps Manager palette to select the ones you want and begin painting. The strokes paint down through the layers to the selected maps.

You can customize how Painter 3D's palettes are arranged on your desktop. You can tear off the subpalettes you work with most frequently so that they're always available. If you have a favorite arrangement of palettes on your desktop, you can save that arrangement and load it whenever you work in Painter 3D.

A Contemporary Artist's Studio

Working in Painter 3D is like working in a contemporary artist's studio. You have a range of traditional tools and media to choose from, combined with the sophisticated techniques computer technology can offer.

For example, you can paint with Painter 3D's arsenal of brushes to create traditional images, such as oil paint on canvas. Then use Plug-in brushes to deliver effects like fire or pinching.

Dynamic plug-in floaters can also transform the images you create for maps. For example, use the Liquid Lens plug-in floater to distort and smear the underlying imagery in your maps. Or use the Kaleidoscope plug-in floater to create a symmetrical pattern based on the imagery beneath it.

You can also use selections, masks, patterns, weaves, textures, fill techniques, and more to achieve almost any look you want. You can apply surface textures or color overlays to an entire map or just a portion of it; you can specify a texture grain to which a painting tool reacts.

It doesn't matter whether you're trying to create maps that are photorealistic or ones that are surrealistic; Painter 3D can deliver the artistic look you want, limited only by your imagination.

Lighting and Rendering

Painter 3D provides control over the lighting environment in the Model window (the 3D view of your model). You can illuminate models with up to ten lights and set their brightness, color and concentration. With the Light tool, you can click directly on the model to add a light shining at the spot you clicked.

You can also lock or unlock lights to objects in the Model window. You'll find this useful if you're painting directly on the model or if you're positioning the model to render.

The lighting controls in Painter 3D are there to help you view and paint your models, and render them in the Model window—they don't carry over into other 3D applications. This prevents lighting conflicts between Painter 3D and lighting effects in your 3D application.

When your model is mapped, lit, and positioned just the way you want it, you might want to render it into a 2D image. Painter 3D can render 3D models at any resolution, complete with anti-aliasing and mask information. You can composite renderings directly in Painter 3D or copy them to another image-editing program.

What's New for Detailer Users

If you're a Detailer user, you'll find it easy to make the switch to Painter 3D. The basic method of working in Painter 3D remains the same as it was in Detailer, but Painter 3D's functionality has been streamlined and expanded, letting you work more efficiently with a greater number of materials, tools, and effects at your fingertips.

The Painter 3D CD-ROM contains a PDF file, *What's New In Painter 3D*, that fully describes new and changed features. Here are some of the highlights:

- The new Maps Manager palette gives you a central place for managing maps. It lists all the maps associated with a selected object and gives you controls for manipulating the maps.
- The new Objects 3D palette concentrates actions and tasks for the model. For example, you can view the hierarchy of objects that make up a model, view images associated with objects and vice versa, control lighting in the Model window, and more.
- You can now share maps across objects by linking the same set of maps to different objects. This is a great time and space saver if you're working with models that contain repetitive objects.
- Painter 3D comes with plug-in floaters, a new type of floater that lets you apply an effect that can be changed, moved, and reapplied without altering your original source material.
- New plug-in brushes give you astonishing new brush strokes to experiment with in your surface maps. Brushes such as Fire, Blur, and Twirl let you paint on a transparent floater to transform the imagery beneath.
- There are new, refined map controls that make your work go more smoothly. For example, you can hide or show all Image windows, depending on what you want to see on your desktop. And the Maps manager now uses a layered approach where all the maps for one object are stacked in a single Image window (unless you choose to open a new view). This helps eliminate Detailer's tendency towards desktop clutter from having separate Image windows open for each map.
- It's easier to look at your model from different angles thanks to new preset views you access from a pop-up in the Controls palette: Virtual Trackball tool. These preset views let you quickly shift the model's orientation, freeing you from manually dragging and positioning the model. You can also save your own custom viewing angles.
- You can now let Painter 3D figure out the best aspect ratio for your maps by using the Minimal Distortion Ratio option in the Apply Map dialog. Painter 3D calculates the optimum width and height dimensions based on your model. (Of course, you're still free to determine the aspect ratio yourself if you like).

The are many more features and enhancements than those listed here. Take a look at "Painter 3D Basics" on page 29, "Working With Models" on page 57, and "Using Maps" on page 67 for information about basic changes in functionality. And be sure to read the *What's New in Painter 3D* PDF file on the CD-ROM to help you get the most out of moving up from Detailer to Painter 3D.

About Your User Guide

This manual provides basic information you need to get started using Painter 3D. It will help you learn the application and become familiar with basic features and functions.

This user guide assumes you are already familiar with basic Macintosh® and Windows® concepts—menus, dialogs, and mouse operations, such as clicking and dragging. If you need more information on these subjects, or on the Macintosh Finder or the Windows Desktop, refer to the Macintosh User's Manual or the Microsoft Windows User's Guide, respectively.

The best way to learn Painter 3D is to read the chapters "Getting Acquainted With Painter 3D" on page 13 and "Painter 3D Basics" on page 29. Then, complete the lessons in the online Painter 3D Tutorial (PDF format), located on the Painter 3D CD-ROM. The tutorial leads you through the process of using Painter 3D with maps and models.

After you complete the tutorial, it's best to jump right in and start experimenting with Painter 3D. You can use this User Guide for reference and refer to the online book *Painter 3D Advanced Guide* (located on the Painter 3D CD-ROM) for further information about sophisticated techniques and effects.

Conventions

The Painter 3D User Guide is for both Macintosh and Windows. By convention, Macintosh commands precede Windows commands in the text. For example, Command/Ctrl+I, is equivalent to the Macintosh Command-I and the Windows Ctrl+I. For simplicity, the term folder refers to directories as well as folders. The Painter 3D interface for Macintosh and Windows platforms is identical, unless otherwise specified.

There are also several conventions used to identify paths to certain tools and controls. The convention to a menu follows the rules of the **menu name**> **menu item**. The convention to a palette follows the rules of the **palette name**: **subalette name**. The convention to a palette menu follows the rule of **palette name**: **palette menu**> **menu item**.

Modifier Keys

When a modifier key differs between the Macintosh and Windows platform, the Macintosh modifier is listed first followed by a slash and the Windows modifier key. **Option**/**Alt** means Macintosh users press the **Option** key and Windows users press **Alt**.

Customer Support

Technical support is free* to registered users of Painter 3D. There are many easy ways to contact technical support for questions about installation, configuration or functionality. These options are Web, e-mail, phone, and fax support.

* MetaCreations does not currently charge for technical support for Painter 3D. The only expense to the user is telephone toll charges.

You will find the answers to most of your questions within the pages of this User Guide and in the online book *Painter 3D Advanced Guide*. If you need further assistance, you can contact MetaCreations's Technical Support in any of the following ways:

Web Support

Many of the answers to your questions are available 24 hours a day on our Web site:

http://www.metacreations.com/support

In addition to frequently asked questions (FAQs), the Web site provides troubleshooting techniques, late breaking product news, and other resources to help you get the most out of Painter 3D.

E-mail Support

To answer your technical support question most effectively and quickly, please use the e-mail form provided to you on our Web site:

http://www.metacreations.com/support

Phone Support

Phone support hours are Monday–Friday, 8:00 AM–5:00 PM Pacific Standard Time, excluding holidays.

Call (408) 430-4062. When calling, please have your serial number handy and be at the computer where you need assistance.

Fax Support

Dial (408) 438-9672 to send a fax.

Please include your name and serial number on all correspondence.

MetaCreations reserves the right to change its support policies at any time.

Who Is MetaCreations?

MetaCreations is a major force in 2D and 3D graphic software, developing and marketing next generation products that unite traditional art, and design techniques with digital technology. MetaCreations products are engineered to deliver real-time interaction, intuitive functionality, and creativity to design professionals, graphics hobbyists, and consumers who work on desktop computers.

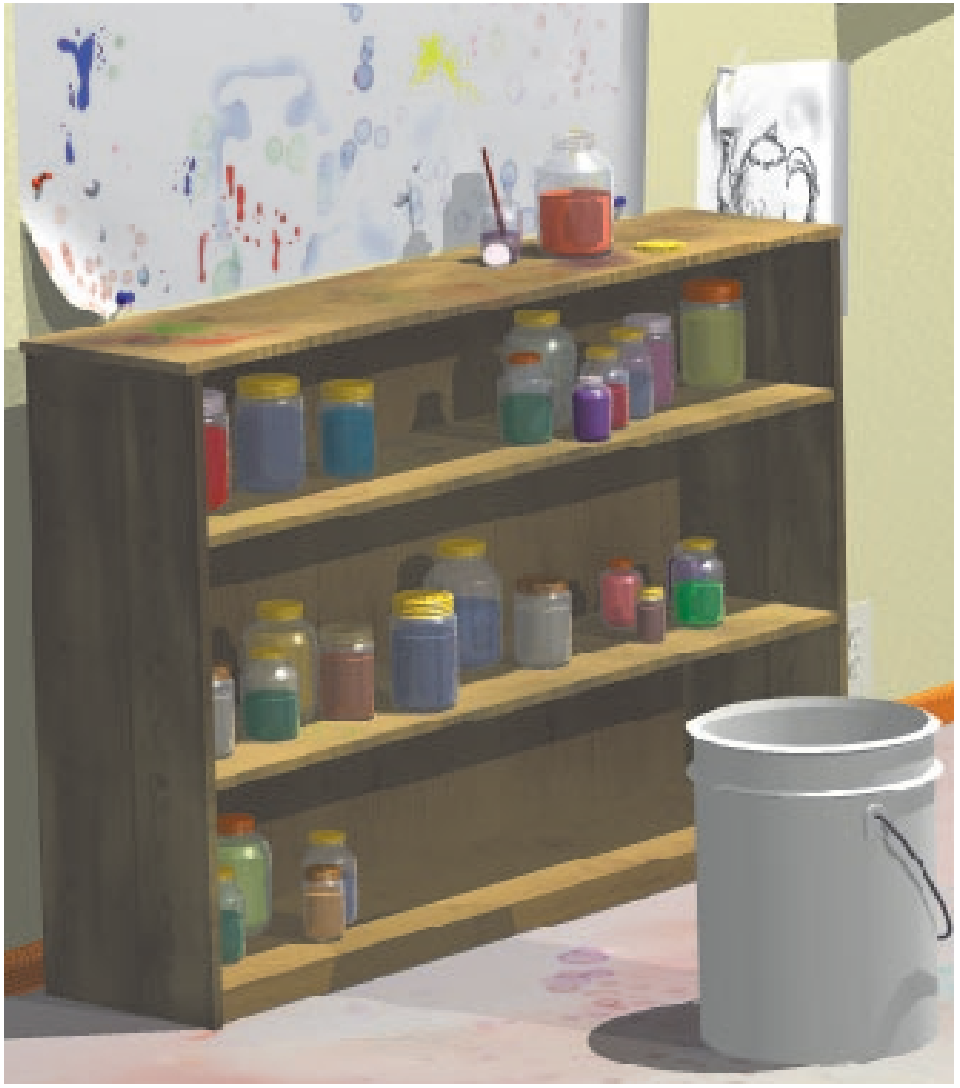
MetaCreations' focus is maintained by three product values:

- Faithfully replicate Natural-Media and real world looks in the digital medium.
- Facilitate and extend the range of creativity by allowing artists to do things they couldn't do before.
- Capture human expression and allow the artist's perspective and intent to show through.

For More Information

For more information about MetaCreations' products, see our Web site on the Internet:

http://www.metacreations.com



Installation

Installing Painter 3D

This chapter describes the system requirements for Painter 3D and provides installation instructions.

Painter 3D runs on both Macintosh and Windows computers. Follow the instructions appropriate for your system.

Late-breaking information about Painter 3D can be found on a text document called Read_Me on the Painter 3D CD-ROM. The information might affect your installation so it's a good idea to read this file before beginning the installation process.

Macintosh Installation

This sections describes the system requirements and installation procedure for Macintosh computers.

System Requirements

Painter 3D works on any Power Macintosh with at least the following configuration:

- Power Macintosh computer
- A minimum of 16 MB application RAM (24 MB or more recommended)
- A minimum of 30 MB hard disk space; you'll need additional space to save files you create
- A pressure-sensitive graphics tablet and stylus are recommended but not required (Painter 3D supports most types of tablets)

Installing Painter 3D on a Macintosh Computer

To install Painter 3D:

1. Turn off any virus protection and compression programs, and close any other applications currently open.
2. Insert the Painter 3D CD-ROM into your CD drive.
3. When the Painter 3D icon appears on your desktop, double-click to open it.
4. Double-click the Installer icon and follow the onscreen instructions.

Windows Installation

This section describes the system requirements and installation procedure for Windows computers.

System Requirements

Painter 3D works on any PC with at least the following configuration:

- 486, Pentium or Pentium Pro computer running Windows 95 or NT 4.0 or later
- A minimum of 16 MB RAM (32 MB or more recommended)
- A minimum of 30 hard disk space; you'll need additional space to save files you create
- A pressure-sensitive graphics tablet and stylus are recommended but not required (Painter 3D supports most types of tablets)

Installing Painter 3D on a Windows Computer

To install Painter 3D:

1. Turn off any virus protection and compression programs, and close any other applications currently open.
2. Insert the Painter 3D CD-ROM into the CD drive.

   Windows locates the installation program on the CD-ROM.
3. Click Install.
4. Follow the onscreen instructions to complete the installation.

Launching Painter 3D

When you launch Painter 3D for the first time, you need to enter the serial number of your copy.

A set of serial number stickers is included in your Painter 3D package. If you haven't done so already, affix the stickers to a convenient spot such as the Painter 3D CD-ROM case or the title page of this manual.

To launch Painter 3D on a Macintosh computer:

- Double-click the Painter 3D icon in the Painter 3D folder.

To launch Painter 3D on a Windows computer:

- From the Start menu, choose **Program> MetaCreations> Painter 3D**.

Setting Memory and Printing Options

You can find detailed technical information on Painter 3D's memory requirements and optimizing the program in "Memory Considerations" on page 10.

Macintosh

By default, Painter 3D is set to use the minimum amount of memory—16 MB. If you have more memory available, you can significantly improve Painter 3D's performance by increasing its memory allocation.

Before changing the memory allocation, figure out how much memory you have available and how much of it you can allocate to Painter 3D.

To determine available memory:

1. If Painter 3D is running, quit the program. If you want to run other applications simultaneously with Painter 3D, launch them.
2. In the Finder, choose **Apple menu> About This Macintosh**. The system displays a window describing memory usage and availability.
3. Make a note of the number of the Largest Unused Block size. You should set Painter 3D's memory allocation to a number that is a little bit less than this number.

You may need to adjust the memory allocation to programs you want to use simultaneously with Painter 3D.

If you add new fonts or INITS to your system, the available memory may change.

To change Painter 3D's memory allocation:

1. Open the Painter 3D folder and locate the Painter 3D icon. Click the icon to select it.
2. Choose **File menu> Get Info** from the Finder or press Command-I.
3. Click in the Preferred Size field and enter the amount of memory you want to allocate to Painter 3D.
4. Click the Close box to save the setting and close the dialog.

Windows

Painter 3D has a preferences dialog that helps you optimize the program's use of memory, printing speed, and display quality.

Choose Edit menu> Preferences> Windows to display memory and printing options.

Refer to "Preferences for Windows" on page 47 for a discussion of these Windows preferences.

Memory Considerations

Painter 3D runs with a minimum of 16 MB application memory (Macintosh) or 16 MB system memory (Windows). Some of Painter 3D's features have particular memory requirements. With more RAM available, you increase your capabilities in these areas.

Like any graphically intense 3D application, Painter 3D uses a lot of memory. The benefit you receive, however, is well worth the cost in memory. Painter 3D renders the model (and all associated maps) in *real time*. This means that whenever you look at the Model window, you see all your artistic enhancements without having to go through a separate rendering process. Any mark you make or effects you create appear instantly on the model. (You can, of course, render the Model window for purposes of creating a high-resolution 2D image.)

The major areas of the program with high RAM requirements are as follows:

- The size of the Model window
- The complexity of the model (the total number of facets in all objects)
- The resolution (number of pixels) of maps you apply
- The number of undo steps allowed without using the disk.
- The dimensions of a fractal pattern you create

By paying attention to the RAM you allocate to Painter 3D, you can avoid frustrating delays in your work.

Allocation

If your Macintosh system has enough RAM to allocate more than 16 MB to Painter 3D, do it. More RAM extends your capabilities and the speed of some operations.

For example, Painter 3D virtualizes to disk when image resolution and changes go beyond available memory. This may be required to accommodate the levels of undo you've set. Writing to and reading from disk takes time. More RAM available to Painter 3D can help you avoid such delays.

A fast hard disk improves performance for memory. You can choose which hard disk Painter 3D uses in the Edit menu> Preferences> General dialog.

Allocating a large amount of RAM to Painter 3D may mean that you won't be able to run other graphics applications simultaneously. If you do want to run another program such as Ray Dream Studio at the same time as Painter 3D, you'll need to find a balance that allocates enough memory to both applications.

The Model Window

The 3D view in the Model window requires 68 bytes per pixel. You can choose to work with a small window or, if you have enough memory, set the window to the desired size. For better performance and to keep memory available for other uses, use a small Model window.

The following table describes RAM requirements at several Model window sizes.

3D View Size	Memory Required
200 x 200	2.6 MB
400 x 400	10.6 MB
640 x 480	20.4 MB

These figures apply to each Model window you open, so you probably want to work with one model at a time. Keep in mind that these values are for the Model window only. The rest of the application has additional requirements.

Complex Models

Files for 3D models can be quite large. It's a question of how much data is used to describe the surface. More data points (vertices) provide better fidelity in form (smoother surfaces), but increase file size and memory requirements.

You can control the number of facets created from patches in objects exported from Ray Dream Studio. Refer to "Using Painter 3D With Other Programs" on page 49 for more information on export options.

A related consideration that depends on RAM is saving a model file. With minimum RAM, you might not be able to save a complex Painter 3D model.

Images and Resolution

Open images require memory, and the larger they are, the more they require. Additionally, each floater in the image increases the memory needed to maintain the image in the window. For example, a floater of the same size as the canvas image effectively doubles the file size.

Painter 3D allows you to use maps that are several thousand pixels across and have any number of floaters. However, the result on the model might not justify the performance hit and memory requirement of the large scale image.

Each of the maps you apply to an object can be a different size. You might want to use high resolution maps for the texture map, but use low resolution images for the bump, highlight, and reflection masks.

The fidelity of the map image on the model depends on factors beyond the map's resolution. The mapping process is one factor and rendering is the other. The mapping mode you choose should be appropriate to the image and model, as well as compatible with your 3D application. Otherwise, the results may be unsatisfactory—regardless of image resolution.

Because of the rendering process, increased resolution in the map improves image fidelity on the model surface up to a point. Beyond this point, higher resolution maps don't help.

You'll probably want to experiment by loading progressively larger maps on your model, then examining the renderings they produce.

Undo

Painter 3D offers up to 32 levels of undo for changes you make in an image. The default setting is 5 levels of undo. (You can set your preference by choosing Edit menu> Preferences> Undo and making a choice in the dialog.)

Each undo level requires Painter 3D to save the document at that level. When the set of changes can be kept in memory, they will be. Otherwise, Painter 3D must write them to disk, which might delay you momentarily.

You should set an undo level appropriate to your system capabilities (RAM vs. disk speed), work habits, and level of patience.

Fractal Patterns

The Make Fractal Pattern feature (available from the Art Materials palette: Pattern menu> Make Fractal Pattern) allows you to create fractal textures at various dimensions. The larger dimensions are available only when Painter 3D has sufficient RAM to create them.

Getting Acquainted With Painter 3D

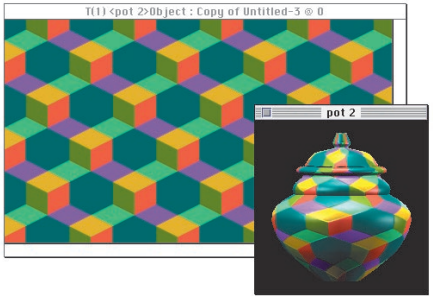
An Overview of Painter 3D

Painter 3D lets you create surfaces on three-dimensional models by wrapping the models with images.

There are two types of windows in Painter 3D where you create the images to wrap your models in:

- The Model window shows you a 3D view of your model. You can paint directly on the surface of your model in this window.
- The Image window shows you a two-dimensional representation—a map—of the image you want to wrap

on your model. You can have several, connected images in which you can wrap a single model object.



The map appears in the Image window and the model appears in the Model window.

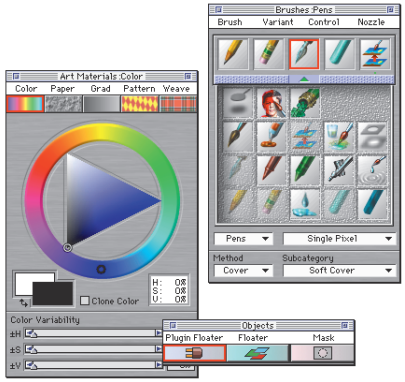
Some of Painter 3D's features and tools are specialized for working in 3D on the model. Others are geared more towards working on the 2D image. And some are used exclusively to apply the images to the model, a process called *mapping*.

Painter 3D has a wealth of features. You access these features by using *menus* and *palettes*.

Palettes

Palettes are windows that float over your "document" windows (the Model and Image windows). Palettes contain tools, options, and materials that you use to create images.

Some palettes have all their functions visible. Others save space on your screen by storing features in drawers or subpalettes.



Some of Painter 3D's palettes.

Types of Palettes

Painter 3D has seven main palettes—Tools, Controls, Brushes, Art Materials, Objects, Maps Manager, and Objects 3D.

You can control the display of these palettes using the Window menu.

- The Tools palette determines your current activity. For example, you use this palette to draw, zoom in on a document, or select part of an image.

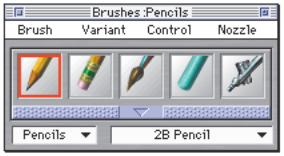
The Tools palette.

- The Controls palette complements the Tools palette. It changes to reflect options appropriate for whatever tool you select in the Tools palette. The Controls palette gives you instant access to the tool's main functions. For example, if you select the Brush

tool, the Controls palette shows drawing style options such as size, opacity, and grain.

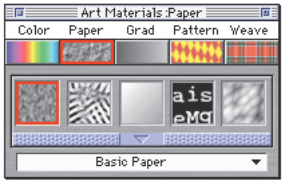
The Controls palette.

- The Brushes palette is where you choose from Painter 3D's abundant drawing, painting, and image editing brushes. You can move brushes from inside the palette drawer to the drawer front to access them more quickly.



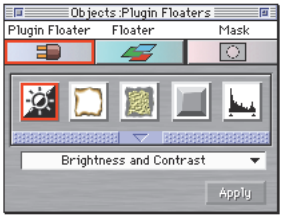
The Brushes palette.

- The Art Materials palette is where you select your materials—from the basics, like a color for your pencil, to sublime effects, like paper grain, patterns, and gradations. The subpalettes of the Art Materials palette are Color, Paper (texture), Grad, Pattern, and Weave.



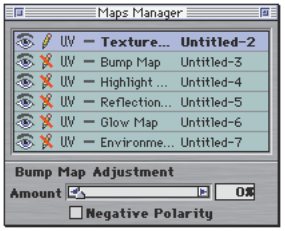
The Art Materials palette.

- The Objects palette gives you access to plug-in floater effects and helps you keep track of floaters and masks. For example, the Floater palette contains a Floater list that you use to select, view, and order floaters in your image maps. The Objects palette has three subpalettes: Plug-in Floater, Floater, and Mask. (For previous Detailer users, the Plug-in Floater and Mask subpalettes are new features.)



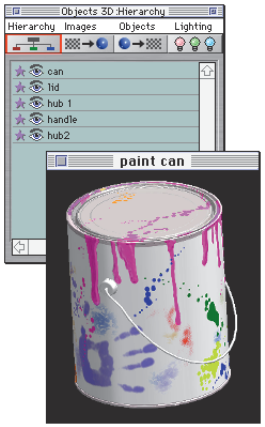
The Objects palette.

- The Maps Manager palette helps you manage the maps you apply to objects. For each object you select in the Model window, the Maps Manager palette lists the map types and gives you information about which ones you're using. From this palette, you can switch between various maps, edit several maps simultaneously, turn visibility on and off, view the mapping type, and see shared maps.



The Maps Manager palette.

- The Objects 3D palette helps you keep track of models, maps, objects, and lighting. Each of the subpalettes gives you information about the model. For example, the Hierarchy subpalette shows you the model's object hierarchy (if your model contains multiple objects), and the Objects subpalette lists all the objects associated with each map.



The Objects 3D palette in Hierarchy mode.

Rearranging Palettes

You can drag a palette to any location that's convenient for your work. You can also stack palettes together to save space. When palettes are moved in close proximity, they snap together.

Painter 3D saves your palette arrangement when you quit, including locked items, so that the arrangement appears as you left it the next time you start the program.

Viewing and Hiding Palettes

You can hide a single palette by clicking its close box. You can display a palette by choosing its name from the Window menu or using the key combination shown on the Window menu.

To hide all of the palettes:

- Choose **Window menu> Hide Palettes**.

  Or

- Press Command/Ctrl+H.

To display palettes again:

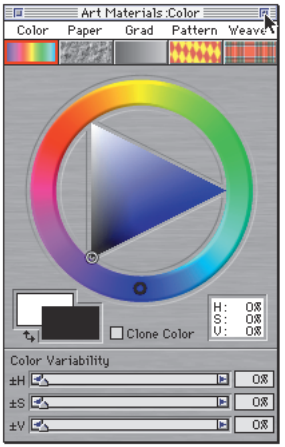
- Choose **Window menu> Show Palettes** to display the palettes.

  Or

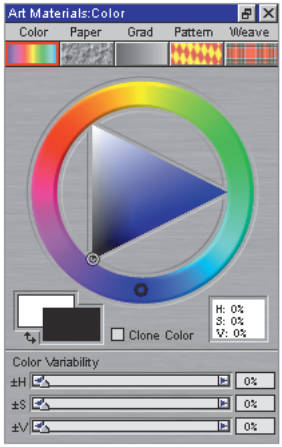
- Press Command/Ctrl+H.

Viewing Additional Palette Controls

Many of Painter 3D's palettes have additional controls you can display or hide, depending on the task at hand. If you open a subpalette, you can expand it by clicking its grow box. For example, the Maps Manager palette can be expanded to show you options for flipping the map along the X or Y axis or for dropping the mesh onto the map. Click the grow box again to hide these options. In the following example, you can view the Color Variability sliders in the expanded Art Materials palette.



To expand the palette on a Macintosh, click the "grow box" in the upper-right corner.



To expand the palette on Windows, click the Maximize button in the upper-right corner, left-hand position.

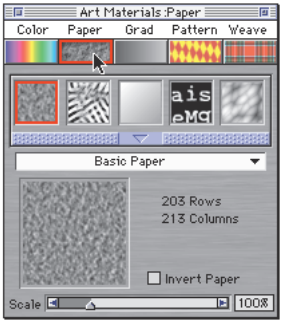
Using Items in Palettes

To select an item from the palette:

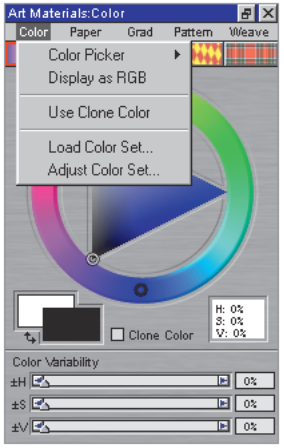
- Click the item's icon on the front of the palette.

  A red outline appears around the icon you select. If you clicked an icon representing a subpalette, the palette displays the options for that subpalette.

  For example, when you click the Paper icon on the Art Materials palette, the palette appears along with a drawer containing a collection of different papers. You can collapse this subpalette by clicking its icon again.



Click items on the front of a palette to select them.



Pop-up menus within palettes offer additional options.

To select a command from the palette:

- Choose a command from a menu above an icon.

Some menu items open other palettes. For example, you can open the Brush Size palette by choosing Size from the Brushes palette: Control menu.

When you've finished using the Brush Size palette, close it by clicking its close box.

Using Palette Drawers

- You can open the drawer of a main palette or subpalette to see the other items inside the drawer. The pushbar indicates which palettes or subpalettes have drawers.

Clicking the pushbar opens the drawer.

Storing items in closed drawers gives you more screen space. It's a good idea to keep items on the drawer front that you use most often and retrieve other items when you need them. For example, you can keep the most often used papers on the front of the Paper subpalette. Then open the paper drawer to retrieve a paper you use less often.

To retrieve items from inside a drawer, open the drawer by clicking its pushbar. A down arrow on the pushbar means the drawer can be opened. You can click anywhere on the pushbar to open and close a drawer. There are three ways to retrieve items from drawers:

- By clicking the icon
- By dragging the icon from inside the drawer to the drawer front
- By selecting the item's name from the pop-up menu.

You can reload some of the drawers with a new set of materials (a library). How to use, create, and manage libraries is covered later in this chapter.

You can access any palette drawer while in the Effects dialogs. Your new selection updates in the preview window. For more information about effects, see the online book Painter 3D Advanced Guide located on the Painter 3D CD-ROM.

To take items out of a drawer:

- Open the drawer and click the icon for the item you want.

The item moves to the front of the drawer and is outlined in red to show that it is selected. Painter 3D automatically replaces the least recently used item.

Items that are already on the front of the drawer are ghosted inside the drawer. This means that there's a dimmed space inside the drawer for the item, but because the item is already on the drawer front, its space appears dim inside the drawer. When you put an item away, it goes back to the same location so that you can always find it easily.

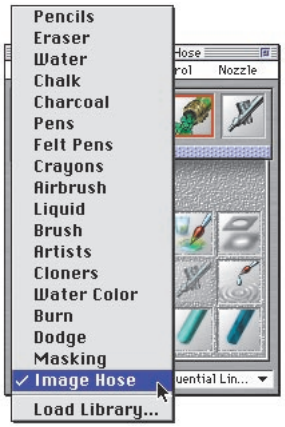
To drag items out of a drawer:

- Once the drawer is open, you can drag items out of the drawer to a specific position on the drawer front.

If you want to rearrange an icon's position on the drawer front, first replace it by an icon from the drawer. Then drag the icon from inside the drawer onto the desired position on the drawer front.

To use the pop-up menu to take items out of a drawer:

1. To select an item by name, click the Brush pop-up menu to display a list of all the items in the drawer.



You can use the Brush pop-up menu to select items within drawers.

2. Highlight the item you want and release the mouse or stylus to confirm your selection. The item's name appears on the Brush pop-up and its icon appears on the drawer front outlined in red.

3. Click the pushbar to close the drawer.

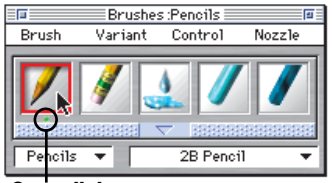
Locking Items on the Drawer Front

You can arrange the items you use most frequently on the drawer front and lock them in place. When an item is locked, Painter 3D will not put another item in its place. You can lock your favorite tools to the front of the drawer so they are always there when you need them.

To lock items in place:

1. Drag each item out of the drawer to where you want it on the drawer front.

2. For each item you want to lock, click its icon, and hold down the mouse button until a tiny green light appears under the icon. When you let go, the light stays on to show that the item is locked.



Green light (indicates a locked item)

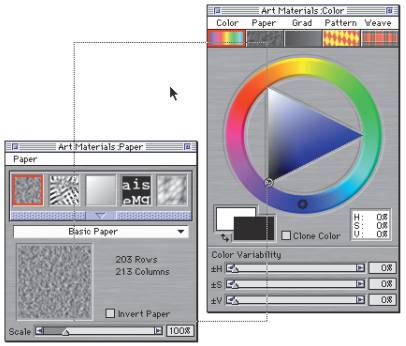
Hold down on an icon until a small green light appears beneath the icon. This item is now locked on the drawer front.

The item stays locked until you unlock it by clicking the icon again and holding down the mouse button until the green light disappears. Painter 3D lets you lock all but one item on any drawer front. One item must remain unlocked to allow a space for any new item you might select.

Tearing Off Palettes

At times you'll want to work with two palettes that usually aren't available at the same time. For example, you might want to work simultaneously with the Images and Objects subpalettes.

If you want to work with two subpalettes side-by-side, you can "tear off" one of them to display it separately. Just drag its icon off the main palette. The torn off palette appears where you drop it.



Tear an unselected palette off the main palette by dragging out the palette icon.

When you no longer need the palette you've torn off, just click its close box.

One subpalette must remain displayed in the main palette.You can tear off any subpalette *that is not currently selected.* If you want to tear off the current palette, select a different palette first, then drag the icon of the palette you want to tear off.

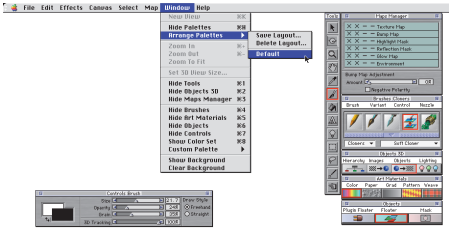
If you find you can't tear off a subpalette, it's probably because it's the currently selected palette. Deselect it first before trying to drag it off the main palette.

Cleaning-up Palettes

If the palettes start to clutter your desktop, you can tidy up by returning palettes to Painter 3D's default arrangement along the edges of the screen.

To clean up palettes:

- Choose **Window menu> Arrange Palettes > Default.**



When you choose the default palette arrangement, Painter 3D stacks them neatly on the right of your screen.

Palette Tips:

- Arrange your palettes so you can find and identify controls more effectively. Make sure that open palettes don't overlap each other. Palettes hidden in this way can be hard to find.
- Lock your favorite brushes to the Brushes palette drawer front for quick access.
- If you have two monitors, use one to display the palettes, and use the other monitor to work in the Model and Image windows.
- If you like the palettes arranged in a particular manner, save the layout by choosing Windows menu> Arrange Palettes> Save Layout.

The Tools Palette

This section describes the tools in the Tools palette. The other palettes are described more fully in subsequent chapters.

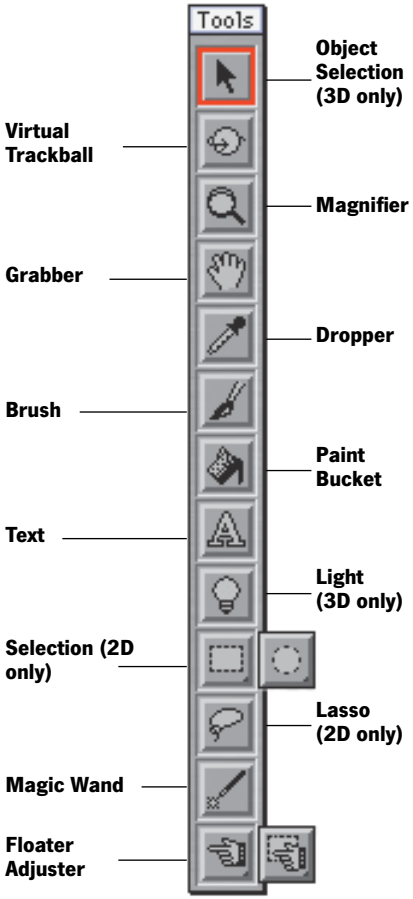
The Tools palette contains tools for viewing and navigating, adding light, painting, filling with color, and creating selections. If the Tools palette doesn't appear on your screen, you can display it by choosing Window menu> Show Tools.

Some tools are exclusively for working in the Model window. Others are only for working in 2D Image windows. Several tools may be used in both windows. Depending on which window is active, Painter 3D dims the icons of tools that are not available for the current window.

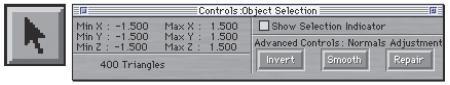
All of the tools have keyboard shortcuts, refer to the *Quick Reference Card* which is included in your Painter 3D box.

The Controls palette relates to the Tools palette in that it contains options for the current tool. The Controls palette updates

as you select different tools to reveal the selected tool's options. If the Controls palette is not displayed on your screen, you can display it by choosing Window menu> Show Controls.



The Object Selection Tool



The Object Selection tool works only in the Model window.

The Object Selection tool lets you select the object (in a model comprised of several) that you want to detail. The Controls palette shows technical information on the selected object. If you don't want the object outlined in red in the Model window, be sure the Show Selection Indicator option is unchecked in the Controls palette.

The Controls palette also gives options for adjusting normals. Normals are used by 3D applications to perform smoothing and shading calculations. Adjusting normals might be useful with certain imported models. Refer to "Special Features for Normals" on page 52 for more information.

The Virtual Trackball Tool

The Virtual Trackball tool works in both the Model and Image windows.

Model Window

The Virtual Trackball tool lets you rotate your view of the model in the Model Window. The Controls palette offers sliders for controlled rotation on each of the three axes. You can control rotation more precisely by either typing in rotation values or by choosing preset and custom views from the Preset View Position pop-up menu.

The Virtual Trackball tool rotates the view of the model in the Model window so you can view it from different angles; it does not rotate the model itself. By default, lights remain fixed in relation to the surfaces of the model (unless you specify otherwise). Refer to "Using the Virtual Trackball" on page 33, for more information about using the Virtual Trackball tool.

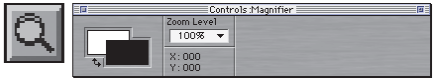
Image Window

In an Image window, the Virtual Trackball tool lets you rotate the image canvas to an angle that's comfortable to your drawing style.

Using the Virtual Trackball tool, drag (in the Image window) to rotate your page. When you want to set the image back to its natural orientation, click once in the window, or double-click the tool in the Tool palette.

The keyboard shortcuts for this tool work regardless of the window type. Use Option-Spacebar for Macintosh or Spacebar+Alt for Windows. (Also, holding down the Shift key while rotating the view disables locked lights.)

Magnifier Tool



The Magnifier tool works in both the Model and Image windows.

The Magnifier tool allows you to magnify areas of an image to perform detailed work or zoom-out to get an overall view of an image. Click once to zoom in. To zoom out, hold down the Option/Alt key and click. Double-click the tool to return the Model window to original magnification.

Drag a marquee to zoom in on a given area of an image. You can also use the Controls palette to set the zoom level in Image windows.

You can access the Magnifier tool while any other tool is selected. For Macintosh, hold down Command-Spacebar and click to zoom in or Command-Option-Spacebar and click to zoom out. For Windows, use Spacebar+Ctrl to zoom in and Spacebar+Ctrl+Alt to zoom out.

Grabber Tool

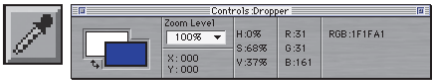
The Grabber tool works in both the Model and Image windows.

The Grabber tool gives you a quick way to scroll the image or the model. You can also set the zoom level on the Controls palette for an Image window when the Grabber tool is selected.

Double-click the Grabber tool to center the model in the window.

You can access the Grabber tool while any other tool is selected by holding down the Spacebar.

The Dropper Tool



The Dropper tool works in both the Model and Image windows.

The Dropper tool lets you pick up a color for use elsewhere. The Controls palette shows you values for the color. When you select a color with the Dropper tool, that color becomes the current color on the Art Materials: Color palette.

You can access the Dropper tool from any color related tool by holding down Command for Macintosh and Ctrl for Windows. These tools include the Brush, Paint Bucket, Rectangular and Oval Selection tools, and the Floater Adjuster.

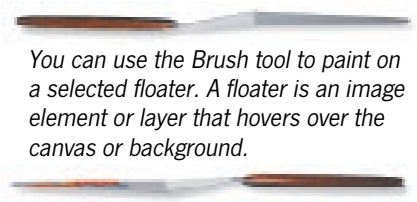
When used on a model, the Dropper picks up the color of an object without calculating the color of a light on the surface.

The Brush Tool

The Brush tool works in both the Model and Image windows.

The Brush tool lets you paint strokes directly on the model, on images or on a floater. You can set Size, Opacity, Grain, and Draw Style (Freehand or Straight Lines) in the Controls palette. You can also set 3D tracking speed, which affects how quickly a brush stroke appears on a model. (This can be useful when working with big brushes that take time to draw onscreen.) Refer to "3D Tracking Speed" on page 124 for further information.

The Brush tool represents a category of marking tools. Within the Brush category are pencils, crayons, pens, chalk, airbrushes, the remarkable Image Hose, and more. The Brushes palette lets you choose between these tools and gives you access to controls that let you customize the brushes. All of these features are described in "Painting" on page 117 and in the online book *Painter 3D Advanced Guide*.



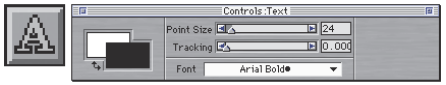
You can use the Brush tool to paint on a selected floater. A floater is an image element or layer that hovers over the canvas or background.

The Paint Bucket Tool

The Paint Bucket works in both the Model and Image windows.

The Paint Bucket tool lets you fill an area. The Controls palette shows choices for what area to fill and what to fill it with. You now have the choice of doing a cartoon cell fill, a method useful for filling areas bounded by anti-aliased lines.

The Text Tool



The Text tool works in both the Model and Image windows.

The Text tool lets you create text floaters. Use the Controls palette to choose a font, point size, and set tracking.

The Light Tool

The Light tool works only in the Model window.

The Light tool lets you click the model to create a light that shines on the spot you click. The Controls palette gives you sliders to adjust the light you create. You can also choose to lock lights to objects and unlock them.

The Selection Tools

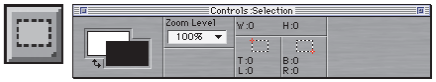
The Selection tools work only in Image windows.

The Selection tools lets you select an oval or rectangular area. When you create a selection, its coordinates appear on the Controls palette.

These tools share a space on the Tools palette. Only one appears at a time. To select the other tool, hold down the mouse button when you click the icon. The other tool pops up so you can select it.

Hold down the Shift key while using these tools to constrain the selection to perfect squares and circles.

Rectangular Selection Tool



The Rectangular Selection tool allows you to create square or rectangular selections.

Oval Selection Tool

The Oval Selection tool allows you to create circular or oval selections.

The Lasso Tool

The Lasso tool works only in Image windows.

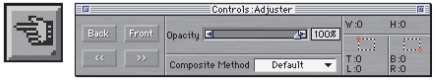
The Lasso tool lets you create a freehand selection area. The selection automatically snaps closed when you let up on your mouse or stylus. On the Controls palette, you can choose to add or subtract from an existing selection.

The Magic Wand Tool

The Magic Wand tool works only in the Image window.

The Magic Wand tool lets you select a contiguous area based on color similarity. This tool can be quite useful because it quickly selects a free-form area based on pixels in a similar value range.

The Floater Adjuster/Selection Adjuster Tool



The Floater Adjuster works in both the Model and Image windows; however, not all functions are available in the Model window.

The Floater Adjuster tool allows you to select and adjust floaters. Click once to select one floater, or shift-click to select additional floaters.

Floaters are image elements that float above the background image. The Controls palette lets you change opacity, feathering, composite methods and floater layer order. It also allows you to group and drop floaters.

The following functions of the Floater Adjuster are restricted to Image windows:

- Selecting floaters by dragging a marquee.
- Adjusting a reference floater by dragging its handles.

Libraries

A library is a saved collection of similar tools that can be loaded into a palette. For example, Painter 3D's built-in brushes (and their variants) are contained in the default brush library, which is loaded when you launch Painter 3D. As you customize brushes and other materials, you can save them into your own libraries. (For Macintosh computers, the default brush library is **Painter 3D Brushes**; for Windows, it's **PAINTER3D.BRS**.)

Libraries are available for papers, patterns, gradations, brushes, nozzles, floaters, and lighting. You can have any number of libraries, but only one (of each type) can be open at a time. When you want to use other tools, load the alternate libraries.

Libraries allow you to extend Painter 3D's tools and materials, without overloading the palette drawers. The methods for working with all libraries are the same.

You can create new libraries, add tools or materials, and move items between libraries.

It's a good idea to limit the number of tools or materials in a library. This makes it easier to find a particular tool and helps Painter 3D manage memory.

Brushes are loaded into memory when you launch Painter 3D, so adding brushes to the default brush library increases Painter 3D's need for RAM. If you're working close to the memory threshold, you'll want to organize new brushes into secondary libraries. When you want a different brush set, switch libraries. This allows Painter 3D to be more efficient with memory.

Adding Resources to the Current Library

As you work with Painter 3D and create new resources, you can save them to the current library. The command for adding a resource depends on its type. In some cases, you click a Save button. In others, you choose a menu command. And in the case of floaters, you drag them from the image into the Floater Portfolio.

The method of adding a particular resource to the library is described in the section on customizing that resource.

Loading Alternate Libraries

To use the items in a library different than the one currently loaded, load that library.

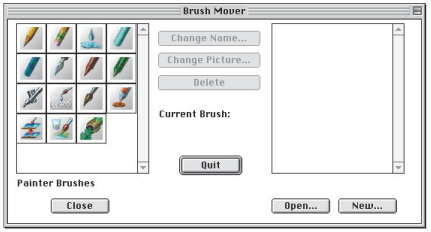
To switch libraries:

1. Open the palette drawer from within the palette you are currently working, for example, Brushes.
2. Click the Brush pop-up and choose Load Library. Painter 3D displays an Open dialog.
3. Select a library, then click Open or OK. Painter 3D loads the items from that library into the palette.

Customizing Libraries

The controls for creating libraries and managing their contents are contained in the Movers, which are special dialogs that help you work with libraries. A Mover is provided for each category supported by libraries—papers, patterns, gradations, brushes, nozzles, floaters, weaves, and 2D lights. (Color is the only art material not supported by libraries; therefore, there is no Mover dialog for colors.)

You access the various Mover dialogs by choosing the appropriate Mover command from palette menus: either an art material's menu or a tool's menu.



Create new libraries with the Movers. The Brush Mover lets you customize your Brush Library.

Creating a New Library

Create a new library first, then copy or save items to the library.

To create a new library:

1. Open the Mover for the art material or tool you want.
2. Click New. Painter 3D prompts you to name the new library.
3. Enter a descriptive name and click Save or OK.

It's a good idea to save libraries in the same folder. This makes them easy to locate and load when you want them.

The new library's name appears on the right-hand side of the Mover window. The area above the name is blank because this new library is empty. To put things in it, you can move them from other libraries.

Moving Items Between Libraries

Movers copy items from the two open libraries displayed in the dialog.

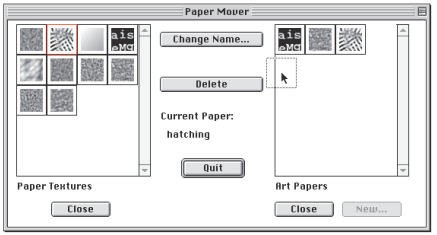
When you open a Mover, the resources of the current library are listed on the left. If this is not the library you want to move items from, open a different library by first clicking Close. Then click Open and select a different library file.

You must have a destination library open in the dialog. If you just created a new library, it appears in the right side of the dialog. If the dialog is empty, open an existing library. Click Open and select a library file.

When the source library is open on one side and the destination library is open on the other, you are ready to move resources.

To copy an item between libraries:

- Drag the item you want to move from the source to the destination library.



Move items between libraries by dragging.

Modifying a Library

If you want to delete a resource from a library, you can—but be careful. If you remove one of Painter 3D's default brushes by mistake, the only way to retrieve it is to reinstall Painter 3D. When you reinstall Painter 3D, you'll lose any of the custom resources you've created, unless you save them into other libraries.

Deleting Items

To delete an item from a library:

1. Open the Mover for the resource category you want to modify.
2. Select the item you want to delete.
3. Click Delete.

Renaming Items

To change the name of an item:

1. Open the Mover for the resource category you want to modify.
2. Double-click the icon of the item. (You can also click once to select the item, then click Change Name.)
3. Enter the new name and click OK.

Changing Brush Icons

When working with brushes, you have the option of replacing the icon used on the Brushes palette.

Before you open the Brush Mover, use the Rectangular Selection tool to select part of a 2D image you want as the brush icon.

To change the image icon of a bush icon:

1. Create artwork for the brush icon. Use the Rectangular Selection tool to select the image.
2. Open the Brush Mover by choosing **Brushes palette**: **Brushes menu> Brush Mover**.

3. Select the brush whose picture you want to change.
4. Click Change Picture. Painter 3D displays the change that you're proposing.
5. If you're sure you want to change the picture, click OK.

Deleting a Library

To delete an entire library on a Macintosh, go to the finder and drag the library to the trash. On Windows, you can delete the file from the Windows 95 Explorer. You can also drag the file to the Recycle Bin. Be careful not to delete Painter 3D's default libraries. Painter 3D needs them to start up.

About Plug-Ins

Painter 3D supports third-party Photoshop®-compatible plug-ins such as Kai's Power Tools™. There are three kinds of plug-ins: Filter plug-ins, Acquire plug-ins, and Export plug-ins. Plug-in modules are available from Painter 3D menus. However, the actual operation of these plug-ins is determined by the plug-in developer. You should refer to the documentation that came with your plug-in modules for instructions on how they work.

If you are interested in developing plug-in modules, please contact Adobe Systems Inc. for Developer kit information.

Filter Plug-ins

Filter plug-ins appear after Painter 3D's built-in effects, in the Effects menu. These Filter plug-ins are usually comprised of special image-editing effects. Plug-in filters operate the same way that Painter 3D's Effects operate. If you have an active selection, the filter is applied to the selection. If you have no selection, the filter is applied to the entire image. Once the effect is applied to a map image that has been associated with a model, the view updates in the Model window.

Because Painter 3D and Photoshop were developed by different companies, there may be filters that run in one program, but not in another. MetaCreations has made a conscientious effort to maintain compatibility with as many third party filters as possible. Check with the filter developer to find out whether there are any compatibility problems between their product and Painter 3D. Please note that since Painter 3D is an RGB-based program, it cannot run filters that are specific to CMYK or Grayscale modes.

Acquire Plug-ins

Import plug-ins are accessed through File menu> Acquire. The Import interface is generally used to support file formats that are not built-into Painter 3D.

Export Plug-ins

Export modules are used to export models. Export modules are available through File menu> Export.

Check the Web site at www.metacreations.com for new information and availability of import and export plug-ins for different 3D file formats.

Making Plug-Ins Available to Painter 3D

When Painter 3D launches, it searches for plug-ins in two locations. Painter 3D first looks in the Painter 3D application folder and subfolders. The second place that Painter 3D looks is the folder specified by the Edit menu> Preferences> Other Raster Plug-Ins preference.

Before Painter 3D can display your plug-ins in the Effects menu, you must indicate where your plug-ins are located on your hard drive. Painter 3D loads plug-ins from the selected folders.

To locate the plug-ins folder:

1. Choose **Edit menu> Preferences> Other Raster Plug-Ins**. The Open File dialog appears.
2. Locate the folder that contains your plug-ins.
3. Click Select Plug-ins.
4. Quit Painter 3D and then restart the program to load these plug-ins.

When Painter 3D starts up, it quickly displays the names of all available plug-ins on the start-up screen.

To use third-party 2D plug-ins from within Painter 3D:

- Choose **Effects menu**. A list of available plug-ins appears at the bottom of the menu. You can use them to edit your image.

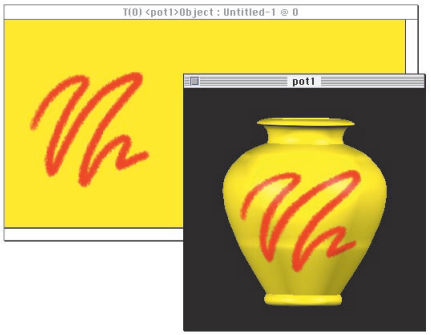
Painter 3D Basics

How Painter 3D Works

Using Painter 3D at its simplest level, you basically work with two items: a 3D model and a 2D image that decorates the surface of the model. The image wraps around the model in a process called mapping. (There are various mapping methods you can choose from.) Depending on the images and settings you use, you can make the model look like wood, metal, stone, plastic, even skin, and more.

With Painter 3D, you develop the image by painting directly on the model in the Model window (for real-time accuracy) or by working on a canvas in an Image window. In fact, you'll probably find yourself switching constantly between the two windows, depending on the look you're trying to achieve. As you make

changes in either window, the changes appear immediately on the model in the Model window.



As you paint in one window, the other updates with your changes.

You can choose to not view brush strokes in the Model window. This lets you concentrate on the 2D image, if it suits you, and also saves your computer's resources if you're working with complex models.

You can get much more elaborate with Painter 3D—using models made of several objects and applying several maps to a single object—but the fundamental idea is the same. You create a 2D surface and apply it to your 3D object.

Putting It All Together

This section briefly describes the typical process you use with Painter 3D.

1. Begin with a model. This can be a multi-object model you've created in a 3D modeling program and opened in Painter 3D. Or it can be a simple primitive model you created within Painter 3D.
2. Select an object and apply images to it as surface maps. You can have six types of maps associated with a single object to create various effects.
3. Add lights, if necessary, so you can clearly see the effects of the images you're creating. (Note that lights are provided strictly as an aid to working with your model in Painter 3D. Painter 3D's lights do not carry over into 3D applications.)
4. Save the maps and apply them to your model in your 3D application. Or, if you created and painted a primitive model in Painter 3D, you can export it and the maps individually to another application.
5. If you like, render the finished model as a 2D image complete with mask for compositing in other 2D applications.

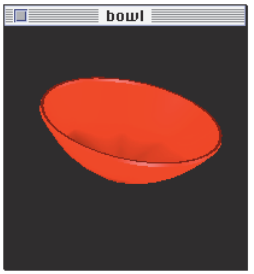
Working With the Pieces

The next several sections describe each of the items you work with in Painter 3D.

Models

You have several ways to generate and import models in Painter 3D, including creating primitive models directly in Painter 3D, and opening 3D files that were created in Ray Dream Studio and saved as VDU or P3D files. You can also import 3D files from various other 3D modeling programs as long as they use DXF, 3DMF, 3DS or OBJ formats.

When you open a model, Painter 3D displays a 3D view of it in the Model window. You can rotate your view of the model, zoom in, and move the model in the window.

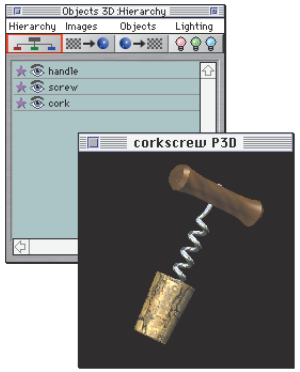


Your model appears in 3D in the Model window.

Once you have a model in the Model window, you can begin creating a surface for it, which you do by creating a map.

Objects

Objects are the pieces that make up complex models. Models can be comprised of many separate objects, limited only by your computer's resources. In Painter 3D, each object can have completely different colors and surface characteristics.

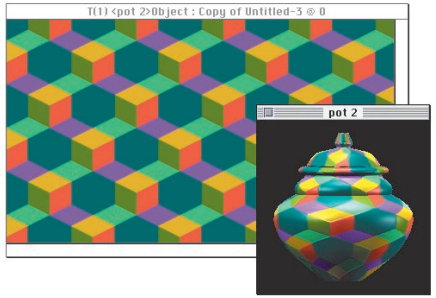


A model's objects are listed in the Hierarchy list.

If your model is made up of several objects, you select each object individually before beginning to detail it. You can, however, "share" a single map to multiple objects. This lets you reuse a particular surface over and over again, which is handy if your model contains repetitive objects such as the rungs of a ladder or the legs of a centipede. It also lets you make sweeping changes easily because you simply make your changes in one map and the change is reflected in all the objects that use that map.

Maps

Once you select an object, you can apply one or more 2D images to its surface. Painter 3D maps these 2D images onto the 3D object to give it color and surface relief.



A 2D image mapped onto a 3D object.

For each object, you can load one image for each of six map types. You can leave any map type empty. The six map types are texture, bump, highlight, reflection, glow, and environment.

Texture Map

A texture map adds color to the object. With the Painter 3D array of colors, brushes, and art materials, you can create rich, detailed imagery on this map. You'll probably find yourself using this type of map more often than any other.

Bump Map

A bump map creates surface relief or the appearance of physical texture for the object. You can carve out or build up surfaces with this map based on luminance values. This means that peaks and valleys are created from dark and light areas, not from color itself.

Highlight Mask Map

A highlight mask map controls the highlight in different areas. Dark areas of the mask reduce highlights and light areas increase them. Using black, white, and shades of gray, you can specify the areas on a surface that should be shiny or matte with this map.

Reflection Mask Map

A reflection map controls the reflection in different areas on the object. Dark areas of the mask reduce the reflection and lighter areas increase it.

Glow Map

A glow map applies additional color after the other maps have been applied to the object. The glow map is useful for enhancing objects that emit light such as lamps or LEDs.

Environment Map

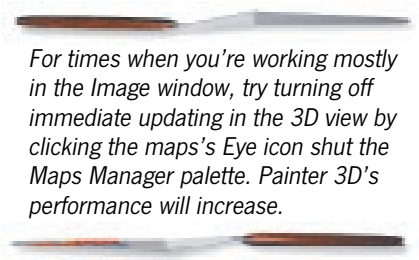
An environment map is an image that appears in reflections on objects. The effects can be quite subtle or dramatic, depending on whether the object's reflection setting is low or high.

Map Files and the Image Window

Once you begin creating a map for an object, pick a mapping method, then Painter 3D opens the map in an Image window. Although you can have several maps for a single object, there is only one Image window associated with each object. This helps avoid clutter on your desktop.

If you have more than one map type for an object, you can work on the maps one at a time or simultaneously. Working on several maps at the same time ensures that the brush strokes you perform on one map are duplicated exactly on another map. Use the Maps Manager palette to select single or multiple maps (refer to "The Maps Manager Palette" on page 37).

You can create surfaces working in 2D in the Image window or working in 3D by painting directly on the object in the Model window. If you're working in the Image window, you can set up Painter 3D so that the changes you make appear immediately on the surface of the object in the Model window. If you do so, be aware that constantly updating the Model window consumes more of your computer's resources and may cause Painter 3D to react sluggishly.



For times when you're working mostly in the Image window, try turning off immediate updating in the 3D view by clicking the maps's Eye icon shut the Maps Manager palette. Painter 3D's performance will increase.

Mapping Methods

Painter 3D offers several methods for mapping the 2D image onto the 3D object: cylindrical, spherical, pass-thru, cubical, and implicit (UV).

Each method is suited for objects of different shapes. The mapping mode you choose, and how you design the imagery, makes a huge difference in how the map appears on the object. You can change the mapping method at any time using Mapping button on the Objects 3D: Object palette or by double-clicking the mapping method in the Maps Manager palette.

In fact, you might want to experiment with different mapping methods so you can see how different the results can be, even though you're using the same map. Refer to "Using Maps" on page 67 for a fuller discussion of the various mapping methods.

Lighting

Several of the surface effects you can create depend on light. Painter 3D's Light tool and the Objects 3D: Lighting palette makes it easy to shine lights on your model. You can color or dim the lights to light the object just how you want it.

Lighting effects are specific to Painter 3D only. They appear in the Model window as you add them or change their color. They also appear when you render your image in Painter 3D. They have no effect when you export maps and models to another application.

Rendering

When you're satisfied with the maps you've applied, the lighting you've set up, and the position and orientation of your model, you can render the Model window to a 2D image.

The rendering can be a larger, anti-aliased version of what you see in the Model window. You can save the rendering and use it as a still image for printing or displaying on the Web.

The rendering includes a mask of the model, so compositing with other images is clean and easy. You can composite images directly in Painter 3D or in another 2D image-editing application.

Refer to "Rendering an Image" on page 38 for more information.

Working in the Model Window

The Model window shows a 3D view of the model you're working on. When you're adding detail to a model, you'll want to keep the area you're painting centered in the window, at a reasonable scale, and square to your view.

Painter 3D provides three navigation tools that make it easy to view and paint on any surface of the model—the Virtual Trackball, the Magnifier, and the Grabber tools.

The Model window displays the 3D view of the model.

Key shortcuts let you temporarily switch to the navigation tools.

To switch to Virtual Trackball tool, choose Option-Spacebar for Macintosh, Spacebar+Alt for Windows.

To zoom-in, choose Command-Spacebar for Macintosh, Spacebar+Ctrl for Windows.

To zoom-out, choose Command-Option-Spacebar for Macintosh, Spacebar+Ctrl+Alt for Windows.

To switch to the Grabber tool, hold down the Spacebar.

The Macintosh System has a keyboard option for cycling through different keyboard layouts. You'll want to make sure this is disabled before zooming out—otherwise your keyboard might start acting unpredictably. Choose Apple menu> Control Panels> Keyboard. In the dialog, make sure the Command-Option-Spacebar feature is disabled.

Using the Virtual Trackball

You can view the model from any angle by rotating your view. Viewing from a particular angle helps when you're painting. It's much easier to work when you're facing the surface you're painting. Trying to paint oblique surfaces (on the side or edge of an object) can be difficult.

To change the 3D view:

1. Choose the Virtual Trackball tool.
2. In the Model window, drag to rotate your view of the model.

Here are some tips for rotating the model:

- Drag down from the center of the window to view the model from above (rotating the model along the X axis).
- Drag left or right from the center of the window to view from the other side (rotating the model along the Y axis).
- Drag in a circle (or arc) from a corner of the window to change which side is up (rotating along the Z axis).
- Drag at an angle to rotate on several axes.

In the model space, the model doesn't actually move. The model is fixed with respect to the lights. When you use the Virtual Trackball, you're changing your view of the model. That is, the model stays in one place and you move around it. You may want to adjust lighting after rotating your view or lock the lighting to the object.

If you move around the model, you might find an area that is dark. This is because there is no light shining from that side. You could add a light to shine there, increase ambient light, or enable the Flat Lighting option in the Objects 3D: Lighting palette. See "Using Light" on page 95 for more information on controlling light.

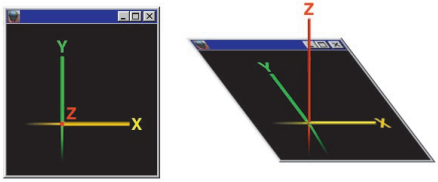
If you prefer, you can have the lighting remain stationary relative to your viewpoint by holding down the Shift key as you drag in the Model window. In effect, it looks as if the model moves while the lights remain motionless.

Controlled Rotation

When the Virtual Trackball is selected, the Controls palette provides several ways to rotate the view. You can use sliders or type in precise values for rotating the view on the X, Y, and Z axes. The X axis runs horizontally. The Y axis runs vertically. The Z axis runs perpendicular to the plane of your monitor screen.

Drag the slider or enter a specific value for the direction you want to rotate the view.

Controlled rotation allows you to drag the slider to rotate around the desired axis.



The X axis runs horizontally. The Y axis runs vertically. The Z axis runs perpendicular to the plane of your monitor screen.

The direct view of the north pole, in the model space, is 0°, 0°, 0°. A direct view of the front would be 90°, 0°, 0°.

Preset Views

You can also choose from preset or custom views to snap the model to a typical orientation. You choose preset views from the Preset View Position pop-up. The choices are top, right, left, front, back, or bottom. You can also set a custom view using sliders or values, then use this pop-up to save and name the custom view so you can use it again.

Magnifying Your Subject

The Magnifier tool works in Image windows and in the Model window.

To zoom in:

1. Choose the Magnifier tool.
2. Click the area you want to view closer. You can also drag a marquee around the area you want to magnify. Painter 3D zooms to the highest level that can display the full area of the marquee.

To move back and get a larger view:

- Hold down the Option/Alt key, then click in the window.

  Or

- Double-click the tool to return to 100% in the Image window.

Magnification Pop-up Menu

The Controls palette: Magnifier tool provides a pop-up with a set of magnification factors. Select the level you want and Painter 3D immediately sets the magnification to that level in the Image window. This pop-up is active only if the Image window is the active window.

Panning the Model Window

Use the Grabber tool to pan the Model window so that the area you're working on is centered in the window. The Grabber tool works in the Model window and in Image windows.

To pan the Model window:

1. Choose the Grabber tool.
2. Drag the model (or image) to view the area you want.

To return the object to center:

- Double-click the tool.

Changing the Size of the Model Window

You can change the size of the Model window at any time.

To change the size of the Model window:

1. Choose **Window menu> Set 3D View Size**. The Set View Size dialog appears.

   The dialog shows how much RAM is required for the window specified. A larger window may be more comfortable to work in, but requires more RAM. The bigger the window, the longer it takes to display. A large window might not be possible on your system.
2. Click OK. Painter 3D sets the Model window to the new size.

Don't set a Model window that requires more RAM than your system has available. Between 200 and 300 pixels square is a good size for most systems.

Setting the Model window Background Color

You can choose a color for the background of the Model window to show off your model and its surfaces in different ways. You might want to use a dark background with a light colored image and vice-versa.

When you render the image in Painter 3D, the background color is included in the image. It is not included if you export the model or maps to another application.

If you are creating a 2D collage of several renderings, you might want to set the background color accordingly.

Change the background color and see how it affects the way the model appears.

To change the background color:

1. Choose **Edit menu> Preferences> Model**. Painter 3D displays the Model Preferences dialog.

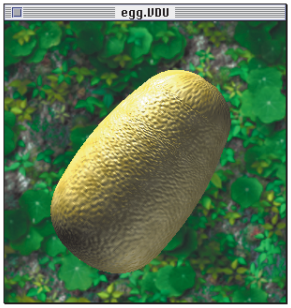
   The other model preferences are described in "Model Preferences" on page 45.

2. Click the Background Color swatch. Painter 3D opens the system color picker so you can choose a color for the window background.

Importing a Background Image

Painter 3D lets you import an image as the background of the Model window. You can use the image in the rendering of the finished model. This lets you adjust the surface maps, lighting, and view of your model to match the imagery in the scene.

When you render the 3D view, the background is included in the image. It is not included when you export a model or maps to another application.



You can import a background and render with it.

To import a background:

1. Open the model you are working on.
2. Choose **File menu> Acquire> Background**. A standard Open dialog appears.
3. Navigate to the location of the file you want, select it, then choose Open.

   Painter 3D imports the background image you chose.

Painter 3D supports the following image file formats: RIFF, TIFF, PICT, Photoshop 2.0 and 3.0, BMP, PCX, TARGA, FRM, PYR, and JPEG.

The background image appears in the Model window aligned at the top left corner.

If the background image is larger than the Model window, only the upper left region of the image is visible. If this is not the effect you want, create a new image that is either scaled or cropped to the region you want.

If the background image is smaller than the Model window, the image is tiled (repeated) to cover the area.

The background image file cannot be edited while it is associated with the model. If you need to edit the background image, you can do so in another application. Or, open it as a separate 2D image in Painter 3D, edit it, then save and reimport it as a background again.

Hiding and Showing the Background Image

At times, you might want to temporarily remove the background image. Perhaps you find the image a distraction to your painting or you want to render without it.

To hide the background image:

1. Bring the Model window to the front.
2. Choose **Window menu> Hide Background**. Painter 3D sets the window to display the background color.

To show the background image:

1. Bring the Model window to the front.
2. Choose **Window menu> Show Background**. Painter 3D sets the window to display the background image.

To remove the background image completely:

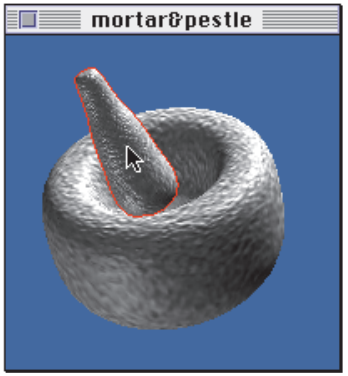
- Choose **Window menu> Remove Background.**

Objects and Maps

Painter 3D supports models constructed of hundreds of separate objects, limited only by your computer's resources. Each object can have a unique set of maps applied to it. When you work with a multi-object model, you need to select which object within the model you want to detail.

To select an object:

1. Choose the Object Selection tool.
2. In the Model window, click the object you want. The selected object appears outlined in the 3D view.



Selecting one object of a multi-object model.

In a model comprised of a single object, like Painter 3D's own primitives, that object is automatically selected.

By default, Painter 3D outlines the selected object in red. If you find the red outline distracting, you can toggle it off and on during the session or change the default.

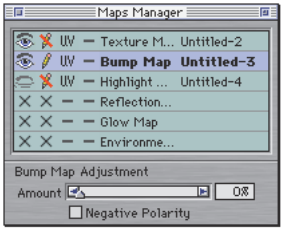
To temporarily remove the red outline, uncheck the Show Selection Indicator in the Controls: Object Selection palette. To change Painter 3D's default behavior, uncheck the Show Red Indicator When Selecting Objects setting in the General Preferences dialog. Refer to "General Preferences" on page 41 for more information about Painter 3D's preferences.

The Maps Manager Palette

The features for applying and controlling maps are found on the Map menu and on the Maps Manager palette. Some features appear in both places to give you a choice of how to work.

The Maps Manager palette lists the six map types that you can apply to objects: Texture, Bump, Highlight, Reflection, Glow, and Environment.

When you select an object, the Maps Manager palette updates to show any settings and maps loaded for that object.



The Maps Manager palette holds the controls for the six maps.

In each map type listing, there are four icons to the left of the map type, and the name of the map file to the right. Two Xs at the left of a map list indicates that the selected object does not have a map of this type loaded.

If an object has a map associated with it, Eye and Pencil icons appear next to the map type. The map file name appears on the right of the listing.

The Eye icon controls whether Painter 3D displays the map on the object in the Model window. When the Eye is open, the map appears on the object in the Model window. When the Eye is shut, the map is not applied; it's only viewable in the Image window, which saves memory. You can click the Eye once to open and close it.

The Pencil icon controls which map is active for editing. Click the map name to select it for editing. The Pencil icon for an active map is clear—the other Pencil icons have a red slash over them. When you select a map to edit, it moves to the top of the stack in the Image window. (You can open a new view by choosing Window menu> New View if you want to have maps in separate Image windows.)

The remaining two icons show you the mapping method for the map (spherical, cubical, UV, and so on) and whether the map is shared. (Shared maps are indicated with a yellow link icon.)

Simultaneous Map Editing

You can select multiple maps for simultaneous editing. This is useful when you want to precisely carry over brush strokes from one map to another. Shift-click Pencil icons to select and deselect multiple maps.

Rendering an Image

You can render the 3D view of your model to a separate image at any time. The rendering you create is a high resolution version of what you see in the Model window. The rendering includes a mask, which makes it easy to composite with other images.

Painter 3D's rendering camera does not create perspective views of the model. If you want a true perspective effect, you can export your Painter 3D model to Ray Dream Studio or another 3D program.

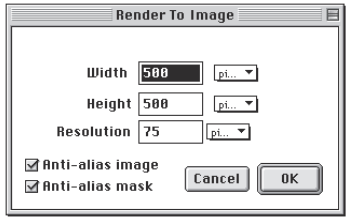
Render to Image

Rendering settings are found in the Render to Image dialog.

To render the 3D view:

1. Before rendering, use the Virtual Trackball, Magnifier, and Grabber tools to set the view of the model. Set the lights how you want them.

2. Choose **File menu> Render to Image**. Painter 3D displays a dialog that lets you set rendering options.



Set your rendering options in the Render to Image dialog.

3. Enter width and height values (in pixels) for the rendering resolution you want.

   The values you enter should conform to the aspect ratio of the Model window. Values that describe a different aspect can lead to unexpected results in the rendering.

4. Enter a pixel resolution at which to render the image. (Refer to "Images and Resolution" on page 11 for information about resolution.)

5. Set your anti-aliasing options.

   Anti-alias image: when this option is enabled, pixels at the edge of the model are faded to the background color. Anti-aliasing the image creates a softer edge.

   Use this option if you intend to use the rendering as a complete image.

   Anti-aliased images take significantly longer to render.

   Anti-alias mask: when this option is enabled, mask pixels at the edge of the model's shape are given intermediate density values.

   Use this option (and disable Anti-alias image) if you intend to composite the model with other images.

If you will be using your rendering as a finished image, choose to anti-alias the image but not the mask. If you are going to turn your rendering into a floater or layer, choose to anti-alias the mask, but not the image.

6. When you click OK, Painter 3D renders the image. Rendering can take some time, depending on the resolution you requested and the speed of your system. When the rendering is ready, Painter 3D opens it in a new Image window.

If you like the results, save the image file. If the rendering isn't what you expected, close the window without saving changes. Adjust your model, maps, or lights and render again.

Not all formats maintain the mask information. Save in RIFF, TIFF or Photoshop formats to maintain the mask information.

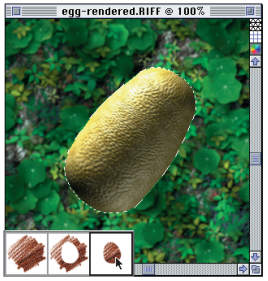
Using Renderings in Painter 3D

Often you'll want to composite the image of the rendered model with other imagery. The mask Painter 3D creates in the rendering makes compositing easy.

The dinosaur eggs are separate renderings composited in Painter 3D.

To composite your renderings in Painter 3D:

1. Open the saved rendering in Painter 3D. The rendering must be saved in a format that retains the mask (RIFF, TIFF, or Photoshop formats).
2. Click the Draw Inside icon at the bottom left of the Image window. A selection marquee appears around the model shape.
3. Choose **Edit menu> Copy**.
4. You can now move to another file and paste the selection. The selection is pasted as a floater. Refer to the online book *Painter 3D Advanced Guide* for more information about working with floaters.



Select the model object with the Draw Inside icon, then copy the image element and paste it in another image.

Saving Files

A model you've painted can have up to six maps for each object. If the model is comprised of a number of objects, there may be quite a few image files used for this one model. You'll need to save all these image files with the model.

When you select the Save command, Painter 3D applies it to the foremost window.

When an Image window is active, Painter 3D saves that image.

When the Model window is in front, Painter 3D saves the model as a Painter 3D model (P3D format). If any map images have not been saved, Painter 3D requires you to save them before saving the model file. When you save the model, Painter 3D prompts you to save any unsaved maps associated with the model.

Map Image windows must remain open while you are working with the model. If you close a map Image window, that map becomes dissociated from the model. You can hide them however, by clicking the Show Maps option in the Maps Manager palette.

Tips for Saving Files

When you're working with multi-object models and multiple maps, naming, and saving files can quickly become chaotic unless you apply some organization to the process. Here are some tips to help you:

- Save the model and all the maps associated with it in a single, separate folder. This simplifies opening and importing files in both Painter 3D and other 3D applications.
- Name your maps descriptively and consistently. For example, name all the maps for a single object using the same prefix but different suffixes: Handle Texture, Handle Bump, Handle Highlight, and so on. This helps you quickly find the maps that belong together when you're applying them to a model in another application.
- Get in the habit of using File menu> Save As. It's easy to lose track of maps and objects when you're working with

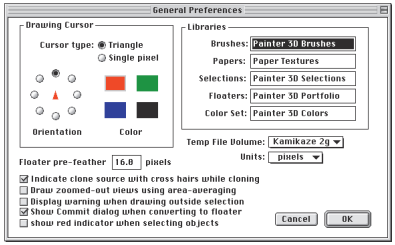
complex models. Save As gives you the chance to review the location and name of the file before performing the save, saving you from overwriting a file you may not have wanted changed. This can be a life-saver if you've copied several maps for several objects.

Setting Painter 3D's Preferences

Painter 3D has several preference dialogs: General, Brush Tracking, Function Keys, Interface, Other Raster Plug-ins, Undo, and Model. There are also preferences you can set that are specific to Windows.

General Preferences

To display the general Painter 3D preferences dialog, choose Edit menu> Preferences> General.



The Painter 3D General Preferences dialog.

Drawing Cursor

Painter 3D gives you several choices for the appearance of your cursor. To choose whether the cursor appears as a triangle or a single pixel, check the radio button next to Cursor Type. To determine the direction the cursor will point (depending on your design and whether you're left- or right-handed), click the appropriate button in the circle above Orientation. To select a cursor color that contrasts with your working area and is therefore clearly visible, click the appropriate rectangle above Color.

Setting the Default Libraries

Painter 3D provides several libraries that contain many different brushes, papers, floaters, lights, and color sets. You can also create your own libraries. By typing a file name for the library in the text box next to Brushes, Papers, Floaters, and Color Set, you can designate the libraries that appear in drawers when you open Painter 3D.

Choosing a Default Scratch Disk

To select the disk volume that Painter 3D writes its temporary file on, choose the volume name from the Temp File Volume pop-up menu.

Default Units

This setting lets you control the default unit of measurement (pixels, inches, centimeters, and so on) for any aspect of Painter 3D that requires measurement. For example, suggested sizes for new model or Image windows are based on the unit of measurement specified with this preference. Also, if you choose to display rulers in the Image window, the rulers will appear in the units specified with this option.

Floater Pre-Feather

The Floater pre-feather box determines how much you can feather a floater's visibility mask without bumping into the

edges of the floater. The default setting is 16 pixels. You can change this default to any number up to 50. The change takes effect the next time you launch Painter 3D.

Cloning Preference

When you clone an image, Painter 3D uses the color information from the original as you fill in your clone. If you want Painter 3D to display what part of the original you're cloning, check the box next to Indicate Clone Source with Cross Hairs While Cloning.

Draw Zoomed-out Views Using Area-averaging

When looking at an image at less than 100% view, screen re-draw is faster if you leave this option disabled. Drawing is slower but more accurate if this option is enabled.

Display Warning When Drawing Outside Selection

Enabling this option activates the warning that appears when you draw outside a selection. The warning will not appear if this option is disabled.

Show Commit Dialog when Converting to a Floater

Enable this checkbox if you want to reinstate the Commit dialog after you have selected the Don't Ask Again button in the Commit dialog.

Show Red Indicator When Selecting Objects

Enabling this option sets default behavior for the Object Selection tool. If this option is checked, when you select an object in the Model window, Painter 3D outlines it in red.

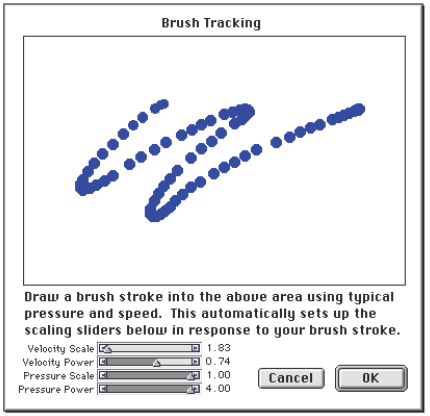
You can override this default on an object-by-object basis by checking and unchecking the Show Selection Indicator in the Controls: Object Selection palette.

Brush Tracking and Setting Pressure Sensitivity

When you draw with Natural-Media, the amount of pressure you use with a tool determines how dense and how wide your strokes are. Using a pressure-sensitive stylus with Painter 3D gives you this same kind of flexibility. Each artist bears down on a drawing or painting tool differently. In Painter 3D, you can program the computer to react to your individual touch just by dragging in the Brush Tracking dialog.

To display the Brush Tracking dialog, choose Edit menu> Preferences> Brush Tracking.

To set how sensitive the stylus will be to your hand pressure and speed, move the stylus across the scratch pad area at a normal speed and with a normal amount of pressure.



Set Brush Tracking to customize how Painter 3D responds to your stylus pressure and speed.

Just as your signature varies, so will the way you work with the stylus at any given time, so you'll set up Brush Tracking each time you start Painter 3D. When you exit Painter 3D, the Brush Tracking sliders go back to their default settings.

Function Keys

If your keyboard has function keys, Painter 3D lets you assign commands to your keyboard function keys (the F-keys). This saves you time by giving you immediate keyboard access to your favorite commands. Using the Shift key with the function keys lets you double the number of commands you can use.

To assign commands to function keys:

1. Choose **Edit menu> Preferences> Function Keys**.
2. Choose the function key you want to assign from the pop-up.
3. Check the Shift key box if you want to use the Shift key in combination with the function key.

   The Current Function field shows the command assigned to this key (if any).
4. Choose the command you want—either from a main menu or a palette menu.

   New Function displays the command you chose.
5. Click Set to assign the command to the selected key.
6. Repeat steps 2 through 5 for each key you want to set, then click Done when you're finished.

Customizing the Interface

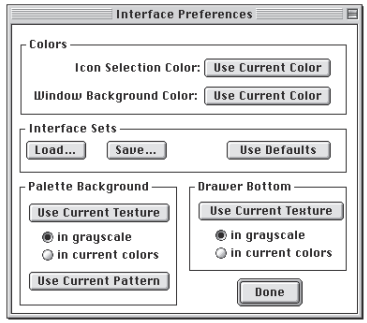
The colors and textures for Painter 3D's interface were chosen to be aesthetically pleasing and very legible. However, you may want to experiment with your own interface colors and textures.

To change Painter 3D's interface, choose Edit menu> Preferences> Interface. The Interface Preferences dialog appears.

Changing Icon Selection Color

To change the icon selection color:

1. Using the **Materials: Color palette** or the Dropper tool, choose the color you wish to use.
2. Click Use Current Color next to Icon Selection Color. The selection box changes to the currently selected color. This color is used until you change it again.



The Interface Preferences dialog.

To change the palette background texture:

1. Choose the texture you wish to use in the Paper palette.
2. Choose **Edit menu> Preferences> Interface**. The Interface Preferences dialog appears. Click in grayscale from the Palette Background section if you want the texture to be rendered in grayscale. Click in current colors if you wish the texture to be rendered in the current primary and secondary colors.

3. Click Use Current Texture.
4. Click Done. Your palette background texture changes.

To use the current pattern as the palette background texture:

1. Choose one of the default patterns or use the Rectangular Selection tool to select part of an image to capture as a pattern. Choose **Art Materials palette: Patterns menu> Capture Pattern**.
2. Return to the Preferences dialog and click Use Current Pattern. The palettes updates so you can preview your choice.
3. Click Done. Your palette background texture changes to the current pattern.

To change the drawer bottom:

- To change the drawer bottom texture, follow the steps above, but use the selections under Drawer Bottom.

To change the window background color:

1. Set the current color using the **Materials: Colors palette** or Dropper tool.
2. Click Use Current Color next to Window Background Color. The background is filled with the current color.

When in current colors is selected in the Interface Preferences, Painter 3D uses the primary and secondary colors from the Materials: Color palette to customize interface elements. Experiment with two colors for interesting effects.

You can save your interface preferences by clicking Save at the bottom of the Interface Preferences dialog. A standard save dialog appears asking you to name the interface setting. Enter a descriptive name and click Save.

To load a saved interface set:

1. Click Load in the Interface Sets section.
2. Choose the interface set from the Open dialog that appears.
3. Click Open to load the interface set.

To return to Painter 3D's default interface:

1. Click Use Defaults in the Interface Sets section.
2. Click Done. Painter 3D reverts to the default interface.

Other Raster Plug-ins

Before Painter 3D can display your raster plug-ins (Photoshop-compatible filters) in the Effects menu, you must indicate where your plug-ins are located on your hard drive. Painter 3D loads plug-ins from the selected folder and its subfolders.

To indicate the plug-ins folder:

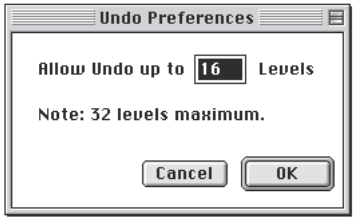
1. Choose **Edit menu> Preferences> Other Raster Plug-ins**.
2. Locate and select the folder containing your plug-ins.
3. Click OK, then restart Painter 3D to activate this feature.

Setting Multiple Undo Levels

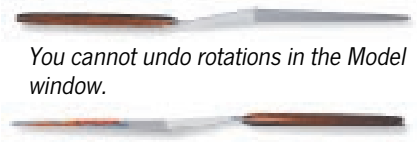
Multiple Undo allows you to undo and redo up to 32 levels of changes. The number of undo levels is set in Undo Preferences, found under Edit menu> Preferences> Undo. Five levels are set as a default.

Undo levels apply across open documents. With five levels set, if you have two documents open and you have "undone" three operations on the first document, you can only undo two operations on the second.

Multiple Undo can use a significant amount of disk space. If you perform multiple operations on the entire image, the whole image must be saved for each undo step. So be careful with the number of Undo levels you choose to save.



Set the number of levels of undo in the Undo Preferences dialog.



You cannot undo rotations in the Model window.

Model Preferences

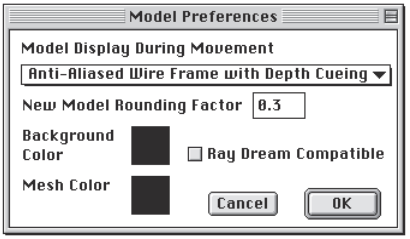
You can set preferences that affect the model and the Model window only.

Choose Edit menu> Preferences> Model. Painter 3D displays the Model Preferences dialog.

Model Display During Movement

Painter 3D lets you set an option for the model display during tracking. The model display option is only effective when changing the view of a model, such as when rotating or panning.

To change the model display during movement, choose the setting you want from the pop-up menu. The pop-up lists choices from fastest to slowest.



Model display preferences are set in the Model Preferences dialog.

Wire Frame

The model appears as a framework of wires.

Wire Frame with Depth Cueing

The model appears as a framework of wires. Wires that are distant appear fainter than those that are close.

Anti-Aliased Wire Frame

The model appears as a framework of anti-aliased wires.

Anti-Aliased Wire Frame with Depth Cueing

The model appears as a framework of anti-aliased wires. Wires that are distant appear fainter than those that are close.

Fully Textured Rendering

The model appears rendered with all surface maps. This is a computation-intensive display mode. Updating and tracking will be slower. Some systems might not be fast enough to work comfortably in this mode.

Shaded Non-Textured Rendering

The model appears with solid surfaces, but no surface maps.

New Model Rounding Factor

The rounding factor lets you add a degree of convexity or concavity to flat faces of the Painter 3D primitives you create.

The valid range for rounding is -1 to 1. When the rounding factor is zero, models have perfectly flat faces.

Negative values make the flat faces appear slightly concave; positive values make the faces appear convex.

Background Color

The color of the Model window background is displayed on screen and in the final rendering. Sometimes a light-colored object is easier to view on a dark background and vice-versa.

To change the window background color:

1. Click the Background Color swatch. Painter 3D opens the system color picker.
2. Choose a color for the window background. Model renderings will use this background color.

Mesh Color

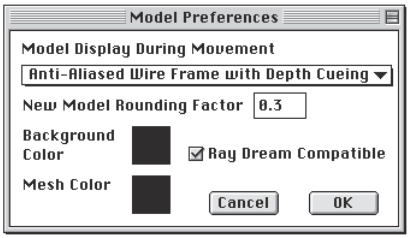
The mesh is an optional overlay of mapping vertices on image files. The mesh makes it easier to paint on map image files. Its color should contrast the colors in the map image, so the mesh is easier to see.

To change the mesh color:

1. Click the Mesh Color swatch. Painter 3D opens the system color picker.
2. Choose a color for the mesh.

Ray Dream Compatible

Painter 3D allows you to use a different mapping mode for each map type; however, this is rarely practical. Usually, you'll want all maps applied to an object to use the same mapping mode. This is a requirement for detailed models you intend to export to Ray Dream Studio.



Enable Ray Dream Compatible to create models you can use in Ray Dream Studio.

If you want all maps to use the same mapping mode, enable the Ray Dream Compatible option.

When Ray Dream Compatible is enabled, you set mapping options for the first map you apply to a model. Painter 3D automatically assigns this mapping mode to all subsequent maps.

If you then change the mapping mode for one map, Painter 3D updates all maps to the new mode.

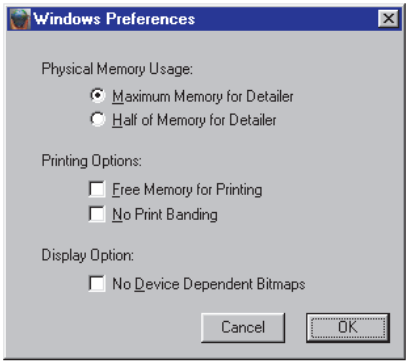
This option may also be useful for other applications that require the same mapping type for all maps

If you intend to export your Painter 3D model to Ray Dream Studio, enable the Ray Dream Compatible preference before applying the second and successive maps.

Preferences for Windows

The preferences described in this section are for computers running Windows 95 or NT 4.0.

Choose Edit menu> Preferences> Windows to display memory and printing options.



Set your Windows preferences in the Windows Preferences dialog.

Physical Memory Usage

For best performance, choose Maximum Memory for Painter 3D and run Painter 3D with no other programs running in the background. Choosing Half Memory for Painter 3D allows Painter 3D to run more efficiently with other Windows applications running at the same time.

Printing Options

Free Memory for Printing increases printing speed by writing the active image to disk, increasing the amount of memory available for the print manager and the printer driver.

No Print Banding disables print banding for devices that support it. Disabling print banding may help some PostScript printers, but will hurt the performance of some bitmap printers, such as the Hewlett-Packard DeskJet printers. Most dot matrix printers are faster with No Print Banding left unchecked in the dialog. If you experience problems printing in landscape orientation, you may have to turn off banding by checking the radio button in the dialog.

Display Option

If your video display driver is set to 65,000 colors, you may experience some color irregularities on your screen when using Painter 3D. Checking No Device Dependent Bitmaps corrects this problem with most 65,000-color video displays. If you are not using 65,000 colors, this checkbox has no effect on your system.

Using Painter 3D With Other Programs

Overview

It's most likely that you'll use Painter 3D in conjunction with other programs. Using Painter 3D with other programs falls into these four general categories:

- Saving the maps you've created in Painter 3D and applying them to models within another 3D application.
- Exporting the model (in standard formats) with its attached maps and placing it into a scene in another 3D application.

- Using the application-specific plug-in to step seamlessly back and forth between Painter 3D and Ray Dream Studio or between Painter 3D and 3D Studio MAX.
- Saving your maps and renderings as 2D images and compositing them with other 2D image editing applications.

The remainder of this chapter describes typical scenarios for using Painter 3D with various 3D and 2D applications. If you don't find the information you need in this chapter, try looking at the FAQs on the MetaCreations Web site (www.metacreations.com) for solutions to your situation.

Saving Maps for Use in Other 3D Applications

You can use Painter 3D to create surface maps for models created in other 3D applications. With Painter 3D, you can choose to save just the maps, then use your 3D application to apply the maps to your model.

To save maps and apply them in another application:

1. In your 3D application, save the model you want to paint in a file format compatible with Painter 3D (OBJ, 3DMF, VDU, P3D, DXF, or 3DS).
2. Choose **File menu> Acquire** to open the model in Painter 3D.
3. Create the surface maps, using a comparable projection map type or implicit UV mapping.
4. With the image window active, save the maps in a file format compatible with your 3D application.
5. Return to your 3D application and apply the maps you've just created to the original object.

If the results from applying your maps to your model are not what you expected, you may need to return to Painter 3D and adjust various options, such as the mapping type or orientation. In some cases, you might need to just flip the map along its X or Y axis. (This is usually the easiest way to fix maps where the text appears incorrectly.) You can do all these tasks easily in the expanded Maps Manager palette.

Exporting Models and Maps from Painter 3D

Another method of working with models in Painter 3D is to import the model from another application, paint it, then save and export both the model and its maps back to your 3D application.

To save and export a model and maps to another application:

1. In your 3D application, save the model you want to paint in a file format compatible with Painter 3D (OBJ, 3DMF, VDU, P3D, DXF, or 3DS).
2. Choose **File menu> Acquire** to open the model in Painter 3D.
3. Create the surface maps, using all the Painter 3D tools and features at your disposal.
4. With the Model window active, save the model as a P3D (Painter 3D format) file. Painter 3D prompts you to save the map images before saving the model.

   Saving the model as a P3D file lets you continue to paint the model and maps at a later time.

5. Export the model by choosing **File menu> Export**. Choose a file format compatible with your 3D application.
6. Return to your 3D application and import the model and maps.

Some file formats save certain portions of map information but not others. For example, OBJ saves texture map information with the model file but does not save bump map information. Depending on your 3D application, you may need to apply the maps as separate images.

If your 3D application only accepts texture maps, you can use Painter 3D's features to simulate texturing in 2D. For example, use the Apply Surface Texture effect or the Impasto plug-in floater. Refer to the online book, Painter 3D Advanced Guide, for more information.

Working With Models from Poser

MetaCreations Poser provides direct figure manipulation, letting you use models of realistic human figures in your 3D applications. You can use Painter 3D to create surface maps for 3D human figures you create in Poser.

To bring Poser models into Painter 3D:

1. In Poser, save the model in OBJ format.
2. Choose **File menu> Acquire> Wavefront OBJ** to open the model, then create whatever surface maps you like.
3. When you're through, save the maps as PICT files (Macintosh) or TIFF or BMP files (Windows).
4. Return to Poser and open the model, then apply the PICT images as surface maps. If you're planning to bring your Poser image into another 3D application, save the image files in a file format compatible with your 3D application.

If you bring your Poser model into another 3D application first, then try to use the model in Painter 3D, the results may not be satisfactory. Surface maps might distort in unpredictable places. To avoid this, it's best to work directly between Poser and Painter 3D, then place your finished, painted model into your 3D application.

Working with Bryce 3D

Bryce 3D is an easy-to-use 3D animation application from MetaCreations. With Bryce 3D you can create incredible 3D worlds with realistic perspective and shading.

You can import DXF, 3DMF, or OBJ files and texture maps into Bryce 3D.

Using 3DMF Files

Painter 3D accepts 3DMF objects constructed of meshes, triangular grids, and triangles.

Painter 3D does not support 3DMF procedural primitives. Models that include a box, cone, disc, ellipsoid, torus, nurb patch, polygons, and general polygons will not import correctly. The unsupported objects are discarded.

When you've created your models and are preparing them for export, choose options that force them into meshes or triangular grids. Meshes are preferred. Mesh objects provide smaller files and better quality. Smaller files open more quickly.

Painter 3D supports general matrix transforms (scale and translate). Painter 3D ignores all other transforms.

Importing 3DMF Models

When you import a model, Painter 3D converts the 3D information to its native format. This is necessary to work with the model in Painter 3D.

The 3DMF format supports object hierarchy—objects may be collected in groups, and the groups may be collected in larger groups. Painter 3D maintains the hierarchy, which you can view in the Objects 3D palette: Hierarchy list.

Map Assignment

The 3DMF file format "understands" only texture maps. Painter 3D, however, supports six different map types.

3DMF allows multiple maps per object, but the format imposes no standard on which map fulfills what purpose—that's up to the application that created and saved the maps. There's no way to tell which map is what type, so Painter 3D uses the last in the list as the texture map. The other maps remain unassigned. You can reassign them in Painter 3D.

A similar condition may exist on export in 3DMF format.

Shared Maps

In 3DMF, multiple objects may share a single map. If you import a 3DMF model with multiple objects sharing a map, Painter 3D copies the map for each object.

Using DXF Files

There are a few things to know about using DXF files:

- The DXF file format supports geometry only—no maps.
- DXF models have no vertex normals, so you'll need to smooth them after import.
- Painter 3D's import function doesn't support "instancing," meaning that although DXF allows multiple instances of a single object, Painter 3D imports only one each.

Special Features for Normals

The "normal" is the angle perpendicular to the surface of the object at a given point. Certain rendering effects take advantage of the normal data.

Painter 3D offers several commands for adjusting an object's normal vectors. These features may be useful with certain imported models.

These commands are on the Controls: Object Selection palette. To use them, the Model window must be in front.

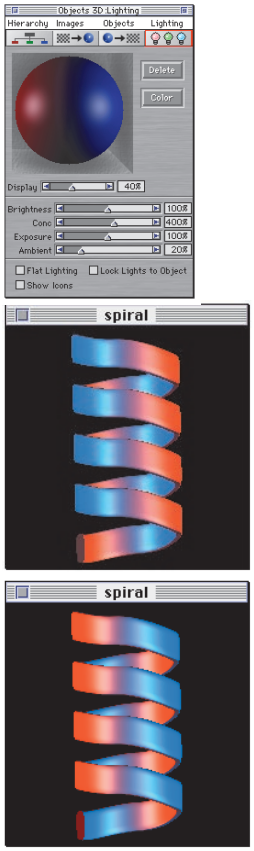
Invert Normals

An imported model may have normals that point the wrong way. This causes lights to shine on the far side of the objects instead of on the side nearest the light.

To invert normals:

1. Select an object in the Model window.

2. In the Controls palette: Object Selection tool palette, click Invert. Painter 3D inverts the object's normal vectors.



You can see the effect of inverting normals under colored, asymmetric lighting.

Repair Normals

Some models may have inconsistent normals—that is, a few normals may have the wrong angle. This problem can be seen on an imported model as triangular areas of contrasting color.

To repair normals:

1. Select an object in the Model window.
2. In the Controls: Object Selection palette, click Repair. Painter 3D makes the object's normal vectors point in a consistent direction.

Smooth Normals

When vertex normal vectors are not present (on imported DXF models, for instance), the model appears heavily faceted. Smoothing corrects this.

To smooth normals:

1. Select an object in the Model window.
2. In the Controls: Object Selection palette, click Smooth.

   A dialog appears that lets you limit smoothing to angles flatter than a specified value (the default is 45 degrees). This helps you avoid smoothing corners that should be sharp.
3. Specify an angle in the dialog, then click OK. Painter 3D smooths the normal vectors for the entire model.

An imported DXF model, before and after smoothing.

Using the Plug-in With Ray Dream Studio and 3D Studio MAX

Painter 3D comes with two important plug-ins: one for Ray Dream Studio and one for 3D Studio MAX. The plug-in lets you move easily back and forth between Painter 3D and either of these two 3D applications, without having to go

through the tiresome steps of saving and importing and exporting to see your latest changes.

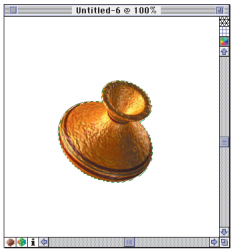
The Painter 3D CD-ROM contains both these plug-ins. Read the online documentation for instructions on how to install the plug-ins and use them with your Ray Dream Studio or 3D Studio MAX.

Using Painter 3D Renderings in Other Applications

Often you'll want to composite the image of your rendered model with other imagery. The mask Painter 3D creates in the rendering makes compositing easy.

To setup your rendering for compositing:

1. Render an image from the Model window and save it in a format that retains the mask: TIFF, RIFF, or Photoshop.
2. With the image open in Painter 3D, set the Selection Draw mode to Draw Inside. The selection marquee appears around the model shape.
3. Choose **Edit menu> Copy**.
4. You can now move to another file and paste the floater.



Choose Draw Inside mode before copying the rendering.

Photoshop Compatibility

Painter 3D reads and writes image data in the Photoshop file format. The following descriptions cover how the several document elements are handled.

Unless otherwise stated, "Photoshop format" refers to both version 3.0 and 4.0.

Layers and Floaters

When reading in a Photoshop file with layers, each layer is automatically trimmed and converted to a Painter 3D image floater with the appropriate opacity.

All of Photoshop 3's layer blending modes are supported by Painter 3D. However, Photoshop 4's new blending modes are not supported. These blending modes are converted to Painter 3D's "normal" method on open. Due to differences in the way Photoshop and Painter 3D deal with color conversions, a few blending modes will look slightly different in Painter 3D than in Photoshop. Once brought back to Photoshop, the file will look as it did before it was brought into Painter 3D.

Painter 3D's "Pseudocolor" compositing method is not supported in Photoshop. "Pseudocolor" is mapped to Photoshop's "Normal" compositing method. Note that in Painter 3D, "Normal" and "Default" methods are identical. "Normal" is included for compatibility with Photoshop.

Photoshop's user-defined layer masks are automatically consolidated in the image floater's visibility mask. When you bring the image back to Photoshop, the layer masks will have been combined with the non-editable transparency mask for each

layer. In addition, Photoshop's ability to clip layer data to the layer below is not supported by Painter 3D.

When saving Painter 3D documents as Photoshop files, each Painter 3D floater is converted to a Photoshop layer. Plug-in floaters are committed so that they may appear in Photoshop layers. Opacity and composite methods are maintained whenever possible. Grouped floaters become separate Photoshop layers.

Rulers, Guides, and Grid

Painter 3D uses the ruler, guide, and grid information when opening Photoshop 4.0 documents. Likewise, Painter 3D saves this data in Photoshop 4 format, so it will be available to Photoshop.

Adjustment Layers

Painter 3D does not support adjustment layers. This data is dropped when Painter 3D opens a Photoshop 4 file.

Channels and Masks

When reading a Photoshop with channels, Painter 3D converts channels #4 and above to user masks. When saving a Painter 3D document with user masks as a Photoshop file, the masks are saved to channels #4 and above in the Photoshop file.

Painter 3D does not support transparent images. Therefore, when you open a transparent Photoshop file, Painter 3D automatically creates a blank background on which all the layers will sit.


4

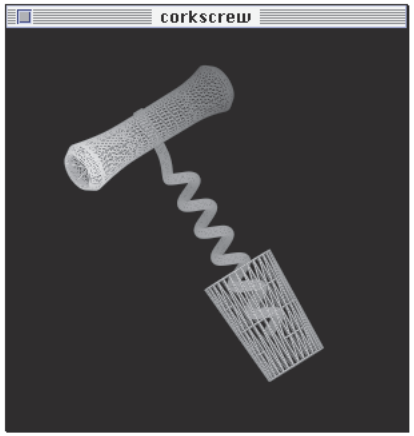
Working With Models

Models in Painter 3D

Painter 3D lets you paint and develop surfaces on three-dimensional models. Naturally, before you can do this you need a model. You can open or import models you've created in another application, or you can create a primitive, single-object model right in Painter 3D.

A 3D model is a file comprised of one or more 3D objects. In Painter 3D, the model can have hundreds of objects, and each object can have a different set of surface maps and properties. For example, a

wooden handle, corkscrew, and attached cork are three separate objects, but can be grouped as a single model.



Three objects make up this single model.

Painter 3D can create primitive objects. Painter 3D also comes with a catalog of interesting models you can work with. Most times, you'll probably use Painter 3D with models you've created in other applications (like Ray Dream Studio), then imported into Painter 3D.

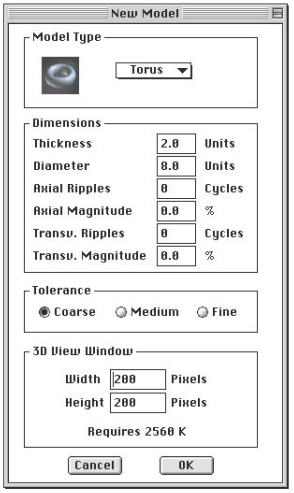
The remainder of this chapter discusses how to create, open, and import models. It also describes how to work with models in Painter 3D.

Creating a Primitive Model in Painter 3D

You can have Painter 3D create very basic 3D models for you. Painter 3D primitive models are single objects; you cannot group multiple Painter 3D primitive models together.

To create a primitive model in Painter 3D:

1. Choose **File menu> New Model**. Painter 3D displays the New Model dialog.
2. Choose the model you want: Box, Sphere, Cylinder, Cone, Cup, Ellipsoid, or Torus.



Select a model type in the New Model dialog.

3. Set the dimensions and tolerance for the model and the width and height for the Model window.

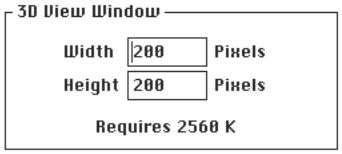
   Dimensions: Enter dimensions that describe the size of the model you want. The dimensions required depend on the model type.

   Tolerance: Painter 3D models are constructed of triangular faces. The Tolerance setting allows you to control the number of triangles used to approximate curved surfaces in the model.

- Coarse creates the fewest triangles. This might lead to irregularities in the renderings.
- Medium creates more triangles than the Coarse setting, but not as many as Fine.
- Fine creates the most triangles, which assures a clean image.

The more triangles used, the smoother the curve. However, more triangles increase memory demands and may slow down some operations.

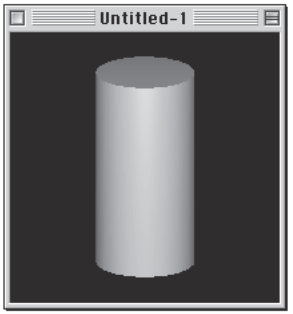
Width and height values: Enter values for the size Model window you want. You can get closer to the model by zooming in with the Magnifier tool, so a large window may not be necessary.



Set the view window size for the 3D model.

The dialog shows how much RAM is required for the window specified. The 3D view or Model window requires at least 64 bytes per pixel. A larger window requires more RAM and updates slower on screen.

4. Click OK. Painter 3D opens the model in the Model window.



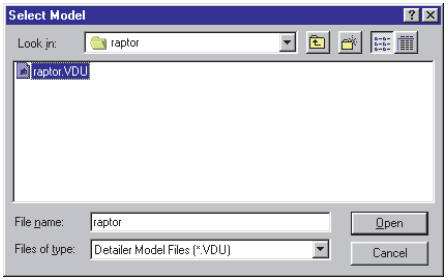
Here, the Model window displays a cylinder model without any maps applied.

Opening Saved Models

Models you save in Painter 3D are saved in Painter 3D format, also called P3D format. You can also export models you create in Ray Dream Studio in Detailer (VDU) or Painter 3D (P3D) format. (Use the special plug-in to work with Ray Dream Studio and Painter 3D at the same time.)

To open a Painter 3D model:

1. Choose **File menu> Open Model**. Painter 3D displays an Open dialog.
2. Navigate to the location of the file, select it, and click Open.
3. If you're opening a Painter 3D model exported from Ray Dream Studio, Painter 3D prompts you to choose a size for the Model window. Enter width and height values for the size Model window you want.



Locate and open a model file.

Painter 3D open all maps and images associated with this model. However, if a file has been moved or renamed, Painter 3D won't be able to load it. In this case, Painter 3D displays a dialog giving you a chance to locate the missing file. If you cancel the dialog without selecting an

image, Painter 3D opens the model without a map, background, or reflection environment.

Opening Models Created in Ray Dream Studio or 3D Studio MAX

Use the plug-in that comes with Painter 3D to work with Ray Dream Studio or 3D Studio MAX models. The plug-in lets you work quickly and easily between either of the applications and Painter 3D without having to save, export, and import files between the two applications.

Refer to the online documentation on the Painter 3D CD-ROM for complete details on how to use the plug-in with Painter 3D.

Importing Models

Painter 3D lets you import models saved in 3DMF, 3DS, DXF, and OBJ formats.

To import a model:

1. Choose **File menu> Acquire** and select the format of the file you want to import. The Import dialog appears.
2. Locate and select the file, then click OK.

Once imported, the model appears as any Painter 3D model. When you save the model in Painter 3D, it is saved in the Painter 3D (P3D) format. If you want to move the file back to your 3D modeling and rendering program, you'll need to export it from Painter 3D. Refer to "Exporting Models" on page 65 for more information.

The Model in Painter 3D

A Painter 3D model can be constructed of many separate objects. Each object can have a unique set of maps applied to it.

Selecting an Object within a Multi-object Model

When you work with a multi-object model, you need to select which object you want to work on.

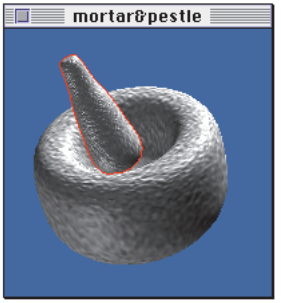
When a model is comprised of a single object, like Painter 3D's own primitives, that object is automatically selected.

To select an object:

1. Choose the Object Selection tool.

The Object Selection tool

2. In the Model window, click the object you want. The selected object appears outlined in red in the Model window.



Use the Object Selection tool to select the object you want by clicking.

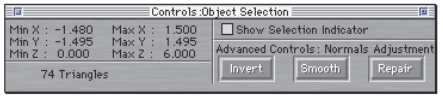
If the object isn't outlined in red, it may be that the Show Selection Indicator option is turned off in the Controls palette: Object Selection tool. Click the option to turn it back on.

If you try to paint on an object that isn't selected, Painter 3D asks you if you want to select it. If you click OK and you have already applied maps to the object, Painter 3D locates the first map it finds, which is either the texture map, if you just opened the model, or is the last map you edited, if you're already working with the map. If you click OK and you do not have any maps applied to the object, Painter 3D assumes you want to create a texture map and opens the Apply Texture Map dialog.

When you select an object, the Objects 3D: Objects palette and the Maps Manager palette update to show the settings and maps, if any are loaded for this object.

The Controls palette: Object Selection tool

The Controls palette: Object Selection tool displays technical information describing the selected object.



The Controls palette: Object Selection tool displays information describing the selected object.

The minX, minY, and minZ and maxX, maxY, and maxZ describe the dimensions of the bounding box of this object. The bounding box is the smallest box that will enclose the object completely.

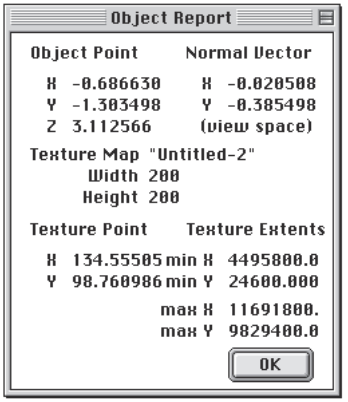
The Controls palette shows you the number of triangles in the surface mesh. It also gives you the option to turn the selection indicator on and off and it provides advanced options for adjusting normals.

Getting Technical Information

You can get technical information for a particular point on the object. You might find this information useful if you need precise data about the object point, texture point, and so on.

To obtain 3D information:

1. Choose the Object Selection tool.



The Object Report provides technical information.

2. Hold down the Control key (Macintosh), Shift+Ctrl keys (Windows), and click a point of interest on the model.

   Painter 3D displays an Object Report, which describes that object's point on the model, its normal vector, and its correlation to the texture map.

Setting a Base Color for an Object

You can color an object without applying a texture map.

Setting a base color for an object doesn't make sense if you intend to apply a texture map to it because the texture map hides the base color completely. However, if you want the object to have a single, flat color, you can set its base color. This is useful if you have a multi-object model and you only want to create texture maps for a few objects.

To give the model a base color:

1. Select the object you want to color.
2. Display the **Objects 3D: Hierarchy palette**.
3. Choose **Objects 3D: Hierarchy menu> Set Object Color**.

   Painter 3D displays the system color picker.
4. Select a color for the object and click OK.

To set the base color of an object using the Dropper tool:

1. Use the **Art Materials: Color palette** to choose a color.
2. Select the Dropper tool.
3. Hold down the Option key (Macintosh), Alt key (Windows), and click the object you want to color.

To give all objects in a multi-object model the same color:

1. Choose **Objects 3D: Hierarchy menu> Set All Objects Colors**. Painter 3D displays the system color picker.
2. Select a color and click OK. Painter 3D applies the color you select to all objects in the model.

Setting Object Properties

The Objects 3D: Objects palette provides controls for an object's basic shading properties. These properties control how the object appears under the lights. Particular settings help describe the object's substance—whether it is glass, metal, cork, skin, or whatever.

Object shading properties are set in the Objects 3D: Object palette.

Select the object whose properties you want to adjust. Drag the Diffuse, Specular, and Reflection sliders to set levels appropriate to your object's surface. If the Objects 3D: Objects palette doesn't show the sliders, expand the palette by clicking its grow box.

Diffuse

The Diffuse slider controls how much base color the object shows.

Specular

The Specular slider controls the object's tendency to show highlights. Highlights are the bright spots and streaks that appear on an object where light is reflected directly.

You can control specularity in regions of the object with the highlight mask.

Reflection

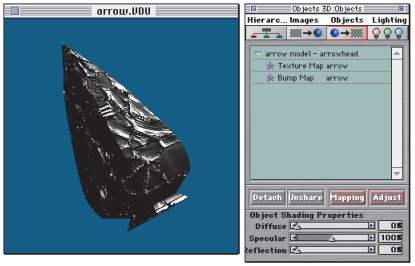
The Reflection slider controls the object's tendency to reflect its environment. Moving the Reflection slider to the right allows more of the environment image to appear reflected in the object.

You can control reflection in regions of the object with the reflection mask.

Reflection is useful when a good reflection map is loaded as the environment. If you do not have an environment image, Painter 3D uses the current pattern. See section "Using Maps" on page 67 for more information.

These settings offer combinations for achieving different surfaces:

Material	Diffuse	Specular	Reflection
Chalk	100%	0%	0%
Obsidian	0%	100%	0%
Mirror	100%	100%	100%
Plastic	60%	40%	0%



An example of a surface using the obsidian combination.

The Objects 3D Palette Menus

The subpalettes in the Objects 3D palette (Hierarchy, Images, and Objects) provide menus and commands to help you identify and keep track of object and image relationships.

The Objects 3D: Hierarchy Menu

The Objects 3D: Hierarchy menu lets you change the way the entire model appears in the Model window.

Choose the Show All Objects command to display all the objects associated with the model in the Model window.

Choose the Hide All Objects command to hide all objects associated with the model. If an object is selected, the red selection indicator remains visible in the Model window, even though all objects are hidden.

The Toggle Visibility command reverses the visibility state of objects and is useful for isolating parts of the model. For example, you may have hidden all objects, but then turned visibility back on for certain objects you want to focus on. (You turn visibility on for individual objects by clicking open the Eye icon in the Hierarchy list.) When you choose this command, objects that were visible become invisible and vice versa.

Set colors for individual objects or for all objects with either the Set Object Color or Set All Objects Color command. Refer to "Setting a Base Color for an Object" on page 61 for more information.

The Objects 3D: Images Menu

The Objects 3D: Image palette lists all open images and gives you information about whether the images are being used as maps and if they are shared across objects.

If an image is being used as a map, it has a triangle icon next to its name. Click the triangle to see which objects are using that map. Images that are open but are not being used as a map do not have a triangle icon next to their names.

You can choose to view all open images in the list or only those being used as maps. From the Objects 3D: Images menu, choose Show All Open Images, or choose Show Maps Only to list just the maps.

The Objects 3D: Objects Menu

The Objects 3D: Objects menu lets you change the way individual objects are listed in the Object list. The Object list shows you the relationships between objects and associated maps. Objects with maps have a triangle icon next to their names in the list. Click the triangle icon to expand the list of maps beneath the object name.

Choose the Show All Objects command to display all the objects associated with the model in the Objects list.

Choose the Show Selected Only command to isolate a selected object in the Objects list. All the remaining objects are hidden.

Saving a Painter 3D Model

After developing the surface of your model, save your work in P3D format. You'll be able to open the model later and continue working. Saved models include settings for object properties, lights, and all references to applied maps, the background, and environment.

A finished Painter 3D model consists of several files—the 3D model itself and each image file used as a map, environment, or background. For the sake of organization, it's a good idea to keep your model with its image files in a new folder.

To save a Painter 3D model:

1. Bring the Model window to the front. You can click in the window or select its listing from the Window menu. Model windows appear at the bottom of the menu.
2. Choose **File menu> Save**.

If your model has maps associated with it that have not been saved, Painter 3D requires you to save them now before it saves the model. Painter 3D displays a Save Image dialog for each image that has not already been saved.

Stay organized! Create an appropriately named folder for this model and save all images associated with the model to this folder.

3. Save the map files to the same location and name each file descriptively.

If you use floaters in your image and want to preserve them as independent floating objects, you must save in either the RIFF or Photoshop 3 file formats. To keep file size to a minimum, use the RIFF file format. If you intend to export your model, use the TIFF file format.

4. When all images have been saved, Painter 3D opens a Save dialog for the model. In the Save dialog, enter a name for your model and click OK.

Closing a Model

If you have maps associated with a model, Painter 3D asks whether you want to save the maps before closing the model. If

there are no masks associated with the model, Painter 3D asks whether you want to save the model before closing it.

To close a Painter 3D model:

1. Bring the Model window to the front.
2. Click the window's close box, or choose **File menu> Close**. If you don't want to save the model or any of its maps, click Don't Save.
3. If you want to save any associated maps and the model, click Save. You're prompted for a name and location for each map and the model.

Exporting Models

Painter 3D is a powerful tool for developing surfaces on 3D models. Painter 3D lets you render a model, but you'll probably want to move your finished models to a full featured 3D program for assembling in a 3D scene and rendering.

Ray Dream 3D and Ray Dream Studio are examples of 3D programs. They offer advantages that Painter 3D doesn't, including:

- You can create a scene with numerous models.
- You can develop sophisticated lighting and rendering effects, like shadows, luminous objects, and translucence.
- You can achieve different perspective effects with an adjustable camera.
- You can create animations in Ray Dream Studio or Ray Dream 3D.

These are only a few of the benefits you get from moving your Painter 3D models to a scene-building and rendering program like Ray Dream 3D or Ray Dream Studio.

Ray Dream 3D and Studio can import models saved in Painter 3D format. The model retains its surface properties and all of the maps applied to it. When you import the model in Ray Dream Studio, all of your details, including the alignment of the maps, remain intact.

For models created in Ray Dream 3D or Studio, you have the option of importing just the maps and shading from Painter 3D. Ray Dream automatically applies the maps to the existing model objects.

Use the special plug-in that comes with Painter 3D to step easily back and forth between Ray Dream 3D or Studio and Painter 3D.

See "Using Painter 3D With Other Programs" on page 49 for more information on importing Painter 3D models in Ray Dream Studio. Additional information is in the Read_Me file in the Painter 3D folder and at the MetaCreations Web site at www.metacreations.com.

Some aspects of the Painter 3D model might not apply when you move to a separate 3D program. Lights are discarded and the background image and environment map might be discarded unless your program accepts 2D images for these effects. If so, you can create these aspects of the scene in your 3D scene-building program.

Painter 3D can export models in several formats.

- Wavefront OBJ
- QuickDraw 3D, also known as 3DMF

- 3D Studio (R4), also known as 3DS
- DXF

To export a Painter 3D model:

1. Open the model you want to export.
2. Choose **File menu> Export** and select the format you want to use. An Export dialog appears.
3. Choose a location to save it to and name the file.
4. Click OK. Painter 3D exports the model file.

You can now import the model to your other 3D program.

Painter 3D has an extensible architecture for 3D file formats. Plug-ins for import/export in other 3D formats may become available. Visit the Painter 3D area of www.metacreations.com for updated information.

Using Maps

Creating Surfaces on the Model

A model is a 3D file made up of one or more objects, and each object can have a different surface. The combination of applied maps gives an object its overall surface, also known as shading. Shading is the set of characteristics that give an object its appearance—color, surface relief (bump), shininess, and so on. Shading is apparent when the object is rendered or when viewed in the Model window, which always renders your objects in real time.

For example, a model of a cork screw and cork might be constructed of three objects—the cork, the screw, and the cork screw handle. Each of these objects would have a different set of maps and surface

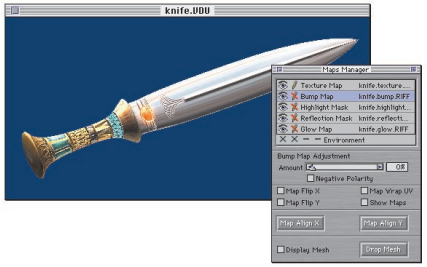
properties that describe its material—cork, chrome, and wood, respectively.

About the Six Maps

In Painter 3D, you color and texture objects by wrapping them with two-dimensional images, called maps. You can create up to six maps for each object to describe its surface attributes. "Map channel" is another term used to describe one of the six map types for a single object.

Each map consists of a single 2D image you apply to the object. Of course, for each object you can leave one or more channels empty.

The Maps Manager palette lists the maps for the selected object.

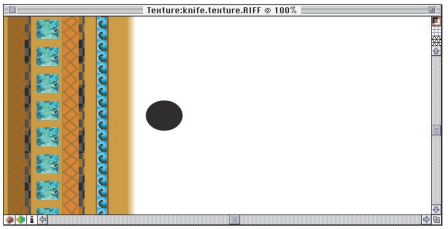


The six maps combined create the overall shading of the 3D model.

Texture Map

The texture map gives the object color. For example, a pattern of red bricks mapped onto a box-shaped object turns the box into a chimney.

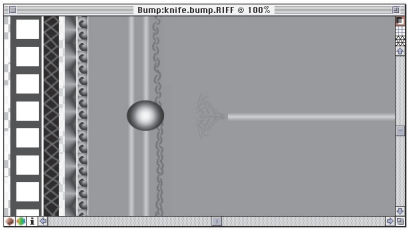
The texture map adds color, not physical texture. This might be confusing at first, but it's the standard 3D graphics term for this map type.



The texture map.

Bump Map

The bump map creates surface relief, like the rough terrain of tree bark. The bump map can be a grayscale image. When the program renders the object, the bump map deflects the light (in the model space) according to its imagery (light and dark features). Bright areas of the bump map appear recessed in the rendering and dark areas appear raised.



The bump map.

You can invert the map with the Negative Polarity option on the Maps Manager palette.

It's important to note that the actual shape of the object doesn't change—only the appearance of the rendered surface. The silhouette edges of the object are not affected by the bump map.

The bump effect is created by the interaction of light and the bump map. Different lighting conditions change the appearance of the bump. See "Light Reveals the Third Dimension" on page 96 for more information about using light to bring out surface relief.

To continue with the chimney example, you can use the same brick image in the bump map as you did in the texture map.

When applied to the bump map channel, the image creates the appearance of recessed mortar lines between the bricks.

You can also use the bump map to add wrinkles, crinkles, moles, dimples, and scars to the face of the bricks.

After loading a Bump Map, you can adjust the level of bump. At the bottom of the Maps Manager palette, the Bump Map Adjustment: Amount slider lets you control the height and depth of the bump features. Dragging the slider to the right increases bump depth.

Painter 3D renders the new bump settings to the Model window in real time, so you'll get immediate feedback on your depth adjustment.

Highlight Mask Map

The highlight mask map controls the amount of specularity (shininess) for different areas of the object. Highlights are the bright spots on an object where the light is reflected directly.

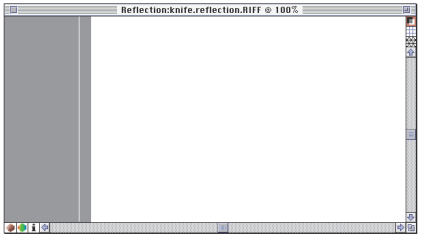
The highlight mask map.

The object has an overall highlight amount, set with the Specular slider on the Objects 3D: Object palette. The highlight mask lets you control the highlight amount for specific areas on the object.

For example, say you're developing a model of a wine bottle. You use the texture map to place a rectangular label on the bottle. The object should have a strong highlight on the glass, but much less on the paper label. In the highlight mask map channel, use a dark rectangle that matches the size and position of the label in the texture map to reduce the highlight on the paper label.

Reflection Mask Map

The reflection mask map controls the amount of reflection for different areas of the object. Reflectivity is only interesting when the environment (the object's surroundings) appears in the reflection. In Painter 3D, you apply an image in the environment map channel to be reflected as the environment.



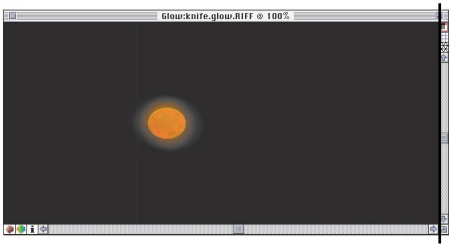
The reflection mask map.

The object has an overall reflection amount, set with the Reflection slider on the Objects 3D: Object palette. The reflection mask lets you control the amount of reflection for specific areas on the object.

To continue with the wine bottle example, the glass bottle should be reflective, but the paper label shouldn't be. In the reflection mask image, use a black rectangle that matches the size and position of the color label to eliminate reflection in the area covered by the paper label.

Glow Map

The glow map applies additional color on top of the other maps' effects. Glow is a special effect that is particularly useful for objects that actually produce light, like light bulbs, LEDs, and CRTs. For example, a red LED on a control panel looks red, even when there are no other lights in the scene. A little airbrushing of color in the right spot of the glow map helps you create this effect—without interfering with your texture map.



The glow map.

Painter 3D applies the glow map after the other maps. This means that an area darkened by other shading effects will receive uniform color from the glow map.

The glow map applies color to the object. It does not create a light source within the object. If you want an object to actually cast light onto other objects, you'll need to work with it in a 3D rendering program.

Environment Map

The environment map is an image that appears in the reflective areas of an object. The Reflection slider in the Objects 3D: Objects palette determines how much of the image is reflected onto the object.

You can use an environment map in connection with a reflection mask map. Areas of the object that you set up with high reflectivity will reflect the environment map. Areas with limited reflectivity will not.

Combining environment maps with reflection settings requires some additional explanation. Refer to "Reflection Mapping" on page 86 for more information about environment maps.

About Images in the Different Maps

In Painter 3D, you create images for the six map types using the brushes, effects, and other image creation features.

Throughout this section, "painting on the model" refers to creating images in any of the six map channels. Remember that the effect of an image on the model depends on the map that it's in. In the texture map, a colored brush stroke puts color on the model. That same stroke in the bump map might cut a notch in the model.

The method and features for developing images are the same, regardless of the effect on the model. Tools and techniques for creating images are described in "Developing Images" on page 103, in "Painting With Painter 3D's Brushes" on page 117, and in "Working With Art Materials" on page 133. The online book *Painter 3D Advanced Guide* also contains information about creating images.

Grayscale Images

One thing to keep in mind as you develop imagery for a given map is what Painter 3D does with the image. For the bump map, reflection mask, and highlight mask, Painter 3D uses only the pixel luminance values to control shading. Hue and saturation are ignored.

This means that the bump map, highlight mask map, and reflection mask map can be grayscale, which gives 256 value settings. Black is the lowest value, white is the highest.

As a consequence, the bump map image can describe up to 256 levels of bump elevation. And the highlight or reflection mask images can describe up to 256 levels of mask density. The darker the pixels in the image, the greater the masking effect on the object.

Applying Maps

Once you've selected an object, you can apply one or more images for the surface maps. The Maps Manager palette holds the central controls for working on maps.

The process of applying a map to an object is the same regardless of which of the six map types you apply. When you first create a map, you must provide Painter 3D with parameters of information.

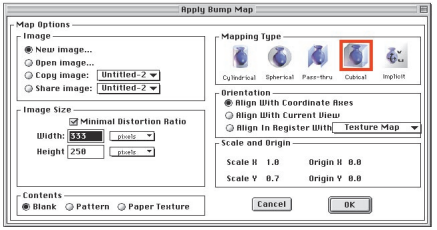
To apply a map to an object:

1. Display the Maps Manager palette by choosing **Window menu> Show Maps Manager**.
2. Select the object you want to work with.
3. Choose **Map menu> Load>** and select the map type you want (Texture, Bump, Highlight, Reflection, Glow, or Environment).

   Or

   Double-click the map type in the **Maps Manager palette**.

   Painter 3D displays the Apply Map dialog.
4. Choose the map source and content, the image size, the mapping type, and the orientation. (The next several sections provide information about the choices in this dialog.)

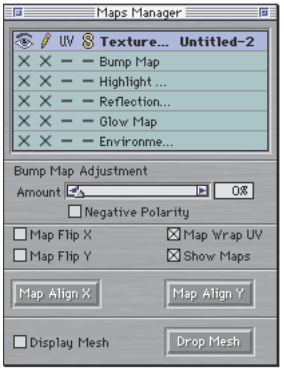


The Apply Bump Map dialog.

5. Click OK.

Painter 3D opens an Image window to display the new map. If you based the new map on an image or material, the image or material fills the Image window and is mapped onto the model in the Model window.

Notice that the Maps Manager palette changes to show that a map is loaded. You can load additional maps by double-clicking the map type you want in the map listing.



To load a map, double-click the map type in the Maps Manager palette.

If you choose the Brush or Paint Bucket tool and start to paint on an object that doesn't have a map, Painter 3D displays the Apply Map dialog.

Determining the Map Source

There are various ways to specify the image you create for the map. You can start with a new canvas, use existing images, or use an art material as the basis for a map.

Making a New Image

When you create an entirely new image, you can start with a blank canvas or fill the image with the current pattern or paper texture.

Blank

If you want to start with a blank canvas, select Blank in the Apply Map dialog. Painter 3D displays fields that let you set the dimensions for the new image. Enter the dimensions you want, then click OK.

Current Pattern or Paper Texture

If you want to use a pattern or paper texture, you can use the Art Materials palette to choose a pattern or paper texture and set options for it.

Painter 3D lets you select your pattern or paper texture from the Art Materials palette while the Apply Map dialog is open.

Patterns and paper textures "tile" over the image area. Tiling describes how a rectangular image repeats to cover a larger area, like squares of linoleum covering a kitchen floor.

When you select one of these options, Painter 3D displays text fields that let you set the number of horizontal and vertical "repeats" (the number of tiles in each direction).

By default, Painter 3D suggests 2 x 2, which means that four tile images will be used in the map. The image size will equal the paper texture or pattern dimensions. Enter values to describe how many tiles to use horizontally and vertically.

To avoid distortion when Painter 3D maps the image onto the object, you'll want to use a specific number of repeats in each direction. See "Technical Considerations for Designing Maps" on page 87 for more information.

Opening an Image into a Map

When you apply a map, you can choose to open a saved image file as the basis for the new map. In the Apply Map dialog, the Open Image option lets you open a saved image file. When you select this option, Painter 3D displays an Open File dialog so you can locate and select the file you want.

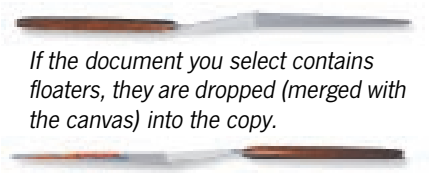
Painter 3D opens a number of popular image formats. When you open a RIFF file (Painter and Painter 3D's native format), the floaters remain floating. You can move, scale, distort, and rotate these floating images.

If you open a Photoshop 3.0 file, the layers are converted to floaters. Photoshop files have some technical considerations. See "Using Painter 3D With Other Programs" on page 49 for more information.

Copying an Image into a Map

When you apply a map, you can choose to copy an image from another open map. In the Apply Map dialog, the Copy image pop-up lets you choose any open image

file as the basis for the new map. Use the pop-up to select the name of the open file you want to copy.



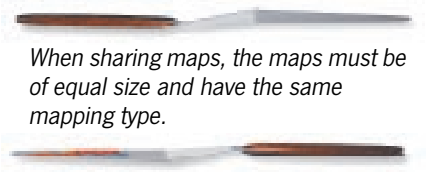
If the document you select contains floaters, they are dropped (merged with the canvas) into the copy.

Copying an open image is often quite useful. For example, if you have a texture map applied, you can create bumps that enhance the imagery in the texture map. By copying the texture map, you have the perfect starting point for developing the bump map because the bumps can precisely correspond to the brush strokes and materials in the texture map.

Likewise, copying the texture map helps in developing a highlight or reflection mask. You can see which areas need to be masked, and you can edit the image appropriately. (Tracing paper is also useful in this regard. Tracing paper is discussed in the online book, *Painter 3D Advanced Guide*.)

Sharing an Image

When you apply a map, you can choose to share an image already assigned to another model or a different type of map. In the Apply Map dialog, the Share Image pop-up lets you choose any open image file as a basis for the new map. Use the pop-up to select the name of the open file to share. Sharing is different from copying because all shared maps continue to update all shared versions simultaneously in the Model window while a copied map will not affect the original.



When sharing maps, the maps must be of equal size and have the same mapping type.

Image Dimensions

The dimensions of the image you map onto the object can be critical in avoiding distortion. You'll need to use an image with an aspect ratio appropriate to the selected mapping mode and object scale. Checking the Minimal Distortion option helps avoid aspect ratio problems. See "Technical Considerations for Designing Maps" on page 87 for important information on designing surface maps with the correct aspect ratio.

The Image Window

Maps applied to a model appear in an Image window. The maps for a single object appear in one Image window, "layered" with the active map on top. You can open a new view if you want to see two maps for the same object in two different windows.

Clicking an Image window's close box, in effect, hides that Image window. The Image window still remains attached to the object. You can select one of the Image window's maps in the Maps Manager palette and the Image window will reappear.

Tips for Creating New Images

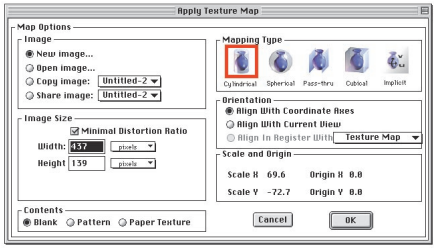
Avoid creating excessively large maps. The map image files must remain open while you're painting the model. Larger images increase the demand for RAM.

Larger (higher resolution) images increase detail on the model; however, the rendering process limits the detail that appears in the final image. This means that there's a point beyond which increasing map resolution does not lead to higher detail in the final rendering. However, if you are planning for high resolution rendering, you should use a texture map of at least the planned rendering resolution.

Choosing a Mapping Type

As you apply a map to an object, you set various options to affect the way the map wraps around the object. You set these options in the Apply Map dialog.

The word "mapping" refers to the method Painter 3D uses to transfer the two-dimensional image to the surface of the 3D model. Painter 3D offers five mapping modes. Each mode has benefits for certain types of models and map images.



Set your mapping options to specify how Painter 3D transfers the two-dimensional image to the surface of the 3D model.

If you are using the Ray Dream Compatible option as your model preference, the Apply Map dialog appears only for the first map you apply to an object. All subsequent maps automatically inherit the mode setting of the first map. See "Model Preferences" on page 45 for more information on the Ray Dream Compatible model preference.

The mapping mode you use and the dimensions of the object determine the optimum aspect ratio for the map image. Using the correct aspect ratio minimizes distortion. By default, Painter 3D suggests an aspect ratio that will minimize distortion.

Tip: To view the distortion of a mesh on the object, display the mesh using the Maps Manager, then click the Drop Mesh button. This converts the mesh display to actual pixels on your image so you can see how the mesh translates to the 3D view. Save your image before trying this experiment—dropping a mesh cannot be undone.

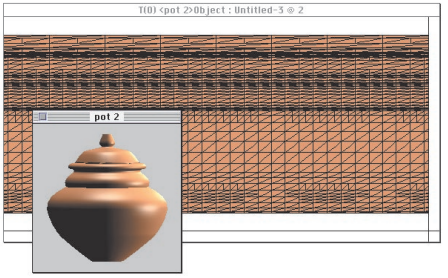
Implicit

Implicit mapping assigns points on the map to points on the object and tightly wraps the image onto the model by lining up these points.

The object must have implicit UV coordinates defined in its geometry to use implicit mapping. Exported Ray Dream Studio models have implicit UV coordinates. Some Quickdraw 3D (3DMF) models have implicit UV coordinates. All of Painter 3D's own primitives have implicit UV coordinates. DXF models do not have UV coordinates.

In some cases, text used in an implicit map may appear in mirror image. This is a result of the object's construction and UV coordinate system. You can adjust for this difference by using the Flip X and Flip Y buttons in the Maps Manager palette.

Implicit is not a projective mapping method. It usually provides the best results on objects containing UV coordinates. You'll probably find implicit mapping most useful for objects that bend backward on themselves or that contain a hole.



Display the mesh to view the implicit mapping coordinates in the map window.

See "Changing the Aspect Ratio of a Map Image" on page 93 for information on determining the optimum aspect ratio for images used in implicit mapping.

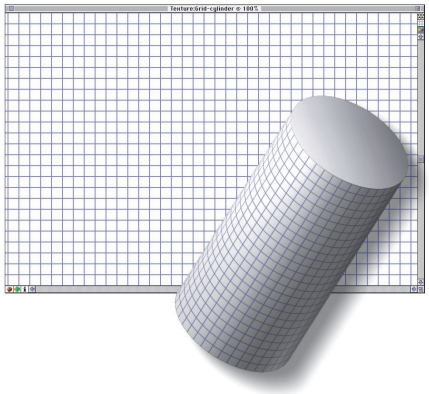
About Projective Mapping

All of the map types other than implicit use various ways of projecting the images onto the objects. Each of the projective map types—cylindrical, spherical, cubical, and pass-thru—give very different results. To become more familiar with the map types, try experimenting with applying the same map to the map object using different map types.

See "Technical Considerations for Designing Maps" on page 87 for information on determining the optimum aspect ratio for images used in the various projective maps.

Cylindrical

Cylindrical mapping wraps the image around the object horizontally. This projective mapping method is ideal for lathe-type objects, like cans, cups, cones, and vases.

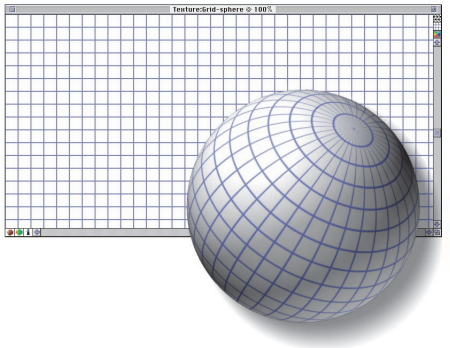


Apply a grid to the texture map image by choosing Effects menu> Esoterica> Grid Paper. This displays the mapping method on the model and helps you determine if there is distortion.

Spherical

Spherical mapping wraps the image around the object horizontally and vertically. This projective mapping method is useful for spheres, ellipsoids, eggs, and other rounded objects.

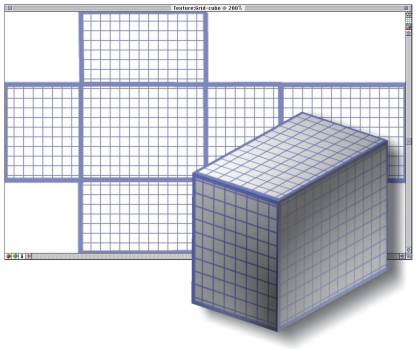
Images used in spherical mapping should be approximately twice as wide as they are tall. This helps minimize distortion.



Map a grid in the texture map to display the lines of latitude and longitude of the facets on the sphere. The spherical mapping method projects these lines into a rectangular grid.

Cubical

Cubical mapping folds the image to cover each box face. This projective mapping method is used for boxes.



Map a grid in the texture map to demonstrate the cubical mapping method.

To take full advantage of cubical mapping, you'll need to create a map in the correct aspect ratio for the dimensions of your box and know which regions of the image are folded (mapped) onto which faces of the box. Refer to "Technical Considerations for Designing Maps" on page 87 for an explanation of which map regions correspond to which box faces.

Pass-thru

Pass-thru mapping passes the map through the object, leaving imagery on the surfaces. Pass-thru is a projective mapping method, useful for flat objects, like walls, and for creating wood grain. This is similar to what happens when you shine a slide projector on an object. Pass-thru mapping is directional. The angle at which the projector shines is the angle of pass-thru.

In pass-thru mapping, the image appears on the distant side (from the angle of pass-thru) as well. On the distant side, you'll see a mirror image of what appears in front.

An example of pass-thru mapping. The model is rotated to show the view from the other side.

If the object is closed, someplace on the surface the map stretches and doubles back.

Sometimes it's helpful to disable auto-wrapping of maps (also known as wrap-around colors) when using pass-thru mapping. By default, if you paint off the edge of the map, the stroke appears on the opposite side. To temporarily disable this behavior, uncheck the Map Wrap UV option in the expanded Maps Manager palette.

You can only have one type of each map per object. To use two mapping modes for one map type, use two objects. For example, cylindrical mapping does a great job on the circumference, but distorts the image on the top and bottom. To apply a map on the top of a cylinder as well, place an appropriately sized disk (a separate object) on the end of the cylinder and map it with pass-thru mapping. You can also use Implicit mapping on an object that supports it.

Orientation

The Orientation options in the Apply Map dialog let you choose where the map begins on the object. If you need to adjust the map later, you can do so in the Set Mapping Options dialog.

Align with Coordinate Axes

Painter 3D orients the map according to the object's construction axes. You can get information on the object by selecting it with the Object Selection tool and looking in the Controls palette.

Align with Current View

Painter 3D orients the map according to the view in the Model window. For example, if you choose this option with Pass-thru mapping, the image is "projected" onto the object from your current vantage point.

Align in Register With

Painter 3D aligns this map with the one you select in the pop-up. Corresponding regions of the two images will map to the same area on the model.

This setting can be quite useful. For example, say you use a texture map to put a label on a bottle. You want a highlight mask to cover the paper label, reducing its specularity from the glass surface. With the color label in the texture map and the dark area of the highlight mask occupying the same region of their respective images, aligning the one with the other ensures that the two features map to the same area on the model.

Scale and Origin

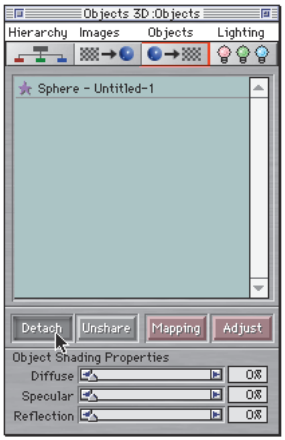
Scale and Origin values in the Apply Map dialog provide further technical information. You can't change these values manually. These values do change however, depending on the selected mapping mode.

Removing or Detaching a Map

At some point, you might want to remove or detach a map image. You might even want to replace the map with a different image.

To replace a map, simply apply a different one. Painter 3D gives you a chance to save the map before replacing it.

You can detach a map from an object by selecting the image in the Objects 3D: Objects palette and clicking the Detach button. A detached map is disassociated from the model, but remains onscreen as a 2D Image window, which you can then close by clicking the window's close box.



Detach a map using the Detach button in the Objects 3D: Objects palette.

When you detach a map, the Image window might not appear to change, depending on the imagery in the maps or if the maps are displayed on the model. If you have obviously different imagery in two different maps, and you detach one, the active image disappears and the remaining image appears in the Image window. If you have two similar maps however, you might not notice the first image disappearing because it appears so similar to the second. Check the map list in the Maps Manager palette to be sure you have the set of maps you want.

Unlike Painter 3D's predecessor Detailer, you can close a map's Image window without removing the map. Closing the Image window has the effect of hiding the map. You simply select it in the Maps Manager palette to make the Image window reappear. The only way to remove a map is to click the Detach button in the Objects 3D: Objects palette.

Unsharing a Map

If you've been sharing maps across objects, at some point you might want to "unshare" or disassociate them to work on them independently. Select the map you no longer want to share in the Objects 3D: Objects palette and click the Unshare button. Unshared images remain attached but changes don't affect prior shared images.

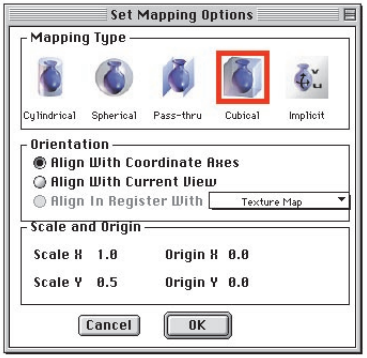
Changing Mapping on a Current Map

After applying a map, you might realize that a different mapping mode or alignment might be better. You can easily change these settings.

When you open the Apply Map dialog, Painter 3D "auto-ranges" to determine the optimum values. You can use the Adjust features to change scale, origin, and orientation (the specific adjustments that are available depend on the mapping mode), but if you later decide to change mapping options, auto-ranging and the orientation setting in the Set Mapping Options dialog will effectively wipe out your adjustments.

To change mapping:

1. With the Object Selection tool, select the object you want to work with.
2. Choose **Map menu> Set Mapping Options> Map Type**. Painter 3D opens the Set Mapping Options dialog for the selected map. Refer to "Choosing a Mapping Type" on page 74 for more information.



You can open the Set Mapping Options dialog from the Objects 3D: Object palette.

You can also use the Objects 3D: Objects palette to open the Set Mapping Options dialog. Click the listing for the map you want to change, then click Mapping.

If you're using the "Ray Dream Compatible" preference, Painter 3D updates all maps for this object to the new mapping.

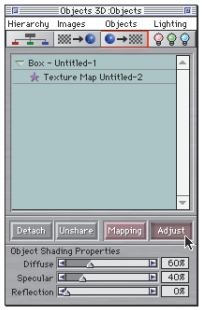
Adjusting a Map

After applying a map, you might want to adjust its position on the object. You can drag the map image across the object surface, change its scale, and set its orientation.

The adjustments available depend on the mapping mode of this map. (You cannot make adjustment for maps that use implicit mapping.)

To adjust a map:

1. Choose **Map menu> Adjust Mapping>** and select the map you want to adjust.

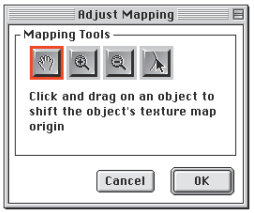


You can also select the map you want to adjust by clicking it in the Objects 3D: Object palette. The selected map is highlighted. Then click the Adjust button.

   Painter 3D displays the Adjust Mapping tools. **This dialog must remain open while you are adjusting the map**.

2. Choose an appropriate tool and adjust the map.

The tools provided and their adjustment effect depend on the mapping mode.



Use the Adjust Mapping dialog for more control over how the map appears on the model.

Mapping Tools

There are four mapping tools you can use to adjust maps. Not every tool is available for every map type.

- The Grabber tool lets you drag the map image on the surface of the object. This doesn't move the position of the map seam. It uses the Pattern feature "wrap-around seams" to move the entire map, including the seam to different locations in the image. The Grabber tool is available for cylindrical, cubical, spherical, and pass-thru maps.
- The Plus Magnifier tool reduces the number of repeats in the Y dimension by a factor of two and then magnifies the single tile. The Plus Magnifier tool is available for cylindrical, spherical, and pass-thru maps.
- The Minus Magnifier tool doubles the number of repeats of the image in the Y dimension, making the map half of its former size. Scale in the X dimension does not change. The Minus Magnifier tool is available for cylindrical, spherical, and pass-thru maps.
- The Seam Adjuster tool lets you set the angle of pass-thru. Painter 3D projects the map onto the object perpendicular to the surface at the point where you click with the tool. The Seam Adjuster tool is available for pass-thru maps only.

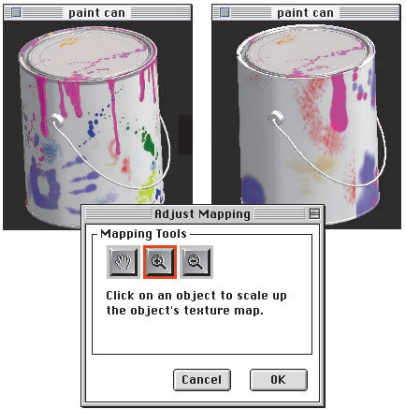
Implicit

The Adjust Mapping tools are not available in implicit mapping. Because of the variety in the topology of objects, there's no way to know which areas of the map image correspond to which surfaces on the model. Showing the mesh might help in some cases, but you'll probably need to start painting on the model to make sense of it.

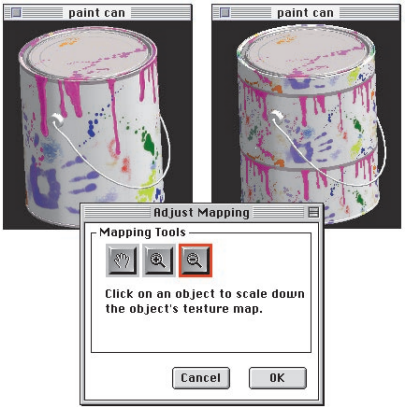
Cylindrical

You can use the Grabber and Magnifier tools with cylindrical maps.

If you want to move only a portion of the map, work in the 2D image to select and float the region. Then you can move it.



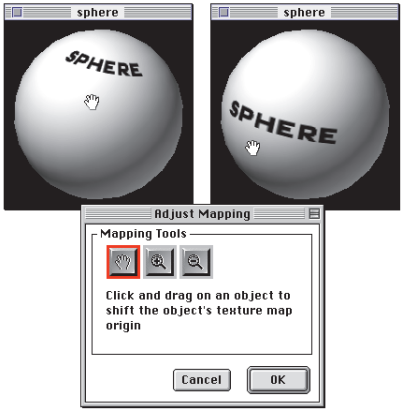
In the Adjust Mapping dialog, using the Plus Magnifier enlarges the map on the model.



In the Adjust Mapping dialog, using the Minus Magnifier reduces the map scale. The map tiles and repeats on the model.

Spherical

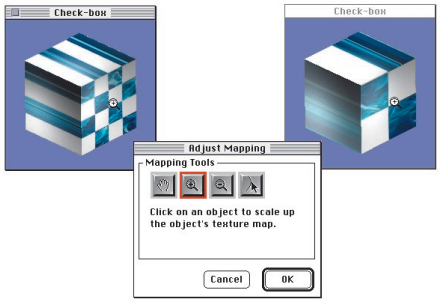
Only the Grabber tool is available for adjusting spherical maps.



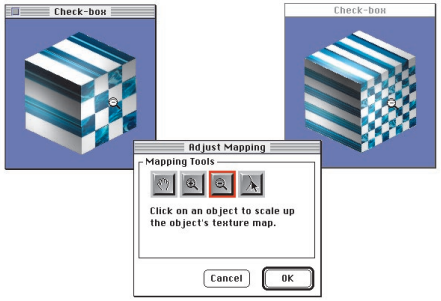
In the Adjust Mapping dialog, using the Grabber moves the map on the model.

Pass-thru

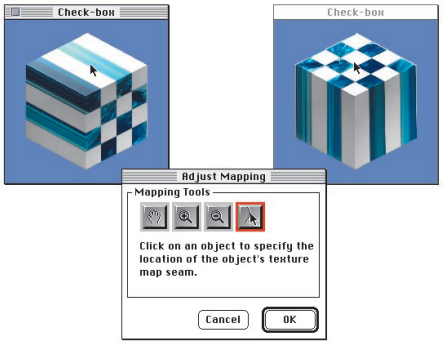
All of the adjustment tools are available for pass-thru maps.



Click once with the Plus Magnifier to reduce repeats and enlarge the single map tile on the model.



Click once with the Minus Magnifier to increase repeats and decrease the size of the repeating tiles on the model.



Click once with the Seam Adjuster to change the angle of pass-thru.

Cubical

Only the Grabber tool is available for adjusting cubical maps. If you design your map properly, adjustment is not necessary. For more information, see "Finding the Box Faces" on page 92.

Working in the Maps and Painting on the Model

Painter 3D lets you work on the map images while they are applied to the object. You can paint new imagery, apply image effects, create floaters, and move floaters around in the image. (Floaters are an excellent way to place details on the model.)

Painter 3D offers you a wealth of tools, features, and options for creating imagery. The remainder of this manual, as well as the online book, *Painter 3D Advanced Guide*, describes the tools, features, and techniques for developing imagery in surface maps.

Saving Map Images

As you develop images in your maps, you should save your work periodically. For better organization, save all map images in the same folder as the model.

For best results, save the image using the RIFF file format, Painter 3D's native format for images. This format retains the mask and all floaters. Other formats might not retain this information, which can limit your options for editing the image later. If you intend to export the model to another 3D program other than Ray Dream Studio or Ray Dream 3D, use the TIFF or another compatible file format.

See "Saving Images" on page 114 for more information on saving map image files.

Controlling Applied Maps

There are several ways to control maps you've applied, including making a map active, making more than one map active, and hiding maps.

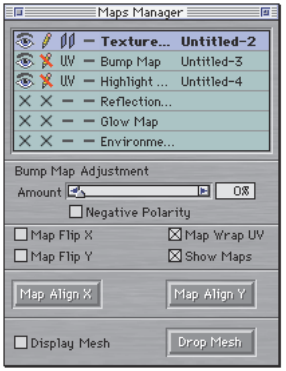
Making a Map Active

When you have several maps applied to an object, you'll need to identify which one you want to work in. Usually, only the active map is available for painting, applying effects, and editing, unless you have shared maps.

To make a map active:

Use any of these methods:

- Click the map name listed under the object in the **Objects 3D: Objects palette**.
- Click the map type listed under the image name in the **Objects 3D: Images palette**.
- If the map you want is attached to the currently selected object, click the map name in the **Maps Manager palette**.



Click the Pencil icon to activate the map so you can paint on it.

The foremost Image window (displayed above all other Image windows) is active for painting. Regardless of which method you use to select the map, its window comes forward.

Making Multiple Maps Active for Simultaneous Editing

At times, you might want to work on more than one map at the same time. For example, you might want to paint a color on a texture map while simultaneously carving a niche with the same brush stroke on a bump map.

To select multiple maps:

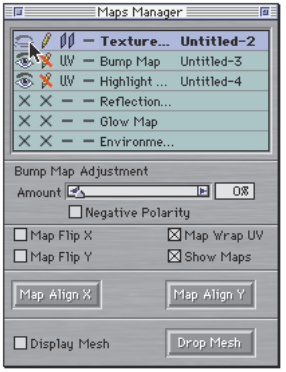
1. Select a map in the **Maps Manager palette** list.
2. Shift-click the Pencil icon for any additional maps you want to select.

Shift-click the Pencil icon again to deselect any map.

Hiding a Map

You might want to hide a map from the Model window temporarily. For example, you might want to check the effect of a bump map on the model without the distraction of the texture map.

Preventing maps from displaying in the Model window also speeds up the display.



Hide a map to remove it from the Model window.

To hide any map:

1. Click the Eye icon beside its listing in the **Maps Manager palette**. The Eye winks shut and the map disappears from the 3D view of the object.
2. To bring back the map, click the Eye icon again to open it.

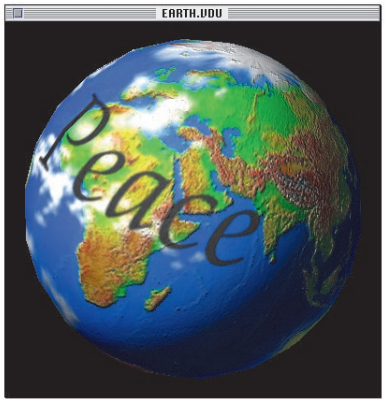
The Map menu> Show submenu also lets you hide and show the maps. The submenu has a listing for each applied map. Checked items are currently displayed on the model. Select an item to toggle its display state.

Working in Either the Image Window or Model Window

After making a map active, you can paint into it, apply effects, or use any of the other tools to develop and change the imagery. You can work in either the Image window or directly on the model. In either case, your brush strokes and effects appear almost immediately in the other window.

Some tools and features require you to work only in the 2D window.

In the Model window, you can paint on the object with the Brush tool, fill with the Paint Bucket tool, sample color with the Dropper tool, create text with the Text tool, and drag floaters with the Floater Adjuster tool.



You can create text directly on the model.

In the Model window, you cannot create selections with the Lasso, Magic Wand, Rectangular Selection, or Oval Selection tools. You cannot drag handles of a reference floater for resizing, rotating, or skewing. You cannot use the Effects menu> Orientation> features on the model. You can select a floater by clicking on it, but not by dragging a marquee.

You can create a mask (or selection) in the 2D image and set the Drawing Mode to Masked Inside (or Masked Outside). When you paint on the model, the brush respects the Drawing Mode setting and the canvas mask.

When a floater is selected, your brush strokes and effects apply only to the floater—the canvas isn't touched. This is true whether you're working in the Image window or painting right on the model.

Using the Mesh

Painter 3D uses a mesh for the mapping correspondence between the 2D image and 3D surface. The mesh type depends on the mapping mode selected for this map and the 3D modeling application that created it. Viewing the mesh might help you see correspondence between the 2D image and 3D surface. In some cases, this information might be helpful in developing images.

To show the mesh:

1. Select the Image window for the map whose mesh you want to view.
2. Choose **Canvas menu> Display Mesh**.

   Or

   Click the mesh icon in the top right corner of the Image window.

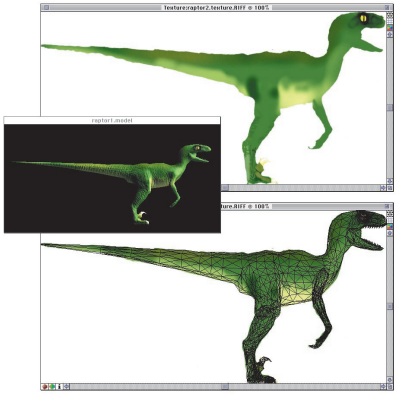
   Or

Click the Display Mesh option in the expanded **Maps Manager palette**.

To view the mesh, click the Mesh button.

To hide the mesh:

- Choose **Canvas menu> Display Mesh** again. You can also click the mesh icon in the top right corner of the Image window or uncheck the Display Mesh option in the expanded **Maps Manager palette**.



An example of mesh for pass-thru mapping on a more complex model.

Dropping the Mesh

If you like working with the mesh, you might like to "drop" it onto the image as a graphic element. When you drop the mesh, the lines that make up the mesh become part of the image.

To drop the mesh onto the image:

1. Select the map into which you want to drop the mesh.
2. Display the mesh by clicking the mesh icon in the top right corner of the Image window.
3. In the **Maps Manager palette**, click the Drop Mesh button.

Painter 3D drops the mesh into the image. You cannot undo this action.

Wrap-around Colors and Seamless Maps

So far in this chapter, you've seen that Painter 3D wraps a 2D image around a 3D model. You might be wondering about what Painter 3D does with the edges of the 2D image. Painter 3D wraps colors around and creates seamless edges.

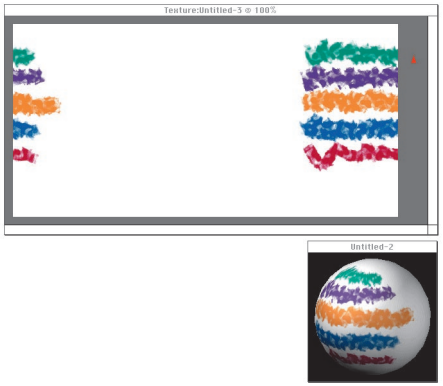
Wrap-around Colors

Early sailors thought the world was flat. They feared that if they sailed too close to the edge, their ship would fall into nothingness.

Now, imagine your cursor as that ancient sailing ship on the sea of a 2D image. Dragging a brush stroke beyond the edge of the image would send it into nothingness.

Innovative thinkers and explorers proved the world was round. Magellan demonstrated that by sailing in one direction, you'll eventually return to your starting point.

This is how the Brush tool behaves in a Painter 3D Pattern image. Drag it off the right edge of the image and the stroke continues on the left. This behavior is called “wrap-around colors.”



You can paint off the edge of the map image file and your stroke appears on the other side while it appears seamless on the model.

Painter 3D wraps the map image onto the model. But there must be an edge where the two sides of the map meet (this is where you’d place a piece of tape on a gift wrapped package). Wrap-around colors lets you paint right across this seam. This is a huge advantage when painting directly on the model.

All surface maps applied to a model have the Pattern wrap-around seams attribute. An image you create with the File menu> New Image command won’t have wrap-around colors. You can enable this feature for an image if you like. Choose Art Materials palette: Pattern menu> Define Pattern. Once the image is defined as a pattern, all features will wrap around.

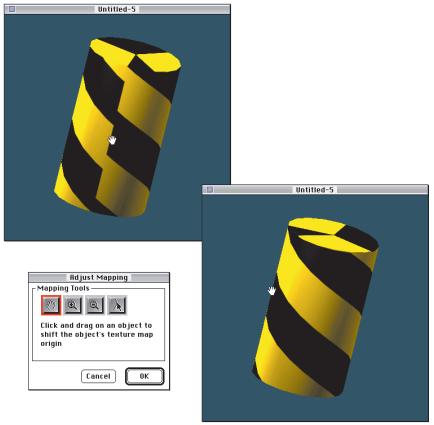
Disabling Wrap-Around Colors

Sometimes you might not want the canvas map wrapping, especially when painting on maps that use pass-thru mapping, and sometimes on ones that use implicit mapping. To temporarily disable wrap-around colors, uncheck the Map Wrap UV option in the expanded Maps Manager palette.

Seamless Maps

Normally, the right edge of a Pattern tile meets the left edge of the next tile. With the map wrapped in 3D, the right edge of the map meets its own left edge. In a sense, the map is a Pattern tile that “meets itself.”

The seam where the edges of the map meet should be invisible. The imagery should flow together as though it was continuous. This is the case for map images created from Painter 3D’s patterns, paper textures, and weaves.



When the seam is apparent, rather than move the view of the model, you can use Adjust Mapping with Grabber to move the map and seam to the opposite side.

However, if the colors on the left edge of the map contrast with the colors on the right edge, the seam will be visible. You can use the Adjust feature to move the map and seam to the other side of the model, or you can modify the imagery to make it seamless.

If you need more information on developing seamless maps, look at the section on developing seamless pattern tiles in “Creating Patterns” on page 156.

Features and techniques described for creating seamless patterns apply equally to developing seamless maps.

Reflection Mapping

If you're in a museum and you look closely at an 18th century porcelain vase, you might see your own face reflected on the surface. It's a subtle detail, but reflection adds visual interest and realism to your models. Painter 3D lets you develop this kind of detail with reflection mapping.

There are two ways to use reflection mapping in Painter 3D. One method requires you to create an image specifically for use as an environment map, which you can then apply to an object like any other surface map. The other method is more passive. It simply uses the current pattern as the image to reflect. Both methods require that you adjust the Reflection slider in the Objects 3D: Objects palette before the effect can be seen.

Here are some pointers for getting the most out of reflection mapping.

- If you create an image for an environment map, you might need to warp it.
- If you don't create an environment, Painter 3D uses the current pattern.
- You need to select each object in the model and use the Objects 3D:Objects palette: Reflection slider to set the degree of reflection for reflection mapping to have any effect.
- If a single object has areas with different reflectivity, apply a reflection mask map to describe the areas with limited reflectivity.

Reflection mapping is most useful for rendering your models into 2D images. You lose the effect when you import your models and maps into your 3D application. You might be able to use an environment map you've created if your 3D application accepts 2D images for use as a background or backdrop.

Creating an Environment Image

An environment map isn't mapped directly onto the surface of an object. The image in an environment map is the image that appears in the reflection of an object.

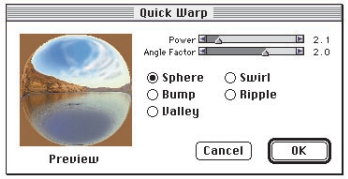
Curved objects, like a porcelain vase, warp the image across the curve of their surface. In Painter 3D, you may need to warp the image before loading it as the environment. This depends on the topology of the object. The rounder the object, the more likely you'll need to warp the image.

The original landscape image.

To warp an image:

1. Before warping, make sure all floaters are dropped.
2. Choose **Effects menu> Surface Control> Quick Warp**.

3. In the Quick Warp dialog, use the default settings (sphere) and click OK.



Using Sphere Quick Warp to create an environment map.

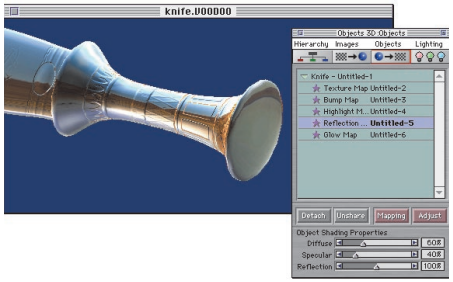
4. When you've finished developing the environment image, save it.

The resulting environment map.

Using an Image for the Environment Map

If you have an image you want to use as an environment map, the steps for applying it are the same as applying any other type of surface map. You select the object and apply the map, specifying your existing image as the source of the map.

Once you load the image into the map, be sure to set the reflection setting high enough to view the image.



Model shown using the landscape environment map for reflection.

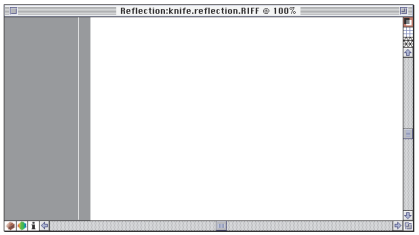
Setting Reflection for an Object

The Objects 3D: Objects palette: Reflection slider controls the object's overall reflection.

Select each object and drag the slider to describe its basic reflection amount.

Using a Reflection Mask

You can mask areas of the object to inhibit reflection by applying a reflection mask.



The reflection mask for the previous example.

Refer to "Applying Maps" on page 71 for more information.

White areas of the reflection mask allow the full Reflection slider setting. Black areas in the reflection mask block reflection completely. A shade of gray in the mask inhibits reflection at a level that's the inverse of its luminance value. The darker the gray, the more it inhibits reflection, and vice versa.

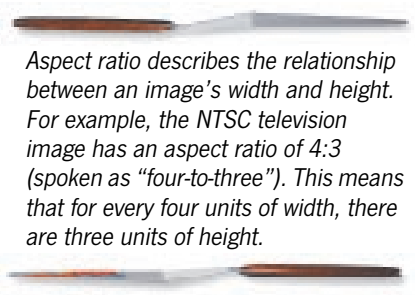
Technical Considerations for Designing Maps

This section offers technical information on designing maps to minimize distortion.

Distortion is inherent in applying 2D images to some curved 3D surfaces. It's the consequence of scale differences between the 2D image and the areas it maps to on the 3D surfaces. You'll recognize this problem if you consider some real-world examples:

- Imagine wrapping a basketball in newspaper. It's impossible to wrap the paper close to the ball without creating folds. That's because in some areas, you've got more paper than basketball surface. This is just what happens in spherical mapping. The folds in the paper translate to distortion when you map a 2D image onto a 3D object.
- Now imagine gift wrapping a can. It's easy to get the paper tight around the circumference, but how do you cover the ends? You've got to fold the wrapping paper. What if your paper isn't long enough to go all the way around the can? You'd need to stretch the paper until the ends meet. In terms of cylindrical mapping, stretching the paper stretches the images on it as well.

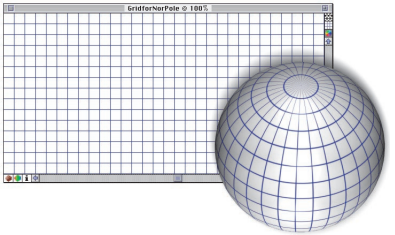
Fortunately, distortion can be minimized by choosing the right mapping mode for the model and designing the map images carefully. The most important factor in map design is the aspect ratio of the image.



Aspect ratio describes the relationship between an image's width and height. For example, the NTSC television image has an aspect ratio of 4:3 (spoken as "four-to-three"). This means that for every four units of width, there are three units of height.

Scale Changes Across the Surface

The grid paper wrapped onto the sphere demonstrates how scale can change across the 3D surface. In the 2D map, the grid is fairly regular—the cells are the same size and nearly square. Near the poles of the sphere, however, the cells are smaller and triangular.



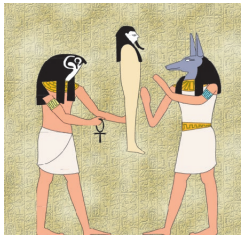
The grid is constant in the 2D texture map. On the sphere, scale diminishes approaching the pole.

Grid paper is an excellent image to use as a reference when exploring image aspect and mapping. Any distortion of the square grid will be apparent immediately. You can apply grid paper by opening an image, then choosing Effects menu> Esoterica> Grid Paper.

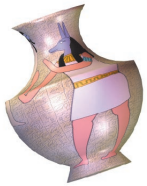
Painting and Distortion

If you paint with the Brush tool in the 2D image, the brush dab will have the same size anywhere in the image. However, if you use that same brush on the sphere, the dab will be compressed by the distortion and become smaller as you paint nearer the pole; this is just one example. Brush scale (and mapping scale) changes across regions of an object depending on the mapping mode and object shape. Even with implicit mapping, scale varies with the dimensions of the object at that point.

Distortion cannot be eliminated, but its effect can be made negligible. For one thing, the ability to paint directly on the model is a tremendous advantage in avoiding distortion. Because you're painting on the model, you can develop the imagery at the size and shape you want.



This texture map is used with the following examples.



Mapping scale changes with the diameter of the vase.

Scale is constant on the walls of the cylinder.

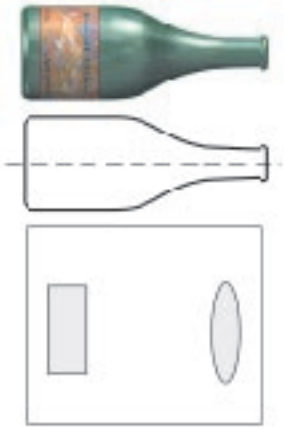
Optimizing Maps for Implicit Mapping

Implicit mapping correlates points on the object with points in the map and wraps the image to align the two sets of points.

The points on the object are defined by the UV coordinates. Painter 3D locates points in the map based on the UV data from the model and the map aspect. This means that you can use almost any aspect in a map used for implicit mapping. The nature of implicit mapping minimizes distortion problems.

Because of the variety in object shape, there are no set rules for setting up images for implicit mapping. Ideally, the distribution of points in the map will minimize distortion on the model. You can support this by approximating the object surface area with the map image.

For example, if the object is long and slender, like a snake, it makes sense to make the map relatively wide and not-so-tall. However, the orientation of the UV coordinate system might differ from your logical sense of what is "left" and "up" for the object.



The model's construction determines the orientation of the map imagery.

The correspondence between regions of the map and points on the model is defined in the model's construction. Depending on the nature of the model, imagery may appear mirrored or backwards. This may not be a problem with some types of imagery; however, it usually is a problem for text. You can easily correct this by flipping any floater or map that appears mirrored on the

model. Use the Map Flip X or Map Flip Y options in the Maps Manager palette to easily flip maps.

After choosing implicit as the mapping mode, display the mesh on the map image. If the mesh "openings" are extremely narrow in one dimension, you might want to increase the image size in the other dimension. For example, if the openings are really wide, but not very tall, you might want to increase the image height.

You'll discover more about the mapping when you begin painting on the model. After you paint a few strokes, you might decide that a different image aspect will produce a better map for this object.

When you create a new map based on the pattern or paper texture, you can often use a shortcut to determine the correct number of repeats. The shortcut works only if the pattern/paper texture tile is square. (A tile is square if the columns and rows values are equal. This information appears in the Pattern or Texture palette when the drawer is closed.)

Here's the shortcut: Determine the correct aspect ratio for the object scale and mapping mode you plan to use. When you load a new map, enter the values for this aspect ratio (or multiples of it) in the horizontal and vertical repeats fields.

Optimizing Image Aspect for Cylindrical Mapping

The aspect ratio of the map image should match the dimensions of the cylinder. If it doesn't, the imagery on the map will be distorted in one dimension.

Remember from geometry class that the circumference of a circle is π multiplied by the diameter (πd). The images you create for cylindrical mapping on a cylinder should have an aspect ratio consistent with the ratio of the cylinder's circumference to its height.

The map image width should be:
3.14*cylinder_diameter

The map image height should be:
cylinder_height

For example, if the cylinder is 3 units in diameter and 6 units tall, the image should be 3.14*3 wide and 6 high, or 9.42 by 6 units.

You can use images of any resolution, but they must be consistent with this aspect ratio.

A simple shortcut: Use 942 pixels as the width and 600 pixels as the height.

You can convert the results to an aspect ratio, then determine appropriate dimensions in pixels. You can also choose File menu> New Image and create a new image using inches as the units (which allow decimals). Then resize the canvas to the dimensions you want. Resizing the canvas maintains its proportions.

If you resize a map, you may need to update the mapping information. Open the Mapping Options dialog, make sure the options are set as you want them, then close the dialog.

Optimizing Image Aspect for Spherical Mapping

In spherical mapping, Painter 3D maps the width of the image to 2π radians and maps the height to π radians; therefore,

the aspect ratio of the map should be 2:1. (The image width should be twice the height.)

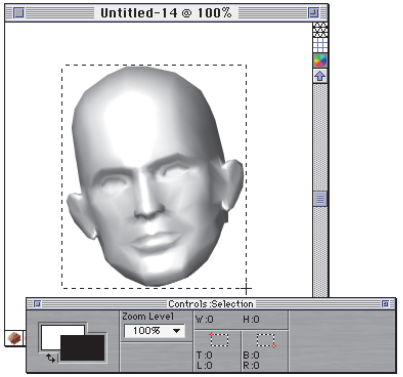
Optimizing Image Aspect for Pass-thru Mapping

In pass-thru mapping, the map image should have an aspect ratio that approximates the dimensions of the object's silhouette when viewed at the angle of pass-thru.

The following steps suggest one method of working.

To optimize the image aspect:

1. Set the view in the Model window for the angle of pass-thru you want.
2. Choose **File menu> Render to Image**.
3. In the rendering, use the Rectangular Selection tool to draw a marquee that's just large enough to enclose the object.



The selection describes an appropriate aspect for pass-thru mapping at this angle.

   This marquee describes the aspect of an appropriate image for pass-thru mapping at this angle.

4. You can get width and height values by looking in the **Controls palette: Selection Tool**. Then create a new image based on this aspect ratio.
5. You can also copy the selection, then choose **Edit menu> Paste> Into New Image**. Now you can choose **Canvas menu> Resize** and scale the image to any resolution you want.

   Then you can develop imagery in this new canvas.

When you apply this map and set mapping options for it, use the Align with current view orientation option.

Optimizing Image Aspect for Mapping onto a Box

When mapping onto a box using either cubical or implicit mode, the aspect ratio of the map image should match the dimensions of the box. If it doesn't, the imagery on the map will be distorted.

You can calculate the correct aspect ratio for mapping to any box as follows:

1. Note the width, depth, and height of the box. To check the dimensions, you can click on the box with the Object Selection tool. The Controls palette updates to show the extents in the X, Y, and Z dimensions. Width is X, height is Y, and depth is Z.
2. Use the following equations to determine the correct aspect ratio for images used in cubical or implicit mapping on a box:

   Map Width = 2*(width + height)

   Map Height = 2*height + depth

For example: Your box is 3 units wide, 4 units high, and 2 units deep.

Map Width... 2*(3 + 4)=14

Map Height... 2*4 + 2=10

This gives you an aspect ratio of 7:5. Any image with dimensions consistent with that aspect ratio will map correctly on that box. For example, if you want the image width to be 700 pixels, the height should be 500 pixels.

If you wanted, you could create an image at the dimensions you calculated (140 pixels by 10 pixels), then use the Canvas menu> Resize command to scale the image to the dimensions you want. This is an easy way to get the right proportions at a particular size.

Finding the Box Faces

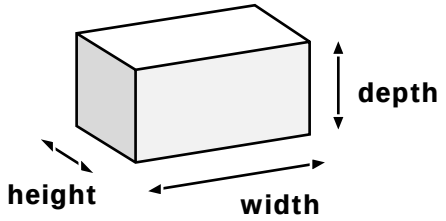
This section assumes you have determined the correct image aspect ratio for mapping onto a box. If you are not sure about this, please refer to the previous section.

When developing a map for a box, you'll need to know which areas of the image correspond to which of the box's six faces. You can create text and imagery for the front, the sides, and the back of the box, and each image region will map to the correct box face.

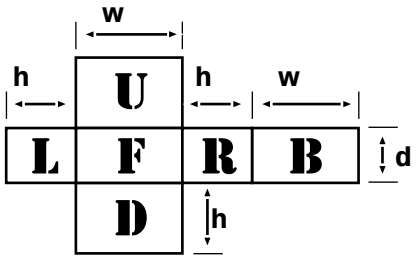
Imagine cutting along the corners of a cardboard box in such a fashion that you could flatten the cardboard into a cross. Cubical mapping (and implicit mapping on a Painter 3D primitive box) is just the opposite of this. It takes the cross and folds it to reconstruct the box.

You lay out imagery for each of the six faces in a cross on the map image. To do this properly, you must know which areas of the cross will map to which faces of the box.

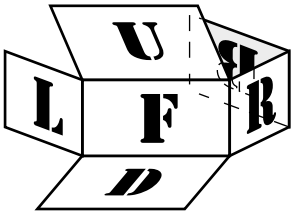
The following diagrams describe how to lay out images for box mapping:



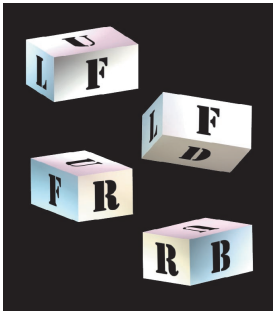
When you create a new box in Painter 3D, it has the orientation shown above.



This diagram shows the box height, width, and depth on the map.



This diagram shows how the map is folded onto the box.



The finished box, rendered from several angles.

When you're developing your image, display the mesh by clicking the mesh icon in the top right corner of the Image window. The mesh lines help identify the regions that map to the different faces.

Tip: Use one reference floater for the imagery on each face. You can easily move, resize, and rotate the floaters without sacrificing image quality. You'll be able to see the results of your changes on the 3D view of the box. Adjust the reference floaters until they're on the correct faces. Reference floaters are described in the online book, Painter 3D Advanced Guide.

Finding the Dimensions of Each Box Face Region

You might want to know exactly which pixels in the map correspond to the box faces. In most cases, this won't be necessary to do your work. The mesh lines and how your work appears on the model will give you enough information to scale imagery for the face regions. However, if you're interested or technical considerations require it, the following mathematical example describes how to determine the dimensions of each face in pixels.

To determine pixel dimensions:

1. Use the formula described in "Optimizing Image Aspect for Mapping onto a Box" on page 91 to determine the width in units of the map.

   For this example, use a box model that is 6 units wide, 4 units high, and 3 units deep.

   Map Width..... 2*(6 + 4)=20 units

2. Divide the width of the map image (in pixels) by the map width (in units). This gives you the pixels per unit (ppu) of the map. That is, how many pixels in the image are mapped to one unit on the box.

   For the example, we'll use a map that's 1280 pixels wide (chosen arbitrarily).

   1280/20=64 ppu

3. Now you can multiply the ppu value by the box width, height, and depth dimensions.

   Width: 64*6=384 pixels

   Height: 64*4=256 pixels

   Depth: 64*3=192 pixels

4. Refer to the diagrams in "Finding the Box Faces," earlier in this chapter, to see how these values relate to regions of the map image.

Changing the Aspect Ratio of a Map Image

If the map stretches on the object in a way you don't like, you might want to change the aspect ratio of the map image.

To change the aspect ratio:

1. Make sure that all floaters are dropped.
2. Choose **Effects menu> Orientation> Scale**. Painter 3D floats the image and opens the Scale Selection dialog.
3. Disable the Constrain Aspect Ratio check box.
4. Enter scaling percentages for the width or height. Notice that a rectangle in the Image window describes the scaled dimensions of the image. When you're satisfied, click OK. Painter 3D scales the floating image.

5. Choose **Edit menu> Copy** to begin moving this floater to its own image file.
6. Choose **Edit menu> Paste> Into New Image**.

   Painter 3D creates a new image document for the scaled floater.

   Now, you can replace the old map with this new, scaled map.
7. In the Maps Manager palette, double-click the listing for the map type (texture, bump, etc.) you are working with. You can also click once to select it, then click Load.
8. In the Apply Map dialog, use the Copy Image pop-up to select the name of the modified image. Click OK. Painter 3D loads the image in the selected map channel.

Using Reference Floaters to Avoid Regional Distortion

Determining the correct aspect ratio for a map image works well when the object is regular—when the walls of the cylinder are straight, for example. But what do you do when the scale of the object changes? Consider a wine bottle.

The body of a wine bottle has one diameter, and the neck has another. Labels placed on the body and neck should have different aspect ratios, but the texture map applied to the bottle can have only one aspect ratio. What do you do? The answer is to scale the labels differently.

This technique works for both cylindrical mapping and implicit mapping.

To scale labels differently:

1. Set up your texture map so that the larger label (on the body) is at its natural proportions.
2. Add the label for the neck as a reference floater. Position the floater on the neck of the bottle.
3. Increase the horizontal scale of the neck label.

- If you know the diameter of the neck, use the **Effects menu> Orientation> Set Transform** feature. Disable the Constrain Aspect Ratio option. Set the Horizontal scale factor to the inverse of the diameter change between the body and the neck. (For example, if the neck is one-third the diameter of the body, the horizontal scale factor should be 300%.)
- You can use the Floater Adjuster tool to scale the label by hand. For this, you need to work in the 2D Image window. Using Free Transform, drag either side handle to stretch the floater horizontally. When the label looks right in the 3D view, Commit Transform and you're done.

The online book, *Painter 3D Advanced Guide*, provides information about working with reference floaters.

Using Light

Lighting the Model

In Painter 3D, as in other 3D programs, light illuminates the model for the rendering camera. The rendering camera's view is shown in the Model window. Without light, all you would see in the Model window is black. If you're going to render the model in Painter 3D, you'll want to set the lighting with care. Lighting directly determines the 3D appearance of the model.

If you're going to export your model to a 3D scene-building program, like Ray Dream 3D or Studio, you don't need to pay much attention to Painter 3D's lighting. You'll set final lighting in your 3D program. In Painter 3D you use light to see how your surface maps will look as you create them.

Colored Lights on the Model

Painter 3D lets you use colored lights. The color of the lights you use influences the colors on the surface of your model. For example, if your model has a cyan texture map and you shine yellow light on it, the model surface will appear green.

Use white lights to illuminate your model without adding tints to its surfaces.

This model has colored lights shining on it.

When you've finished adding surface detail to your models, you might want to export them to Ray Dream 3D or Studio or another 3D program. Ray Dream's rendering engine uses ray tracing. Ray tracing offers light effects that Painter 3D doesn't. If you want objects that cast shadows and render with translucence and refraction, you'll need to export your models to a 3D program.

Light Reveals the Third Dimension

Lighting the model creates two effects that contribute to its three-dimensional appearance: highlights and depth shading.

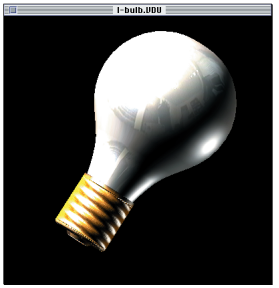
Highlights

Specular highlights are the bright spots and streaks where light reflects directly.

You can control an object's tendency to produce highlights with the Objects 3D: Objects palette: Specular slider and with the highlight mask map.

Depth Shading

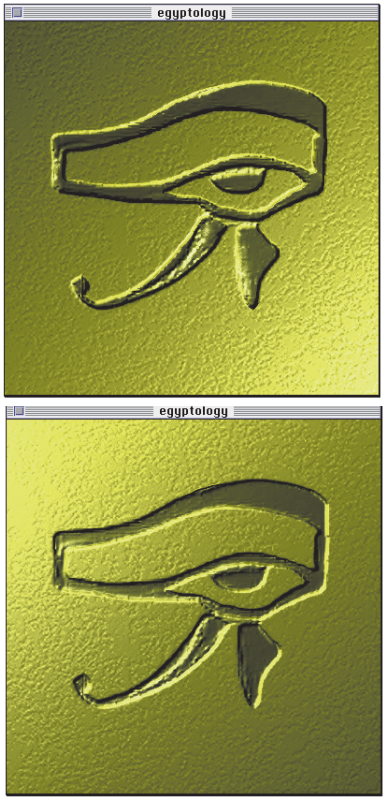
Depth shading describes the dark areas that develop on surfaces away from the light source. Depth shading is only apparent when ambient light is low.



This model has pronounced highlights and depth shading.

Lighting and the Bump Map

Different lighting conditions change the appearance of the bump map.



The effect of the bump map changes under different lighting.

- Lights that shine from a low angle create greater contrast in the bump map.
- Ambient light shines from everywhere, so it minimizes the relief developed by the bump map. To see more bump texture, reduce the ambient light.
- Lighting a bump area from opposite directions creates a canceling effect on the bump features. To reveal more texture, light the model primarily from one side.

The bump effect responds to lighting changes just as you'd expect in nature. Shine a flashlight straight into a sidewalk crack, and you'll see into it. The sidewalk surface and the crack are much the same color. But if you put the flashlight on the ground so that the light shines across the crack, the sidewalk is lit, but the crack is dark and its detail remains hidden.

Using Painter 3D's Lighting Palette

Painter 3D opens new models with a single light shining on the front of the model. You can move this light and create others. Each light can have different color, brightness, and concentration settings.

Painter 3D's lights are distant lights. They shine on the model like the sun shines on the Earth. You set lights for the entire model, not for individual objects within the model.

Most of the features for working with light appear in the Objects 3D: Lighting palette.

The central controls for lighting are found on the Objects 3D: Lighting palette.

If you want more sophisticated lighting, for example spot lighting, you will need to import your Painter 3D model into a 3D rendering program.

Preview

The lighting preview sphere represents the model space. Imagine your model just inside the sphere. The lights shine on the preview sphere just as they shine on your model.

Light Icons

The small circles on the preview sphere are icons representing the individual lights. The light's color appears inside the circle.

Display Slider

The Display slider controls the brightness of the lighting on the preview sphere. This slider changes the appearance of the preview; it has no effect on the lighting of your model.

Show Icons

When Show Icons is enabled, the light icons appear on the preview sphere. You might want to disable this option to hide the icons and see the preview without their distraction. You can hide the icons by disabling the Show Icons check box at the bottom of the palette.

Controlling Individual Lights

You can add individual lights and control them in various ways.

To add a new light:

- Click the preview sphere where you want the new light. Painter 3D creates a new light using the settings of the current, selected light.

To move a light:

- Drag the light's circle icon. By moving the lights on the sphere, you move them around your model.

Drag a light on the preview sphere to move it on the model.

To select a light:

- Click inside the light's icon. The icon for the selected light appears in "bold."

When you've selected a light, you can change the settings for its color, brightness, and concentration.

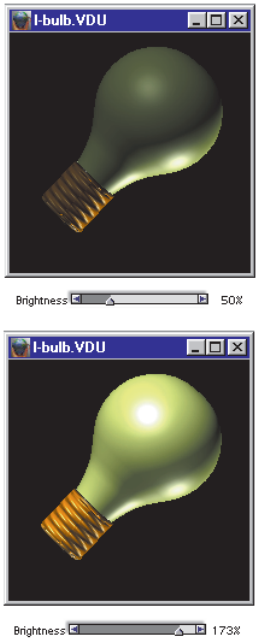
To change the selected light's color:

1. Click the Color button. Painter 3D displays the system color picker so you can choose a color.
2. Choose a color from the color picker and click OK. The model in the Model window is tinted with the color of the light.

When you use colored lights, the appearance of the model changes.

To change the selected light's brightness:

- Drag the Brightness slider to the right to increase the selected light's intensity. Drag the Brightness slider to the left to decrease the selected light's intensity.



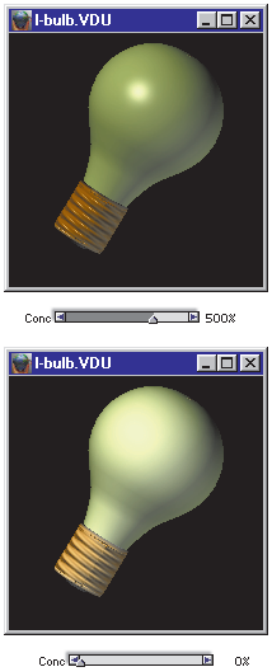
Dragging the Brightness slider changes the light's intensity.

To change the selected light's concentration:

- Drag the Concentration slider to control the spread of the selected light. Increasing concentration (dragging the slider to the right) creates a smaller patch of light on the model. Decreasing concentration (dragging the slider to the left) spreads light across the model.

To delete the selected light:

- Click the Delete button.



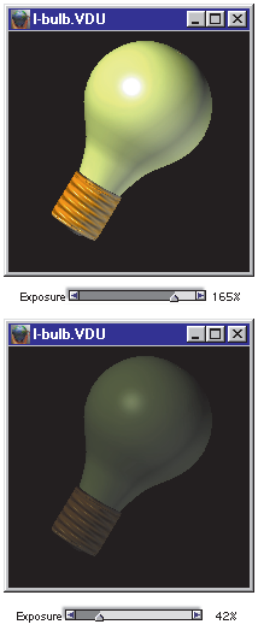
Dragging the Concentration slider changes the spread of the selected light.

Controlling Model Lighting

The following controls apply to the model in general.

Exposure Slider

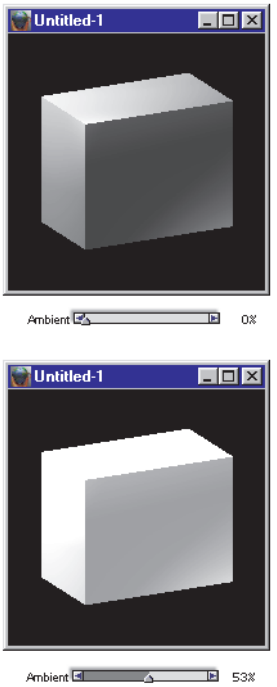
The Exposure slider controls how much light enters the rendering camera. It works just like the exposure setting on a regular camera. Increasing exposure (dragging the slider to the right) allows more light into the camera, so everything gets brighter.



The Exposure slider controls how much light enters the camera.

Ambient Slider

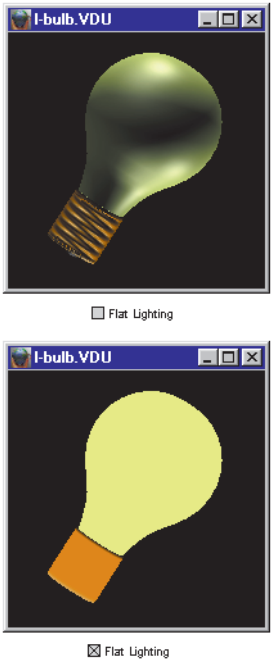
Ambient light is general—it illuminates the model from all directions. To get a stronger 3D effect from the specific lights you set, keep ambient light low.



The Ambient slider affects the general lighting from all directions.

Flat Lighting

Flat Lighting puts a lot of light on all surfaces. Flat Lighting is equivalent to maximum ambient light. When you're painting in the texture map, you might want to use Flat Lighting to see all areas clearly. You should disable this option to see depth shading, highlight, and bump effects.



Flat lighting removes the 3D effects from the model.

Adding Lights With the Light Tool

Sometimes, you'll want to add a light without going to the Objects 3D: Lighting palette.

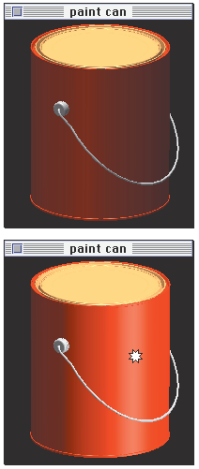
The Light tool lets you add a light by clicking directly on the model in the Model window. It concentrates a light directly at the spot on the model where you click. This lets you illuminate an area of the model more precisely than the Objects 3D: Lighting palette.

To add a light using the Light tool:

1. Select the Light tool from the Tools palette.

The Light tool.

2. Click the model at the spot where you want the light to shine. Painter 3D adds the light. You'll see the effect on the model immediately. (The preview sphere in the **Objects 3D: Lighting palette** updates to show the new light as well.)



Click the model once with the Light tool to add a light at that location.

3. Use the **Controls palette**: **Light tool** to adjust the light's Brightness, Concentration, Exposure, and Ambence. These are the same sliders provided on the **Objects 3D**: **Lighting palette**.

Locking Lights to Objects

By default, Painter 3D keeps lights fixed in relation to objects. This means that as you rotate the model in the Model window, certain portions of the model always stay lit and certain portions always stay dark.

You can temporarily disable this effect when rotating a model by holding down the Shift key as you use the Virtual Trackball tool. When you do this, you see that the lights remain fixed in relation to your view, and the faces of the model move in and out of light and shadow as you rotate the model.

You can lock lights to an object so that no matter how you're rotating the model, the portion of the object with the locked lights remains lit. You lock lights to objects when you add lights with the Light tool. Check the Lock Lights to Objects option in the Controls palette: Light tool. Lights will remain locked to objects until you disable this option.

Saving Light Settings

When you've created a set of lights that you like, you can save them to a retrievable setting. You can load the saved lights for any model you work with.

To save light settings:

1. Set the lighting you want. The settings for position, color, and all of the sliders will be saved.

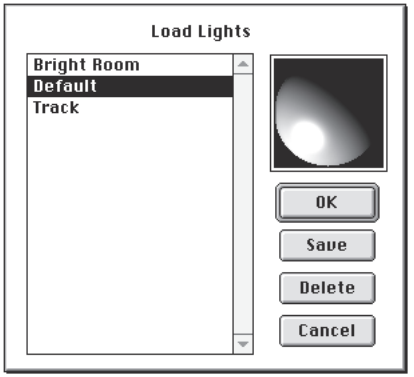
Create new light sets and click the Save button to save them for use with other models.

2. Choose **Objects 3D**: **Lighting menu> Save.** Painter 3D prompts you to name the light set.
3. Enter a descriptive name and click OK.

Access saved light sets with the Load button on the Light palette. 3D light sets do not have libraries or movers.

To load saved light settings:

1. Choose **Objects 3D: Lighting menu> Load**. Painter 3D displays a dialog list of the saved light sets.



After clicking the Load button, you can preview the light set in the Load Lights dialog before making your selection.

2. Click the listing you want. Painter 3D displays a preview of the light set.
3. Click OK. Painter 3D closes the dialog and loads the light setting for the model.

You can remove unwanted sets by selecting them, then clicking the Delete button.

Working With Images

Developing Images

Applying maps to your models is just one aspect of Painter 3D. The major portion of your work will probably be creating images in the map image files.

You can create images and apply them later as maps; or you can apply a map, then develop an image in it. Painter 3D lets you work either way.

One of the advantages to applying the map first is that you can then paint directly on the model. This is often the best way to get the effect you want, in just the location you want it.

The remainder of this manual and the online book *Painter 3D Advanced Guide* cover the many features for creating images. In this chapter, the text refers to "working in the image." It makes no difference whether an image file is currently applied as a map or not—it's still just an image. Painter 3D's image development features are as well suited for putting the finishing touches on a rendering as they are for developing map imagery.

Learning About Painter 3D Map Image Files

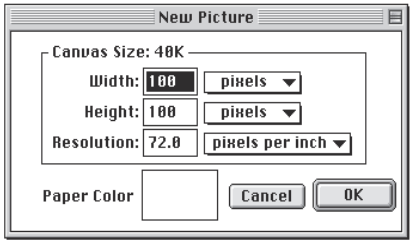
Painter 3D has its own 2D file format called RIFF. RIFF files have special properties. A RIFF maintains floating objects so you can return to the file to rearrange floaters. When you work in Painter 3D, you should always work in RIFF format to preserve editability. For compatibility with other programs, you can save finished work in other formats. If you intend to export your model to another 3D program, you should save all of your maps as RIFF files first and then in a format compatible with your 3D applications. (RIFF files are compatible with Ray Dream 3D and Studio.)

Creating a New Image File

When you create a new image file, you set the image's width and height, resolution, and paper color.

To create a new image:

1. Create a new image by choosing **File menu> New Image**. The New Picture dialog appears.



Painter 3D's New Picture dialog.

2. Set dimensions, resolution, and paper color, then click OK.

Canvas Size

The Canvas Size describes the file size. Next to the Canvas Size is how much memory (RAM) the document requires. RIFF is a lossless compressed file format. When saved in RIFF, the saved size of the document is roughly one-half to one-fourth of this number, depending on how many colors are present in the document. A document with fewer colors or more white space can compress in RIFF format more than a document filled with many different colors.

Width and Height

When you create a new image, the Width field is highlighted in the dialog. You can use the Tab key to move from field to field.

Choosing a Unit of Measurement

The default settings are in pixels. You can change the measuring units by using the pop-up menus. Choose from pixels, inches, centimeters, points, picas, and columns. Columns are two-inch columns, and you can indicate how many columns wide and tall you'd like your image to be.

To set the width and height for a new document, enter a value for Width and a value for Height in the dialog.

Setting Resolution

In Painter 3D, resolution refers to the number of pixels per inch (ppi) that make up an image. When you enter a value for Resolution, you need to consider the intended output or use for your project:

- If you want a low resolution map, use the default 72 ppi resolution.
- If you intend to make a large, high quality map, the resolution of the map should be increased. If you try to make a high resolution rendering with a low resolution map, the map will appear softened on the model.
- If you are creating a 2D collage or a rendering intended for print, you will need to consider the output device's resolution, measured in dpi, and, in the case of halftones, lines per inch (lpi). Output-device resolutions vary depending on the press and paper you're printing on. Generally, a photograph to be printed on glossy magazine stock will be output at a crisp 150 lpi, and at 85 lpi for more porous, and therefore more forgiving, newspaper stock.

In the New Image dialog, setting the document's pixels per inch is the same as setting its dpi. Using the default resolution setting of 72 pixels per inch means that your document's dpi will also be 72.

You can also set your size in inches, centimeters, points, or picas at a specific dpi.

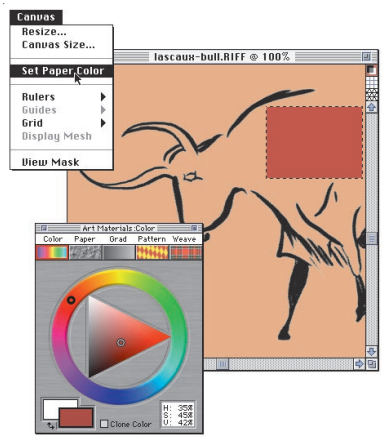
Paper Color

You can choose the background paper color. This color fills the image as the background color when the image opens. The Paper Color swatch shows the current paper color. Paper color differs from the backgr3ound color of the Model window. Paper color affects the background of the Image window only. The background color of the Model window is a color that appears behind the model in the Model window.

To set paper color, click the Paper Color swatch. Painter 3D displays the system color picker so you can choose a color.

To change an existing paper color:

1. Use the **Art Materials**: **Color palette** to select the color you want.
2. Choose **Canvas menu> Set Paper Color**. The paper is set to the current primary color



Choose Canvas> Set Paper Color to set the paper color to the current primary color. Delete part of the image to see the new paper color.

To see the change, you need to delete areas of the image or use the eraser brush to erase areas (do not use a bleach variant, bleach variants erase to white).

You can choose a surface for the paper as well as a color. You can specify a paper surface full of texture so that the grain appears beneath your brush strokes. You set paper surfaces in the Art Materials: Paper palette. Refer to "Working With Art Materials" on page 133 for more information about paper textures.

Opening a New View

You can choose to open a new view of any open image, which opens the image in a second Image window. When you open a new view, you're working with the same image but seeing it twice onscreen.

A new view can be quite useful. For example, you can set different magnification levels for each window. If you zoom in close in one window but leave the other at 100%, you can paint fine details in the magnified view but keep an eye on the overall effect in the regular view. Because it's the same image, the windows update simultaneously.

To open a new view:

- With an Image window selected, choose **Window menu> New View**.

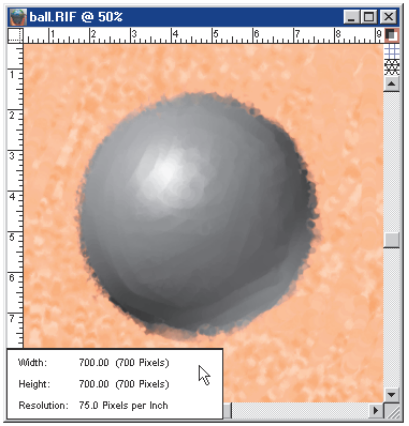
  The same image appears in a second Image window.

To close the view:

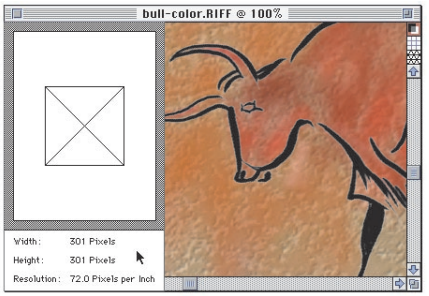
- Click the Image window's close box.

Image Size Information

You can use the *i* (the international symbol for information) near the bottom left-hand corner of the Image window to check image size.



The image information pop-up contains your image's dimensions and resolution.



When a printer is defined, the image size pop-up shows how your image fits on the selected page.

To check image size and orientation:

1. Move the pointer to the *i* and hold down the mouse button.

   The Width, Height, and Resolution appear in a pop-up window.

   When a printer is defined, the window also shows how your image fits on the page. Page size and orientation (landscape or portrait) are based on those designated in the Page Setup dialog. The non-printing area around the edge of the page is dim.

   If you change your image's resolution or dimensions by choosing Canvas menu> Resize, you can use the information window to see how the changes affect the way the image fits on the page.

2. Release the mouse button to close the image information window.

Navigating Your Image

You can navigate through an image by changing the level of magnification (zooming in or out), scrolling to a different part of the image, or rotating the page.

Zoom to Fit

By default Painter 3D opens an image file at 100% view, but you can change the view to suit your needs. Choose Window menu> Zoom to Fit and Painter 3D generates a view of the entire image to fit the size of your monitor.

Zooming In and Out

Zoom in by clicking with the Magnifier tool. Zoom in to a given rectangle of the image by dragging with the Magnifier.

Zoom out by holding down the Option/ Alt key and clicking.

In an image file, you can also choose a zoom level from the pop-up on the Controls palette: Magnifier tool. The zoom factors range from 8.3% to 1200%.

You can access the Magnifier tool while almost any other tool is selected. For Macintosh, hold down Command-Spacebar and click to zoom in and Command-Option-Spacebar to zoom out. For Windows, use Spacebar+Ctrl to zoom in and Spacebar+Ctrl+Alt to zoom out.

To magnify a specific area:

- Use the Magnifier to drag a marquee around the area you want to magnify.

The area inside the rectangle is magnified to the closest magnification level that fills the screen.

The Magnifier tool works the same way in the Model window and Image windows, with one exception. The zoom level pop-up in the Controls palette applies only to Image windows.

Double-click the Magnifier tool in the Tools palette to return the image to 100% magnification.

Using the Grabber Tool

The Grabber tool gives you a quick way to scroll an image.

Drag the Grabber inside the window to pan or move your image.

Here are some Grabber tool shortcuts:

- To center an image with the Grabber tool, click once in the Image window.
- If you double-click the Grabber tool in the Tools palette, Painter 3D fits the entire image to the largest size window your monitor will permit. This feature is also available by choosing Window menu> Zoom to Fit.
- To use the Grabber tool while almost any other tool is selected, hold down the Spacebar.
- Double-click the tool while the Model window is active to center visible objects.

The Grabber tool works the same way in the Model window and Image windows.

Rotating an Image Window

You can rotate an image on the screen to accommodate the way your arm, wrist, and hand draw naturally.

This feature doesn't rotate the image data—only your view of it.

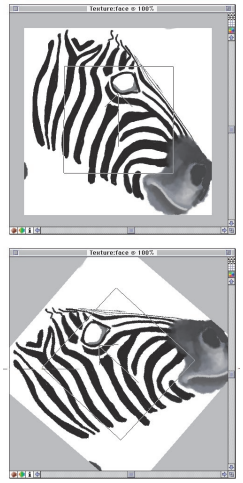
To rotate an Image window to suit your drawing style:

1. Choose the Virtual Trackball tool or with almost any other tool selected, hold down Option-Spacebar (Macintosh) or Spacebar+Alt (Windows).
2. Press down on your stylus or mouse and drag, and a rectangle with an arrow pointing at the top of the screen appears.
3. Drag the rectangle or the arrow to the angle you want. To constrain page rotation to 90° angles, hold down the Shift key while rotating the page.

   To use the key combinations, press the Shift key first, before choosing Option-Spacebar (Macintosh) or Spacebar+Alt (Windows).

To return the Image window to its normal position:

1. Choose the Virtual Trackball tool or hold down Option-Spacebar (Macintosh) or Spacebar+Alt (Windows).
2. Click once in the Image window.



Rotate the Image window to accommodate the way your arm, wrist, and hand draw naturally.

Rulers

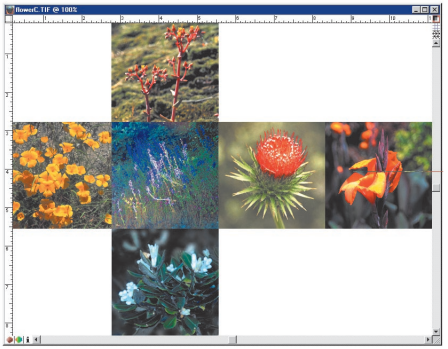
For assistance in laying out your images, Painter 3D provides rulers and guides.

To display the rulers:

- Choose **Canvas menu> Rulers> Show Rulers.**

To hide the rulers:

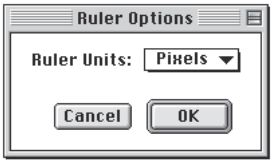
- Choose **Canvas menu> Rulers> Hide Rulers**.



Rulers are displayed in the Image window.

Ruler Options

You can set ruler units by choosing Canvas menu> Rulers> Ruler Options. You can also hold down the Option/Alt key and click in the ruler to open the Ruler Options dialog.



Set the ruler units in the Ruler Options dialog.

Use the pop-up to choose the units you want: Pixels, Inches, Centimeters, Points, or Picas.

Snap to Ruler Ticks

Each mark in the ruler is called a tick. If you want the guides you create to land precisely on the tick marks, choose Canvas menu> Rulers> Snap to Ruler Ticks.

Changing the Origin

Normally, the origin (0, 0) is in the top left corner. Sometimes you might want to choose a different origin to assist in measuring between points.

To change the origin of the rulers:

1. Drag from the box where the horizontal and vertical rulers meet to the point in the document you want as the origin.
2. When you release the mouse button, the ruler updates to describe the new point as the origin.

   This applies to the ruler only—not to floater placement or other location features.

To restore the top left corner as the origin:

- Double-click the box where the horizontal and vertical rulers meet.

Guides

Guides are non-printing lines that help you align objects, like floaters.

To create guides:

1. Show the rulers. You must display the rulers to create guides.
2. Click once in either the horizontal or vertical ruler to create a guide at that point. If you drag, instead of clicking, you can move the guide to any point on the ruler.

If a guide doesn't appear, Painter 3D may be set to Hide Guides. To show guides, choose Canvas menu> Guides> Show Guides.

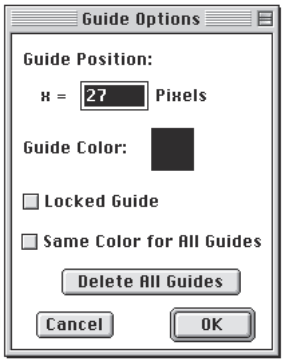
After creating a guide, you can drag it (by its triangular marker) to any point on the ruler.

To remove a guide, drag its marker off the edge of the document.

Guide Options

Each guide has an options dialog that lets you move it to a particular point and change its color.

Double-click a guide marker. If you haven't created a guide, double-click anywhere in the ruler. Painter 3D displays the Guide Options dialog.



Set a guide's position and color in the Guide Options dialog.

The Guide Position value shows the current position of this guide. You can set the guide to a specific position by entering a value in the Guide Position field. The units are specified in the Ruler Options dialog.

By default, guides are created in black. You can change the guide's color by clicking the color chip and using the system color picker to choose a color.

If you want all guides to be the same color, check the Same Color For All Guides option. Choosing this option makes all existing guides the current color. If this option is off, you can create guides of different colors. This might help if you have several guides near each other and want a reminder for which is which.

If you want to lock a guide, check the Locked Guide option. This makes the guide "un-draggable." You'll need to open the guide's options dialog again to unlock it.

You can clear all guides by clicking the Delete All Guides button.

Hiding and Showing Guides

To display the guide, choose Canvas menu> Guides> Show Guides.

To hide the guides, choose Canvas menu> Guides> Hide Guides.

Snap to Guides

If you want drag and click operations to snap to the guides, choose Canvas menu> Guides> Snap to Guides.

This feature is enabled when the menu item has a check beside it. Choose it again to disable the feature.

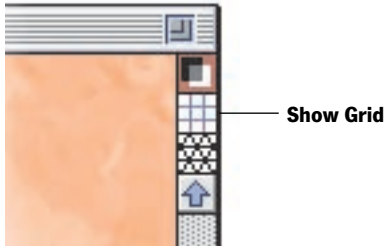
The "snapping" occurs when the cursor (or edge) is within 6 pixels of the guide.

The following operations respect Snap to Guides:

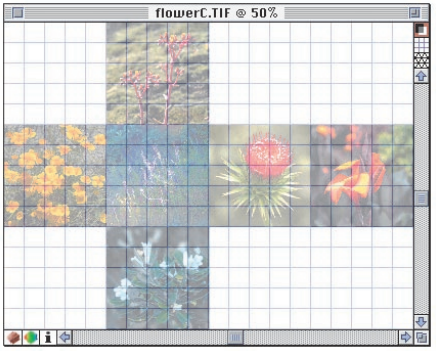
- Dragging with the Rectangle and Oval Selection tools.
- Drawing straight lines with the Brush tool.
- Clicking and dragging with the Paint Bucket tool and Magnifier tool.
- Dragging floaters. The edges of the floater rectangle snap to the guides. The cursor—wherever it might be in the floater—also snaps to the guide.
- Dragging the handles of reference floaters to scale or slant (skew) them.
- Dragging with the Floater Adjuster tool to create a selection marquee.

Using the Grid Overlay

Painter 3D has a grid layer to help guide you when laying down brush strokes or creating compositions. To activate the grid, choose Canvas menu> Grid> Show Grid, or click the Show Grid button on the right side of your Image window.



Click the Show Grid button to activate the grid.



Painter 3D's grid overlay.

The Grid Overlay is a special kind of guide. It's not part of the imagery. If you want a grid in the image itself, use the Effects menu> Esoterica> Grid Paper feature.

When you paint or draw with the grid turned on, you'll see your brush strokes at 50% opacity. When you turn off the grid, the strokes will be at 100% opacity. To have 100% opacity when the grid is turned on, enable the Transparent Background option in the Grid options dialog.

Grid Options

You can set up the grid to suit your working style by choosing Canvas menu> Grid> Grid Options.

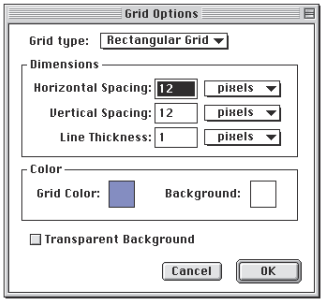
You can use the Tab key to move between the following fields:

Grid Type

Choose a command from the pop-up menu to determine whether your grid will be rectangular, have vertical or horizontal lines, or consist of small dots.

Horizontal Spacing

The Horizontal Spacing setting determines the spacing between vertical lines. The unit of measure can be in pixels, inches, centimeters, points, picas, columns, or percent. Each column is equivalent to two inches. Percent refers to the percentage of the image's width. For example, if the user chooses 10% for width and height in a 100 x 120 pixel image then grid lines will appear every 10 pixels going across (vertical lines) and every 12 pixels going down (horizontal).



Access grid options under Canvas menu> Grid> Grid Options.

Vertical Spacing

The Vertical Spacing setting determines the spacing between horizontal lines. Percent refers to the percentage of the image's height.

Line Thickness

The Line Thickness setting sets the width of grid lines.

Grid Color

Click the Grid Color swatch to change the color of the grid lines. Choose a color in the system color picker, then click OK or press Return or Enter. The default color is a light blue.

Background

Click the Background color square to change the grid's background color. Choose a color in the system color picker, then click OK or press Return or Enter. The default color is white.

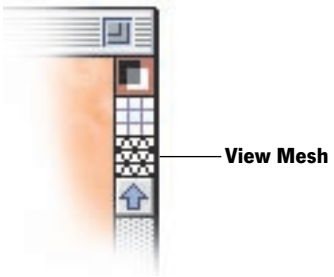
Transparent Background

Click Transparent Background if you want the grid to be transparent so that your image will appear at 100% opacity when the grid is turned on.

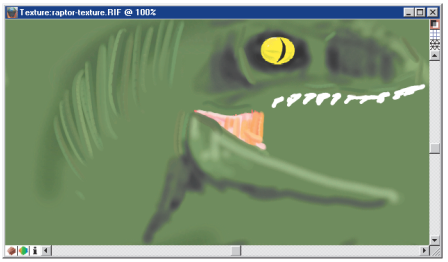
Using the Mesh

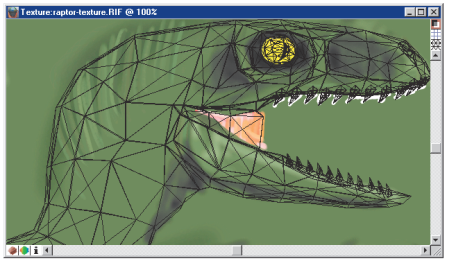
Painter 3D uses a mesh for the mapping correspondence between the 2D image and 3D surface. The mesh type depends on the mapping mode selected for this map and the 3D application used to create the model. Viewing the mesh helps you see correspondence between the 2D image and 3D surface; this information might be helpful in developing images.

Display the mesh by clicking the Mesh button in the upper-right corner of the window. You can also choose Canvas menu> Display Mesh, or click the Display Mesh button in the expanded Maps Manager palette.



To view the mesh click the Mesh button.





The mesh displays the correspondence between a model and its 2D map.

You can also drop the mesh onto the image as a graphic element. To do this, click the Drop Mesh button in the Maps Manager palette. This converts the mesh to actual pixels in the image; as a consequence, the action cannot be undone.

Opening and Saving Images

You can open and save images regardless of whether they're associated with a model or not.

Opening Existing Images

Painter 3D will open files saved in any one of its compatible formats (except EPS). You can open documents from other graphics applications and use Painter 3D to add brush strokes, tints, or textures.

To open an existing image file:

1. Choose **File menu> Open Image**. An Open dialog appears.
2. Locate the file you want to open. If it was saved in Painter 3D or Painter, the right-hand side of the dialog shows a thumbnail of the document.
3. From the Open dialog or the Browse dialog, open the document by double-clicking the file name, or by selecting the file name and clicking Open. You can also select the file name and press Return or Enter.

Painter 3D doesn't open files saved in EPS format.

In Painter 3D you can have multiple images open at a time; however, each image has a requirement for RAM. Depending on the size and resolution, keeping multiple images open at a time may make Painter 3D run significantly slower.

Painter 3D can read files created with other programs only when they are saved in the RGB color or grayscale formats. Grayscale files are automatically converted to RGB on import. If you try to open a file that was saved in another format, for example CMYK, a dialog tells you the file must be in RGB.

Making Sense of Open Images

There might be times when you have several images open in Painter 3D. Some might be maps attached to objects and others might be images you're experimenting with.

Depending on what you're trying to accomplish at the moment, you may want to see a list of all open images onscreen or only those images that are maps associated with objects. Use the Objects 3D: Images palette to toggle back and forth between listing all open images and listing just maps.

To list all open images:

- Choose **Objects 3D: Images menu> Show All Images**.

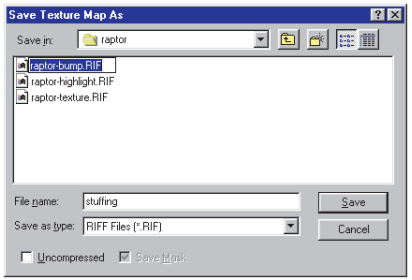
To list only maps:

- Choose **Objects 3D: Images menu> Show Only Maps.**

Saving Images

To name and save an image file or rendering, make sure the Image window is active and choose File menu> Save As.

Use the file type pop-up menu to save your document in any of the formats Painter 3D supports: RIFF, TIFF, PICT, Photoshop (2.0 and 3.0), BMP, PCX, Targa, EPS, or JPEG. Name your file and click Save.



The Save As dialog.

You can create a 2D collage in Painter 3D with renderings and image files. This file can be saved in any image format Painter 3D supports.

RIFF Format

It's recommended that you save working files (files in process) in RIFF format. RIFF lets you compress files and save disk space with a "lossless" compression method. This option is dimmed with other formats.

Select the RIFF format. The checkbox for Uncompressed should automatically be disabled.

RIFF is the only format in which you can save the user mask and keep floaters floating. Photoshop 3.0, TIFF, and PICT formats can retain only the selection information.

RIFF is the best format for working in Painter 3D (or in any of the Painter or Ray Dream products); however, if you intend to export your finished models or images, you need to save your map images or renderings in a format supported by the other program. TIFF is a good choice in most cases.

TIFF Format

For compatibility with other programs, in general, TIFF is the best file format to use. If you intend to export your model or images to another program, save your map images or renderings in TIFF format.

JPEG File Format

Painter 3D supports the Joint-Photographic-Experts-Group (JPEG) file format. Because of its small file size and high quality, JPEG is commonly used to transmit files via modem.

JPEG allows you to compress your file on a scale of Fair to Excellent, where quality is directly proportional to file size. These quality settings will let you achieve compression ratios from less than 10-to-1 to greater than 100-to-1.

JPEG is a lossy file format, meaning that a decompressed JPEG file will not be pixel-for-pixel identical to the original. However, because the JPEG algorithm takes into account the sensitivity of the eye to different colors, the higher quality settings should achieve visually satisfying results.

To save a file as a JPEG:

1. Choose **File menu> Save As** and select JPEG from the list of file types.
2. Click the Save button and the JPEG Encoding Quality dialog appears.
3. Choose a quality option and click OK.

   Excellent compresses the least but retains the most data. Fair compresses the most but loses the most data.

It is best not to decompress and recompress a file multiple times. Although JPEG can compress and discard data that is not visible or obvious, the degradation of the data can affect the condition of your file. When a file has lost a significant amount of data, blocky patterns may appear in areas of the image. If you use a JPEG as your bump map or if you try to use Painter 3D's Apply Surface Texture effect on a JPEG image, you may find it will accentuate the blocky patterns.

Undoing Operations

To reverse changes, you can set multiple undo levels, and you can also use the Fade command to partially undo effects.

Multiple Undo

Multiple Undo allows you to undo and redo up to 32 levels of changes you make in an image. By using the Multiple Undo feature, you can experiment freely with Painter 3D's brushes and effects without "committing" to every edit you make. The number of undos is set in the Undo Preferences dialog, found under Edit menu> Preferences> Undo. Five levels are set as a default.

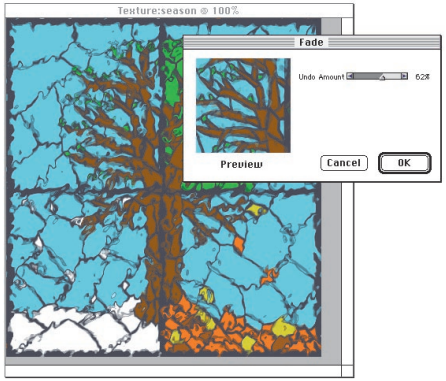
To Undo an action, choose Edit menu> Undo. To Redo an "undone" operation, choose Edit menu> Redo. Redo is generally only available immediately after an Undo.

The Fade operation merges data from the image into the previous undo layer. An Undo of a faded operation will effectively take you back two Undo levels.

Undo applies to changes you make in Map Images. Changes to the view in the Model window, including Lights, are not part of Undo.

Fade

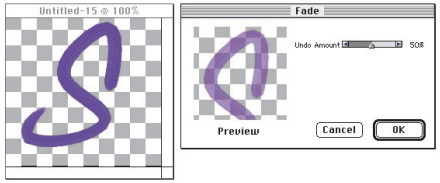
Fade is used to partially undo effects and brush strokes. It is a form of undo, but only works on strokes and effects. The Fade command measures an undo as a percentage of your last effect or stroke. This is a great way to achieve just the right amount of an effect.



Fade allows you to partially undo an effect.

To see how fade works:

1. Draw a dark brush stroke or apply an effect.
2. Choose **Edit menu> Fade**. The Fade dialog appears.
3. Drag the Undo Amount slider and watch the brush stroke or effect fade in and out.
4. When the preview shows the weight of stroke you want, or the right effect, click OK.



Fade allows you to partially undo a brush stroke.

Painting

Painting With Painter 3D's Brushes

Painter 3D lets you draw and paint just like you do in the real world. You use the Brush tool to make marks in the Image window or on the model in the Model window. An infinite variety of marks is possible. The result of any single stroke depends on the specific brush you're using, the current paper texture, color, and other choices you make.

Painter 3D provides a drawer full of different brushes, each with its own characteristics. Many of the brushes are digital equivalents to the traditional media you're familiar with (a unique MetaCreations concept known as Natural-Media). Using these brushes, you

can create images and maps that look like they were hand painted and sculpted on real surfaces.

Many of Painter 3D's brushes respond to the additional control provided by a stylus and graphics tablet. Brush strokes fade in and out, change width, or penetrate based on the pressure of the stylus.

This chapter is an introduction to the Brush tool and painting, including information about plug-in brushes. You'll find more information about the default brush variants in "Painter 3D Brush Variants" on page 165. The many controls and features for customizing brushes are described in the advanced painting chapter of the online book *Painter 3D Advanced Guide*.

To begin painting:

1. Open a model and load a blank texture map.
2. Choose the Brush tool from the Tools palette.
3. In the Brushes palette choose a brush, then choose one of its variants from the Variant pop-up.
4. Choose a color to paint with from the **Art Materials: Color palette** or from the color set. (When you first launch Painter 3D, the default color is black.)
5. Choose a texture from the **Art Materials: Paper palette**.
6. Adjust the sliders for brush size, opacity, and penetration into the paper grain on the **Controls palette: Brush tool**.
7. Mark in either the Image window or the Model window.

The following sections provide details on each of these steps.

Choosing a Brush and Variant

The Brush tool represents a category of marking tools. The Brushes palette lets you choose different types of brushes—Pencils, Chalk, Crayons, Oils, Airbrush, and more. The Brushes palette also lets you choose different varieties (called variants) of each brush. For example, the Pencils brush offers the following variants: 2B Pencil, 500 lb. Pencils, Colored Pencils, a Sharp Pencil, a Single Pixel Scribbler, and Thick & Thin Pencils.

You can show the Brushes palette in any one of three ways:

- Choose Window menu> Show Brushes.
- Press Command/Ctrl+2.
- Double-click the Brush tool in the Tools palette.

To select a brush from the Brushes palette, click the icon for the brush you want. You might have to open the palette drawer to find a particular brush. You can also choose a brush from the Brushes pop-up menu.

After you select the Brush tool, choose a brush and a variant from the Brushes palette.

Most of Painter 3D's brushes apply color to the image or map. Some of the brushes, however, make changes to the pixels

already in the image or map. If you use one of these brushes in a blank area, you might not see a change. If one brush doesn't produce the results you'd like, try a different one. You'll learn more about brushes and their methods in "Learning about Brushes—Starting with Method" on page 125.

Special Brushes

There are a few special brushes worth mentioning. You can find out more about how to use these brushes in the online book *Painter 3D Advanced Guide*.

The Cloner brushes are very handy. They take their color from a clone source rather than the Color palette.

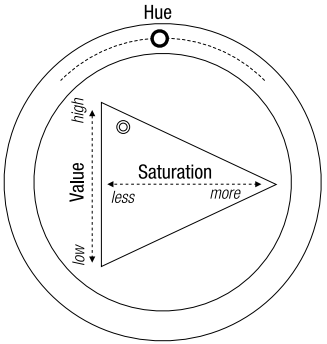
The Image Hose brush is unique—it lets you paint with images instead of brush dabs.

The Layer brush is particularly useful for painting in 3D. It lets you paint on a transparent floater while viewing the imagery beneath it.

You have so many brushes and variants to choose from in Painter 3D that you might use them with only the basic adjustments—size, opacity, and the amount of grain. If you want to create your own, custom variants, Painter 3D offers a number of controls that let you modify the brush effect. To retain these specific adjustments for future use, you'll need to save the variant. Refer to the advanced painting chapter in the online book Painter 3D Advanced Guide for more information.

Choosing Colors

Before painting, you'll want to choose a color. Usually, you'll pick colors from the Art Materials: Color palette or from the color set. You could also sample colors from an existing image using the Dropper tool.



In the Art Materials: Color palette, drag in the ring to select a hue. Drag in the triangle to pick the color.

When you choose a color from the Color palette, the color you select appears in the front overlapping rectangle. This is the primary color. The rectangle in back shows the secondary color, which is used to create two-color brush strokes and two-point gradations.

To choose the secondary color, click the back rectangle, then select a color.

If you have colors in the image already, you can pick one by clicking on it with the Dropper tool. The Command/Ctrl key toggles the Brush tool to the Dropper tool, so you can easily sample a color.

Selecting a color on the Color palette is just the beginning of working with color in Painter 3D. Painter 3D offers a powerful range of color features, including random color variability and color sets. For more information, refer to "Working with Colors: The Color Palette" on page 139.

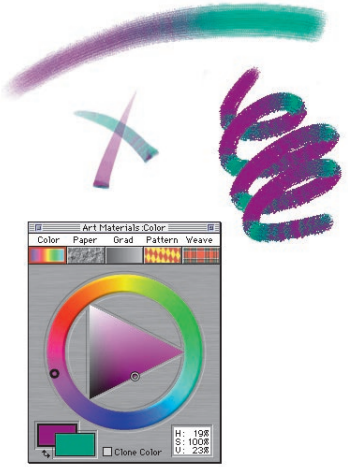
Two-color Brush Strokes

Usually you work with only the primary color, the front rectangle of the two overlapping rectangles in the Color palette. Using one color produces a solid brush stroke.

By selecting a secondary color, you can determine the colors for a two-color brush stroke.

Multicolored brush strokes are created using Color Variability. For more information, refer to "Setting Color Variability" on page 142.

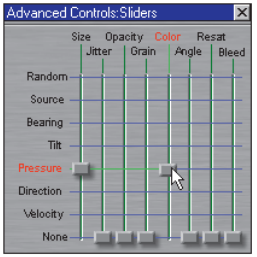
The settings for the brush on the Brushes palette: Control menu> Sliders palette determine how Painter 3D decides when to use one color or the other.



Set the primary and secondary colors to use two colors at once.

To set two colors for brush strokes:

1. Choose the Brush tool from the Tools palette.
2. Select the Graduated Brush variant of the Brush in the Brushes palette, or choose another mark-making brush variant.
3. Click the front rectangle on the Color palette to select it.
4. Select a color in the **Art Materials: Color palette** or from a color set. The front rectangle shows your selection.
5. Click the back rectangle and select a secondary color.
6. Click the front rectangle again to make it active. This keeps the primary rectangle selected for the next time you pick a color.
7. Before you make a stroke, choose **Brushes palette: Control menu> Sliders**. Painter 3D displays the Sliders palette.
8. Set the Color slider to Direction.
9. In the Image window, paint an "X." Notice that the primary color is used in one mark and the secondary color is used in the other. Draw some loops and circles to see the transitions.



The sliders help you to set up a two color brush stroke.

You might want to try a different setting for the Color slider. If you have a pressure-sensitive tablet, try Pressure instead of Direction.

For more information, refer to the Sliders palette discussion in the advanced painting chapter of the online book *Painter 3D Advanced Guide*.

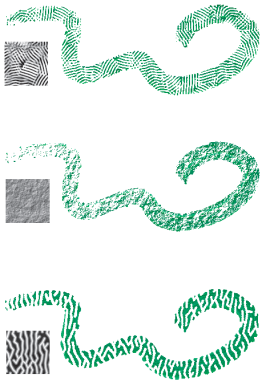
Choosing Paper Texture

In the natural world, a marking tool has different effects on surfaces of different texture. Painter 3D allows you to control the underlying texture beneath the marks on the image or map to achieve the results you'd expect from natural media on a given surface—pencil on watercolor paper, felt pens on cotton paper, chalk on the sidewalk, and so on.

You might think that specifying a paper texture lends itself more to 2D imagery, but the grain of a paper texture can add depth and realism to your 3D model too. The underlying paper texture is apparent when you paint in either the Image window or the Model window; paint into both to achieve the optimum effect. Paper texture is also useful for simulating bump maps for 3D applications that only support texture maps.

Of course some brushes, like the Airbrush, don't reveal paper texture in their strokes. This follows the behavior of the natural tools. In Painter 3D, brushes that react with paper texture have a "grainy method." You'll learn more about controlling grain interaction in "The Water Color Brush Variants" on page 128 and brush methods in "The Methods" on page 126.

Choose a paper texture on the Art Materials: Paper palette. Painter 3D uses the current selected texture, so you can make a few strokes, then change the paper and make a few more strokes with different results.

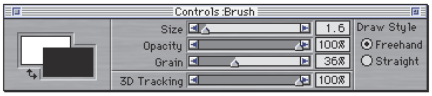


Most of Painter 3D's brushes interact with the current paper texture.

If you have a stylus and tablet, you can adjust grain by changing the stroke of the stylus on the pressure sensitive tablet. In most cases, a light stroke colors only the peaks and ridges of the grain. A heavy stroke fills color deep into the pockets and valleys. You can also use the Grain slider on the Controls palette: Brush tool.

Setting Basic Brush Controls

Basic brush controls for Size, Opacity, and Grain are found on the Controls palette when the Brush tool is selected.



The Size, Opacity, and Grain sliders are found on the Controls palette: Brush tool.

The Controls palette: Brush tool might contain other sliders, depending on the current variant. You'll learn about these and other advanced controls in the online book *Painter 3D Advanced Guide*.

Changes you make in variant size, opacity, grain, and so on are temporary unless you deliberately save them. For complete information on customizing and saving your brushes, refer to the online book Painter 3D Advanced Guide.

Size

The Size slider controls the size of the brush dab. The text field lets you enter a specific size (in pixels). Or, you can use the resizing shortcut, but the shortcut

only works in the Image window—it won't have any effect in the Model window.

Some brushes must be "built" after you resize them. Choose Brushes palette: Brush menu> Build Brush. You can also press Command/Ctrl+B (or click the Build button on the Size palette) to build the brush. If you try to paint with an "unbuilt" brush, Painter 3D alerts you. For more information on building the brush, refer to the online book *Painter 3D Advanced Guide*.

To change brush size in the Image window:

1. Hold down the Command-Option/ Ctrl+Alt keys.
2. In the Image window, click and drag. A circle that represents the brush size appears beneath the cursor. When you've dragged the circle to the size you want, release the button.
3. You might need to build the brush now.

The quickest method to set brush size is to use the keyboard shortcut in the Image window.

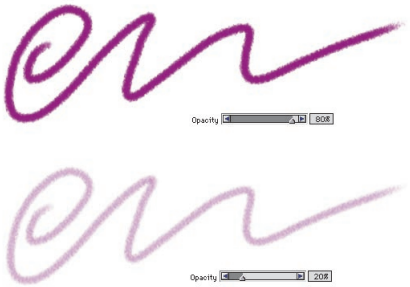
When you use this method to resize the brush, you must do so in the Image window. You can't resize the brush in the Model window.

Opacity

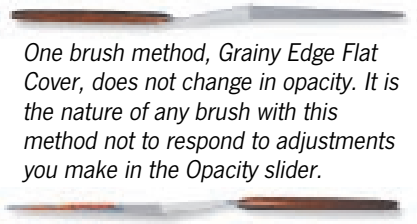
The Opacity slider controls the degree a stroke "covers" or "builds up" on the underlying colors. You can also enter an Opacity percentage in the text field.

When Opacity is at maximum, the color is solid, completely covering, or building up, on the underlying colors.

With Opacity low, the color is thin. You'll be able to see through to the underlying colors.



Use the Opacity slider to adjust buildup and cover strength.



One brush method, Grainy Edge Flat Cover, does not change in opacity. It is the nature of any brush with this method not to respond to adjustments you make in the Opacity slider.

Grain

The Grain slider controls how much color penetrates into the paper texture. You can enter a percentage for specific grain penetration. Lower settings show more of the grain.

Moving the Grain slider to the right intensifies penetration of the color. This allows less texture to show through.

Moving the slider to the left reduces the stroke's penetration, which reveals more texture.

Use the Grain slider to control how brush strokes react with the paper grain.

Painting the Surface

You paint the surface by dragging freehand in the Image window or the Model window with the Brush tool. Each drag is considered a stroke. Painter 3D also lets you create straight line strokes in the Image window by clicking.

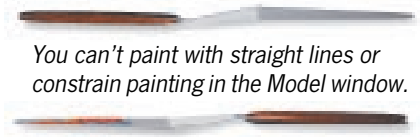
Painter 3D offers a number of other brush stroke features that help you get the results you want as easily as possible.

Freehand versus Straight Lines Drawing

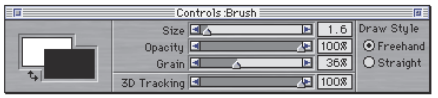
With Painter 3D, you can draw freehand, or with straight lines in the Image window. Radio buttons on the Controls palette: Brush tool let you choose the mode you want.

Freehand allows you to drag in any motion or direction you like. The stroke follows your drag path.

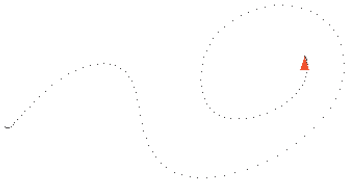
Straight Lines mode connects each point you click with a line. Instead of clicking, you can drag to place the point exactly where you want it. You can close the polygon (connected to the origin) by pressing the Return/Enter key. When you're through drawing straight lines, click the Freehand button to return to freehand drawing. You can toggle between the Draw Styles as you paint.



You can't paint with straight lines or constrain painting in the Model window.

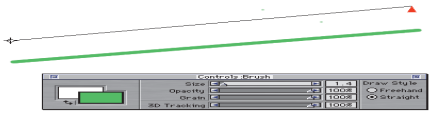


Use the Controls palette: Brush tool to choose the Freehand or Straight Lines Draw Style.



Drag in an image to create strokes using the Freehand Draw Style.

With some brushes, you see a dotted line before the mark appears. This dotted line appears when you use complex brushes. For example, the Van Gogh brush and the Hairy Brush must be precomputed, which delays the stroke's appearance on the screen. For best results, apply these brushes in short strokes. Wait for each stroke to appear before you start the next one.



Click to create the first point. Click or drag to create a stroke using the Straight Lines Draw Style.

Keyboard Shortcuts

Use these keyboard shortcuts to switch between Freehand or Straight Lines mode.

Key	Description
b	Choose Freehand mode.
v	Choose Straight Lines mode.

Working in Straight Line mode, typing "v" will end the current polygon so you can begin a new one.

Constraining Stroke Angle

In either drawing mode, to constrain your strokes to 45° increments, hold down the Option-Shift/Alt+Shift keys as you drag or click.

In Straight Line mode, lines automatically are constrained to a grid if the Snap to Grid option is turned on. Snap to Grid is found under the Canvas menu> Grid submenu.

Undo stroke

If you make a stroke you don't like, choose Edit menu> Undo and Painter 3D removes it. Repeat the command to remove the previous stroke. You can set the level of undos as a preference. For more information, refer to "Setting Multiple Undo Levels" on page 45.

Fade stroke

If you apply a stroke, but want it less opaque, choose Edit menu> Fade. Set the fade amount for the opacity you want as shown in the preview.

Stylus Versus Mouse

Many of Painter 3D's brushes respond to the pressure information provided by a drawing stylus. Greater pressure can increase the width of a brush stroke, the penetration of color, or the degree of some other effect, depending on the variant.

Many stylus and graphics drawing tablets provide 256 levels of pressure information. The mouse has no pressure information. The mouse is either "on" (button down), or "off" (button up).

If you are using a mouse with Painter 3D, you can compensate for the lack of pressure information by adjusting the Size, Opacity, and Grain sliders on the Controls palette: Brush tool. For example, moving the Opacity or Grain slider to the left can give the same results as pressing lightly with a stylus.

Painter 3D offers brushes specifically designed for using a mouse. Load the Mouse brush library located in the New Brushes folder.

If you have a mouse, you can use the Brushes palette: Control menu> Sliders palette to compensate for the lack of pressure information. Instead of using pressure to determine size or color, you could use direction. For more information, refer to the advanced painting chapter in the online book Painter 3D Advanced Guide.

3D Tracking Speed

Using the Controls palette: Brush tool, you can set the 3D tracking speed, which affects the number of screen redraws in the Model window during a brush stroke.

With many of Painter 3D's brushes, you might not notice much difference between the settings at the ends of the slider. For larger, complex brushes that take time to compute onscreen, you'll see a difference. When you set the speed at

100%, Painter 3D continuously updates the screen to try to match the speed of the cursor. This can make the paint look like it appears more smoothly on the model, but the stroke can sometimes finish after you release up on the stylus or mouse.

Setting the speed slower makes the paint appear incrementally because Painter 3D updates the screen less frequently than at the 100% setting. However, the stroke finishes at the same time as you release up on the stylus or mouse.

You can set the 3D tracking speed to suit your personal working style as well as the brush and model you're working with. Painting as close to real time as possible may be desirable much of the time, but might not be important at other times, such as when you're using broad, big strokes to fill an area. Experiment with this setting to get a feel for what works best for you.

Where You Can Paint—the Image, a Floater, or a User Mask

Most of the time you'll want your brush strokes applied directly to the image in either the Image window or the Model window. But you can also paint into a floater. When a floater is selected (highlighted in the Floater List), that floater is the target for your brush strokes. For more information, refer to the floaters chapter in the online book *Painter 3D Advanced Guide*.

If you try to paint on a floating object that's not an image floater (a plug-in floater or reference floater), Painter 3D immediately converts the object to an image floater so it can accept your brush strokes.

There's one other possible destination for your brush strokes—a user mask. When a user mask is selected (highlighted in the Mask List), that mask is the target for your brush strokes. For more information, refer to the masks chapter in the online book *Painter 3D Advanced Guide*.

In all cases, your brush strokes go to the selected target, so make sure of the destination before starting to paint.

Learning about Brushes—Starting with Method

Painter 3D has so many different brushes that searching out the right one can be a daunting task. You can expedite the search by learning more about the brushes—specifically, what makes them different from each other.

The Method defines the most basic level of brush behavior. A brush method is the foundation on which all other brush variables build. Painter 3D provides eight Methods—Buildup, Cover, Eraser, Drip, Mask, Cloning, Wet, and Plug-in.

Because of Painter 3D's masking capabilities, the Mask method is no longer required. The Mask method is provided for compatibility with Detailer brushes. In Painter 3D, all Mask methods will be mapped to the Cover method.

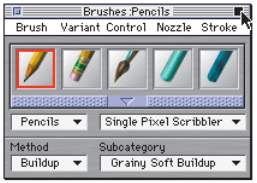
Each method may have several versions, called method subcategories. The subcategories further refine the brush behavior. The following terms are used in describing most of the variations:

- Soft methods produce smooth, anti-aliased strokes.
- Flat methods produce strokes with hard, “pixellated” edges.
- Hard methods provide brush strokes with semi-anti-aliased edges

In a few instances, you’ll see the words “edge” and “variable” in a method subcategory. Edge refers to strokes that are thick and sticky looking. Variable refers to a brush stroke that starts off a bit more transparent. Last, there’s “grainy,” which refers to how the brush reacts to the paper grain.

Method and method subcategories are set from the pop-ups in the expanded Brushes palette. You can think of the method and method subcategories as attributes of the stroke’s appearance. Putting together the method categories and their variations results in the specific brush method (that may be assigned to a given brush). For instance, Grainy Hard Cover means that brush strokes interact with paper grain and have semi-anti-aliased strokes that hide underlying ones. Grainy Hard Cover is the default method for Chalk and Charcoal.

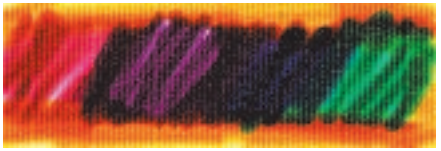
To display the method and subcategory, click the Brushes palette grow box. You can hide the pop-ups by clicking the grow box again.



The Method and Subcategory pop-ups show the method of the current brush.

The Methods

Buildup



The Buildup methods produce brush strokes that build toward black as you overlay them. A real-world example of buildup is the felt pen: Scribble on the page with blue, then scribble on top of that with green, then red, and so on. The scribbled area keeps getting darker—approaching black. Even if you were to apply a bright color like yellow, you couldn’t lighten the scribble, it would stay dark; this is buildup. Crayons and Felt Pens are buildup brushes.

Cover

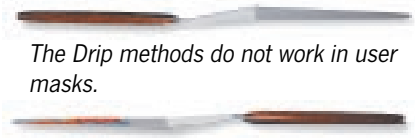
The Cover methods produce brush strokes that cover underlying strokes. An example of “cover” is oil paint. No matter what colors you paint, you can always apply a layer of paint that completely hides what’s underneath. Even with a black background, a thick layer of yellow will be pure yellow. Chalk and Airbrush are examples of Cover brushes.

Eraser

The Eraser methods either erase, lighten, darken, or smear the underlying colors. The Eraser variants, Dodge, and Burn all use the Eraser method.

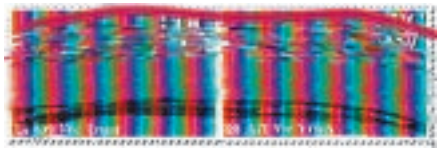
Drip

The Drip methods interact with the underlying colors to distort the image. The Liquid brush variants use the Drip method. The Grain slider controls the strength of distortion a Liquid brush exerts on an image.



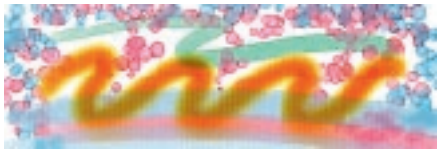
The Drip methods do not work in user masks.

Cloning



The Cloning methods take imagery from a clone source and re-create it in another location, often rendering it in a Natural-Media style. Cloning is covered in detail in the online book *Painter 3D Advanced Guide*.

Wet



The Wet methods work in the wet layer to produce water color effects. Using the Water Color brushes and working in the Wet method is described in "Water Color" on page 128.

Plug-in

Plug-in is a special method. It defines no specific brush behavior itself, but is an avenue to a wide range of behaviors. The specific behavior is determined in the method subcategory. You'll find more information on Plug-in brushes in "Expandable Plug-in Brushes" on page 129.

Changing Methods

Because the method sets a brush variant's most basic behavior, you can alter a variant's behavior by changing its method.

Lets say you want a charcoal-looking stroke, but instead of hiding underlying strokes, you want brush strokes to build to black. You can get this effect by changing the method to Buildup.

Or perhaps you want the Scratchboard Rake variant of the Pens brush to smear underlying colors. You can change its method from Cover to Drip.

Some brush effects are closely dependent on their own methods. The results from some brushes may differ.

The brush stroke on top was created using Grainy Hard Buildup. The stroke on bottom was created using Soft Variable Buildup.

Water Color

The Water Color brush variants produce natural looking watercolor effects.

The Wet Layer

Water Color brushes are different from the other brushes. Water Color brushes paint into the "wet layer," which has special properties that enable the colors brushed into it to flow and mix.

The wet layer floats over the image. This separation of layers enables effects and techniques that wouldn't otherwise be possible. You can edit the watercolors, including erasing and blurring, without changing anything in the image layer. For example, you can draw pencil outlines in the image layer, then overlay watercolor shading without smudging the pencil lines.

When you want the Wet layer to merge with the canvas, choose Canvas menu> Dry.

You can't edit the wet layer with image-layer tools. If you're using the Eraser brush and it has no effect on a brush stroke, that stroke may be in the wet layer. Use the Wet Eraser instead.

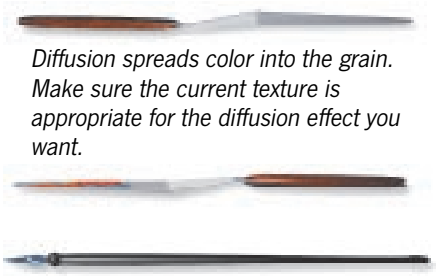
You can't use the Selection tools to select and delete an area in the wet layer.

You can't use the Dropper tool to sample colors from the wet layer.

Diffusion

Diffusion creates wonderful, soft, feathery edges on the strokes of some water color variants. In terms of natural water colors, wet paper produces more diffuse strokes.

After applying water color strokes—but before drying—you can increase the diffusion of your strokes.



Diffusion spreads color into the grain. Make sure the current texture is appropriate for the diffusion effect you want.

To use diffusion:

1. Apply one or more strokes with a water color brush variant.
2. To restrict the diffusion to a region, make a selection with any selection tool, such as the Lasso or the Rectangular Selection tool. The diffusion effect will apply only within the selection.
3. Press Shift-D or adjust the slider on the Water palette.
4. Repeat the command until the strokes show the level of diffusion you want.

A water color stroke before and after diffusion.

The Water Color Brush Variants

All of the Water Color variants, except Wet Eraser, interact with the canvas texture. The Grain slider works differently with the Water Color brushes than with the other brushes. With Water Color variants, moving the slider to the right makes the texture more pronounced. Moving the slider to the left reduces the grain interaction.

Stylus pressure affects the width of the brush stroke for all of the Water Color brush variants (except Wet Eraser). Increased pressure widens a brush stroke; decreased pressure narrows a stroke.

Expandable Plug-in Brushes

Painter 3D's Natural-Media engine has an extensible, open architecture for creating and adding new brushes. The architecture is called the Plug-in Brush. Painter 3D comes with a variety of great Plug-in Brushes. This extensibility allows you to add new exciting brushes by copying files to your Painter 3D folder. The next time you launch Painter 3D, the program loads the new brushes and you can paint with them.

The Plug-in Brush enables new brush behaviors never before possible, like painting on a transparent floater with color and into the mask simultaneously.

The power and behavior of future brushes is virtually unlimited. Visit the MetaCreations Web site occasionally to learn what's available.

MetaCreations encourages third-parties to develop Plug-in Brushes. If you're interested in creating new Plug-in Brushes for Painter 3D or Painter 5, visit the MetaCreations Web site for more information.

Plug-in Brushes can deliver extraordinary effects and diverse painting styles. Painter 3D comes with dozens of cool Plug-in Brushes.

Each Plug-in Brush is unique.

All of the Plug-in Brush variants that come with Painter 3D are in alternate libraries. The brush files for F/X, Gooey, Layer, Mouse, New Paint Tools, Photo, and Super Cloners variants are found in the New Brushes folder in the Painter 3D folder. You can quickly load the New Brushes by choosing Window menu> Custom Palette> Shortcut to New Brushes. You can also load one of these libraries by choosing Brushes palette: Brush pop-up> Load Library. Use the Open dialog to locate and open the library you want. If you want to customize your access to the New Brushes, place the brush variants on custom palettes.

During start-up, Painter 3D scans its own folder and its sub-levels. The program loads any plug-in brushes it finds.

Some Plug-in Brushes may have a specific set of controls. These controls are accessible through the Brushes palette: Control menu. The nature of the controls depends on the actual Plug-in Brush.

Plug-in Brushes fall into two categories: those that define a new method subcategory and those that define a new stroke type.

Remember that the variants you find under the Plug-in Brushes are just the start. You can customize the effect from any of these brushes by moving sliders and changing options in the Controls palette—Size, Spacing, Rake, etc. You can experiment to discover brush effects you like.

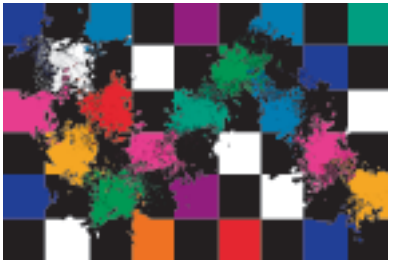
The subcategories you find under the Plug-in Method are just the start. You can give any brush Plug-in behavior by choosing a Plug-in Method and Method subcategory.

Many plug-in brushes let you use a captured dab. This can lead to extraordinary and unique brush variants. For more information, refer to the online book Painter 3D Advanced Guide.

Using Plug-in Methods with Other Brushes

Remember that you can change the behavior of any brush by changing its method. You can take advantage of this by giving one of the traditional brushes a Plug-in method.

You can choose any of Painter 3D's traditional brush variants (for example, the Impressionist variant of the Artists brush) then set its Method to Plug-in and choose one of the available method subcategories—Left Twirl, for example. This gives you a brush that performs left-handed twirls with the dab and stroke of the Impressionist variant. This is only one example; the possible combinations are limited only by your imagination.



You can give any built-in brush Plug-in power by changing its method.

Painting on a Transparent Floater with the Layer Brush

The Layer brush uses a Plug-in brush method subcategory that lets you paint on a transparent floater. With the Layer brush, you're able to look right through the floater to the background imagery, but each brush stroke appears in the floater. You can paint over the image without "damaging" it. You might find this feature particularly useful while painting in the Model window.

The Layer brush works by adding color to the floater image while simultaneously adding to the floater's mask to make the stroke visible.

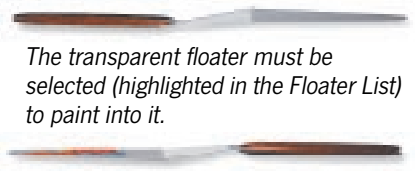
You can customize almost any brush to paint into a transparent floater by changing its method to Plug-in and its subcategory to Transparent Layer Brush.

To paint on a transparent floater:

1. Choose **Objects palette: Floater menu> Transparent Layer**.
   Painter 3D creates a new transparent floater that's equal to the canvas size.

You can find out more about floaters in the floaters chapter in the online book *Painter 3D Advanced Guide*.

2. Choose one of the Layer brush variants and start painting. To find the Layer brush, click the Layer brush icon from the Shortcut to New Brushes Custom palette or load the Layer brush library from the New Brushes folder.



The transparent floater must be selected (highlighted in the Floater List) to paint into it.

Applying Art Materials

Working With Art Materials

Painter 3D's Art Materials palette holds the media you apply to images and maps—color, paper textures, gradations, patterns and weaves. You'll use the art materials in several ways:

- To load the Brush tool for painting.
- To fill selections with the Effects menu> Fill command or with the Paint Bucket tool.
- To control certain image effects by applying surface textures.

This chapter shows you how to select and customize the different Art Materials. It also shows you how to create your own materials and save them to a library.

The Art Materials Palette

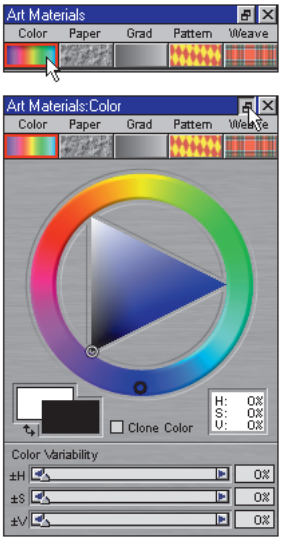
The Art Materials palette organizes all of Painter 3D's art materials. The materials are:

- Colors
- Papers
- Gradations
- Patterns
- Weaves

You can display the Art Materials palette in a variety of ways. In its smallest form, you see the face of the palette displaying the subpalette icons.

The Art Materials palette is a main palette, and each material is a subpalette. Click the icons to switch between subpalettes. You can tear off the subpalettes if you like, for example, to use the Color palette and Grad palette at the same time.

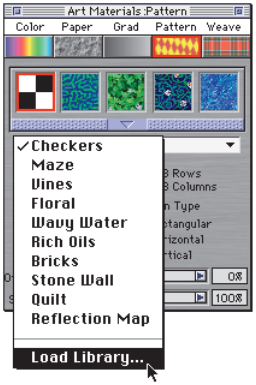
If you do not see the Art Materials palette on your screen, you can display it by choosing Window menu> Show Art Materials.



Click the icon below the Art Materials palette menu names to display their subpalettes. Click the grow box in the upper right to expand the palette.

For more information on palettes and subpalettes, refer to "Palettes" on page 14.

For color, Painter 3D offers Color Sets. All of the other art materials use libraries. The default libraries offer sample materials. You'll find more libraries with additional materials on the Painter 3D CD-ROM.



The Paper, Grad, Pattern and Weave palettes use libraries. Load other libraries for more materials.

For more information on libraries, including loading alternate libraries, creating your own libraries and managing library contents, refer to "Libraries" on page 24.

Filling With Art Materials

In order to use the art materials to their fullest, you need to know how to fill areas in your images. To fill an area with art materials—color, a gradation, pattern or weaving, use the Effects menu> Fill command or the Paint Bucket tool.

The remainder of this chapter first describes filling techniques, then describes the various art materials.

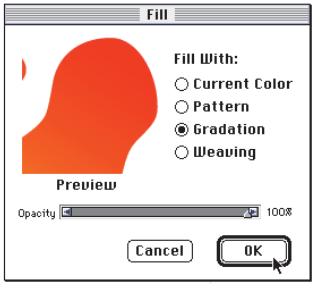
What about filling with paper? Paper is a texture or grain. It has no color by itself. However you can get grain into the image with various image effects. Use Effects menu> Surface Control> Express Texture for pure texture. You can also try other surface control effects that let you use paper as the control medium, for example, the Apply Surface Texture command.

Filling an Area

To fill an area with color, gradations, pattern or a weaving, use the Effects menu> Fill command or the Paint Bucket tool.

To use the Fill command:

1. Select part of your image. Refer to the selection chapter in the online book *Painter 3D Advanced Guide*.
2. Choose **Effects menu> Fill**. You may also press Command/Ctrl+F. The Fill dialog appears.



Use the Fill command to fill a selection.

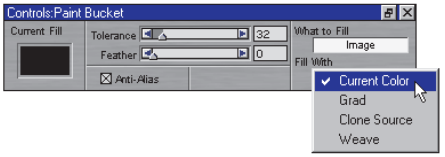
3. Select what you want to fill with—the current color, gradation, clone source/pattern, or weaving.

   If no Clone Source file is selected, Painter 3D uses the current Pattern.
4. Adjust fill opacity if you like.
5. Click OK. Painter 3D fills the selection.

You can also fill a user mask. Just select the mask in the Mask List before choosing Effects menu> Fill.

To fill with the Paint Bucket:

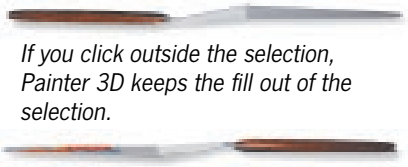
1. Select the Paint Bucket tool from the Tools palette.
2. Make sure the **Controls palette: Paint Bucket** tool is visible. You need it to set your Paint Bucket controls.



The Controls palette: Paint Bucket tool lets you choose what to fill and what to fill it with.

3. Use the What to Fill pop-up to choose the type of fill you want.

   Image fills the canvas selection based on where you click and the current Tolerance and Feather settings.



If you click outside the selection, Painter 3D keeps the fill out of the selection.

Cartoon Cel fills the interior of areas bounded by lines in the selection mask. For more information about Cartoon Cel fills, refer to "Using the Cartoon Cel Fill Method" on page 137.

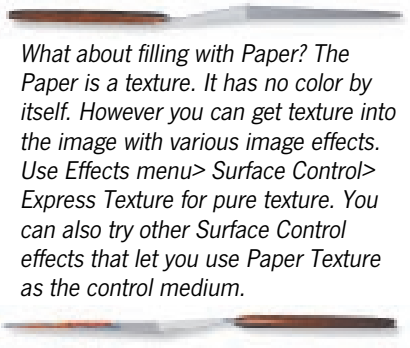
4. Use the Fill With pop-up to choose the material you want in the fill. The Current Fill preview at the left of the Controls palette shows the selected fill material.

   Current Color uses the selected color.

   Grad uses the selected gradation.

   Clone Source uses the current clone source image. If you haven't defined a clone source, Painter 3D uses the current Pattern. For more information, refer to the cloning chapter in the online book *Painter 3D Advanced Guide*.

   Weave uses the selected weave.



What about filling with Paper? The Paper is a texture. It has no color by itself. However you can get texture into the image with various image effects. Use Effects menu> Surface Control> Express Texture for pure texture. You can also try other Surface Control effects that let you use Paper Texture as the control medium.

5. Use the Art Materials palette to choose the specific material you want.

6. If you are doing an Image fill, adjust the Controls palette sliders for Tolerance and Color Feather and the setting of the Anti-alias option. (These settings do not apply to Cartoon Cel filling.)

   Tolerance sets the amount of variance allowed from the color of the pixel you click on. With Tolerance set low, the Paint Bucket fills only contiguous pixels that are very close to the color of the pixel you click on. With Tolerance high, the Paint Bucket fills a greater range of colors.

   Color Feather controls the fill opacity for pixels outside the Tolerance range. With Color Feather low, pixels with neighboring colors receive partial fill. Increasing the Color Feather "expands the neighborhood." (Typically, Tolerance is set low when Color Feather is high.) The more distant a pixel's color is, the less opaque the fill.

   Anti-alias creates intermediate fill values on the boundaries. This gives soft edges to the fill. (Anti-aliasing is desirable when Color Feather is zero or extremely low.)

7. Click in the area of the image you want to fill.

   If the result is not what you want, undo the fill, change the settings and try again.

Leaky Line Work

In complex images, the lines don't always meet. This creates a leak that can send Cartoon Cel or contiguous pixel fills into areas where you don't want them—sometimes even through the whole image. This can be particularly problematic when the image is mapped onto a 3D model. Fortunately, there's a way to limit leakage.

To limit leakage:

1. With Cartoon Cel or Image selected on the **Controls palette: Paint Bucket** tool, click within the image section you wish to fill.
2. Without releasing the mouse or stylus, drag a rectangle that is a bit larger than the area you are filling.
3. Let go. If there is no leak, only the area within the black lines will be filled. If there is a leak, the fill will go outside the area, but not beyond the constraints of your rectangle.

Sometimes you can't tell if there's a leak just by looking at your image. But if you click in a small area and see the prompt, "Now Looking for Extent of Fill," there probably is a leak and Painter 3D is preparing to fill a bigger area than you had in mind. To stop the fill, press Command/Ctrl+. (period) or choose **Edit menu> Undo**, press Command/Ctrl+Z if you don't catch it.

Lock-Out Color

The Lock-Out Color feature protects areas of a given color from accidental filling. The Lock-Out Color sets a color that will not accept filling when clicked on with the Paint Bucket. Black is the default.

This feature applies when filling the Image—not Cartoon Cels.

To change the Lock-Out Color:

1. In the **Art Materials**: **Color palette**, choose the color you want protected.
2. Double-click the Paint Bucket tool icon in the Tools palette. The Mask Threshold dialog appears.
3. Click Set. The Lock out color chip updates to the new color.
4. Click OK to close the dialog.

Using the Cartoon Cel Fill Method

The Cartoon Cel fill method is especially good for producing solid fills of regions bounded by anti-aliased lines. The Cartoon Cel fill method works in conjunction with the selection to fill the regions completely and without damaging the lines.

With a Cartoon Cel fill, you paint the lines first, then fill areas afterward.

The Cartoon Cel Fill method is a three-step process:

To copy the lines to the selection:

1. Choose **Select menu> Auto Select**.
2. Choose Image Luminance from the Using pop-up.
3. Click OK. Painter 3D creates a selection that will protect the dark lines.

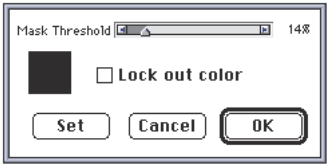
   When you protect anti-aliased or non-black lines in this way, the lines in the selection mask have varying levels of transparency—depending on the pixel luminance. The Mask

Threshold lets you compensate for the semi-transparency of the selection mask to get just the fill you want.

To set Mask Threshold for the Paint Bucket:

1. Double-click the Paint Bucket tool icon in the Tools palette. The Mask Threshold dialog appears.
2. Set the Mask Threshold slider for the softness of your lines. This slider controls how much the Cartoon Cel fill respects the mask. At zero, the fill will overrun the mask boundaries. Higher threshold values force the fill to respect the boundaries.

   The appropriate threshold setting depends on the softness of your lines. You'll have to experiment with the Mask Threshold slider settings until the fill is limited to the area within the line.



14% is a good setting for lines created with the Scratchboard tool variant.

3. Click OK.

To fill with the Cartoon Cel fill method:

1. Choose the Paint Bucket tool from the Tools palette.
2. On the **Controls palette: Paint Bucket** tool, choose Cartoon Cel, from the What to Fill pop-up.
3. Choose what you want to fill with—Color, Grad, Clone Source (Pattern) or Weave.
4. Use the Art Materials palette to choose the material you want.
5. Click inside a bounded region. Painter 3D fills the area.

   If the fill overruns the lines, you should increase the Mask Threshold setting. If the fill leaves line pixels anti-aliased to the background color, you should reduce the Mask Threshold setting.

The finished image filled using Cartoon Cel.

Closing Leaks

When you use the Cartoon Cel fill method, you can fix leaks by saving the selection to a mask, editing it by hand, then reloading it to the selection.

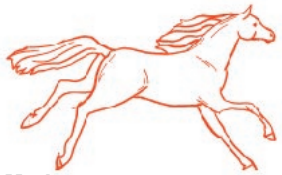
To close a leak:

1. Make sure you have an active selection.
2. Choose **Select menu> Save Selection**. The Save Selection dialog appears.
3. Choose New from the Save to pop-up.
4. Click OK. A new mask appears in the **Objects palette: Mask List**.

5. Select the mask from the **Objects palette: Mask List**.
6. Choose a brush for masking. The same brush you created the lines with would be ideal.
7. Set Black as the current primary color.
8. Paint in the mask to close the gaps that allow the Cartoon Cel fill to escape.
9. Choose **Select menu> Load Selection**.

In typical cartoon line work, unbounded areas—for example, hair, tail feathers, and brush bristles—sometimes need to be filled. You can use the above technique to make these items closed off in the selection mask. This technique works only with Cartoon Cel.

Line drawing



Mask

Cartoon cel filled image

Edit the mask to close leaks. Remember to load the mask back into the selection after editing.

Working with Colors: The Color Palette

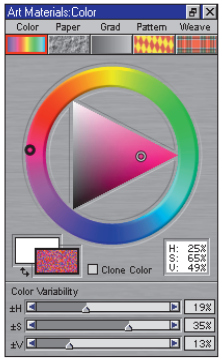
In Painter 3D, you can add color to images in many ways. The Color palette is where you select the colors to use. You can also use the Dropper tool to sample or "pick up" a color from an image.

A feature unique to Painter 3D is the ability to set color variability. Color variability can enhance the Natural-Media appearance of your work. The Color palettes contain sliders to adjust variability. Variability allows you to create brush strokes of several color levels.

Using the Color Palettes

Painter 3D provides three different types of Color palettes for you to use: Standard Colors, Compact Colors, and RGB Colors. You can choose between palette displays using the Art Materials palette: Color menu> Color Picker.

The Standard Color palette has a hue ring and color triangle.



The Standard Color palette expanded to show Color Variability sliders.

The Compact Colors palette displays the hue ring as a single bar with a color triangle.

The RGB Colors palette provides simple RGB sliders for choosing color.

Click the grow box to expand the palette and to see the variability sliders.

To select a hue and color from the Standard Color palette:

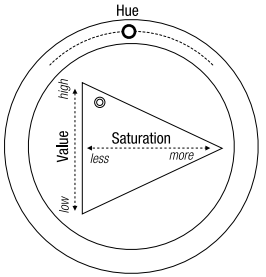
1. Drag the circle on the color ring to select the predominant hue. You can also select the hue by clicking once anywhere on the ring.

   The triangle displays all the available colors within a predominant hue.

2. Select a color on the triangle by dragging the circle or clicking on the color you want.

   Within the triangle, the colors are organized by value and saturation. Values span the triangle from top to bottom, with the top of the triangle being the highest value (white), the bottom the lowest value (black).

   Saturation levels go from left to right. Dragging to the right produces the purest color within the predominant hue. Dragging to the left gives muddier or grayer colors.



A diagram of the Standard Color palette.

Primary/Secondary Color Rectangles

The color you select appears on the front rectangle in the pair of overlapping rectangles. The front rectangle shows the selected primary color. The back rectangle shows the selected secondary color. Whenever you start Painter 3D, black is the selected primary color and white is the selected secondary color.

You can swap the primary and secondary colors by clicking the “swap” icon.

Don’t confuse the secondary color with what other graphics programs call “the background color.” In Painter 3D, the background color is color of the background in the Model window. Paper color is the color of the background in the Image window.

Most of the time you'll work with the primary color. The secondary color is for multicolor brush strokes, two-point gradations, and Image Hose effects.

You can change the secondary color by clicking on the back rectangle, then picking a color. After changing the secondary color, click the front rectangle again.

Sampling Colors from Images

In addition to choosing colors from the Art Materials: Color palette, you can use the Dropper tool to pick up a color from an existing image and use the color elsewhere. You can also choose the Clone Color option to use colors from the clone source image.

Dropper Tool

To use the Dropper tool:

1. Click the front overlapping rectangle on the **Art Materials**: **Color palette** if you want to change the primary color. Click the back rectangle if you want to change the secondary color.
2. Choose the Dropper tool.

From the Brush or Paint Bucket tools, you can temporarily switch to the Dropper by holding down the Command/Ctrl key.

3. Move the cursor to the color you want to pick up and click on it.

   The color picker updates to the color. The Controls palette: Dropper tool shows the HSV and RGB values for the color. RGB values are given in both decimal and hexadecimal format (which can be useful in Web authoring).

Clone Color

The Clone Color option is another way to choose color. This feature lets the brush pick up color from the original (source image) while staying true to its own nature. Clone Color takes averaged samples of color from the clone source, resulting in an approximation of the original.

To use clone color:

1. Set up a clone source. If you don't set a file as the source, Painter 3D uses the current Pattern.

To set up a clone source, open a file and choose File menu> Clone. Delete the contents of the resulting clone file by choosing Select menu> All and pressing the Delete/Backspace key. Now you can work in the new file, taking data from the original, source file. For more information, refer to the cloning chapter in the online book Painter 3D Advanced Guide.

2. Select any brush.
3. Click the Color icon on the Art Materials palette to open the **Art Materials**: **Color palette**.
4. Click Clone Color. You may also choose **Art Materials palette**: **Color menu> Use Clone Color**.

   Enabling the Clone Color option disables the color picker. This is a reminder that your color information is coming from the clone source.

5. When you paint in the clone file, Painter 3D uses colors from the clone source image.

Setting Color Variability

Use the Art Materials: Color palette to set up multiple colors for any of Painter 3D's brushes.

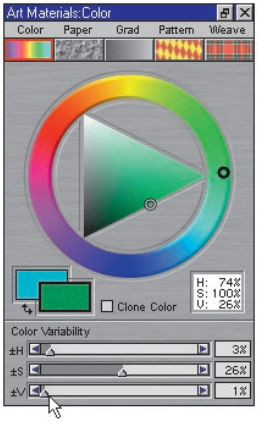
To display the Art Materials: Color palette, click the Color icon on the Art Materials palette and expand the palette if necessary.

The ±HSV sliders control ranges of hues, saturations, and values. Moving the ±Hue slider to the right increases the number of hues in the brush stroke. These colors are the ones adjacent to the selected color on the color wheel.

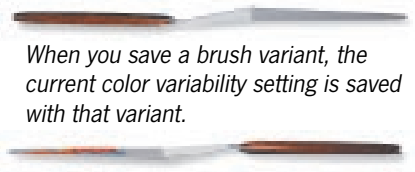
Moving the ±Saturation slider to the right increases the variability in the color intensity of the brush stroke.

Moving the ±Value slider to the right increases the variability in the brightness of the brush stroke.

You can try different ±HSV slider settings with any of the brushes to get some interesting results. Moving these sliders to the right is most useful when you're working with brushes like Painter 3D's Loaded Oils brush, as well as the Van Gogh and Seurat variants of the Artists brush.



Use the Color Variability sliders in the Color palette to set up multiple colors for Painter 3D's brushes. The variable colors are shown in the primary color rectangle.



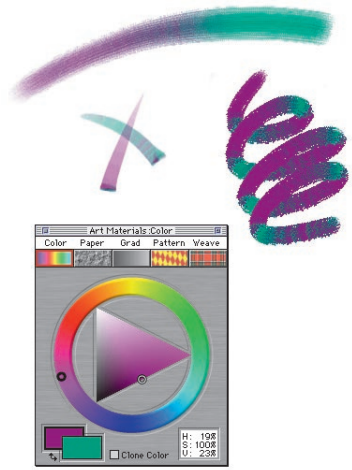
When you save a brush variant, the current color variability setting is saved with that variant.

Using Two Colors at Once

Usually you work with only the primary color, the front rectangle of the two overlapping rectangles in the Color palettes. Using one color produces a solid brush stroke.

By selecting a secondary color, you can determine the colors for multicolored brush strokes. Many brush variants are able to paint with a variable range of colors.

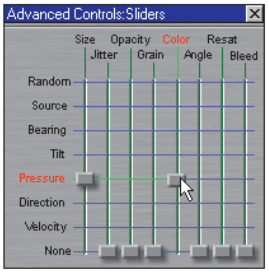
The settings for the brush on the Sliders palette (Brushes palette: Control menu> Sliders) determine how Painter 3D decides when to use one color or the other. For information on this palette, refer to the advanced painting chapter in the online book *Painter 3D Advanced Guide*.



Set the primary and secondary colors to use two colors at once.

To set up a two-color brush stroke:

1. Select the Graduated Brush variant or another mark-making brush variant.
2. Click the front rectangle on the Color palette to select it.
3. Select a color on the Color palette or from a color set. The front rectangle shows your selection.
4. Click the back rectangle and select a secondary color.
5. Click the front rectangle again to make it active. This keeps the primary rectangle selected for the next time you pick a color.
6. Before you make a stroke, choose **Brushes palette**: **Control menu> Sliders**. The Sliders palette appears.
7. Set the Color slider to Direction.



The sliders help you to set up a two color brush stroke.

8. In your document, paint an "X." Notice that the primary color is used in one mark and the secondary color is used in the other. Draw some loops and circles to see the transitions.

   You might want to try a different setting for the Color slider. Try Pressure instead of Direction.

Color Sets

Color sets are used to organize groups of colors. Some color sets, like the Pantone color set, are organized both by name and color relationship.

Painter 3D provides several color sets—Painter 3D Colors, and the Macintosh and Windows system palettes are a few.

One color set is open at a time, but you can easily load a different set.

Using the Color Sets

To display the current color set:

- Choose **Window menu> Show Color Set**.

  You can also press Command/Ctrl+8. The Color Set palette appears on the screen.

Painter 3D's default color set.

To load a different color set:

1. Choose **Art Materials palette**: **Color menu> Load Color Set**. A standard Open dialog appears.
2. Locate and double-click on the color set or select the color set and click Open. The new color set is loaded.

You can set a default color set in the Preferences dialog. For more information, refer to "Setting Painter 3D's Preferences" on page 41.

To choose a color from a color set:

1. In the Color palette, click on the primary or secondary (front or back) rectangle to select the one you want to change.
2. In the Color Set palette, click the color you want.

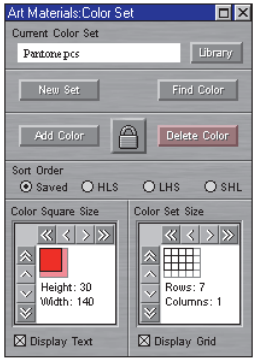
Finding Colors

There are two ways to find a color on a color set—by searching for the color name or by matching the current color.

To name your colors, refer to "Naming Colors" on page 146.

To find a color:

1. Choose **Art Materials palette**: **Color menu> Adjust Color Set**. The Color Set palette appears.



Use the Color Set palette to find colors.

2. Click Find Color. The Find Color dialog appears.
3. Select a search method. You can find a color by name or find a color that's closest to the current color.
4. Click Search. If the name isn't found, the OK button is dimmed.
5. Click OK. If the color set is visible, Painter 3D surrounds the found color with the selection frame.

Customizing Color Sets

You can rearrange color set layouts, create new color sets, and add and delete colors from color sets.

Customizing Color Set Layouts

You can arrange a color set in a variety of ways. You can specify the number of rows and columns, the size of the color swatches, whether or not there are grid lines, and whether or not the colors are named.

You can make changes in any order until the color set is exactly the way you want it. The numbered steps in the next set of instructions give you a place to start.

To customize a color set layout:

1. Choose **Art Materials palette**: **Color menu> Adjust Color Set**. The Color Set palette appears.
2. If the color set is locked (padlock closed), click the Padlock button on the Color Set palette to unlock it.
3. Click a Sort Order radio button to order the colors in the set:

   Saved sorts colors in the order they were originally entered.

HLS sorts colors by hue, luminance, and saturation.

LHS sorts colors for a luminance, hue, saturation order.

SHL sorts colors by saturation, hue, and luminance.

4. Use the Color Square Size box to adjust the size of the individual squares in the color set. Click the single arrows to expand or contract each square by one pixel. Click the double arrows to double or halve the size of each square.
5. Use the Color Set Size box to change the number of rows and columns in the color set. Click the single arrows to add or delete rows or columns one at a time. Click the double arrows to double or halve the number of rows or columns in the color set.
6. Click the Display Text checkbox at the bottom of the Color Square Size box to turn the color names on and off.
7. Click the Display Grid checkbox at the bottom of the Color Set Size box to turn the grid on and off. Turning it off eliminates the lines between colors. You can see more colors, but the separations between colors are not as distinct as when the grid is on.

Creating Color Sets

You can create your own color sets to control the colors in particular projects or create groups of your favorite painting colors. You might call one color set "shades of purple." You might call another color set "crayons" or "watercolors."

If you want to pick up colors from an image, open the image before you begin creating the color set. You can customize the swatch size, grid lines, and names as described in "Customizing Color Set Layouts" on page 144.

To create a color set:

1. Choose **Art Materials palette**: **Color menu> Color Set**. The Color Set palette appears.
2. Click New Set. A new empty Color Set palette appears.

Sometimes when you create a new set, the title bar is hard to see. Once you add a color, the color set expands and the title will be easy to locate.

3. Choose a color you wish to add to the new color set. You can choose a color from the **Art Materials**: **Color palette** or from an existing image.

   If the color set is locked, click the Padlock button on the Color Set palette to unlock it.
4. On the Color Set palette, click Add Color. The color is added to the color set. To name the newly added color, double-click the color swatch and enter a name in the dialog that appears.
5. Repeat this procedure until you have chosen all of your color set colors.

   You may change the name of any color in a color set by double-clicking the color. A dialog appears asking you to name the color. Type the new name and click OK.
6. Click the Library button. A dialog appears asking if you want to save the changes you've made.
7. Click Save. Enter a name for the color set, choose a destination directory, and click Save.

   The Open Color Set dialog appears. You can cancel this dialog to keep your saved color set as the active one.

Adding and Deleting Colors from a Set

You can customize color sets further by changing, adding, or deleting colors.

To add a color to an existing color set:

1. Choose the color you want to add to an existing color set. You can choose a color from the **Art Materials**: **Color palette** or from an existing image.

   If the color set is locked, click the Padlock button on the Color Set palette to unlock it.

If you want to add a color from an existing color set, select the color in the existing color set before you open the destination set. When you open or create a new set, Painter 3D will first close the current set and then display the new set.

2. On the Color Set palette, click Add Color. The color is added to the color set. To name the newly added color, double-click the color swatch and enter a name in the dialog that appears.

To delete a color from an existing color set:

1. Choose the color set that contains the colors you want to delete.

   If the color set is locked, click the Padlock button on the Color Set palette to unlock it.

2. Select the color you want to delete. The current selection frame appears around the color.
3. On the Color Set palette, click Delete Color. A dialog appears asking if you really want to delete the color.
4. Click Yes. Painter 3D deletes the chosen color from the color set window.

To change a color in an existing color set:

1. Choose the new color you want to place into the open color set. You can choose a color from the **Art Materials**: **Color palette** or from an existing image.

   If the color set is locked, click the Padlock button on the Color Set palette to unlock it.

2. Hold down the Option/Alt key and triple-click the color in the color set that you want to replace. The new color replaces the old one in the color set.

Naming Colors

Naming colors can be useful if you want to search for a particular color.

To name a color:

1. Double-click on a color swatch in the open Color Set palette. The Color Name dialog appears.
2. Enter the color name and click OK.

Surface Grain: The Paper Palette

Paper grain, also known as paper texture, is useful in many ways. The word “texture” has many definitions in 3D software. It can refer to a texture map, which is wrapped onto a 3D model to give a particular characteristic to the model’s surface. In the case of Painter 3D’s Paper palette, texture refers to the physical surface of the “canvas” you’re painting on.

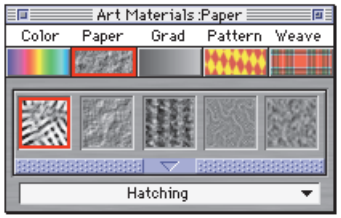
Painter 3D's brushes interact with the grain just as natural tools react with the texture of the surfaces on which you mark. Paper grains are also useful in applying Surface Texture and other Effects, like Glass Distortion.

In this chapter, the terms "paper grain," "texture," and "paper texture" are synonymous.

When you choose a brush that interacts with paper grain, you see the results with each stroke. If you find a brush and paper combination you like, you can save it as a brush look.

You can select different paper textures, modify them, organize them in libraries, and even create your own custom textures.

Click the Paper Texture icon on the Art Materials palette to display the Art Materials: Paper palette. Click the palette push bar to display additional papers stored inside the drawer. Click the grow box to expand the palette.



Click the Paper icon to display the Paper palette.

The Paper palette is where all your paper textures are stored. In addition to using it to select papers, you can use this palette to invert or resize the grain and to open other paper libraries.

Selecting Paper Texture Grain

To select a paper texture grain:

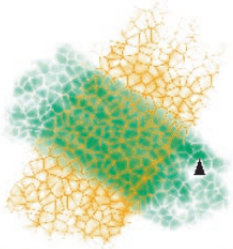
1. Click the Paper icon on the Art Materials palette to open the **Art Materials: Paper palette**.
2. Click the push bar and open the drawer to see more selections.
3. Click a paper texture to select it.

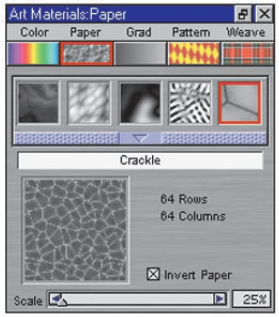
   The palette shows the dimensions of the paper (in pixels). Painter 3D tiles the paper to cover as much canvas as needed.

Remember that paper textures are stored in libraries. You can load alternate libraries for more paper choices. For more information on working with libraries, refer to "Loading Alternate Libraries" on page 25.

Inverting Paper Grain

You can think of paper grain as a three-dimensional landscape. Usually, brushes react to paper texture by coloring the peaks and ignoring the valleys. Enabling the Invert Paper option (either in the Paper Texture menu or the checkbox in the palette) makes color fill the valleys and ignore the peaks.



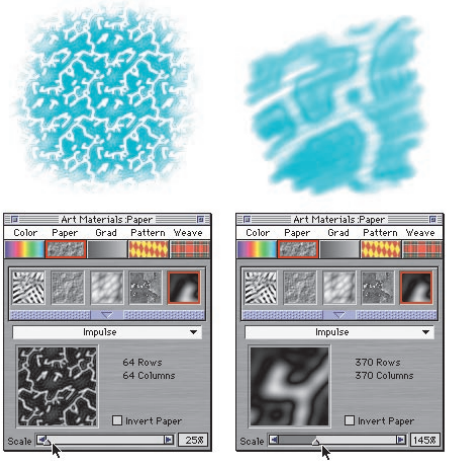


Two brush strokes overlapping; the green was painted with grain inverted.

If you want paper texture grain to appear uniformly across the image, you should create the artwork first, then apply the grain as a surface texture. If you apply a paper texture when you create an image, the paper is erasable. You can't erase brush strokes without erasing the paper. Generally, you'll add the paper texture as the last step, not the first step, in developing your image.

Scaling Paper Texture Grain

Use the Scale slider at the bottom of the Paper palette to resize the paper grain. As you move the slider, the texture preview updates to display the new size. You can scale the texture down to 25% and up to 400%.



Scaling paper grain affects how the grain appears in brush strokes and image effects.

Scaling large textures can use a great deal of RAM. Most textures in Painter 3D are from 50 to 400 pixels square, at 100% scaling.

Capturing Paper Textures

The Capture Paper command lets you turn a section of an image into a paper texture. Once textures are saved, they are available from the Paper palette drawer and Library pop-up menu.

To capture paper texture:

1. Open or create an image. The Make Fractal Pattern feature creates excellent textures. Certain weaves also produce good textures.
2. Using the Rectangular Selection tool, select all or a piece of the image.
3. Choose **Art Materials palette: Paper menu> Capture Paper**. The Save Paper dialog appears.
4. If necessary, move the Crossfade slider to the right to blend the distinction between tile borders.
5. Type the name of your new paper and click OK.

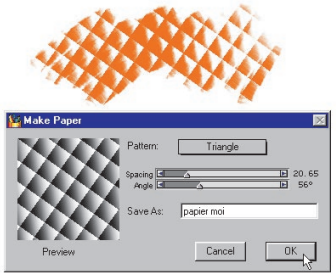
   Your paper now appears in the Paper palette drawer and is added to the current library.

Making Paper Textures

The Make Paper command lets you make your own paper textures.

To create paper textures:

1. Choose **Art Materials palette: Paper menu> Make Paper**. The Make Paper dialog appears. The Preview window reflects your changes.



The Make Paper Texture dialog allows you to create your own Painter 3D textures based on the patterns in the Pattern pop-up menu.

2. Choose a pattern from the Pattern pop-up menu to use as the basis of your paper texture.

The reference to patterns in this discussion has no relation to the Pattern palette or the Define Pattern and Capture Pattern features. "Pattern" is only used to describe the nature of the paper texture.

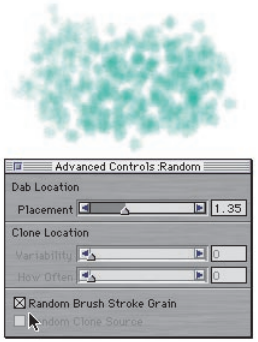
3. Adjust the Spacing and Angle sliders. Moving the Spacing slider to the right opens up space between rows and columns in the selected pattern. Moving the Angle slider changes the direction in which the pattern rows are lined up.
4. When you like the look of the texture, type a name for it and click OK. Your new texture appears as the last item in the Paper palette.

Randomizing Paper Grain

Normally, paper grain is fixed—the texture is in the same position each time you apply a brush stroke. You may change this if you want the grain to move randomly.

To randomize the paper grain:

1. Choose **Brushes palette: Control menu> Random**. The Random palette appears.
2. Enable the Random Brush Stroke Grain option.



Randomize paper grain to create a cool effect.

Using Gradations: The Grad Palette

A gradation is a gradual transformation of one color into another. Sometimes they are called blends or fountains. Painter 3D provides several different types of gradations: linear, radial, spiral and circular.

What you can do with gradations:

- Fill an image, selection, floater or mask.
- Control the Pop-Art Fill effect (for other effects, fill a mask and use it.)

- Express the gradation in an existing image by mapping its colors to image luminance.

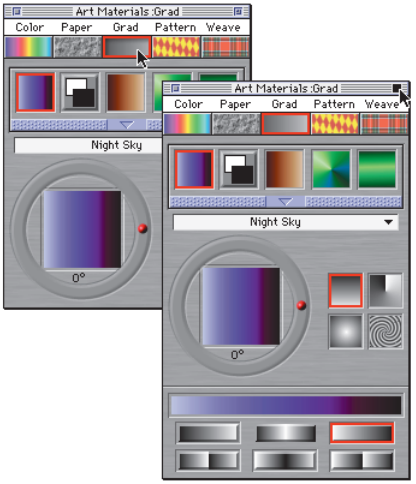
Although Painter 3D comes with libraries full of gradations, you'll want to create some of your own. You can define two colors and create a gradation between them. You can also capture gradations from existing images and save them for use in other images. You can create libraries for your gradations.

Working with Gradations

Use the **Art Materials**: **Grad palette** to select and adjust Painter 3D's gradations.

Click the Grad icon on the Art Materials palette to display the **Art Materials**: **Grad palette**. Click the palette push bar to display additional gradations stored inside the drawer. Click the grow box to expand the palette.

Remember that gradations are stored in libraries. You can load alternate libraries for more grad choices. For more information on working with libraries, refer to "Loading Alternate Libraries" on page 25.



Click the Grad icon to display the Grad palette.

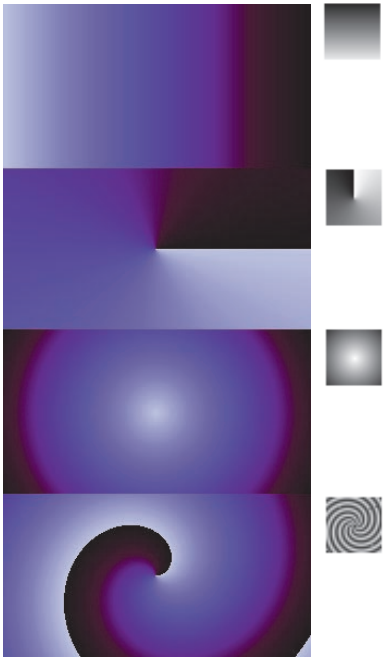
In the center of the palette, the Preview window shows how the current settings affect the selected gradation.

The Rotation Ring changes the angle of the gradation. Drag the red ball in the ring to change the angle. You can also select the angle by clicking once anywhere on the ring. The numeric value appears below the preview.

For a spiral gradation, you can use the Rotation Ring to change how tightly the spiral is wound. Hold down the Command/Ctrl key and drag around the Rotation Ring.

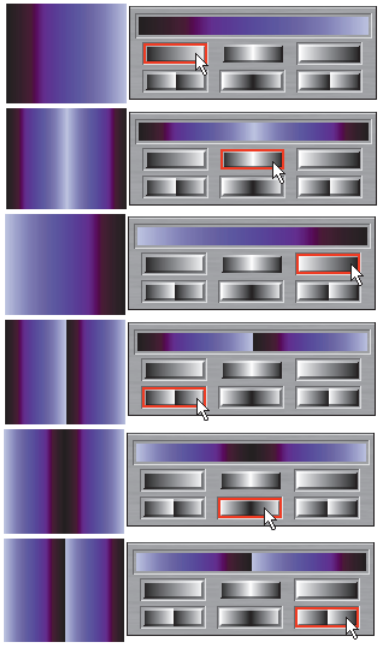
You can click inside the gradation preview and Painter 3D rotates the gradation for you. Click anywhere outside the preview to stop the rotation.

The Gradation Types on the right of the palette let you select from four types of gradations—linear, radial, spiral or circular.



Examples of the gradation types.

The Gradation Orders at the bottom of the expanded Grad palette determine how a gradation behaves. The Preview Strip (above the gradation orders) shows the selected gradation order.



Examples of the gradation orders.

The top row (from left to right) orders the current gradation from left to right, left to right and mirrored, and right to left. The bottom row orders the current gradation from left to right and doubled, right to left and mirrored, and right to left and doubled.

Creating Gradations

You can create your own gradations from simple to complex. For a simple gradation, choose primary and secondary colors to define a two-point gradation. For more complex gradations, use the Gradation Editor, or capture gradations from existing artwork.

Creating a Two-Point Gradation

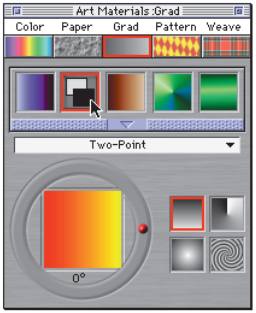
You can define a two-point gradation by defining two colors in the Art Materials: Color palette and then having Painter 3D create the gradation between them.

You might want to tear off the Grad palette or the Color palette, so you can see both at once. For more information on tearing palettes, refer to "Tearing Off Palettes" on page 19.

To create a two-point gradation:

1. Open the **Art Materials**: **Color palette**.
2. Choose a primary color.
3. Choose a secondary color.

   Now that you have defined the two colors, you can make the gradation in the Grad palette.
4. Open the **Art Materials: Grad palette**.
5. Select the Two-Point icon.
6. Make sure the drawer is closed, so you can see the preview of your gradation.



Click the Two-Point icon or select Two-Point from the Library pop-up menu.

7. Try changing the color order by clicking the different icons at the bottom of the window. You can also try out different gradation types.

   You can save the gradation or use it to fill a selected object. For more information on filling an object, refer to "Filling With Art Materials" on page 135.

Saving a Gradation

Once you've created a gradation you like, you might want to save it.

To save a gradation:

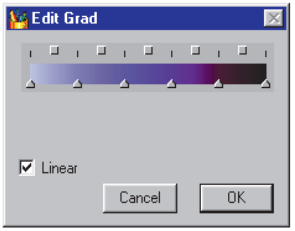
1. Choose **Art Materials palette: Grad menu> Save Grad**. The Save Grad dialog appears.
2. Enter the name for your gradation.
3. Click OK.

Creating Gradations with the Gradations Editor

Use the Gradations Editor to create new gradations or edit simple, two-point gradations into a more complex blend.

To edit a gradation:

1. Choose **Art Materials palette: Grad menu> Edit Grad**. The Edit Grad dialog appears.



Use the gradation editor to edit saved gradations.

It is often convenient to have both the Color palette and the Grad palette available during editing.

The colored ramp across the top of the dialog displays the current gradation bar.

The pointed gray markers along the bottom of the bar are the color control points. You can select these points and change the color of the blend at this point.

2. Make your changes to the gradation as discussed in the following sections.
3. Click OK to exit the Edit Grad dialog.

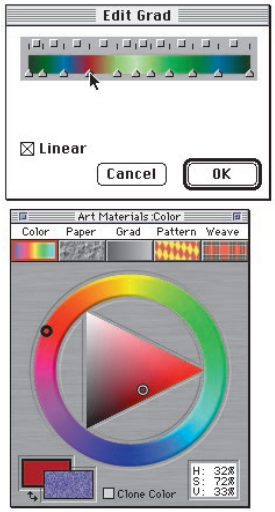
Changing Color Control Points

You can change the color control points in a gradation to change how colors are blended ina gradation.

To change a control point color:

1. Click a color control point (pointed gray marker) to select it.
2. Select a new color from the Color palette.

   To start with a two-point gradation, click on the far right control point and then choose a color. Click on the far left control point and choose a different color. Now you can generate additional colors in between by adding new control points.



Click the color ramp bar to add a color.

Adding and Deleting Color Control Points

You can easily add new color control points by clicking in the gradation bar. Click anywhere in the color ramp bar and a new control point is added without changing the color at this location in the bar. If you Option/Alt-click in the bar, a new control point is added and set to the current color. You can also press the Delete/Backspace key to remove the selected color control point.

Using the Linear Check Box

Leave the Linear check box checked to create ramps that blend linearly between colors. When editing non-linear gradations (Linear is unchecked), all ramps within the gradation are non-linearly blended using smooth curves. When using non-linear ramps, you should use the Color Spread slider to control the color smoothness at each color control point.

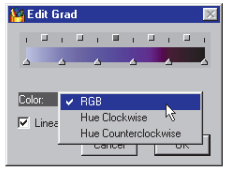
Changing the Color Space

The color space is represented by boxes located at the midpoints between the adjacent color control points. They allow you to change the hue of the blend within that segment.

To change the color space:

1. Click on a square box above the color ramp bar.

   The Color pop-up menu appears.



The Color pop-up appears with you select a Color Space square at the top of the color ramp bar.

2. Select an option from the Color pop-up.

   RGB blends directly between the red, green, and blue components of the two colors.

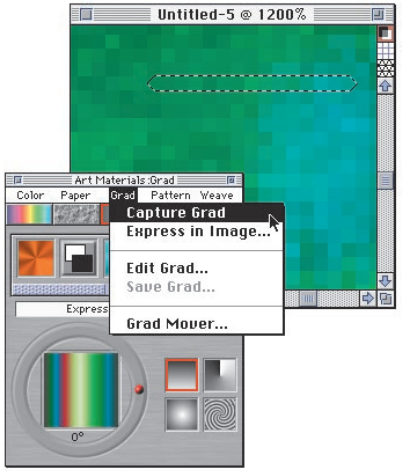
   Hue Clockwise and Hue Counterclockwise blends between the endpoint colors by rotating around the color wheel. For a better understanding of this concept, refer to the standard Color Picker (ring and triangle) and note the order of the colors on the Hue ring.

   Notice that as you change the parameters within the Edit Grad dialog, the gradation previews are updated within the Grad palette.

3. Click OK when you're finished. You can now save your new gradation.

Capturing a Gradation from an Image

You can use any existing imagery as a source for creating new gradations.You could capture the colors in a photo of a sunset or paint your own range of colors as the content of a gradation.



To make perfect blends between a series of colors, it's better to work with a row of single pixels rather than a large piece of an image. The Image window at left shows a selected row of single pixels. The gradation they make is shown on the Grad palette.

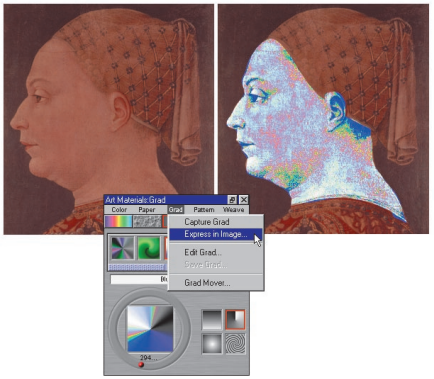
To capture a gradation:

1. Use any tool to draw a gradation or open an existing image.
2. Using the Rectangular Selection tool, select a horizontal or vertical area. Make the selection as narrow as possible. If the selection is horizontal, Painter 3D uses the first row of pixels starting at the upper left for the gradation. If the selection is vertical, Painter 3D uses the first column of pixels starting at the upper left for the gradation.
3. Choose **Art Materials palette: Grad menu> Capture Grad**. The Save Grad dialog appears.
4. Type a name for the gradation and click OK. The new gradation is saved in the current library. In the future you can choose it by name from the Grad palette Library pop-up menu.

   For information on working with libraries, refer to "Libraries" on page 24.

Mapping a Gradation to Image Luminance

You can also map a gradation to an existing image, replacing an image's colors with those of the gradation. This effect applies gradation colors to the pixels of the image based on their luminance values.



Painter 3D allows you to apply a gradation based on the luminance value of existing colors.

To express a gradation in an image:

1. Open the image you want to use. You can select part of the image or use the entire image. Patterns created with Make Fractal Pattern provide excellent source images.

2. On the **Art Materials: Grad palette**, select the gradation you want to use.
3. Choose **Art Materials palette: Grad menu> Express in Image**. The Express in Image dialog appears.
4. Adjust the Bias slider to define how the gradation is mapped. Painter 3D replaces the colors in the image with the colors in the gradation, based on matching luminance.
5. Click OK.

Using Patterns: The Pattern Palette

A pattern is a repeating design. The smallest unit of a pattern is known as a tile. When you fill with a pattern, the tile is repeated across the area. Painter 3D saves tiles in separate files and in libraries.

You'll find a sampling of patterns in the default library. You'll find other pattern libraries on the Painter 3D CD-ROM.

All of the patterns are displayed in the Pattern palette. Click the Pattern icon on the Art Materials palette to display the Art Materials: Pattern palette. Click the palette push bar to display additional patterns stored inside the drawer. Click the grow box to expand the palette.

Click the Pattern icon to display the Pattern palette.

Patterns are created by repeating a rectangular image tile across the area. Ideally, the images are created so that they tile seamlessly. Painter 3D provides several features to help you generate seamless tiles.

Once a pattern is defined as a tile, you can paint off the side of the canvas and your stroke appears on the opposite side of the canvas. Or you can capture the pattern after you create it and manipulate it to be a half-drop design, traditionally used in wallpaper design.

If you have not set a clone source, the current pattern is used in any operation referring to clone source colors or luminance. This means you can paint with the pattern using a Cloner brush.

To choose a pattern:

1. Click the Pattern icon on the Art Materials palette to open the **Art Materials: Pattern palette**.
2. Click the icon for the pattern you want. You can click the push bar to open the drawer and display more choices.
3. When you've selected a pattern, close the drawer.

   The palette shows a preview of the pattern, gives the dimensions of the tile image (Rows and Columns describe the number of pixels horizontally and vertically), and gives you options for scaling and arranging the tile in fills.

   Rectangular places the tile in a regular grid for fills. The Offset slider does not apply.

   Horizontal offsets the tiles in subsequent rows. The Offset slider controls the amount of offset.

   Vertical offsets the tiles in subsequent columns. The Offset slider controls the amount of offset.

When you've set these options, you can use the pattern. To test it, open a new image. (To see the tiling, the image must be larger than the tile.)

To fill an image with multiple pattern tiles:

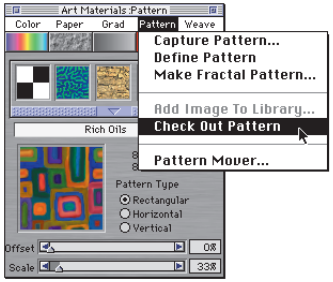
1. Choose **Effects menu> Fill.** The Fill dialog appears.
2. Choose Pattern as the art material source.
3. Click OK.

Editing the Pattern Tile with Check Out Pattern

If the preview in the Pattern palette isn't detailed enough, or you want to edit an existing pattern, you can open the pattern tile in its own window. By checking out the pattern as a file, you can view the pattern tile or modify it.

To check out a pattern's tile:

1. In the Pattern palette, select the pattern you want to work with.



Check out a pattern to view it close-up or to modify it.

2. Choose **Art Materials palette: Pattern menu> Check Out Pattern**.

   Painter 3D opens the selected pattern tile in its own document window.

   You can edit the pattern tile as you would any image. To put the modified pattern back in the palette, you'll need to use the save the pattern to the library. For more information, refer to "Adding Images to the Pattern Library" on page 157.

Creating Patterns

Painter 3D offers three ways to create patterns:

- By defining the current image as a pattern and adding it to the pattern library.
- By creating a rectangular selection and capturing it as a pattern.
- By making a fractal pattern and adding it to the library.

After creating a pattern tile, you'll probably want to work with it to improve the way it tiles. Refer to "Tips for Creating Seamless Tiles" on page 158.

Creating patterns can become addictive. It's a good idea to keep libraries small. Use the Patterns Mover to create new libraries and delete unwanted patterns. You can switch libraries whenever you want to use a different set of patterns. For more information about movers, refer to "Moving Items Between Libraries" on page 26.

Defining Patterns

You can give any image the pattern tile characteristics. This helps if you want to create seamless tiles.

To define a pattern:

1. Open the image file you want to work with.
2. Choose **Art Materials palette: Pattern menu> Define Pattern**.

   Defining the image as a pattern gives it the wrap-around characteristics.

If you want the defined pattern in your Pattern palette drawer, you'll need to add it to the library.

Images tagged as patterns using the Define Pattern command, and saved in RIF format, will maintain these characteristics even after they have been saved and reopened.

Adding Images to the Pattern Library

You can add any image to the current library as a pattern tile.

To add a pattern to the current library:

1. Open the image you want to add to the pattern library.
2. Choose **Art Materials palette: Pattern menu> Define Pattern**.
3. Choose **Art Materials palette: Pattern menu> Add Image to Library**. Painter 3D prompts you to name the pattern.
4. Give it a descriptive name and click OK. If a pattern of that name already exists in this library, Painter 3D will ask if it's okay to replace it. If not, click No and try again with a different name.

Capturing Patterns

To capture a pattern:

1. Open the image that contains the area you want to use.
2. Using the Rectangular Selection tool, select the area you want. Remember, the edges of the selection will meet when the image is tiled, so select carefully.

To capture a pattern, make a selection and choose Capture Pattern.

3. Choose **Art Materials palette: Pattern menu> Capture Pattern**. The Capture Pattern dialog appears.

4. Make other selections as needed. You have the following options:

The Capture Pattern dialog lets you decide how much to offset pattern tiles and in which direction.

Rectangular Tile places the tile in a regular grid for fills. The Bias slider does not apply.

Horizontal Shift offsets the tiles in subsequent rows. The Bias slider controls the amount of offset.

Vertical Shift offsets the tiles in subsequent columns. The Bias slider controls the amount of offset.

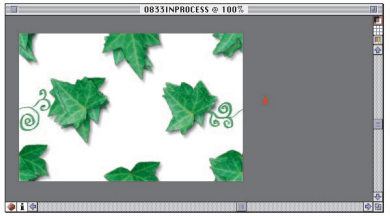
As you try different tile arrangements and Bias settings, the Preview window shows their result. Don't worry about making it perfect, you can change the direction and Bias setting in the Pattern palette.

5. Enter a descriptive name for the pattern and click OK.

Painter 3D captures the pattern and saves it to the current library. You can find your captured pattern in the Pattern palette. If you want to edit it, you can check it out of the library.

Tips for Creating Seamless Tiles

Patterns are created by repeating a rectangular image tile across an area. When you develop patterns, you're creating images for tiling. Ideally, the images will tile seamlessly. That is, the eye will not be able to distinguish between tiles. Painter 3D provides several features to help you generate such pattern tiles.



Wrap-around colors lets you paint off one side of your image onto the other side.

To help in making seamless tiles, Painter 3D gives documents defined as pattern tiles two special characteristics: wrap-around colors and wrap-around seams.

To wrap-around the seams:

1. Open an image.
2. Choose **Art Materials palette: Pattern menu> Define Pattern**.
3. Click the Grabber tool on the Tools palette.
4. Hold down the Shift key and drag in the image. You'll see a horizontal and vertical line where the image edges meet. When the crossing lines are centered, release the mouse button.

To create a seamless tile, you'll need to edit the image to get rid of the edge lines. Several techniques are possible, depending on the type of image.

Wrap-around seams lets you move the pattern tile edges to the middle so you can edit them.

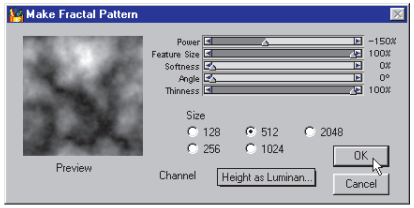
If you disabled wrap-around colors for your image, you might end up with dramatic edge lines, which would require heavier editing to make the tile seamless. Refer to "Disabling Wrap-Around Colors" on page 85.

Make Fractal Pattern

Make Fractal Pattern is a pattern generator that creates interesting landscapes. These topographic patterns can be filled with color and embossed with a paper texture.

To use the Make Fractal Pattern command:

1. Choose **Art Materials palette: Pattern menu> Make Fractal Pattern**. The Make Fractal Pattern dialog appears.



Make Fractal Pattern is a pattern generator.

2. Select your options as described in the following paragraphs. Any changes you make appear in the dialog Preview window.
3. When you are satisfied with your selections, click OK.

   Wait a moment while Painter 3D creates your new pattern file. When Painter 3D is finished, your pattern file will be displayed in its own window.

Sizing the Tile

The Size option describes the exact size of the tile you are creating. If you have a lot of memory, you can make a larger file with a higher resolution.

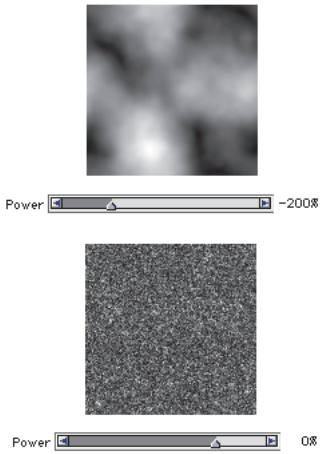
Depending on the amount of memory you have available to Painter 3D, some of the size options may be unavailable.

Make Fractal Pattern Sliders

The sliders within the Make Fractal Pattern dialog affect the look of the pattern.

The Power Slider

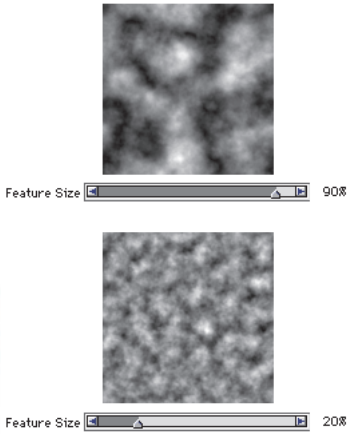
The Power slider controls the intricacy of the pattern's definition, as if you were "zooming" in and out on a textured surface with a microscope. Move the Power slider to the right to zoom out and you will see many, smaller patterns. Move the Power slider to the left to zoom in and you will see few, larger patterns.



The Power slider determines the degree of detail.

The Feature Size Slider

The Feature Size slider defines the number of prominent features within the tile. Move the slider to the left to increase the number of repetitions per tile.



The Feature Size slider determines the number of repetitions.

The Softness Slider

The Softness slider adjusts the softness of the edges of the pattern.

The Angle Slider

The Angle slider changes the direction from which you view the fractal.

The Thinness Slider

The Thinness slider controls directional tendencies of the fractal pattern. Reducing thinness introduces linearity.

Low Thinness settings show the fractal as streaks. Use the Angle slider to change the direction of streaking.

Channel Options

Painter 3D uses four channels to store graphic information: Red, Green, Blue, and Alpha (or Mask). Information other than color values can be placed in these channels as well. The channel options allow you to visualize this information in new and different ways.

Height as Luminance

Height as Luminance displays pseudo-height information as luminance. Images generated with this option are useful in conjunction with the Apply Surface Texture feature. White areas are represented as peaks, and dark areas become depressions.

You can also create interesting patterns by choosing a colorful gradation and using the Art Materials palette: Grad menu> Express in Image command.

Gradient Bearing

Gradient Bearing uses the Red channel to display the bearing of the down angle of a height field.

Surface Normal

Surface Normal uses the Green and Blue channels to represent the X and Y components of the surface normal (angle perpendicular to the surface at a given point) of the height field (Green=X, Blue=Y).

These two latter options for viewing a fractal texture are offered for purely aesthetic reasons. One way to take advantage of them is to create color variations of the texture with the Adjust Colors feature. Other Effects can lead quite a ways from the original image.

To colorize a fractal pattern, choose an appropriate gradation and use the Express in Image feature.

Converting a Pattern to a Paper Texture

Fractal Patterns you create make great paper textures.

To convert a fractal pattern to a texture:

1. Check out the pattern to display it in an Image window.

   The luminance and contrast are all that matters. You might want to adjust the contrast and brightness.

2. When you're satisfied with the tonal balance, choose **Select menu> All**.
3. Choose **Art Materials palette: Paper menu> Capture Paper**. The Save Paper dialog appears.
4. Name the Paper and click OK.

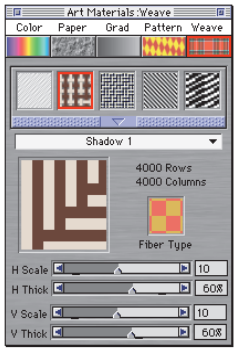
Using Weaves: The Weave Palette

The Weave palette is, in effect, a virtual loom you can use to create weaves to use as fill patterns.

Two libraries of weaves are included with Painter 3D. You can modify a weave by changing its fiber type, the scaling and thickness of its threads, or its color. You can also create and save new weaves of your own.

Click the Weave icon on the Art Materials palette to display the Art Materials: Weave palette. Click the palette push bar to display additional weaves stored inside the drawer. Click the grow box to expand the palette.

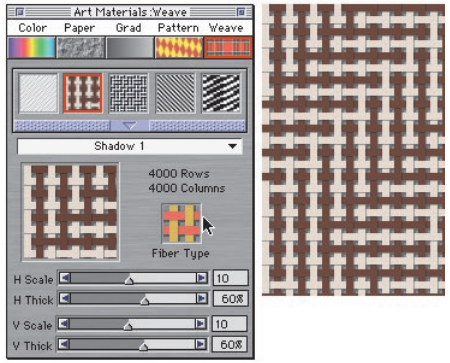
Below the drawer are controls that let you preview a selected weaving, choose its fiber type, change colors, vary the scale of the weave and the thickness of its threads, and open the advanced editing palette.



Click the Weave icon to display the Weave palette.

Changing Weave Fiber Type

Painter 3D can display a weave as two-dimensional or show the interwoven threads three-dimensionally, complete with shadows.



The weave can appear differently when displayed as a three-dimensional fiber type.

To change how a weave is displayed:

- On the **Art Materials: Weave palette**, click the Fiber Type icon. The button changes to show either a two-dimensional or three-dimensional weave.

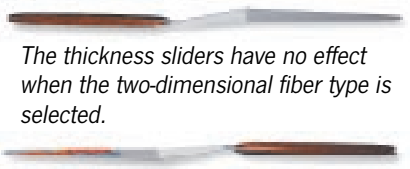
  Depending on which weave is selected, you may or may not see a change in the Preview window. For different two- and three-dimensional effects, you can adjust the scaling and thickness sliders at the bottom of the Weave palette.

Adjusting Scaling and Thickness

The four sliders at the bottom of the Weave palette control the thickness of threads and the spacing between them. The top two sliders control horizontal dimensions; the bottom two control vertical dimensions. By adjusting these sliders, you can create a wide variety of weaves with any one of the patterns supplied.

To adjust scaling and thickness:

1. Select the weave you want to adjust. Its image appears in the Preview window.
2. Click Fiber Type until the button shows a three-dimensional weave. For most weaves, you won't see a change in the Preview window yet. In order to see a change, you have to enlarge the weave by increasing its scale and reducing its thickness.
3. Adjust the horizontal and vertical scale sliders. You still might not see a change in the Preview window until you also adjust the thickness sliders.
4. Adjust the horizontal and vertical thickness sliders.



The thickness sliders have no effect when the two-dimensional fiber type is selected.

Editing Weave Colors

Each weave uses its own color set. You can display the color set used for a weave, change the colors in the set, and apply them to the weave. Remember that you can tear off palettes to see more than one at a time.

To display the color set for a weave:

1. Select the weave in the palette and close the drawer.
2. Choose **Art Materials palette: Weave menu> Get Color Set**. The color set for the selected weave appears.

To change the colors for a weave:

1. Select a new color from the **Art Materials: Color palette**.
2. Hold down the Option/Alt key and click the color chip on the weave color set (**Weave menu> Get Color Set**) that you want to replace. The new color replaces the old one.
3. Choose **Art Materials palette: Weave menu> Put Color Set**. The Preview window shows the weave with the new colors. If you fill an image with the weave pattern, now Painter 3D uses the new color set.

To change the color patterns within a weave, you must work in the Edit Weave dialog.

Saving Weave Changes

After altering the scaling and thickness or color of a weave, you can save your changes as a new weave pattern.

To save weave changes:

1. Choose **Art Materials palette: Weave menu> Save Weave**. A dialog appears asking you to name the new weave.
2. Type a name for the weave and click OK. If you don't type a new name, Painter 3D replaces the existing weave with the changed weave. The new weave pattern appears in the current weaves library.


10

Painter 3D Brush Variants

Introduction

This appendix is a catalog of Painter 3D's built-in Brush and Plug-in Brush variants.

The descriptions of the variants outline the behavior of a brush when pressure information is available. If you are using a mouse to paint, you'll want to modify a brush to achieve those pressure-sensitive effects. Modifying brushes will help you get the most out of the mouse as an input device.

Brush Variants

Brush variants are located in the Brushes palette. After selecting a brush, you can select a variant from the pop-up menu within the palette.

For more information, refer to "Choosing a Brush and Variant" on page 118.

Pencils

Pencils are great for anything you'd use real pencils for—from rough sketches to fine-line drawings. Like their natural counterparts, Pencils interact with canvas texture.

All the Pencils variants build to black. Pencils are pressure sensitive in terms of opacity. The Colored Pencils variant is an exception. Colored Pencils have uniform opacity regardless of pressure.

With the Colored Pencils, 2B Pencil, Sharp Pencil, and 500 lb. Pencil variants, dragging quickly produces a thinner line; dragging slowly leaves a thicker line.

The thick-to-thin variation becomes more apparent as you increase the ±Size setting on the Brushes palette: Controls menu> Size palette.

Thick & Thin Pencils

With this semi-anti-aliased variant, line width depends on the direction of your stroke.

2B Pencil

This variant is a soft lead pencil that produces thin, anti-aliased lines.

500 lb. Pencil

The 500 lb. Pencil creates fat, semi-anti-aliased lines.

Single Pixel Scribbler

The Single Pixel Scribbler has a one-pixel pencil point. Pressure affects opacity.

Sharp Pencil

This variant is a hard lead pencil with semi-anti-aliased strokes.

Colored Pencils

The Colored Pencils variant produces lines with semi-anti-aliased edges.

Eraser

Painter 3D has two ways to remove color: the Eraser variants, which erase down to the paper color, and the Bleach variants, which erase to white. Darkeners are Eraser

variants that increase color density, building colors toward black. Darkeners are the inverse of Bleach.

With all of the Eraser variants, pressure determines how much you erase. To erase lightly, press gently.

If you're using a mouse, the Opacity slider controls how much you erase. With an eraser variant's opacity at 100%, it will completely remove color in one stroke. With opacity low, the eraser removes color gradually.

Small Darkener

Ultrafine Eraser

Fat Bleach

Small Eraser

Medium Darkener

Medium Bleach

Medium Eraser

Ultrafine Bleach

Flat Eraser

Fat Eraser

Small Bleach

Single Pixel Bleach

Fat Darkener

Ultrafine Darkener

Water

Water smudges and dilutes existing colors in the image. It doesn't add any color. All of the Water variants are pressure sensitive—the harder you press, the more you'll smear the image.

The Water variants work in the image layer. They are not associated with the wet layer or the Water Color variants.

Just Add Water

This variant smudges with smooth, anti-aliased strokes. It removes grain and responds to the velocity of your stroke, smearing more when you drag slowly.

Frosty Water

This variant smears with a hard-edged, brittle stroke. It interacts with the texture grain. Try choosing other textures for different results.

Tiny Frosty Water

This variant is a sharpened version of Frosty Water.

Single Pixel Water

This is the smallest Water brush available, similar to wetting a single hair and using it to smear an image.

Water Rake

This variant is a multi-bristle water applicator.

Water Spray

This variant sprays pixels of water onto the image.

Big Frosty Water

This variant is a large version of Frosty Water.

Grainy Water

This variant reacts to grain. It is ideal for smearing existing textured strokes because it helps them maintain their graininess. You can also use it to add texture to smooth strokes.

Chalk

Chalk produces the thick, rich texture of the natural pastel sticks. Chalk covers with strokes that interact with grain.

The Chalk variants are pressure sensitive in terms of opacity. Adjust the Opacity slider to get the same effect with a mouse.

Large Chalk

This variant is a wider version of Artist Pastel Chalk.

Artist Pastel Chalk

This variant produces a medium width, semi-anti-aliased stroke.

Oil Pastel

This variant slightly smears the underlying color. It uses a captured triangular tip to produce a chiseled edge.

Sharp Chalk

This variant is a sharper version of Artist Pastel Chalk.

Square Chalk

This variant uses a captured rectangular tip to produce a chiseled edge.

Charcoal

Charcoal produces covering strokes that interact with grain. Both Grain and Opacity are pressure sensitive

Gritty Charcoal

Gritty Charcoal gives deep-toned, semi-anti-aliased strokes. The width of the stroke depends on the direction you drag.

Default Charcoal

This variant produces heavily textured, semi-anti-aliased strokes.

Soft Charcoal

Soft Charcoal produces a soft, anti-aliased stroke.

Pens

The Pens variants give you ink pens that never clog, spatter or run dry.

Smooth Ink Pen

This variant behaves like a traditional fountain pen. Strokes get darker as you layer them. Stroke width and grain depend on pressure. Heavy pressure

produces a wide stroke that penetrates the grain. Light pressure produces a narrow stroke that reveals grain.

Scratchboard Tool

The Scratchboard Tool is smooth, anti-aliased and pressure sensitive.

Scratchboard Rake

This variant is a multi-toothed version of the Scratchboard tool. This brush is ideal for crosshatch shading. Line width depends on pressure.

Pixel Dust

Pixel Dust sprays a random distribution of pixels.

Calligraphy

The Calligraphy pen is great for stylized lettering. The line width varies with the direction of the stroke.

Heavy pressure produces a wide stroke; light pressure produces a narrow stroke.

Keep the Opacity slider in its default position for the most ink-like lines.

With variants where direction determines stroke width, you can set the angle where the width changes. For information, refer to the online book *Painter 3D Advanced Guide*.

Leaky Pen

This variant leaves a scattering of drops, like you'd expect from a leaky pen. The slower you drag, the bigger the drops.

Single Pixel

The Single Pixel variant draws with a single pixel brush.

This variant is not pressure sensitive.

Use this variant with the Straight Lines drawing style to draw single-pixel lines.

Pen and Ink

With the Pen and Ink variant, the width of the stroke is determined by how fast you drag. The faster you drag, the thinner the lines become.

Fine Point

The Fine Point variant produces a ballpoint pen stroke that reveals texture.

Flat Color

This variant lets you cover large areas with even color.

Image Hose

The Image Hose is a special brush that applies images instead of color. The images it paints come from Nozzle files.

The following examples are previews of the default nozzles. For complete information on Image Hose variants, creating Nozzle files, loading them, and controlling the Image Hose, refer to the online book, *Painter 3D Advanced Guide*.

Hands

English Ivy

Poppies

Mediterranean Village

Small Forest

Cumulus Clouds

Ivy

Sushi

Grass

Stones

Felt Pens

The Felt Pens variants draw smooth, anti-aliased lines that build toward black as you layer strokes. Pressure determines opacity for all of the Felt Pens.

Dirty Marker

The Dirty Marker produces shades that build toward black more quickly than those made with the Felt Marker. The direction of the stroke determines its width.

Medium Tip Felt Pens

This variant draws medium-width lines. Drag quickly for a narrow stroke. Drag slowly for a wider one.

With variants where drag speed determines stroke width, you can adjust the width range and the smoothness of transitions between wide and skinny in the Brushes menu> Controls menu> Size palette. For information, refer to the online book, *Painter 3D Advanced Guide*.

Single Pixel Marker

This variant is a one-pixel Felt Pen. Pressure affects opacity.

Felt Marker

The Felt Marker produces a softer shade than the Felt Pens. The direction of the stroke determines its width.

With variants where direction determines stroke width, you can set the angle where the width changes. For information, refer to the online book, *Painter 3D Advanced Guide*.

Fine Tip Felt Pens

This variant draws narrow strokes.

Crayons

The Crayons produce semi-anti-aliased strokes that interact with texture and build up as you layer them. Pressure determines opacity and grain.

Waxy Crayons

This variant smears the primary color with the underlying colors.

Default

This is a basic crayon.

Airbrush

The Airbrush applies a fine spray of color that covers underlying colors. Stylus pressure determines the concentration of color.

Spatter Airbrush

The Spatter Airbrush introducing a random texture into the airbrush spray. This variant produces a semi-anti-aliased stroke. Stylus pressure determines how much grain is revealed.

The results vary with different textures. Experiment with different textures and see how the brush stroke is affected.

Fat Stroke

The Fat Stroke variant covers a large area with a soft, anti-aliased paint stream.

Feather Tip

Feather Tip is a small sized variant that paints soft, anti-aliased lines of varied widths. The width variation is more apparent when you widen the brush size.

Single Pixel Air

This variant is a single-pixel brush. Color builds up based on pressure.

Thin Stroke

This variant covers a smaller area than Fat Stroke.

Liquid

The Liquid variants treat the underlying image as though it was floating on a thick liquid. The brush stroke drags image colors behind it.

This can be particularly useful when working with scanned photographs. These brushes can create a palette knife painting effect.

To smear existing paint with a Liquid brush variant—without adding color—move the Opacity slider all the way to the left.

To smear while adding some color, move the Opacity slider to the right.

Stylus pressure affects texture differently for the Liquid variants (drip method). More texture is visible when you press heavily, and less texture is apparent when you press lightly. This follows the natural behavior of smearing—the harder you smear the paint, the more you will reveal the surface it is painted on.

Drag these brushes slowly. The amount of pressure determines how much of the image you smear.

The Grain slider controls the strength of distortion a Liquid brush exerts on an image.

Smeary Bristles

This variant smears the primary color into the image. It is also grain-sensitive. Dragging quickly produces a thinner stroke; dragging slowly creates a wider one.

Total Oil Brush

This variant is similar to Smeary Bristles, but produces a tighter stroke.

Tiny Smudge

Tiny Smudge is a single-pixel, multi-bristled smudging tool.

Smeary Mover

This variant is similar to Smeary Bristles, but it smears existing paint without adding color.

Coarse Smeary Mover

This variant is a semi-anti-aliased version of Smeary Mover.

Coarse Smeary Bristles

This variant is a semi-anti-aliased version of Smeary Bristles.

Coarse Distorto

This variant is a semi-anti-aliased version of Distorto.

Thick Oil

Thick Oil smears with a stroke loaded with the primary color.

Distorto

This variant moves paint around without adding color. Dragging quickly produces a thinner stroke; dragging slowly creates a wider one.

Brush

The Brush provides effects you'd expect from oil paints and acrylics. All of the brush variants cover underlying brush strokes, and many are capable of multi-colored strokes.

For information on defining the colors for multi-color brushes, refer to"Using Two Colors at Once" on page 142.

Some of the brush variants, like Loaded Oils, give the striated effect of real bristles. Using these variants with Apply Surface

Texture in the Effects menu produces some great oil or acrylic-like brush strokes.

Penetration Brush

This brush has hard, aliased edges. Its strokes look like acrylics when you apply surface texture to them using the Effects menu. For more information, refer to the online book, *Painter 3D Advanced Guide*. The Penetration Brush reacts to grain. Pressing lightly with a stylus allows more texture to show through; pressing heavily reveals less texture.

Camel Hair Brush

The Camel Hair Brush produces soft, anti-aliased strokes. Bristle size is dependent on drawing speed. Dragging quickly narrows each bristle; dragging slowly widens each bristle. Opacity depends on pressure.

Brushy

Brushy is a multi-bristle brush that runs out of paint toward the end of a stroke and picks up colors it's dragged through.

Fine Brush

The Fine Brush is a very fine-hair brush that changes scale quickly based on pressure.

Sable Chisel Tip Water

This variant is a fine-hair brush that uses water to smear the colors in an image.

Loaded Oils

The Loaded Oils brush simulates the look of a traditional loaded brush—a brush dipped in more than one color. Use the Color Variability sliders to adjust how loaded oils appear. For more information refer to "Setting Color Variability" on page 142.

Big Rough Out

This variant is a wider version of Rough Out.

Big Dry Ink

Big Dry Ink is like Big Wet Ink, but with a bit harder edge.

Huge Rough Out

This variant is an even wider version of Rough Out.

Big Loaded Oils

This variant is a wider version of Loaded Oils.

Hairy Brush

The Hairy Brush simulates strokes made by a bristle brush, showing semi-anti-aliased "brush hair" lines. The Hairy Brush interacts with grain and is pressure sensitive in terms of opacity and stroke width. It can also paint multi-color strokes.

You can customize the Hairy Brush dramatically by adding bristles and opening up space between them. For instructions, refer to "Spacing Palette" on page 61.

Big Wet Oils

Big Wet Oils is a wide loaded brush that mixes with the colors in the image.

Graduated Brush

The Graduated Brush is ideal for shading. It paints semi-anti-aliased brush strokes of just the primary color or the primary and secondary color, depending on pressure. It interacts with grain, and its stroke width is also determined by pressure.

For instructions on selecting primary and secondary colors, refer to "Primary/ Secondary Color Rectangles" on page 140.

Smaller Wash Brush

The Smaller Wash Brush has a multitude of fine, closely spaced bristles that mix and smear the current color with colors in an image.

Big Wet Ink

Big Wet Ink is a thick striated brush, loaded with ink. It has a soft appearance and looks like the bristles are spread apart.

Cover Brush

The Cover Brush produces brush strokes that have soft, anti-aliased edges. It does not interact with grain. Stroke width and opacity are determined by pressure.

Rough Out

Rough Out acts like a fast, dry brush and is ideal for roughing out ideas. The dab size of the brush is dependent on drawing speed. The faster you drag your stylus, the thinner the lines. Dragging slower produces thicker lines. The amount of grain revealed by this brush depends on pressure. Pressing lightly reveals more grain; pressing harder reveals less grain.

Ultrafine Wash Brush

This variant is similar to the Smaller Wash Brush but with a larger bundle of finer bristles.

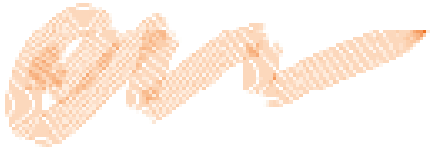
Oil Paint

The Oil Paint brush gives you strokes that have hard, aliased edges. Its strokes interact with grain. Stroke width and opacity are determined by pressure.

Small Loaded Oils

This variant is a narrower version of Loaded Oils.

Digital Sumi



The Digital Sumi brush variant is a multiple-bristle brush made up of single-pixel bristles. Pressure affects width.

Coarse Hairs

The Coarse Hairs brush produces a stroke with a small number of coarse hairs that change scale quickly based on pressure.

Artists

The Artists brush helps you paint in the styles of the master artists. You can paint in the style of Vincent Van Gogh, where your brush strokes are multishaded, or in the style of Georges Seurat, where multiple dots combine to form an image.

With all of the Artists brush variants, dragging quickly produces narrower strokes, dragging slowly produces wider strokes. Use the Color Variability sliders to adjust how the Artists brush strokes are colored. For more information about Color Variability, refer to“Setting Color Variability” on page 142.

Van Gogh

One of the things that made Vincent Van Gogh's style special was his use of multicolored brush strokes. The Van Gogh brush re-creates this style with a multicolored, anti-aliased brush stroke that covers underlying colors.

This is a complex brush and the strokes must be pre-computed; hence the dotted line that follows the cursor during the stroke. For best results, use shorter strokes and wait for them to render before making new strokes.

Impressionist

This brush re-creates the style of the Impressionists who painted with flattened dabs of color. The direction you drag determines the angle of the dab.

You can use the Impressionist variant to push around existing paint in an image by moving the Opacity slider to the left.

Flemish Rub

This variant creates an effect similar to the Impressionist variants. The difference is that Flemish Rub smears existing color instead of applying new color. Use this variant to apply an impressionistic effect to an existing image.

Piano Keys

This variant creates a colorful ribbon-like stroke with color bands perpendicular to the direction of your stroke. Piano Keys uses a closely spaced, thin captured rectangular tip to produce the effect.

Seurat

Georges Seurat painted in the pointillist style, a neo-Impressionist technique of using clusters of dots to represent the subject. The Seurat brush automatically creates multicolored, anti-aliased dot clusters. To add more dots, drag over the area again.

You can regulate dot size on the Size palette accessed from the Brushes palette: Controls menu> Size. Move the Size slider to the right to make the dots bigger.

Cloners

The variants of the Cloners brush behave like their "plain" brush counterparts—for example, the Chalk Cloner produces the same effect as the Artist Pastel Chalk variant of the Chalk brush.

You can customize the Cloners variants with Painter 3D's other customizing functions that are described in the online book, *Painter 3D Advanced Guide*.

Melt Cloner

The Melt Cloner melts an image so that it looks like it's dripping, and works the way the Distorto variant in the Liquid brush

works. When you use this brush with oil painting, it looks like you applied paint with a palette knife.

Van Gogh Cloner

This variant paints multicolored brush strokes in the style of Vincent Van Gogh.

Felt Pen Cloner

This variant re-creates felt pen strokes that get darker as you paint over other strokes. To keep the colors from darkening too quickly, move the Opacity slider in the Controls palette: Brush tool to the left.

Hard Oil Cloner

The Hard Oil Cloner gives you a harsh stroke with a hard edge that interacts with the grain and covers underlying strokes. It's good for oil painting and works best with short strokes.

You can configure this cloner to respond to speed or velocity of stroke. Use Brushes palette: Control menu> Sliders and Brushes palette: Control menu> Size to adjust the size based on velocity. How quickly you drag the mouse or stylus determines the width of the stroke. Drag slowly for thick strokes, quickly for thin ones. This brush interacts with the current paper texture.

For more information on the Size and Slider palettes, refer to the online book, *Painter 3D Advanced Guide*.

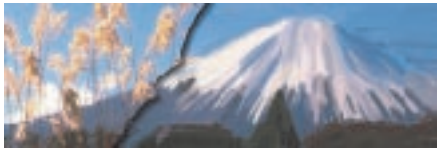
Driving Rain Cloner

This variant clones your image as it would look through a window during a rainstorm.

Soft Cloner

The Soft Cloner gives you airbrush-style strokes that softly recreate the source area. The edges of the Soft Cloner brush are soft, allowing it to blend realistically with an existing background.

Hairy Cloner



The Hairy Cloner paints like the Hairy Brush variant of the brush, producing somewhat anti-aliased strokes that show the brush's "hair lines" and react to the grain. This brush is useful with oil painting.

Oil Brush Cloner

The Oil Brush Cloner gives you anti-aliased brush strokes that hide underlying ones. This is another good brush to use with oil painting. Short strokes work best with the Oil Brush Cloner. How quickly you drag the mouse or stylus determines the width of the stroke. Drag slowly for thick strokes, quickly for thin ones.

Impressionist Cloner

The Impressionist Cloner uses the directions of your brush strokes to place many short dabs in varied colors based on the source point.

Straight Cloner

This variant duplicates the image without changing it. Simply click and drag and you'll see the area around the source point come through.

Pencil Sketch Cloner

This variant imitates pencil lines. To get a quick-sketch effect with uneven lines, open the Brushes palette: Controls menu> Random palette and move the Clone Location How Often slider all the way to the left.

Chalk Cloner

This variant draws like the Artist Pastel Chalk variant of the Chalk brush.

Water Color

The Water Color brush variants produce natural looking watercolor effects.

All of the Water Color variants, except Wet Eraser, interact with the canvas texture. The Grain slider works differently with the Water Color brushes than with the other brushes. With Water Color variants, moving the slider to the right makes the texture more pronounced. Moving the slider to the left reduces the grain interaction.

Stylus pressure affects the width of the brush stroke for all of the Water Color brush variants except Wet Eraser. Increased pressure widens the brush stroke; less pressure narrows the stroke.

Pure Water Brush

This variant behaves like the Water Brush Stroke variant except without adding color. Use it to spread and blend the colors of existing watercolor strokes.

Broad Water Brush

This variant paints a wide brush stroke that shows its bristles.

For ways to customize bristle brushes, refer to the online book, *Painter 3D Advanced Guide*.

Spatter Water

This variant spatters water randomly with each stroke.

Simple Water

The Simple Water variant paints a stroke of the primary color without bristles.

Large Simple Water

This is a larger version of the Simple Water variant.

Water Brush Stroke

This variant is a watercolor bristle brush. When you first make a stroke, a dotted line appears while Painter 3D computes the stroke.

Large Water

This variant paints a broad wash of color.

Diffuse Water

This variant produces a stroke with diffuse edges (refer to the description of Diffusion at the beginning of the Water Color section).

Wet Eraser

The Wet Eraser removes watercolor strokes from the wet layer. The Wet Eraser is pressure sensitive. Pressing heavily erases more quickly.

If you've "dried" the wet layer (by saving the image), use the regular eraser to remove the stroke from the image.

New Brush Variants

Painter 3D's new brush variants include plug-in brushes. You can access these brushes by choosing Window menu> Custom Palette> Shortcut to New Brushes.

You can also load these new brush variants by choosing Load Library from the Brush Library pop-up in the Brushes palette.

For more information, refer to "Choosing a Brush and Variant" on page 118.

F/X

Glow

The Glow brush delivers soft-edged color that increases in value with each overlapped stroke. The Opacity slider controls brush strength. The Grain slider controls the saturation of the glow. Low Grain settings lead more quickly to white. High Grain settings increase the saturation of the glow.

To use the Glow brush, choose the color you want for the glow. The range between red and yellow produces excellent glows. To slow the effect, choose a color with very low value. (Saturation=100% and Value=10%). Repeat strokes to build the effect.

This brush is useful for painting the halo of light on a glowing object. For best results, use Glow on a dark background.

Fire

Fire is a variation of the Glow brush that uses a captured dab to produce tongues of flame. Fire delivers color that increases in value with each overlapped stroke. The Opacity slider controls brush strength. The Grain slider controls the saturation of the flames. Low Grain settings lead more quickly to white. High Grain settings increase the saturation of the flames.

To use the Fire brush, choose the color you want for the fire. An orange-red creates excellent fire. To slow the effect, choose a color with very low value. (Saturation=100% and Value=10%). Repeat strokes to build the effect.

For best results, use Fire on a dark background.

You can create fire in a separate floating layer. Create a floater over the area you want to light on fire. Fill the floater with pure black. Set the floater's Composite Method to Screen. This makes it effectively transparent (because all pixels in it are black). Now you can use the Fire brush in this floater.

Graphic Print

The Graphic Print brush adds contrast broadly. Colors are reduced to black, white or the closest major hue—R, G, B, C, M or Y. Regions are homogenized and borders are softened. Opacity controls brush strength.

Confusion

The Confusion brush creates a confusion pattern in existing imagery. Repeat strokes to build confusion. Only the Size slider has an effect on Confusion. The Color palette and other sliders have no effect.

Bubbles

The Bubbles brush creates circles of distortion in underlying imagery. The distortion is like the refraction you see in bubbles. The Opacity slider controls the warping in the bubble. Higher Opacity settings produce greater warping. Grain and color settings have no effect.

Gooey

Bulge

The Bulge brush distorts existing imagery by spreading it apart. Opacity controls brush strength.

Pinch

The Pinch brush distorts existing imagery by pulling it together. Opacity controls brush strength.

Horizontal Pinch

The Horizontal Pinch brush distorts existing imagery by pulling it together in horizontal strokes and spreading it out in vertical strokes. Opacity controls brush strength.

Vertical Pinch

The Vertical Pinch brush distorts existing imagery by pulling it together in vertical strokes and spreading it out in horizontal strokes. Opacity controls brush strength.

Left Twirl

The Left Twirl brush distorts existing imagery by pulling it in counterclockwise spirals. Opacity controls brush strength.

Right Twirl

The Right Twirl brush distorts existing imagery by pulling it in clockwise spirals. Opacity controls brush strength.

Twister

Twister is an extreme Right Twirl variant that uses a captured dab.

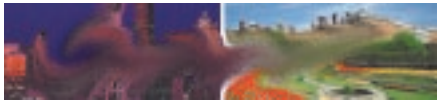
Blender

Blender is an extreme Right Twirl variant that uses a captured dab.

Turbulence

Turbulence is a Left Twirl variant with randomized dab placement. This brush creates chaotic, fractal-like effects.

Diffuse Pull



The Diffuse Pull brush distorts and smears existing imagery in the stroke direction. Opacity controls brush strength.

Marbling Rake

The Marbling Rake uses a rake stroke to smear existing imagery in the stroke direction. It's like dragging a comb through thick oil paint. Grain controls the amount of smearing.

Runny

Runny brush creates directional distortion with randomized dab placement. Opacity controls the amount of color applied. Grain controls the amount of distortion.

Layer

The Layer brushes use the Transparent Layer Brush Plug-in method subcategory. These brushes paint on transparent portions of image floaters.

Brush

The Brush variant of the Layer brush creates paint brush-type strokes in a transparent floater.

Airbrush

The Airbrush variant of the Layer brush creates paint airbrush-type strokes in a transparent floater.

Pen

The Pen variant of the Layer brush creates Pen-type strokes in a transparent floater.

Mouse

The Mouse brush variants are designed for artists using a mouse, not a stylus.

Dotted

The Dotted variant creates dotted. lines. Change the size in the Size palette for larger or smaller dots.

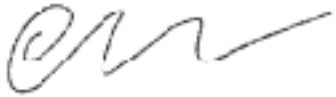
Spirex

The Spirex variant fragments the image.

Line Tool

The Line variant is good for drawing in straight line mode.

Scratchy



The Scratchy variant produces a random width line.

Brush Dab

The Brush Dab variant produces nice brushed looking strokes. This brush responds to the velocity of your stroke.

Rubber Stamp

The Rubber Stamp variant clones the active clone source. Hold the Control/Shift key to set the source point in the same document.

Single Pixel

The Single Pixel variant produces good clean aliased (jaggy) lines.

Impressionist

The Impressionist variant uses direction in conjunction with thin brush pads.

Calligraphy

The Calligraphy variant produces a stroke similar to calligraphy.

New Paint Tools

Palette Knife

The Palette Knife smears existing colors with a large, rectangular dab. It lets you emulate the traditional artist's palette knife painting technique.

Dry Brush

The Dry Brush smears existing colors but keeps them from blending too much. This is exactly the effect a traditional artist gets by dragging a stiff, dry brush over oil paints.

Sargent Brush

The Sargent Brush smears existing imagery and applies color. The Grain slider controls the smearing amount. The Opacity slider controls how much of the current color is added in.

Big Wet Turpentine

Big Wet Turpentine smears existing colors with a large, bristle dab. The Grain slider controls the smearing amount.

Big Wet Luscious

Big Wet Luscious applies color and smears existing colors with a large, bristle dab. The Grain slider controls the smearing amount. The Opacity slider controls how much of the current color is added.

Photo

Dodge

Dodge lightens the colors of the image.

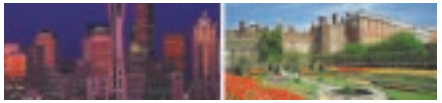
Dodge is a photographer's technique. A photographic print is made in the darkroom by projecting the negative's image onto light-sensitive paper. While making a print, a photographer might mask a small portion of the image for a few seconds. The photographer keeps the mask moving, "dodging" it over the paper, so that it won't leave an outline. When the exposure is finished, the area that was dodged received less light. When the paper is developed, the dodged area is lighter.

Burn

Burn darkens the colors of the image.

Burn uses the same technique as dodge, but with the opposite mask—one that covers most of the image. The un-masked portion receives more light during the exposure, so it develops darker.

Blur



The Blur brush softens color transitions in existing imagery. Lower Opacity produces a more gentle blur.

Diffuse Blur

The Diffuse Blur brush creates a directional motion blur on existing imagery. Lower Opacity produces a milder effect.

Sharpen

The Sharpen brush increases contrast in imagery on a small scale so that borders become sharper. For best results, use extremely low Opacity.

Scratch Remover

The Scratch Remover brush uses blurring to remove aberrations in the image. For best results, use low Opacity and a small Size setting.

Add Grain

The Add Grain brush produces value changes in existing imagery based on the current Paper grain. The Grain slider controls the strength of the effect. For best results, keep the Grain slider very low.

Relief

The Relief brush changes contrast in existing imagery based on image luminance. The result is surface relief (three dimensional appearance) in the image. For best results, keep the Opacity slider very low.

Comb

The Comb brush changes contrast in existing imagery following the stroke direction. The result is surface relief lines that follow the brush stroke.

Overlay

The Overlay brush adds contrast broadly. Colors are reduced to black, white or the closest major hue—R, G, B, C, M or Y. Opacity controls brush strength.

Hue

The Hue brush migrates existing colors toward the hue of the current primary color. Saturation and value are not changed. Opacity controls brush strength.

Both the existing imagery and the current primary color must have some degree of saturation for this brush to be effective.

Hue Add

The Hue Add brush migrates the hue of existing colors around the color ring. The Grain slider controls the direction of hue migration. Grain slider settings above 50% migrate hues clockwise. Grain slider settings below 50% migrate hues counterclockwise.

Hue Sat

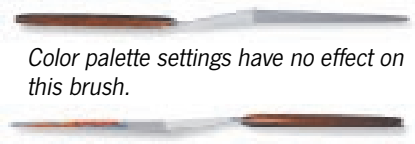
The Hue Sat brush migrates existing colors toward the hue and saturation of the current primary color. Value is not changed. Opacity controls brush strength.

To use the Hue Sat brush: Set the color you want to move toward as the primary color on the Art Materials: Color palette. Set the Opacity slider to describe how quickly you want to get there. Paint in the image to change hue and saturation.

The Hue Sat brush is ideal for colorizing grayscale imagery.

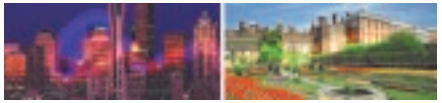
Saturation Add

The Saturation Add brush changes the saturation level of existing colors. Hue and Value are not changed. The Grain slider controls whether the brush increases or decreases saturation. Grain slider settings above 50% increase saturation. Grain settings below 50% decrease saturation. The closer the Grain slider is to either extreme (zero or 100%) the more quickly the colors change saturation level. Opacity controls brush strength.

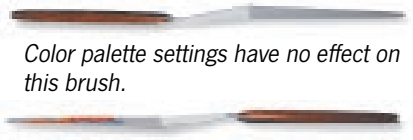


Color palette settings have no effect on this brush.

Value Add



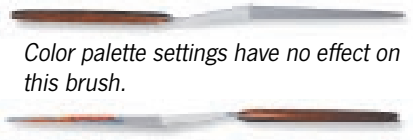
The Value Add brush changes the value level of existing colors. Hue and saturation are not changed. The Grain slider controls whether the brush increases or decreases value. Grain slider settings above 50% increase value (move toward white). Grain settings below 50% decrease value (move toward black). The closer the Grain slider is to either extreme (zero or 100%) the more quickly the colors change in value. Opacity controls brush strength.



Color palette settings have no effect on this brush.

Value Add Sat Subtract

The Value Add Sat Subtract brush changes the value and saturation of existing colors. Hue is not changed. The Grain slider controls whether the brush increases or decreases value. Grain slider settings above 50% increase value while reducing saturation. Grain settings below 50% decrease value while increasing saturation. The closer the Grain slider is to either extreme (zero or 100%) the more quickly the colors change. Opacity controls brush strength. With the Grain slider below 50%, this brush is ideal for darkening touch-up work.



Color palette settings have no effect on this brush.

Super Cloners

The Super Cloner brush variants use multi-point cloning to transform source imagery when you clone it.

Cloning and the Super Cloner brushes are described in the online book, *Painter 3D Advanced Guide*.

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MetaCreations
The Visual Computing Software Company

MetaCreations Painter 3D Troubleshooting Worksheet

MetaCreations Technical Support

Phone: (408) 430-4062

Fax: (408) 438-9672

Date: _____

Your Name: _____

Phone: _____

Fax: _____

❒ Macintosh ❒ Windows

System Software version: _____

MetaCreations Software version (ex. 4.1.2)

Found on the splash screen: _____

Serial #: _____

Description of Problem:

Do symptoms appear: Consistently Intermittently Once only

Describe how to duplicate the problem, step by step:

1)

2)

3)

4)

Have you checked our Web site, www.metacreations.com, to see if the solution to the problem is already posted? ❒ Yes ❒ No

Does the problem still occur under the following conditions?

Windows

Using Standard VGA video driver? Yes/No

When all TSRs are off? Yes/No

Macintosh

When all Extensions are off? Yes/No