Piranesi

The Piranesi tutorials

Piranesi offers a number of tutorials, aimed at different levels of experience. You are recommended to start with Tutorial 1, and work through the tutorials in sequence.

- Tutorial 1: Painting with Piranesi is an introduction to the basic techniques that you use when you paint with Piranesi (approximately 75 minutes)
- Tutorial 2: 3D Effects introduces some three-dimensional effects, such as 3D brushes, textures, and fading effects with depth (55 minutes)
- Tutorial 3: Photorealism introduces techniques you can use to make your scene look more realistic, such as adding people to a scene (20 minutes)
- Tutorial 4: Working with Cutouts introduces advanced techniques for working with items of scenery, such as generating shadows (30 minutes)
- Tutorial 5: Beyond Photorealism demonstrates some techniques you can use to create special non-photorealistic effects (35 minutes)
- Tutorial 6: Working with Piranesi Panoramas shows you how to navigate and paint panorama files, and includes how to generate a style library from a set of image files (30 minutes)
- Tutorial 7: Painting 2D Images demonstrates how you create an EPix file from a 2D image file, and how you can add geometry to the scene (45 minutes)
- Tutorial 8: Advanced Photorealism shows you how to blend with textures and colours, add reflections and lighting, and 'model' with paint (30 minutes)
- Tutorial 9: Procedural Textures and Thresholding demonstrates how to use computer-generated textures and filters to produce halftoning effects (30 minutes)

To move from one exercise to the next, click the button at the end of the exercise.

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Click on blue underlined text to jump to the indicated topic. You can then click the Back button on the toolbar to return to the original topic.

If you want more information about using the Piranesi windows and tools, you can refer to Piranesi Help.

To display Piranesi Help

- on the Piranesi Help menu, click Piranesi Help

The Contents page of the Help system is displayed. Click any link in the Contents to display help on that topic.

To find a help topic

- in the **Ask a question** box, type a word or phrase that may identify a help page and press **Enter**

To read a topic, click the topic title and then click **Show** or double-click the title.

Tutorial 1: Painting with Piranesi

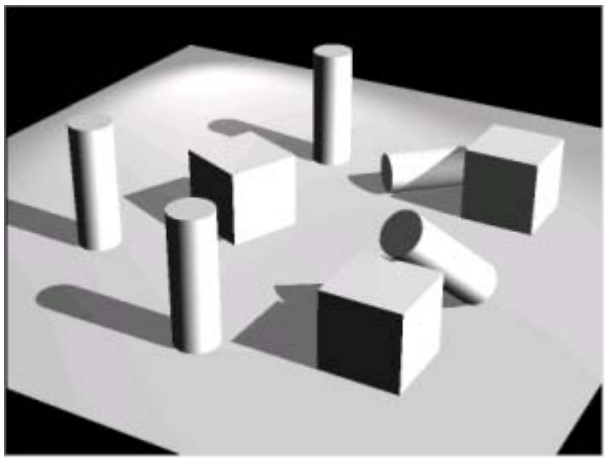
This tutorial covers:

- opening a file
- setting up the style library
- applying styles to the scene
- painting with the brush tool
- changing the paint colour
- reapplying styles
- navigating the scene
- using styles with locks
- changing the brush shape
- restoring the original colour
- using the fill tool
- varying the opacity amount
- using different blend modes
- creating a new library
- saving a new style
- printing the scene
- saving and closing files

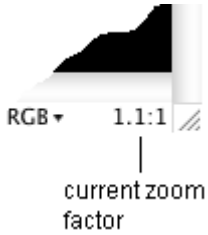
Opening a file

To use Piranesi, you will need to open an Extended Pixel (EPix) format file.

1. **Now,First, just to make sure that everyone starts with the same Piranesi setup and screen lay-out, click Reset Tools on the Window menu, followed by Reposition Tool Windows also on the Window menu.**
2. **To open the first EPix file, on the File menu, click Open.**
   The Open: Piranesi dialog is displayed.
3. **Browse to the location of the Piranesi Tutorial EPix files.**
   If you installed Piranesi 6 Pro in the default location, the tutorial EPix files are in Applications:Piranesi 6 Pro:Tutorial:EPix.
4. **Open the file, 'Blocks1'.**
   A greyscale picture of a number of blocks and cylinders opens in a document window:



   Piranesi fits the scene to the document window at the largest size possible. The current zoom factor of the scene is shown on the status bar at the bottom of the document window. For example:



When you opened the EPix file, a new layer (called Layer 1) was automatically created and added to the Layer Manager. You can use layers for many reasons, such as to enable you to create several variations of the original scene within the same file. Unless we add new layers, this layer will store all colour, depth, and material information. Each layer shows a thumbnail which reflects the paint effects that you add to the layer. You will be creating new layers in later tutorials, but for now just close the Layer Manager (if its open) by clicking its Close button

Setting up the style library

The easiest way to paint with Piranesi is to select an existing style from a style library. This can be from one of the supplied libraries or from a library that you have created yourself. Each style defines a collection of settings for the tools and features that you use to paint the scene. A style does not always specify all of the options. For example, it may define the colour and texture to be used, but not the tool, locks, grain, fade, and blend mode.

You don't have to use styles in Piranesi, but they save you from having to remember the settings each time you want to reproduce an effect. Note that we use the term 'effect' to describe the result of all the toolbar and palette settings.

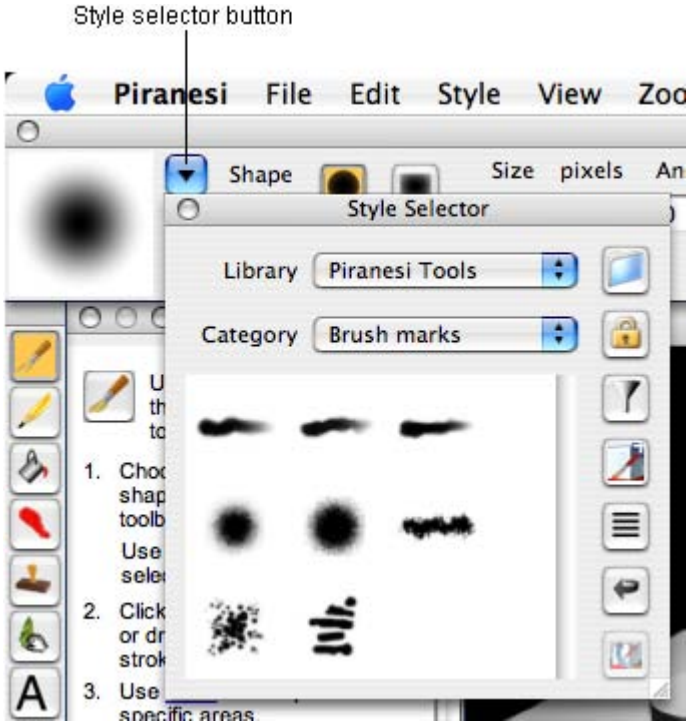
Styles are stored in style libraries, which are divided into categories. Categories group related styles together so that you can locate them easily.

You usually access styles from the 'Style selector'. The Style selector lets you attach a style category to each painting tool so that you can select its styles quickly. You access the Style selector from the Tool Options toolbar, which you use to change the settings of your tools.

You can also select styles from the Style Manager, which you use to manage your libraries and categories. You'll use the Style Manager later to create a library for styles you create during the tutorials.

1. **To attach a style category from the tutorial style library to the current tool, click the Style selector button on the Tool Options toolbar.**

   The Style selector is displayed, for example:



   In the illustration, the Brush tool is selected. However, it doesn't matter which tool you have selected as we'll be choosing to remember the style category for all tools. If you do have a different tool, the settings on the Tool Options toolbar will also be different.

   The styles and location details that are currently attached to the tool are shown. Note that when you install Piranesi, appropriate libraries and categories are automatically set up for each tool. You can return

to the Piranesi defaults at any time by clicking the Reset button towards the bottom of the Style selector.

You'll now attach the tutorial library to the tools.

2. **Click the Library box and select 'Tutorial Library' from the list.**

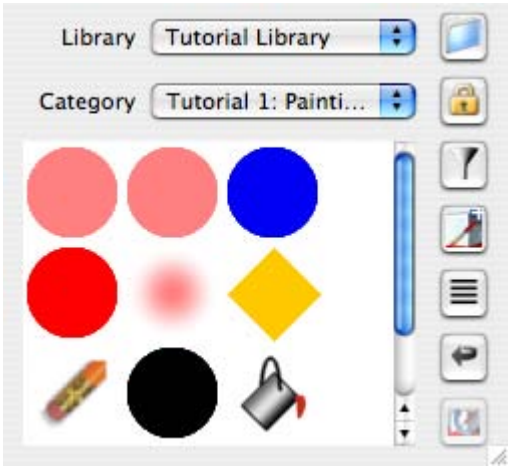
   If the tutorial library is already open, Piranesi selects the first category, or the last category used in this session, and lists its styles. If 'Tutorial 1: Painting with Piranesi' is not shown, select it now.

   If the tutorial library is not currently open, you'll first need to open it:

   a. On the Style selector, click
      An Open dialog is displayed.

   b. Locate the Tutorial folder, select Tutorial Library and click Open.

   The styles that you will be using for the first tutorial are now associated with the current tool:



   This category contains a number of brush styles, in different colours and shapes, and a fill style.

   If your view is not set to show icons, your styles will be shown differently. You can change the view to details by clicking

   To see the name of the first style, move the pointer over its icon. Its name, '01 Pink paint', is shown in a Help Tag. Move over the next few styles to see their names. Notice that Piranesi orders the styles in dictionary order, with numerics listed first. This is important to remember when you begin to create your own styles.

3. **We want Piranesi to remember this category for all tools, so lock the settings by clicking the padlock so that it shows**

   If the Filter button is selected, only styles that use the current tool are shown. Although this is often useful for isolating styles of a specific type, we are using styles in an ordered sequence and want to see and use styles of any type. So, ensure the Filter button is not selected

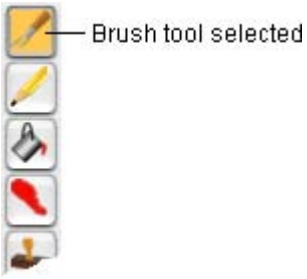
Applying styles and painting

Now that you have the tutorials style library ready to use, you can select a style and begin to paint the scene.

1. **Apply the style '01 Pink paint':**

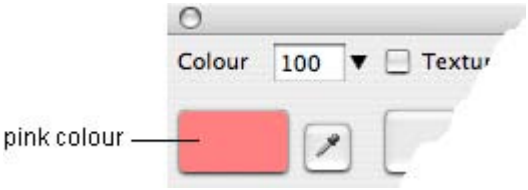
   Open the Style selector and click the first style '01 Pink paint' in the attached category 'Tutorial 1: Painting with Piranesi'.

   The style applies its settings to the toolbars and palettes. This style uses the Brush tool which is now selected on the Tools toolbar:

   You can see the name and shortcut of a tool by holding the mouse pointer over the tool. To see a description of a tool, press ⌘ when the pointer is over the tool. You can change and set up new keyboard shortcuts for the tools using your the Keyboard Shortcuts command on the Edit menu. For details, refer to Piranesi Help.

   Notice that the colour has changed to pink on the Colour, Texture and Grain toolbar:

   By default, the Piranesi toolbars are located at the top and to the left of the Piranesi title bar and are joined. Moving one window moves all windows to its right and below. You can position a tool window independently by moving any lower adjoining tool windows away first. To rejoin a tool window, drag it so that it's adjacent to another toolbar or palette.

   This style uses a hard, circular brush with a brush size of 50 pixels. Look at the other settings on the toolbars; see that the colour is set to 100% which means it is completely opaque and that no grains or textures are in use.

   If you change some of the current settings and then reselect '01 Pink paint' you'll see that all the style's settings are returned.

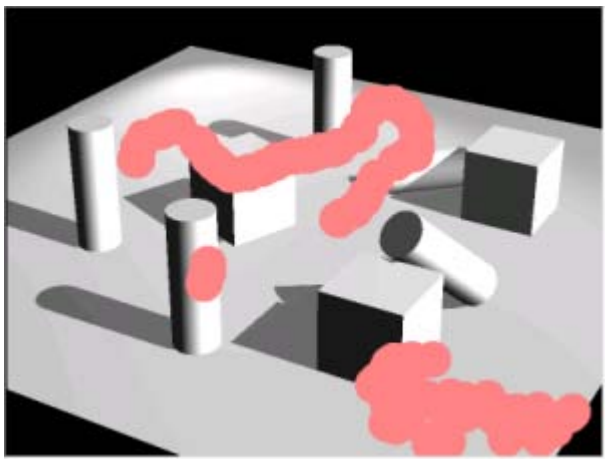
   You will now apply the effect to the scene.

2. **Paint the scene:**

   Click on the scene to create a circular brush mark or drag the brush to paint a continuous mark. Notice that the mouse pointer has a brush attached to indicate that the Brush tool is active:

   To constrain the brush vertically or horizontally, press Shift as you drag.

   For example:

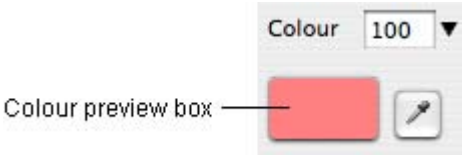


3. **Undo each paint action that you have just done to return the scene to its original state:**
   To undo a paint action, press ⌘-Z.
   You can also redo an action that you have undone. To redo an action, press ⇧-⌘-Z.
   The number of edits that you can undo and redo depends on the 'Undo buffer list' size set in your preferences. Refer to Piranesi Help for details about setting and changing your preferences.

Changing the paint colour

Now we will change the colour of the paint.

1. **If the Colour palette is not displayed, click the Colour preview box on the Colour, Texture and Grain toolbar.**



   Piranesi has several palettes that are displayed at different times, depending on the current settings. When a palette opens, it is displayed at its last placed location. To keep your screen tidy, you can choose to keep all palettes in the same place and access them from one or more tabbed windows. To do this, just drag one palette onto another. The palettes are then ordered in a separate window, with a tab for each. Click a tab to bring a palette to the front;press Ctrl, click over a tab and click 'Remove this tab' (or 'Remove all tabs' if there are just two tabbed windows) to return it to its own palette window.

2. **Select a colour.**

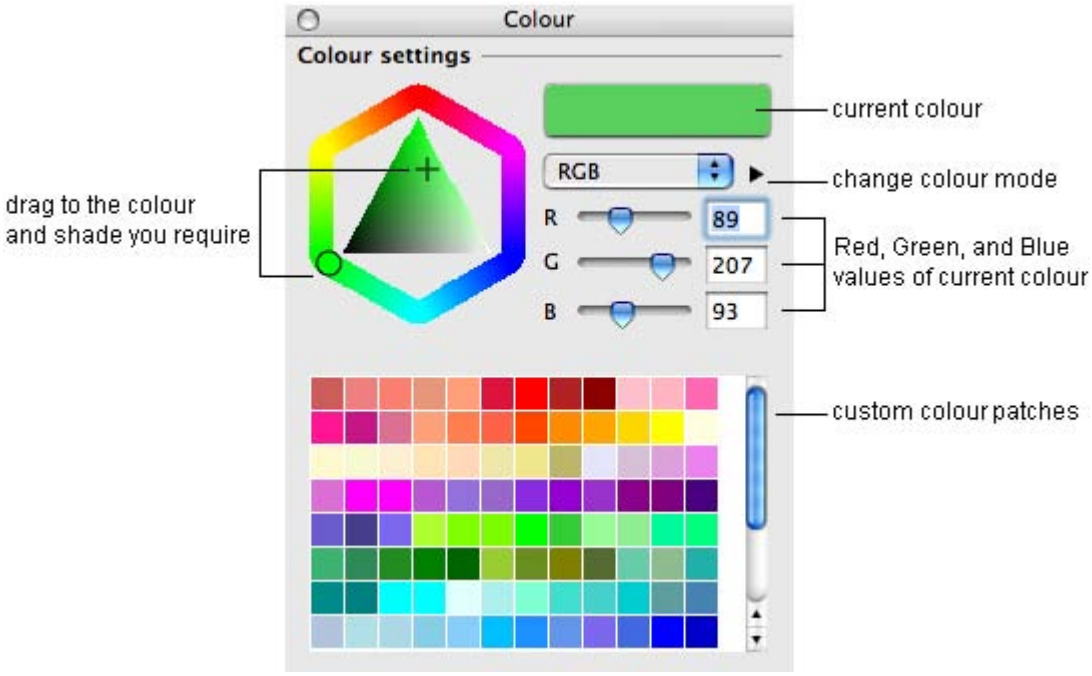
   You can select the new colour by dragging the sliders to the required value or by typing the appropriate values in the boxes and pressing Tab or Enter. A preview of the selected colour is shown in the box above the colour mode.

   Alternatively, you can select the colour by dragging the circle and cross on the colour spectra. If you double-click on the circle, the cross automatically moves to give you 100% colour saturation.

   The colour mode is set to RGB (Red, Green, Blue) by default. You can change the colour mode by clicking the arrow button above the colour value boxes and selecting from apop-up menu. For further details, refer to Piranesi Help.

   You can save a colour for future use by dragging the colour from the current colour box onto one of the custom colour patches. You can also save and recall sets of colour palettes and use them whenever you require.

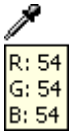
   Notice that a number of the colour patches are automatically populated by a set of commonly used colours:



The selected colour is displayed in the Colour preview box on the Colour, Texture and Grain toolbar.

Paint the scene in your new colour by pressing the mouse button and dragging the brush over the scene.

You can also select an existing colour from anywhere on your screen, using the Colour picker:

1. **On the Colour, Texture and Grain toolbar, click**
   The mouse pointer changes to a pipette, with the values of the current colour displayed in a Help Tag attached to the pointer. For example: 

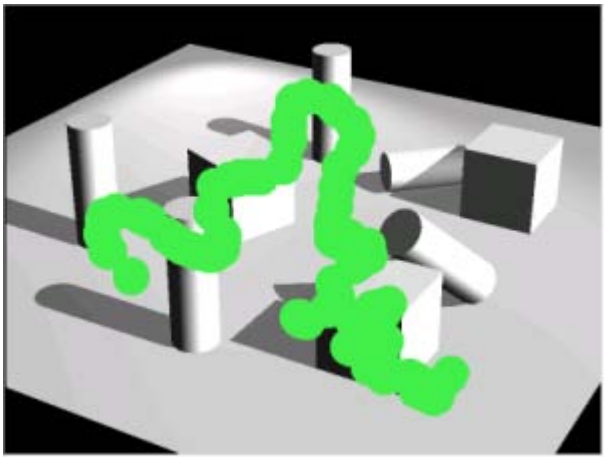
   The colour values are shown in the colour mode that is selected on the Colour palette. Here, the values are shown in RGB which is the default colour mode.
2. **Move your pointer over the screen to the colour you want to use.**
   The colour in the Colour preview box changes continuously to display the colour currently under the pointer.
3. **Click on the screen.**
   The selected colour is displayed in the Colour preview box, and the pointer returns to normal.
4. **When you have finished experimenting with selecting different colours, press ⌘-Z to undo your brush strokes before you proceed to the next exercise.**

Reapplying paint

You'll now see how you can paint the scene in one colour, then reapply the same paint stroke using another colour, in a single action.

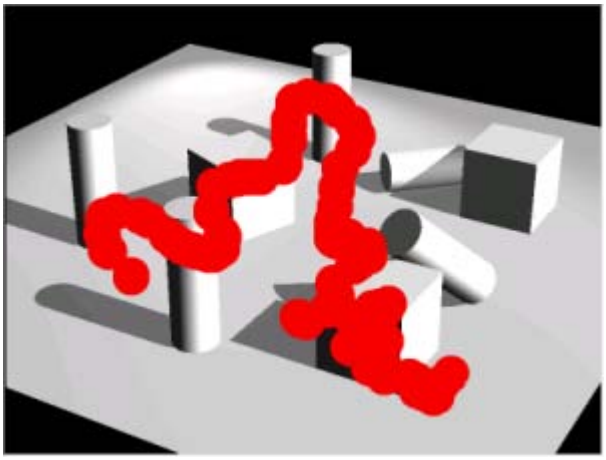
1. **Paint the scene in your selected colour by dragging the brush over the scene, using a single brush stroke.**

   For example:

2. **Select a different colour.**
3. **Reapply the brush stroke by pressing ⌘-R.**

   Piranesi undoes the last painting action and then applies the paint again using the same action, but this time Piranesi uses the new effect. For example:

   Note that Reapply redoes only the last brush action. If you painted the scene using more than one brush stroke, only the last brush stroke is reapplied.

4. **Pressing ⌘-Z to undo the painting.**

   Notice that the original brush stroke is undone, not just the 'reapply'. 'Reapplies' are not stored separately.

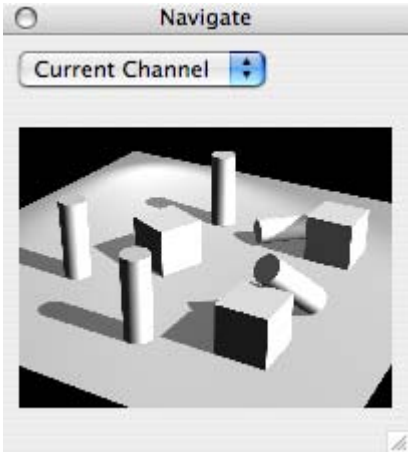
5. **Close the Colour palette for now as you won't be using it again for a while.**

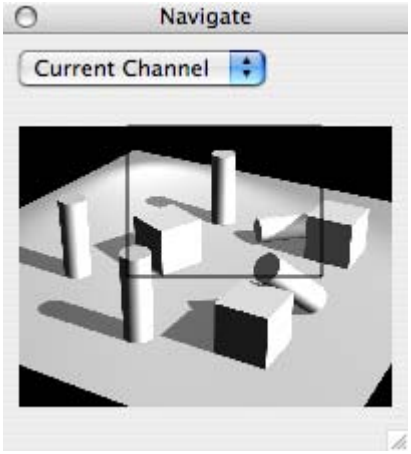
   To close the palette, click the Close button at the top left of the palette.

Reapplying actions is useful when you want to try out an effect that you have created. We will use this powerful feature again later in the tutorials.

Navigating the scene

Piranesi provides several ways in which you can navigate your way around the scene. In this exercise, we will cover only a few; for full details refer to Piranesi Help.

1. **On the Tools toolbar, double-click the Zoom tool**
   The Navigate palette is displayed:
   

   You need click only once on the Zoom tool to select it. Double-clicking the tool both selects it and resets the scene to its original pixel resolution, that is at 1:. (In Piranesi, 'pixel' refers to EPix file pixels, not the display pixel resolution.)
   If the scene changes in size, this is because it no longer fits the document window but is instead shown at its normal viewing size.
2. **Move the mouse pointer into the document window, and click on the vertical cylinder at the back of the scene.**
   The scene is enlarged to twice its current size with the cylinder on which you clicked at the centre of the view.
   Notice how the current view extent is represented on the preview image by a rectangle:
   

3. **Drag the rectangle on the Navigate palette to move the view extent.**
   The view in the document window is panned simultaneously.

4. **To define a new view extent, press Ctrl and drag on the Navigate palette.**
   The view in the document window is updated immediately.
5. **Click on the Tools toolbar and paint the scene in the document window.**
   To see how the changes are reflected on the Navigate palette, click the Zoom tool. Then pan the preview image to show a different area.
   Switch again to the Brush tool and paint the scene.
   If you need to pan the scene during a paint stroke, you can suspend painting by keeping the mouse button pressed and pressing ⌘ as you move the mouse to the edge of the scene. To continue the brush stroke in another area, release ⌘ and drag the brush. This is very useful when it's important to paint with a single stroke.
6. **To zoom out, press ⌘- – (minus key) or, on the Zoom menu, click Out.**
   Alternatively, to return the scene to its original size, click Fit to Window on the Zoom menu or double-click the Hand tool.
7. **Undo your painting by pressing ⌘-Z as many times as necessary.**

For full details about using all the available pan and zoom features, refer to Piranesi Help.

If you are using a wheel mouse, you can use the wheel of the mouse to zoom in and out of the scene in the document window. You can also press the wheel and drag to pan the view.

Styles and locks

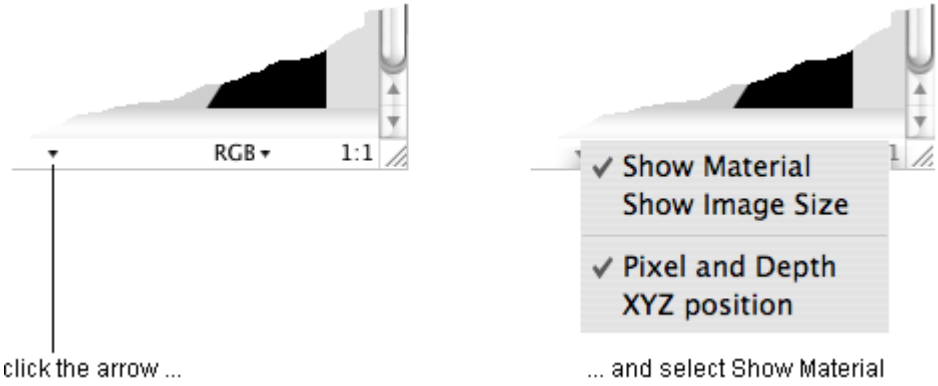
When you paint a scene, often you will want to restrict which items you paint. For example, you may want to apply paint only to items that have been rendered in a particular material.

1. **From the Style selector, click the style '02 Material lock' to apply the style to the toolbars and palettes.**

   Remember that you can check the name of a style in a Help Tag by pointing to its icon. You can also change the view in the Style selector to Details by clicking

   The settings for this style are similar to the pink paint style, except that the brush is smaller and the Material lock is now switched on:

   You can see the names of materials in the scene on the right of the status bar at the bottom of the document window. If the material name is not currently shown, click the arrow to the left of the channel name on the status bar, and click 'Show Material' on the popup menu:



2. **Move the mouse pointer anywhere over the front-most cube.**

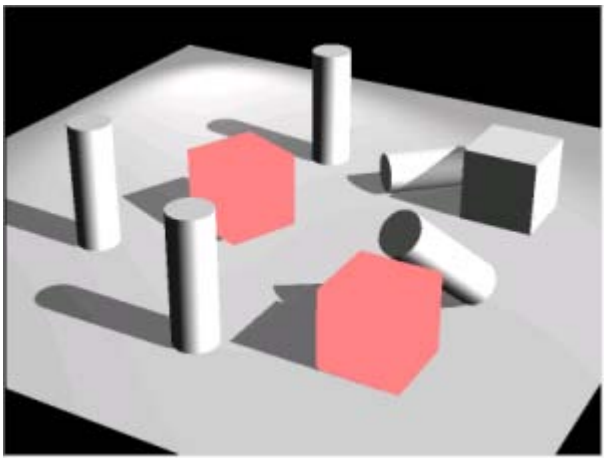
   Notice that a padlock is now attached to the mouse pointer, indicating that one or more locks are switched on:

   The status bar tells you that the material of this cube is called 'Two Cubes'. The material of the cube to the left is also Two Cubes.

   With the mouse pointer over the front-most cube, Piranesi highlights the two cubes in 50% opaque paint in the current colour as they have the same material. This *query* locks facility enables you to check that you have the correct locks in use before you begin to paint. You can toggle this feature on and off by

pressing Q. You can also choose to highlight matching surfaces only when the Q key is pressed down, by setting your preferences. See Piranesi Help for more details.

3. **Starting with the pointer over either of these cubes, paint both cubes with a single drag action.**
   Don't worry about painting over the edges of the cubes.

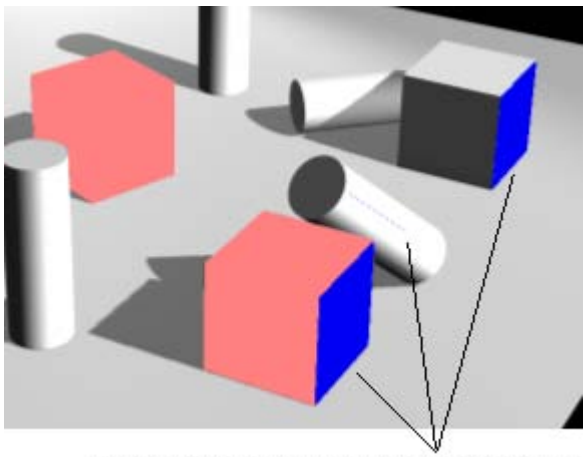


   See how the paint is restricted to the two cubes, just as you saw demonstrated when you queried the locks. This is because Piranesi restricts the paint to the material of the pixel that was under the pointer when you started painting.

4. **Apply the style '03 Orientation lock'.**
   Orientation lock is now selected, and Material lock is no longer selected.

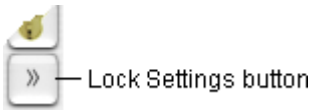
   Before we paint any further, let's temporarily switch off the query Lock feature by pressing Q.

5. **Now, move the pointer to the right face of the front cube, and, in one brush stroke, paint the cube face then paint backwards into the scene to paint the right face of the cube behind, as shown below.**
   The two faces of the cubes are painted because they are facing in the same direction.
   Where the brush swept over the cylinder between the two cubes, you will notice that a thin line is also painted on the cylinder. This is because the painted part of the cylinder is in almost the same orientation as the cube faces that you painted.



When you use locks, you can set tolerance levels to determine how strictly the locks are to be applied. With Orientation lock, you specify the number of degrees away from the orientation of the initial pixel; a higher number means more pixels will be painted. The tolerance level for the Orientation lock is currently too high; you will now change this.

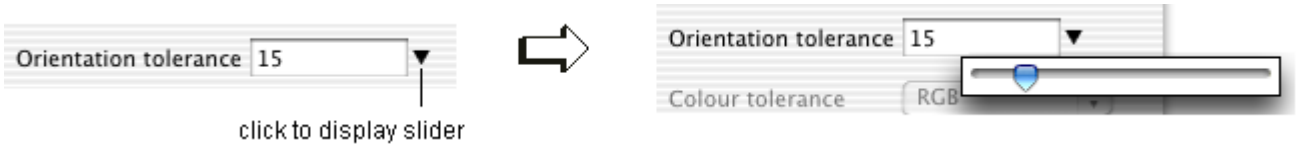
6. **On the Locks toolbar, click the Lock Settings button:**



The Lock Settings palette is displayed. It shows that the Orientation tolerance is set to 15 degrees.

7. **Change the Orientation tolerance to 6.**

You can type the value or click the arrow and drag the slider. For example:



8. **Press ⌘-R to reapply the effect.**

The line on the cylinder has now disappeared, because its orientation is not close enough to the orientation where the brush stroke started.

9. **Close the Lock Settings palette by clicking the Lock Settings button again.**

In the next exercise, you will see how you can use locks together.

Using multiple locks

In this exercise, you will combine locks to restrict painting. When you combine locks, the locks 'add together', so pixels must fulfil the conditions for all the selected locks.

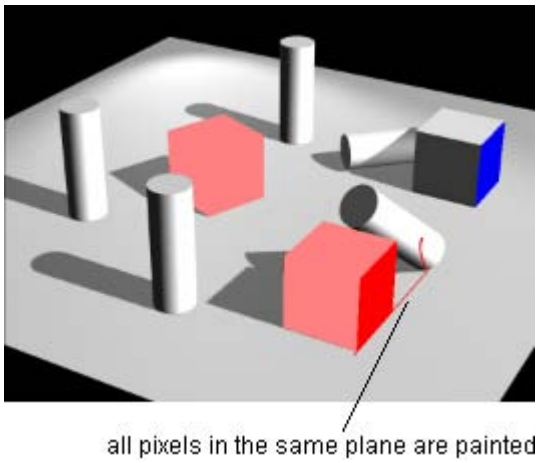
1. **Apply the style '04 Plane lock'.**
   Plane lock is now switched on, and Orientation lock is switched off.

   The colour has also changed to red.

   If you want to highlight surfaces that match the active locks, press Q to toggle the query lock feature on once again.

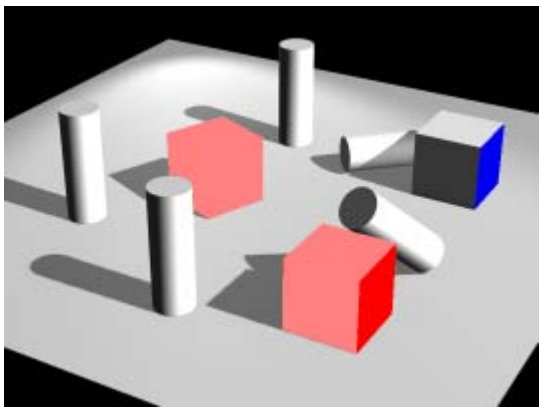
2. **Move the pointer to the right face of the front cube, and, in one brush stroke, paint backwards into the scene to paint the face of the cube behind, as you did in the previous exercise.**
   You will not be able to paint the face of the back cube because the face is not on the same plane as the pixel that was under the pointer when you started painting.

   You will notice, however, that a thin line on the ground and cylinder is painted. This is because this line is on the same plane as the initial pixel:

3. **Click on the Locks toolbar to switch the Orientation lock on.**
   Both the Plane lock and the Orientation lock are now switched on.

4. **Reapply the effect.**
   As before, the back cube is not painted because it is not in the same plane. But now, the thin line on the ground and cylinder is not painted either, because it is not in the same orientation.

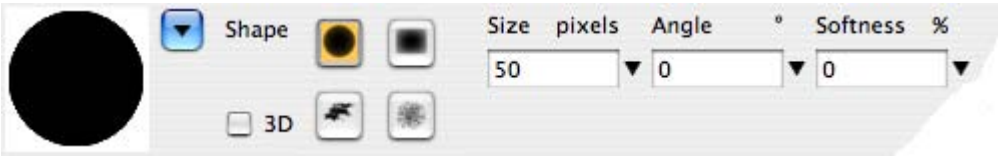


5. **Finally, clear all locks by clicking** **on the Locks toolbar.**

Changing the brush shape

So far, we have been using a circular brush to paint the scene. You can change the characteristics and shape of the brush. In this exercise, you will use a different circular brush, and a rectangular brush.

1. **Apply the style '01 Pink paint' that you first used from the Style Manager.**
2. **Paint part of the scene so that you can later compare the effect of painting with different brushes.**
3. **Look at the brush settings on the Tool Options toolbar:**



These settings will change when you apply another style that uses a brush.

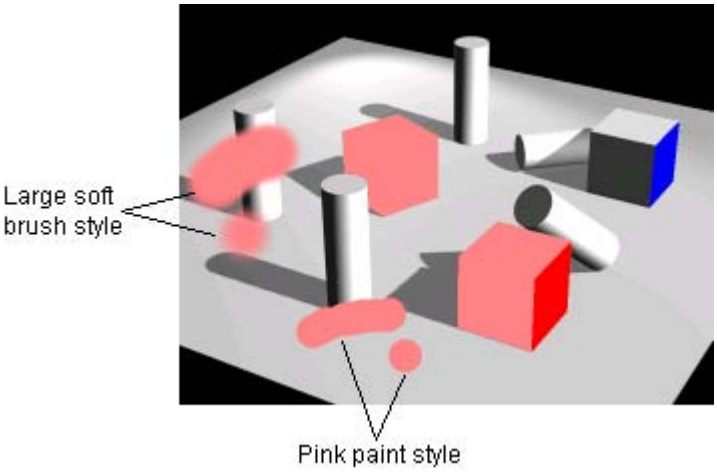
4. **Now apply the style '05 Large soft brush'.**

   Notice that the **Size** and **Softness** settings have changed to 100.

   The size of the brush is measured in pixels. This refers to the EPix file pixels, not the display pixel resolution. Therefore, you might find that a particular brush appears bigger on the screen if the EPix file you are working on has fewer pixels. (You will see an example of this in Tutorial 2.)

5. **Paint the scene with the new brush, and compare this with the previous style.**

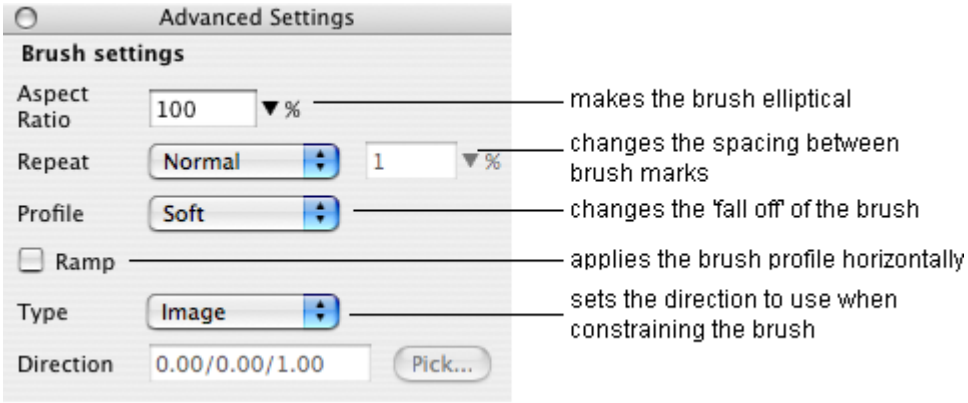
   For example:



   Notice that the brush strokes are softer, with fuzzy edges. The higher the softness, the more fuzzy the brush becomes.

6. **If the Advanced Settings palette is not currently displayed, on the Tool Options toolbar, click**

   The palette provides more options for the brush:



7. **Experiment with the Circle brush settings on both the Advanced Settings palette and Tool Options toolbar.**

   If you type a value on the Brush settings, press Tab or Enter (or move your mouse pointer over the scene) to confirm the value. The preview of the brush is updated.

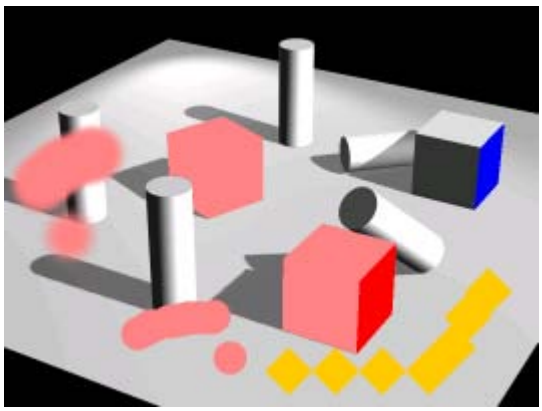
   The brush **Profile** is applied to the brush radially. Change the brush profile and see how the image is changed in the preview box. You will have to change the Softness setting of the brush, for example to 50%, to see the difference between the Soft and Spike profiles. Then select the **Ramp** checkbox to apply the profile horizontally from the left-hand edge of the brush (for an unrotated brush).

   Refer to the Piranesi Help for more details about the options.

8. **Apply the style '06 Rectangle brush', and paint the scene.**

   Remember that you can constrain the brush vertically or horizontally as you paint, by pressing Shift when you drag the mouse.

   Look at the settings for this brush. The brush **Shape** is now Rectangle. This time, **Spaced** is selected for the brush **Repeat**, and it is set to 100%, which means that the brush strokes are separated by the full size of the rectangle when you drag the mouse across the scene. For example:



   Try varying the spacing. You can get a smooth brush stroke by selecting **Continuous**; or select **Normal** for spacing that depends on the speed of the brush stroke.

   The **Aspect ratio** is set to 100%, which means that the height is 100% of the width. The **Angle** is set to 45°, which rotates the rectangle from the horizontal. The **Profile** settings have no effect with this brush as it has 0% softness, making it hard edged.

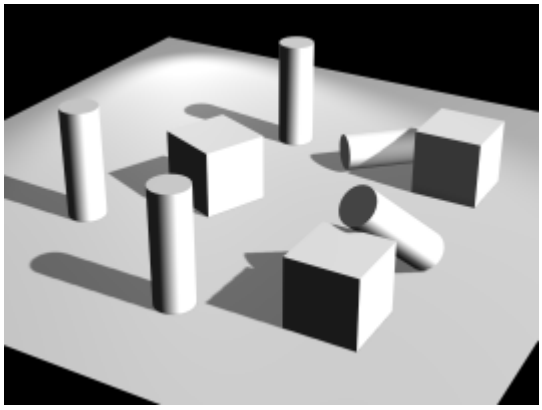
Experiment with the rectangle options to see the effect they have. Try changing the **Brush constraint** then painting with the Shift key pressed; you can use the image axes, the world axes, or specify a fixed direction. See Piranesi Help for details.

Restoring the original colour

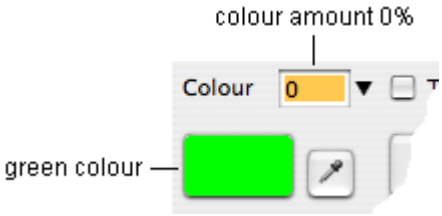
Sometimes you will want to restore a scene to its original colour. For example, you may want to do this when you are creating special effects, or if you have made a mistake.

Piranesi stores information about the original rendered scene in the EPix file, as well as information about the painted scene. The information is stored in 'channels'. The RGB (Red, Green, Blue), Depth, and Material channels store the colour, depth, and material information about the current settings in the painted scene; the Restore RGB, Restore Depth, and Restore Material channels store the colour, depth, and material information about the rendered scene.

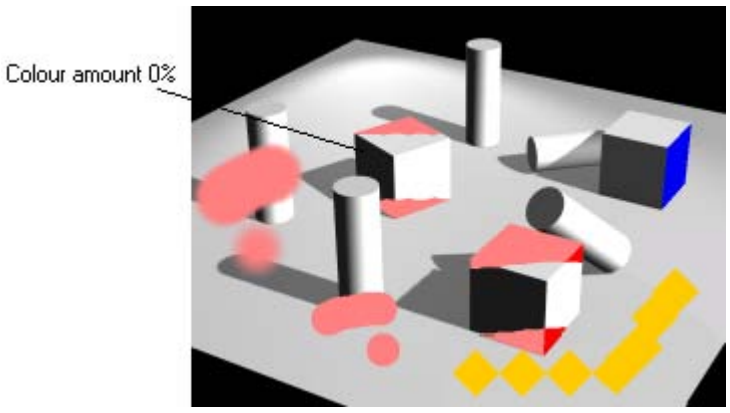
1. **On the View menu, click Restore RGB Channel.**
   The colour in which each pixel was rendered in the original EPix file is shown.



2. **To redisplay the current RGB, click RGB Channel on the View menu.**
   Note that if you do not display the current RGB, you will not be able to see what you are painting.
   Now, let's restore the original colour to the scene.
3. **Apply the style '07 Restore colour brush'.**
   The Brush tool is selected, the colour is set to green and the Colour amount slider is set to 0% on the Colour, Texture and Grain toolbar.



   Notice that when a value is set particularly low, and zero in this case, Piranesi highlights the value as a visual reminder.
4. **Paint the scene.**
   The brush restores the colour, for example:



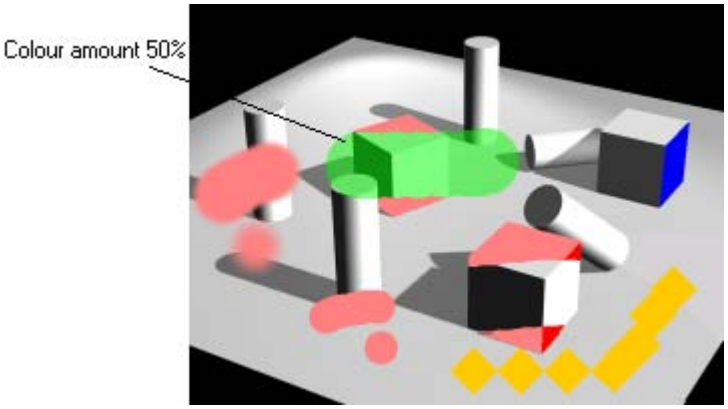
This is because the Colour amount slider controls the balance between the colour in the Restore RGB channel, and the selected colour. A value of 0% uses only the Restore colour.

You can also restore colours to a scene using the Erase tool. However, the Erase tool also restores the Restore Depth and Restore Material channels and this is not what you want here. You can also use locks with the Restore channels. You'll learn more about these channels in Tutorial 3.

5. **Change the Colour amount slider to 50%, and reapply the brush stroke.**

   You can drag the slider, or click on the slider and use the arrow keys on your keyboard, to change the colour amount.

   This time the green colour is used. However, notice that the Restore RGB colours show through. A Colour amount value of 50% mixes the Restore colour and the selected colour equally. For example:



   Experiment with different Colour amount settings.

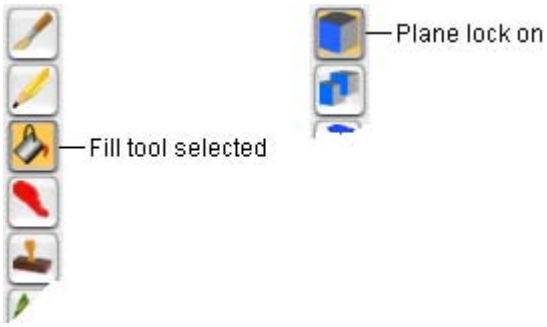
6. **When you have finished, use the colour restore brush to restore the scene to its original greys-cale.**

   To restore the scene quickly, you could select the colour restore brush and then switch to the Fill tool and click on the scene instead.

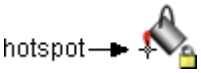
Filling the scene with paint

Sometimes you will want to fill entire areas of the scene with paint, or even fill the entire scene.

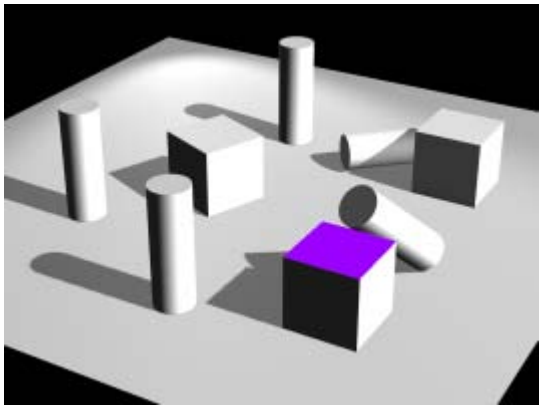
1. **Apply the style '08 Plane flood-fill'.**
   The Fill tool is selected, and so is the Plane lock.



2. **Click on the top of one of the cubes.**
   Ensure that the 'hotspot' of the Fill cursor is on the top of the cube when you click:



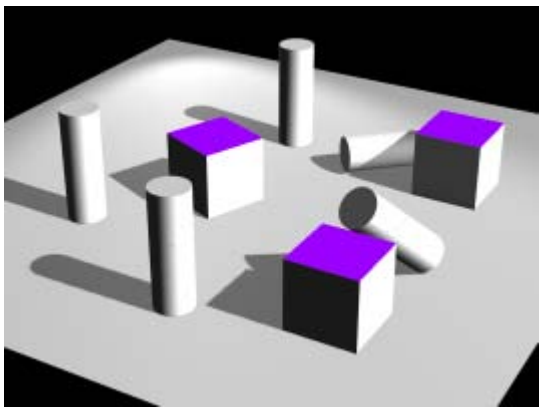
   The plane that you click on is filled with purple paint.



   Although Plane lock is on, and the tops of the other cubes are in the same plane, they are not filled because we used a contiguous fill. Contiguous fill paints only those pixels that are connected to the pixel you click on (and match the lock criteria).
   If you change to a non-contiguous fill, you'll see a different result.

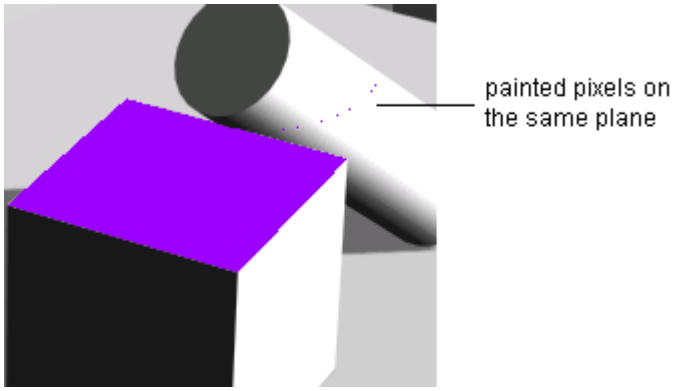
3. **On the Tool Options toolbar, clear the Contiguous checkbox.**

4. **Press ⌘-R to reapply the effect.**
   The tops of all three cubes are now painted.



Notice, however, that some pixels on the tilted cylinder are also painted. This is because these pixels are on the same plane as the top of the cubes.

If you can't clearly see the painted pixels on the tilted cylinder, zoom in to the area (if you use the Zoom tool, remember to reselect the Fill tool). For example:



We will correct the 'leakage' by combining the Plane lock with the Orientation lock, as we did in Using multiple locks.

5. **Click to switch on Orientation lock, then check that the Orientation tolerance is set to 6 on the Lock Settings palette.**

   Remember that you open the Lock Settings palette by clicking on the Locks toolbar.

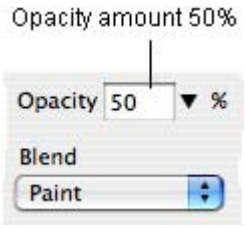
6. **Ensure that the Fill tool is still selected, then reapply the effect.**

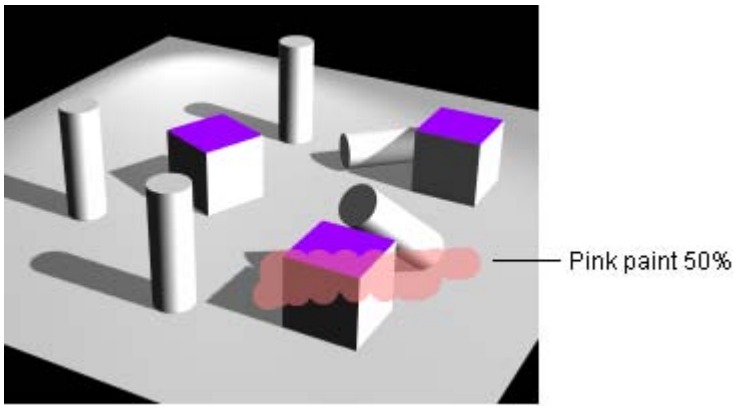
   The paint is reapplied, but this time it is applied only to those pixels in the same plane and orientation as the initial pixel you clicked on, so the cylinder is not painted.

7. **If you zoomed in to see the painted pixels on the tilted cylinder, now zoom back out by pressing ⌘- – to return to the previous view.**

Varying the opacity amount

You can vary the amount of paint applied to the scene, by changing the Opacity amount.

1. **Apply the style '09 Pink paint 50%'.**
   The Opacity amount slider, toward the right of the Colour, Texture and Grain toolbar, is set to 50%:
   

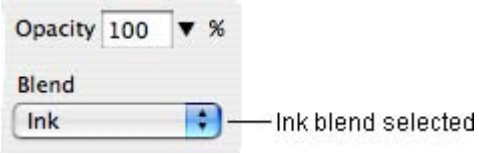
2. **Paint the scene.**
   Notice that the shading of the scene shows through the paint. Paint that you have already applied also shows through. For example:
   

   The Opacity amount slider controls how much of the total effect is applied to the scene. For example, if you added a texture or grain to the paint, this would also become transparent as you reduce the Opacity amount.
3. **Adjust the Opacity amount and paint the scene, to see how it changes the result.**
4. **Undo your additions, leaving only the purple paint on the blocks.**
   Remember that you can press ⇧-⌘-Z to redo your painting if you undo too far.

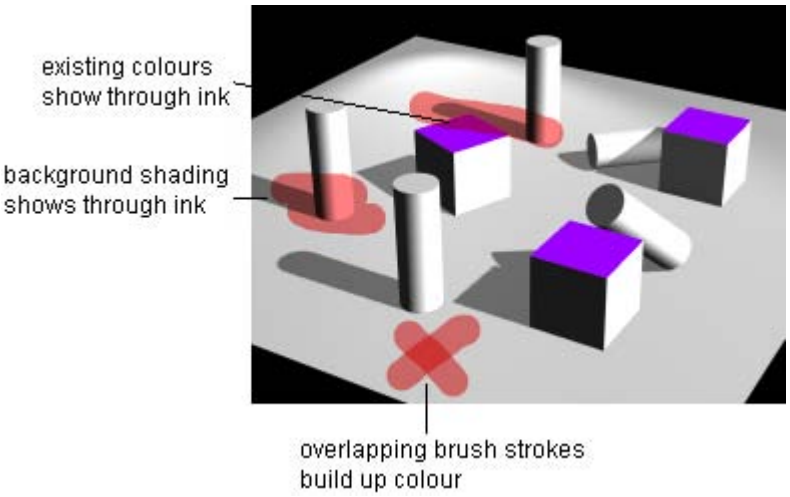
Changing the blend mode

So far, we have been using the Paint blend mode. Piranesi offers many other types of blend that you can use to create different effects.

1. **Apply the style '10 Pink ink'.**
   The Blend box on the right of the Colour, Texture and Grain toolbar is changed to Ink, and the Opacity amount is set to 100%:



2. **Paint the scene.**
   Notice that the shading of the scene shows through the paint, even though the Opacity amount is set to 100%.
3. **Experiment with applying overlapping brush strokes.**
   The colour builds up where the brush strokes overlap.



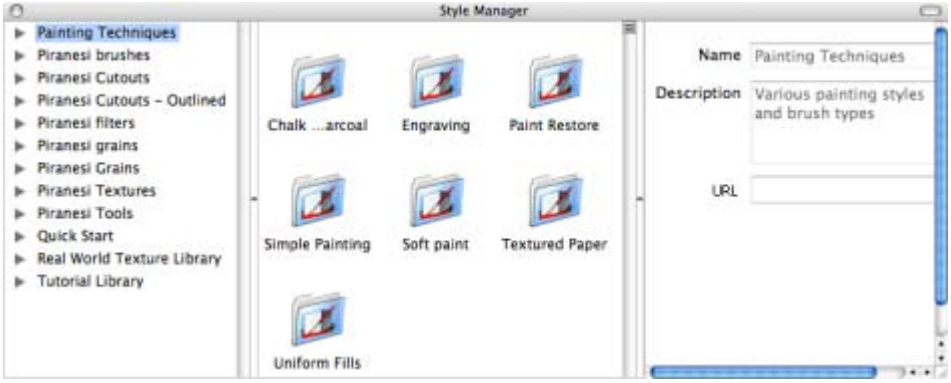
   To see overlapping paint to best effect, select a colour that has mixed Red, Green, and Blue values, such as lilac (Red 128, Green 128, Blue 192).
4. **Adjust the Opacity amount and paint the scene, to see how it changes the effect.**

Creating a new library

When you have changed an existing style (or created a new style from scratch), you can save the style so that you can use it again in the future. You can either overwrite the existing style, or you can save it to a new name. Of course, you don't have to save your effects as styles when you use Piranesi; you could just paint freely. However, if you wish to reproduce an effect later, it means you don't have to remember all the settings.

In this tutorial, we will save the previous ink style with a different Opacity amount to a new name. First we'll create a new library in which to save the new style, using the Style Manager.

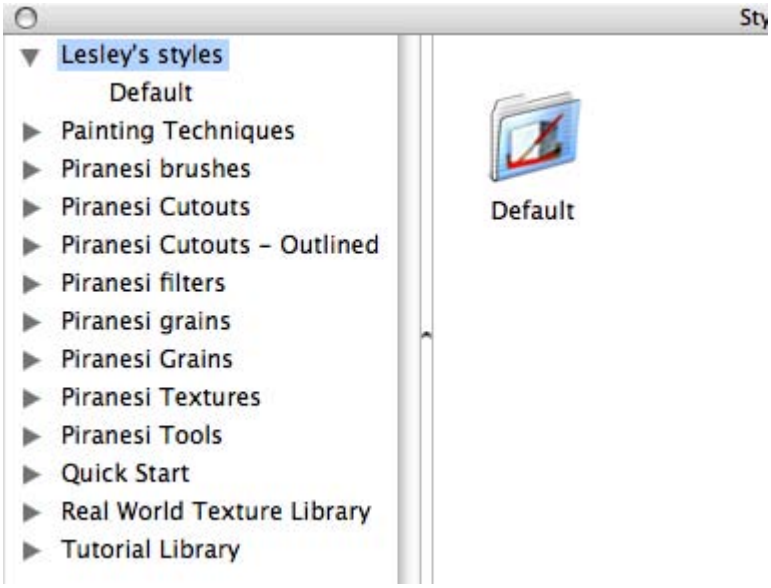
1. **If the Style Manager is not already displayed, click Show Style Manager on the Window menu.**
   The Style Manager is displayed.



   Any libraries that have already been added are displayed in the Style Manager.

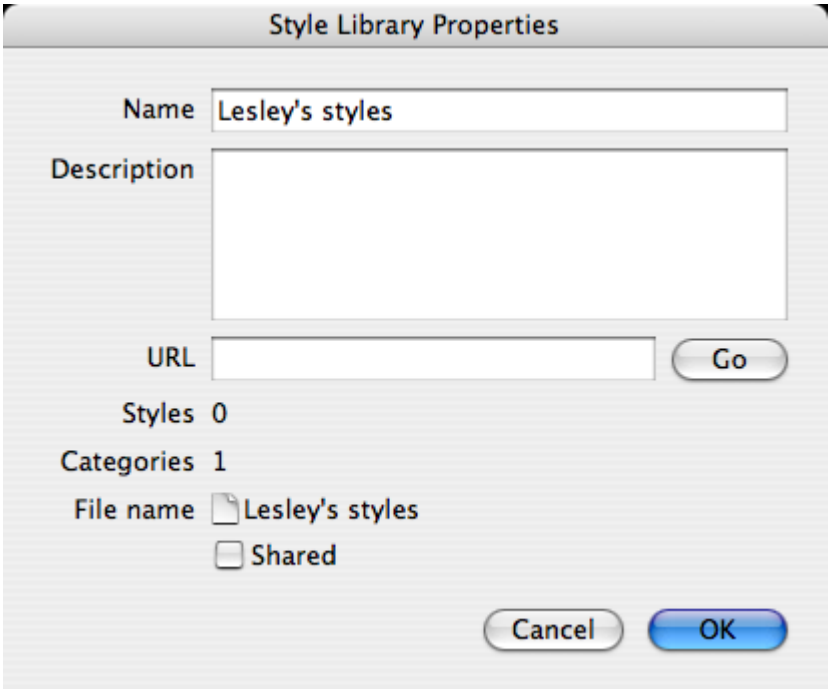
   Your system administrator may have protected your libraries by locking them.

2. **On the Style menu, click Library, New.**
   A Browse dialog is displayed.
3. **Browse to the folder in which you want to create the new library.**
4. **In the Save As box, type a name for the library.**
   You may wish to name your library using your own name, to enable you to recognize it later.
5. **Click Create.**
   The new library is displayed in the tree pane, on the left of the Style Manager. Libraries are listed in dictionary order.
6. **Expand the library by clicking the arrow or by double-clicking its name.**
   A category called **Default** has automatically been created for you in the new library:



7. **To edit the properties of the new library, select it, then click Library, Properties on the Style menu.**

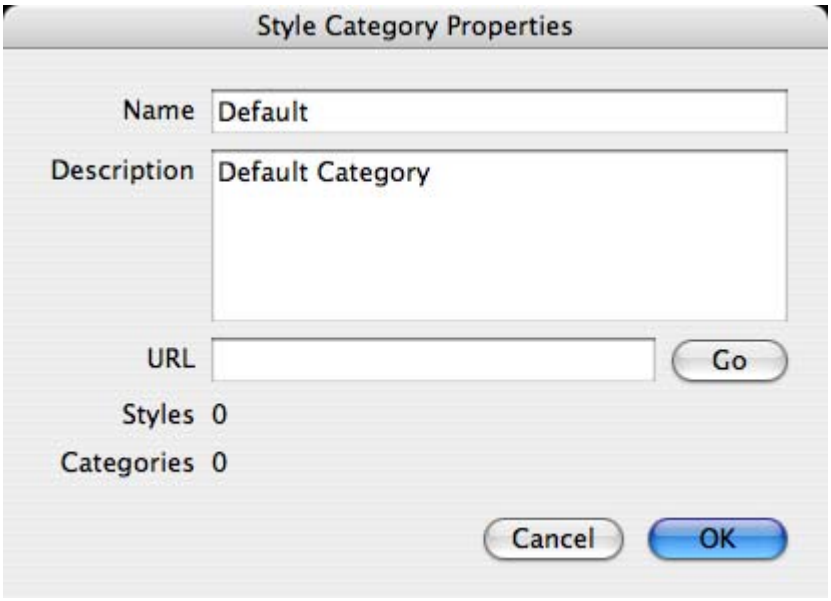
   The Style Library Properties dialog is displayed:



   Type a description for the library. The description is displayed in the details pane of the Style Manager, when you select the library.

   If you want other users to have access to a library, you select the Shared checkbox. Other users can then open your library in their Style Manager (if the library is stored on a network drive). However, if you do this, the library is locked to prevent it from being updated. Therefore, on this occasion you'll leave this checkbox cleared so that you can save the new style to the library.

8. **Click OK.**
   Now you are going to change the name of the category to something more descriptive.
9. **Click on the category 'Default' in the tree pane, then click Category, Properties on the Style menu.**
   The Style Category Properties dialog is displayed:

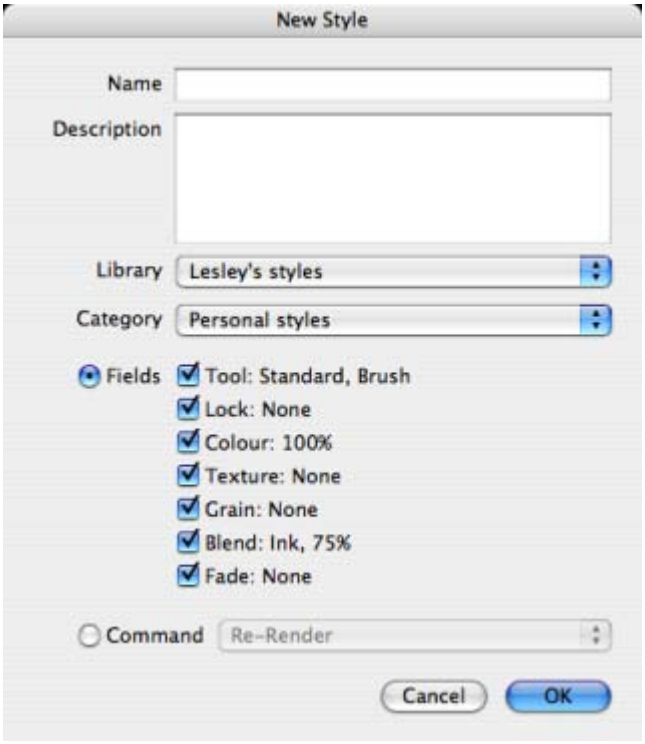


10. **Type a new name (for example, 'Personal styles') and a short description for the category, and click OK.**
    The category's name is changed in the list.

Saving a new style

When you are creating a new style, you set up the style on the toolbars and palettes and then save the settings to a style name. We've already set up the options for this style, so we can go ahead and save it.

1. **Click on the new category that you created in Creating a new library.**
2. **On the Style menu, click New.**
   The New Style dialog is displayed:



   The Fields list summarizes the effect settings that will be saved to the style. We will look at this more closely in Tutorial 2.
3. **Type a name that reflects your new style, for example '50% pink ink' or '100% lilac ink'.**
4. **Type a description for the style.**
   Because you selected the new category before you displayed this dialog, the new library and category names are shown in the Library and Category boxes.
5. **Click OK.**
   The style's details are shown in the list pane in the Style Manager.
6. **On the Style menu, click Library, Save to save the new style in the library.**
   If you don't save the library now, it will be saved for you automatically when you exit Piranesi. If you don't want to save changes to a library, use the Revert command on the Library submenu before you exit.

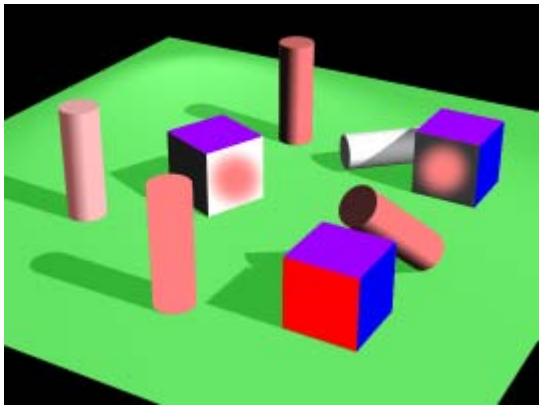
See Piranesi Help for more details about how you create and save new styles.

Printing the scene

Before printing, you can first preview the scene to see how it will look on the printed page.

1. **If you want to practise the techniques you have learnt in this tutorial, paint up the scene using the supplied styles, and styles of your own.**

   For example:

   Note that the Style selector and the Style Manager work with styles independent of each other. The style category attached to the Style selector is not changed when you apply a style from the Style Manager. Therefore, you can use styles from both sources, without altering the locations in either.

2. **On the File menu, click Page Setup.**
3. **To change the page setup, click Setup.**

   Select the Landscape orientation option.To select the 'Landscape, rotate to the right' option, click
   You can also change the printer settings or the paper size, if required.
   Click OK on the Page Setup dialog.
4. **On the File menu, click Print.**
5. **If you want to print the scene, click Print; if you don't want to print the scene, click Cancel.**

For more details about previewing a scene, defining the page setup, and printing, refer to the documentation supplied with your Macintosh computer.

Saving and closing files

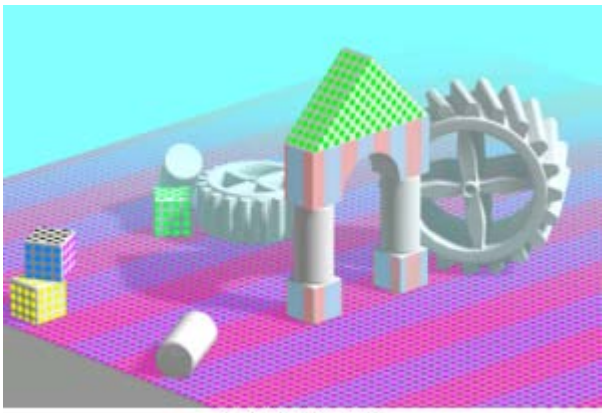
When you have finished working, you will want to save your work and close the file. In this exercise, we will save the blocks scene to a different name, and then close it.

1. **On the File menu, click Save As.**
   A save dialog is displayed.
2. **Specify the location into which you want to save the file.**
3. **Type a name for the new file.**
4. **Click Save.**
5. **On the File menu, click Close, or press ⌘-W.**

Tutorial 2: 3D Effects

In this tutorial, you will learn how to work in 3D with colours and textures, using the depth information in the scene. You will then export the painted scene to an image file.

original scene



finished scene

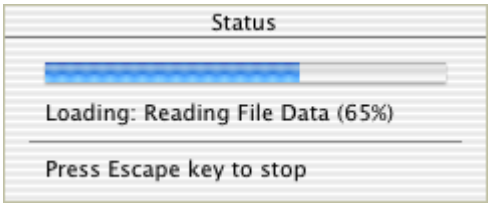
Creating a greyscale scene

Sometimes, the scene you are going to paint already uses a variety of colours. For example, if you use Vedute to save a file in EPix format, each material can be shown in a different colour.

'Vedute' is supplied with Piranesi. It enables you to create a view with an eye position, a look-at point, and lighting, and save it to EPix format so that it can be opened in Piranesi. Refer to the Vedute Help for details of how to use Vedute.

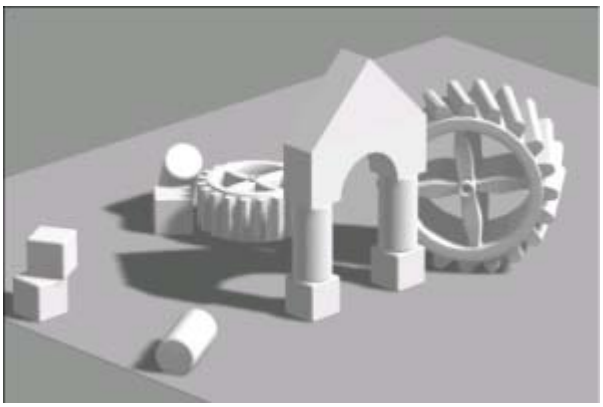
You may want to convert a colour scene to greyscale, for example if you want to paint the scene in new colours, but you also want to use the lightness and darkness of the existing colours to preserve shading and shadow effects.

1. **Open the file 'Blocks2'.**
   See Opening a file for details of how to locate the tutorial EPix files. If the file takes a few moments to load, a Status window may be displayed showing the progress of the file loading:

   Piranesi displays the Status window whenever there is a short delay during an operation, to keep you informed of its progress. The frequency in which you will see the Status window depends on the speed of your computer. That is, you will see the window less often on a faster computer.

   Each material in the scene is shown in a different colour.
2. **Using the Style selector, open the category 'Tutorial 2: 3D effects'.**
3. **Double-click the style '01 Greyscale' to apply it to the toolbars and palettes.**
   This style uses a non-contiguous fill with a 100% white Tint blend. Tint replaces the original colours in the image with the effect colour, but at the same time preserves their lightness and darkness.
4. **Since there are no locks set in the style, click anywhere on the image to paint the scene.**
   The result is similar to a black-and-white photograph:

   Next, we will lighten the shadows to make them look more realistic.
5. **Apply the style '02 Paint lighter'.**
   The Paint lighter blend is selected with a dark grey effect colour. This blend mode paints pixels that are darker than the effect colour.

6. **To check the lightness of the effect colour, change the colour mode on the Colour palette to HLS.**

   See Changing the paint colour for details about how to use the Colour palette.

   HLS mode shows the Hue, Lightness, and Saturation of the selected colour. The Lightness value is 40.

7. **To check the lightness of the colours in the scene, click the Colour picker on the Colour, Texture and Grain toolbar.**

   Then, as you move the mouse pointer over the scene, the lightness of the pixel under the pipette is shown in a Help Tag. The shadows have a lightness value of 29.

8. **Press Esc to cancel the Colour picker and then paint the shadows.**

   Don't worry about using broad brush strokes over the shadows; only the shadows are painted, because only the shadows are darker than the effect colour.

Re-rendering a scene

Sometimes, you will want to change the information that is stored in the Restore channels. For example, you may want to store a 'snapshot' of the picture, so that you can later restore parts of the snapshot, as we will see later in the tutorials. Re-rendering also reduces the size of the saved file.

Here, we will re-render the file, which will save the greyscale image to the Restore RGB channel.

You cannot undo re-rendering, so we will begin by saving the greyscale scene.

1. **On the File menu, click Save As and save the scene to a new name, such as Blocks2Greyscale.**
2. **On the View menu, click Restore RGB Channel to display the colours that were in the original rendered EPix file:**

3. **On the File menu, click Re-Render and click OK at the prompt to confirm.**
   The colours in the Restore RGB channel are now the same as those in the current RGB channel. Now, these colours will be restored when you use the Restore brush.

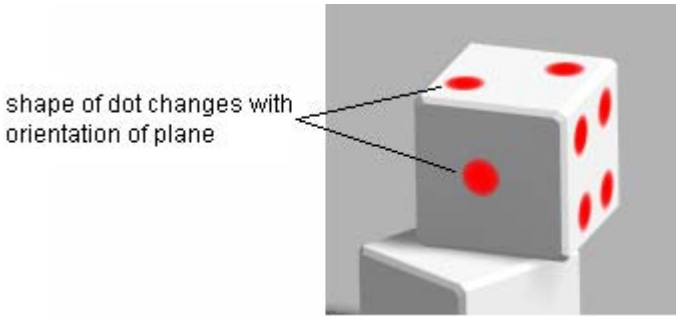
   Note that Re-Render also changes the Restore Depth and Restore Material. You'll learn more about these channels in Tutorial 3.
4. **To return to the current RGB view, click RGB Channel on the View menu, or click the channel name on the status bar at the bottom of the document window, and click 'RGB Channel' on the pop-up menu.**
   If you forget to return to the current RGB view, you won't be able to see any changes when you paint!
5. **Press ⌘-S to save the rendered scene.**

Painting with 3D brushes

In Tutorial 1, we used two-dimensional circle and rectangle brushes. These two brushes, and the raster brush (which we will cover later), have 3D equivalents which we will look at in this exercise.

1. **Using the Style selector, apply the style '03 3D Circular brush'.**
2. **Notice the size of the brush on the Tool Options toolbar.**
   3D brushes are measured in 'real world' units, unlike 2D brushes which are measured in pixels. You can specify the units of measurement you want to use in your preferences. See Piranesi Help for details.
3. **Move the mouse pointer around the scene without pressing the mouse button.**
   Notice how the orientation of the brush changes according to the plane of the pixel beneath the pointer. For example:

4. **Experiment with painting with the brush, using different colours and locks.**
   For each brush stroke, the orientation of the brush when you start the stroke is used for the entire brush stroke.
   Change the distance between brush marks by changing Normal to Spaced in the Repeat pop-up menu on the Advanced Settings palette, and increasing the value.
   If the Advanced Settings palette is not currently displayed, click on the Tool Options toolbar.
   By increasing the distance between strokes, you can see more clearly how the shape of the brush stroke varies according to the plane you are painting.
   In the example below, the brush size was changed to 0.5m, and individual clicks were used to place the dots:

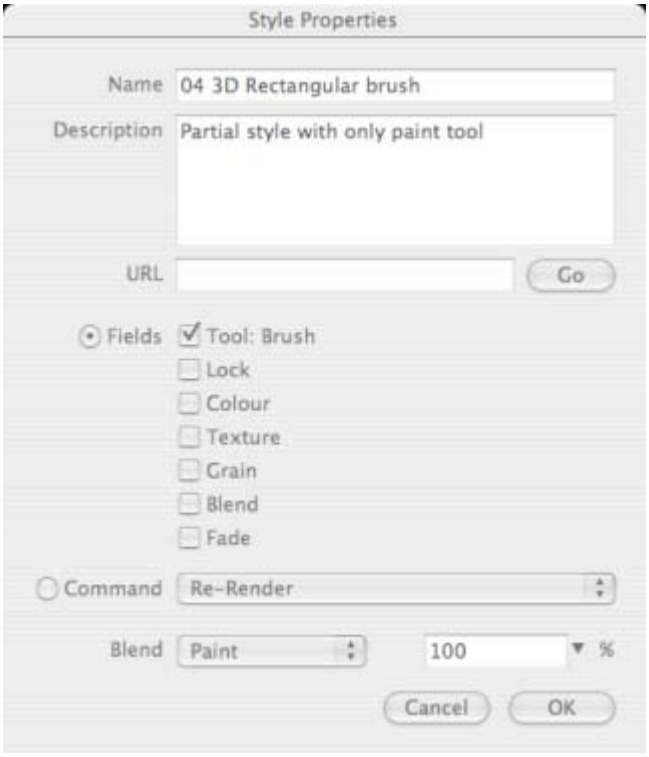


Using partial styles

Some styles do not update all of the settings on the toolbars and palettes. These styles are called partial styles. You can use a series of partial styles to build up the required effect.

This exercise uses a 3D rectangular brush partial style.

1. **Open the Style selector, Ctrl-click over the style '04 3D Rectangular brush', and click Properties on the contextual menu.**



   Notice that only the Tool checkbox is selected in the Fields list. This means that when you apply the style to the toolbars and palettes, only the tool is updated. All the other settings remain the same.

2. **Click Cancel and then click '04 3D Rectangular brush' to apply the style.**
3. **Change the colour of the paint, using the Colour palette.**
4. **Now, apply the '04 3D Rectangular brush' style from the Style selector again.**

   The colour you selected in the previous step remains as it is.

5. **Change the size of the brush on the Tool Options toolbar, and apply the style again.**

   This time, the brush settings are reinstated, because the style updates the tool.

   Try changing some of the other settings on the toolbars, and selecting the style again. Unless you change the tool or any of the brush settings, your toolbar settings remain as they are.

   It is useful to create partial styles when you build up your libraries. For example, you could create a library of standard tools. Many of the supplied Piranesi styles are partial styles.

6. **To revert to the re-rendered file you saved in Re-rendering a scene, on the File menu, click Revert to Saved.**

You are asked whether you want to discard your changes. In reply to the prompt, click OK.

Using raster brushes

In this exercise, you will select a style that uses a raster brush. A raster brush uses an image to define the brush shape. For example, you could use a raster image of splattered paint to create a brush.

When you set up a brush that uses a raster image and save it as a style, Piranesi reads the raster image file each time the style is used.

If the raster image file is in the same folder or in a subfolder below, the style library, the folder containing the library file can be moved without affecting use of styles in Piranesi.

1. **Apply the style '05 3D Raster brush'.**

   A preview of the raster image used by the brush is shown on the Tool Options toolbar. The style is using a raster image file called Brush1.tif, which is located in a subfolder below the tutorial style library, called Resource.

2. **Move the mouse pointer over the scene.**

   The outline of the raster image is shown. You can choose to show a simple rectangular outline instead, by clearing the 'Use outline for raster brush cursor' checkbox in your preferences.

   This is another 3D brush, so the orientation of the brush changes as you move over the scene.

3. **Click on the scene.**

   Notice that the amount of paint applied depends on the darkness of the raster image; white areas are transparent.

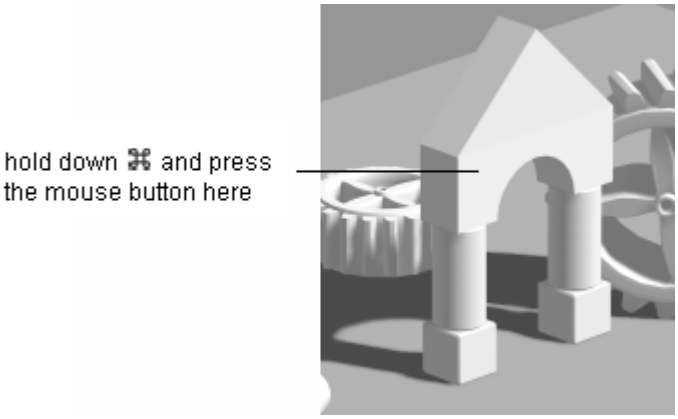
4. **Practise painting with the raster brush.**

   Experiment with different settings, then undo your work.

   With brushes that have transparent areas, like this one, or graduated areas (such as soft circular brushes), it is sometimes useful to start the brush stroke 'off the edge' of the item you want to paint, to avoid painting an area twice. An example is shown in the following steps.

5. **Click on the Locks toolbar to switch Plane lock on.**

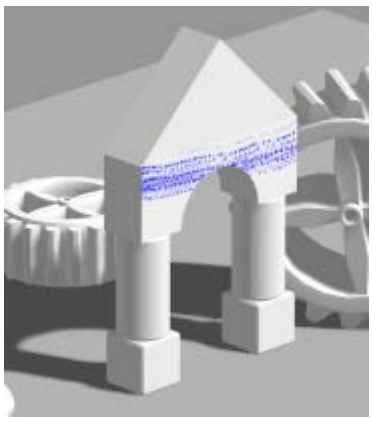
6. **Press ⌘ to suspend painting, then press-and-hold the mouse button with the pointer over the arch, as shown below:**



   Plane lock is on, so this selects the plane that you want to paint.

7. **With ⌘ still pressed, move the mouse pointer off to the side of the arch.**

8. **Release ⌘, then sweep across the top of the arch in a single movement and release the mouse button.**



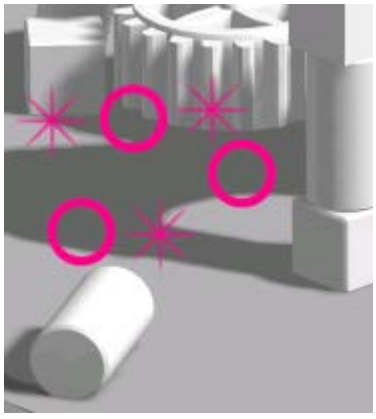
The brush stroke is made right across the arch, with no overpainting.

9. **Apply the style '06 Multiple raster marks.**

   This style uses the Stamp tool which enables you to paint with multiple raster images. This style has two different raster images—a star and a circle—which define the brush shape.

10. **Paint in the scene.**

    Piranesi cycles through the different raster images. Because the stamp marks are spaced at 100%, you can clearly see their shapes:



11. **Click Define on the Tool Options toolbar.**

    The Define Multiple Marks dialog is displayed. There are two tabs; one for each raster mark. Click on the tabs to see the settings for the different brush shapes. You could experiment with different settings or raster images. You can drag files from Mac Finder onto the tab or background of the Define Multiple Marks dialog to swap or add images, respectively. See Piranesi Help for details.

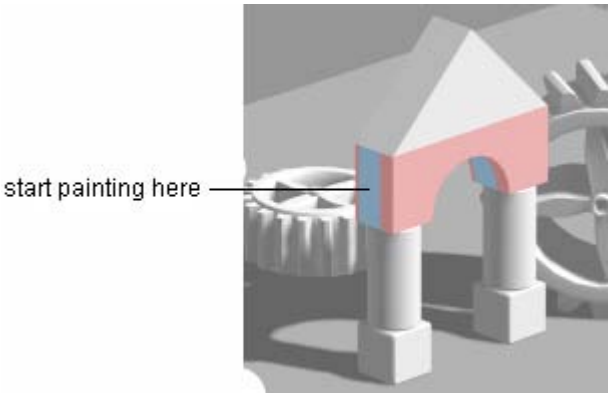
    Click Define on the Define Multiple Marks dialog to continue painting.

Using coloured raster textures

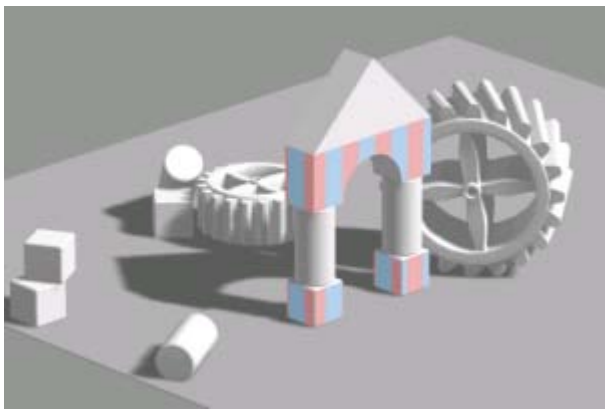
You can use a number of different types of texture with Piranesi. In this exercise, the texture is a stripy, coloured raster image.

Before you proceed however, you will restore the greyscale image. First you'll reset all the tool settings to their defaults.

1. **On the Window menu, click Reset Tools.**
   The toolbars and palettes are reset to the default settings; for example, locks that you may have set are now switched off, colour and opacity amounts are set to 100%, and the Paint blend mode is selected.
2. **On the Tools toolbar, click to select the Fill tool. Then, on the Tool Options toolbar, ensure that the Contiguous check box is selected.**
3. **On the Colour, Texture and Grain toolbar, set the Colour Amount to 0% and then click anywhere on the scene.**
   The greyscale scene that we re-rendered in Re-rendering a scene is restored from the restore channels.
4. **Apply the style '07 Stripy texture'.**
   This style has the Plane and Material locks switched on, so only pixels that are in the same plane as the first pixel, *and* are rendered in the same material are painted. However, to begin with we will work with the Plane lock off.
5. **Click to turn Plane lock off, then paint the top of the arch:**
   Press-and-hold the mouse button on the side of the arch, and paint back from there in a single brush stroke.

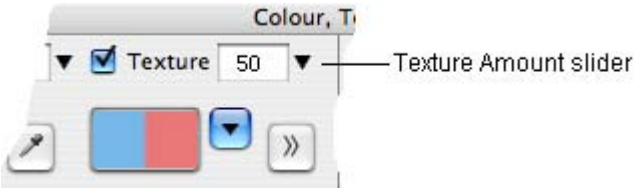


   Notice how the texture is painted in 3D; the blue stripe appears to be a solid stripe through the arch.
6. **Press ⌘-Z to Undo, and turn Plane lock back on.**
7. **Paint the arch as shown below.**
   You will have to use a number of separate brush strokes to paint the different planes of the arch. Remember you do not have to keep your brush stroke within the area you want to paint, because the plane lock ensures that only the selected plane is painted.
   The Opacity amount slider is set to 50%. This means that overlapping brush strokes will build up the colour (as we saw in Varying the opacity amount). If you don't want this effect, ensure that you paint each area using only one brush stroke. This is achieved by holding down the mouse button and dragging the paintbrush until the area is filled with paint.



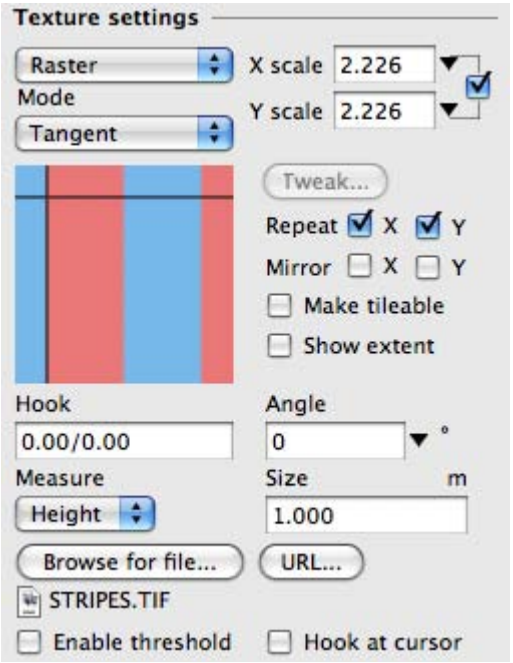
Although the colour on the Colour, Texture and Grain toolbar is set to black, the texture overrides this with its own colours because the Texture Amount slider is set to 100%. The Texture Amount slider defines the balance between the texture's colour and the selected colour.

8. **On the Colour, Texture and Grain toolbar, set the Texture Amount slider to 50% and press ⌘-R to reapply the last paint stroke.**



Piranesi mixes black with the texture's colour, to produce a darker result. This doesn't look as good, so reset the Texture Amount to 100%, and reapply.

9. **If the Texture palette isn't currently displayed, click » below the Texture Amount slider.**
Look at the Texture settings:



The texture type is Raster. The File name box shows the raster file that is being used for the texture.

Try changing some of the settings, such as the scale and angle, to see what effect they have. The 'Repeat X and Y' boxes specify whether Piranesi is to repeat the pattern in the X and Y direction. Switch one box off to paint in one direction only; switch both off to place a single tile on the scene.

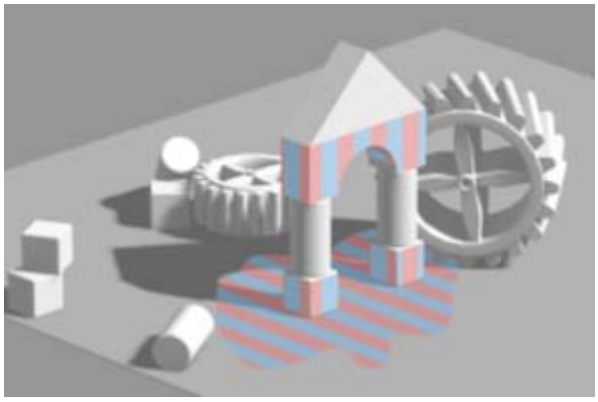
Refer to Piranesi Help for more details about the options.

Undo your experimental edits using Undo, leaving the arch painted.

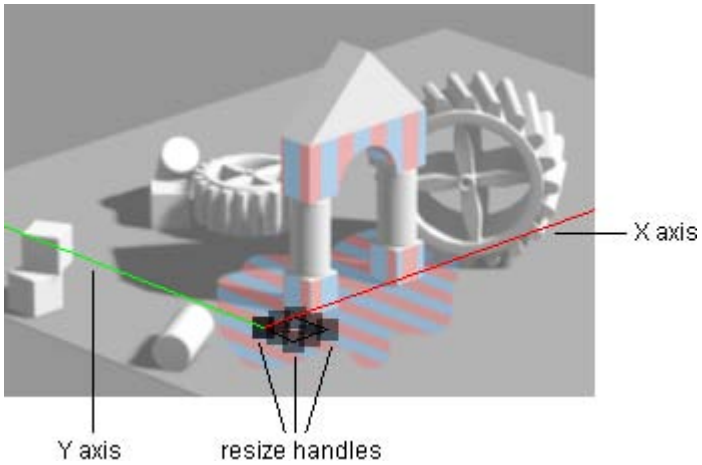
Tweaking textures

When you place a raster texture, you can immediately tweak its size, shape, position, and orientation. In this exercise, we will paint an area of the base, then tweak the texture to change its orientation and size, before repainting the entire base with the texture.

1. **Apply the style '07 Stripy texture' once again.**
   This resets the style to its saved settings.
2. **Start at a point at the base of the scene, just below the left-most pillar, and, using a single brush stroke, paint an area approximately this size:**



   Only pixels that are in the same plane as the first pixel, *and* are rendered in the same material are painted because this style has Plane and Material locks switched on.
3. **Under the Texture settings on the Texture palette, click Tweak.**
   Notice that the Tweak button remains pressed to indicate that you are currently in tweak mode, and all other texture settings become unavailable.
4. **Move the pointer into the scene.**
   A rectangle is drawn in the scene to represent the size of the raster texture tile. Resize handles are added to the tile. The X and Y axes represent the hook point of the tile. For example:



   If you can't see the resize handles, check that the Piranesi window is active when you move your pointer over the scene.
   The active window is the window in which you are currently working. To make a window active, click on its title bar. Alternatively, click the name of the window on the Window menu.

The resize handles may be shown in a different place on your scene, depending upon where you started painting.

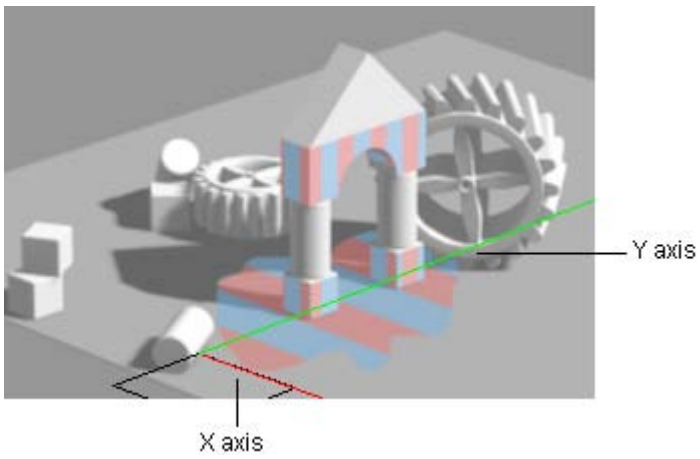
5. **With the pointer over a corner resize handle ↙↗, drag the handle to stretch the tile until it is approximately twice its original size.**

   When you release the mouse button, the brush stroke is immediately repainted with the texture at its new scale, and the Texture settings are updated with the new scale.

   We will now rotate the tile.

6. **Move the mouse pointer over the X axis or the Y axis of the tile (see above), until you see the rotate handle:**

7. **Rotate the tile approximately 90°, by dragging in a clockwise direction, until the X and Y axes are aligned with the pillar's feet:**



   Again, the texture is immediately repainted, this time with its new orientation. The angle is updated under the Texture settings.

8. **Click the Tweak button to end tweak mode.**

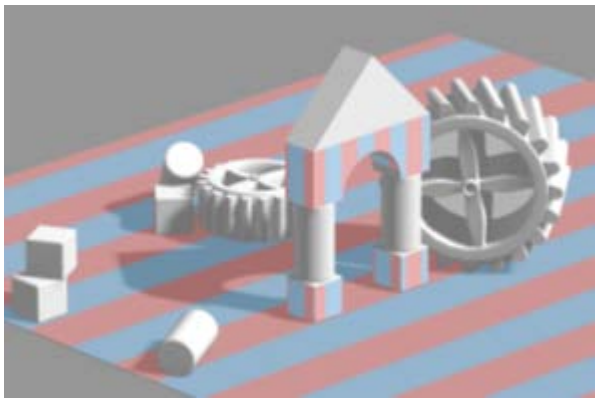
   Now that the texture is the scale and orientation that we require, we can fill the entire base with the texture.

   If you know in advance the exact size and orientation you require for a raster texture tile, you could just as easily enter the values under the Texture settings, then paint the texture in the usual way.

9. **Click** **to select the Fill tool.**

   The Plane and Material locks are on, so painting will be restricted to the plane and material that were under the initial pixel when you first painted the base.

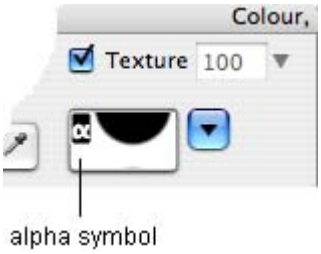
10. **Press ⌘-R to reapply the effect globally to the base:**



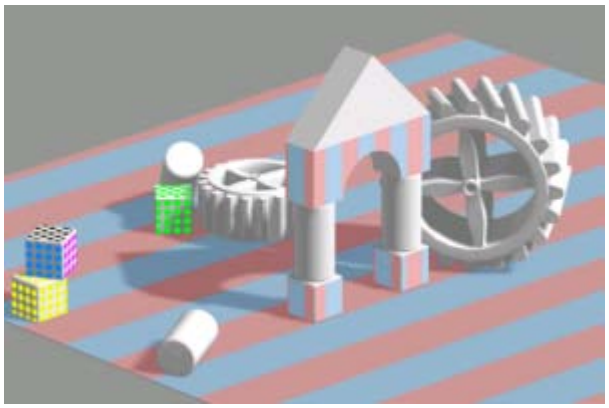
Using alpha textures

In this exercise, the style uses an 'alpha texture'. With alpha textures, the alpha information defines the transparency of the texture; Piranesi paints solid paint in the black areas, and the white areas are transparent. If there are any grey areas in the texture, these are painted proportionally to how light or dark the grey is.

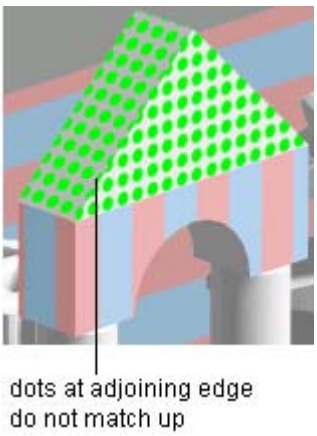
1. **Apply the style '08 Dot alpha texture'.**
   The raster dots image is shown in the Texture preview box on the Texture palette. Notice that the dots are black, on a white background.
2. **Paint one face of a cube.**
   Zoom in if necessary, using the navigation tools described in Navigating the scene, or refer to Piranesi Help.
   The spots are painted in the colour selected on the Colour, Texture and Grain toolbar, rather than the black shown in the image. The white parts of the raster image are transparent.
   You can check whether a raster image is an alpha texture by looking at the Texture preview box on the Colour, Texture and Grain toolbar; if there is alpha information, an alpha symbol is shown.



   Notice that the Texture Amount slider is not available, because there is no colour information in the raster image.
   Now paint the remaining cubes, changing the colour for different faces. For example:



3. **Paint the top section of the arch, using any colour you like.**
   Notice how the dots do not meet at the adjoining edge:

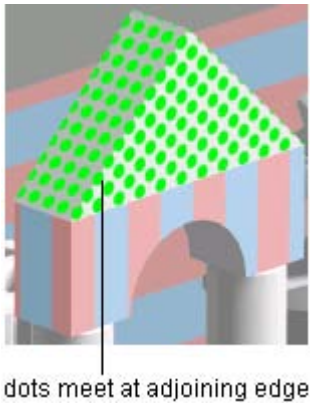


Look at the Texture settings on the Texture palette; the texture mode is set to Tangent. When you paint with the texture, Piranesi places the raster tile tangential to the plane you paint.

We can use a different texture mode to ensure that edges that meet match up.

4. **From the Mode popup under the Texture settings, select Wrapped.**
5. **Undo the painting of the arch by clicking ⌘-Z as many times as necessary.**
6. **Now repaint the top of the arch.**

   The dots now meet at the adjoining edge:



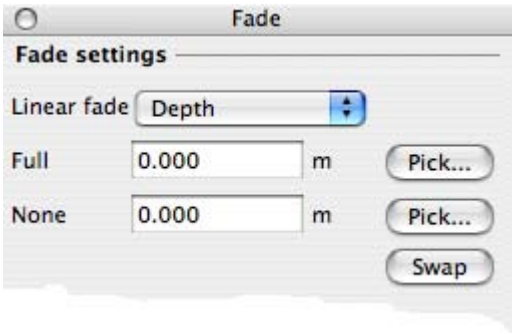
Note that the orientation of the dots depends upon which plane you paint first. In the example above, the sloping plane was painted first.

Refer to Piranesi Help for more information about alpha textures.

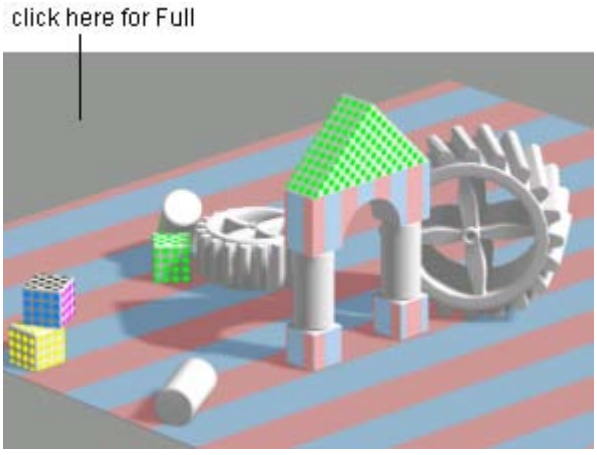
Using fade

You can create effects that fade in the scene using the Fade tools.

1. **Apply the style '09 Blue fog'.**
   The Linear fade button is selected on the Colour, Texture and Grain toolbar.

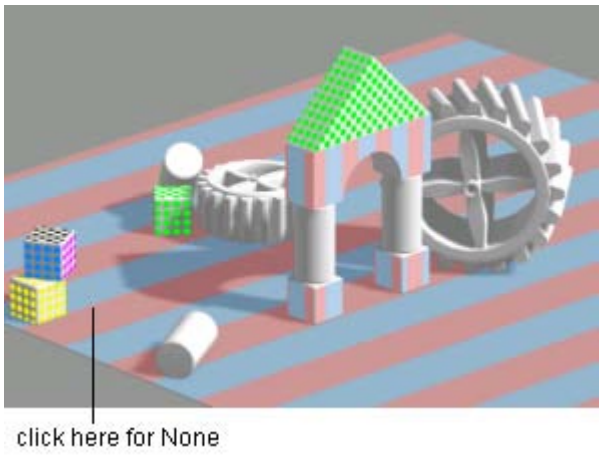
2. **On the Colour, Texture and Grain toolbar, click » to display the Fade palette.**
   

   The fade mode is set to Depth, which means that you can fade the effect uniformly between two depths in the scene.
   We want the effect to be full at the back of the scene, and to fade gradually to nothing towards the front of the scene.

3. **Click Pick next to the Full box, and click on the background, as illustrated below:**
   

   The Full box is updated with the depth of the point you selected.

4. **Click Pick next to the None box, and click between the cylinder and the two blocks:**

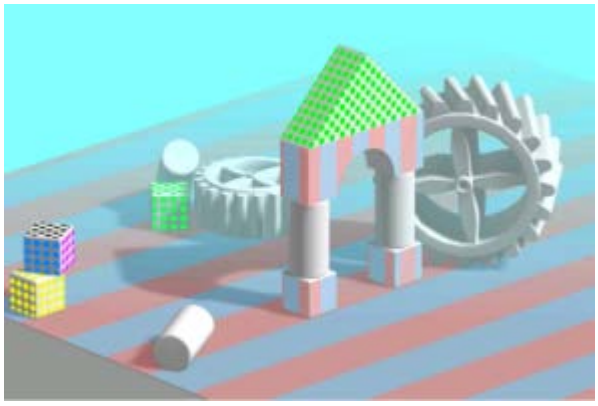


The None box is updated with the point you selected. Notice that the setting for Full is at a greater depth than that for None.

You can also select Full and None in one action. Refer to Piranesi Help for details.

5. **Use the brush to paint the effect over the top two thirds of the scene.**

Ensure you paint using a single brush stroke, otherwise the colour builds up where the brush strokes overlap.



The thickness of the paint increases with the depth of the scene.

The paintbrush may appear to be a rather slow way of painting the scene, but it creates the result we want. If we had used a fill instead, the entire background of the scene would be painted, including the triangle at the bottom left of the scene. This is because the background actually has 'infinite' depth (the 'back depth' stored in the EPix file is shown in the Full box on the Fade palette).

6. **Now apply the style '10 Fading dots'.**

This style is more complex as it combines a Linear fade with the dot alpha texture we saw earlier. It also has the Plane and Material locks switched on, and uses the Fill tool instead of the brush. This time the Full and None values were saved in the style for you.

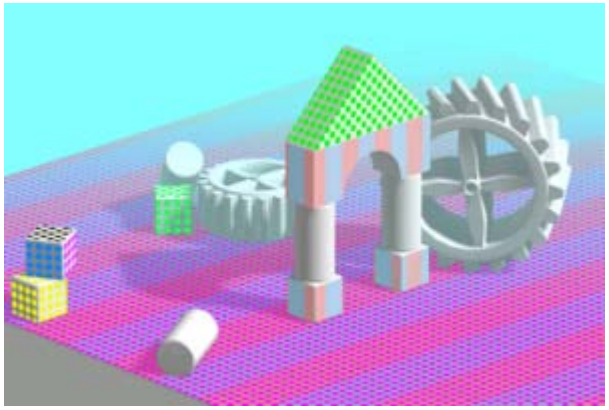
7. **Click anywhere on the base.**

Now we shall reverse the effect, making it strongest at the front of the scene.

8. **On the Fade palette, click Swap.**

The Full fade setting is now at a lesser depth than the None setting.

9. **Choose a different colour, then press ⌘-R to reapply the effect.**



10. **Save the scene to a new name, such as Blocks2Painted, but don't close it.**

You can use other fade actions to create different atmospheric effects. Piranesi Help has full details of all the fade effects.

Exporting and importing colour images

When you have painted a scene, you can export any Piranesi channel and save it to a file of a different format.

For example, you may want to export a channel for use in a different application, or even in a Piranesi style as you will see in later tutorials.

We're going to be exporting the current RGB channel to an image format. By default, the EPix file shows the current RGB channel, so we don't need to change the channel to export.

1. **On the File menu, click Export.**
2. **In the displayed dialog, select the folder into which you want to save the exported file.**
3. **Type a name for the exported file.**
4. **From the Format pop-up menu, select 'Portable Network Graphics Image' (.png).**
   You can also export to numerous other formats, such as bitmap, Tiff, and Photoshop.
5. **Ensure that 'Export only the visible extent' is not selected.**
   You can zoom into a scene, and export only the extent that is shown in the document window. However, in this case we will export the entire scene.
6. **Click Save.**
   The PNG Options dialog is displayed.
7. **Ensure that 'Best Depth' is set for colours, Best is set for filters, and the Interlaced checkbox is not selected, then click OK.**
8. **Close the current EPix file.**
9. **Open the greyscale EPix file that you saved in Re-rendering a scene (for example, Blocks2Greyscale.epx).**
   You can select the file name from the Open Recent list on the File menu to open the file.
   We'll now import the RGB channel we just exported, to see the result.
10. **On the File menu, click Import.**
11. **In the displayed dialog, select the PNG file you just saved and click Choose.**
    The scene is painted in the colours you saved. What has actually happened is that the imported file has been overlaid on the greyscale file as a new layer. You can see this by opening the Layer Manager from theWindow menu. The EPix file shows two layers: the greyscale layer is labelled Layer 1 and the painted layer is automatically given the name by which the file was imported:

    You will learn more about layers in the later tutorials.
12. **Close the file.**
    Piranesi displays a prompt asking you whether you want to save changes before closing. Click. Don't Save. The file is closed without being saved.

You could also try opening the PNG file in another application, such as a word processor that allows you to import PNG files.

Tutorial 3: Photorealism

In this tutorial, you use Piranesi to paint a lobby to produce a photorealistic scene.

You will explore more textures and blend modes. You'll also learn how to place cutouts (items of scenery) and create reflected lighting effects.

original scene

painted scene

Using Overlay with textures

In Tutorial 2, you used some raster textures. In this tutorial, we will begin by adding a raster texture to the floor.

1. **Open the file 'Lobby'.**
   See Opening a file for details of how to locate the tutorial EPix files.
2. **In the Style selector, select the category 'Tutorial 3: Photorealism'.**
   See Setting up the style library for details of how to associate the tutorial style libraries with the style selectors.
3. **Apply the style '01 Flooring' to the toolbars and palettes.**
   The style uses a texture with 100% Paint blend mode.
   Click anywhere on the lower floor.
   Because the style has the Plane and Material locks switched on, only the lower floor is painted. The style applies the raster texture tangentially, so the texture aligns with the plane of the floor and perspective is preserved.

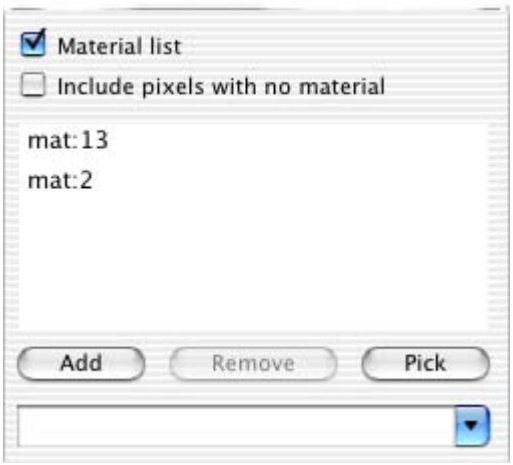
   The texture does not have alpha information, so it is not transparent, and the Paint blend mode paints each pixel in the effect colour. The shadows on the floor are, therefore, obscured by the effect.
   Instead, we will use the Overlay blend mode so that the shadows show through.
4. **Select Overlay from the Blend mode list on the Colour, Texture and Grain toolbar, and press ⌘-R to reapply the paint.**

   Overlay mixes the current colour with the effect, preserving the lightness and darkness of the current colour so that the shadows show through.

More textures and blend modes

To explore textures and blend modes further, we will use two raster textures and a noise texture with different blend modes.

1. **Apply the style '02 Wooden desk'.**
2. **This style selects a contiguous fill and the Material lock. A wood grain raster texture is also selected, and the Paint blend mode is used.**
3. **On the Locks toolbar, click » to display the Material lock settings.**



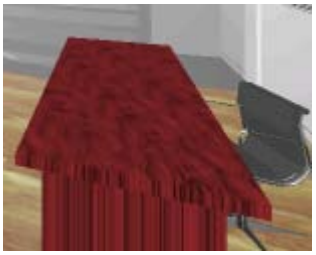
'Material list' is selected, so Piranesi will paint only those materials that are shown in the list.

Notice that the Material lock button has changed its appearance to remind you that 'Material list' is selected.

Click » again to hide the Lock Settings palette.

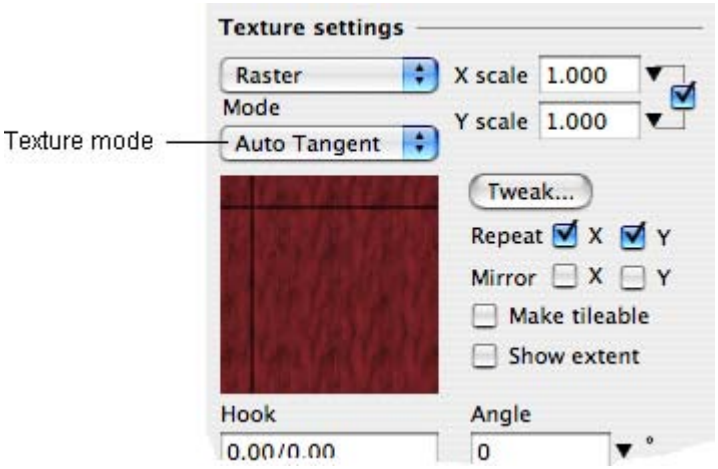
4. **Click on the desktop.**

The desktop and base are painted.



Notice how the paint on the edge of the desktop gives the effect of wood grain that has been cut through, because Tangent mode was selected on the Texture settings.

Under the Texture settings on the Texture palette, change the Mode to Auto Tangent.



If the Texture palette is not currently displayed, click on the Colour, Texture and Grain toolbar.

5. **On the Edit menu, click Reapply to reapply the texture.**

   This time the texture is applied as if you had painted each plane individually with a tangential texture.

6. **Apply another raster texture style, '03 Slate walls', and paint the curved wall on the left using a single brush stroke.**

   This style uses Overlay blend mode.

   Material lock is switched on for this style (with no materials specified), and the curved wall on the left is rendered in a different material from the other walls, so the paint is applied only to the curved wall:

   Although you can clearly see the shadows on the wall with the Overlay blend, the walls were too bright in the original image and are now too light.

7. **Press ⌘-Z to undo your painting on the wall, and check the lightness of the walls by pressing ⌥ to temporarily change to the Colour picker.**

If necessary, change the colour mode on the Colour palette to HLS, then move your mouse pointer across the walls.

The lightness is generally above 70, and is as high as 94 in places. Overlay blend mode doesn't work well over lightnesses this high, so we'll tone down the walls.

8. **Apply the style '04 Tone walls'.**

   Paint blend mode is selected, with Material lock, and the Filter tool is selected on the Tools toolbar.

   Filters distort the colours in the scene to create a particular effect.

9. **Look at the filter settings on the Tool Options toolbar:**

   The Brightness filter is selected. You use this filter to alter the contrast and brightness in a scene. In this case, the brightness will be reduced by 20%.

10. **Paint the curved wall to apply the filter.**

    The wall now looks considerably darker.

11. **Apply style '03 Slate walls' again, and paint the curved wall.**

    This looks much more realistic.

12. **Now use style '04 Tone walls' to tone down the flat walls to the left of the scene and to the back of the scene, including the walls around the staircase.**

    Use a single brush stroke to apply the filter.

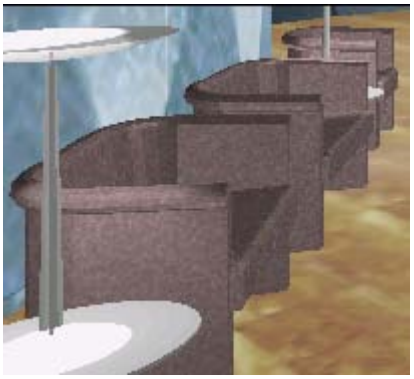
13. **Apply style '03 Slate walls', and paint the same walls, starting from the left-most wall.**

As you saw when you painted the desktop, the texture is painted tangentially to the plane on which you start painting. In this case, the texture looks odd around the area of the lifts, because it is painted tangential to the left wall.

Change the Mode to Frontal under the Texture settings on the Texture palette, and press ⌘-R to reapply the effect.

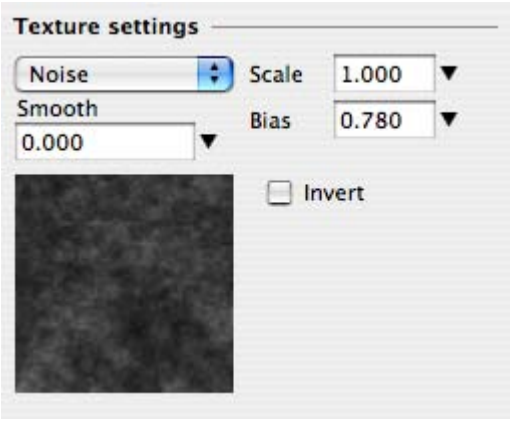
Frontal mode 'projects' the texture onto the scene, preserving perspective and scaling.

14. **Now apply the style '05 Leather texture', and paint the chairs to the left of the scene in one continuous brush stroke.**



This style uses Ink blend mode to produce a translucent effect, where the underlying colours can still be partially seen.

Notice that the alpha symbol is shown in the Texture preview box, so this is an alpha texture like the Dot alpha texture you used in Tutorial 2. However, the textures you have used until now have been raster textures, which use raster images to produce the texture effect. If you look at the texture settings, you will see that the texture type for the leather style is Noise.



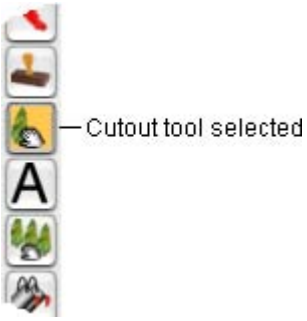
Noise textures are 'procedural' textures, which means that they are calculated from the parameters you set in the Texture settings. The noise pattern is then used as an alpha texture, so the light and dark areas define how heavily the effect is applied.

You can specify the structure, scale, and the transition between light and dark areas, using the Smooth, Scale, and Bias settings respectively. Adjust these settings, and press ⌘-R to reapply, to see how they change the texture.

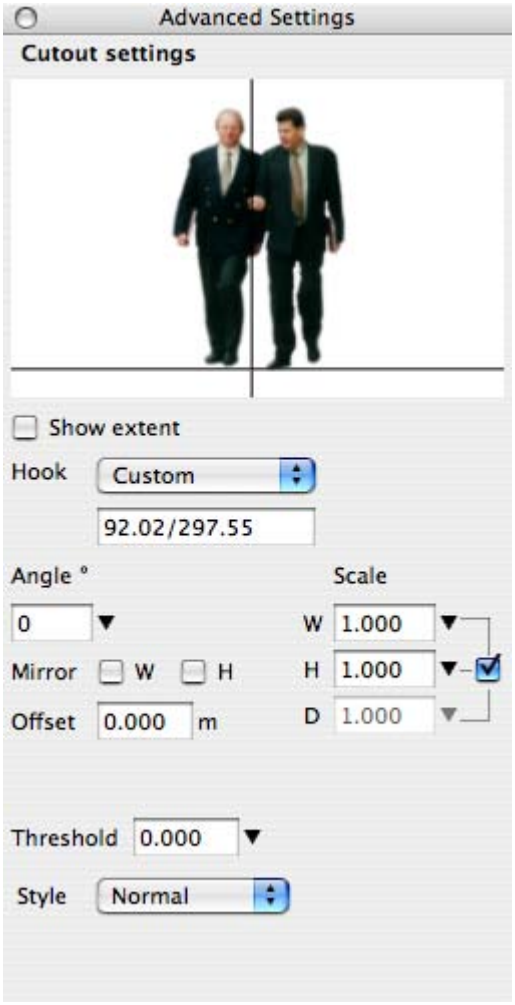
Placing raster cutouts

You can place items of scenery, called 'cutouts', in the scene to create a livelier photorealistic effect.

1. **Apply the style '06 People cutout 1'.**
   The Cutout tool is selected.



2. **Look at the settings on the Tool Options toolbar.**
   A picture of the cutout, an image of two men, is shown in the preview box on the left. Notice that the Mode is Frontal. This means that the cutout will be facing forwards when you place it in the scene.
   The size of the cutout is 1.9m. Note that the size at which the cutout is placed in the scene depends upon how the model units relate to real world units. You can change this by using the model units section of the File Properties dialog. This lobby scene was modelled at a scale of 1 unit to 10cm (model to real world), so the model units in Piranesi is set so that 1 model unit is 0.1m. The Piranesi libraries are set up so that cutouts and texture have 'real world' sizes, therefore it is advisable to set up the model units appropriately. You will see how to do this in Tutorial 7.
   If the Advanced Settings palette is not currently displayed, click on the Tool Options toolbar and then look at the Cutout settings:



If you select the 'Show extent'checkbox, you will see the extent of the cutout tile in the preview box.

3. **Move your pointer over the scene.**

   By default, an image of the cutout is attached to the mouse pointer. As you move your pointer around the scene, Piranesi recalculates the size and shape of the image, so that it is always shown in perspective.

   You can display the cutout as a detailed or rectangular outline if you prefer, by setting your user preferences. See Piranesi Help for more details.

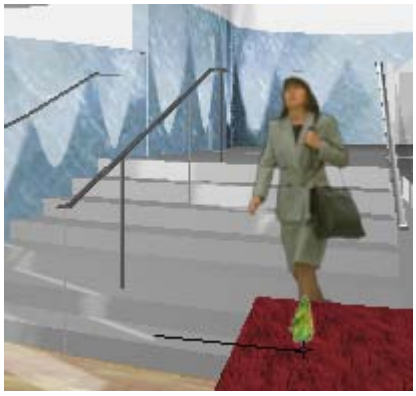
4. **Click on the floor near the leather chairs.**

   The men are drawn in the scene.

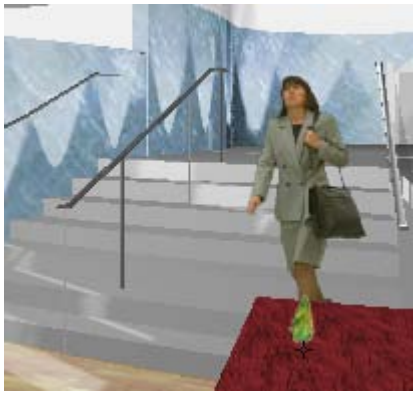
If you have the Layer Manager visible, you'll see a new Cutouts layer has been added. This shows the number of floating cutouts in the scene. You'll learn about layers in Tutorials 5 and 8.

5. **Now apply the style '07 People cutout 2'.**
   This time, we'll place the cutout on the stairs behind the desk.
6. **Look at the Cutout settings on the Advanced Settings palette for this cutout.**
   Notice that the hook point, where the cross-hairs intersect on the preview, is at the woman's feet.
   When you click on the scene to place a cutout, the hook point is positioned at the point you click. However, in this case, the desk hides the step onto which we want to place the woman's feet.
7. **Move the mouse pointer to the tread of the first step where it is visible, and press-and-hold the mouse button:**

8. **Drag the mouse so that the outline is behind the desk.**
   A line is drawn between the initial point and the mouse pointer. Move the pointer so that the line is roughly parallel with the step, so that you place the woman at the appropriate depth.



9. **Release the mouse button.**
   The cutout of the woman is painted:



The woman's feet are placed on the plane of the step when you release the mouse button. Piranesi automatically works out that the desk is in front of the cutout, and hides the woman's lower legs behind the desk.

You can also place cutouts so that they are cropped at the edge of the scene. You will see some examples of this in Tutorial 8: Advanced Photorealism.

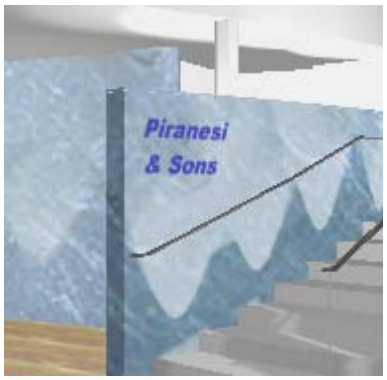
Creating text cutouts

In this exercise, we will use a text cutout style to place a sign in the scene. We will then modify the style to create a new sign and add some thickness so that it becomes three dimensional.

The cutouts you have used so far have been placed facing the front of the scene. You can also place cutouts so that they are tangential to a particular plane.

1. **Apply the style '08 Sign cutout'.**
   This style uses the Text tool, which is now selected on the Tools toolbar:

   The Cutout settings on the Advanced Settings palette shows a picture of the cutout you are going to place on the scene. The text 'Piranesi & Sons' is shown.
   Notice on the Tool Options toolbar that the Mode is Tangent.
2. **Move your mouse pointer over the scene.**
   An image of the cutout in the current colour is shown. As you move the pointer, Piranesi automatically changes the size of the cutout so that it is in perspective, as before. In addition, the orientation of the cutout is changed so that it matches the plane of the pixel under the pointer.
3. **To zoom in to the centre of the view, press ⌘-+ twice, then place the cutout on the wall to the left of the stairs.**
   The sign is placed on the wall, with correct perspective and orientation.

   You can also place tangential cutouts behind existing items in the scene (as in Placing raster cutouts), and you can choose one plane for the orientation, and a different plane for the placement of the hook point. Refer to Piranesi Help for more information.
   Now we will create a new sign. First we'll zoom in to the area at which we'll be placing the sign.

4. **On the Tools toolbar, select the Zoom tool:**

The Navigate palette is now displayed. An outline of the current view extent is shown in the preview.

Although the scene is zoomed in, you will first centre the view on the position at which you will place the new sign.

5. **Drag the outline until the bottom centre of the rectangle is positioned just below the suited mens' shoulders.**

For example:

6. **Reselect the Text tool on the Tools toolbar and then replace the text 'Piranesi & Sons' with the word 'LIFTS' in the text box, under Text settings.**

To delete the existing text, select the text in the text box, and then type the new text.

7. **Click Font on the Tool Options toolbar, change the font to one that has a Regular typeface, and click the Close button on the Font dialog.**

The text font is updated in the preview. The cutout is tangential, as in the previous exercise.

Move your pointer over the ceiling above the heads of the men; the cutout aligns with the ceiling, as expected.

8. **On the Tool Options toolbar, change the size to 1.25 to make the sign bigger.**

Note that you must use the Size box to change the size of the text, rather than the Font size on the Font dialog. See Piranesi Help for more information.

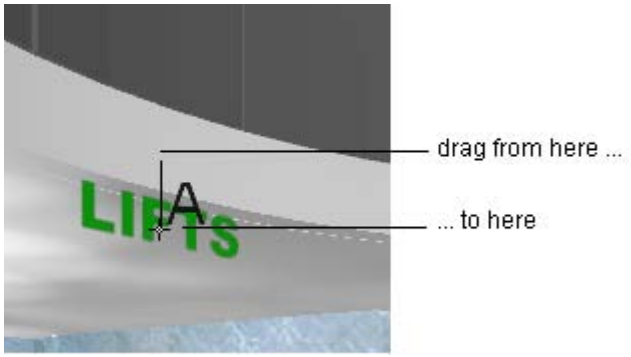
9. **To ensure that the cutout is placed vertically in the scene, select the 'Vertical' checkbox on the Tool Options toolbar.**

Move your pointer over the ceiling again; now the cutout is always vertical.

10. **From the Hook pop-up menu on the Advanced Settings palette, select Top Edge.**

This moves the hook point of the cutout to the top-most point. The cutout will be easier to place with the hook point in this position.

11. **Now, click the Colour preview box on the Colour, Texture and Grain toolbar and change the colour of the text to green.**
12. **Place the cutout above the heads of the men, as follows:**
    a. press-and-hold the mouse button on the vertical section of the ceiling, above the mens' heads, to select the orientation
    b. drag the mouse so that the text is 'hanging' from the ceiling



    c. release the mouse button

    Because the sign is suspended from the ceiling, two-dimensional text doesn't work as well as the wall sign. So you will now add some thickness to convert it to a 3D sign.

13. **In the Thickness box on the Tool Options toolbar, type 0.1 and then reapply the effect.**
    The sign looks more realistic now that it has some depth:

    Notice the colours on the preview of the text cutout on the Tool Options toolbar and in the Cutout Manager are now inverted, white on black. This indicates that the cutout is a 3D cutout. You can change the background colour if you prefer. For details, refer to Piranesi Help.

14. **Finally, to display the scene as large as possible within the document window, on the Zoom menu, click Fit to Window.**

Depth and material views

When you add a cutout to the scene, the material and depth definitions of the pixels that you replace are changed. As we saw in Restoring the original colour in Tutorial 1, you can look at the different properties of the pixels, by selecting different views.

1. **On the View menu, click Restore Material Channel.**
   The material in which each pixel was rendered in the original EPix file is shown.

   Piranesi stores this information so that you can restore the material using the Erase tool.
   To see which material a colour represents, select Show Materials on the Window menu.The Materials palette is displayed, listing each material and its assigned colour.

2. **Now click Material Channel on the View menu, to see how the materials have changed.**

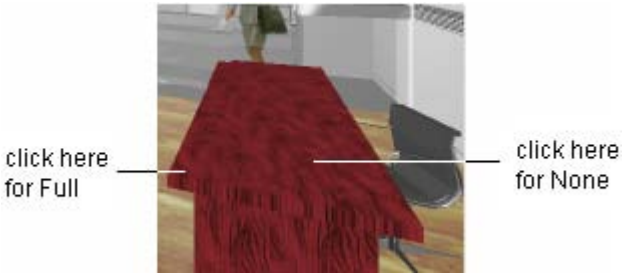
   Notice how the cutouts show up as different materials. You can also see how the depth has changed, by selecting the Restore Depth Channel and Depth Channel commands using the View menu.

3. **Return to the RGB view using either the View menu or select RGB Channel from the pop-up menu on the status bar at the bottom of the document window.**

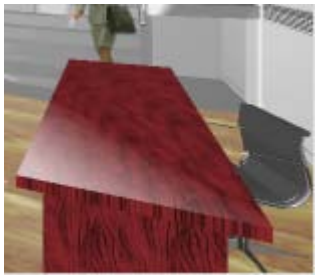
Adding highlights

You can use the Fade tools to add lighting effects to your scene. Here, we will add the reflection of a light on the desktop.

1. **Apply the style '09 Graduated highlight'.**
   This style has Plane lock switched on, and Linear fade selected. Hard light blend mode is used, to create the effect of shining a harsh spotlight on the scene. The Opacity amount is 70%, to make the effect more subtle.
2. **Look at the Fade palette.**
   If the Fade palette is not currently displayed, click to the right of the fade buttons on the Colour, Texture and Grain toolbar.
   The Linear fade is set to Any. This mode graduates the effect between any two parallel planes on the scene.
3. **Click the Full Pick button and click on the front left of the desktop.**
4. **Click the None Pick button and click about one third into the desktop, as shown below.**



5. **Use the brush to apply the effect to the desktop.**
   Notice that the effect is strongest in the corner of the desk, and gradually fades away to nothing.



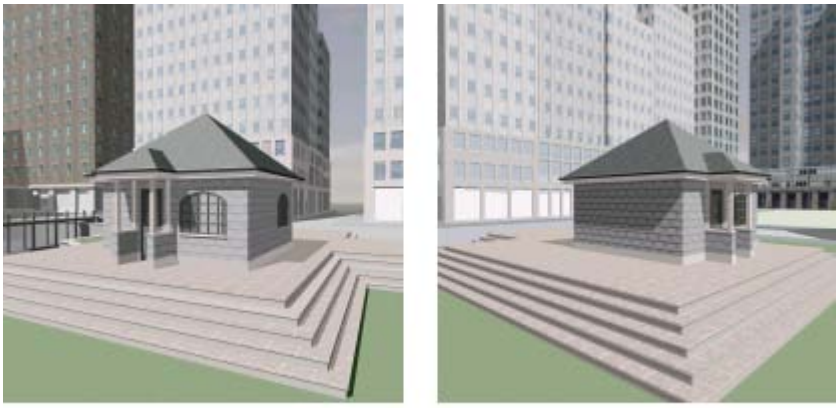
6. **If you have zoomed in, to see the finished lobby scene, on the Zoom menu, click Fit to Window.**

7. **Save the EPix file to a new name to save your work.**
   The floating cutouts are saved in the EPix file. Floating cutouts are cutouts that you have placed in the scene, but you haven't 'burnt in'. We will look at this in detail in the next tutorial.
8. **Close the file.**

Tutorial 4: Working with Cutouts

In this tutorial, you will add cutouts to a view of a scene. You will use the Cutout Manager to work with the cutouts and add shadows.

You'll then save the cutouts to a separate cutouts file, and use the same cutouts in a different view of the same model.



original scenes

painted scenes

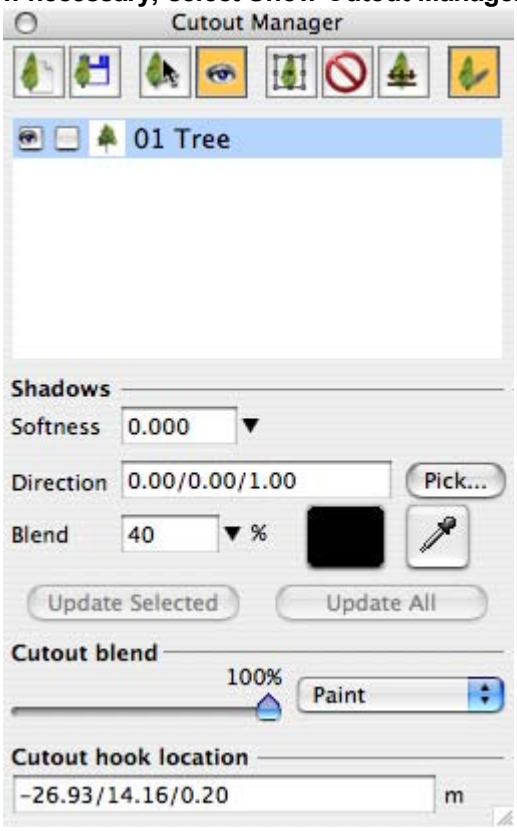
Placing cutouts with shadows

In this exercise, you'll place some tree cutouts in the scene, then set up the shadows.

1. **Open the file 'Pavilion View 1'.**
   See Opening a file for details of how to locate the tutorial EPix files.
2. **In the Style selector, select the category 'Tutorial 4: Working with cutouts'.**
   See Setting up the style library for details of how to associate the tutorial style libraries with the style selectors.
3. **Apply the style '01 Tree'.**
   This style selects the Cutout tool with a tree cutout.
4. **Move your pointer over the scene.**
   As you saw in Tutorial 3, if you have not changed your preferences, an image of the cutout is attached to the mouse pointer. Remember that you can display the cutout as a detailed or rectangular outline by setting your user preferences.
5. **Place the tree in the bottom left-hand corner of the scene, by clicking on the scene.**
   The hook point of the tree cutout is placed where you click, as you saw in Placing raster cutouts.

   Because the tree doesn't fit in the scene, Piranesi simply crops it at the edge. In Tutorial 8 you will see how to place a cutout with its hook point outside of the scene.

6. **If necessary, select Show Cutout Manager on the Window menu to open the Cutout Manager.**



The tree cutout that you placed is shown in the list, with the position of its hook point shown in the Cutout hook location box.

The pavilion is casting a shadow in the scene, but the tree is not, so we will now use the Cutout Manager to set up shadows.

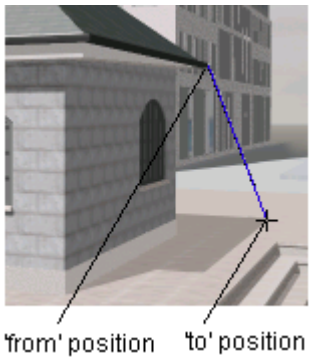
We have to define the direction of the 'light' that casts the shadows, so that Piranesi knows where to paint them.

7. **Click Pick next to the Direction box, and define the shadow direction using the existing shadow to ensure that it is consistent:**

   a. press-and-hold the mouse button on the corner of the pavilion roof to identify the 'from' position

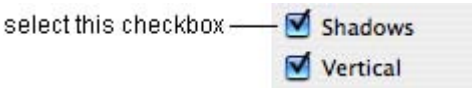
      Ensure that the material displayed on the status bar is GUTTER when you press the mouse button. You will probably have to zoom in to pick the point accurately.

b. drag the mouse to the corner of the corresponding shadow, to identify the 'to' position



The Direction box is updated with the new direction values. Now that the shadow direction is correct, we will reapply the cutout, this time with a shadow.

8. **On the Tool Options toolbar, select the Shadows checkbox.**



9. **On the Cutout Manager, ensure that:**

- **the button is selected in so that shadows are generated**
- **Shadow Softness is set to 0.40**
  This setting defines the 'blurriness' of the shadow edges.
- **Shadow Blend is set to 40%**
  This setting defines the translucency of the shadows.
- **the Shadow Colour is black**
  Click on the colour box to change the colour, if necessary.

See Piranesi Help for more details about the shadow settings.

10. **Press ⌘-R to reapply the tree.**
    This time a shadow is cast by the tree. Notice how the shadow is distorted realistically as it goes up the steps.

In the Cutout Manager, the shadow box is selected to the left of the style name.

11. **Now place another tree, as shown below.**

12.

The shadow is generated automatically. It is drawn using the same shadow settings, because the shadow settings apply to all new cutouts so that you don't have to set them each time. Notice that the second tree is also listed in the Cutout Manager.

The light on the tree cutouts is falling on the trees from the wrong direction, so it doesn't match the shadows. We will correct that now.

13. **Under the Cutout settings on the Advanced Settings palette, select the 'Mirror W' checkbox, then press ⌘-R to reapply the second tree.**

The cutout image is flipped horizontally.

before mirroring

tree mirrored

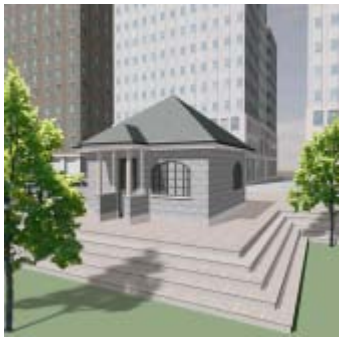
Now we want to mirror the first tree that you placed.

14. **In the Cutout Manager, double-click the first tree in the list.**

The settings on the Advanced Settings palette are updated with the first tree's settings.

15. **On the Advanced Settings palette, select the 'Mirror W' checkbox, then reapply the first tree.**

The first tree cutout is flipped horizontally.



Notice that the tree you have just mirrored has been moved to the bottom of the cutouts list, (highlighted in blue). This is because when you reapply a cutout in this way, Piranesi assumes that you just placed the cutout. For example, if you now used Undo, Piranesi would remove the tree you just mirrored.

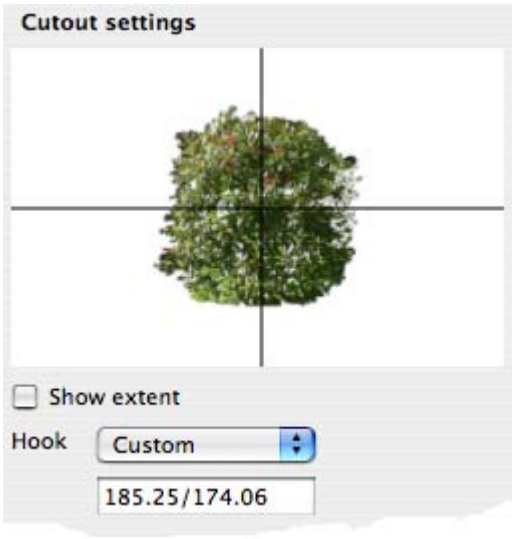
Tweaking cutouts

You'll now place some more cutouts in the scene, then tweak them to change their appearance.

1. **Apply the style '02 Shrubs'.**
   This style already has Shadows selected, so shadows will be created when you place the cutout.
2. **Click on the scene to the right of the pavilion to place the shrub.**

   The shrub looks too big, so we will reduce its size to make it look more realistic.

3. **Click in the preview box on the Advanced Settings palette, to move the hook point of the cutout as shown below.**



4. **Press ⌘-R to reapply the shrub.**

As you saw earlier, when you place a cutout, the hook point is positioned at the point you click. In this case, the hook point is placed on the raised paved area; the section of the image that is below the hook point is placed 'under' the raised area and is therefore invisible.

Notice that the shrub is 'falling' down the steps on the right. We'll correct that now. (Even if your shrub isn't falling down the steps, you can still continue with the exercise.)

5. **Look in the Cutout Manager.**

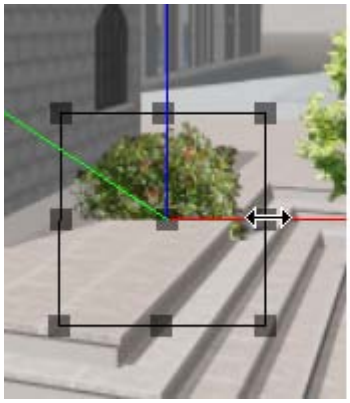
The shrub has been added to the list, and is highlighted to show that it is selected.

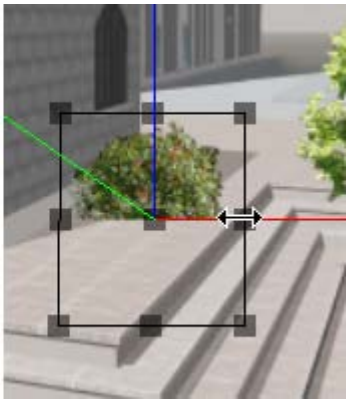
6. **Click on the Cutout Manager and move your pointer into the scene.**

Resize handles are shown on the cutout tile to represent the size of the cutout.

7. **Drag the right-hand handle ↔ to make the cutout smaller so that it doesn't overspill onto the steps.**

For example:





When you release the mouse button, the cutout is immediately redrawn to its new scale. However, its shadow is not redrawn until you finish tweaking it. This means that Piranesi doesn't repeatedly regenerate shadows until you have finished tweaking.

8. **When you have finished tweaking, click or press Esc.**

The Advanced Settings palette now shows the tweaked values, for example the Width scale is probably less than 1.0 (it was 1.0 in the original style).

The tree at the back of the scene looks a bit small, so we'll make it taller.

9. **Move your pointer over the tree in the document window, and press ⌘-T.**

   This is an alternative way of selecting tweak mode. Notice that the tree is now highlighted in the Cutout Manager.

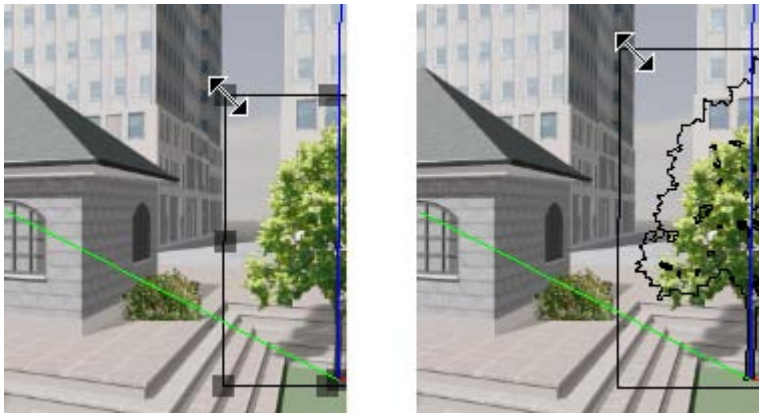
   This time, we want to ensure that we preserve both the aspect ratio of the tree and its hook point position when we resize it.

10. **With the diagonal resize cursor ⤡ displayed in the top left, press the Shift and Option (⌥) keys , then drag the top left-hand corner to make the tree bigger.**

    Shift preserves the aspect ratio, and ⌥ preserves the hook point.

11. **Release the mouse button first, then release ⌥.**

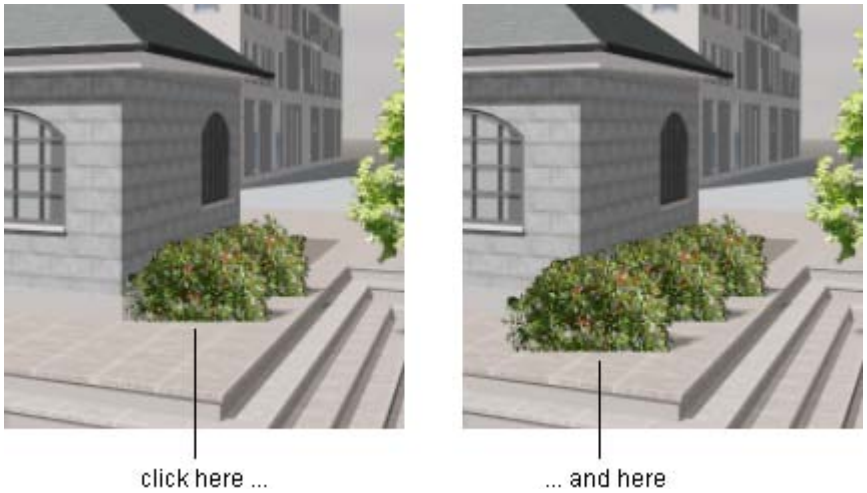
    For example:



When you have finished tweaking the tree (and Piranesi has finished redrawing it), press Esc.

Now we will place some more shrubs. We want to place them at the same scale as our tweaked shrub.

Place two more shrubs, as shown below.



The placement of the vegetation looks a bit unrealistic because it is 'growing' out of the concrete. In a real situation, you could paint a proper border with edging and further planting.

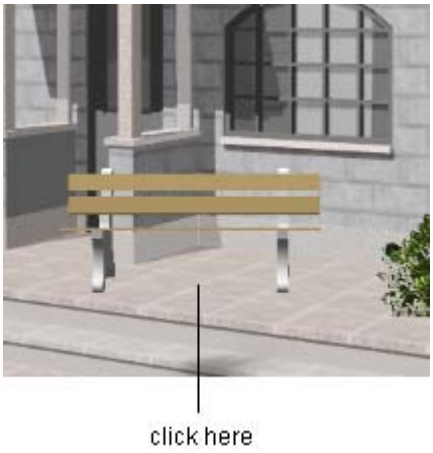
You can find more information about resizing cutouts in Piranesi Help.

Using 3D cutouts

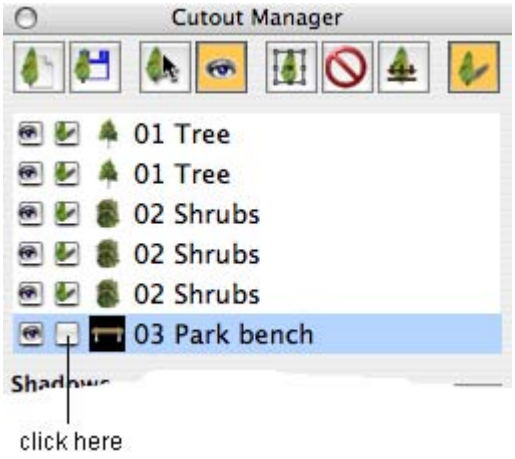
In Piranesi, you can use various types of files as cutouts. You can use raster files such as BMP and PNG, and model files such as SketchUp, 3DS and DXF. In this exercise, we'll be using a 3DS model file as a cutout.

Note that you can access the Google 3D Warehouse directly from Piranesi. The 3D Warehouse is a collection of SketchUp 3D models of furniture, cars, buildings, bridges and much more, that you can use as cutouts in Piranesi.

1. **Apply the style '03 Park bench'.**
   When the style has been applied, look at the cutout settings on the Tool Options toolbar. A preview of a park bench is shown. Notice that Shadows is not selected.
2. **Place the bench on the raised paved area, as shown below.**



   Now we will add a shadow. In exercise 4.1, you did this by selecting the Shadows checkbox on the Tool Options toolbar and reapplying the cutout. This time, we will use the Cutout Manager.
3. **In the Cutout Manager list, click the box to the left of the park bench preview.**



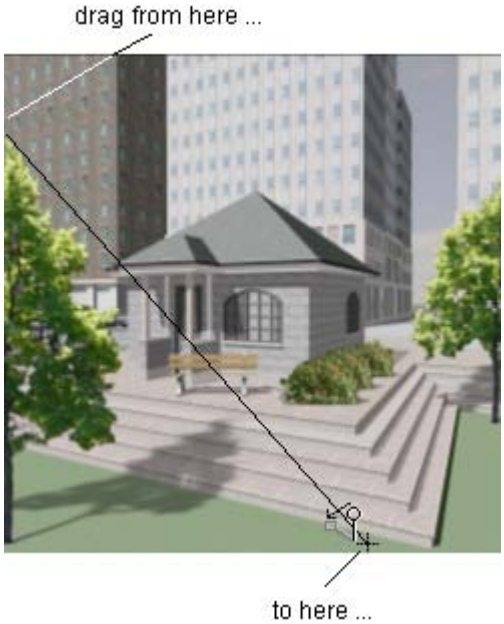
   Again, notice that the background of the cutout is black, indicating that this cutout is a 3D model.
4. **Ensure that the cutout is highlighted in the Cutout Manager list, then click 'Update Selected'.**
   The cutout's shadow is drawn, using the shadow settings on the Cutout Manager.

Unlike raster cutouts, model cutouts are 'three dimensional'. We'll demonstrate that now by changing the shadow direction.

5. **Select the coordinates in the shadow Direction box, and press ⌘-C.**

   This copies the coordinates to the Clipboard so that we can use them again later. You could just note them down, if you prefer.

6. **Click Direction Pick, and set the shadow direction as illustrated below:**



   Ensure that the point at which you release the mouse is approximately level with the bottom of the tree. This sets up the shadow direction 'edge on' to the tree cutout.

7. **Click 'Update All'.**

   The shadows for all of the cutouts are updated with the current shadow settings, including the new direction.

   Notice how narrow the shadow is for the tree, compared with a more realistic model cutout shadow.

Now we will reapply the original shadow direction.

8. **Select the coordinates in the Direction box, press ⌘-V to paste the original coordinates, and click 'Update All'.**

   If you prefer, you could type the coordinates in, or set up the shadow direction in the same way as you did in Placing cutouts with shadows.

Moving cutouts

In the exercise Tweaking cutouts, you saw how you can change the shape of cutouts once you have placed them. You will now see how you can change the position of a placed cutout. You will move the park bench closer to the window and then rotate it so that it's parallel with the wall.

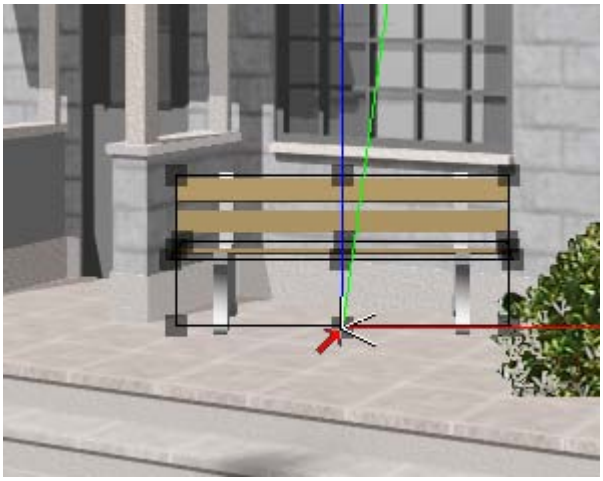
As we saw in the earlier exercises, shadows are regenerated every time you tweak a cutout. To speed things up, we'll temporarily turn shadow regeneration off.

1. **On the Cutout Manager toolbar, click to switch off Generate shadows.**

2. **Click or press ⌘-T to select tweak mode.**
   Remember that the document window must be active, and your mouse pointer must be over the cutout when you press ⌘-T.

3. **Move your pointer over the park bench in the scene until you see , then press the mouse button.**
   With this cursor displayed, when you move the cutout around the scene the hook point of the cutout follows the surface beneath it. Notice how the outline of the cutout 'jumps' to the hook point ready to place on a surface.

4. **With displayed, drag the cutout to just below the main window and place as shown below:**

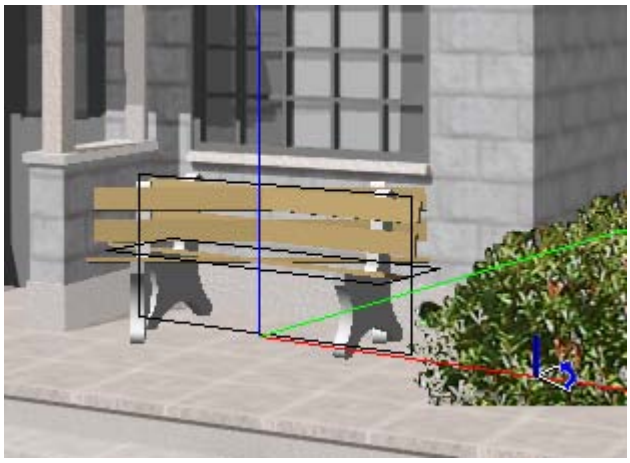


We won't end tweak mode just yet as we'll now look at another feature of 3D cutouts.

5. **Move your pointer over the red axis (representing the X axis) on the cutout outline, until you see **

For example:

6. **Press the mouse button and drag the axis clockwise, to the point shown below:**



When you release the mouse button, the cutout is rotated in the specified direction:

Now, move the bench a little closer to the pavilion wall by pressing Ctrl-Up. This moves the cutout away from you in small increments. You can move a cutout in larger increments by holding down Shift when you press the Up arrow. If you move the cutout too far, it will begin to go through the wall! If necessary, use Ctrl-Down to walk the bench back toward you.

Sometimes, you will want to move a cutout in the same plane without snapping to its hook point. This could be useful for partially hiding a cutout below a surface. In the earlier exercise Placing cutouts with shadows, you changed the hook point to reduce the amount of the shrub that is visible. You'll now see how you can enlarge one of the shrubs, by tweaking it in its current plane.

7. **Move the mouse pointer over the front shrub, and press ⌘-T.**

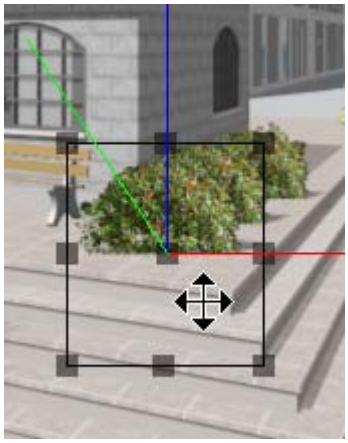
8. **When you see the 'move in perspective' cursor , try enlarging the cutout by moving it up the screen.**

   Because the cutout remains in perspective, you cannot change its size with this tweak action.

9. **Press ⌘-Z to undo the tweak, then with displayed, press⌥**

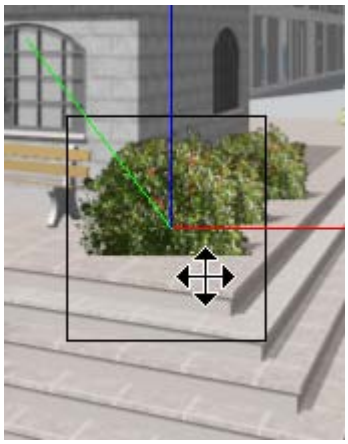
   The cursor changes to: . When this cursor is displayed, you can move the cutout in its current plane.

10. **Drag the cutout up the screen, and release the mouse button when the shrub is slightly taller than the other two shrubs:**



11. **Release the mouse button then release ⌥**

More of the cutout is lifted out of the ground, and is redrawn at its new size.



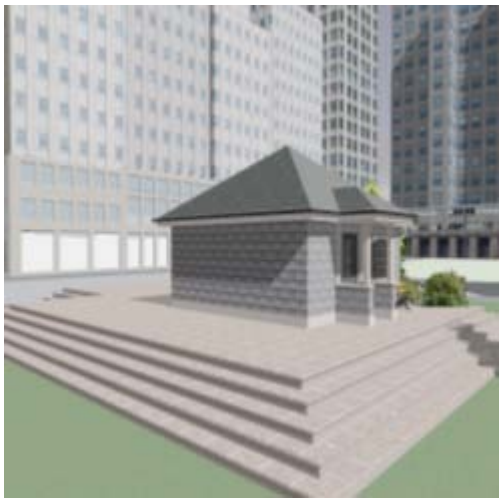
12. **Click again or press Esc to end tweak mode.**

13. **On the Cutout Manager toolbar, click to turn Generate shadows back on then select both cutouts in the list and click 'Update Selected' to update the shadows.**

Saving cutouts to a file

Floating cutouts are saved in the EPix file. You can also save cutouts to a separate file so that you can use them again, for example in a different view of the same scene.

1. **On the Cutout Manager toolbar, click**
2. **In the Save dialog, browse to the folder in which you want to save the cutouts file.**
3. **Type 'View 1' in the Save As box, and click Save.**
   The cutouts are saved.
4. **Open the EPix file 'Pavilion View 2'.**
   This EPix file is a different view of the same model.
   If you look in the Cutout Manager with the 'View 2' document window selected, you'll notice that there are no cutouts listed for this file.
5. **On the Cutout Manager toolbar, click**
6. **Browse to 'View 1.xml', select the file, and click Open.**
   Piranesi opens all of the cutouts in the new view, then generates the shadows for the cutouts.

   The cutouts are listed in the Cutout Manager, but not all of the cutouts are visible in the scene because of the different view direction.
   Notice that the 2D cutouts have turned around to face the eye. If they had not, they would have been 'edge on' to the viewer. This happens only if the cutouts are placed in 'Frontal' mode, as we shall see later.
   Also, notice that the shadows have been created in the correct direction. This is because the shadow settings are saved in the cutouts file.

Burning in cutouts

So far we have saved the cutouts to a file, but they are not an integral part of the scene. Cutouts that are not part of the scene are called 'floating cutouts'. When you have finished manipulating cutouts, you can burn them into the scene. Burning in cutouts will reduce the file size, and therefore speed up loading of the file in the future.

Zoom in so that you can see the cutouts clearly.

1. **If all of the cutouts are not already selected in the list area of the Cutout Manager, click in the list area and press ⌘-A.**
2. **Click**
   All the cutouts are burnt in. They are removed from the Cutout Manager, because once they are burnt in you can no longer tweak them.
3. **Save the EPix file 'Pavilion View 2' to a new name, such as 'Work View 2'.**

More cutouts files

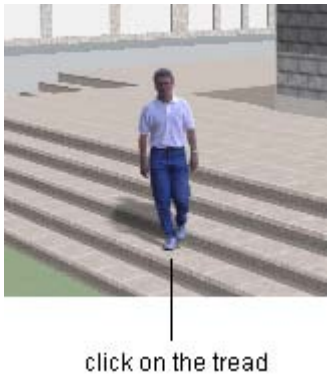
The scene in View 2 is looking a little bare, so we'll add some more cutouts to liven it up. Then we will add the cutouts back into View 1.

1. **Apply the style '04 Man'.**
2. **Click on the raised paved area to place the man in the scene.**

   We could leave him there, but all of the activity in the scene is currently on the top of the raised area, so we'll move him down the steps.
3. **Click** **or press ⌘-T to select tweak mode.**

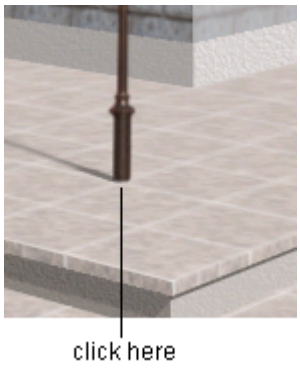
   Remember that the document window must be active, and your mouse pointer must be over the cutout when you press ⌘-T.
4. **Move your pointer over the man in the scene until you see** **, and move the man to the steps, then release the mouse button.**

   Place the man in the position shown below. Ensure that the hook point is on a step tread (rather than a riser) when you release the mouse button.

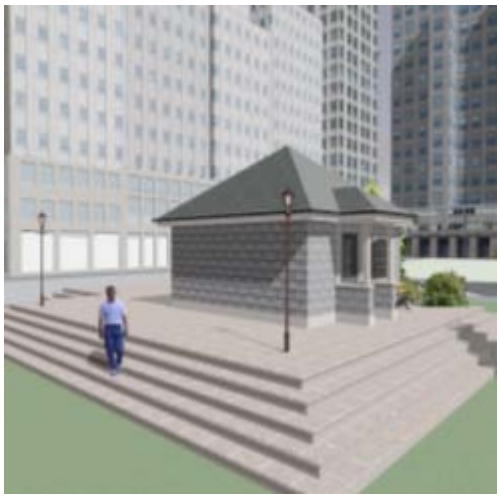
   

   The man is placed on the steps.
5. **Press Esc or click** **to end tweak mode.**
6. **Apply the style '05 Lamp post'.**

7. **Place the lamp post at the front corner of the raised paved area, two tiles in.**



8. **Place another lamp post at the back corner of the raised area.**



We want to place the third and fourth lamps in the other corners of the raised paved area. However, we can't see clearly to place them in this view because the pavilion is in the way, so we'll use the other view. First, though, we'll place one more cutout.

9. **Apply the style '06 Sale sign', and click on the pavilion wall to place the sign, as shown below.**

The cutouts we placed before this one have all been placed in 'Frontal' mode. The sign cutout is in 'Tangent' mode, so it is placed tangentially to the pavilion wall. You met a tangential cutout in Creating text cutouts in Tutorial 3.

Now we want to save the cutouts to a file so that we can open them in View 1. Note that we must save the cutouts to the file *before* we burn them in.

10. **10. On the Cutout Manager, click , name the cutout file 'View 2', then click Save.**
This saves only the floating cutouts listed in the Cutout Manager. The cutouts that we burnt in earlier are not saved to the file as they are already part of the scene.

11. **Select all the cutouts in the Cutout Manager list, then click to burn the cutouts into View 2.**

12. **Select 'Pavilion View 1' from the bottom of the Window menu to switch back to the first view.**
The Cutout Manager now shows the cutouts that are in View 1. If necessary, zoom out so that you can see the entire scene.

13. **On the Cutout Manager toolbar, click , select View 2.xml, and click Open.**
The man, lamp posts, and sale sign are loaded into the scene.

Notice how the Sale sign is partly obscured by the pillar in this view. Because it was placed in 'Tangent' mode, it doesn't turn to face the eye. You probably can't see the other cutouts.

14. **On the Cutout Manager toolbar, click**
When you move your mouse pointer over the scene, the cutout that is under the pointer is outlined so that you can identify it.

15. **Click on the left-hand tree to select it.**
The selected tree is highlighted in the Cutout Manager list.

16. **Click** **to switch select mode off.**

17. **Now click** **on the Cutout Manager toolbar.**
The selected tree is made invisible, and you can see the lamp post and the man behind it.

tree is visible

tree is invisible

It can be useful to make cutouts invisible, if, for example, you need to place one cutout partially behind another cutout.

18. **Click** **on the Cutout Manager toolbar to make the tree visible again.**

19. **Select the tree at the back-right of the view, and click** **to the far left of its preview in the Cutout Manager.**

This is an alternative way to make a cutout invisible.

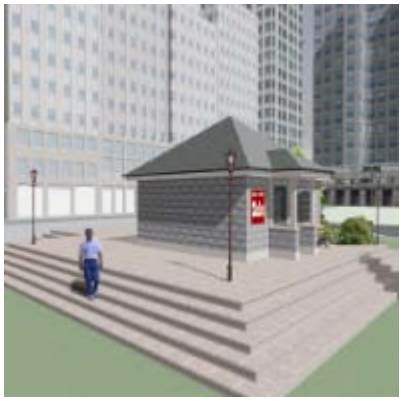
20. **If necessary, switch select mode off, then apply the style '05 Lamp post' and place the lamp post behind the tree as shown below.**

21. **Make the tree visible by clicking the box again.**
    You can see the lamp post behind the tree.

22. **Add a fourth lamp post, to complete the scene.**

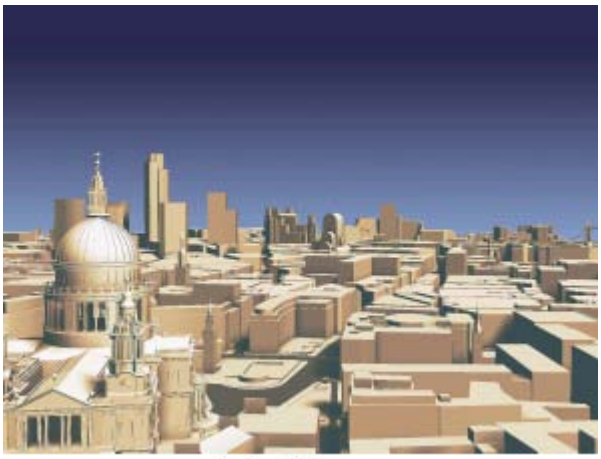
Saving your work

We have now finished adding cutouts to the scenes. All the cutouts we have used are listed in the Cutout Manager for View 1. Earlier we saved the floating cutouts to a separate file. In this exercise, you will see how you can also load floating cutouts directly from another EPix file.

1. **With the 'Pavilion View 1' window active, on the File menu, click Save As and save the file to a new name, such as 'Work View 1'.**
2. **On the File menu, click Close to close the file.**
   Although we haven't burnt in the cutouts, they will automatically be loaded into the scene when you open the file again.
   Now we want to add the final two lamp posts to View 2.
3. **On the Cutout Manager toolbar, click**
   The Open dialog is displayed.
4. **Select the EPix file you just closed and click Open.**
   The cutouts are loaded into the scene.
   
   But now we have duplicate cutouts, because most of the cutouts have already been burnt into the scene.
5. **On the Cutout Manager, deselect the final two lamp posts.**
   The cutouts are all selected from when you imported them. To deselect a cutout, press ⌘ and click on the cutout in the list.
   You can use the Shift and ⌘ keys to select and deselect multiple cutouts, in the same way as in Mac Finder.
6. **To remove the selected cutouts, on the Cutout Manager toolbar, click**
   If you have deleted the wrong cutouts, you can press ⌘-Z to undo the deletion.
7. **Now select the two lamp post cutouts in the Cutout Manager, then click** **to burn them into the scene.**
8. **Reopen 'Work View 1' and, when the cutouts have loaded into the scene click** **to burn them in.**
9. **Save and close the files.**

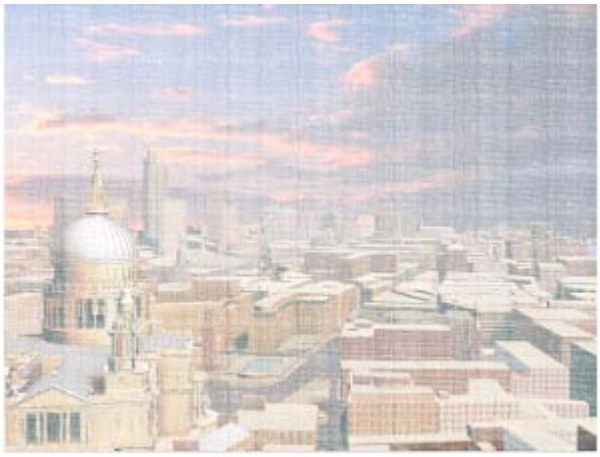
Tutorial 5: Beyond Photorealism

With Piranesi, you can express your ideas using a whole range of artistic effects. In this tutorial, we will use textures, grains, edge rendering, raster brushes, multiple fill, and the Painter tool to demonstrate how you can create non-photorealistic effects.



original city scene

We will begin by adding textures to the original scene and re-rendering the scene. Then we will apply different painting styles to create each example:



Example one

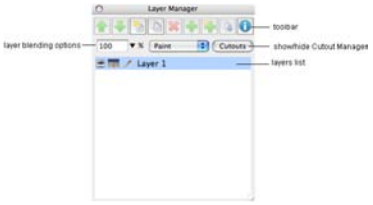
Example two

Example three

Preparing the scene

In this exercise, you will practise painting with textures and tweaking them. You will then import a pre-painted scene which will be overlaid on the original image. Here, you will also see how Piranesi uses layers to store different types of effects. You will finish by re-rendering the painted scene to the Restore channel.

1. **Open the file 'London'.**
   See Opening a file for details of how to locate the tutorial EPix files.
2. **Open the Style selector, and click the Category box to display the list of categories in the Tutorial style library.**
   See Setting up the style library for details of how to associate the tutorial style libraries with the style selectors.
   Notice that the Tutorial 5 category has two subcategories, one of which is called 'Tutorial 5 - Textures. In Piranesi, you can have categories within categories in much the same way as you can have folders within folders in Mac Finder.
3. **Select the subcategory 'Tutorial 5 - Textures'.**
   Paint some of the scene to practise using textures. Don't worry about painting too much of the scene as we've also supplied a pre-painted version for you to import over the scene.
   Use:
   - styles **01** to **05** to paint the windows of the buildings (other than the cathedral)
   - style **06** to paint the roofs
   - style **07** to paint the sky

   These styles use photographic raster textures. Styles 01 to 06 are tangential, so they change their perspective and orientation appropriately. Style 07 is 2D, so a single raster tile covers the width of the entire scene, with no perspective. Use the Tweak button on the Texture settings of the Texture palette to tweak the textures as required.
   Let's now import the pre-painted scene, but first open the Layer Manager if it is not already displayed.
4. **Open the Layer Manager by clicking Show Layer Manager on the Window menu.**
   The Layer Manager is displayed:
   

   As you can see, you currently have a single layer, called Layer 1. This first layer is added automatically whenever you open or create a new EPix file. Unless you create additional layers, all your paint effects are painted onto this layer. Layers are drawn from the top down, with each layer higher in the list being drawn on top of any lower layers. A layer can contain just colour information or colour, depth, and material information. Layers which contain only colour information can be used to create special effects, such as outline edges or drawing frames.
5. **On the File menu, click Import.**
   An Import dialog is displayed.

6. **Click the name of the folder that contains the tutorial resource files.**
   If you have installed Piranesi 6 Pro in the default location, the resource files are in Applications:Piranesi 6 Pro:Tutorial:Resource
7. **From the list of files, double-click City_rgb.tif.**
   The file is imported into the RGB channel:

   The imported image is laid on top of the original scene.
   Notice that Piranesi has now added a new layer to the top of the layers list called City_rgb:

   The paint effects on the imported layer are overlaid on the original layer. If you now temporarily switch off the new layer, by clicking to its left, you'll once again see only your partially painted scene. Click again to redisplay the imported image.
   The layer blending options control how the selected layer is blended with the underlying layers. Select the City_rgb layer and try reducing the blend amount so that you see a little more of the underlying layer. Ensure that you reset the blend amount to 100% before you continue.
8. **Save the scene to a new name, such as Citywork.**
   When we use the Erase tool, we want to restore the effects from the painted scene, not the original scene, so we will now re-render the file. You cannot undo a re-render.
9. **Click Restore RGB Channel on the View menu, to display the colours that were in the original EPix file.**
10. **Click Re-Render on the File menu, and click OK to confirm.**
    The colours in the Restore RGB channel are now the same as those in the current RGB channel.
11. **Click RGB Channel on the View menu to return to the RGB view.**
12. **Press ⌘-S to save the scene to the same name.**

You have now prepared the scene for the artistic effects.

Adding layers

In the following exercises, you'll be applying different painting styles to create three variations of the scene. So, you'll first add some new layers so that you can create a different effect on each one.

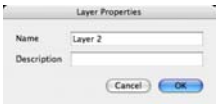
1. **To add the first new layer, select the City_rgb layer in the Layer Manager and then click 'Insert layer' on the contextual menu or click on the Layer Manager toolbar**
   A new layer, labelled Layer 2, is inserted above the existing layer.

   Each layer you add begins as a transparent sheet over the initial layer. As you add brush strokes, cutouts, or text, you cover up parts of the layer; transparent areas allow you to see the underlying layers.

   The new layer automatically becomes the current layer. If you now started painting, the effects would be painted onto Layer 2.

   You'll now rename the layer and give it a description before adding the remaining two layers.

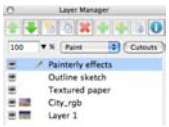
2. **With Layer 2 selected in the Layer Manager, click to open the Layer Properties dialog.**

   Change the name to 'Textured paper' and type the description 'Textured paper using grain', then click OK.

   Now create a further two layers in the same way, naming them 'Outline sketch' and 'Painterly effects'. You can add descriptions later if you wish, after you've created the effects.

   You should now have five layers, in the order:

   If your layers are ordered differently, use and to move them into this sequence.

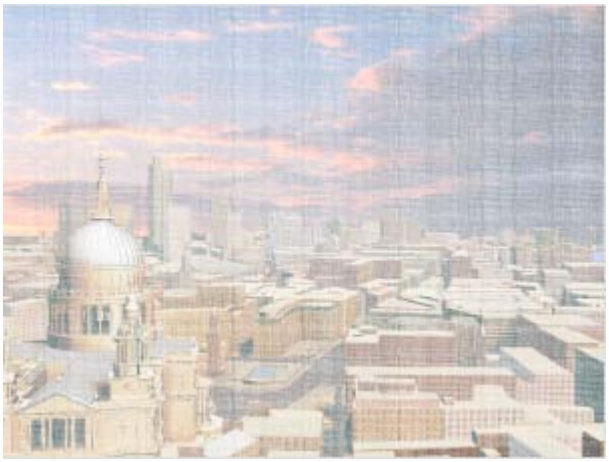
   Your layered EPix file is now ready for your artistic effects.

Exercise one - using grain

You can use grains to create the effect of a textured paper or canvas surface.

1. **Paint effects are always painted on to the current layer, so ensure you have the 'Textured paper' layer selected in the Layer Manager.**
2. **Using the Style selector, select the category 'Tutorial 5: Beyond photorealism'.**
3. **Apply the style '1a Clear to white', and click on the scene.**
   The style uses a non-contiguous fill to fill the entire scene with 100% white paint.
   Remember that we replace only the RGB channel when we paint the scene; the Restore RGB channel still contains the painted scene re-rendered in the previous exercise.
4. **Apply the style '1b Restore colour'.**
   This style uses a raster grain. The grain is previewed on the Colour, Texture and Grain toolbar.

   A raster grain is similar to an alpha raster texture used with 2D mode; more paint is applied at the dark areas of the raster image, and less is applied at the light areas. Piranesi offers separate texture and grain options so that you can overlay grain onto texture.
   Notice that the Colour amount slider (on the Colour, Texture and Grain toolbar) is set to 0%, so in this case, the dark areas will restore the Restore RGB colour. The lighter areas will mix the white paint with the Restore RGB, to give the canvas a faded appearance.
5. **Click on the scene.**

   In just a few simple steps, we have transformed the scene to look like a faded canvas.
6. **From the Grain type pop-up menu on the Grain palette, select Noise.**
   Noise grain works in the same way as noise texture. You met a noise texture in More textures and blend modes.

7. **Increase the scale of the grain, for example to 15, and press ⌘-R to reapply the effect.**

You could adjust the Colour amount slider to see how the result changes depending on the amount of colour Piranesi mixes with the Restore RGB colours. Try this with different selected colours.

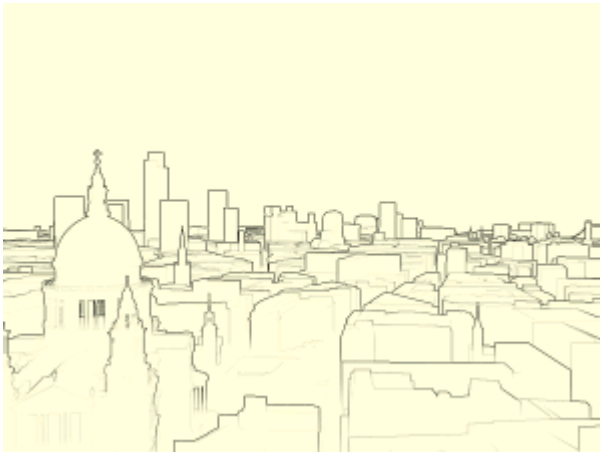
Note that if you set the colour amount to 10% or lower, Piranesi highlights the value as a visual reminder.

You could also try adjusting the Bias setting on the Grain palette: as you decrease the bias, less of the scene is restored, producing a more 'washed out' result.

Exercise two - creating an outline sketch

In this exercise, we will create an outline sketch of the scene using the Edge tool. We will then use a Filter and a multiple raster Painter tool to refine the result.

1. **First select the second new layer, 'Outline sketch' in the Layer Manager.**
   If you don't select this layer, the paint effects will be drawn on the textured paper layer thereby overwriting the previous effect.
2. **Apply the style '2a Clear to cream', then click on the scene.**
   The entire scene is filled with cream paint, to give the appearance of vellum.
3. **Apply '2b Silhouette edges'.**
   Look at the Edge settings on the Tool Options toolbar. Depth edge is selected, and the Balance slider is set to Silhouette. The outline—or silhouette—will be drawn wherever there are abrupt changes in depth.
4. **Paint the scene, working from the bottom of the scene to the top.**
   You can increase the size of the brush if you wish.
   Notice that no outline is painted for the detail in the sky. This is because the sky is a two-dimensional texture and has no depth.

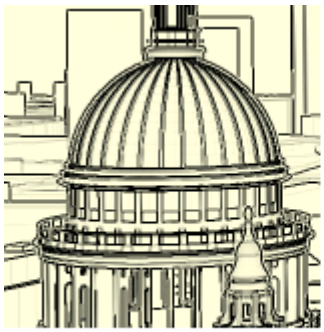
   

   If you paint an area of the scene with more than one paint stroke, the effect is stronger where the paint overlaps.
   We can add much more detail to the scene by also picking out the internal edges of the image.
5. **Now move the Balance slider to Internal on the Tool Options toolbar, by dragging it fully to the right.**
6. **Use the brush to paint some areas of the scene, such as the cathedral to the front left of the scene.**
   Piranesi picks out edges where the surface angle changes:

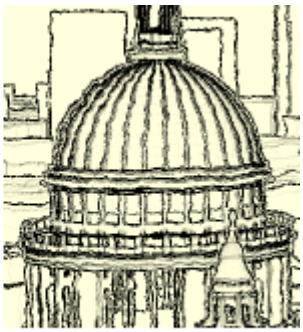
7. **Apply '2c Wobble image', then click on the scene.**

   Note that this style is quite complex and Piranesi may take some time to process the calculations and paint the scene. You won't see any difference in the scene until about 30% has been painted.

   This style sets the tool to Filter, and the filter mode to Random. This scatters the colour of the painted pixels to produce a 'wobble' effect. The Filter Amplitude is set to 5. This means that the pixels in the image may be scattered within 5 pixels of their original position. Scale specifies how dispersed the pixels will be; the lower the value, the more dispersed are the pixels.



before wobble effect



after wobble effect

   We'll now use a raster painter brush to restore some of the original colour to the scene.

8. **Apply '2d Restore brush.**

   Look at the Painter settings on the Tool Options toolbar. This style is a multiple raster painter brush, which uses three different raster images to define shapes of the brush marks.

9. **Paint an area of the scene to restore the colour to this part of the image.**

   For example:

The Painter tool scatters the brush marks around the mouse pointer as you move it across the scene. If you make three individual clicks you can the see the marks more clearly, or click Define on the Tool Options toolbar to see the bitmap images you are using.

The Opacity amount is set to 30% on the Colour, Texture and Grain toolbar, to create a soft effect. You can build up colour, similar to watercolour paint, by overlapping brush strokes, or by holding the mouse pointer at the same position.

10. **When you have finished painting, save your work.**

    Now you will repeat steps 1 to 8 to produce a similar result, using a single click!

11. **Apply '2e Multiple fill'.**

    This style uses the Multiple Fill tool:

    Look at the Multiple Fill settings on the Tool Options toolbar. The style category 'Tutorial 5 - Multiple fill' is selected.

12. **Click anywhere in the scene.**

    The Multiple fill tool works through all the styles in the selected style category that use the Fill tool. The progress of each fill is shown in the Status window.

    Note that Multiple Fill tool can also apply painter-splatter styles and command styles to a scene. For more details, refer to Piranesi Help.

13. **When Piranesi has finished painting, open the style category 'Tutorial 5 - Multiple fill' in the Style selector.**

    You will see that some of the styles are identical to the styles you used manually.

    An extra style has been added for the 'internal edges' step. Apply the style '2bii Silhouette - internal edges', so that you can look at its settings. This style uses Material lock. Look at the Lock settings by

on the Locks toolbar. 'Material list' is selected, which means that Piranesi paints only the materials shown in the list. (Click the button again to close the Lock Settings palette.)

The '2d Restore brush' style is also slightly different to its equivalent. Apply the style so that you can look at its settings.

The style uses the Fill tool with a grain. The grain was created by painting with the Painter tool (black on white) in an EPix file, then exporting the RGB channel. In this style, the grain is used in 'Fit' mode, so that the tile is fitted exactly to the size of the scene. This means that you could use the same grain in another EPix file that isn't exactly the same dimensions.

Exercise three - further artistic effects

In this final exercise of Tutorial 5, we will combine techniques you have already learnt with some new techniques using the Painter tool.

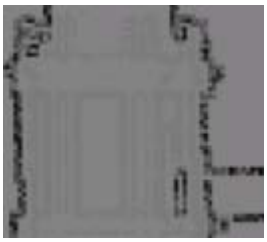
1. **Select 'Painterly effects' in the Layer Manager to make this layer the current layer.**
2. **From the category 'Tutorial 5: Beyond photorealism', apply the style '3a Clear to grey', then click on the scene.**

   The entire scene is filled with grey paint.
3. **Apply '3b Black silhouette edges', then click on the scene.**

   This style uses black paint with the Edge tool and a noise grain to outline the image. The Bias setting on the Grain palette controls the contrast between the light and dark areas of the grain. A bias of 0.5 produces a grain with equal light and dark areas.

   You won't see any difference in the scene until about 30% has been painted.

   If you zoom in to the scene, you will clearly see the grainy edge. For example:

   Zoom out again.
4. **Apply '3c White internal edges', then click on the scene.**

   Here, we are using an Internal edge style with noise grain and white paint. The Invert checkbox is selected on the Grain palette, so that the light and dark areas of the grain are reversed compared with the previous style. The overall effect is that of a chalked painting:

   We can smooth the edges of a scene to produce a softer effect using a Blur filter. We will combine this with a linear depth fade to fade the blur effect between two depths in the scene.
5. **Apply '3d Blur with depth fade'.**

   The Full and None settings for the depth fade are defined in the style. Use the status bar to find the approximate location of these depths.

Set the positional information on the status bar to 'Pixel and Depth' if this is not already displayed, by selecting from the first pop-up menu.

You can see the positional information on the left of the status bar, at the bottom of the document window.

6. **On the Tool Options toolbar, select the Splatter checkbox, then click on the scene.**

   Piranesi begins splattering the scene. Since this may take some time, press Esc when 20–50% of the scene has been splattered (when you are happy with the result). You can see the percentage and progress of the action in the Status window.

   For example:

   Look at the Painter settings on the Tool Options toolbar. This time the painter mark shape is 'Rounded', which means that the brush marks are simple strokes with rounded ends. The Advanced Settings palette offers a number of options for you to specify the shape of a rounded brush, such as the start and end size of the brush mark, and its orientation. Refer to Piranesi Help for details.

   The 'Mark orientation' is 2D, so the brush marks are always facing forwards.

   This style has the Plane and Material locks switched on. However, the 'Reset lock' option on the Tool Options toolbar is switched on. This means that the locks are applied to the material and plane that is under each splatter mark, then reset for the next splatter mark. The locks prevent paint from different planes and materials being smeared into one another, but paint is applied to the entire scene.

7. **Now apply '3f Small 3D painter brush'.**

   This is another Painter style, but the style does not use a grain.

8. **Zoom in to the area around the cathedral and paint the building and surrounding area with a continuous brush stroke.**

   If you have selected the Zoom tool to zoom in, click to select the Painter tool again.

   For example:

Notice how the 3D brush applies paint in the direction based on the plane beneath the mouse pointer:

before 3D splatter

after 3D splatter

Look at the Painter settings on the Advanced Settings palette. This time the 'Mark orientation' is Fixed, which means that the brush is oriented in a plane that is orthogonal both to the plane of the scene, and a specified fixed reference plane. Refer to Piranesi Help for more information.

9. **Use the '3g Restore edges' style, to refresh some of the edges.**
10. **Finally, apply the '3h Sky splatter' style and use the 2D brush to lighten the sky by restoring more of the restore RGB channel.**

    In this style, 'Reset lock' is not selected on the Tool Options toolbar, so the Material lock means that only the sky is painted. Use the automatic splatter feature if you prefer.
11. **Save your work.**

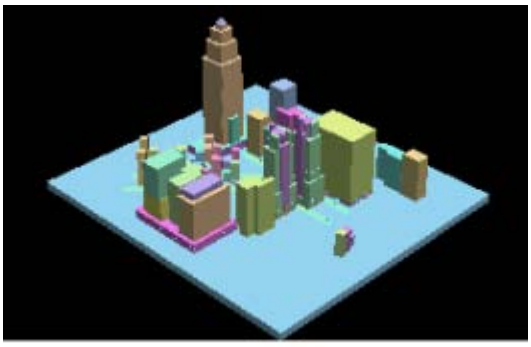
    Now that you have your three effects on three different layers, you can switch the view between them. Remember that the order of the layers represents their order in the scene; the top layer in the list is the top layer in the scene. Therefore, the final image is a view of the layer stack from the top down.

    To change the view of the final image, either make two of the special effects layers invisible by clicking thereby viewing only the third, or move a layer to the top of the stack by selecting it and clicking or by dragging it to the top.
12. **When you have finished switching between your painted effects, close the file.**

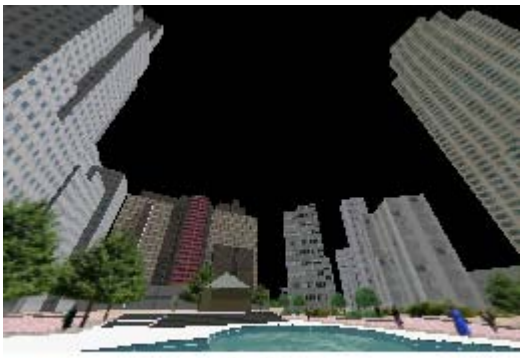
Tutorial 6: Working with Piranesi Panoramas

In this tutorial, you will learn about working with panoramas in Piranesi. In a Piranesi panorama, the geometry surrounds the position from which you view the scene.

You will be using a Piranesi panorama file that has been created from the model shown below. The scene has been partially painted for you. You will generate a style library of textures to complete the painting, and add a hemispherical sky texture.



original model

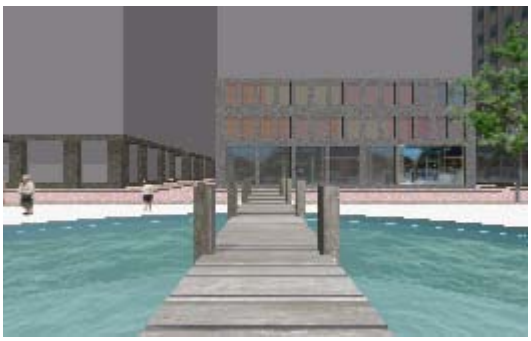


original scene

painted scene

Viewing a Piranesi panorama

In this exercise, you will open a Piranesi panorama file and practise navigating the scene.

1. **On the File menu, click Open.**
   Browse to the folder that contains the tutorial EPix files.
   See Opening a file for details of how to locate the tutorial EPix files.
2. **In the list of files, double-click on The Square.epp.**
   The scene shown is a view onto the Piranesi panorama defined by the view angle, the view direction, and the aspect ratio of the document window. The view angle and direction are set up in the EPix file, for example using Vedute.
   For example:
   
   Initially, the document window fills a portion of the screen. If you resize the document window, Piranesi remembers the new size when you next open the file, providing you have 'Load previous session's settings' selected in your preferences.
3. **Click the Hand tool on the Tools toolbar.**

   Note that in a standard EPix file, you can double-click the Hand tool to select it and also fit the scene to the current window size, but has no effect in a Piranesi panorama file.
   You will now pan the window, by moving the view extent.
4. **On the Navigate palette, drag the rectangle on the preview of the scene directly to the left.**
   You will notice that the view in the document window is simultaneously panned around the Piranesi panorama. If you keep panning directly to the left, you can pan around the entire scene until you are back where you started. You can also pan vertically until you are looking directly up or down (but you cannot pan past the vertical).
5. **Practise panning the Piranesi panorama.**
   You may find a smaller document window easier to pan.
   You can also use Page Up and Page Down to pan in the document window. See Piranesi Help for details.
   Notice that when you resize the document window, you do not see any scroll bars. This is because there is no 'maximum extent' in a Piranesi panorama.

6. **When you have finished, click Initial on the Zoom menu to return to the initial view.**

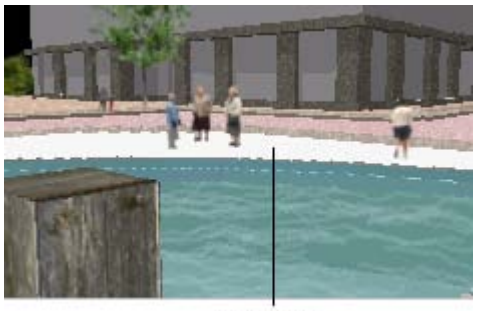
You can zoom in and out of a Piranesi panorama in a similar way to a normal EPix scene, as in Navigating the scene.

For full details about using all the available pan and zoom features, refer to Piranesi Help.

Painting Piranesi panoramas

Now you will paint the Piranesi panorama.

1. **In the Style selector, select the category 'Tutorial 6: Working with Piranesi panoramas'.**
   See Setting up the style library for details of how to associate the tutorial style libraries with the style selectors.
2. **Apply the style '01 Grass'.**
   This style uses a 2D hard circle brush, and a noise grain. Material lock is switched on, and Paint blend mode is selected.
3. **Move the mouse pointer over the scene.**
   The shape of the brush changes as you move it around. This is because it follows the shape of the Piranesi panorama as though you are painting on the inside of a sphere. You may have to zoom out to see this effect clearly.
4. **From the Brush settings on the Tool Options toolbar, select the 3D checkbox, then move the mouse pointer over the scene again.**
   Now the shape of the brush follows the geometry of the items in the scene, just as it did in Painting with 3D brushes.
5. **Click to select the Fill tool.**
   Ensure that the Contiguous checkbox is not selected on the Tool Options toolbar.
6. **Navigate the scene so that you can see the area of grass that is not painted, and click on it.**



Pan or zoom to view the scene; the entire area of grass has been painted all around the Piranesi panorama.

Because you can never view the entire Piranesi panorama at once, when you are using a non-contiguous fill you should be careful that you don't inadvertently paint an area of the scene that you cannot see.

Building a style library

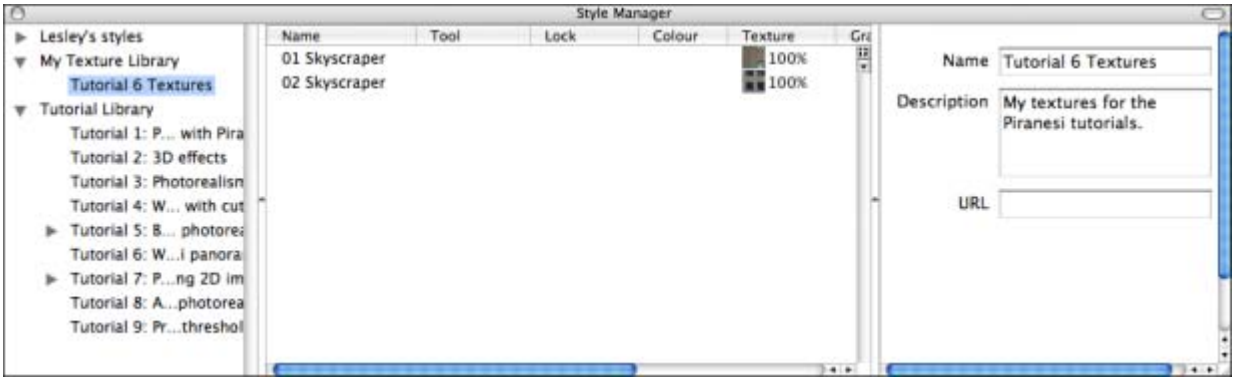
If you have a set of images that you want to use as brushes, cutouts, textures, or grains, Piranesi can build a set of styles from the files for you. In this exercise, you will build a library of textures to use in the Piranesi panorama.

1. **On the Style menu, click Library, Style Library Builder.**
   The Style Library Builder Assistant is displayed.
2. **Ensure that Texture is selected for 'Type of styles to create'.**
   This tells Piranesi to use the files in the folder to create a set of raster texture styles.
3. **Click Browse and browse to the folder that contains the tutorial resource files.**
   If you have installed Piranesi 6 Pro in the default location, the resource files are in :Applications:Piranesi 6 Pro:Tutorial:Resource.
4. **In the Resource folder, select the 'Tutorial 6 Textures' folder and click Choose.**
   The Browse dialog is closed, and the name of the folder you selected is shown in the 'Select folder containing your images' box.
5. **Click Continue.**
6. **Ensure that the Mode is set to Tangent and the width in the Size box is set to 1000 (or 1.00 if units is in metres), then click Continue.**
   You can adjust the size of each texture later by editing the individual styles.
7. **Click Browse.**
   A Save dialog is displayed. Select the folder in which you want to create the new library, type a name for the file and then click Save.
8. **Type a description for your new texture style library in the Description box.**
   Notice that the default name for the Style Library is 'My Texture Library'.
9. **Click Create.**
   The Style Library is created with the name 'My Texture Library', and is shown in the tree view in the Style Manager.

Working with style libraries

Now that you have created the texture library, you can open the styles and change them as required. But first, we'll look at the new styles, and reorganise the style libraries.

1. **Using the Style Manager, open the library 'My Texture Library' that you just created.**
   A category called 'Tutorial 6 Textures' has been created in the library.
2. **Click the 'Tutorial 6 Textures' category to open it.**
   Your new texture styles are displayed in the list view.

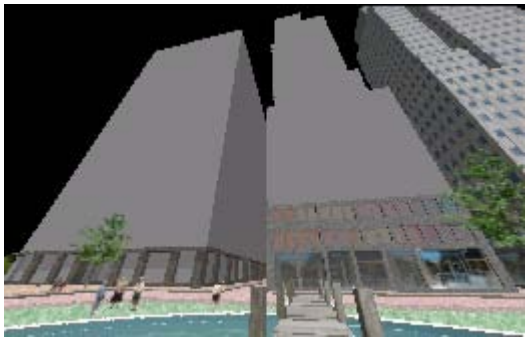


   The name of each style has been generated from the file from which it was created. Notice that the default view shows details. If you prefer, you can change the display to icons instead using the View menu.
3. **Click on '01 Skyscraper' and click Style Properties on the contextual menu, to see the style's properties.**
   Only the Texture box is selected. This is because the style is a partial style, like the one you met in Using partial styles.
4. **Click OK to close the Style Properties dialog.**
   We will now copy the new category to the style library that you created in Creating a new library.
5. **Open the library you created in exercise 1.14, if it is not already open.**
   If you didn't create a new library in Tutorial 1, you can open any existing library that is not locked or read-only. Alternatively, you could create a new library.
6. **With the pointer on the 'Tutorial 6 Textures' category that you just created, press ⌘-C.**
7. **Move the mouse pointer to your library and press ⌘-V.**
8. **On the Style menu, click Library, Save All to save all the changes to the libraries.**
9. **If you do not save now, Piranesi will save the changes for you automatically when you exit.**

Applying textures to panoramas

You can paint textures in a Piranesi panorama in just the same way that you paint in a standard EPix file. We will now use your new texture styles to paint the scene.

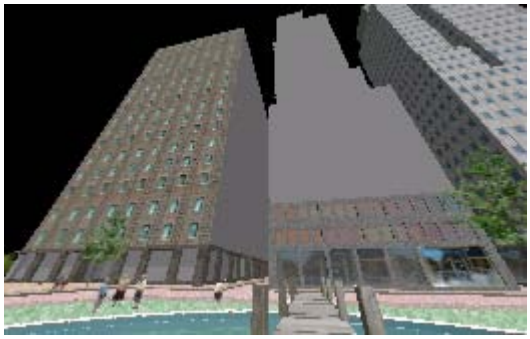
First you will pan the scene so that you can see the area that you are going to paint.

1. **Click on the Tools toolbar.**
   The mouse pointer changes to
2. **Drag the scene in the document window so that you can see the buildings that have not yet been painted.**
   The buildings are at the shore end of the jetty.
   
3. **Apply the style '01 Grass'.**
4. **Now, from the 'Tutorial 6 Textures' category of your own library, apply the style '01 Skyscraper'.**
   Because this is a partial style, only the texture is applied to the toolbars and palettes. All the other settings remain the same as for the 01 Grass style you applied in the previous step.
5. **Click to switch on the Orientation lock.**
   Material lock is already switched on.
6. **We don't want to use the grain this time, so clear the Grain checkbox on the Colour, Texture and Grain toolbar.**
7. **Look at the Texture settings on the Texture palette.**

   If the Texture palette is not currently displayed, click to the right of the Texture preview box.
   The Type, Mode, Hook, Size, and File name settings were set up by Piranesi when the style was created.
8. **Set the other values as follows, if necessary:**
   - Repeat X and Y: selected
   - Angle: 0
   - Measure: Width
   - Size: 10.0m
     If your units are not set to m (metres), you can change the display units in your preferences. See Piranesi Help for details. Alternatively, type an equivalent size in the box (such as 10000, if you are using millimetres).

   All other settings should be switched off.

9. **Click on the Tools toolbar to change to the Fill tool, make sure that the Contiguous check-box is selected on the Tool Options toolbar, then click on the front of the left-hand building.**



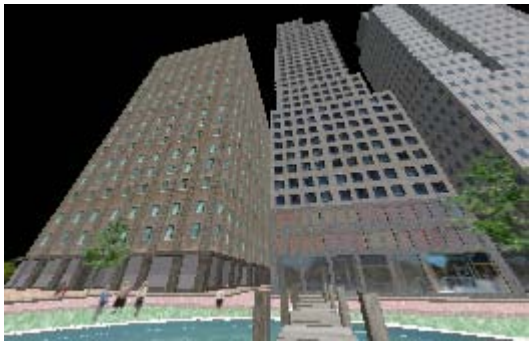
If you would like to experiment further, you could tweak the texture just as you did in Tweaking textures.

When you are happy with the texture, you could save it to the same style, or you could save it to a new style if you prefer. If you want to save more than just the texture setting, remember to select all the appropriate boxes in the Fields list. Refer back to Saving a new style, or refer to the Piranesi Help for a reminder of how to save styles.

10. **Paint the rest of the left-hand building, then paint the other unpainted building using the '02 Skyscraper' texture style.**

Remember to change the size and scale of the texture, and tweak it as necessary.

For example:



11. **When you have finished, save the Piranesi panorama to a new name.**

Adding a hemispherical sky

To complete the scene, we will add a sky. However, because you are working with a Piranesi panorama, to achieve a realistic appearance the sky must be hemispherical.

Hemispherical image files are created in specialist software. The sky we use in this tutorial is provided courtesy of Marlin Studios (see http://www.marlinstudios.com) and must not be redistributed. You can purchase other textures that you can use in Piranesi from Marlin Studios.

1. **Using the Style selector, from the 'Tutorial 6: Working with Piranesi panoramas' category, apply the style '02 Hemispherical sky'.**
2. **Click on an area of sky.**
   The sky is painted.

3. **Pan around the sky.**
   You will notice that the sky has wrapped around the entire Piranesi panorama. If you look directly upwards, you'll see a small area that has not been painted because of the way in which the texture has wrapped around the scene.

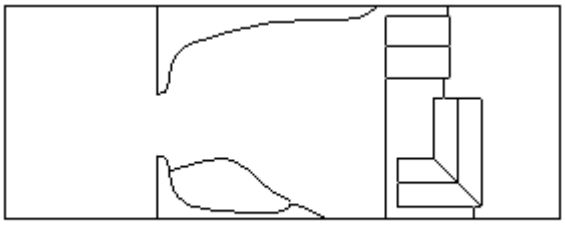
4. **Apply the style '03 Simple brush'.**
5. **Click on the Colour, Texture and Grain toolbar, and pick the colour near to the hole in the sky.**
   You may have to zoom in to do this.
6. **Paint over the area that has not been painted.**
   This completes the painting of the Piranesi panorama. You may wish to print the scene. Note that when you print a Piranesi panorama, you print only the current view. Refer back to Printing the scene or see Piranesi Help for details about printing.

7. **Save your work and close the file.**

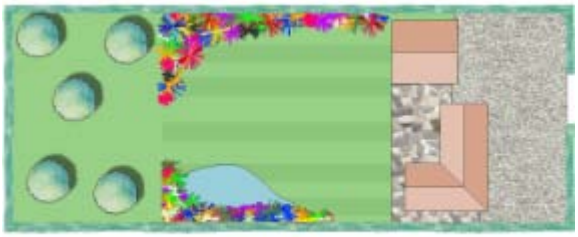
Tutorial 7: Painting 2D Images

This tutorial shows you how you can use a 2D image, in this case a PNG file, to create a new EPix file. The 2D image you will use is a line drawing of a house and garden in plan view.

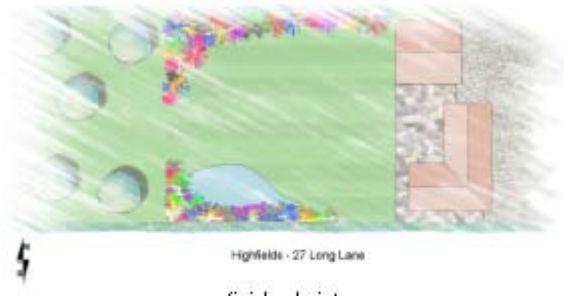
You will then paint the new EPix file to create materials and depth information. You'll also learn how you can create a new cutout in Piranesi.



original image



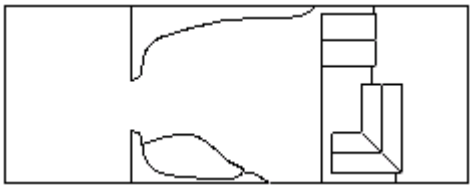
painted scene



finished picture

Creating a new EPix file

In Exporting and importing colour images, you imported a PNG file into the RGB channel of an existing EPix file. In this tutorial, you will create a new EPix file from a PNG file.

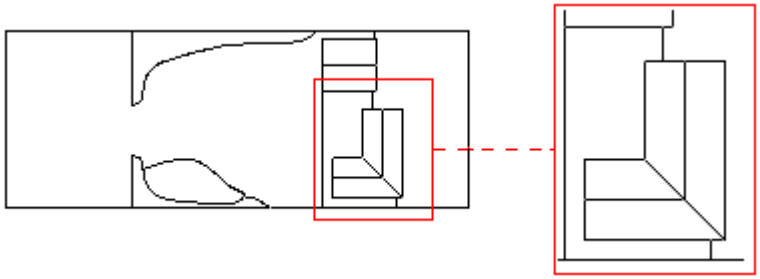
1. **On the File menu, click New.**
2. **Select 'Create an EPix file from an Image file' and click Continue.**
   Click Browse and open the folder that contains the tutorial resource files.
   If you have installed Piranesi 6 Pro in the default location, the resource files are in :Applications:Piranesi 6 Pro:Tutorial:Resource
3. **In the list of files, double-click 'House Plan.png'**
   The Choose a File dialog is closed, and a thumbnail of the file you selected is shown in the preview box.
4. **In the Depth range box, type 200.**
   Piranesi will create the EPix file with a depth range of 200 model units. The image will be placed at half the maximum depth, at 100 model units, so that you can construct planes both in front of, and behind, the original image.
5. **Ensure that 'Plan view' is selected in the View type pop-up menu and click Create.**
   The House Plan is opened in a document window.
   
   Piranesi gives the file a default name of 'untitled'.
   Move your mouse pointer over the scene and watch the Z coordinate shown on the status bar. If X, Y and Z are not shown, select 'XYZ position' from the pop-up menu (on the right of the status bar). The linework has been placed on a plane at Z = zero.
6. **On the File menu, click Save As to save the file to a new name.**
   Specify the location into which you want to save the new file, and type a name for the file.
7. **On the Save dialog, click Save.**

Setting up the EPix file

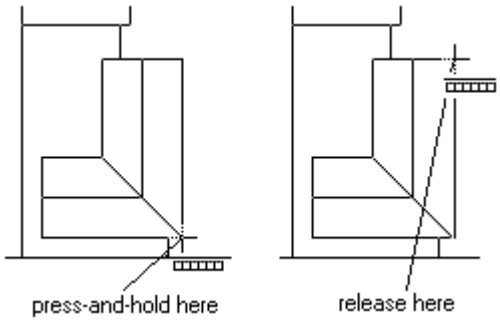
Now that you have created the EPix file from the image file, you can paint the scene in the usual way. However, first you must set up the model geometry so that any real world brushes, textures, or cutouts that you use will be the correct size.

To do this, you need a known measurement in the real world. In this case, you will use the frontage of the house, which is nine metres.

1. **Zoom in to the house.**



2. **On the File menu, click Properties.**
   On the File Properties dialog, notice that the model units section shows '1 model unit is 1.000' and that the units is Unknown.
3. **Click OK on the File Properties dialog and then on the Edit menu, click Set Model Size.**
   The Set Model Size dialog is displayed. If necessary, move the dialog if it obscures the line drawing in the window.
4. **In the 'Real world measurement' box, type 9, and select 'm' from the pop-up menu.**
5. **Click Pick From Model, and indicate the distance in the scene that represents nine metres:**
   a. drag from one corner of the house frontage, as shown below
   b. press Shift to constrain the mouse movement to the image axes, and drag the mouse to the other corner
   c. release the mouse button then the Shift key



6. **Click OK.**
7. **To check that the model units have been correctly updated, click Properties on the File menu.**
   Notice that Piranesi has updated the '1 model unit is' box with the correct scale factor (approximately 0.033m).

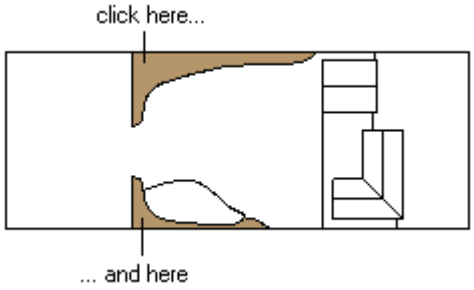
8. **Click OK on the File Properties dialog.**
   Now we will show that the geometry setting is correct.
9. **Open the Style selector, select the category 'Tutorial 7: Painting 2D images' and apply the style '01 3D Rectangle brush'.**
   See Setting up the style library for details of how to associate the tutorial style libraries with the style selectors.
   If you look in the Brush settings on the Tool Options toolbar, you will see that the size (long edge) of the brush is 9m (rotated through 90 degrees).
   If necessary, click to open the Advanced Settings palette and you'll see that the brush is set to an aspect ratio of 10%. This changes the brush shape from a square to a rectangle, one tenth of its size saved in the style.
10. **Move the mouse pointer over the house in the scene.**
    The brush is the same length as the house frontage, showing that the model geometry has been set up correctly.

You can use the Set Model Size dialog whenever the model units are set up incorrectly in an EPix file. If the known 'real world' distance is not parallel to the view plane, Piranesi automatically accounts for the perspective. You can constrain the mouse pointer to the 'real world' axes when you pick the distance, or to a fixed direction. See Piranesi Help for more information.

Adding geometry to the scene

In Depth and material views, we looked at the depth and material channels of the lobby scene. We will now do the same with the new EPix file.

1. **On the View menu, click Material Channel.**
   The Material view is shown as solid black. This is because there are no materials defined in a 2D image such as a PNG file.
2. **Now view the Depth channel.**
   The Depth view is shown as solid grey. This is because a PNG file does not hold any depth information.
3. **Return to the RGB channel.**
   You can add depth and material information to a scene using the Construct tool, as you will see in the following steps.
4. **Apply the style '02 Flower borders'.**
   This style uses the Construct tool, with a contiguous fill.
   Click on the Locks toolbar to open the Lock Settings palette. The only lock we can use at this stage is the Colour lock, because there are no materials and everything is in the same plane and orientation. The tolerance is set to 8, so only those pixels whose RGB values are within 8 of the RGB value you click on are painted.
5. **Close the Lock Settings palette and then look at the Construct settings on the Tool Options toolbar and also on the Advanced Settings palette.**
   The 'Replace farther pixels' and 'Include pixels in plane' options are selected, so Piranesi will change the pixels that lie behind, or in the same plane as, the plane you click on.
   An Offset of 0.025m is set. This offset does not have any 'real world' significance, but we want to have some different depths to work with. We have also specified a new name to be used for the material.
6. **Zoom out if necessary, and click on the flower border areas in the scene, as shown.**



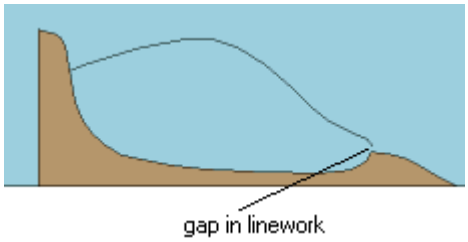
   If you move your mouse pointer over the scene and look at the Material box on the Information toolbar, you will see that a new material called Soil has been created in the areas that were painted. You can also see the material if you look at the Material channel again.
   Look at the Z coordinate shown on the status bar as you move your mouse pointer over the scene. The painted area is at 0.025, because we used an offset of +.025m. The new plane is closer to the eye than the base drawing.

Re-touching the line drawing

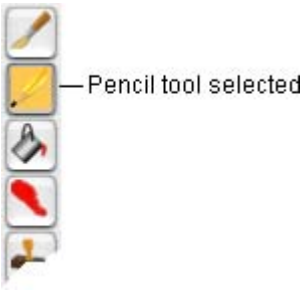
Often, when you create a new EPix file from an image file, some of the linework is incomplete. In this exercise, you will re-touch a missing part of the image.

1. **Apply the style '03 Pond'.**
   This style also uses the Construct tool and Colour lock. This time, no offset is set, so that the level of the pond will be 'below' the level of the borders.
2. **Click on the pond.**

   The pond is filled with blue paint, but so is the lawn.
3. **Zoom in to the pond area.**
   You'll see a small gap in the linework. This is where the Pond style 'leaked' out.

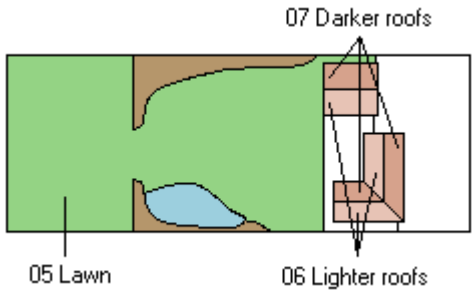


4. **Press ⌘-Z to undo the pond paint.**
5. **Apply the style '04 Fill in the gap'.**
   The pencil tool is selected.



6. **Click the mouse button over one end of the gap, move to the other end and click again.**
   Alternatively you can drag from one end of the gap to the other.
   A line is drawn across the gap.
   You can constrain the pencil vertically or horizontally in the same way as you can with the brush. Look back at Applying styles and painting, or see Piranesi Help for more information.
   As well as drawing single lines, the pencil can draw connected lines, and hollow or filled rectangles and ellipses. All these options are described in Piranesi Help.

7. **Now use style '03 Pond' to paint the pond again.**
   This time, the paint is restricted to the pond area.
8. **Paint the lawn and the roofs using styles 05 to 07, as shown below.**



These styles also use the Construct tool to create new materials and depth information. The lawn is created 'above' the pond and soil, and the roofs are 1m above the pond. Again, the different depths are used to create geometry to work with, rather than for any realistic effect.

You will learn about using Construct to create 'realistic' geometry in Tutorial 8.

Constructing with textures and grains

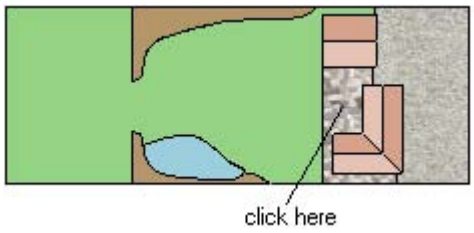
We will now paint the drive so that it looks like gravel, using a noise grain.

1. **Apply the style '08 Drive grain'.**
   This style uses the Construct tool with an offset of 0.05m, and a noise grain.
   Click » on the far right of the Colour, Texture and Grain toolbar and look at the settings on the Grain palette to see the grain that you will use. Remember that with a noise grain, paint is applied at the dark areas of the raster image, and less is applied at the light areas.
   Click on the drive.

   If you move your mouse pointer over the painted drive area and look at the status bar, you will notice that the Z coordinate alternates between 0m and 0.05m. This is because the new depth and material information is constructed only in the areas of the grain that are more than 50% grey, so there are 'holes' in the drive. This is not what we want.

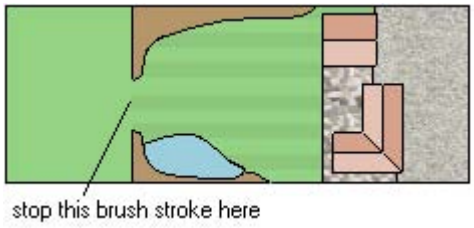
2. **Apply the style '09 Drive texture', and press ⌘-R to reapply.**
   This time the drive is painted at a constant depth of 0.05m, because we used a raster texture that did not have alpha information, instead of the grain.

3. **Apply the style '10 Paving', and click in the remaining blank space.**



4. **Apply the style '11 Mow the lawn'.**
   This style uses the Brush tool. We don't need to use Construct this time, because we created the lawn plane in Re-touching the line drawing.
   Notice that the style uses the Material lock. We can use the Material lock now because we created a number of materials in the previous exercises. Switch to the Material channel to see the new materials, but remember to switch back to RGB view.

5. **Paint stripes on the lawn, to create the effect of a mown lawn as shown below.**
   Press Shift as you paint each stripe to constrain the brush stroke to the horizontal image axis.

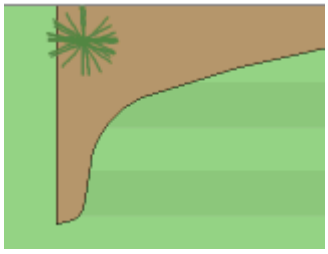


Because we have created materials, the effect is painted only on the lawn.

Recording styles for future use

We will now bring the scene to life by painting some flowers in the borders. This can be quite time consuming, so we will use the automatic style recording facility to help.

1. **On the Window menu, clickShow Style Recorder.**
   The Style Recorder is displayed ready to start recording and storing your styles.
2. **On the Style Recorder palette, select the 'Record styles' checkbox.**
3. **Now apply the style '12 Planting'.**
   The Painter tool is selected which you'll use to add paint to the scene.
4. **Press-and-hold the mouse button with the pointer over the border, then release.**
   The Painter brush marks rotate around the mouse pointer in a circular pattern. For example:

   To see how the brush marks have been set up, open the Dynamic Settings palette by clicking Show Dynamic Settings on the Window menu. The brush marks are painted at a variety of angles because the Angle spread is set to 90 degrees. The marks, however, do not deviate far from the pointer because the Mark spread is only 4%. The Delay of 30msec shown in the Painter settings on the Advanced Settings palette means that the marks are painted slowly so that you have more control.

   As soon as you started painting, the style was automatically added to the Record Styles palette. Whenever you next change any of the style's settings, a new style will be created and added to the palette.
5. **Paint some more foliage, then change the colour to create the impression of brightly coloured flowers.**
   Experiment with different Painter settings. For example you could vary the size of the brush or add some random colour spread (using the Dynamic settings) to the brush. Refer to Piranesi Help for details.

   The Style Recorder palette should now have several styles recorded, each shown in the colour you selected:

In the next exercise, you will reuse these styles to paint the other border. If there are any styles you don't want to keep, select them and then Ctrl-click in the list and click Delete on the contextual menu.

6. **To stop recording any future styles, switch off the style recorder by clearing the 'Record styles' checkbox.**

Creating cutouts from EPix files

Now that you have a series of Painter styles, you could paint the other border quite quickly. Instead, however, we will show how you can create a cutout from your painting and use it in the other border. Once you have created a cutout you can use it again in other scenes.

1. **On the File menu, click New.**
2. **On the New File Assistant, select 'Create an EPix file' and click Continue.**
3. **Select Custom from the Size pop-up menu.**
4. **We will be specifying a custom size, so type a width of 400, a height of 200, and a Depth range of 100.**
5. **Select Plan view, and click Create.**
   A new, blank EPix file is created.
6. **Apply '13 Fill with black', and click in the new scene.**
   The scene is filled with black paint. A black background creates a softer edge for cutouts, as we shall see.
7. **Now, double-click the first style in the Style Recorder and paint some flowers and foliage.**
   Paint roughly in the shape of the other border, working through the recorded styles in any order you choose.
   Ensure you do not paint the top, left-hand pixel of the EPix file. This is because the top, left-hand pixel of a cutout image defines its 'transparency colour'; Piranesi makes all pixels that are the same colour as this transparent.

8. **When you are happy with the image, on the File menu click Export, and save the file as a Portable Network Graphics Image file called 'flowers.png'. Accept the default PNG Options when offered.**
   For a reminder of how to do this, look back at Exporting and importing colour images, or refer to Piranesi Help.
9. **Save the EPix file, and close it.**

Placing cutouts in the scene

We will now add the cutout flowers that you created in the previous exercise to the scene. Then we will add some cutout trees.

1. **Apply the style '14 Planting cutout', and click OK at the prompt. Then click Browse on the Tool Options toolbar, and select the PNG file you created in Creating cutouts from EPix files.**
2. **Click just to the left of the flower border, and use the Tweak features on the Cutout Manager to fit the cutout to the border.**

   Ensure that you click on the lawn when you place the cutout so that the cutout is placed at the same depth as the lawn. For example:

   before tweaking

   after tweaking

   Refer to Tweaking cutouts for a reminder of how to tweak cutouts, or refer to Piranesi Help. You may want to place more than one cutout to fill the border.

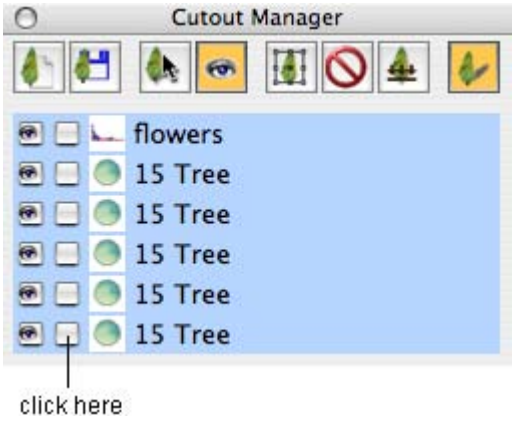
   Notice that the black background of the cutout is not painted, because you left the top, left-hand pixel black in the EPix file.
3. **Apply the style '15 Tree'.**

   This is another Cutout style, this time using a picture of a tree that was painted by hand, then scanned in and saved as a Tiff file. An alpha channel was then added using a painting package. See Piranesi Help for more information.
4. **Place a tree at the end of the garden.**

   We want the tree to cast a shadow, so we need to raise it from the lawn. If you look at the cutout hook location on the Cutout Manager, you'll see that the Z coordinate (the last coordinate) is 0.05.
5. **In the Cutout settings on the Advanced Settings palette, type an offset of 2.0 and reapply the cutout.**

   The tree cutout is redrawn with its hook point raised 2 metres off the ground. You can check this by looking at the hook point coordinates again on the Cutout Manager.
6. **Add a further four trees to the grass area. Each will be placed at the same height.**

   Now we will add shadows to the cutouts.
7. **In the Cutout Manager list, select all of the tree cutouts and click the empty box to the left of one of the tree cutouts.**

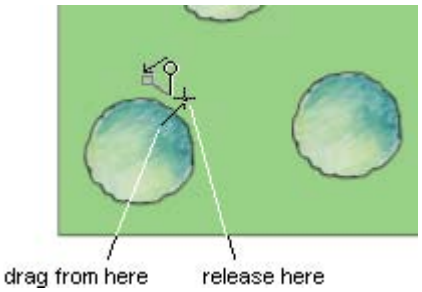


This switches Cast shadows on for all selected cutouts. We now need to regenerate the shadows.

8. **Ensure that the following settings are set:**
   - Generate shadows: On
   - Shadow Softness: 0.40
   - Shadow Blend: 50%
   - Shadow Colour: black

   We will now set the shadow direction.

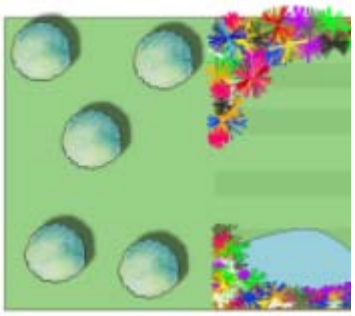
9. **Zoom in to a tree, and click Pick on the Cutout Manager.**
10. **Press-and-hold the mouse button on the tree, drag a short distance diagonally upwards and to the right, then release the mouse button.**



The shadow Direction box is updated on the Cutout Manager.

11. **Zoom out, then on the Cutout Manager, click 'Update All'.**

The shadows are generated for the trees:

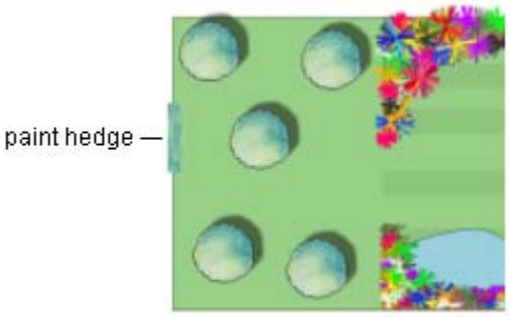


12. **Save your work.**

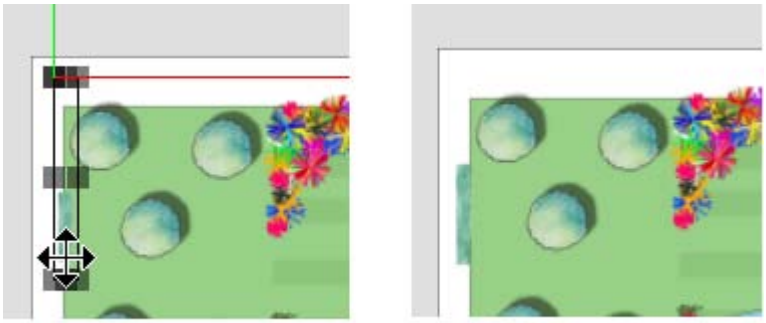
Using textures

You'll now paint a hedge using a texture.

1. **Apply the style '16 Hedge'.**
   This style uses a raster texture with the Construct tool.
2. **Paint a short section of the hedge at the end of the garden.**
   For example:

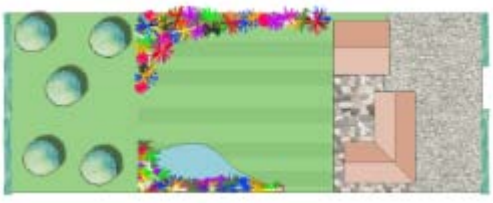


3. **Under the Texture settings on the Texture palette, click Tweak, then move the hedge to the left so that it is drawn at the boundary of the garden, and press Esc.**



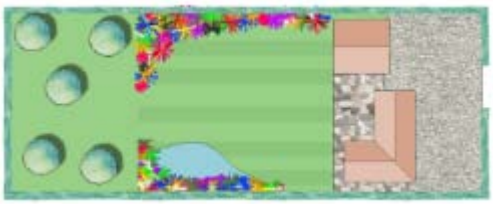
shift the hedge to the left

4. **Press ⌘-Z to undo the painting (but not the tweak), then paint the full length of the hedge.**
   If you are zoomed in to paint the hedge, you may need to suspend the brush stroke to pan the window. If this is the case, make sure that you begin your new brush stroke on the white border and not on the hedge. This is because the hedge is constructed with an offset 1 metre high, and painting over it would construct the new section of the hedge 1 metre higher than the first.
5. **Paint the drive end in the same way, leaving a gap for the drive.**
   You may need to tweak the texture again.



6. **On the Texture settings, type 90 in the Angle box to rotate the texture, then paint the top and bottom boundaries.**

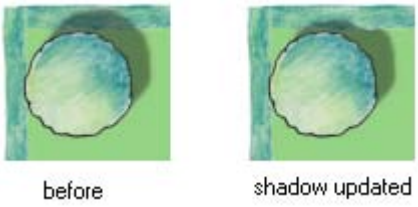
Again, you may need to tweak the texture.



Notice that any shadows cast by the trees are painted over the top of the hedge, because the trees were placed 'higher' than the hedge, and the cutouts have not yet been burnt in. However, the flowers are lower than the hedge, so Piranesi has painted over these where they overlap.

7. **If any of your trees cast shadows over the hedge, select the trees in the Cutout Manager, then click 'Update Selected'.**

   The shadows are recalculated to account for the new geometry you created when you painted the hedge. For example:



8. **In the Cutout Manager, press ⌘-A to select all of the cutouts, then click to burn them in.**
9. **You may find that some of your flowers extend beyond the hedge at the top; if so, you can use the style '17 Restore brush' to tidy up the scene.**

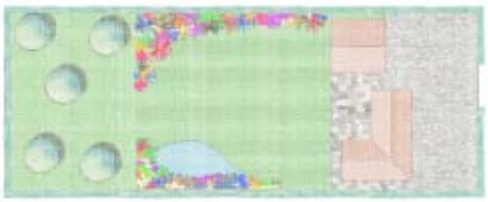
   This style has Material lock switched on, so only the material under the mouse pointer will be painted. To restore only the background of the scene, start your brush stroke on the white background and brush over any extending flowers using a continuous stroke.
10. **Save your work.**

Non-photorealistic effects

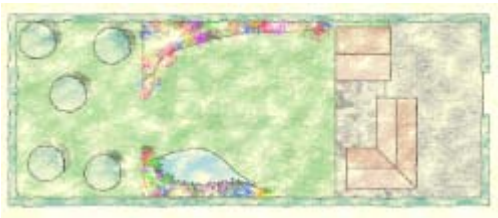
Now that you have created material and depth information in the scene, you can use this to create non-photorealistic effects.

First, we need to re-render the file so that we can use the Restore channels for the effects.

1. **On the File menu, select Re-Render, and click OK at the prompt.**
2. **Apply the style '18 Multi fill - Canvas effect' , then click anywhere in the scene.**
   This is a Multiple Fill style, which re-creates the effect you saw in Exercise one - using grain.



3. **Apply the style '19 Multi fill - Watercolour effect', then click anywhere in the scene.**
   This is a multiple fill style, which re-creates the effect you saw in Exercise two - creating an outline sketch. In this style, however, the grain restores the entire scene.



4. **Apply the style '20 Multi fill - Streaked effect', then click anywhere in the scene.**
   This style also uses a grain to create a soft, streaked effect.

5. **Complete the scene by adding a North sign and a title, using styles '21 North' and '22 Title'.**
   '21 North' is a raster cutout. Change the angle as required, and click on the scene to place the sign.
   '22 Title' is a text cutout. Type the title **Highfields - 27 Long Lane** in the Text box on the Tool Options toolbar, and click on the scene to place it.
6. **In the Cutout Manager, select the cutouts and then click** **to burn them in.**
7. **Save your work and close the file.**

Tutorial 8: Advanced Photorealism

This tutorial builds on the techniques you have already learnt, and introduces some new features, such as how to add reflections to the scene and create point light illumination.

You will paint a hallway to create a daytime scene. You will then adapt the scene to create the effect of dusk.

original scene

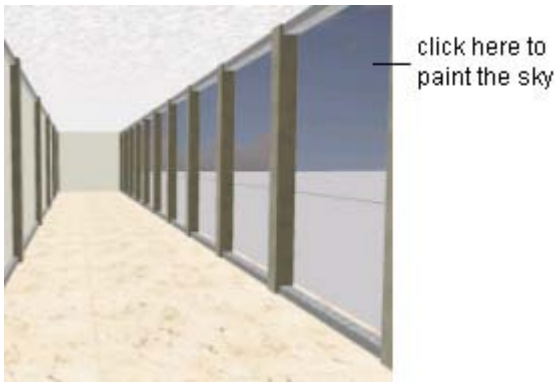
daytime scene

dusk scene

Mixing textures and colours

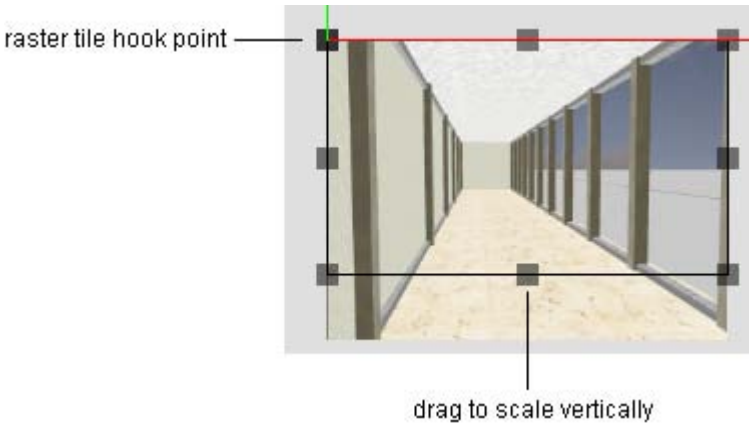
In this exercise, we will set the scene by adding sky, grass, and a road to the scene. The styles blend the textures and colours to produce the results we require.

1. **Open the file 'Hallway'.**
   See Opening a file for details of how to locate the tutorial EPix files.
2. **In the Style selector, select the category 'Tutorial 8: Advanced photorealism'.**
   See Setting up the style library for details of how to associate the tutorial style libraries with the style selectors.
3. **Apply the style '01 Sky background'.**
   Notice that the Texture amount is set to 75%. This means that 75% of the raster file's colour is mixed with 25% of the selected paint colour (white).
   Look at the Texture settings on the Texture palette. It shows a preview of the picture that you will be using. The texture mode is 2D, which means that the texture will not be painted with perspective.
4. **Click on the background of the scene to paint the sky:**

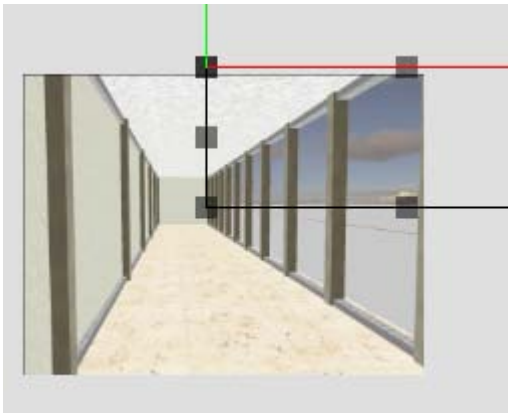


   Note the difference in colour between the preview image on the Texture palette and the painted sky. This is because 25% of the white colour has been mixed in.
   The raster tile is larger than the background area that is painted. To give the sky the appearance of more depth, we will resize and move the tile, using the tweak tools.
   When you tweak the texture, you will see an outline of the raster tile. You'll see the outline more clearly if you zoom out of the scene.
5. **Press ⌘- – (minus key), or click Out on the Zoom menu, until you can see a border around the scene in the document window.**
6. **On the Texture settings, click Tweak and move the pointer into the scene.**

7. **Drag the bottom-centre handle up to just below the horizon.**



8. **Now move the tile so that the bottom-left corner is aligned with the far wall, also at the horizon level:**



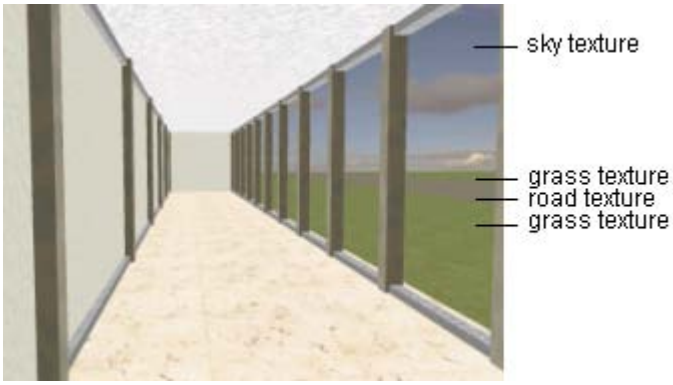
Notice how the vertical resize of the tile created a more panoramic view of the sky, whereas sliding the tile diagonally moved the view point of the tile.

9. **When the raster tile is correctly positioned, end tweak mode by pressing Esc or clicking the Tweak button.**
10. **To switch back to the last view stored in Piranesi, click Previous on the Zoom menu.**
11. **Apply the style '02 Grass', then click on the scene in the grey area to the right of the columns.**

The style uses a non-contiguous fill with Plane lock. Two separate areas are filled with paint, because they are both on the same plane:

Look again at the Texture amount. This time it is set to 60%, so 60% of the raster file's colour is mixed with 40% of the selected pale green colour.

12. **Now apply '03 Road', and click on the road between the grass.**
13. **This style also blends the texture colour with the current colour.**



14. **Save your work to a new name.**

Constructing new scenery

As you saw in Tutorial 7: Painting 2D Images, you can use the Construct tool to create new planes, thereby changing the physical structure of the scene.

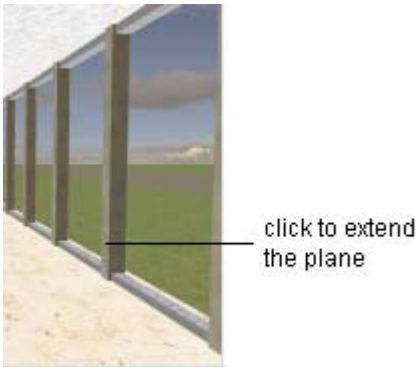
In this exercise, you will construct a hedge by extending an existing plane in the scene.

1. **Apply the style '04 Hedge'.**

   Look at the Construct settings on the Tool Options toolbar.

   The Construct Mode 'Replace farther pixels' will change the pixels that lie behind the selected plane, but not the pixels on, or in front of, the selected plane.

2. **Construct the hedge by clicking on the inner plane of the second column on the right, towards the bottom, as shown:**

   The plane of the column is extended and the hedge constructed. Obviously the hedge is in the wrong place; we will move it in the next step.

   The extended plane is assigned the same material as the selected plane. You can see this by looking at the Material channel or on the Information toolbar when the mouse pointer is directly over the hedge in the scene.

   We are now going to create the hedge again, this time in the correct place and with a new material.

   If you are viewing the Material channel—indicated on the status bar of the document window—click RGB Channel on the View menu.

3. **If you are working in units other than metres, on the Piranesi menu, click Preferences, then select 'm' from the 'Display units' pop-up menu and click OK.**

4. **Under the Construct settings on the Advanced Settings palette, type –20 in the Offset box and select 'New name each time', then reapply the effect.**

Note that a negative offset moves the construct location away from you, in this case to the far side of the road.

If the Advanced Settings palette is not currently displayed, first click » on the Tool Options toolbar.

The hedge is painted on the far side of the road:

The new plane is placed at the specified distance behind the selected plane because we entered a negative offset.

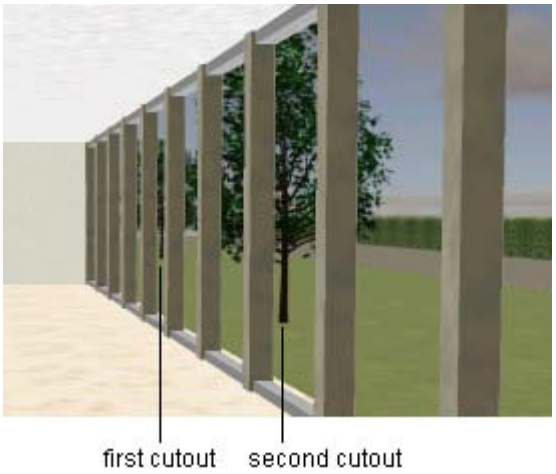
Now view the Material channel again. You will see that the hedge and columns are shown in different colours, which indicates that they are assigned different materials. If you look at the Information toolbar or the status bar, you'll also see that Piranesi has assigned the name 'Construct 1' to the new material. The next plane you extend with a new material is given the name 'Construct 2', followed by 'Construct 3', and so on. You can also enter a new name for a material, as you saw in Tutorial 7, or you can pick an existing material name.

5. **Ensure that you switch back to the RGB channel before you continue.**

Adding cutouts to the scene

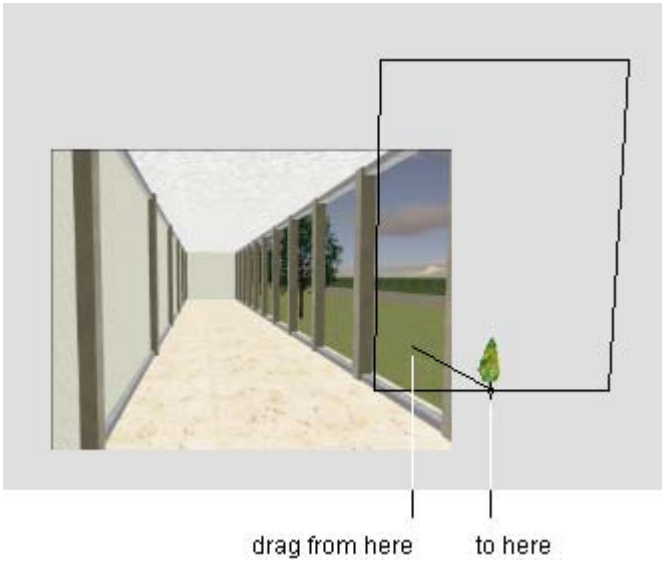
In this exercise, we will add some activity to the scene by placing some cutouts in the picture. We will also place a cutout partially out of the scene, to give a photorealistic impression.

1. **Apply the style '05 Trees'.**
   The Cutout tool is selected. Look at the preview of the tree cutout that you will use on the Tool Options toolbar or the Advanced Settings palette.
   The tree is a complex cutout. Remember that you can display the cutout as a detailed or boxed outline, if you have not already done so, by setting your preferences.
2. **Place two tree cutouts in the scene as shown here:**



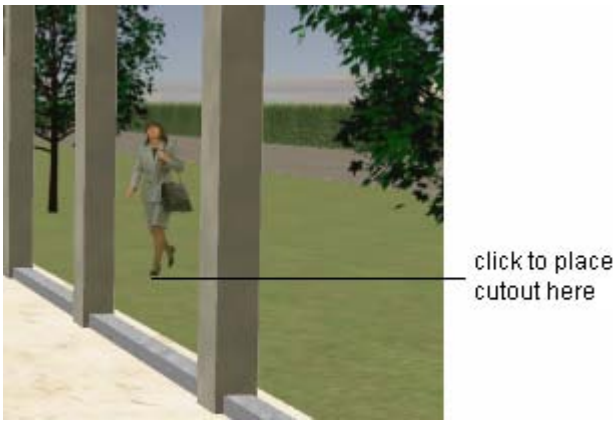
   You may want to zoom in to place the trees.
   Before we continue, lets just look at the Layer Manager. If the Layer Manager is not currently open, you can open it by clicking Show Layer Manager on the Window menu.
   A new Cutouts layer has been added. This shows the number of floating cutouts currently in the scene:

   The cutouts are not actually on this layer as they are stored in the Cutout Manager. The Cutouts layer is more a visual aid to remind you that there are floating cutouts in the scene.
   We shall now add another tree, this time, though, we will place it with its hook point outside of the scene.
3. **Zoom out until you can see a border around the scene in the document window.**
   If you use the Zoom tool, remember to reselect the Cutout tool.
4. **Move your mouse pointer to the position shown below, press the mouse button then drag the outline to the second position shown:**



5. **Release the mouse button to place the cutout:**

6. **On the Zoom menu, click Previous to return to the previous (unzoomed) view.**
   Finally in this exercise, we'll place a woman in the scene.
7. **Apply the style '06 Business lady', and place the cutout on the grass outside the hallway.**



The business lady appears to be walking into the hallway. We will now reverse the direction in which she is walking.

8. **Under the Cutout settings on the Advanced Settings palette, select the 'Mirror W' checkbox, and then reapply the effect:**

9. **Save the scene, but don't close it.**

Constructing special effects

Earlier in this tutorial, we used Construct to create a hedge in the scene. You can also use Construct to create special effects, such as frosted or smoked glass, by changing the opacity amount.

1. **Before we paint the scene, click Material Channel on the View menu to see the different materials of the items outside the hallway.**
2. **Click RGB Channel on the View menu to show the current RGB channel again.**
3. **Apply the style '07 Bronze glass'.**
   This style selects the Construct tool and uses a fill to apply the effect.
4. **Paint the scene by clicking on the inner plane of the second column on the right.**
   The plane is constructed slightly behind the selected plane, producing a realistic representation of tinted glass:

   You'll immediately notice that the painted scenery behind the new plane is visible, but the cutouts are not.

   Before we correct this, let's first look at how the plane was constructed. If you look at the settings on the Tool Options toolbar, you'll see that the Mode is set to 'Replace farther pixels'. If you now look at the Construct settings on the Advanced Settings palette, you will also see a negative offset of –0.137m is specified. These settings instruct Piranesi to change only the pixels that are more than 0.137m behind the selected plane. Also, notice that 'New name each time' is selected to create a new material for the new plane.

   The scenery is visible because the glass was constructed with an Opacity amount of 30% to produce a result about one third between the new effect and the current scene.

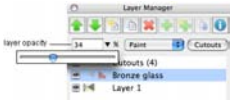
   The cutouts have their own depth and so are now behind the plane you've just created. If we had burnt the cutouts into the scene before constructing the glass, they would still be visible. But, that would also mean they could no longer be tweaked. Here's where layers become really useful. If we constructed the glass on a separate layer, the cutouts would not only be visible and could continue to be tweaked but by switching the layer on and off, we could also further paint the scenery behind the glass. So, let's do this.
5. **Before we create a new layer, undo the constructed glass by pressing ⌘-Z.**
6. **In the Layer Manager, select Layer 1 and then click to add a new model layer.**
7. **Change the name of Layer 2 to 'Bronze glass' using the Layer Properties dialog.**
   If you need a reminder of how to do this, refer back to Adding layers in Tutorial 5.

This time we're also going to change the way the glass is painted. Previously the opacity was set to 30% which made the glass semi transparent. However, once painted you cannot change the percentage of transparency. Layers have their own blending options so if we return the effect opacity to 100% and lower the layer opacity, we can then increase or decrease the opaqueness at any time.

8. **On the Colour, Texture and Grain toolbar, set the Opacity to 100% and then click on the inner plane just as you did in step 4.**

   This time the glass is completely opaque, totally painting out the outside scene:

   Now ensure that the Bronze glass layer is the current layer and then use the Opacity slider to specify the amount of layer transparency:



   Set the percentage to a value between 30-40%. Remember you can always increase or decrease the amount later.

9. **View the Material channel again to see how the material definitions have changed.**

   Although the background items are still visible in the current RGB channel, they are not visible in the Material channel. The newly constructed plane has changed the geometry of the model.

   If you move your mouse pointer over the new plane, you will see on the status bar that the material name 'Construct 2' has been allocated to the plane.

10. **Now display the Materials palette using the Window menu.**

    Each colour you can see in the Materials view is shown, along with the corresponding material name.

    Find the colour that represents the new plane, and click on it.

    The material for the new plane is called Construct 2 (or a higher number if you have constructed more planes in this session).

11. **Type a new name for the material, such as 'Bronze window' and press Enter.**

    The new name is shown in the materials list. You can also change the colour in which the material is represented; see Piranesi Help for details.

12. **Return to the RGB channel using the channel pop-up menu on the status bar.**

Adding reflections to the scene

You can use the Texture Capture feature to calculate reflections and paint them into a scene. Before we capture the reflections, we'll add some more activity to the scene by placing a cutout in the hallway.

1. **Apply the style '08 Business men', and place the cutout as shown below:**

2. **Now apply the style '09 Reflections'.**
   Look at the Texture settings on the Texture palette. The texture type is Captured.
3. **Click the Capture button under the Texture settings, and move your mouse pointer over the scene.**
   The pointer changes to:
4. **Click on the hallway floor.**
   Piranesi calculates the reflections of the items in the scene that would be visible on the floor. A preview of the reflections is then shown.
5. **Ensure that Layer 1 is selected in the Layer Manager and then click on the hallway floor to apply the reflections.**

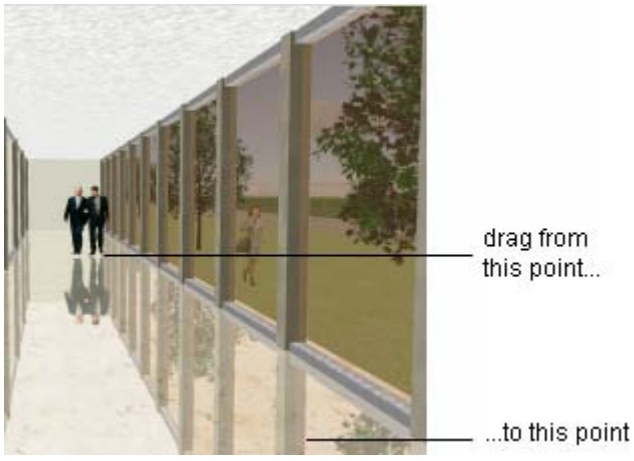
If you look at the Dispersal value for the reflections on the Texture settings, you'll see that it is set to zero which produces absolutely still reflections. You could increase this value for reflections such as those that may appear in rippling water. The floor is also far too shiny, resembling a mirror. If we had applied the reflections to the Bronze glass layer, they would have inherited the layer opacity, set to about 34%.

However, if we later increased this opacity, it would also affect the floor. So in this case, a better solution is to tone down the effect by adjusting the effect opacity instead.

6. **Undo the reflections by pressing ⌘-Z**
7. **To tone down the reflections, set the Opacity Amount to about 50% and then click again on the hallway floor.**

Compare this with the previous result. We can see an improvement, but we can enhance the scene further by fading the effect from the back of the scene to the front, giving the scene some real depth.

8. **To switch on Linear fade, on the Colour, Texture and Grain toolbar, click**
9. **Click** **to the right of the fade buttons to display the Fade palette, and then set up your linear fade:**
   - select **Depth** from the pop-up menu (if necessary)
   - click the **Full Pick** button
   - press-and-hold the mouse button by the feet of the men to identify the Full value, then drag the mouse to the front of the scene and release to identify the None value:



10. **Reapply the effect:**

The floor now has a soft sheen, and the reflections are much more subtle.

Saving reflections

In this exercise, we will create some more reflections and then save them so that we can use them later when we create the dusk scene.

1. **Apply the style '09 Reflections' again.**
2. **We're going to capture the reflections in the glass window, so ensure that you select the 'Bronze window' layer in the Layer Manager. Then capture the reflections in the glass and apply them to the window with the Opacity Amount set to 20%.**

   See the previous exercise for a reminder of how to do this.

   Now we will save the reflections for use later in this tutorial.
3. **Under the Texture settings on the Texture palette, click Save.**
4. **Select a folder in which to save the reflections file, select 'TIFF Document' from the Format list' and type a name for the file.**
5. **Click Save on the Export dialog and accept the default TIFF settings when prompted.**
6. **Under the Texture settings, now click 'Use Saved'.**

   The .tif file you saved is loaded as a raster texture, and the Texture settings are automatically changed to hold the correct settings, such as the appropriate scale.

   We will now save these raster texture settings to a style that we can use later.
7. **On the Style menu, click New.**

   The New Style dialog is displayed.
8. **Type an appropriate name and description for the style.**
9. **Select the library and category that you created in Creating a new library in Tutorial 1 from the pop-up menus, and click OK.**
10. **The front of the hallway looks a bit bare, so complete the daytime scene by applying style '10 Man carrying file'.**

    Place the cutout so that the man looks as though he is walking out of the scene, the way you did with the tree in Adding cutouts to the scene.

You have now completed the daytime hallway scene.

11. **Before moving on to creating a dusk version of the scene, save your work.**

Atmospheric effects

You can use filters to lighten or darken the scene. In this exercise, we will darken the scene to create the impression of dusk.

1. **To enable us to switch between our daytime scene and the darkened scene, create a new layer and call it Dusk.**

   If necessary, click on the Layer Manager toolbar to move the Dusk layer above the Bronze glass layer.

2. **With the Dusk layer selected, apply the style '11 Darken scene', and click on the scene.**

   This style uses a Custom filter with a non-contiguous fill. Custom filter enables you to create your own filters. The filter used in this style darkens the scene:

before using the filter

after using the filter

Look at the Filter settings on the Advanced Settings palette. The Filter action works by altering the colour of each pixel based on its current RGB and the current RGB of neighbouring pixels. The amount by which the current colour of the pixel and its neighbours affects the new colour is controlled by the filter matrix, which is shown in the Filter settings.

In this case, the central value of the grid is 0.8 and the other values in the grid are all zero. This means that each pixel's RGB value is multiplied by 0.8, and the RGB values of its neighbouring pixels have no effect.

Refer to Piranesi Help for more information on setting up customized filters.

We will now darken the outside of the scene even further.

3. **Now apply '12 Darken with burn'.**
   The style sets the Blend mode to Burn, and uses the same filter as the previous style. The Opacity amount is 50%.
4. **Click on one of the window panes.**
   The scenery outside the hallway is darkened considerably:

Adding point lights

In this exercise, we will simulate point lighting in the scene.

1. **Apply the style '13 Point lights'.**
   The Blend mode is set to Light, to mix the current colour with cream to create a soft point light and the Light tool is selected on the Tools toolbar.

   The light Type is set to Point on the Tool Options toolbar. Point light projects the effect in all directions from a central position, to a specified range.
   We are going to add three point lights.

2. **Under the Light settings on the Advanced Settings palette, click Centre Pick and then click on a point towards the front of the ceiling:**

3. **Now, in the Range box under the Light settings, type a range of 4 metres.**
   Light will be emitted from the centre of the point light to a range of 4 metres in all directions.

4. **Click anywhere in the scene.**

Notice how light is reflected off the floor, walls, and the windows but not off the ceiling, similar to a recessed spotlight. This is because the light source centre is in the same plane as the ceiling. When you use the light tool, the items in the scene are painted according to their orientation to the 'light source': Planes orthogonal to the light are painted with full effect, and planes parallel to the light are not painted.

If we add an offset to the light, we can create the effect of a light source suspended from the ceiling.

5. **The offset applies to the surface you pick not the surface painted, so first undo the effect.**

   Type an offset of 0.5 in the 'Pick offset' box on the Tool Options toolbar and then define the centre point again, using the Pick button. Now click again anywhere on the scene.

6. **Add two further point lights by subtracting 5 from the X coordinate (the first coordinate) in the Centre box for each light, and clicking on the scene.**

   The scene should now look like this:

   Complete the scene by adding the reflections that you saved earlier to the windows.

7. **Apply the style that you saved in Saving reflections, and click on the window.**

   The reflections you captured earlier are painted onto the windows.

You have now completed the dusk scene.

8. **Now switch between your daytime and dusk scenes by toggling the Dusk layer on and off**
9. **Save your work and close the file.**

Tutorial 9: Procedural Textures and Thresholding

This tutorial introduces a number of advanced techniques to create halftoning and engraving effects using textures with thresholding, and using filters.

This tutorial is intended as a 'taster'. When you have understood the styles, you can use the features to create your own effects. For example you could try combining other Piranesi features with textures and thresholding.

original scene

using textures and thresholding

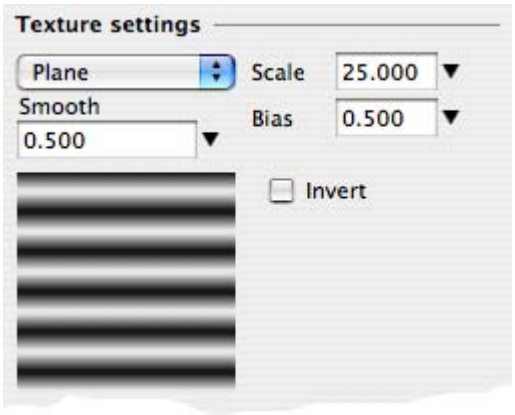
original scene

using halftone filter

Using plane textures

This exercise introduces a new type of texture, called a 'plane' texture.

1. **Open the file 'Stein'.**
   See Opening a file for details of how to locate the tutorial EPix files.
2. **In the Style selector, select the category 'Tutorial 9: Procedural textures and thresholding'.**
   See Setting up the style library for details of how to associate the tutorial style libraries with the style selectors.
3. **Apply the style '01 Clear to white', then fill the scene with white paint, as in previous tutorials.**
4. **Apply the style '02 Plane texture'.**
   Plane texture patterns are 'procedural', similar to the noise texture you met in More textures and blend modes in Tutorial 3. The texture is calculated from parameters that you set on the Texture settings on the Texture palette. If the Texture palette is not displayed, click to the right of the Texture preview box. The current result is shown in the preview box:

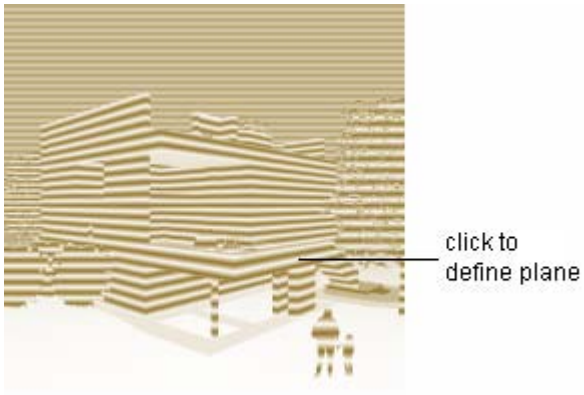
   Note that plane textures are three-dimensional, and the preview shows a cross-section. This means that the pattern you see when you apply the effect depends upon the plane of the surface you paint.

   Plane textures are alpha textures. Therefore when you apply a plane texture, the light and dark areas of the pattern define how heavily the paint is applied; the darker the area, the more paint is used.
5. **Click anywhere on the scene.**

   Objects that are not horizontal have stripes 'projected' onto them, in perspective, so the different planes in the scene are distinguishable.

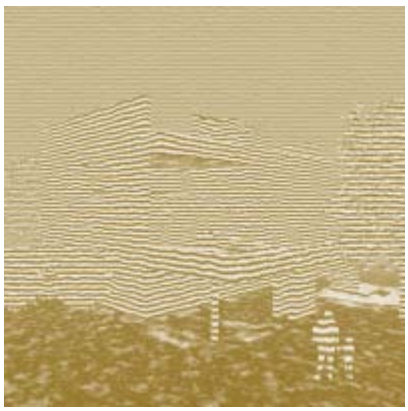
Look at the definition of the style on the Texture palette. The texture lies in the XY plane with normal 0.0/0.0/1.0 (shown as the first three facets in the Plane box), and its origin at zero (shown as the fourth facet). It therefore changes in the Z direction.

6. **Change the Scale to 50 and press ⌘-R to reapply the effect.**
   Increasing the scale produces larger stripes in the pattern.
   We will now select a plane on the scene to change the orientation of the pattern.
7. **Click the Plane Pick button under the Texture settings, then click on the new plane:**



   The preview shown in the Texture settings now shows vertical stripes. The texture lies parallel to the XZ plane with normal (0.0/1.0/0.0), so it changes in the Y direction.
8. **Reapply the effect.**

9. **Press ⌘-Z to undo the texture effect, back to white paint.**
   Even though we have used Reapply more than once, only one 'undo' is necessary to undo the original fill.
10. **Now, apply the style '03 Wavy plane texture', and press ⌘-R to reapply the effect.**
    You can use reapply even when you have undone an action. (You cannot reapply if you have used Undo more than once consecutively.)
    This time the stripes are wavy.



In this style, the Frequency and Amplitude have been set in the Texture settings. The Frequency controls the number of undulations, and the Amplitude defines the height of the undulations. If either setting is zero, the lines are flat.

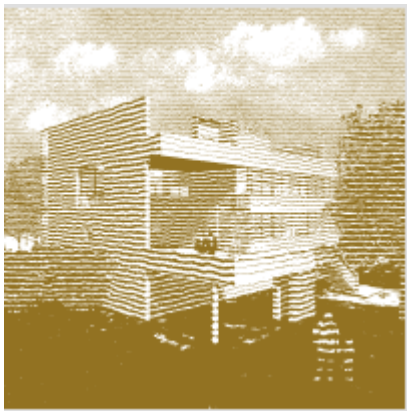
The ground is now speckled. This is because the Plane in this style has been set to the XY plane. The ground is horizontal (parallel to the XY plane) and an Amplitude of 1.0 means that the wiggles of the pattern produce a grainy texture on all horizontal surfaces.

Next, we will add thresholding to the plane texture, to refine the effect.

Thresholding

This exercise shows how you use thresholding to define areas of a scene over which solid paint will be applied, and areas over which no paint will be applied, based on the colour of the scene. The areas can be defined using the lightness and darkness of the Restore RGB or the current RGB. In this case, we shall be using the Restore RGB. Thresholding is useful for creating etching and halftone effects.

1. **Apply the style '04 Plane texture with threshold'.**
   This style is the same as '03 Wavy plane texture', except that the 'Enable threshold' checkbox is selected on the Texture settings of the Texture palette.
2. **Press ⌘-R to reapply the effect.**



   When you use thresholding, all areas darker than the Dark setting are painted, and all areas lighter than the Light setting have no paint applied. For areas that fall between the Dark and Light settings, the amount of paint is dependent upon the lightness of the pixel colour (and on the texture itself).
   In this style, 'Use Restore RGB' is selected in the Texture settings, so the colour in the Restore RGB channel is used. The Light threshold is set to 1.00 and the Dark threshold is set to 0.0. So, the white pixels in the Restore RGB, such as the clouds, have no paint applied, and anything darker is painted.
   You can create a 'negative' image effect by reversing the Light and Dark values. You could also try changing the Soft value, which defines the transition between light and dark areas; a low value gives a sharp transition, and a higher value gives a more gradual transition.
3. **Undo the effect to return to the 'whitened' scene.**
   Alternatively, apply the '01 Clear to white' style, then click on the scene.
4. **Apply '05 Noise texture' and click on the scene.**
   This style is a noise texture. Noise textures are also procedural textures, but the pattern is the same in all directions. We met a noise texture in More textures and blend modes in Tutorial 3.
   As you can see, this has produced a totally random pattern and the image has almost disappeared. We need to apply thresholding to define the areas of the scene over which we want to apply solid paint and no paint.
5. **Under the Texture settings on the Texture palette, select the 'Enable threshold' checkbox.**
   Leave the Light and Dark settings as 1.0 and 0.0 respectively, and the Soft setting as 0.0.
   Reapply the effect.
   Notice how this gives quite a 'mottled' effect.

6. **Now change the Soft parameter to 0.5 and press ⌘-R.**

   Increasing the Soft parameter produces a more gradual transition between the light and dark areas of the effect.

   We can control the granularity of the texture by changing the Scale of the noise pattern. Currently, scale is set to 25.0.

7. **Change the Scale on the Texture settings to 0.5, then reapply the effect.**

   The noise has a much finer texture.

8. **Apply the style '06 Threshold raster texture'.**

   This is a 2D raster texture, with threshold applied. The texture has a set X and Y value, and the pattern is repeated in both X and Y directions.

9. **Click on the scene to paint over the noise grain.**

Practise changing the threshold settings to soften, lighten, and darken the effect. You could also change the scale of X and/or Y.

10. **When you have finished experimenting, save your work and close the file.**

Creating sketchwork effects

You can use halftone filters to create a number of textural effects. In this exercise, we will create the impression of pencil sketching.

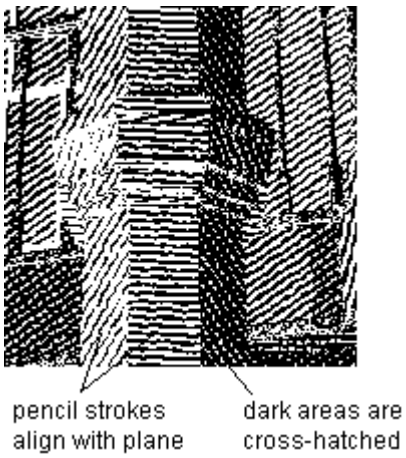
1. **Open the file 'Gatehouse'.**
2. **Apply the style '07 Pencil'.**
   This style uses the Filter tool with a non-contiguous fill. We used the Filter tool in More textures and blend modes in Tutorial 3.
   Look at the Filter settings on the Tool Options toolbar. This time Halftone is selected, with a Pencil pattern. You can use halftone filters to create continuous-tone effects, as used in printing processes.
3. **Click in the scene.**
   The scene looks as though it has been sketched with a pencil.

   Zoom in to look at the detail. The pencil strokes are all at the same angle, which was specified in the Filter settings. The dark areas are painted solid black, and the light areas have been left white.
   If you used the Zoom tool, remember to select the Fill tool again, or apply the style again.
4. **Change the Bias setting on the Tool Options toolbar to 0.3, then press ⌘-R to reapply.**
   The bias controls the contrast between light and dark areas. With a low bias, the scene is much darker because the filter paints more of the lighter areas. Reapply the effect with a bias of 0.9. This time the scene looks 'washed out'.

bias 0.3

bias 0.9

5. **When you have finished experimenting, set an intermediate bias setting, such as 0.65.**
6. **Under the Filter settings on the Advanced Settings palette, change the Angle to zero, select 'Align with normals' and 'Cross-hatch', then press ⌘-R to reapply.**
   Because 'Align with normals' is selected, the direction of the pencil strokes now changes with the orientation of each plane. The dark areas are cross-hatched.



Now we will smudge some of the pencil lines to produce a softer effect.

7. **Apply the style '08 Pencil smudge'.**

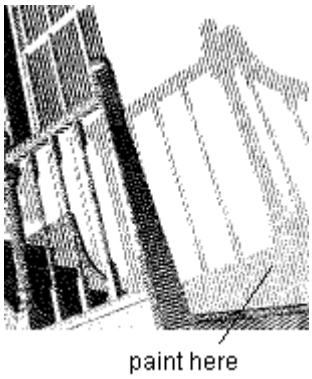
   Smudge is set to 30% on the Filter settings.

   Notice that 'Use Restore' is selected on the Tool Options toolbar; this is because we want the filter to work on the colours in the original scene, rather than the pencil markings.

   The Colour lock is on. Open the Lock Settings palette by clicking on the Locks toolbar. You'll now see that HLS is selected with a Lightness of 5, and 'Use Restore channels' is selected. This means that the first pixel you click on sets the lightness, and only those pixels in the restore channels that have a lightness within 5% will be painted.

8. **Zoom in to the shadows of the banister, and paint over the shadows.**

   Ensure that you start painting on a shadow.



   The pencil lines are 'smudged' into one another.

before smudging after smudging

You can also vary the pencil strokes so that they are further apart or more 'wiggly', by changing the Scale and Frequency settings. Experiment with painting different parts of the scene using different settings. You may want to change the locks. Remember to ensure 'Use Restore' is selected on the Filter settings of the Tool Options toolbar, otherwise the filter will work on the painted scene and you won't see any changes.Press ⌘-Z to undo any changes you don't like.

9. **When you are happy with your pencil work, apply the style '09 Edge', and click in the scene.**
   This style uses the Edge filter to add outlines to the items in the scene.

10. **Save your work to a new name.**
    Now we will use our greyscale scene to create the appearance of coloured pencil work.
11. **On the File menu, click Export, and save the scene to a Portable Network Graphics Image file called 'pencilwork.png'.**
    If you need a reminder of how to do this, look back at Exporting and importing colour images, or refer to Piranesi Help.
12. **Apply the style '01 Clear to white' to fill the scene with white paint.**
13. **Apply the style '10 Coloured pencil grain'.**
    If you saved your pencilwork.png file in the Resource folder, Piranesi automatically opens the png file for you.
    If you did not save pencilwork.png in the Resource folder, Piranesi displays a message saying that the file cannot be found. Click Browse on the Grain palette and find the png file.
14. **Click in the scene.**
    The Colour amount is set to 0%, so the style restores the underlying colour using the pencil marks that we created earlier, to create the effect of coloured pencil work.

15. Save your work and close the file.

You can also use Piranesi halftone filters to create other textural effects, such as newsprint. Refer to Piranesi Help for details.

Congratulations! You have now completed the tutorials.

Finally, if you want to reset the library and category lists to their Piranesi defaults, click on the Style selector.